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26th Congress of the European Society for Paediatric Urology

14 – 17 October, 2015
Prague, Czech Republic

Abstract Book

Introduction



Dear Colleagues,

It is with great pleasure that we provide you the digital abstracts book of 26th Congress of the European Society for Paediatric Urology. This year the meeting is joint with Society for Pediatric Urology, American Association of Pediatric Urologists, American Academy of Pediatrics/Section on Urology, Society for Fetal Urology, International Children's Continence Society and the ESPU-Nurses group.

The scientific program is quite exceptional as we had the privilege to receive a record number of 1045 abstracts and videos! Forty-seven international experts have worked hard to select the best of them according to our traditional objective and anonymous review process.

This year the joint scientific committee has organized for you: 42 scientific sessions, 8 guest lectures, 7 panels, 2 satellite symposia, and 5 educational sessions and workshops.

The meeting of this year will be again a unique occasion to meet and exchange knowledge between pediatric urologists from all over the world. Although the program is quite intensive and busy, the discussion time will be strictly respected to allow fruitful and instructive debates.

We are looking forward to meeting you in Prague.

A handwritten signature in black ink, appearing to read 'Alaa El Ghoneimi'. The signature is fluid and cursive, with a long horizontal stroke at the end.

Professor Alaa El Ghoneimi, MD, PhD, FEAPU
Chairman of the Joint Scientific Committee.

Committees

This meeting is a Joint Meeting with Society for Pediatric Urology, American Association of Pediatric Urologists, American Academy of Pediatrics/Section on Urology, Society for Fetal Urology and International Children's Continence Society.

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ESPU meeting

S1: BASIC SCIENCE 1

Moderators: Nicolas Kalfa (France), His-Yang Wu (USA)

ESPU Meeting on Wednesday 14, October 2015, 13:30 - 15:00

13:30 - 13:33

S1-1 (PP)

★ KCTD13 GENE-DOSAGE CHANGES ARE ASSOCIATED WITH ANOMALOUS LOWER URINARY TRACT DEVELOPMENT

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PURPOSE

The molecular basis for hypospadias and lower urogenital birth defects is poorly understood. Using comparative genomic hybridization arrays (aCGH), we have identified a novel candidate gene, potassium channel tetramerization domain containing 13, KCTD 13 at 16p11.2 in patients with hypospadias, cryptorchidism. KCTD13 encodes a substrate-specific adapter of a BCR E3 ubiquitin-protein ligase complex, which regulates the cytoskeleton and cell migration. We hypothesize that gene-dosage defects in KCTD13 result in aberrant development of the GU tract.

MATERIAL AND METHODS

Genomic DNA from patients with hypospadias, cryptorchidism, ambiguous genitalia and control patients was analyzed by aCGH. Quantitative PCR was performed using CNV-taqman assays to validate putative regions of deletion or duplication. In-situ hybridization (ISH) of mouse embryos was performed to elucidate KCTD13 expression. Phenotypic analyses of Kctd13 +/- and -/- mice are being performed.

RESULTS

A de novo 16p11.2 deletion encompassing KCTD13 was identified in a child with hypospadias by aCGH. A ~600 kb paternally (asymptomatic) inherited duplication in the same region was identified in a second patient with hypospadias, cryptorchidism and micropenis. We identified 2 more patients in our cohort and 31 other patients in literature and public databases (DECIPHER) with defects in KCTD13 and concomitant GU anomalies. These GU anomalies range from ectopic testes to ambiguous genitalia. In-situ hybridization of mouse embryos shows robust expression of KCTD13 in the entire urinary tract, particularly in the genital tubercle. Immunofluorescent staining of mouse urethra shows robust expression of KCTD13 in the urothelium. Preliminary phenotypic analyses of Kctd13 +/- mice reveals cryptorchidism in 2/4 (50%) of mice and 0/4 control mice.

CONCLUSIONS

KCTD13 gene-dosage changes are found in a subset of children with hypospadias, cryptorchidism and lower GU tract anomalies. Using CRISPR genome editing, a kctd13 +/- and null mouse was produced and currently undergoing phenotypic analyses to prove causation beyond association.

IL-33 MAST CELL AXIS IN BLADDER INFLAMMATION AND PAIN

Siam OOTTAMASATHIEN¹, Wanjian JIA¹, Austin SCHULTS¹, Xiangyang YE², Laura SPRINGHETTI¹, Jeremiah ALT³ and Glenn PRESTWICH⁴

1) University of Utah, Pediatric Urology, Salt Lake City, USA - 2) University of Utah, Biostatistics, Salt Lake City, USA - 3) University of Utah, Otolaryngology, Salt Lake City, USA - 4) University of Utah, Medicinal Chemistry, Salt Lake City, USA

PURPOSE

We've previously demonstrated the naturally occurring urinary anti-microbial peptide LL-37 can induce bladder inflammation and pain. Our aim was to establish a molecular and cellular axis by which this occurs. We first hypothesized that IL-33 is upregulated in LL-37 induced bladder injury. We further hypothesized that both bladder inflammation and pain, along with IL-33 levels, are attenuated in mast cell deficient mice (C-kit(-/-)).

MATERIAL AND METHODS

To test hypothesis one, C57Bl/6 mice bladders were challenged with LL-37 for 1hr (six concentrations). Controls consisted of saline. Bladders were harvested after 24hrs. Both immunohistochemistry (IHC) and quantitative ELISAs were performed to detect IL-33. For hypothesis two, both C-kit(-/-) and normal C57Bl/6 mice (controls) were challenged with four concentrations of LL-37. Pain responses with von-Frey filaments were performed before LL-37 instillation and after 24hrs. Bladders were obtained after 24hrs, evaluated with histology, tissue myeloperoxidase (MPO), and IL-33 ELISA's.

RESULTS

IHC revealed no evidence of IL-33 in controls. In LL-37 challenged tissues, IL-33 was observed in urothelium and fibroblasts. ELISAs for IL-33 levels in LL-37 challenged tissues demonstrated a dose response rise. Histologically, C-kit(-/-) bladders were less inflamed compared to normals. Quantifying inflammation with MPO confirmed significantly less inflammation within C-kit(-/-). Pain responses were also significantly less in C-kit(-/-). Substantial differences in IL-33 levels were observed at higher concentrations of LL-37 challenge (C-kit(-/-):567 pg/ml vs. normal:972 pg/ml).

CONCLUSIONS

Our findings demonstrate a novel inflammatory and pain axis, implicating IL-33 and mast cells. Future therapeutics aimed at targeting the IL-33 mast cell axis may serve as useful treatment approaches.

TESTING THE URETERIC BUD THEORY

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PURPOSE

During development, each component of the genitourinary (GU) tract must join in a stereotypical way to produce a functional urinary outflow tract. The anatomy of this system is complex and changes rapidly throughout embryonic development. Congenital anomalies of the kidney and urinary tract (CAKUT) are common and represent a substantial source of morbidity in children. There are limited publications on human developmental anatomy and great reliance has been placed on animal models, primarily the mouse. We sought to analyze human embryos to establish detailed information on the development of the GU system.

MATERIAL AND METHODS

With institutional review board approval, human embryos were serially sectioned and representative sections were stained with hematoxylin and eosin for histological analysis. For immunohistochemistry, primary antibodies to p63, caspase-3, PAX-2, upk, krt5, FoxA2, and e-cadherin were used. Because the structures and developmental pathways of the mouse are known, we compared human embryos to equivalent stages in mouse.

RESULTS

Insertion of the nephric ducts (NDs) into the cloaca occurs at approximately 3 weeks in humans (embryonic day 9 in mouse), creating a connection between the upper and lower urinary tracts. The ureteric bud emerges from the posterior aspect of the NDs shortly after. The ureters are joined to the most posterior ND segment, known as the common nephric duct (CND). The CND in humans appear to be larger than in mouse. The CND does not differentiate into the bladder trigone but rather undergoes apoptosis, contradicting the Ureteric Bud Theory of Mackie and Stephens. This apoptosis occurs near the sinus ridge, a raised epithelial structure situated at the dorsal aspect of the urogenital sinus. Signals from this site may be important for normal ureteral insertion.

CONCLUSIONS

This research is an important basis for understanding human GU tract anatomy and development and will be critical for understanding the basis of CAKUT.

ELUCIDATING THE FUNCTION OF THE POLYCOMB REPRESSIVE COMPLEX 2 EPIGENETIC PROGRAM IN BLADDER DEVELOPMENT AND REGENERATION

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PURPOSE

The polycomb repressive complex 2 (PRC2) functions as an epigenetic modifier. Through trimethylation of lysine 27 on histone H3 (H3K27me3), PRC2 represses gene expression. While PRC2 is critical in development and tissue homeostasis, no studies have examined its role in the bladder. The aim of this study was to determine if PRC2 functions in urothelial development and regeneration and repair.

MATERIAL AND METHODS

Using a conditional knock-out strategy, we generated mice in which *Eed*, the main structural component of PRC2, was deleted in bladder urothelium. Urothelial development, differentiation, and regeneration were assessed through immunohistochemical and immunofluorescence analyses and RT-PCR analysis.

RESULTS

H3K27 trimethylation is highly enriched in wild-type bladder urothelium compared to smooth muscle cells. Conditional deletion of *Eed* leads to loss of H3K27me3 marks in bladder urothelium. This results in aberrant urothelial differentiation characterized by premature differentiation of CK5+ basal cells and reduced numbers of p63+CK5- intermediate cells. Likewise, loss of *Eed* leads to impaired proliferation of urothelial cells, which correlates with increased expression of the cell cycle inhibitor p16. Loss of PRC2 activity also causes dysregulation of sonic hedgehog (Shh) signaling, a master regulator of bladder development. Studies are underway to evaluate whether loss of *Eed* impairs urothelial regeneration following chemical injury with cyclophosphamide or urinary tract infection.

CONCLUSIONS

PRC2 temporally regulates urothelial differentiation and proliferation during embryogenesis, partly through its actions on Shh signaling and p16 expression. The role of PRC2 in homeostasis and regeneration of adult urothelium is actively being investigated. These results indicate that urothelial development and differentiation is under epigenetic control.

AQUAPORIN 3 EXPRESSION INCREASES WITH GESTATIONAL AGE IN FETAL PORCINE BLADDER

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PURPOSE

The bladder is considered an organ for voiding and storage of urine, with the urothelium serving as an impermeable barrier. Recent discovery of aquaporins in the bladder urothelium in rodents and later on also in humans, challenges this notion of impermeability. Upregulation of aquaporins in response to dehydration or bladder outlet obstruction and downregulation following transitional-cell-carcinoma has been shown. This emphasizes the need to better understand the function and development of aquaporins, as well as their role in bladder diseases. The present study aims at establishing basic knowledge about the expression of aquaporin 3 (AQP3) in the fetal porcine bladder.

MATERIAL AND METHODS

Three pregnant sows at 60, 80 or 100 days of gestation were sacrificed (full term: 110 days). Fetal bladders were immediately removed and whole wall samples were snap frozen and stored at -80°C . Genetic gender determination was performed and fetuses with uncertain gender determination were excluded. AQP3 mRNA expression was analyzed using QPCR, beta-actin was used as the reference house keeping gene. Results were compared using two-way ANOVA.

RESULTS

A total of 41 samples were analyzed. Gestational age was either 60 (n=11), 80 (n=14) or 100 days (n=16). AQP3 was expressed in all samples. AQP3 mRNA expression was increased in the fetal porcine bladder with increasing gestational age ($p < 0,001$). There was no significant difference in AQP3 expression between genders ($p = 0,71$).

CONCLUSIONS

Expression of AQP3 in fetal porcine bladder is demonstrated with increasing expression during gestation. To our knowledge aquaporins in the porcine bladder tissue have not previously been studied. This exciting new knowledge contributes to the ongoing discussion on reviewing the dogma that the lower urinary tract has an impermeable barrier function

PROTOTYPE OF A NOVEL UROFLOWMETER SYSTEM UTILIZING DIAPER-EMBEDDED SENSOR

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PURPOSE

Method for non-invasive recording of micturition is limited in infants before potty-training. We devised a prototype of novel uroflowmeter system utilizing a sensor for urine soaking to be embedded in diaper, and investigated whether this system can effectively record electrolyte fluid as surrogate of urine.

MATERIAL AND METHODS

Sixty-four pairs of electrodes are arranged in an 8x8 matrix on a glass epoxy circuit board. This sensing system multiplexes the electrodes' pairs to acquire an impedance value of each pair. Electric impedance through a diaper is highly capacitive (insulated) under dry condition. When urine soaks and makes the diaper wet, it's internal impedance changes conductance. For evaluating the system, multiple cotton cloths are placed on the sensor board as an absorbing layer, and 1% phosphate buffered saline (PBS) as a test liquid was dropped on it. The dropping flow rate was controlled with a syringe pump and change in impedance distribution was recorded.

RESULTS

Time variations of admittance value (inverse of impedance) could be captured for each electrode pair. Admittance distribution varied along with the diffusion of the test liquid, and diffusing speed of the admittance distribution conformed to the flow rate in a linear correlation at the rate between 1 to 11ml/sec.

CONCLUSIONS

This prototype can create novel and non-invasive diaper-embedded sensor system for infants before potty-training. Such system may enable precise analysis of post-natal development of micturition, congenital neurogenic bladder, and pre-and post surgical status of hypospadias repair in infancy.

THE IMPACT OF AUTOPHAGY IN NEUROPATHIC BLADDER REMODELING

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PURPOSE

Neurogenic bladder dysfunction is the result of disease or injury to the neural pathways and commonly occurs in patients with meningomyelocele or after spinal cord injury. During the pathogenesis the smooth muscle cells (SMC) shift from contractile SMC phenotype towards a synthetic type. In muscular disorders increased autophagy is known to protect cells from deterioration by compensating for defects in lysosome function. However, the accumulation of autophagosomes can also impair cell function over time. Autophagy may play an important role in remodeling of bladder SMC in children with neuropathic bladder. In this study we investigated the role of autophagy in neuropathic bladders in the pediatric population.

MATERIAL AND METHODS

Full thickness bladder biopsies were taken from children with neuropathic disorder. Samples obtained from healthy donors without urological problems were used as control. A piece of bladder tissue was snap frozen for genetic analysis and another piece was fixed for immunostaining. Samples were stained with SMC lineage associated markers calponin, smoothelin, α -SMA and autophagy proteins LC3, Atg5 and Beclin1. In addition the expression of autophagy genes and proteins were investigated by real time PCR and Western blot analysis.

RESULTS

We found that the ATG5 gene, a key regulator of autophagy, is upregulated in neuropathic muscle tissue compared with normal bladder. At protein level increased ATG5 protein was repetitively shown in WB and immunostaining. Neuropathic bladder muscle exhibited a punctated immunostaining pattern for LC3 in subset of SM confirming accumulation of autophagosomes. Pronounced elevation of ATG5 in SM in neuropathic bladder tissue co-localized with a downregulation of the key contractile proteins smoothelin and calponin.

CONCLUSIONS

Our study reveals that autophagy is important factor in the remodeling of SMC and functionality of bladder SM tissue in neuropathic bladder. Since autophagy can be influenced by oral medication this research might lead to novel strategies preventing the remodeling and deterioration of neuropathic bladder muscle tissues.

POSTERIOR URETHRAL VALVES: ONLY A TINY MEMBRANE?

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PURPOSE

Despite the high incidence of congenital anomalies of the kidney and urinary tract (CAKUT), the genetic mutations responsible for the majority of cases remain unknown. Some familial cases of posterior urethral valves (PUV) have been described. The goal of this study was to assess the presence of sub-microscopic chromosomal imbalances (microdeletions and microduplications) by molecular karyotyping in a cohort of PUV patients.

MATERIAL AND METHODS

224 patients with CAKUT were prospectively included between September 2012-March 2015. Forty-six (20.5%) had PUV. With provided informed consent, genomic DNA was isolated from peripheral blood samples.

RESULTS

Copy number variations (CNV) were detected in 18 patients with CAKUT (8%). Of the 18 patients with CNV, patients diagnosed with PUV were the most frequent (n=7, 39%), followed by VUR (n=4; 22%) and MCDK (n=3; 17%). CNV were detected in 15.2% of PUV patients (7/46). Duplications were identified in 5 patients, deletions in 2. Parents from 5/7 cases harbouring CNVs participated in the study and revealed a de novo mutation in 1 case and 4 inherited paternally cases. Among the seven patients with CNV, nearly 60 genes were contained in the altered genomic regions.

CONCLUSIONS

Our data reveals a significant contribution of a duplication-type CNV, mostly inherited, to PUV malformation. Novel genomic regions were identified providing a list of PUV causing candidate genes. In a selected population of valve patients, further studies will be conducted in order to correlate the genotype-phenotype and determine the potential implication of CNV in the renal function prognosis.

DEVELOPMENTAL REGULATORS YAP/TAZ IN THE BLADDER RESPONSE TO INJURY.

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1) *University of Toronto, Institute of Medical Sciences, Toronto, CANADA* - 2) *Research Institute, Sickkids Hospital, Developmental and Stem Cell Biology, Toronto, CANADA* - 3) *Sickkids Hospital, Division of Urology, Department of Surgery, Toronto, CANADA*

PURPOSE

In muscle cells, YAP or TAZ localization to the nucleus can promote either growth or differentiation. While YAP has been studied developmentally in the urinary tract, little is known concerning the regulation of YAP or TAZ and its downstream partners in models of mechanical stress in bladder smooth muscle. **PURPOSE:** To examine the regulation of YAP and TAZ transcription and localization during bladder mechanical strain. **HYPOTHESIS:** YAP and TAZ and downstream targets are differentially regulated during mechanical strain injury.

MATERIAL AND METHODS

For in vitro stretch, neonatal rat bladder smooth muscle cells (BSMC) were exposed to 0 or 5% elongation in vitro. To create partial bladder outlet obstruction (PBO) in Sprague-Dawley female rats (n=8), a silk suture was tied around a 0.9 mm steel rod. The rod was removed with suture remaining in place. Controls included sham-operated rats (n=6). QPCR was performed for key YAP/TAZ pathway members (MST, YAP, TAZ, TEADs 1-4) and YAP downstream targets. YAP/TAZ nuclear localization, which indicates activation, was studied by immunofluorescence.

RESULTS

During mechanical strain expression of YAP mRNA was maintained, while TAZ mRNA expression was significantly decreased ($p < 0.05$). A 27-fold reduction ($p < 0.05$) in MST1 mRNA expression during mechanical strain was consistent with an observed increase YAP protein nuclear localization ($p < 0.03$). TAZ was also downregulated during PBO ($p < 0.01$). YAP nuclear localization was correlated with increased hypertrophy, but YAP mRNA did not change. Many transcriptional targets of YAP/TAZ were upregulated during mechanical strain and obstruction ($p < 0.03$).

CONCLUSIONS

The YAP-TAZ complex responds to both cell strain and PBO in vivo with associated SMC growth and hypertrophy, using both transcriptional and post-translational mechanisms.

ROLE OF EZH2 IN INFECTION-INDUCED URO-EPITHELIAL CELL PROLIFERATION

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PURPOSE

Upon Urinary Tract Infection (UTI), UPEC infected superficial umbrella cells undergo apoptosis and exfoliation. In regenerating endoderm such as uro-epithelium, signal transduction cascades alongside epigenetic events underlie proliferation and differentiation events. Understanding that UPEC can alter epigenetic machineries upon infection as shown from in previous research (Lab Invest, 2011), we investigated if UPEC induced proliferation is dependent upon another epigenetic events, Histone lysine27 trimethylation (H3K27me3).

MATERIAL AND METHODS

To establish an association between proliferation and EZH2, immunofluorescence was used to quantify the expression of EZH2 and PCNA in UPEC inoculated HTB9 cells within 3 days (p.i.). H3K27trimethylation was also examined grossly by immunostaining. To establish a causation relationship between cell proliferation and EZH2, cell viability assay was performed to quantify the metabolic activity of UPEC inoculated HTB9 cells treated with UNC1999, a catalytic inhibitor of EZH2, 48 hours p.i. The effect of GSKJ4, a catalytic inhibitor of JMJD3, involved in de-methylation at H3K27, was also examined.

RESULTS

UPEC inoculation of HTB9 cells significantly increases H3K27me3 levels 48 hours post-inoculation (p.i.). In HTB9 cells, UPEC induced a significantly higher expression ($p < 10^{-15}$) of EZH2 and PCNA than control within 3 days of post-inoculation. These expression levels correlated with each other ($R^2=0.74$, $p < 0.05$). A significant reduction of viability is also found in UPEC inoculated cells treated with UNC1999, vs. vehicle. GSKJ4 further enhanced PCNA expression in FIM H+ inoculated cells, confirming the positive role that EZH2 plays in UPEC-induced proliferation.

CONCLUSIONS

The results from our study have implications in enhancing progeny cells' defense against chronic UTI via manipulating the epigenetic aspect of host cells' response to infection. It also provides potential epigenetic markers that help to evaluate the risk of UTI reinfection in clinical settings.

A NEWLY IDENTIFIED ROLE FOR INTERLEUKIN-22 IN BLADDER IMMUNITY

Michael HSIEH¹ and Jared HONEYCUTT²

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PURPOSE

Bacterial and parasitic urinary tract infections(UTI) plague many children but our understanding of immunity to these pathogens remains poor. Recent data indicates that during infection of other epithelial organs, interleukin-22(IL-22) is crucial for epithelial immunity. We hypothesized that IL-22 would prove crucial during UTI.

MATERIAL AND METHODS

IL-22-null(KO) and wild type(wt) mice underwent bladder wall injection with *S. haematobium* eggs(eggs) or transurethral uropathogenic *E. coli*(UTI89) infection. Bladder RNA and protein expression was analyzed by qPCR and microarrays and immunofluorescence, and infiltrating cells characterized by flow cytometry. Urine, bladder, and kidney cfu were measured in UTI89-infected mice.

RESULTS

Bladder levels of IL-22 and its soluble binding protein(IL-22BP) increased after egg exposure. Genes typically induced by IL-22 were expressed at higher levels after egg injection. IL-22 stimulation of bladder tissue and the MBT-2 bladder cancer cell line induce expression of antimicrobial proteins. IL-22 receptor- α 1 expression was detectable in the urothelium by immunofluorescence and qPCR.

Egg injection into IL-22-KO vs wt mice induced differential expression of genes related to transferase activity and epithelial cell development. Uroplakin gene expression was downregulated in egg-injected, IL-22-KO mice vs. wt counterparts. These decreases in uroplakin expression suggest that, as in the gut, IL-22 replenishes epithelia during infection-related injury.

IL-22-KO and wt mice were transurethrally infected with UTI89. FimH is an adhesin used by type I piliated bacteria like UTI89 to bind to the uroplakins of mature urothelial cells, permitting urothelial colonization during UTI. IL-22-KO mice had less urine, bladder, and kidney bacteria. Giving stabilized IL-22 cytokine (IL-22-Fc) to UTI89-infected mice led to higher kidney bacterial counts and increased morbidity.

CONCLUSIONS

Our data underscore IL-22's importance in urinary tract immunity, and its interference with clearance of bacteria from the urinary tract, potentially through its role in maintenance of mature urothelium.

THE CREATION OF THE SKIN-CNS-BLADDER REFLEX ARC - AN EXPERIMENTAL VERIFICATION

Pavel ZERHAU¹, Matej HUSÁR¹, Zdenek MACKERLE², Eva BRICHTOVA², Daniela SOCHURKOVA², Martin KUBÁT¹, Eduard GOPFERT³ and Martin FALDYNA³

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PURPOSE

Somatic-to-autonomic ventral root anastomosis remains an insufficiently verified neurogenic bladder treatment method. Specifically, possible detrusor-sphincter synergy during artificial stimulation is unclear and requires verification.

MATERIAL AND METHODS

During 2012 and 2014, 34 male rabbits underwent laminectomy. Under electromyographic (EMG) and urodynamic controls, ventral spinal roots leading to suitable musculocutaneous segments (donor, L5-S1) and detrusor muscle (recipient, S1-S2) were located, resected and intradural anastomosis of donor and recipient root was performed. After 8-16 months (mean 11), the artificial reflex arc's function was examined (to date in 13 rabbits). Skin segments L5-S1 and the spinal roots above the anastomosis were stimulated, detrusor and sphincter EMG response and intravesical pressure (Pves) were monitored.

RESULTS

EMG confirmed detrusor response to peripheral skin stimulation in 7 (54%) animals and sphincter response in 8 (62%). Five (38%) animals displayed elevated Pves up to 15 cm H₂O. Root stimulation induced detrusor and sphincter EMG response in 8 (62%) and 10 (77%) rabbits, respectively, and 4 (31%) animals displayed increased Pves up to 24 cm H₂O. Micturition was not induced in any animals, external sphincter activity was never inhibited. Hind limb paresis occurred in 2 (15%) animals and spinal lesion in 4 (31%).

CONCLUSIONS

Lumbar-to-sacral-nerve rerouting is a technically manageable method. Only in a limited percentage of cases, however, can the method achieve positive functional results, i.e. demonstrable detrusor contractions and elevated intravesical pressure. Physiological micturition without detrusor-sphincter dyssynergia did not occur in our experiment. Supported by Grant IGA NT 13871-4

EXPRESSION AND ANTIMICROBIAL FUNCTION OF REG3GAMMA DURING URINARY TRACT INFECTION

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PURPOSE

Reg3g is an antimicrobial peptide (AMP) expressed by gastrointestinal, pulmonary and integumentary epithelium. Its expression and antimicrobial function during urinary tract infections (UTI) is unknown. We hypothesized that Reg3g is induced by uropathogens and required for UTI clearance.

MATERIAL AND METHODS

6 week old C67BL/6 wild type (Reg3g+/+) and Reg3gknock out (Reg3g-/-) female mice were inoculated transurethrally with 10⁸ colony forming units (CFU) uropathogenic Escherichia coli (UPEC), Enterococcus faecalis, or Staphylococcus saprophyticus. Mice were sacrificed 24 hours post infection (hpi). We measured Reg3g mRNA by qRT-PCR, Reg3g protein with immunoblotting and immunofluorescence, inflammatory cells using flow cytometry, and bladder bacterial burden. We also tested bactericidal activity of recombinant Reg3g toward 10⁵ CFU UPEC or S. saprophyticus.

RESULTS

Reg3gmRNA and protein expression was significantly induced in a time dependent manner in Reg3g+/+ bladders after UPEC infection. Renal Reg3gmRNA levels increased significantly in response to UPEC and Gram-positive uropathogens. Reg3g protein localized to intermediate cells of infected bladder and renal urothelium and its expression was mutually exclusive from that of Uroplakin 3a. There was no difference in inflammatory cell recruitment or recovery of bacterial uropathogens in Reg3g+/+ and Reg3g-/- mice following infection. Recombinant Reg3g demonstrated dose-dependent bactericidal activity toward S. saprophyticus but did not kill UPEC.

CONCLUSIONS

Urothelial Reg3g expression increases in response to Gram-positive and UPEC infection, but Reg3g is dispensable for bacterial clearance and leukocyte recruitment. We propose that Reg3g may synergize with other AMPs or serve a role in urothelial regeneration/barrier function following bacterial infection.

A NATIONWIDE REGISTER STUDY ON MATERNAL AND FOETAL FACTORS IN BLADDER EXSTROPHY IN SWEDEN

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PURPOSE

Bladder exstrophy is a rare congenital complex malformation where the underlying cause is largely unknown with both environmental and genetic mechanisms involved.

The aim of this study was to conduct a nationwide epidemiological study related to maternal and foetal risk factors of bladder exstrophy in Sweden 1973-2011.

MATERIAL AND METHODS

120 patients were identified in the Medical Birth Register with ICD codes; 753.50, 753F and Q64.1, 1973-2011. The cases were matched with 5 controls per patient for calendar year of delivery and sex, and a case-control study was performed by linkage between several national registers.

RESULTS

The study showed a total live-birth prevalence of 2.98:100 000 with a male-to-female ratio of 1.14:1. We found a higher risk among mothers with Nordic origin of birth, higher age, extremes of BMI and smoking. Neither maternal disease, parity nor assisted conception were identified as risk factors for bladder exstrophy. Delivery mode, birth weight, gestational week at birth, Apgar score and survival rate did not differ from controls. Associated malformations were present in 7.5% of the cases, including anal atresia, esophageal atresia, CDH, cardiac malformations, cleft palate and malformations of extremities. 41% had surgery for congenital inguinal hernia and 11% of the boys had surgery for retentio testis.

CONCLUSIONS

This national register study on bladder exstrophy demonstrated a prevalence of 2.98:100 000 live-births with an almost equal sex ratio. The majority of the cases were isolated without major associated malformations. Nordic maternal origin of birth, higher age, extremes of BMI and smoking were associated with higher risk.

CLARIFICATION OF MAMMALIAN CLOACA MORPHOGENESIS USING HIGH-RESOLUTION EPISCOPIC MICROSCOPY

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PURPOSE

The cloaca of placental mammals is divided during embryogenesis but the underlying mechanism remains obscure. Furthermore, growing evidence suggests that the incompatibility exists between experimental findings and the anticipated outcomes of the classical septation models.

MATERIAL AND METHODS

We use high-resolution episcopic microscopy to examine a series of normal and mutant mouse embryos in which the detailed 3-dimensional morphological features are illuminated and "time-lapse" imaged. A total of nine stages of wild type embryos from day 9.5 to 13.5, 4 stages of *Dkk1* mutants with imperforate anus phenotype and 2 stages of *Shh* mutants with persistent cloaca phenotype were analyzed. Virtual sections and 3-D video were generated. Relative position of each involved structures were examined using the standard point of reference along the rostrocaudal axis.

RESULTS

The dorsal peri-cloacal mesenchyme (dPCM) marks the caudal boundary of the cloaca and unexpectedly, the dPCM remains at a fixed position while other surrounding mesenchymal tissues grow and shift caudally. Stationariness of the dPCM is likely important for narrowing and eventual occlusion of the cloaca. Indeed, *Shh* mutants exhibit a hypoplastic defect of the dPCM. Conversely, *Dkk1* mutants have hyperplastic dPCM.

CONCLUSIONS

We show that dPCM is critical for cloaca septation. The presumptive urorectal septum is not observed. Together, these findings provide supporting evidence of an occlusion model and offer a new framework to investigate molecular basis of urogenital and anorectal development and birth defects.

S2: BASIC SCIENCE 2

Moderators: Berk Burgu (Turkey), Christian Radmayr (Austria)

ESPU Meeting on Wednesday 14, October 2015, 15:35 - 17:05

15:35 - 15:38

S2-1 (PP)

★ EFFECTIVENESS OF ARGON NOBLE GAS FOR KIDNEY PRESERVATION IN A PRECLINICAL MODEL OF PEDIATRIC LIVING DONOR TRANSPLANTS.

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PURPOSE

Taking into account that it is nowadays possible to prolong preservation of perishable food products under modified atmosphere, we developed an innovative method for organ preservation. The use of noble gas to saturate a cold-storage solution to preserve kidney graft functionality and integrity was investigated in an clinically relevant porcine preclinical model.

MATERIAL AND METHODS

We developed a protocol based on the saturation of a cold-storage solution Celsior saturated with pure argon (Argon-Celsior) or xenon (Xenon-Celsior) in a established pig-model of kidney autotransplantation (Faure A et al. Transplant Proc. 2013;45:672-6). Celsior saturated with atmospheric air (Air-Celsior) was used as a control. The left kidney was removed and Air-Celsior (n=8), Argon-Celsior (n=8) or Xenon-Celsior (n=6) was used at 4°C to flush and store the transplant for 30h. Heterotopic autotransplantation and contralateral nephrectomy were performed. Renal function parameters were monitored for 21 days. Survival and histological characteristics were addressed.

RESULTS

Argon-Celsior vs Air-Celsior: i) improved graft function recovery as monitored using creatinine clearance (116 ±15 ml/min vs 418.3 ±16.5 ml/min at postoperative day 14, p=0.05), fraction of excreted sodium, and tubulopathy duration; ii) enabled diuresis recovery 2-3days earlier; iii) improved survival (7/8 vs 3/8); iv) preserved histological structures as explored by monitoring fibrosis, tubular lesions and inflammation. In contrast, the use of Xenon-Celsior was detrimental and no animal survived at day-8. The positive effect of argon is not attributable to noble gases as a group.

CONCLUSIONS

Saturation of a preservation solution with argon improves function recovery, and hence ex vivo preservation of the transplant during static cold-storage. The manipulation of the gas component of a preservation medium constitutes a promising approach to improve graft preservation in clinical conditions.

★ INTERACTION BETWEEN MTHFR 677C>T AND PERICONCEPTIONAL FOLIC ACID SUPPLEMENTATION IN THE RISK OF HYPOSPADIAS

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PURPOSE

Hypospadias is a congenital malformation of the penis with the meatus located on the ventral side. Both environmental factors and genetic predisposition are believed to play a role in the pathogenesis. As adequate folate levels are essential during embryogenesis but are reduced by the C677T polymorphism in the methylenetetrahydrofolate reductase (MTHFR) gene, we studied the role of maternal periconceptional use of folic acid supplements and the mother and child MTHFR C677T polymorphism in the etiology of hypospadias.

MATERIAL AND METHODS

We conducted a case-control study among 914 hypospadias cases and 711 population-based controls from a large data- and biobank, born between 1990 and 2012. Information on folic acid use was derived from maternal questionnaires and DNA from mother and child was used to assess the MTHFR C677T polymorphism using Taqman assays. In the analyses, we assumed a dominant effect of the polymorphism.

RESULTS

Preliminary univariable analyses showed a small protective effect of folic acid supplements on the risk of hypospadias (OR=0.8, 95%CI: 0.6-1.0). No associations were found for mother or child MTHFR C677T polymorphisms (both OR=1.1; 95%CI: 0.9-1.4). However, lack of folic acid supplement use in combination with carrying the MTHFR C677T polymorphism increased the risk of hypospadias (child: OR=1.5; 95%CI: 1.1-2.1, mother: OR=1.5, 95%CI: 1.1-2.2).

CONCLUSIONS

This study showed an increased risk of hypospadias when no folic acid supplements were used and mother or child carried the MTHFR C677T polymorphism.

COMPLETE PENILE DISASSEMBLY FOR REPAIR OF EPISPADIAS CAUSES ERECTILE TISSUE ALTERATIONS

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PURPOSE

Several cases of complete or partial penile corporal body loss have been reported following complete penile disassembly for the repair of epispadias in the recent literature. Injury to the penile blood supply during radical soft-tissue mobilization has been proposed as an etiology of this catastrophic complication. To better characterize the effects of the current techniques for epispadias repair on corporal tissue, the authors investigate possible changes in vascularization and viability of corpus cavernosa after complete penile disassembly and modified Cantwell-Ransley epispadias repair.

MATERIAL AND METHODS

The Johns Hopkins Committee for Animal Care and Use approved the experimental protocol (RB14M38). Sixty four rabbits were allocated into four groups: Control group, Sham operation (penile degloving), complete disassembly model, and Cantwell-ransley technique model. On weeks 2, 4, 12, and 24 post-op the penile tissue was harvested. Immunohistochemical antibody staining was performed for endothelial (CD31) factor. Terminal deoxynucleotidyl transferase biotin-dUTP nick end labeling (TUNEL) assay was used for the assessment of apoptotic indices.

RESULTS

The expression of CD31 and the number of microvessels was significantly ($P < 0.05$) lower in complete disassembly group compared to the other groups in all time points while no significant difference was observed between the Cantwell-Ransley group, the sham operation and control group. Moreover, apoptosis was markedly increased in the group that underwent complete disassembly technique when compared to sham or control group ($p < 0.05$). However, the apoptosis index was consistent between the sham, control and Cantwell-Ransley group.

CONCLUSIONS

Complete detachment of the urethra from corpus cavernosa may alter the endothelial and vascular structure of erectile tissue and increases the apoptotic process in cavernosal cells, possibly causing erectile dysfunction as these patients age. Further studies are needed to evaluate the effect of complete and partial urethral detachment on erectile function.

COMBINATION OF GROWTH HORMONE WITH TESTOSTERONE IS HELPFUL TO NORMALIZE PENILE SIZE IN HYPOGONADAL RATS WITH MICROPENIS

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PURPOSE

Testosterone treatment of micropenis is often refuted by the concern that it may result in premature termination of penile growth caused by downregulation of penile androgen receptors (ARs). This study was designed to test the assumption that combination treatment with growth hormone (GH) is preferable to conventional testosterone treatment by suppressing downregulation of ARs.

MATERIAL AND METHODS

Fifty Sprague-Dawley rats were equally grouped into control (C), micropenis (MP), testosterone monotherapy (T), growth hormone monotherapy (G) and growth hormone plus testosterone (GT). Apart from C, micropenis secondary to hypogonadotropic hypogonadism was induced in the remained 40 using leuprolide acetate. Prepubertal administration of testosterone or GH began 7 days after birth and continued up to 12 weeks of age. Comparison of penile length, weight, mean testicular weight and volumetric comparison of collagen I, III and smooth muscle was used to evaluate the effect of each treatment. The expression of androgen receptor was evaluated to understand potential mechanism of action.

RESULTS

Although mean penile length or weight of T was larger than G or MP, it was shorter than C. Conversely, GT was comparable to C in mean penile length as well as weight. All investigated components, especially smooth muscle actin, were increased in GT. Higher androgen receptor expression than C was only seen in combination arm.

CONCLUSIONS

Growth hormone can supplement androgen action and help to increase penile size. It maintained higher androgen receptor expression which could explain the result.

MOLECULAR BASIS OF NON-SYNDROMIC HYPOSPADIAS: SYSTEMATIC MUTATION SCREENING AND GENOME-WIDE COPY-NUMBER ANALYSIS OF 63 PATIENTS

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PURPOSE

Although non-syndromic hypospadias is a multifactorial disorder, this condition can also occur as a result of mutations in single genes or submicroscopic copy-number variations (CNVs). A total of 25 genes have been implicated in the development non-syndromic hypospadias. The aim of this study was to clarify the contribution of monogenic mutations and cryptic CNVs in the etiology of non-syndromic hypospadias

MATERIAL AND METHODS

The study group consisted of 58 Japanese and five Vietnamese patients. We performed mutation screening for 25 known causative/candidate/susceptibility genes using a next-generation sequencer. Functional consequences of nucleotide alterations were assessed by in silico assays. The frequencies of SNPs in the patient group were compared with those in the male general population. CNVs were analyzed by array-based comparative genomic hybridization and characterized by fluorescence in situ hybridization.

RESULTS

Eight of 63 patients with anterior or posterior hypospadias carried putative pathogenic mutations in AR, BNC2, NR5A1, SRD5A2 or HSD3B2. Two of the eight patients had mutations in multiple genes. We did not find any rare SNPs that were abundant specifically in the patient group. One patient carried mosaic dicentric Y chromosome.

CONCLUSIONS

Our data indicate that mutations in known causative genes and submicroscopic CNVs account for more than 10% of cases with non-syndromic hypospadias. Pathogenic defects appear to underlie both severe and mild hypospadias. In contrast, known susceptibility SNPs seem to play only a minor role in the development of the disease. Most importantly, this is the first study documenting the possible oligogenicity of non-syndromic hypospadias.

THE EFFECT OF L-ARGININE AND TADALAFIL IN RAT TESTIS ISCHEMIA REPERFUSION INJURY

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PURPOSE

We aimed to examine the effect of L-arginine and tadalafil for prevention of ischemia reperfusion injury after testis torsion in rats.

MATERIAL AND METHODS

A total of 40 adult, male Sprague Dawley rats were divided into 5 groups randomly. No testicular torsion was performed in control (1st) group and 3 hours of left testicular torsion was performed in study groups. No drug was applied in the 2nd group, L-arginine was injected in the 3rd group, tadalafil was injected in the 4th group, L-arginine and tadalafil together were injected in the 5th group. All drugs were injected intraperitoneally 30 minutes before the detorsion. Then left testis was untwisted for four hours of reperfusion. Bilateral testes were removed. For biochemical examination, lipid peroxidation (LPx) and glutathione (GSH) activities were examined in testicular tissue. Spermatogenesis was evaluated with Johnsen's score.

RESULTS

Ipsilateral testis: LPx levels of 2nd group were found to be significantly higher than all other groups in ipsilateral testis ($p < 0.001$). GSH levels revealed similar between groups ($p = 0.021$). Johnsen's score of 2nd group was significantly lower than all other groups ($p < 0.001$). Johnsen's score of 5th group was significantly higher from Johnsen's score of 3rd and 4th groups.

Contralateral testis: LPx levels of 2nd group were significantly higher than others ($p = 0.001$). 4th group level was significantly different than results of control and 5th group. GSH levels of 5th group were significantly higher than other groups. Mean Johnsen's score of 2nd group was significantly lower than all others (< 0.001). Johnsen's score of the 4th group was significantly lower than Johnsen's score of 5th group.

CONCLUSIONS

L-arginine, tadalafil and combination of these two molecules showed protective effect against ischemia/reperfusion injury.

PREVENTION OF RENAL SCARRING IN ACUTE PYELONEPHRITIS IN THE RAT BY PROPHYLACTIC PROBIOTIC ADMINISTRATION

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PURPOSE

To present the protective effect of probiotic regimen as a prophylaxis treatment in renal scarring by increasing the immune response in a rat model of acute pyelonephritis.

MATERIAL AND METHODS

Twelve rats were divided into 3 equal groups. All groups received direct inoculation of 10^9 colony-forming units of *Escherichia coli* (E. coli, ATCC 25922 strain) into the right kidney. Group I was served as control. Group II: prophylactic probiotic regimen 1 month before and 2 months after E. coli injection. Group III: therapeutic probiotic regimen 2 months after E. coli injection. Body temperature was recorded after bacterial inoculation. Technetium-99m-DMSA renal scan, histopathological evaluations, concentrations of CA19-9, Ig-A, blood urea nitrogen, and creatinine were performed 1 and 2 months post-injection.

RESULTS

It took an average of 4.2 ± 1.1 hours between the injection and onset of fever. In group II, this period was longer (7.5 ± 1.4). Probiotic administration resulted in reduction of interstitial fibrosis, tubular, and glomerular atrophy in group II. Two months after the injection, Technetium-99m-DMSA renal scan showed that right kidney reached to near normal cortical configuration in group II (48%) as compared to control group (38%) and group III (41%). In group II, CA19-9 level was lower, while Ig-A level was in higher concentration as compared to other groups.

CONCLUSIONS

These findings may pave the road for prevention of renal scarring in children with vesicoureteral reflux and recurrent pyelonephritis. However, its application after the onset of fever may not be as efficient as its prophylactic administration.

KCNG4: A NOVEL GENE CANDIDATE UNDERLYING VESICoureTERAL REFLUX

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PURPOSE

A genetic basis for VUR has been inferred through linkage analysis studies, yet few candidate genes are known. Using comparative genomic hybridization microarray analysis (aCGH), we identified KCNG4 as a novel candidate gene underlying vesicoureteral reflux. KCNG4 encodes a protein that functions as a modulatory unit in a voltage gated potassium channel. We hypothesize that gene dosage changes in the KCNG4 gene are responsible for VUR in a subset of children.

MATERIAL AND METHODS

Genomic DNA from 35 pediatric patients with VUR and 5 control patients was analyzed by aCGH using 720K NimbleGen arrays (Roche). Quantitative PCR was performed using CNV-taqman assays to validate putative regions of duplication or deletion that were distinct from CNVs found throughout the genome.

RESULTS

We identified a microdeletion of 74,043 base pairs spanning a single gene - KCNG4 (16q24.1). This deletion in KCNG4 was validated using qPCR. This deletion was outside areas of known benign copy number variations (CNVs) and was not present in healthy, disease-free controls. Incidence of known defects in KCNG4 in the population of individuals tested for a variety of indications is 0.04%, as extracted from the DECIPHER database. We identified two patients in the DECIPHER database with duplications in KCNG4 and concomitant GU tract anomalies including VUR and hypospadias. We conducted in-situ hybridization and found robust KCNG4 expression in the developing GU tract of mouse embryos. Initial phenotypic analysis of the first *Kcng4* ^{-/-} mouse showed bilateral VUR.

CONCLUSIONS

We used aCGH analysis to identify KCNG4 as a possible novel gene defect that may be responsible for VUR in a subset of patients. Recapitulation of VUR in KCNG4 knockout mouse models would prove causation beyond association. Using CRISPR genome editing, we have produced *Kcng4* knockout mice and are in the process of conducting phenotypic analyses.

INHIBITION OF DNA-METHYLATION ENHANCES FUNCTIONAL RECOVERY AFTER RELEASE OF BLADDER OUTLET OBSTRUCTION.

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PURPOSE

Long-term partial bladder outlet obstruction (PBO), in diseases such as prostate hyperplasia or posterior urethral valves, is a widespread cause of urinary dysfunction. Bladder remodelling due to PBO involves overlapping processes of inflammation, hypertrophy and hyperplasia leading to irreversible fibrosis. Epigenetic changes, such as DNA methylation, contribute persistent fibrosis and dysfunction in other diseases. We hypothesized that inhibition of DNA methylation enhances recovery after release of obstruction.

MATERIAL AND METHODS

24 Sprague-Dawley female rats underwent PBO by tying a silk suture around the proximal urethra and 0.9mm steel rod; the latter was then removed. Sham operation without tying the suture was done in 12 rats. 6 weeks later, we recorded sleep micturition patterns. We then removed the suture in PBO rats or exposed the proximal urethra in sham-operated animals. Animals in each group were randomized to treatment with normal saline (NS) or DNA methyltransferase inhibitor, 5-aza-2'-deoxycytidine (DAC), at 1mg/kg 3-times/week intraperitoneally for 4 weeks. The DAC dose had proven hypomethylating activity. 4 weeks after the secondary procedure, we recorded micturition patterns again to analyze micturition volumes, frequencies and bladder capacities. We determined residual volumes in anaesthetized rats, followed by sacrificed to measure bladder and body weights and harvest bladder tissue for future histologic workup, qPCR and evaluation of gene-specific methylation levels.

RESULTS

In the obstructed and later deobstructed rats, residual volumes of the DAC treated group were not significantly higher than in the NS group. Among the same animals, DAC treatment helped preserve micturition volume (data shows a trend) with a significant ($p=0.05$) increase in micturition fraction (ratio "mean voided volume"/"maximum bladder capacity") by one third.

CONCLUSIONS

In bladders, persistently altered by PBO, inhibition of DNA-methylation enhances functional recovery AFTER release of obstruction. Further analysis is necessary to characterize the underlying mechanisms.

ESTABLISHING A NEW MODEL FOR EVALUATION OF DRUG TREATMENT IN THE CLINICALLY RELEVANT PHASE OF BLADDER DE-OBSTRUCTION: GENE EXPRESSION AND FUNCTIONAL ANALYSES

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PURPOSE

The mTOR-inhibitor rapamycin attenuates bladder smooth muscle hypertrophy during developing in vivo partial bladder outlet obstruction (PBO). Clinically, however, treatment begins after release of established obstruction. **PURPOSE:** Our objectives were to establish a model to evaluate pharmacotherapy following release of PBO (REL). We hypothesise that the release (REL) phase has associated persistent functional and specific gene expression changes that can be targeted with novel treatments.

MATERIAL AND METHODS

78 Sprague-Dawley female rats received a moderate PBO or sham for 6 weeks. A PBO alone control was sacrificed at 6 weeks. Prior to PBOR, by removal of the obstructing suture, voiding was recorded in metabolic cages and residual urine was measured. After PBOR, daily s.c. rapamycin/vehicle treatment began. Six weeks later voiding was recorded. Residual volumes, bladders and body weights, and muscle bundle size (by histology) were measured. Gene expression was examined by HT-QPCR on 62 genes curated from PBO literature.

RESULTS

Bladder/body weight ratios with PBO were 5.8 fold those of sham operated groups and remained high in REL. Residual urine, micturition fractions and voiding frequencies were significantly improved toward sham levels in rapamycin- vs. vehicle-treated rats. KCNB2, was significantly dysregulated in both PBO and REL compared to shams. Rapamycin treatment significantly altered expression of several genes during REL that pertained to ECM, growth, SMC phenotype, and free radicals ($p < 0.05$).

CONCLUSIONS

New treatments during the recovery phase after release of obstruction can be proposed through analysis of function, histology and gene expression patterns associated with recovery, as with rapamycin-induced recovery.

USE OF MRI DIFFUSION SEQUENCE TO QUANTIFY KIDNEY PARENCHYMA IMPAIRMENT IN A PARTIAL URETERAL OBSTRUCTION MOUSE MODEL

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PURPOSE

Obstructive nephropathy constitutes a major cause of paediatric renal progressive disease. Fibrotic lesions in the kidney can be reproduced by a model of partial ureteral obstruction (UUOp). We have proved the importance of morphological impairment evaluation by MRI in UUOp. To go further we propose to use intravoxel incoherent motion (IVIM) diffusion sequence to characterize kidney parenchyma impairment.

MATERIAL AND METHODS

The diffusion coefficient (D_{slow}), the perfusion coefficient (D_{fast}) and the perfusion fraction (f) were extracted from IVIM data acquired on a 7T preclinical system using a Matlab homemade software. The imaging method was validated on 10 sham wild type (WT) mice. Then 6WT mice were subjected to UUOp at day 3 of life. At day 75, mice underwent MRI examinations.

RESULTS

Extracted diffusion parameters from IVIM were similar in both kidneys of sham WT mice. Mean values of D_{slow} , D_{fast} and f were respectively $1.08 \pm 0.31 \text{mm}^2 \cdot \text{s}^{-1}$, $78.67 \pm 70.58 \text{mm}^2 \cdot \text{s}^{-1}$ and $30 \pm 6\%$ in the right kidney and $1.06 \pm 0.32 \text{mm}^2 \cdot \text{s}^{-1}$, $88.39 \pm 65.63 \text{mm}^2 \cdot \text{s}^{-1}$, and $30 \pm 7\%$ in the left kidney. For UUOp mice, right operated kidneys with important morphological impairment on MRI and histologically proven fibrosis, showed a decrease of D_{slow} (right kidney: $0.82 \pm 0.13 \text{mm}^2 \cdot \text{s}^{-1}$, left: $0.98 \pm 0.08 \text{mm}^2 \cdot \text{s}^{-1}$), whereas for the less-injured operated kidneys no difference was observed (right kidney: $0.98 \pm 0.02 \text{mm}^2 \cdot \text{s}^{-1}$, left: $0.98 \pm 0.04 \text{mm}^2 \cdot \text{s}^{-1}$).

CONCLUSIONS

The IVIM sequence has been validated for the first time on mice kidney at 7T. The preliminary results on UUOp mice show the benefit of IVIM to stage kidney parenchyma fibrosis. The study will be enhanced by increasing the number of operated mice.

EPIGENETIC REGULATION BY HDAC PROTEINS PLAYS A CRITICAL ROLE IN THE PROGRESSION OF RENAL FIBROSIS

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PURPOSE

Chronic kidney disease is associated with changes in the expression of approximately 10% of the genome. The histone deacetylases (HDACs) are a family of 10 related proteins which are among the most widely expressed and crucial regulators of gene transcription. In this study, we examine the biologic and therapeutic importance of HDAC proteins during disease progression.

MATERIAL AND METHODS

Chronic renal injury was modeled in vivo in mice by unilateral ureteral obstruction (UUO). The role of HDAC proteins was assessed by using a variety of molecular techniques and treatment with the broad spectrum HDAC inhibitor Trichostatin A (TSA).

RESULTS

UUO leads to a dramatic increase in the protein levels of 9 of the 10 HDAC isoforms. Notably, there is a 6.1-fold increase in HDAC8 expression that localizes specifically to pericyte-derived myofibroblasts, the cell population which accounts for the majority of matrix production during renal fibrosis. To better understand the importance of these findings, we treated mice with the HDAC inhibitor TSA. This resulted in a 3.4-fold increase in the anti-fibrotic gene BMP7, a 41.6% decrease in the matrix protein COL1A1, and a 61.6% decrease in the myofibroblast differentiation marker α -SMA following UUO. These changes in gene expression culminate in a 77.9% decrease in the interstitial proliferative response, a 43.0% decrease in myofibroblast number, 31.1% decrease in renal fibrosis, 42.8% decrease in apoptosis, and a 43.4% decrease in the loss of renal architecture. [All results are $p < 0.05$]

CONCLUSIONS

Chronic renal injury is associated with a dramatic increase in HDAC protein levels that stimulates pro-fibrotic gene expression and suppresses anti-fibrotic gene expression. Importantly, treatment with HDAC inhibitors reverses these changes in gene expression and inhibits the development of renal fibrosis. This suggests that HDAC inhibitors may serve as effective therapies to inhibit disease progression.

ROLE OF DNA-METHYLATION IN PARTIAL BLADDER OUTLET OBSTRUCTION

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PURPOSE

Partial bladder outlet obstruction (PBO), occurring in diseases such as prostate hyperplasia, is a widespread cause of urinary dysfunction. Bladder remodelling due to PBO follows a sequence of overlapping processes of inflammation, hypertrophy and hyperplasia and bladder fibrosis. Epigenetic changes such as DNA methylation play an important role in adaptive processes. In order to evaluate its role in bladder remodelling, we used a hypomethylating agent in a rodent model during the adaptive phase of PBO.

MATERIAL AND METHODS

20 Sprague-Dawley female rats underwent PBO by tying a silk suture around the proximal urethra and a 0.9mm steel rod, which was then removed. Sham operation without the suture was done in 12 rats. After 2 weeks, rats were randomized to normal saline (NS) or treatment with the DNA methyltransferase inhibitor, 5-aza-2'-deoxycytidine (DAC), at 1mg/kg, 3 times/week intraperitoneally. We recorded sleep micturition patterns at 6 weeks post-obstruction to analyse micturition volumes, frequencies and bladder capacities. We measured residual volumes in anaesthetized rats, which were sacrificed to measure bladder and body weights. Histologic workup and high-throughput qPCR (HTQPCR) of candidate genes were performed.

RESULTS

In the obstructed rats, DAC treatment significantly increased micturition frequency 2-fold and significantly decreased mean micturition volume vs. controls ($p < 0.05$). While DAC plus PBO significantly increased maximal bladder capacity and residual volume vs. PBO alone, DAC treatment in sham-operated rats had no effect on these parameters. Bladder weight was significantly increased in DAC obstructions vs obstruction alone, while treatment caused no difference in the sham-operated groups. HT-QPCR and histology indicated that DAC released control of expression of the neurotrophic BDNF and adrenergic receptor 1 and collagen-inducing CTGF.

CONCLUSIONS

Pharmacological inhibition of DNA methylation is crucial factor for regulating the neurotrophic and ecm regulating genes in PBO, in concordance with changes in function.

PREVENTION OF BLADDER DYSFUNCTION BY THE POTENT HYPOXIA INDUCIBLE FACTOR INHIBITOR, 17-DMAG, IN A MOUSE MODEL OF PARTIAL BLADDER OBSTRUCTION

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PURPOSE

Posterior urethral valves are the commonest cause of partial bladder outlet obstruction (PBOO) in the pediatric population, resulting in significant morbidity and mortality. Recent studies suggest that the etiology of pathological changes induced by PBOO is partly due to hypoxia induced by ischemia, which mediates the activity of the Hypoxia Inducible Factors (HIFs). HIFs regulate gene expression in angiogenesis, cell proliferation, and fibrosis. Our hypothesis was that 17-DMAG, a potent HIF blocker would partially reverse the pathophysiological changes in PBOO mouse model.

MATERIAL AND METHODS

PBOO was created in male mice (6-8 weeks) by tying 1Fr tubing externally alongside the proximal urethra with 4-0 silk, followed by the removal of the tube. Sham animals served as controls underwent the same procedure without urethral ligation. Animals were treated either with 17-DMAG or placebo daily up to 5 days starting from the day of surgery. Bladders were harvested at 7 days post-surgery, and subjected to pathophysiological evaluation.

RESULTS

Immunohistochemical analysis showed that 17-DMAG treatment prevented an up-regulation of HIF proteins and collagen III in the obstructed bladders. Detrusor muscle strips from PBOO mice developed reduced contractile force in response to electric field stimulation and KCl in comparison with sham controls (N ≥3 each group). The 17-DMAG treatment improved muscle contractility to both stimuli (68-74% vs. 34-40%, Sham as 100%) in PBOO mice.

CONCLUSIONS

The results of this study suggest that the blockade of HIF pathways may preserve detrusor muscle function in PBOO mice. Inhibition of HIF pathway has a potential clinical implication for the development of novel pharmacological therapies to treat PBOO-associated pathology.

URINARY LEVELS OF PROXIMAL TUBULE PROTEINS ARE SIGNIFICANTLY ELEVATED IN THE SETTING OF URETEROPELVIC JUNCTION OBSTRUCTION AND MAY REPRESENT NOVEL BIOMARKERS

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PURPOSE

Urinary biomarkers have the potential to aid in the diagnosis and management of ureteropelvic junction obstruction (UPJO). Destruction and shedding of proximal tubule brush border proteins occurs early in obstructive uropathy. Thus, we hypothesized that urinary levels of the tubular proteins CD10, CD13, and CD26 would be elevated in the setting of UPJO and could represent novel biomarkers.

MATERIAL AND METHODS

A murine model of complete unilateral ureteral obstruction was utilized, and urine was harvested from the obstructed renal pelvis and bladder after seven and ten days. Voided urine was also obtained from 12 patients with UPJO and 12 controls. Murine urinary protein levels were determined using western blotting, and human urine was analyzed with sandwich ELISA. Protein levels were normalized to urinary creatinine. Human samples were also tested for the published candidate biomarkers KIM-1 and NGAL.

RESULTS

In the murine model, levels of CD10, CD13, and CD26 were increased in urine from the obstructed renal pelvis compared to bladder urine produced by the unligated kidney at both time points tested. These proteins were also significantly increased in urine samples from patients with UPJO compared to normal controls. No statistical differences were observed in the levels of KIM-1 and NGAL between control and experimental groups.

CONCLUSIONS

Urinary levels of CD10, CD13, and CD26 are significantly elevated in the setting of UPJO and may represent novel biomarkers. Further studies are necessary to validate these findings and to determine the correlation of these urinary protein levels with renal damage.

BSP: BASIC SCIENCE (posters)

ESPU Meeting

BSP-1 (P)

NONAUTOLOGOUS MESENCHYMAL STEM CELL TRANSPLANTATION IN EXPERIMENTAL MODEL OF ACUTE PYELONEPHRITIS FOR REPAIR OF RENAL SCARRING

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PURPOSE

We compared the therapeutic effects of nonautologous adipose-derived mesenchymal stem cell (ADMSC) injection, obtained from the nape and perirenal adipose tissue of male rabbits for repair of renal scarring in a rabbit model of acute pyelonephritis.

MATERIAL AND METHODS

Twelve female rabbits were divided into 3 equal groups. Group I (control): direct inoculation of 5×10^9 colony-forming units of Escherichia Coli (E. Coli, ATCC 25922 strain) into the right kidney. Group II: injection of nonautologous ADMSCs (8.5×10^6) obtained from the perirenal adipose tissue of male rabbits into the subcapsular space 6 weeks after injection of E. Coli. Group III: injection of nonautologous ADMSCs obtained from the nape of male rabbits with the same method of group II. Body temperature was recorded after bacterial inoculation. Technetium-99m-DMSA renal scan and histopathological evaluations were performed 1 and 2 months post-injection in all groups.

RESULTS

It took an average of 14.2 ± 1.1 hours between the injection and onset of fever. Injection of ADMSC resulted in reduction of interstitial fibrosis, tubular, and glomerular atrophy in groups II and III as compared to control group. However, the histopathological amelioration was significantly better in group II. Two months after the injection, Technetium-99m-DMSA renal scan showed that right kidney reached to near normal cortical function in group II (47%) and group III (44%), as compared to control group (36%).

CONCLUSIONS

These findings propose that injection of ADMSCs obtained from the perirenal adipose tissue may modify the histopathological characteristics and renal function after acute pyelonephritis.

NOVEL FULLY AUTOLOGOUS TISSUE ENGINEERED URINARY BLADDER MODEL

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PURPOSE

Although numerous models for urinary bladder exist, in vitro bladder model is needed for tissue replacement, disease modeling and drug testing. Self-assembly method of matrix formation using bladder stromal cells would obviate the need for using non-native tissues or exogenous materials. In this study, we aimed at creating an ex-vivo urinary bladder model obtained from the different cell types of urinary bladder.

MATERIAL AND METHODS

Urothelial, stromal and smooth muscle cells (SMC) were isolated from bladder biopsies using enzymatic methods. Bladder stromal cells were stimulated to form collagen sheets under influence of Ascorbic acid for 4 weeks. Following this, SMC and urothelial cells were sequentially seeded for another 4 weeks. Bladder equivalents were collected for histological and functional studies. They were assessed for cell identification, proliferation and morphology, and for tissue architecture and characteristics. Permeability test with standard Franz diffusion was done to assess the function.

RESULTS

Bladder stromal cells formed collagen sheets that could be handled easily. Urothelial cells constituted a well-differentiated epithelial layer confirmed by positive staining for pancytokeratins. Markers for impermeability including uroplakins and ZO-1 were detected. A well-formed basement membrane was identified with Laminin and collagen IV. SMC markers were positive for smooth muscle actin and Calponin. Permeability test for bladder equivalents were similar to native tissues.

CONCLUSIONS

Using the self-assembly, in vitro bladder model was created with many functional and biological similarities with native bladder tissue without any foreign material. It is suitable for bladder substitution and experimental research.

INVESTIGATION OF THE EFFECT OF PENILE TOURNIQUET APPLICATION TO BACTERIAL ADHESION

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PURPOSE

Penile tourniquet (PT) application might decrease local tissue perfusion and alter cell integrity causing increased bacterial adhesion. Experimental study was conducted to evaluate the effect of PT to bacterial adhesion.

MATERIAL AND METHODS

Fifty-six rats were allocated into control group (CG, n=7), sham group (SG, n=21), PT group (PTG, n=21). No intervention was done in CG. A 5 mm-length urethral repair was performed in SG and PTG. In PTG, 10min-duration PT was applied during procedure and tissue oxygenation monitor (MoorVMS-OXY) was used to achieve same degree of ischemia in all subjects. SG and PTG were allocated into 3 subgroups according to time of tissue harvesting; 1 hour (SG-1, PTG-1), 24 hour (SG-2, PTG-2), and 72 hour (SG-3, PTG-3). Samples were examined biochemically (nitric-oxide-NO, malondialdehyde-MDA, myeloperoxidase-MPO, TNF- α , IL-1 β), histopathologically (wound healing scores) and electron microscopically (bacterial adhesion screening).

RESULTS

MDA, MPO, TNF- α , IL-1 β levels were significantly decreased in SG and PTG compared to CG ($p < 0.05$). However, there was no difference between SG and PTG ($p > 0.05$). The mean values of biochemical markers did not show significant difference in early and late harvested samples ($p > 0.05$). Wound healing scores were higher in SG than CG and in PTG than CG and SG ($p < 0.05$). The scores were significantly altered in samples with late harvesting time ($p < 0.05$). Electron microscopic examination showed higher bacterial adhesion in PTG than CG and SG.

CONCLUSIONS

PT did not cause inflammatory marker exhaustion and oxidative injury after urethral repair. However, tourniquet application alters histopathological findings of wound healing and causes increased bacterial adhesion. Since these adverse findings became prominent at 72 hour after application, we can suggest that PT may cause postoperative complications such as wound dehiscence and infection.

CAN RENAL FIBROSIS DUE TO PYELONEPHRITIS BE PREVENTED? : AN EXPERIMENTAL STUDY

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PURPOSE

The circulating renin-angiotensin system (RAS) regulates arterial pressure and sodium homeostasis. But inappropriate activation of intrarenal RAS causes increased Angiotensin II (Ang II) levels that lead to renal injury, proliferation and fibrosis. There are alternative pathways too; forming Ang II, probably a chymase. Chymase is secreted from mast cells. An experimental study was performed to investigate the efficacy of captopril and ketotifen, which are ACE inhibitor and mast cell stabilizer, on the prevention of scar formation after acute pyelonephritis.

MATERIAL AND METHODS

Acute pyelonephritis was created by injecting E. coli suspension into renal cortex. Fifty rats were divided to five equal groups. Group A (sham) animals were given SF inoculums. Group B rats were given E. coli suspension. Group C rats were given E. coli suspension and treated with cephotaxime. Group D rats were given E. coli and received cephotaxime and captopril (50 mg/kg/day) via orogastric lavage. Group E rats were given E. coli and received cephotaxime and ketotifen (1 mg/kg/day) via oral route.

RESULTS

To assess the efficacy of captopril and ketotifen for prevention of renal fibrosis, the rats were sacrificed under anesthesia, six weeks after the bacterial inoculation to determine degree of inflammation, abscess formation, scar formation. The scores of inflamatur criteria's increased significantly in the groups of B compared with the sham group (A) ($p=0.001$). Captopril or ketotifen treatment with antibiotic were found to be the only factor decreasing scar formation ($p=0.007$). The percentage of scar formation was 20% in the group of E, 50% in the group of D while 90% in the group of C. But there was no significant difference between group D and E in the efficacy of preventing scar formation.

CONCLUSIONS

We conclude that captopril and ketotifen have a preventive effect in the development of renal fibrosis in an experimental model of acute pyelonephritis in rats.

PREVENTIVE EFFECT OF AMINOGUANIDINE ON RENAL SCAR IN A RAT MODEL OF PYELONEPHRITIS

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PURPOSE

Acute Pyelonephritis (APN) in children results with scar formation as a result of inflammatory and oxidative/nitrosative stress processes. This study aimed to evaluate the effect of Aminoguanidine (AG), an inducible nitric oxide synthase (iNOS) inhibitor, on the renal function, morphology and biochemical parameters of oxidative stress in an experimental model of APN in rats.

MATERIAL AND METHODS

Forty-rats were divided equally into five groups as control, APN, APN+Antibiotic, APN+AG, and APN+Antibiotic+AG. APN was induced by 0.1 ml of freshly prepared *Escherichia coli* (ATCC 25922) solution containing 10^{10} colony-forming unit/ml into the kidney while control group was administered 0.9 % NaCl solution. Treatment was begun 72 h after bacterial inoculation. Control and APN groups were given 0.9% NaCl solution, treatment groups were given antibiotic and/or AG for five consecutive days. Seven days later, after decapitation trunk blood was collected, both kidneys were harvested were for biochemical and histopathological evaluation.

RESULTS

E. coli -induced APN increased renal dysfunction and oxidative stress parameters (malondialdehyde and protein carbonyl content) and antioxidant enzyme parameters (Superoxide dismutase and glutathione peroxidase). NO_x (nitrite/nitrate) were also raised in APN group. Either antibiotherapy or AG markedly ameliorated renal dysfunction, the antioxidant status of the kidneys and histopathological injuries. The combination of antibiotherapy and AG was significantly more effective than either of the treatment modalities alone. Histopathologic evaluation showed correlation with laboratory results.

CONCLUSIONS

AG might be considered as an adjuvant therapy to classical antibiotherapy to prevent renal inflammation and fibrosis in APN.

3-D IN VITRO UROTHELIUM INFECTION MODEL USING THE SELF-ASSEMBLY TECHNIQUE

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PURPOSE

Previous in vitro and in vivo studies for investigating the development and differentiation of the urothelium have been limited, as they do not represent the normal urothelial development and differentiation process in human. Self-assembly method of matrix formation would form a biomimetic tissue without the need for exogenous materials. In this study, we aimed at the creation of an ex-vivo urinary bladder model and investigating post-infection effects on the urothelium and changes in the cytokeratin expression.

MATERIAL AND METHODS

Bladder stromal (BSCs), urothelial (UCs), and smooth muscle cells (SMCs) were isolated using enzymatic methods. BSCs were stimulated with ascorbate to form collagen sheets. Following, SMCs and UCs were sequentially seeded on the stacked BSC-sheets to form bladder equivalents. After maturation, constructs were analyzed by histology, mechanical tests and permeability studies. Then, the ex vivo bladder model was subjected to epithelial bacterial infection. Effects on urothelial proliferation and keratin expression were noted.

RESULTS

BSCs formed collagen sheets that could be handled easily. UCs constituted a well-differentiated epithelial layer with biomarkers of impermeability. A well-formed basement membrane and SMCs bundles were identified. Post-infection effects included decrease in constructs' thickness, urothelial hyperplasia, increased expression of CK14 and loss of CK20 expression, reflecting skin phenotype changes.

CONCLUSIONS

Using the self-assembly, in vitro bladder model was created with many functional and biological similarities to native bladder tissue without any foreign material. The post-infection changes represent a normal urothelial response to injury, which if not reversed, may lead to squamous metaplasia of the urothelium.

DEVELOPING TESTIS IS HYPOXIC. EMBRYONIC AND EARLY POSTNATAL TESTIS IS LESS VULNERABLE FOR HYPOXIA WHEN COMPARED TO AT LATER STAGES OF LIFE.

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PURPOSE

Developing tissues are hypoxic to generate angiogenesis. We aimed to determine presence of hypoxia and angiogenic pattern in developing testis. As the developing testis is hypoxic, we hypothesized that embryonic and early postnatal testicular tissue is less vulnerable for hypoxia when compared to testis at later stages of life.

MATERIAL AND METHODS

We demonstrated the presence of hypoxia in the developing testis by means of a HIF1- α and pimonidazole and the angiogenic pattern by CD31 in different embryonic stages (E16, E18, E20 and postnatal day 1) in mice model. Whole testes from wild-type mice at embryonic day 16, 18 and postnatal D1 and testicular tissues from one-week, one-month and post-pubertal mice were cultured in 20% and 30% O₂ atmospheres by the technique that we have previously reported. For each group after 1, 3 or 6 days explants were evaluated in terms of apoptosis (tunnel-test) and proliferation (Ki67).

RESULTS

We found that HIF1- α and angiogenic origins were spatiotemporally co-localized. The embryonic, postnatal D1 and one-week 30% O₂ explants were significantly less vulnerable to hypoxic environment after 3 and 6 days when compared to one month and adult testes. In hypoxic conditions the embryonic and postnatal testicular tissues up to 1 week revealed a significantly higher proliferative and a lower apoptotic index when compared to explants of older age ($p=0.012$; $p=0.009$, respectively).

CONCLUSIONS

Hypoxia exists widely in the developing embryonic and even in postnatal D1 testis. Angiogenesis continues even in the first days of postnatal life, which initiates from the tiny hilar peritubular capillaries. In explants (even up to 6 days) embryonic testes and postnatal D1 and one-week old testicular tissues are more resistant to hypoxic damage (shown by proliferative and apoptotic indices) when compared to one month and adult testicular tissues. This initiates the question that, as the neonatal testes is less affected from hypoxia a longer time frame for intervention can potentially be considered. Assuming that viability can still be possible after long hypoxic periods surgeons should still plan surgical detorsion even for late admitting infant patients with long a history.

DOWN-REGULATION OF POSTERIOR HOX GENE EXPRESSION IN THE DEVELOPING CLOACA IS ASSOCIATED WITH THE DEVELOPMENT OF ANORECTAL AND UROGENITAL MALFORMATIONS

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PURPOSE

In vertebrates, the cloaca develops into the urogenital sinus and distal part of the hindgut. Abnormalities of cloacal development result in a variety of anorectal and urogenital malformations. Hox genes have a key role in the organization of the vertebrate body. This study evaluated the expression of posterior Hox genes in the cloaca and its derivatives in normal and ETU-exposed rat embryos and fetuses.

MATERIAL AND METHODS

Embryos of pregnant SD females administered 1% ETU (125 mg/kg) on the tenth day of gestation (gD10) were collected from gD14-17 and gD21. Cloacal development was viewed with serial histology followed by qualitative and quantitative gene expression studies of Shh and targets, Bmp4 and Hox genes to elucidate the expression pattern of these genes during each time point.

RESULTS

In ETU exposed fetus incomplete separation of the cloaca was observed leading to a variety of hindgut developmental abnormalities. Cloacal structures in experimental group rats were smaller and maldeveloped. Adequate Hox gene expression was observed during development and separation of cloaca in control group rat fetuses. In experimental group rat fetuses, HoxA13 and HoxD13 genes were down regulated and relative expression was inadequate during this developmental process.

CONCLUSIONS

This study demonstrates that vertebrate 5'-located Hox A and Hox D genes are expressed during the process of cloacal development and partitioning. Down regulation of these genes during cloacal development and occurrence of a variety of anorectal and urogenital malformations implies that these genes are critical during this stage of development in vertebrates.

URINARY TRACT OBSTRUCTION AND REDUCED NEPHRON NUMBER: ADAPTATION OF NEPHRONS FOLLOWED THROUGH ADULTHOOD IN A MOUSE MODEL

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PURPOSE

Congenital urinary tract obstruction affects renal development and maturation, often leading to chronic kidney disease (CKD). Associated with CAKUT (congenital anomalies of kidneys and urinary tract), reduced nephron number (NN) at birth is an independent risk factor for adult CKD. (Luyckx VA et al. Lancet 2013; 382: 273). We aimed to examine the behavior of nephrons in adult mice with reduced NN subjected to partial unilateral ureteral obstruction (UUO)

MATERIAL AND METHODS

Wild-type (WT) and Os/+ mice (with 50% fewer nephrons) were subjected to sham operation or partial UUO in the first 2 days of life. Additional mice underwent release of UUO at 7 days. All kidneys were harvested at 3 weeks (weaning) or 6 weeks (adulthood). Parameters evaluated by histomorphometry were: glomerular number and area, glomerulotubular junction integrity, proximal tubular volume fraction, and interstitial fibrosis.

RESULTS

In Os/+ mice, NN decreased further in the UUO kidney, and glomerular growth from 21 to 42 days of Os/+ mice was impaired, regardless of the release of UUO. Whereas UUO impaired maturation of the glomerulotubular junction and proximal tubular growth in all mice, release of obstruction preserved these in wild-type mice only. Interstitial collagen accumulated after 42 days of ipsilateral UUO, decreased following release of obstruction in wild-type, but not Os/+ mice.

CONCLUSIONS

Suppression of nephron growth and maturation by UUO is more severe in mice with reduced NN, and release of obstruction is less effective in reversing obstructive renal injury. Children with prematurity and congenital urinary tract obstruction are at increased risk to develop CKD.

AUTOLOGOUS TISSUE EXPANSION IN VIVO WITH A 3-D CONSTRUCT IN A SINGLE SURGICAL PROCEDURE

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PURPOSE

Cultured autologous cells can be transplanted as a method to restore tissue. Drawbacks include the demand of in-house cell culture facilities, high costs and laborious procedures that limits its use in ordinary surgical units. In vivo expansion of tissue can be an alternative solution by the means of using our own body as a bioreactor. The aim of this study was to evaluate a 3-dimensional scaffold with high tensile strength in vivo and assess the possibility of expanding autologous epithelium in one single surgical procedure.

MATERIAL AND METHODS

Plastic compression of two slabs of collagen type I gels including a core of polycaprolactone (PCL) knitted fabric was carried out by a technique previously described. Minced skin was placed on top of the scaffold. The final construct was placed subcutaneously in a rat model. Constructs were analysed up to 4 weeks after transplantation in respect to morphology, histology and mechanical properties.

RESULTS

We showed successful keratinocyte proliferation on top of the scaffold in vivo. A microscopic inflammatory response was only seen in 1 out of 48 samples. All samples were integrated in the surrounding tissue with capillary formation within the construct. The construct kept its integrity and had a high tensile strength during the study period.

CONCLUSIONS

By adding minced tissue to a collagen gel including a PCL-knitted fabric, cell expansion and re-organization of epithelium could take place without the need for conventional in vitro cell culturing. The method is simple and could be used as a one-staged procedure in an ordinary surgical unit for tissue expansion and could be implemented for bladder augmentation.

GENETIC STABILITY IN IN VITRO CULTURED HUMAN UROTHELIAL CELLS

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PURPOSE

Cultured human urothelial cells have a potential use in regenerative medicine for treatment of different urological conditions. We predict that high quality control standards will be imperative for all cellular therapy products. In this study we aimed to investigate genomic stability in human urothelial cells in long-term culture to better understand the effects of in vitro propagation

MATERIAL AND METHODS

The Affymetrix, human genome U133 2 plus set (HG-U133) was used to compare gene expression profiles at early and late passage (p2 vs p8). The Ingenuity Pathway Knowledge database and biological function software tools were used to interpret gene expression profiles and to identify upstream regulators.

Chromosomal structural instability was investigated with high resolution Comparative Genomic Hybridization analysis (CGH) with special focus on oncogenic regions

RESULTS

Bioinformatics analysis of the differentially expressed genes identified several upstream transcriptional regulators and its target molecules. These regulators play an important role in controlling cell-fate and are frequently associated with changes in the cell cycle. Long-term cultured cells had a normal expression pattern of oncogenes/tumor suppressor genes and also of genes associated with bladder cancer. Furthermore, CGH analysis indicated no gain or loss of chromosomal regions of bladder cancer related genes or any other genome regions down to 20kb.

CONCLUSIONS

Urothelial cells in vitro are stable at a submicroscopic genetic level. Patterns of gene expression demonstrate a decrease in proliferative capacity and no increase in oncogenic activity after long-term culture. We suggest array CGH and gene expression studies on selected genes as a routine for regenerative cell therapies.

IDENTIFICATION OF NATURALLY OCCURRING CALCIUM-OXALATE BINDING PROTEINS IN HUMAN URINE THAT PREVENT CRYSTAL ADHESION IN AN IN VITRO MODEL OF KIDNEY STONE FORMATION

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PURPOSE

Approximately one half of renal calculi patients experience at least one recurrence. Calcium oxalate monohydrate (COM) stone formation requires a combination of supersaturation and crystal adhesion to epithelial cells. We hypothesize that naturally occurring urinary proteins are capable of binding calcium oxalate crystals and inhibiting stone formation.

MATERIAL AND METHODS

COM crystals and fluorescently-labeled derivatives (COM-FITC) were synthesized in vitro. Stone formation was modeled in vitro by assessing the adhesion of COM-FITC crystals to confluent monolayers of inner medullary collecting duct (IMCD) cells. Affinity chromatography was used to isolate calcium oxalate-binding proteins from human urine.

RESULTS

Incubation of IMCD cells with COM-FITC crystals resulted in rapid binding to the cell surface with high affinity. The addition of urinary proteins purified from human urine inhibited COM-FITC binding by 76.2% and inhibited growth of COM crystals in a free solution approximating urine composition by 53.5%. Only 16.6% of urinary proteins exhibited calcium oxalate-binding activity. The bound fraction was eluted, purified by electrophoresis, and four prominent proteins were identified (97 kD, 69 kD, 56 kD, 45 kD).

CONCLUSIONS

Naturally occurring urinary proteins inhibit COM adhesion to renal epithelium. Isolated calcium oxalate-binding proteins may provide useful, novel prognostic and therapeutic targets.

ELUCIDATION OF REGULATORY MECHANISMS DURING DIFFERENTIATION OF SPERMATOGONIAL STEM CELLS VIA ANDROGEN ACTION

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PURPOSE

To elucidate the differentiation process of spermatogonial stem cells (SSCs), we investigated the characters of SSCs and precursor cells purified from immature rat testes exposed anti-androgen agent during fetal period. Furthermore, we also assessed differential expressions of some stem cell markers in these cells.

MATERIAL AND METHODS

Flutamide, as anti-androgen agent, was administered to 8-week pregnant SD rats during from the 14th to 20th days of gestation via intraperitoneal injection (7.5mg/body/day). Among their male offspring, the testes at 3 to 28 days after birth were removed. Control rats were administered only vehicle. Single-cell suspension was incubated with RPMI medium with 5%FBS at 37°C, 5%CO₂ for 24-48h. Cells of upper layer were harvested for following experiments. Fluorescent immunohistochemistry and real-time RT-PCR were performed.

RESULTS

In fluorescent immunohistochemistry, since isolated cells were expressed Plzf, Utf1, and c-Kit proteins, these cells were estimated SSCs. There were no significant differences of cell morphology between control and anti-androgen treatment group. On the other hand, expression values of Plzf gene was 2.50 times, and c-Kit gene was 3.07 times in isolated cells derived from anti-androgen treatment group compared to control.

CONCLUSIONS

Both Plzf and c-Kit are stem cell marker, and involved in self-renewal and cell proliferation of SSCs. Spermatogenic failure was observed in the mice lacking androgen receptor (AR), and AR is expressed in the precursor cells of SSCs, suggested that androgen has some roles in differentiation and maturation of SSCs. Suggesting that androgen is involved in the differentiation of SSCs via regulation of these gene expressions.

THE MURINE MODEL OF URINARY TRACT ABNORMALITIES THAT ARE SEEN IN THE VACTERL ASSOCIATION

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PURPOSE

The VACTERL syndrome is a common surgical condition affecting the development of many midaxial organs. We report here urinary tract abnormalities seen in a murine model of VACTERL association similar to those seen in humans.

MATERIAL AND METHODS

Time-mated pregnant rats received 125 mg/kg of 1% Ethylenethiourea (ETU) (experimental group) or vehicle only (control). Their fetuses were examined for urinary tract anomalies and concurrent anorectal, vertebral and limb malformations. Histological sections were prepared to study the morphogenesis of various malformations followed by gene expression studies.

RESULTS

In ETU-exposed fetuses, individual malformations of urinary tract, anorectum, vertebrae and limbs occurred in 54%, 98%, 42% and 34% respectively. VACTERL syndrome (concurrence of 3 malformations) was observed in 13% fetuses in experimental group. Gene expression studies showed reduced expression of Shhand downstream target genes in limb buds, notochord and in cloacal derivatives.

CONCLUSIONS

We conclude that this murine model of VACTERL association will support to further clarify the molecular and morphogenetic processes that lead to many of the structural congenital abnormalities that are seen in infants born with the VACTERL association.

A MINCED TISSUE MODEL FOR TISSUE EXPANSION WITH MINCED AUTOLOGOUS TISSUE FOR UROLOGICAL RECONSTRUCTIVE SURGERY

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PURPOSE

In previous studies we created a urinary conduit in an in vivo animal model for bladder emptying with minced autologous urothelium. To further develop the conduit, we compared cell regeneration and tissue expansion with biografts of urothelium alone or urothelium together with detrusor muscle in in vitro and in vivo studies.

MATERIAL AND METHODS

Porcine minced tissue, 0.3x0.3 mm, of urothelium only or urothelium and detrusor muscle was seeded by plastic compression in collagen-biografts for in vitro cultivation of 2-3 weeks. In vivo, we transplanted the same type of cells on 3D cylinder moulds into the subcutaneous fat of the pig abdominal wall in a one-step procedure for harvesting the urinary bladder tissue and transplanting back, terminating after 4-5 weeks. 6 moulds received urothelium only and 6 received urothelium and detrusor muscle. The expansion rate was 1:3. Outcome was measured by histology of the luminal surface and underlying tissue. Shams without minced were used as controls.

RESULTS

In vitro cultivation demonstrated a single cell-layer of urothelium after 2 weeks. No other cells could be detected. There was no morphological difference between samples when comparing urothelium only to urothelium with detrusor. In in vivo transplantation studies, minced urothelium only demonstrated a multi-layered transitional urothelium but not with transplanting minced urothelium together with detrusor muscle nor in shams. These samples demonstrated that angiogenesis was greater with higher grade of inflammation.

CONCLUSIONS

Minced tissue models can be used to expand urothelium. It is easy and fast to perform in vitro or in vivo. In vivo, there was no improvement on urothelial outcome when seeding together with detrusor muscle.

PERSISTANT HYPOXIA: BAD NEWS FOR THE UROTHELIUM

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PURPOSE

End-stage bladder disease is characterised by fibrosis and loss of capacity. The contributing pathways are unknown, but may include hypoxia as a consequence of recurrent infection and inflammation. Urothelial cells harvested from diseased bladders have a compromised capacity to propagate or differentiate in vitro (Subramaniam et al. J.Urol 2011;186:2014-20), potentially limiting autologous tissue engineering approaches.

MATERIAL AND METHODS

Sections of neuropathic and normal bladder urothelia were immunolabelled for hypoxia-inducible factor 1 α (HIF1 α). Image analysis of nuclear labelling intensity was used to quantify hypoxia-induced pathway activation. Hypoxic culture conditions were used to investigate the impact of hypoxia on urothelial cell proliferation and differentiation, with urothelial barrier function monitored electrophysiologically. Organ cultures were maintained in normoxic and hypoxic conditions before immunohistochemical evaluation of urothelial phenotype.

RESULTS

An increase in nuclear HIF1 α was found in end-stage bladders ($p < 0.001$, $n = 18912$). Chronic hypoxia had a detrimental impact on urothelial cell proliferation ($p < 0.001$, $n = 9$) and form a functional barrier ($p < 0.001$, $n = 9$). Organ cultures demonstrated reduced urothelial thickness in hypoxia-exposed samples, with a diminution of urothelial Ki67 and CK20 immunolabelling.

CONCLUSIONS

The urothelium is not implicated directly in aetiopathologies that can result in terminal loss of bladder function, but yet is compromised as a result. A role for hypoxia in end-stage bladder disease was indicated from nuclear HIF-1 α expression in situ. We have for the first time demonstrated that hypoxic conditions in vitro are able to replicate the compromised phenotype seen in urothelial cells from end-stage bladders, which may offer new approaches for the future.

A STUDY OF TWO COMMON PROINFLAMMATORY POLIMORPHISMS TNF-ALPHA G(-238)A AND IL10 (RS1800871) WITH VESICOURETERAL REFLUX RISK IN RUSSIAN PEDIATRIC POPULATION.

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PURPOSE

The aim of this study was to estimate whether the most common functional genetic polymorphisms in the promoter region of TNF-alpha and IL10 genes are implicated in the development of vesicoureteral reflux (VUR), because a vast literature indicates that genetic variations in this genes play a significant role in pathogenesis of VUR

MATERIAL AND METHODS

The Real-time PCR, using fluorescent TaqMan probes were applied for analyzing the polymorphic sites of G(-238)A of TNF-alpha and C(-819)T of IL10 genes in 109 healthy controls and 97 children with VUR.

RESULTS

We didn't reveal a statistically significant association of polymorphism G(-238)A of TNF-alpha gene with VUR reflux. However, we have a tendency to increase allele A and genotype GA of this polymorphism in children with VUR (OR=1,94, p=0,090). No significant association was found between C(-819)T polymorphism of IL10 and VUR.

CONCLUSIONS

Although the present study didn't reveal an association of two common proinflammatory cytokine gene polimorphisms TNF-alpha G(-238)A and IL10 (rs1800871) and vesicoureteral reflux risk, analysis of results suggests the need for further research of association of other pro-inflammatory cytokines polymorphic markers on a larger sample size. The data obtained will be an important step in identifying the pathogenic mechanisms of VUR. To our knowledge such studies were not previously performed in Russian population and lack of statistically significant associations might be caused by genetic heterogeneity of the sample.

URODYNAMIC EVALUATION OF BLADDER DIVERTICULA IN AN EXPERIMENTAL STUDY IN RABBITS

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PURPOSE

It has not been determined whether dysfunctional voiding causes diverticula, or if congenital diverticula is responsible for dysfunctional voiding. This study evaluates the effect of bladder diverticula on bladder function in a rabbit model based on urodynamic findings.

MATERIAL AND METHODS

In total, 24 New Zealand white rabbits were randomized to four groups (n=6 per group): 1) sham surgery; 2) a single, 1-cm-diameter diverticulum; 3) a single, 3-cm-diameter diverticulum; and 4) four 1-cm-diameter diverticula. Urodynamic evaluations were performed preoperatively and 1 week and 1 month postoperatively, to measure the post-micturition residual (PMR), maximum bladder capacity (MBC), detrusor pressure (Pdet), compliance and unstable detrusor contractions. Statistical significance was determined using Kruskal-Wallis and Student's t-test.

RESULTS

In groups 1 and 2, the MBC, Pdet, and compliance were within the reference ranges and none of the rabbits had PMR. In groups 3 and 4, the rabbits all had PMR. At 30 days after surgery, the MBC was 28% and 31% lower than the reference range in groups 3 and 4, respectively, and compliance was decreased ($p<0.05$). Further, the Pdet was significantly higher than in rabbits with 1-cm diverticula or those in the sham group ($p<0.05$). Group 3 had unstable detrusor contractions.

CONCLUSIONS

Large or multiple bladder diverticula alter bladder storage and emptying, and can decrease the capacity of the bladder and reduce its elasticity, causing higher pressures with reduced volumes. In other words, compliance is decreased. Large or multiple bladder diverticula can cause dysfunctional voiding.

NEW INDICATORS IN BLUNT RENAL TRAUMA: NGAL, KIM-1 AND IL-18

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PURPOSE

We evaluated the changes of urinary and serum NGAL (Neutrophil gelatinase-associated lipocalin), KIM-1 (Kidney injury molecule-1), IL-18 (Interleukin-18) and Cystatin-C levels in blunt renal trauma in rats.

MATERIAL AND METHODS

Twenty Sprague-Dawley rats were studied in three groups. In the Sham group, left kidney exploration was made. In the Trauma group, after left kidney exploration, a 20 g weight was dropped on to kidneys. Third group was Control. To analysis and determination of NGAL, KIM-1, IL-18, Cystatin-C and urine creatinin levels, urine and serum was collected in metabolic cages at the beginning and 12-24., 36-48., 60-72. posttraumatic hours. Results were evaluated with Mann-Whitney U and Kruscall-Wallis tests.

RESULTS

Macroscopic examinations of traumatized kidneys revealed grade II and III injury. Hematuria was observed in all rats in the trauma group. Serum and urine indicators were not change in Control group. Serum IL-18 and urine kreatinine were elevated in the Sham group. While NGAL, KIM-1 and IL-18 were found to be significantly higher than their base levels in urine, NGAL, IL-18 and Cystatin-C were found to be significantly higher than their base levels in serum.

CONCLUSIONS

Both of KIM-1 and IL-18 which were elevated in urine and NGAL which was elevated serum and urine were shown early diagnostic and non-invasive laboratory parameters with blunt renal trauma in rats. We need more and clinical studies at that point.

SYNERGISTIC EFFECTS OF COMBINING UNDIFFERENTIATED ADULT STEM CELLS AND DIFFERENTIATED CELLS FOR THE ENGINEERING OF FUNCTIONAL BLADDER SMOOTH MUSCLE TISSUE.

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PURPOSE

Engineered tissues for bladder augmentation or substitution would allow circumventing the side effects of using bowel tissue for reconstruction. Tissue engineering using a combination of cells may provide novel approach for functional reconstruction. Adipose derived stem cells (ADSC) might be a key instrument to bioengineer contractile bladder tissue when differentiated to smooth muscle cells (SMC). However, it is uncertain whether these cells maintain their cell faith long term in vivo. It is our aim to evaluate different combinations of cells to improve the bladder tissue formation, by improving the microenvironment and cell-to-cell interactions.

MATERIAL AND METHODS

We have characterised rat ADSCs and optimally differentiated them to SMC (3 weeks) prior to subcutaneous injection into nude mice. Cells were injected in different combinations (ADSC, ADSC + differentiated ADSC, SMC, differentiated ADSC + SMC). The tissue formation was followed by MRI and PKH labelling. The formed tissue was analysed for contractile proteins measuring gene and protein expression by using RT-qPCR, Western Blot and immunohistochemistry.

RESULTS

In all experimental conditions, the PKH positive cells could be detected after 4 weeks, indicating the presence and survival of engineered tissues in vivo. MRI was able to visualize the engineered SM tissue over the study period. Collagen without cells showed no signal and was absorbed quickly. The tissue size differed between the experimental conditions with tissues grown from cells with 3 week ex vivo differentiation showing the largest constructs with good correlation in histology. Differentiated ADSC showed positive upregulation of smooth muscle makers (Calponin, Smoothelin, MYH 11 and α SMA) similar to bladder derived SMC.

CONCLUSIONS

The presented research offers key information on survival and functionality of bioengineered smooth muscle tissue grown using differentiated ADSC in combination with differentiated cells. This approach could help to engineering contractile bladder tissue for future clinical application.

S3: SPECIAL SESSION ON CASE PRESENTATION

Moderators: Ramnath Subramaniam (UK), Hillary Copp (USA)

Parallel session with S2.

ESPU Meeting on Wednesday 14, October 2015, 15:35 - 17:00

15:35 - 15:38

S3-1 (CP)

THREE CASES OF URETHRAL DUPLICATION IN GIRLS ASSOCIATING ONE HYPOSPADIC AND ONE EPISPADIC URETHRA

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PURPOSE

We report three cases of urethral duplication in girls, treated over a 30-year period. Such malformation is extremely rare, with less than 40 cases in the literature. The clinical presentation in our cases was particular because of abnormal location of both urethras.

MATERIAL AND METHODS

The first case was diagnosed following discovery of an abdominal mass at birth, whilst the second case had a prenatal diagnosis of pelvic cystic mass. In both cases, clinical examination, sonography and cystography showed an accessory epispadiac urethra placed above a bifid clitoris, a functional hypospadiac urethra opening in the hymen, hydrocolpos and bilateral ureterohydronephrosis. The last case externally presented as a urogenital sinus at birth. The epispadic urethra was diagnosed at genitography, because he was very narrow. For these three girls, pubic symphysis was normal and there were no other associated anomalies.

RESULTS

In two first cases, vaginal dilatation was performed to resolve the hydrocolpos and improve urinary retention and ureterohydronephrosis. The epispadic urethra was later removed through a local incision. In the second case, further partial urogenital mobilization was necessary to improve voiding. The last case was treated by complete urogenital mobilization, to open separately the vagina and the urethra. The first girl is healthy, despite renal hypotrophy, with normal continence, menstruation and intercourse. The second one presents persistent lower urinary tract infections, due to persistent voiding difficulties. The last is too young to experience continence.

CONCLUSIONS

These cases with both urethras in an ectopic location are very rare. All cases presented with genital retention. Treatment has to deal with the incontinent accessory urethra and the obstructive hypospadiac one.

MALE AND FEMALE APHALLIA ASSOCIATED WITH SEVERE URINARY TRACT DYSPLASIA (UTD)

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PURPOSE

Aphallia is exceedingly rare (1/30,000,000). Prior reports infrequently indicate association with severe UTD. We describe 3 patients with aphallia and associated UT findings.

MATERIAL AND METHODS

We reviewed UT anomalies in 2 boys with aphallia (Patients 1, 2) and a girl with UTD and similar external appearance (Patient 3), also consistent with aphallia.

RESULTS

Patients 1 and 2 carried 46XY karyotype, bilateral descended testes in well-formed scrotums, and posterior skin tags containing rudimentary urethras. Patient 1 had PUV; a posterior bladder diverticulum, which drained a ureter; bilateral grade 5 VUR, with right duplication; and hydronephrosis of all moieties. Patient 2 had PUV and a bladder diverticulum (later excised). Right UVJO required tapered reimplant and later conversion to R-L TUU. Patient 3 (Fig. 1E-F, Fig. 2 H-J) was 46XX and had fused, well-formed labia majora. A posterior skin tag was associated with a stenotic UG sinus, with a vagina seen proximal and posteriorly. Anteriorly were an atretic right ureter, miniscule bladder, and left refluxing ureter, consistent with bilateral ureteral ectopia and bladder maldevelopment. Laparoscopy revealed ovaries and normal Müllerian structures. Bilateral renal dysplasia necessitated transplant, ileocecal neobladder and Mitrofanoff. Corporal tissue was diminutive or absent in all.

CONCLUSIONS

This is one of the largest series of aphallia patients with isolated GU abnormalities and the only to include male and female patients. Labioscrotal folds develop with smooth appearance, and posteriorly, a urethral orifice or UG sinus with skin tag may be seen. In girls with severe UTD and characteristic genital ambiguity, aphallia should be considered. We conclude a strong association between aphallia and severe UTD and recommend VCUG, RBUS, and Cr in all aphallia patients.

URINARY TRACT CHANGES IN CHILDREN WITH NEPHROGENIC DIABETES INSIPIDUS

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PURPOSE

Congenital nephrogenic diabetes insipidus is characterized by insensitivity of the distal nephron to arginine vasopressin. Urinary tract dilatation develops in children affected with NDI, as well as other polyuric syndromes, probably due to the large volume of urine produced. We report our series of children with severe distension of the urinary collecting system secondary to persistent polyuric state.

MATERIAL AND METHODS

All patients were evaluated annually, including imaging of their urinary tract by renal sonograms and voiding cystourethrograms. NDI was diagnosed clinically, based on hyposthenuric urine during events of hypernatraemic dehydration, which did not respond to exogenous desmopressin. Conventional therapy, including hydrochlorothiazide, indomethacin and low-salt diet, was initiated at diagnosis. Children underwent an urodynamic study, using standard methods. The investigation comprised full pressure-flow recordings, on an outpatient basis, using a Laborie urodynamic instrument.

RESULTS

The patient group included seven children and adolescents with NDI. Mean urine osmolarity at diagnosis was 89 ± 25 mosm/l. Hydroureteronephrosis was observed in all children, beginning at age 3 years. Sonography also revealed markedly enlarged. Mean bladder volume was 1233 ± 628 ml and all of them had a significant post-voiding residue (>1000 ml). Urodynamic studies, revealed a hypotonic-large-capacity, high compliant (as high as 74ml/cm H₂O) type of neurogenic bladder. Bladder residual was as high as 1000ml. Two children were initiated on a clean intermittent catheterization regimen, which improved the bladder appearance but could not solve the daytime enuresis. Two other children had suprapubic catheter drainage. Impairment in kidney function, including serum creatinine and low molecular weight proteinuria was observed in two children.

CONCLUSIONS

The severe renal concentrating defect in children with NDI is associated with the development of hydroureteronephrosis followed by huge distension of bladder and dysfunction. Careful follow-up is needed in order to assure that no bladder outlet obstruction and/or renal insufficiency develop.

AND IF IT WAS A ZINNER'S SYNDROME?

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PURPOSE

First described in 1914 by Zinner, the triad consisting of renal agenesis, ipsilateral seminal vesicle cyst (SVC) and ejaculatory duct obstruction has been reported in a hundred cases, predominantly adults or adolescents. Since symptoms related to SVC coincide with the onset of a sexually active life, the majority of the cases reported are observed in the second and third decade of life.

MATERIAL AND METHODS

A 2-year-old boy with an unremarkable prenatal diagnosis was admitted to the Emergency Department with abdominal pain and constipation.

RESULTS

Ultrasound (US) showed a large cystic mass between the bladder and the rectum along with absence of the left kidney. Magnetic resonance (MR) confirmed the findings. Endoscopy showed that the cyst was attributable to the male genital tract through the presumable outlet of a seminal vesicle into the posterior urethra. A clinical worsening (pain, constipation, pelvic discomfort) prompted surgical excision of the cystic mass. At surgery, a blind end vas deferens entering into the SVC was found and the entire mass was excised close to the urethra previously cannulated. Pathology confirmed SVC with the typical fibromuscular layer lined with cuboid epithelium. The patient had an uneventful course and at 10 month post-operative follow-up is in good health without symptoms.

CONCLUSIONS

Even though diagnosis of Zinner's syndrome usually recalls fertility issues in adolescent and adult age, there is evidence that such association must be also taken into consideration in the differential diagnosis of congenital anomalies of internal male genitalia in pediatric age. Treatment may be mandatory with regard to possible onset of bladder dysfunction or epididymo-orchitis that can arise with a relative frequency and result in a significant morbidity in these patients. Whether or not treatment and follow-up in pediatric age may prevent impairment of fertility potential later in life remains to be clarified.

URETHRAL POLYP: A CAUSE OF PRENATAL URINARY OBSTRUCTION

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PURPOSE

Lower urinary tract obstruction is a rare congenital condition usually caused by posterior urethral valves. Herein, a clinical case of hydronephrosis due to a novel cause of prenatal urethral obstruction is reported.

PATIENT

A male newborn, with prenatal diagnosis of bilateral hydronephrosis, megacystis and left ureteral dilatation was born product of a 39 weeks gestation. After post-natal US confirmation of bilateral uretero-hydronephrosis, voiding cystourethrogram showed bilateral grade V vesico-ureteral reflux and a filling defect in the bladder neck. At cystoscopy a posterior urethral polyp (PUP) was found, which was resected with no complications.

RESULTS

Histologic examination revealed a fibroepithelial lesion consistent with congenital PUP. At 4-year follow-up there was no evidence of recurrence, but oxybutynin became necessary to control bladder dysfunction.

CONCLUSIONS

Posterior urethral polyp presents later in life but, as the present case illustrates, it should be kept in mind as a possible cause of fetal/neonatal lower urinary obstruction; transurethral resection is usually effective.

URETHRAL DUPLICATION WITH ENLARGED CLITORIS AND FEMALE HYPOSPADIAS. A RARE MALFORMATION.

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PURPOSE

Urethral duplication in girls is of rare occurrence. We report two patients with urethral duplication, enlarged clitoris and pre-anal vagina. Anatomy, diagnosis and surgical approaches are described.

MATERIAL AND METHODS

Patient 1 was 8 years of age and presented with an enlarged clitoris and a pre-anal orifice. Labia minora were absent and labia majora were fused. There was no palpable gonad. Voiding was done through the pre-anal orifice with urinary leakage at the tip of the clitoris. Anus was in normal position.

Patient 2 was a premature baby with a similar anatomical malformation. First gender assignation was made as male.

RESULTS

Karyotype was 46,XX and hormonal profile was normal for female in both patients. Radiologic and endoscopic investigations showed a normal proximal urethra which divided in two channels below the pubic bone. The functional urethra was hypospadiac and opened in the anterior wall of the pre-anal conduit corresponding to the vagina. The second urethra was hypoplastic, running along the ventral aspect of the enlarged clitoris.

The first girl had a feminizing genitoplasty with clitoral plasty and ablation of the accessory urethra with good postoperative evolution. The second patient was reassessed as a girl. She had a vesicostomy and she is waiting for the surgery.

CONCLUSIONS

Urethral duplication in girls is poorly described. As for boys with urethral duplication, the hypospadiac urethra appeared to be the main urethra which needs to be preserved. No clear explanation was found regarding the clitoris enlargement even if embryological hypothesis can be proposed. A multidisciplinary approach of an experienced team is highly recommended for management of such complex anomalies.

ISOLATED CONGENITAL MEGACYSTIS: CASE SERIES AND LITERATURE REVIEW

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PURPOSE

Congenital megacystis usually occurs in association with urological pathology (urethral obstruction or vesico-ureteric reflux (VUR)) or as part of a syndromic condition.

Isolated congenital megacystis (ICM) is very rare and long-term outcome data are limited.

We describe our experience of ICM and review the published literature.

MATERIAL AND METHODS

ICM cases seen over 15yr were identified from a departmental database and the notes reviewed. A comprehensive literature search was performed.

RESULTS

Three cases (2M; 1F) were identified; all were diagnosed antenatally; a family history was noted in one. In the boys, renal impairment was noted initially which resolved with bladder drainage. Recorded bladder capacities at birth were 180-250ml, and MCUG confirmed normal urethral anatomy and no VUR. Clean intermittent urethral catheterisation (CIC) was attempted in all; vesicostomy was required in one boy. In the other two, CIC was discontinued at 9 and 30 months.

EMBASE, PubMed and Medline were searched for megacystis (congenital or isolated). Five articles were identified (1984-2014) describing 5 patients (3M; 2F). Antenatal diagnosis was made in four, and post-natal bladder capacities were 150-400ml. Renal function was normal in all. Vesicostomy was performed in one patient, CIC in another, and no active bladder management was undertaken in three.

CONCLUSIONS

ICM is usually diagnosed antenatally, but postnatal ultrasound and MCUG are required to exclude urethral pathology or VUR. Renal impairment may be seen initially, especially in boys, but seems to improve with adequate bladder drainage. CIC is recommended, but can usually be discontinued once bladder emptying improves.

URACHAL RHABDOMYOSARCOMA: TWO CASE REPORTS

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PURPOSE

Rhabdomyosarcoma (RMS) is the most common soft tissue sarcoma in children and is thought to arise from striated muscle progenitor cells. The management of RMS involves surgical resection and subsequent multiagent chemotherapy with or without radiotherapy, based on the Intergroup Rhabdomyosarcoma Study staging system group, and is well studied. However, urachal RMS is rare and few case reports on urachal RMS have been described. Hence, we seek to augment these numbers with two cases from our own experience as well as to review current literature.

MATERIAL AND METHODS

We describe the management of two cases of urachal rhabdomyosarcomas from 2004 to present, from the larger of two tertiary paediatric surgical centres covering a population of 5.5 million. A review of surgical case logs was performed covering the time period and patient case notes were retrieved for review. A definitive diagnosis of urachal rhabdomyosarcomas was made based on (1) histological confirmation, (2) anatomical site arising from the urachus as observed during surgical resection, and (3) absence of another primary lesion.

RESULTS

Our patients were diagnosed at 15 and 46 months and both underwent surgical resection and adjuvant chemotherapy without radiotherapy. They have been recurrence free for 37 and 99 months for IRS group IV and IIb respectively. We postulate a better prognosis for urachal rhabdomyosarcomas compared with other pelvic rhabdomyosarcomas, being more amenable to complete resection without sacrificing organ function.

CONCLUSIONS

Urachal rhabdomyosarcoma is rare and has unique characteristics that set it apart from other pelvic rhabdomyosarcomas. As few cases are reported and with long term data lacking, a dedicated long term study of urachal rhabdomyosarcomas would be beneficial.

BENIGN PROSTATIC HYPERPLASIA: A 17-YEAR-OLD CASE REPORT

Ismail YAGMUR¹, Burak TURNA², Ali TEKIN¹, Emir AKINCIOGLU², Banu SARSIK KUMBARACI³ and Ibrahim ULMAN¹

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INTRODUCTION

Benign prostatic hyperplasia (BPH) is very rare in childhood. Only three cases younger than 18-year-old have been reported. We present an adolescent who had undergone endoscopic treatment with transurethral resection of the prostate (TUR-P).

CASE

17-year-old male patient with a history of intermittent hematuria was first admitted to another hospital after acute urinary retention. As increase in prostate size was detected, prostate biopsy was performed with a suspicion of malignancy. Histopathological analysis revealed benign prostate tissue and the patient was referred to our after three months with a suprapubic catheter. He didn't have any history of hormonal therapy. Rectal examination revealed a grossly enlarged prostatic mass. Prostate-specific antigen (PSA) level was 3.38 ng/mL, free PSA (fPSA) level was 0.761 ng/mL, and fPSA/tPSA ratio was 0.23. Imaging studies revealed a mass arising from the median lobe of prostate and filling the bladder lumen. Prostate volume was approximately 111 ml. Due to the young age of the patient preliminary diagnosis was a non-ductal tumor; however, no enlarged lymph node or metastasis was detected. In endoscopy; the mass was observed to originate from the median prostate lobe and TUR-P was performed. Histopathology confirmed BPH. The patient was symptom free at 10 months' follow-up.

CONCLUSIONS

BPH should be considered in the differential diagnosis of malignant prostate disease in childhood. As endoscopic method is the treatment of choice in BPH, preoperative histological evaluation should be considered.

PEDIATRIC POSTERIOR URETHRAL POLYPS: RARE CAUSE OF HEMATURIA AND LOWER OBSTRUCTIVE UROPATHY IN KIDS. (REPORT OF 2 CASES)

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PURPOSE

Pediatric posterior urethral polyps are very rare benign pathological growth, it may present with hematuria and lower obstructive symptoms, ultrasound and MCUG aid to diagnosis but cystoscopy is necessary to confirm the diagnosis and to excise the lesion. Due to rarity of the reported cases, our intention was to report 2 more cases to the literature describing symptoms, diagnostic evaluation and treatment.

MATERIAL AND METHODS

2 boys presented with interrupted stream and bloody spots on the underwear at the second year of life. Urine R/M showed microscopic hematuria. Ultrasonography showed a well defined relatively hypodense, mobile, soft tissue structure at the mid line of the urinary bladder in close relation to the bladder neck with mean volume of 0.4 ml (suggestive of polyp), urinary bladder wall was not thick, there were no hydronephrosis. MCUG showed good capacity smooth wall bladder without any filling defect, no VUR, 1 boy was unable to void and the other one had a very weak interrupted stream with significant post voiding residual. Cystourethroscopy revealed a well defined, smooth walled urethral polyp arising from the proximal end of the right half of verumontanum, and it was removed using a 9 French resectoscope with cutting power 30, dormia basket was used to get it out.

RESULTS

Pathological analysis revealed Fibroepithelial polyp and patients were followed for a period of 5 years with no complain or recurrence.

CONCLUSIONS

Posterior urethral polyps should be considered and investigated in boys presenting with hematuria and non-specific voiding disturbances. Diagnosis and treatment are simple and done through Cystourethroscopy

ENDOSCOPIC TREATMENT WITH INJECTION OF SCLEROSING AGENT IN PATIENTS WITH BLADDER VENOUS VASCULAR MALFORMATION

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PURPOSE

Vascular malformations represent a very diverse group of pathologies with different signs, symptoms and type of location. Security and efficiency of sclerosis with sotradecol was evaluated.

MATERIAL AND METHODS

A sixteen years old female patient with a complex venous vascular malformation in pelvis, symptomatic since 6 years old.

An event of massive bleeding and hemartrosis took place during a knee deflection surgery. Subsequently she presented hypersensitivity in the lower right leg with impossibility to extend the homolateral lower limb.

She had episodes of hematuria and prolonged menstrual cycles since 15 years old.

RESULTS

Patient was evaluated by the the Vascular Anomalies Clinic of Hospital Italiano.

CT and Angiography findings: Venous dilatation of the vertebral plexus with nerve compression at the fourth-fifth lumbar vertebrae. An heterogeneous image which protruded in the bladder of 36x41x40 mm, and Multiple enlarged and tortuous veins in the right leg.

MRI displayed a diffuse venous vascular malformation in pelvis and bladder.

In the following four months the patient underwent two episodes of hematuria with signs of hipovolemic shock, the treatment of the vascular malformation was decided.

An Endoscopy was carried out, there were findings of Venous Vascular malformation at the upper side of the bladder with multiple enlarged, tortuous and varicose veins and residual blood. Sclerosis with sotradecol under endoscopic and radiosopic guidance was performed.

The procedure was well tolerated, with no complications. The patient no longer presented episodes of macro or micro hematuria, with a year of follow up.

CONCLUSIONS

Endoscopy is the first choice for diagnostic in patients with vascular malformations and hematuria, in order to detect the location and type of bleeding.

Sclerosis with endoscopic guidance has proven to be useful and safe in patients with venous vascular malformation whom affect bladder and produces hematuria.

ECTOPIC IMMATURE RENAL TISSUE IN THE SPERMATIC CORD: CASE REPORT

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PURPOSE

Ectopic immature renal tissue (EIRT) is a rare entity, with few cases described in the literature. Its difficult diagnosis as well as potential association with extra-renal Wills tumor makes the clinical orientation of these patients a difficult and important issue.

MATERIAL AND METHODS

We report a case of a 1 year old boy that underwent right orchiopexy because of an inguinal testis. During the procedure we identified a dark, firm, small mass adherent to the spermatic cord. Complete resection of the ectopic tissue was accomplished and sent for hystopatological analyses. The surgical procedure underwent without any complication.

RESULTS

The tissue was compatible with EIRT, with no malignant transformation. The post-operative period was uneventful. There were no other findings on physical exam and clinical and imagiological follow-up was the treatment of choice.

CONCLUSIONS

EIRT is a rare entity, with scarce literature on the matter. Until now there have been few case reports in the literature of EIRT, and even fewer cases identified in the inguinal canal. To our knowledge, there is only one report of EIRT in the spermatic cord associated with extra-renal Wilm's tumor (ERWT).

We present one of the few cases of EIRT in the inguinal canal. What we know from previous studies is that the histological analysis of EIRT and the diagnosis between EIRT and ERWT is a difficult one to make and bares clinical implications. So whenever an ectopic mass is encountered in the spermatic cord during inguinal surgery, it should be excised for hystopatological analyses.

UROLOGICAL COMPLICATIONS OF VON RECKLINGHAUSEN NEUROFIBROMATOSIS

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PURPOSE

Von Recklinghausen neurofibromatosis is a rare genetic disease with variable phenotypic expression, in which patients develop tumors along the nerves. Malignant degeneration occurs in 20% of cases. Urological manifestations are rare. We report four such cases.

MATERIAL AND METHODS

1st case: A boy aged 5, with cervical, cephalic, thoracic and spinal localisations of neurofibromatosis developed a neurogenic bladder by thoracic spinal compression. Clean intermittent catheterization (CIC) was impossible. A cystostomy button was inserted under local anaesthesia, and botulinum toxin-A (BTA) injections were performed by the stoma. The situation has been stable for 6 years.

2nd case: A girl aged 6 with bladder neck compression due to pelvic neurofibromatosis. She experienced recurrent episodes of pyelonephritis due to urinary obstruction. She underwent a continent cystostomy (Mitofanoff), which failed rapidly because of invasion of the conduct. A pelvectomy and non-continent diversion was hence performed.

3rd case: A girl aged 9 with posterior fossa tumor. After surgical resection, she experienced meningitis resulting in central neurogenic bladder as a sequel. She is treated by CIC and BTA injections.

4th case: A boy diagnosed at age 3 with "café au lait" spots, developed at age 12 a neurogenic bladder due to thoracic spinal compression. He was treated by CIC, then diversion until his death by cancer.

RESULTS

The most common presentation is related to spinal compression. But these tumours originate from the nerve plexus of the bladder and bladder neck can invade the urinary tract.

CONCLUSIONS

Because of the rarity of this disorder, no guidelines are available for its management. Multidisciplinary discussion is required before surgical treatment.

COWPER'S GLAND SYRINGOCELES IN CHILDREN: 2 CASES WITH DIFFERENT PRESENTATIONS

Naeem SAMNAKAY, Bernardita TRONCOSO, Elizabeth GARNETT, Timothy RENSHAW, Andrew BARKER and Japinder KHOSA

Princess Margaret Hospital, Paediatric Surgery and Urology, Perth, AUSTRALIA

PURPOSE

The aim of this study is to describe urethral syringocele of Cowper's gland, a rare condition that can present incidentally or with obstructive or irritative urinary tract symptoms in the paediatric population.

MATERIAL AND METHODS

2 cases are described.

Case 1 presented perinatally with unilateral antenatal severe hydrouretero-nephrosis. Immediate postnatal imaging suggested VUJ obstruction. The syringocele was incidentally noted on cystoscopy, obstructing the urethra during antegrade urine flow.

Case 2 presented at age 2.5 years with recurrent UTIs and straining to void. MCUG showed a trabeculated bladder with right low grade VUR, and a rounded obstructive area of concentration of contrast in the anterior urethra on the micturition phase. The right kidney also had scarring with 30% split function.

RESULTS

Both syringoceles were deroofed using a resectoscope with cold knife. Both boys also underwent circumcision.

Case 1 went on to have the unilateral VUJ obstruction resected and reimplanted, followed a few weeks later by a laparoscopic left pyeloplasty for secondary left PUJ obstruction. His upper tracts are now well decompressed. He has no trouble voiding. He has had no UTIs.

Case 2 has been followed up for 6 years. He had no further UTIs post-operatively. He has mild bladder urge symptoms and day and night urinary incontinence, well controlled with oral anticholinergics.

CONCLUSIONS

Cowper's gland syringocele may be more common than currently realised. It can present in different ways, including bladder out-flow obstruction. It should be considered, investigated for and treated. Long term follow-up in the setting of bladder outflow obstruction is important.

OVOTESTICULAR DSD ASSOCIATED WITH 46,XX/46,XY TETRAGAMETIC CHIMERISM

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PURPOSE

OTDSD, the presence of both ovarian and testicular tissue, is an uncommon DSD diagnosis. Patients may present with genital ambiguity and mostly have a 46,XX karyotype. We present a phenotypical male presenting with a painless right scrotal mass. Pathology of the gonadectomy specimen showed ovotestis.

MATERIAL AND METHODS

His medical history was unremarkable, with the exception of gynecomastia since puberty at age 14 y. Physical examination showed a male phenotype with gynecomastia, normal masculine external genitalia, left scrotal gonad and empty right hemi-scrotum after recent gonadectomy. He had several striking irregular pigmentations. Initial ultrasound study of the left scrotal gonad showed homogeneous testis tissue, but he developed a cystic mass in the upper part of this gonad 6 weeks after presentation. Hormonal data, after right gonadectomy, were compatible with hypergonadotropic state. Karyotyping in peripheral blood showed a 46,XX/46,XY pattern and FISH analysis of buccal mucosa and ovarian and testicular tissue from the removed gonad was followed by SNP-array and profiling of patient and parents.

RESULTS

Clinical and hormonal data were compatible with the presence of a contralateral, ovotestis in the left hemi-scrotum. FISH studies confirmed the presence of XX and XY in leucocytes, buccal mucosa and gonadal tissues in varying percentages. Profiling and Snip array showed extra alleles from both paternal and maternal origin.

CONCLUSIONS

Chimerism is a rare cause of OTDSD. Additional tests can discriminate between sex-chromosomal mosaicism and chimerism. Pigmentation patterns or (asymmetric) gynecomastia after puberty can be the only clue.

PHEOCHROMOCYTOMA OF THE URINARY BLADDER - A CASE REPORT OF AN UNUSUAL PRESENTATION

Ajaykumar GUNTAKA¹ and Rajendra NERLI²

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PURPOSE

Pheochromocytoma of the urinary bladder is a rare tumor that originates from chromaffin tissue of the sympathetic nervous system associated with the urinary bladder wall. The usual signs are haematuria, hypertension during micturition together with generalized symptoms due to raised catecholamines. We report an unusual presentation of bladder pheochromocytoma in an adolescent.

MATERIAL AND METHODS

A seventeen year old male patient was referred to urooncology services of the hospital for the management of an incidentally detected bladder lesion. The patient was earlier admitted to the hospital for valvular heart disease. The patient was on antihypertensives and anticoagulants. Routine abdominal sonography done for vague upper abdominal pain revealed a mixed echoic lesion abutting the left lateral wall and fundus of the urinary bladder. The lesion showed few specks of calcification. This patient was otherwise asymptomatic for the bladder lesion. CT revealed an ill defined lesion in the superior, posterior and left lateral wall of the bladder, approximately measuring 6 X 5 cms. This lesion showed peripheral enhancement in the arterial phase and homogenous enhancement in the delayed venous phase. A radiological diagnosis of haemangioma of the bladder was made and the patient was prepared for surgery. The patient was put on Inj Heparin and the oral anticoagulants were withdrawn. The INR was brought down to 1.2.

RESULTS

The lesion was excised with a small bladder margin. Intra-operatively the patient's blood pressure got elevated to 200/110 mm Hg, however the anaesthesiologist was able to control easily. Histopathological examination revealed this unusual diagnosis. The imaging too did not give any clue of the catecholamine secreting tumor. In spite of the huge size of the tumor the symptoms appeared blunted.

CONCLUSIONS

This case is a classic example of histopathologic surprise.

H: HISTORY SESSION

Moderator: Cenk Büyükkünel (Turkey)

ESPU Meeting on Wednesday 14, October 2015, 17:15 - 19:00

17:15 - 17:31

Welcome words

Prof. Cenk BÜYÜKÜNAL

17:31 - 17:46

History of medicine in Czech Republic

Prof. Tomáš HANUŠ M.D.

A 15 min lecture regarding the history of medicine in Prague and Czech Republic will be delivered by our distinguished guest, Prof Tomáš HANUŠ M.D.

17:46 - 17:56

History of pediatric urology in Czech Republic

Prof. Radim KOČVARA

Czech Republic is probably the first country in Europe which accepted pediatric urology as a unique and independent specialty. Our host Radim Kočvara will give us the brief history of development of pediatric urology in Czech Republic.

HOW A RECORDING COMPANY, A ROCK BAND AND A NOBEL LAUREATE DEVELOPED COMPUTED TOMOGRAPHY

Sutchin R. PATEL¹, Nicholas A. ROTKER² and Anthony A. CALDAMONE²

1) *University of Wisconsin School of Medicine and Public Health, Department of Urology, Madison, USA* - 2) *Hasbro Children's Hospital, Warren Albert School of Medicine at Brown University, Division of Urology, Providence, USA*

INTRODUCTION

A Nobel laureate, one of the most important recording companies of the 20th century and one of the most influential musical groups of all time come together to develop computed tomography (CT).

METHODS

We reviewed the medical literature regarding the life of Sir Godfrey Hounsfield, the history of Electrical Musical Industries, Ltd (EMI) and the Beatles in reference to the development of CT.

RESULTS

During World War II, EMI played a crucial role in the war effort, working on radar systems for the allies. After the war, EMI would translate its electronic prowess into the recorded music business. In 1955 it would purchase Capitol Records and with the growth of the music industry in the 1950s, EMI would sign the Beatles. With the meteoric rise of the Beatles, EMI's profits rose 80% in their first year after signing the Beatles.

Sir Godfrey Hounsfield, an English electrical engineer, served in the Royal Air Force during World War II as an instructor in radar mechanics. After the war he began his scientific career in 1951 working for EMI. He helped design and construct the first solid-state (transistor) computer in England in 1959. In 1967 Hounsfield began developing what would become the first CT-scanner. By directing x-ray beams through the body at 1 degree angles, with a detector rotating in tandem on the other side, he could measure the attenuation of the x-rays. These values were then analyzed via a mathematical algorithm to produce a 2-dimensional image of the slice of the body. Hounsfield worked with Jamie Ambrose, a radiologist, to conduct the first clinical CT-scan at Atkinson Morley Hospital in 1971 in a patient with a brain tumor. In 1971, EMI entered the medical equipment business marketing the CT-scanner using its previous sales from the recording industry (much of it due to the Beatles) to help finance its new venture. By 1976, the CT industry was booming and EMI could not produce enough CT-scanners to fill demand. In the end, as other companies would enter the CT market, EMI would have a hard day's night maintaining its monopoly and would eventually get back to the music industry.

Allan MacLeod, a South African physicist, working independently of Hounsfield developed the same theory on how x-rays could be utilized to image the body. Both Hounsfield and MacLeod, neither with a medical background, would win the 1979 Nobel Prize in Medicine and Physiology for inventing the CT-scanner.

CONCLUSION

Let it be known that it was only yesterday when a recording company, a band and a radar scientist revolutionized medical imaging and radiology with the development of the CT-scanner.

[Bonus: Can you find the names of 7 Beatles songs hidden in this abstract?]

URETHRAL VALVES - A 'YOUNG' DIAGNOSIS IN PAEDIATRIC UROLOGY

Wolfgang RÖSCH

Klinik St. Hedwig, University Medical Center of Regensburg, Department of Paediatric Urology, Regensburg, GERMANY

ABSTRACT

Morgagni was the first to describe posterior urethral valves (PUV) in 1717. The second mention of this condition found in literature is the work of Langenbeck on lithotomy, published in 1802. Though he described valve-like folds in autopsy specimens, he did not infer any clinical significance to these findings. It was only after 30 years the subject was again referred to by Velpeau in 1832. He also commented on valve-like folds in several autopsy specimens but he felt they might be of clinical importance. Again 38 years elapsed before the first comprehensive discussion of PUV was present by Tolmatschew in 1870. He described the valves as well as the pathology of the bladder and the upper tracts precisely and he was the first to recognize this as a pathological entity.

In the following years a great many almost identical cases had been described in European journals but up to 1912 there were no reports on PUV recorded in the American literature. Knox and Sprunt (1912) published the first case report in the 'American Journal of Diseases of Children' and made a very exhaustive study of the literature up to the time their article appeared. Finally, in 1919 Young et al. described PUV as a clinical and pathological condition in 12 patients while giving an accurate description of the clinical presentation and the anatomy of PUV. Apart from open questions and discussions on Young's classification of PUV this was a landmark paper and our understanding of the anatomy and clinical course for boys with PUV has been enhanced by his work.

This presentation is an attempt to clarify the fascinating development of diagnosis and therapy of PUV by means of literature and to some extent of original drawings and documents.

18:20 - 18:32

H-3 (OH)

HISTORY OF DARTOS POUCH AND ANDERSON HYNES TECHNIQUE

Ricardo GONZALES

Auf der Bult Kinder-und Jugendkrankenhaus, Hannover, Universitätsmedizin Berlin Charité, Berlin, GERMANY

ABSTRACT

"Those who cannot remember the past are condemned to repeat it" (George Santayana)

Working as a journal article reviewer, it is clear to me that many surgeons do not know the historical basis of operations commonly performed.

A recent example prompted me to revisit the original work of Anderson and Hynes (1949) on uretero-pelvic anastomosis and to reflect on its influence on the current treatment of uretero-pelvic junction obstruction.

The original technique and figures described initially to repair a retrocaval ureter and subsequently applied to the more common problem of the UPJO will be presented with emphasis on the V pelvic flap and the spatulation of the ureter.

Another common technique whose origins are often forgotten is the dartos pouch for testicular fixation during orchidopexy. Although often attributed to Lattimer (1957) it was originally described by J. Schoemaker in 1932, a Dutch surgeon working in The Hague.

The original figures and his description of how he developed the idea will be presented. One reason why important historical information is forgotten is that access to old articles can be burdensome and expensive.

We should urge our journals to provide free access to all issues older than 20 years.

THE ROSS CIRCUMCISION RING AND CIRCUMCISION BY LIGATION: A BRIEF HISTORY OF THE RING AND ITS INVENTO

Richard S. HURWITZ

Kaiser Permanente Medical Group, Los Angeles, USA

ABSTRACT

The Ross circumcision ring is a forgotten device that was invented in 1939 by Dr. Cecil J. Ross who practiced urology in Portland Oregon. It was the first of the tourniquet devices that dealt with foreskin removal by necrosis. It was sold as a set of 6 reusable metal rings ranging from neonatal to adult sizes. The rings were supplied in an attractive walnut box and included an initial ligature and articles by Dr. Ross that discussed technique and precautions.

The rings were constructed with a groove for the ligature, a lance guide and scissor guide, and a bale or handle which could be held with forceps for adjusting the position of the ring. Ross stressed that the ligature must be tied as tightly as possible and must have a tensile strength of at least 20 pounds. After ligation, the prepuce distal to the ligature was excised "because its retention is unsightly". The ring was left in place for 48-72 hours.

Ross believed that circumcision was "the most flagrant example of a common surgical procedure which has suffered from indifference on the part of the surgeon".

The main goals of the ring were to provide a bloodless and suture-less means of circumcision by ligation while decreasing post operative discomfort and producing a better cosmetic result.

The Ross ring was the precursor of the Plastibell (1950) and other ring devices.

S4: VESICoureTERAL REFLUX

Moderators: Andy Kirsch (USA), Pedro-Jose Lopez (Chili)

ESPU Meeting on Thursday 15, October 2015, 08:20 - 09:24

08:20 - 08:25

S4-1 (LO)

★ PATTERNS OF ANTIMICROBIAL RESISTANCE AND URINARY TRACT INFECTION RECURRENCE AMONG THE RIVUR COHORT

Caleb NELSON¹, Alejandro HOBERMAN², Nader SHAIKH², Ron KEREN³, Ranjiv MATHEWS⁴, Saul GREENFIELD⁵, Tej MATTOO⁶, Nathan GOTMAN⁷, Anastasia IVANOVA⁷, Marva MOXEY-MIMS⁸, Myra CARPENTER⁷ and Russell CHESNEY⁹
1) Boston Children's Hospital, Urology, Boston, USA - 2) Children's Hospital of Pittsburgh, Pediatrics, Pittsburgh, USA - 3) Children's Hospital of Philadelphia, Pediatrics, Philadelphia, USA - 4) Johns Hopkins Hospital, Urology, Baltimore, USA - 5) Women & Children's Hospital of Buffalo, Department of Pediatric Urology, Buffalo, USA - 6) Children's Hospital of Michigan, Pediatrics, Detroit, USA - 7) University of North Carolina, Collaborative Studies Coordinating Center, Dept of Biostatistics, Chapel Hill, USA - 8) National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, USA - 9) University of Tennessee Health Science Center, Pediatrics, Memphis, USA

PURPOSE

The Randomized Intervention for Children with Vesicoureteral Reflux (RIVUR) trial found that recurrent urinary tract infections (rUTI) with resistant organisms were more common in the antimicrobial prophylaxis (AP) arm. We sought to describe antimicrobial resistance patterns in the RIVUR trial.

MATERIAL AND METHODS

Children aged 2-71 months with 1st or 2nd UTI (index UTI) and grade I-IV vesicoureteral reflux (VUR) were randomized to AP with trimethoprim-sulfamethoxazole (TMP-SMX) or placebo and followed for 2 years. Factors associated with TMP-SMX-resistant rUTI were evaluated.

RESULTS

Among 571 included children, 48% were <12 months old, 43% had grade II VUR and 38% had grade III VUR. Recurrent UTI occurred in 34/278 children receiving AP versus 67/293 children receiving placebo. Among those with rUTI, 76% (26/34) of AP subjects had TMP-SMX-resistant organisms vs. 28% (19/67) of placebo subjects ($p < 0.001$). The proportion of resistant rUTI decreased over time; in the AP arm, 96% were resistant during the initial 6 months, vs. 38% resistant during the final 6 months; corresponding proportions for the placebo arm were 32% and 11%. Among children receiving AP, 7/55 (13%) with TMP-SMX-resistant index UTI had rUTI, while 27/223 (12%) with TMP-SMX-susceptible index UTI had rUTI (adjusted HR: 1.38 [95%CI: 0.54-3.56]). Corresponding proportions in the placebo arm were 17/65 (26%) and 50/228 (22%) (adjusted HR: 1.33 [95% CI: 0.74-2.38]).

CONCLUSIONS

Although TMP-SMX resistance is more common among children treated with AP versus placebo, resistant infection frequency decreased over time. Resistance of the index UTI to TMP-SMX does not reduce the effectiveness of AP with TMP-SMX to prevent rUTI.

★ THE SWEDISH INFANT HIGH GRADE REFLUX TRIAL - UTI AND RENAL DAMAGE

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PURPOSE

Endoscopic injection is an established treatment option for vesicoureteral reflux (VUR) in children. Does endoscopic treatment of VUR grade 4-5 in infants reduce the risk of UTI recurrence and renal scarring?

MATERIAL AND METHODS

This randomized, controlled, multicenter, 1-year follow-up trial, enrolled 77 infants (22 girls, 55 boys) <(less than) 8 months of age with VUR grade 4-5 (n=30/n=47), bilateral VUR in 52(68%). 39 were randomized to continuous antibiotic prophylaxis (CAP) and 38 to endoscopic treatment (and prophylaxis until resolution). Voiding cystourethrogram and DMSA-scintigraphy/MAG-3-renalography were performed at study entry and after 1 year. Parenchymal defects were seen in 67(87%) children at entry, 28(36%) categorized as severe, severity more pronounced in boys. At follow-up new scars, worsening of damaged kidneys and symptomatic UTIs ($\geq 38.5^{\circ}\text{C}$ =febrile) were reported.

RESULTS

There were 27 recurrent febrile UTIs in 6(16%) children in the endoscopy group and in 10(26%) in the CAP group ($p=0.43$), in 8(36%) girls and 8(15%) boys ($p=0.074$).

New renal scars were detected in 1(3%) child in the endoscopic group and in 3(8%) in the CAP group ($p=0.64$), deterioration in 3(8%) and 5(14%) respectively ($p=0.74$). New scars were seen in 3(14%) girls and 1(2%) boy ($p=0.13$), deterioration in 4(19%) girls and 4(8%) boys ($p=0.32$).

There was a weak correlation between number of febrile UTIs and VUR-grade at follow-up (Spearman correlation coefficient 0.26). There was a tendency to more deterioration in children with several febrile recurrences ($p=0.067$). In 5 of the 8 children with deterioration, as in 2 of the 4 with new scars, there was no febrile UTI documented.

CONCLUSIONS

In this high-risk group of children, 87% of them with established renal defects in infancy, the lower risk of febrile recurrences and renal scarring seen after endoscopic treatment compared to CAP was not significant, probably due to the small study population and short observation. Renal scarring can occur in the absence of UTI.

★ THE SWEDISH INFANT HIGH GRADE REFLUX TRIAL - VUR RESOLUTION

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PURPOSE

This study aimed to see if high grade vesicoureteral reflux (VUR) in infants can be treated with endoscopic injection and if endoscopic treatment is superior to continuous antibiotic prophylaxis (CAP).

MATERIAL AND METHODS

In this randomized, controlled, multicenter, 1-year follow-up trial, 77 infants (55 boys, 22 girls) <8 months of age with VUR grade 4-5 (n=30/n=47) were included. 52(68%) had bilateral VUR. 39 were randomized to CAP and 38 to endoscopic treatment (and prophylaxis till resolution). Voiding cystourethrogram (VCUG), ultrasound and renal scintigraphy were performed at study entry and after one year for evaluation of VUR grade, dilatation and renal function.

RESULTS

21(58%) in the endoscopy group and 8(21%) in the CAP group had VUR grade ≤ 2 at follow-up (p=0,0015). The success rate in the endoscopy group was 100% in unilateral VUR grade 4, 75 % in bilateral VUR grade 4, 60 % in unilateral VUR grade 5 and 31% in bilateral VUR grade 5 (p=0,004).

VUR resolution was also more frequent in VUR-grade 4 (40%) than VUR grade 5 (9%) and in unilateral VUR (33%) than bilateral VUR (15%) in the CAP group.

One patient had an UTI possible related to injection therapy.

In our material 4 ureters required reimplantation, only one of them had vesicoureteral obstruction after injection.

CONCLUSIONS

High grade VUR in infants can be treated with injection therapy and resolution rate is higher compared to CAP treatment. Complication rate is low and VUR grade 4 and unilaterality is favorable for resolution and down-grading of high-grade infant VUR.

★ THE SWEDISH INFANT HIGH GRADE REFLUX TRIAL - BLADDER FUNCTION

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PURPOSE

Infants with high-grade vesicoureteral reflux (VUR) often have lower urinary tract dysfunction (LUTD), characterized by high capacity bladder (BC) and incomplete emptying. The aim of this study was to evaluate whether early VUR resolution could prevent the bladder from becoming large i.e. to prevent LUTD.

MATERIAL AND METHODS

The study included 77 infants (55 boys) <8 months, VUR grade 4-5 (n=30/n=47) and randomized to CAP(39)/endoscopic treatment (ET)(38). Voiding cystourethrogram/videocystometry and free voiding observation were performed at study entry and 1-year follow-up. LUTD was defined as large BC (>150% of expected for age) and mean residual urine >20ml. Bladder function outcome was related to VUR resolution (\leq grade2 versus >grade2) for both treatment groups together.

RESULTS

At baseline LUTD was seen in 25% (18/72), high BC 42% and high residual 36%. At follow-up the number with high BC in free voiding studies had decreased (34%), with no difference between treatment groups. A relation with VUR resolution was seen with lower BC in VUR-group ≤ 2 ($p=0,050$). In addition, number of children with LUTD at baseline was lower (12%) in those with resolution compared to those with non-resolution, and was highest (45%) in the non-resolved bilateral grade 5 ($p=0.029$).

CONCLUSIONS

The decrease in BC in children with non-dilating VUR at follow-up might indicate a role of refluxing volume in the development of high BC. However, since LUTD at baseline seems to be a negative predictor for resolution, both after ET and spontaneous, it seems as the severity of the congenital anomaly decide what happens to the bladder and the VUR.

SCARRING ON INITIAL DMSA IS THE MOST SENSITIVE PREDICTOR OF BREAK-THROUGH FEBRILE UTI AND PROGRESSION TO SURGERY IN A PROSPECTIVE COHORT OF CHILDREN WITH VUR

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PURPOSE

The RIVUR trial and revised AAP guidelines have shed conflicting light on the effectiveness of antibiotic prophylaxis in VUR. Recent evidence suggests lower rates of spontaneous VUR resolution. The aim of our study was to identify the most sensitive predictor of break-through febrile infection and hence surgical intervention in a prospective cohort of children with VUR.

MATERIAL AND METHODS

Prospective study of consecutive patients with high-grade primary VUR who underwent MCUG and DMSA between 2011 and 2014. All patients were initially managed conservatively on antibiotic prophylaxis. Break-through febrile infection was the main indication for surgical intervention. Data was tested with Mann-Whitney test, unpaired t test and Fisher's exact test as appropriate. A p-value of <0.05 was considered statistically significant.

RESULTS

34 patients (24 male) met our inclusion criteria. There were 43 refluxing units (RU). Median follow-up was 28 (6-43) months. 17 had breakthrough UTIs and underwent surgical intervention (21 RU). 21 kidneys had uptake defects on DMSA consistent with renal scars and 15 kidneys had a differential function <40%. Refluxing kidneys that progressed to surgery had significantly more uptake defects (16 vs 5; $p = 0.0007$), but a split function <40% was not significant (9 vs 6; $p=0.34$). VUR grade (4.14 vs 3.68; $p = 0.078$), age, gender, laterality, prenatal hydronephrosis, age at diagnosis, presence of duplex or para-ureteric diverticula and timing of reflux (filling vs voiding) on MCUG were not significantly different between surgical and conservatively managed patients.

CONCLUSIONS

Scarring on DMSA is the most sensitive predictor of break-through UTI and progression to surgery in a prospective cohort of VUR patients.

COMPUTER MODEL PREDICTING BREAKTHROUGH FEBRILE UTI IN CHILDREN WITH PRIMARY VESICoureTERAL REFLUX (VUR)

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PURPOSE

We developed and investigated the accuracy of a new multi-variable computational model for predicting breakthrough fUTIs in children with VUR.

MATERIAL AND METHODS

Children with primary VUR and detailed clinical and voiding cystourethrogram (VCUG) data were identified. Patient age, gender, VCUG findings including grade, laterality, bladder volume at onset of VUR, UTI history, and presence of bladder/bowel dysfunction were assessed to determine likelihood of breakthrough fUTI. Median follow-up was 24 months (interquartile range 12 to 52 months). The dataset was randomized into a training set of 288 and a separate representational cross-validation set of 96. Various model types and architectures were investigated using neURon++, a set of C++ programs.

RESULTS

Two hundred fifty children (208 girls, 47 boys) diagnosed with primary VUR at a mean age of 3.1 years (\pm 2.6) met all inclusion criteria; 384 VCUGs were analyzed. Sixty-eight children (26.7%) experienced 90 breakthrough fUTI events. A 2-hidden node neural network model had the best fit with an ROC area of 0.755 for predicting breakthrough fUTI. A prognostic calculator using this model can be deployed for availability on the internet, allowing input variables to be entered to calculate the odds of developing a breakthrough fUTI.

CONCLUSIONS

This is the first computational model using multiple variables including bladder volume at onset of VUR. It provides improved individualized prediction of children at risk for breakthrough fUTI. A web-based prognostic calculator based on this model will provide a useful tool for assessing the risk of breakthrough fUTI in children with primary VUR.

DELAYED UPPER TRACT DRAINAGE (UTD) ON VOIDING CYSTOURETHROGRAM (VCUG) IS NOT ASSOCIATED WITH INCREASED RISK OF URINARY TRACT INFECTION (UTI) IN CHILDREN WITH VESICoureTERAL REFLUX (VUR)

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PURPOSE

VUR with delayed UTD on VCUG was reported to correlate with increased UTI risk (Park et al., J Urol, 2011) We sought to determine whether delayed UTD can be reliably classified, and whether it correlates with UTI incidence, VCUG or endoscopic findings.

MATERIAL AND METHODS

Children undergoing endoscopic surgery for primary VUR (2009-2012) were identified. VUR grade, timing, and laterality were abstracted. Demographics, hydrodistension (HD) grade, reported febrile and culture-proven UTI were assessed. UTD on VCUG was graded on postvoid images as: 1- partial/complete UTD or 2- no/increased UTD. Inter-observer agreement was calculated. Patients were excluded for incomplete imaging, or inability to void during VCUG.

RESULTS

The cohort included 128 patients (10M,118F) with mean age 4.1±2.1 yrs. Mean age at diagnosis was 2.8±2.8 yrs. Mean maximum VUR grade was 3±0.9: 1(10%), 2(26%), 3(55%), 4(33%), 5(4%). UTD occurred in 47(36%), and no drainage in 84(64%) patients. Agreement coefficient between graders was 0.596 (p<0.0001).

Cultures were available in 105 patients (73 positive). Patients experienced a mean of 2±1.2 parent-reported and 1.2±1.2 culture proven UTIs from birth to surgery. UTI rate (reported and culture-proven) among drainage groups did not differ by maximum VUR (p=0.1; p=0.49) or HD grade (p=0.87; p=0.14), or VUR timing (p=0.97; p=0.46). Table 1 outlines UTI rate by drainage.

	N	Mean (SD)	Median (mad)	p
UTI rate/YR-				
Parent Reported UTI				
Complete or >filling UTD	45	.66(.53)	47(.28)	.71
Unchanged or >filling UTD	83	.7 (.5)	.62 (.33)	
UTI Rate/Year-Positive Culture				
Complete or >filling UTD	24	.746(.657)	.47	0.1664
Unchanged or >filling UTD	49	.538(.410)	.441	

CONCLUSIONS

UTD can be reliably scored using a binary system with high inter-observer correlation. Our data shows that children with delayed UTD are not at increased risk for recurrent UTI, higher HD or VUR grades vs those with UTD.

TREATMENT OF URETERAL OBSTRUCTION AFTER ENDOSCOPIC INJECTION IN VESICoureTERAL REFLUX

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PURPOSE

We retrospectively reviewed cases of ureteral obstruction in patients with vesicoureteral reflux who had undergone endoscopic injections with different bulking agents in Russian and Belarusian centers.

MATERIAL AND METHODS

In total 3782 (4898 ureters) patients with a mean age of 49.5 ± 36.4 months and male to female ratio of 1:2.2 were included in the study. Four different injection materials were used; polyacrylamide gel in 2134, collagen in 1424, dextranomer/hyaluronic acid in 578 and polyacrylate polyalcohol copolymer in 762 ureters. The patients were followed-up by ultrasonography the next day, in a month and every 3 months during the year and voiding cystourethrography in 3 months.

RESULTS

A total 33 (0.7%) cases of ureteral obstructions were detected. Acute obstruction was developed in 12 patients within 24 hours after injection. Manifestations of acute obstruction included pain and obstructive anuria in one patient with solitary kidney. Late obstruction (more than 6 months after injection) was identified in 21 ureters. Following treatments were used: stent insertion in 24 ureters, antibiotic prophylaxis in 2, percutaneous nephrostomy with subsequent reimplantation in 2 and reimplantation in 3 cases. One patient underwent endoscopic bulge incision. In stenting group hydronephrosis was relieved in 5 from 6 ureters with acute obstruction, but none with late obstruction. A perfect outcome was discovered in one ureter with antibiotic prophylaxis and after endoscopic bulge incision. Twenty ureters with failure of stenting and antibiotic prophylaxis were reimplanted.

CONCLUSIONS

The ureteral obstruction after endoscopic treatment is rare. Ureteral stenting is unsuccessful in cases of late obstruction.

COMPARISON OF RESULTS OF ENDOSCOPIC CORRECTION OF VESICoureTERAL REFLUX IN CHILDREN USING TWO BULKING SUBSTANCES: DEXTRANOMER/HYALURONIC ACID COPOLYMER (DEFLUX) VERSUS POLYACRYLATE-POLYALCOHOL COPOLYMER (VANTRIS)

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PURPOSE

The aim of the study was to evaluate the efficacy of 2 bulking substances: Deflux versus Vantris in children with VUR.

MATERIAL AND METHODS

From 2009 to 2012, 65 children (39 girls and 23 boys) aged 1.45 - 9.9 years (mean 4.85 ± 2.52) underwent endoscopic correction of VUR using Deflux. VUR was unilateral in 31 and bilateral in 34 patients comprising 108 renal refluxing units (RRUs) grades: II in 52, III in 47, IV in 7 and V in 2. From 2012, 68 children (43 girls and 25 boys) aged 0.6 -17.9 years (mean 4.89 ± 3.46) were treated with Vantris. VUR was unilateral in 33 and bilateral in 35 patients comprising 109 RRUs grades: II in 48, III in 29, IV in 13 and V in 19. Follow-up studies included ultrasound scan 2 weeks after injection and voiding cystourethrogram 3 months after procedure.

RESULTS

All patients completed follow-up. In the majority of patients ultrasound showed Vantris deposit within the bladder wall as compared with Deflux. Reflux resolved in 68 RRUs (63%) after first Deflux injection, in 30 (27,8%) after second and in 10 (9,2%) after third. VUR was corrected in 101 RRUs (92,7%) after first Vantris injection and in 8 (7,3%) after second. No complication related to injection were noted.

CONCLUSIONS

Our data show that Vantris injection is safe and effective procedure for treating all grades of VUR with good clinical outcome and provides higher and almost complete level of reflux resolution after first injection as compared with Deflux.

DOES AUTOLOGOUS BLOOD INJECTION FOLLOWING DEXTRANOMER /HYALURONIC ACID IMPLANTATION IN TREATMENT OF VESICoureTERAL REFLUX AFFECT THE IMMEDIATE AND EARLY MICROSPHERE PARTICLE LEAKAGE?

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PURPOSE

The aim of this study was to evaluate immediate and early dextranomer particle leakage following hydrodistention autologous blood injection technique (HABIT) compared to hydrodistention injection technique (HIT).

MATERIAL AND METHODS

720 patients have received endoscopic implantation of dextranomer/hyaluronic acid co-polymer for VUR at our institutions since 2008. A total of 53 (40 girls and 13 boys) of these patients, admitted from August 2014 till February 2015, were entered in the study. A subset of 37 patients underwent HABIT, while 16 children underwent HIT. Following the completion of the procedure on each ureter, bladder was drained 3 to 5 minutes, then the bladder was irrigated for several minutes and the retrieved sample of irrigation fluid was examined for dextranomer particle count and regarded as "immediate leakage". A Foley catheter was placed and the urine sample after 24 hours was also examined and regarded as "Early leakage".

RESULTS

A total of 82 ureters were treated using HABIT (57) and HIT (25) techniques. Five cases were perforated and excluded from final comparison. Immediate leakage was significantly higher in HIT group [Median (IQR): 536.2 (903)] compared to HABIT group [Median (IQR): 25 (243)] ($p=0.01$). Early leakage in HIT group was higher than HABIT group, however, it was not statistically significant ($P=0.3$).

CONCLUSIONS

This report represents evidence that use of autologous blood in endoscopic correction of VUR in children is associated with significantly less dextranomer particle extravasation from the injection site. We suggest that this modification further stabilizes the mound and prevents future possible migration.

DOES APPLICATION OF THE NEW ESPU/EAU GUIDELINES ON URINARY TRACT INFECTIONS IN CHILDREN INFLUENCE THE VUR DETECTION RATE?

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INTRODUCTION

Recently, the ESPU/EAU recommendations for further evaluation of the upper urinary tract after febrile urinary tract infections (UTIs) in children have changed. Instead of performing an upper tract evaluation by voiding cystourethrography (VCUGs) in every child after the first febrile UTI, a more differentiated approach, based on age, gender and ultrasound findings is recommended.

We aimed to evaluate the number of performed VCUGs and the VUR detection rate comparing the former to the new version of the guidelines.

PATIENTS AND METHODS

We retrospectively evaluated 541 consecutive patients (male/female 28/72%, median age 1,83 years) who underwent as well sonography at the time of UTI as well as primary VCUG after febrile UTIs. Potty-trained children with severe bladder emptying disorders were excluded. Subsequently we analyzed these patients in light of the new guidelines.

RESULTS

Of 220 patients (40,7%) with pathological ultrasound findings 85 (39%) had VUR. Of 321 patients (59,3%) with normal ultrasound 291 patients were eligible for VCUG according to the new guidelines, 80 thereof (26,9%) had VUR. 24 VCUGs (4,4%) that would have been performed according to the former guidelines would have been omitted, 6 VURs, thereof 3 \geq °III, would not have been detected.

CONCLUSIONS

The new guidelines maintain a high sensitivity in VUR detection, only 3,5% (6/171) of formerly detected VURs would not have been detected. None of the 24 boys that would not have undergone a VCUG had a urethral pathology. However, the reduction in performed VCUGs is low (-24/541 VCUGs, -4,4%).

SUCCESS RATES OF ENDOSCOPIC OR OPEN SURGERY ACCORDING TO RISK GROUPS IN CHILDREN WITH VUR - IS RISK GROUPING NECESSARY WHEN SURGERY IS PLANNED?

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PURPOSE

Success rates of surgical treatment in children with VUR were evaluated in different risk groups described in Pediatric Urology Guidelines 2015.

MATERIAL AND METHODS

Data from patients treated by either endoscopic (STING) or open surgery between 2009-2014 were retrospectively analyzed (n=250). Toilet trained, older (>4 years) patients having high-grade VUR (grade 4 and 5) and renal scarring were considered as "high-risk group"; patients without kidney damage and with low-grade VUR (grade 1,2 and 3) were considered as "low-risk group"; all other cases who didn't meet these two were considered as "moderate-risk group". Treatment was considered "successful" in cases with no VUR and no UTI in the follow-up.

RESULTS

The mean age was 6.5±3.5 years. Forty one patients were excluded because of inadequate data. Of the remaining 209 patients, 63 were in low, 97 were in moderate and 49 were in the high-risk groups.

Table: Successful cases (n) / Total cases (n) (%)

	UNILATERAL VUR			BILATERAL VUR		
	First STING success	Overall STING success	Open Surgery success	First STING success	Overall STING success	Open Surgery success
LOW RISK	27/42 (64%)	39/42 (92%)	2/3 (67%)	15/21 (71%)	18/21 (88%)	3/3 (100%)
MODERATE RISK	32/49 (65%)	42/49 (86%)	10/10 (100%)	10/42 (24%)	33/42 (79%)	10/12 (83%)
HIGH RISK	5/19 (26%)	11/19 (58%)	10/11 (91%)	2/20 (10%)	16/20 (80%)	10/11 (91%)
TOTAL	64/110 (58%)	92/110 (84%)	22/24 (92%)	27/83 (33%)	67/83 (81%)	23/26 (88%)
p Value	0.008*	0.003*	0.18	0.001*	0.78	0.68

CONCLUSIONS

STING and open surgery provides success rates of 58-92% and 67-100% respectively, depending on the risk group. Because low and moderate risk patients have similar surgical results in unilateral cases, risk grouping as high and non-high risk seems satisfactory for unilateral VUR. Surgical results do not change between risk groups of bilateral cases.

OUTCOME OF KIDNEY FUNCTION AND GENERAL STATUS IN CHILDREN TREATED FOR PRIMARY VESICoureTERAL REFLUX DURING INFANT OVER 15 YEARS FOLLOW-UP

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PURPOSE

The purpose of this retrospective study was to evaluate outcome of kidney function and general status in children with high grade vesicoureteral reflux(VUR) who were examined renal scarring and underwent surgical treatment during infant and observed over 15 years.

MATERIAL AND METHODS

Between 1988 and 1994, 45 patients were diagnosed with high grade VUR(grade 3-5) and underwent surgical treatment within the first year of life and systematically followed up over 15 years old. Renal scarring was evaluated by DMSA scintigraphy at 6 months after the infection and was classified as group 0 to 3: Group 0(G0) had no parenchymal lesion. Group 1(G1) had unilateral and bilateral single parenchymal lesion. Group 2(G2) have unilateral multiple or diffuse parenchymal lesion with or without contralateral single parenchymal lesion. Group 3(G3) had bilateral multiple or diffuse parenchymal lesion. Chronic renal failure(CRF) was defined as estimated glomerular filtration rate(GFR) under 60ml/min per 1.73 m² body surface area.

RESULTS

Among 45 patients(41 males), 6 had no renal scar, 7 had G1 scar, 24 had G2 scar and 8 had G3 scar at initial evaluation. GFRs(ml/min/1.73m²) at age 15 were 129.1±12.0 in G0, 138.5±19.6 in G1, 118.3±19.6 in G2 and 67.3±47.5 in G3. Five of 45(11.1%) had CRF and all of them were in group 3. Three of 8 patients in group 3 underwent kidney transplantations over 10 years old. High blood pressure (HBP) was found in 16.7% of G0, 14.2% of G1, 33.3% of group 2 and 50% of G3. Proteinuria was found in none of G0 and 1, 16.7% of G2 and 50% of G3. Urine beta-2 microglobulin/Cr level at age 1 correlate with renal scar grade. However urine N-acetyl-β-D-glucosaminidase level had no correlation with scar grade.

CONCLUSIONS

The patients with unilateral multiple or diffuse scar and bilateral multiple or diffuse scar had high prevalence of HBP and proteinuria. Moreover the patients with multiple bilateral renal scar had very high risk of CRF and were needed long-term follow-up.

VUR TIMING ON VCUG AS PREDICTIVE FACTOR OF VUR RESOLUTION AFTER ENDOSCOPIC INJECTION

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PURPOSE

In children with vesicoureteral reflux (VUR), the identification of reflux is made during either the filling or voiding phase of the voiding cystourethrogram (VCUG). The timing of VUR on VCUG is known as a predictive factor of spontaneous resolution in VUR children. We assess the effect of VUR timing on the radiologic outcome after endoscopic dextranomer/hyaluronic acid copolymer injection for VUR.

MATERIAL AND METHODS

We retrospectively reviewed the medical records of 94 VUR patients (136 ureters) who underwent endoscopic dextranomer/hyaluronic acid copolymer injection as initial surgical management at our institution between May 2006 and December 2013. Radiologic success was defined as grade I or less on VCUG at 3-6months after endoscopic injection. We allocated patients to a filling reflux group or a voiding reflux group on the basis of the most recent preoperative VCUG. We evaluated patient demographics and outcomes after endoscopic injection according to VUR timing. Predictive factors for persistent VUR were analyzed in a multivariate logistic regression model.

RESULTS

Of the 94 children (136 ureters), 68 (101 ureters) were allocated to the filling reflux group and 26 (35 ureters) were allocated to the voiding reflux group. Preoperative VUR grade in filling reflux group was significantly higher than that in voiding reflux group ($p = 0.001$). The radiologic success was observed 56.44% (57/101 ureteral units) in the filling reflux group and 88.57% (31/35 ureteral units) in the voiding reflux group ($p = 0.001$). Multivariate analysis showed that higher VUR grade (grade \geq IV) and filling reflux on VCUG were predictive factors of persistent VUR after endoscopic surgery ($p = 0.001$ and $p = 0.005$).

CONCLUSIONS

VUR timing on preoperative VCUG was found to be an independent predictive factor of VUR resolution after endoscopic injection. Our findings indicate that VUR timing should be considered a priority in the management of VUR patients who needed surgical intervention.

CAN WE PREDICT THE RISK OF URETERAL REIMPLANTATION IN PATIENTS WITH DIAGNOSIS OF VESICoureTERAL REFLUX?

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PURPOSE

Factors deciding surgical decision making for vesicoureteral reflux (VUR) are significantly variable and are based on individual preferences and practice patterns. With the current shift towards conservative management, it is crucial to base the surgical decision based on individualized risk factors. Our goal was to assess the individual patient related risk factors, in patients undergoing corrective VUR surgery.

MATERIAL AND METHODS

After IRB approval, a retrospective review of all patients presenting with VUR was performed. Possible independent predictors evaluated included age, gender, number of febrile UTIs, prenatal diagnosis, bilateral VUR, fever >39.8, constipation, voiding dysfunction, and radiographic features on VCUG [Dilating (≥ 7 mm distal ureter), reflux on filling, and persistence on post void phase]. Multivariate logistic regression was performed to identify factors that predicted surgical intervention.

RESULTS

Of the 486 eligible patients (average age-25.2 months), 118 (24.3%) had reflux that either remained stable or resolved while 75.7% required corrective surgery.

Based on multivariate analysis, age, gender, number of febrile UTIs, high grade VUR (<0.001), prenatal diagnosis (0.003), voiding dysfunction (0.026), and dilation of ureter on VCUG (<0.001) were significant predictors of surgical intervention.

Female gender (OR 12.2), dilation on VCUG (OR 8.1) and grade 4,5 VUR (OR 5.9) were the strongest predictors. The logistic model and prediction equation had good discrimination (c-statistic = 0.87) and very high calibration ($p \geq 0.58$).

Max VUR	Odds of Surgery	P-value
Grade 1 & 2	N/A	0.017
Grade 3	0.14	<0.001
Grade 4 & 5	5.99	<0.001

CONCLUSIONS

Female gender, high grade VUR, age (post toilet training), number of febrile UTI, prenatal diagnosis, voiding dysfunction and dilatation of distal ureter are strong preoperative predictive risk factors for corrective surgery for VUR with negative predictive value of 74%.

VOIDING CYSTOURETROGRAPHY AFTER SURGICAL TREATMENT OF VESICoureTERAL REFLUX: REWARDING OR PUNISHING?

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PURPOSE

To investigate the usefulness of postoperative voiding cystourethrography(VCUG) in daily clinical practice after endoscopic subureteral injection and ureteral re-implantation for vesicoureteral reflux.

MATERIAL AND METHODS

The records of the patients who underwent endoscopic subureteral injection and ureteral re-implantation for vesicoureteral reflux at two academic centers were reviewed between 2009-2012. The patients were classified as low, moderate and high-risk groups according to EAU paediatric urology guideline by using VCUG grade, presence of kidney abnormality, lower urinary tract symptoms and toilet training. Postoperative clinical course, causes of failure, intervention type, presence of postoperative VCUG were analyzed.

RESULTS

Surgical interventions were performed on 232 renal units(RU) in 159 patients. Mean age of the children was 6.78±5.5 years. 46(19.8%)RU's were grouped as low-risk, 144 (62.1%) RU's were moderate risk and 42(18.1%)RU's were high-risk. Distribution of postoperative VCUG and presence of urinary tract infection(UTI) were listed in table 1. In moderate risk group who received subureteral injection; out of 57 RU's, 5(8.8%)RUs had UTI. Among these, only 1(1.7%) refluxing RU had UTI(p=0,880). In high risk group, out of 10 RU's who received VCUG, 1(10%)RU had both reflux and UTI(p=0,197). In re-implantation group, out of 37RU's, only 1(%)RU had UTI without reflux.

EAU guideline	Injection				Ureteral Reimplantation		
	Risk grouping	UTI		P	UTI		P
		Positive	Negative		Positive	Negative	
Low risk Group	Postop.VCUGpositive	1(%8.3)	11(%91.7)	0,768			
	Postop.VCUGnegative	2(%5.9)	32(%94.1)				
Moderate risk Group	Postop.VCUGpositive	5(%8.8)	52(%91.2)	0,519	1(%20)	4(%80)	0,097
	Postop.VCUGnegative	4(%5.8)	65(%94.2)		0	13(%100)	
High Risk Group	Postop.VCUGpositive	1(%10)	9(%90)	0,244	0	7(%100)	
	Postop.VCUGnegative	0	13(%100)		0	12(%100)	

CONCLUSIONS

The application of VCUG for postoperative evaluation didn't give an extra clue to identify those patients at risk of further surgical intervention in both groups. The results showed that follow-up after surgical intervention might be set on clinical outcomes rather than VCUG.

EVALUATION OF MATHISEN'S TECHNIQUE FOR URETERAL REIMPLANTATION IN CHILDREN WITH PRIMARY VESICoureTERAL REFLUX

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INTRODUCTION

Although cross-trigonal ureteral reimplantation (Cohen) is the most commonly used technique in children, it represents an unphysiological transfer of the ureteral orifices. Extraanatomical ureteral reimplantation may result in difficulties during ureteral instrumentation later in life. W.Mathisen in 1964 described an alternative method of ureteral reimplantation with lateralization of the neohiatus creating an orthotopic course of the submucosal tunnel which is long enough to ensure antirefluxive length. We retrospectively evaluated success as well as complication rates of both techniques.

PATIENTS AND METHODS

48 consecutive patients (83 ureters, 24 males/24 females, median age 2,01 years) after Mathisen's reimplantation were compared to 53 consecutive patients (99 ureters, 30 males/23 females, median age 1,4 years) after Cohen's reimplantation. Inclusion criterion was primary vesicoureteral reflux (VUR) and no previous intervention. Reflux grades (Mathisen °0-°2[contralateral] 25/30,1%, ≥°3 58/69,9%; Cohen °0-°2[contralateral] 32/32,3%, ≥°3 66/66,7%).

RESULTS

After Cohen's reimplantation there were no immediate complications, during follow-up (median follow-up 24,5 months) 3 patients (5,6%) suffered febrile UTIs, thereof 1 (1,8%) was diagnosed with a persisting VUR. Persistent hydronephroses were recorded in 7 patients (13,2%).

After reimplantation using Mathisen's technique 2 patients (4,1%) suffered significant intravesical bleeding, during follow-up (median follow-up 11,5 months) 4 patients (8,3%) suffered febrile UTIs and a total of 7 patients (14,5%) were diagnosed with persisting VUR. 2 patients (4,1%) had persistent hydronephroses.

CONCLUSIONS

Despite the advantages of an orthotopic ureteral orifice close to the bladder neck, Mathisen's technique for ureteral reimplantation yielded an inferior success rate (85,5%) in comparison with Cohen's reimplantation technique (98,2%) as judged from our series of only patients undergoing the first antireflux intervention. This may be partly explained by a lower level of experience in some of the surgeons in the Mathisen's group. Although there was no intervention for obstruction, persistent hydronephroses were more common in the Cohen group (13,2% vs. 4,1%).

PIC CYSTOGRAPHY AND REDO-PIC CYSTOGRAPHY IN CHILDREN WITH RECURRENT FEBRILE URINARY TRACT INFECTIONS AND NEGATIVE VOIDING CYSTOURETHROGRAPHY

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PURPOSE

In this study we evaluated the value of PIC cystography in patients with febrile recurrent urinary tract infection where VCUG was negative and evaluated the effectiveness of redo-PIC.

MATERIAL AND METHODS

Recruitment for this prospective study was performed between June 2011 - April 2014 and follow-up until December 2014. The study included patients with recurrent f-UTI with no reflux on VCUG. A PIC cystography was performed in all patients. When reflux was found, subureteric injection was performed. Urinary cultures were used for follow-up. Patients that continued having f-UTI, received redo-PIC cystography.

RESULTS

PIC cystography was performed on 35 patients. The average age of patients was 8.0 ± 3.8 years. VUR was detected in 34 patients. Average follow-up time after PIC cystography was 30.0 months. Twenty-eight patients (82.3%) were free of f-UTI after PIC cystography and concurrent subureteric injection. Six patients continued to have recurrent f-UTI. Four of these patients underwent redo-PIC cystography and PIC-VUR was demonstrated in all patients. After an average followup of 21.9 months, no f-UTI was seen in these patients. The success rate of 82.4% after 1st PIC cystography and subureteric injection increased to 94.2% after redo-PIC cystography in 4 patients.

CONCLUSIONS

Patients with recurrent f-UTIs without VUR on VCUG are an important challenge. PIC cystography is an important tool in demonstrating occult VUR in these patients. We advise that PIC cystography is performed in all patients with recurrent f-UTI with negative VCUG and redo-PIC cystography in patients who continue to have f-UTI after 1st PIC cystography and subureteric injection.

DO THE TYPE OF BULKING AGENTS AND INJECTION METHOD HAVE ANY INFLUENCE ON THE INCIDENCE OF URETERAL OBSTRUCTION BY ENDOSCOPIC TREATMENT OF REFLUX?

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PURPOSE

To research the effect of the type of bulking agents and injection method on the frequency of ureteral obstruction (UO).

MATERIAL AND METHODS

During 1998-2014, endoscopic treatment in 3782 patients (4898 ureter) was performed in 9 clinics in Russia and Belarus. I group - 2134 ureters, polyacrylamide copolymer was used, II group in 1424 ureters collagen was used, III group - 762 ureters, polyacrylate polyalcohol copolymer was used and group IV -578 ureters, dextranomer / hyaluronic acid was used. The method STING was used in 3984 ureters (81.3%) and HIT in 914 ureters (18.7%). The patients were followed up by ultrasonography the next day after injection, in a month and every 3 months during the year. For statistical analysis binary logistic regression was used.

RESULTS

High probability of formation of UO was statistically more significant ($p = 0.0001$) in patients of groups III (14) and IV (8) in comparison with children of groups I (9) and II (2). Not statistically significant differences were found in the frequency of UO in comparison with patients of groups III and IV ($p = 0.5$). UO was reported in 18 (0.45%) patients after the injection performed by STING, which was significantly less ($p < 0.0001$), than when we used the HIT method- 15 (1.6%).

CONCLUSIONS

The risk of ureteral obstruction using polyacrylate polyalcohol copolymer and dextranomer/hyaluronic acid was higher than using collagen and polyacrylamide copolymer. The use of HIT increases the risk of obstruction.

S5: IMAGING

Moderators: Kaoru Yoshino (Japan), Haluk Emir (Turkey)

ESPU Meeting on Thursday 15, October 2015, 09:24 - 10:06

09:24 - 09:27

S5-1 (PP)

★ OPTIMIZATION OF FLUOROSCOPIC IMAGING TO REDUCE RADIATION EXPOSURE IN CHILDREN UNDERGOING ENDOUROLOGICAL INTERVENTION

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PURPOSE

The era of minimal-invasive surgery has created a heavy dependence on fluoroscopic guidance to allow a real time imaging of the patient. Radiation protection management recommends radiation exposures that are as low as reasonably achievable, while still maintaining diagnostic image quality. The aim of the study is to prospectively compare fluoroscopy time during pediatric endourological intervention before and after implementation of strategy for optimization of fluoroscopic imaging and study its effect on surgical outcomes.

MATERIAL AND METHODS

We observed 56 consecutive endourological intervention in children in whom a dose reduction strategy was adopted. The strategy included several measures, including optimizing position by performing the procedure with the patient table elevated while keeping the fluoroscopy table as far from the X-ray tube as possible (to reduce skin entry dose), and the image intensifier close to the patient (to maximize image capture), use of pulsed mode with last image hold technique, beam collimation, use of a designated fluoroscopy technician. Outcomes were compared to those in 42 children before implementing dose reduction strategy. Fluoroscopy times, operative time, stone free rate, perioperative complications were compared between both groups.

RESULTS

Operative time ($P=0.53$), stone free rate ($P=0.36$), and complication rate ($P = 0.21$) were similar between the 2 groups. Total fluoroscopy time was significantly reduced by 55% from 1.68 to 0.75 minutes ($p <0.002$) with very little loss of image quality.

CONCLUSIONS

Radiation exposure in children undergoing endourological interventions can be reduced significantly after optimization of fluoroscopy imaging. Reduced radiation protocol did not increase surgical complexity, operative time, or complication rates while reducing radiation exposure in such susceptible population

★ VARIATION IN THE REPORTING OF PEDIATRIC VOIDING CYSTOURETHROGRAM FINDINGS

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PURPOSE

VCUG provides a wealth of data on urinary tract function and anatomy, but few standards exist for reporting VCUg findings. We sought to assess VCUg report quality from a wide range of institutions, using a standardized assessment tool.

MATERIAL AND METHODS

Among the 607 children enrolled in the RIVUR trial, we analyzed the 602 available original VCUg reports. A 23-item checklist was used to evaluate reporting of technical, anatomic, and functional information (e.g. reflux grade, bladder capacity, assessment of skeletal anatomy, filling vs. voiding onset of VUR, etc). Patient, radiologist, and institutional information were collected. Facilities were categorized as free-standing pediatric hospitals (FSPH), pediatric "hospitals within a hospital" (PHWH), non-pediatric hospitals (NPH), or outpatient radiology facilities (ORF). Multivariate linear regression was used to analyze factors associated with the completeness of VCUg reports (% of items reported).

RESULTS

602 VCUg's were performed at 91 different institutions. 76% were read by a pediatric radiologist. 50% were performed at a FSPH, 30% at PHWH, 15% at NPH, and 5% at ORF. On average, less than half of items were included in VCUg reports (mean % of items: 48±12%). Report completeness varied by facility type: 51±11% at FSPH, 50±10% at PHWH, 36±11% at NPH, and 43±8% at ORF (p<0.0001). Clinically-significant items reported infrequently included bladder volume at reflux onset (2%), collecting system duplication (6%), ureteral insertion site (11%), and delayed images for assessment of obstruction (25%). In multivariate analysis, VCUg reports generated at NPH or ORF had 8% fewer items included (95% CI: 3-13%, p<0.01), and those generated at PHWH were no different, compared to FSPH. Reports read by a non-pediatric radiologist had 6% fewer items included (3-10%, p<0.01), compared to those read by a pediatric radiologist.

CONCLUSIONS

There is significant variability among facilities and radiologists in the completeness of VCUg reporting, with more complete reports from FSPH and pediatric radiologists.

★ WHAT IS THE OPTIMUM CUTOFF VALUE OF THE CONTRALATERAL TESTICULAR SIZE BY ULTRASOUND (US) TO PREDICT ABSENT TESTIS IN BOYS WITH NON-PALPABLE TESTIS (NPT)?

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PURPOSE

To determine and investigate the accuracy of ultrasonographic optimal cut-off value of the contralateral testicular size that predicts the absence of the unilateral NPT.

MATERIAL AND METHODS

A prospective study was conducted over 4 years (10/2010-9/2014) on cases with unilateral NPT and normal descended contralateral testicle. All underwent preoperative US for measuring the contralateral testicular size (Length and volume). Patients with testicles rendered palpable under anesthesia were excluded. All patients underwent laparoscopy. Contralateral testicular size was compared to testicular size of an age matched control group and correlated to laparoscopy outcome.

RESULTS

Analysis was completed on 250 cases. Mean age at operation was 1.7 years. During laparoscopy testicles were found intra-abdominal in 112 boys and were absent in 138 (45 were vanished and 93 were nubbin), of those 138 the mean contralateral testicular length and volume was 17.0 mm and 0.76 mL compared with 11.8 mm and 0.32 mL in the boys with the testis present and 12.2 mm and 0.33 mL in the controls, respectively ($P < .05$). The positive predictive value, sensitivity, and specificity for a cutoff value of 16 mm in length were 94.4%, 91.9%, and 93.3% while for a cutoff value of 0.60 ml in volume were 92.1%, 94.6%, and 90%, respectively.

CONTRALATERAL TESTICULAR LENGTH	LAPAROSCOPY FINDINGS OF NPT		Controls
	Absent(138)	Present(112)	
Below 16 mm	11(7.9%)	105(93.8%)	182(91%)
Equal/Above 16 mm	127(92.1%)	7(6.2%)	18(9%)

CONTRALATERAL TESTICULAR VOLUME	LAPAROSCOPY FINDINGS OF NPT		Controls
	Absent(138)	Present(112)	
Below 0.6 ml	7(5.1%)	101(90.1%)	186(93%)
Equal/Above 0.6 ml	131(94.9%)	11(9.9%)	14(7%)

CONCLUSIONS

Ultrasonographic contralateral testicular size may be a useful predictor of laparoscopy outcome, it strongly indicates absent testis at an optimal cutoff value of 16 mm length and 0.60 ml volume. Whenever available preoperatively, it provides valuable information for parents counseling.

ANALYSIS OF RENAL ULTRASONOGRAPHY MEASURES RELATED TO BODY HABITUS AND PRONE AND SUPINE POSITIONS

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PURPOSE

Quantitative renal ultrasonography (RUS) parameters are an important part of the pediatric urinary tract assessment, but these are often obtained when the kidney is best imaged whether prone or supine. This prospective study determines the effect of prone and supine positions and general body habitus on renal sonographic measurements of renal parenchymal area in children.

MATERIAL AND METHODS

With IRB approval planar renal parenchymal area (RPA) and length were determined during RUS in supine and prone positions. Exclusion was inability to position or measure kidney dimensions in both positions. Body habitus was classified by Center for Disease Control body mass index charts (normal, overweight, or obese). Data was analyzed by Pearson correlation (prone vs. supine) and Bland-Altman analyses (scatterplot of mean and differences between positional values).

RESULTS

From October 2010 to January 2011, 213 children had studies and 177 (mean 58.6 months; range 0.3-215 months) were included. 122 children had complete data for body habitus (84 normal, 19 overweight, 19 obese.) RPA determined in prone vs. supine positions showed high correlation (Pearson Correlation 0.90; $p < 0.01$); however, Bland-Altman analysis showed variance due to position was $> 50\%$ of mean. Further analyses showed neither systematic bias of measured kidneys nor body habitus influenced results.

CONCLUSIONS

This analysis shows that sonographic RPA from prone and supine positions correlate well, but cannot be compared (prone and supine RPA cannot be used interchangeably) for clinical assessment. Quantitative ultrasonography measures (RPA) should be made in the same position for clinical assessment regardless of body habitus and should be standardized.

MODIFYING CURRENT INDICATIONS FOR IMAGING IN PEDIATRIC BLUNT RENAL TRAUMA

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PURPOSE

Gross hematuria is seen in 1/3 of significant renal injuries in pediatric blunt renal trauma (PBRT). We analyze whether eliminating gross hematuria and mechanism as imaging criteria in PBRT will affect rates of detection of high (AAST IV-V) and low (AAST I-III) grade renal injury.

MATERIAL AND METHODS

We performed a retrospective review of our PBRT database 1995-2015, stratifying patients into two cohorts: high grade and low grade injury, and analyzed PE findings (abdominal/flank tenderness or bruising), N/V, and gross hematuria. Patients with incomplete data were excluded. Statistics were performed by Fisher's exact test (SPSS v. 21).

RESULTS

Of 74 renal injuries, 23 were high grade (all AAST IV) and 51 were low grade (19 grade III, 13 grade II, 19 grade I). Median age was 12.4 years (0.1-19.6). Comparing high v. low grade cohorts: 100% v. 78% patients manifested abdominal/flank pain on PE ($p=0.0135$), 56.5% v. 24% had N/V ($p=0.0088$), and 90% v. 78% had gross hematuria ($p=0.5250$). Using the criteria 1) abdominal/flank pain or 2) N/V for scanning, one CT in the high grade cohort v. seven in the low grade cohort would NOT have been performed ($p=0.4218$), however all these patients were managed non-operatively and did not require blood transfusions. In the high grade cohort, 4 patients required double J stenting and one patient had angioembolization, all of which would have been scanned based on the criteria above. No trauma or delayed nephrectomies were performed in any patients.

CONCLUSIONS

Our data suggests that indications for CT imaging in PBRT should include abdominal/flank PE findings and N/V, and exclude mechanism and gross hematuria. A larger prospective multi-center trial is warranted to verify these findings.

INTRAOPERATIVE MRI-GUIDED NAVIGATION OF THE PELVIC FLOOR DURING CLASSIC BLADDER EXSTROPHY AND CLOACAL EXSTROPHY CLOSURE

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PURPOSE

Radical dissection of the urogenital fibers and the thickened smooth and striated muscle fibers connecting the posterior urethra and bladder plate to the diastatic pubic rami is crucial for adequate placement of the posterior vesicourethral unit deep within the pelvis during classic bladder exstrophy (CBE) and cloacal exstrophy (CE) closure, and ensuring successful outcomes. Intraoperative MRI-guided navigation of the pelvic floor offers a novel technique for identification of crucial anatomic landmarks during closure.

MATERIAL AND METHODS

IRB and FDA approval was obtained for use of Brainlab® (Munich, Germany) intraoperative MRI-guided navigation of the pelvic floor during closure of CBE and CE at the authors' institution. Pre-operative pelvic MRI was obtained one day prior to CBE or CE closure in patients necessitating pelvic osteotomies. Intraoperative registration was performed after pre-operative planning with a pediatric radiologist utilizing five anatomic landmarks immediately prior to initiation of surgery. Accuracy of identification of anatomy was assessed by three pediatric urologic surgeons and one pediatric radiologist.

RESULTS

Twenty patients with CBE and two patients with CE closed at the authors' institution have successfully utilized Brainlab® technology to navigate and guide the dissection of the pelvic floor intraoperatively. All patients had 100% accuracy in correlation of gross anatomic landmarks with MRI identified landmarks intraoperatively, and all have had successful closure of CBE without any complication.

CONCLUSIONS

Brainlab® intraoperative MRI-guided pelvic floor navigation and dissection is an effective way to accurately identify pelvic anatomy during CBE and CE closure. This technology offers a unique opportunity for surgical skill education in this complex reconstructive operation. Future assessment of real-time changes in pelvic floor anatomy comparing pre-closure to post-closure MRI will allow quantification of pelvic floor anatomy in CBE and CE patients and may allow for intra-institutional telementoring in this most important first step of exstrophy reconstruction.

ACUTE PYELONEPHRITIS IN CHILDREN: COMPARISON OF TWO METHODS - STATIC RENAL SCINTIGRAPHY AND MAGNETIC RESONANCE IMAGING

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INTRODUCTION STATING THE AIM OF THE STUDY

Static renal scintigraphy, using ^{99m}Tc DMSA radiopharmaceutical is regarded since decades as the gold standard for detection of inflammatory changes in the renal parenchyma in acute pyelonephritis. Diffusion weighted magnetic resonance imaging examination (DWI-MRI) shows high sensitivity in the localization of inflammatory processes and changes in soft tissues. We tried to demonstrate these changes in children with acute pyelonephritis. The results of DWI-MRI examination were subsequently compared with static renal scintigraphy-^{99m}Tc DMSA.

PATIENTS AND METHODS

Twenty-three children aged 3-18 years (22 girls), with acute pyelonephritis were examined (diagnosis according Jodal's criteria). Both, static renal scintigraphy (using ^{99m}Tc DMSA) and magnetic resonance (DWI-MRI) were performed to confirm inflammatory lesions in the kidneys of these patients. Both examinations were carried out in the first 5 days after the diagnosis. DWI-MRI was performed without application of contrast medium and without general anaesthesia.

RESULTS

DWI-MRI examination confirmed the inflammatory infiltration in kidney parenchyma in all our patients (100 %). On the other hand, the static renal scintigraphy with ^{99m}Tc DMSA.confirmed inflammation only in 15 children (60%). Six months later, none of the two follow-up examinations showed any signs of inflammation or scarring in 17 children examined so far.

CONCLUSIONS

In conclusion, nuclear magnetic resonance (DWI-MRI) imaging seems more sensitive, beneficial and accurate in the diagnostics of acute pyelonephritis when compared with ^{99m}Tc DMSA. Moreover, DWI-MRI provides more accurate information on the extent of kidney damage.

RELIABILITY OF VESICoureTERAL REFLUX GRADING AND OTHER FINDINGS ON VOIDING CYSToureTHROGRAPHY

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PURPOSE

Although vesicoureteral reflux (VUR) grading is essential for prognosis and clinical decision-making, the inter-rater reliability of VUR grading is poorly understood. We sought to determine the inter-observer consistency of VCUG findings in a large cohort of children with VUR.

MATERIAL AND METHODS

The Randomized Intervention for Children with Vesico-Ureteral Reflux (RIVUR) trial is a randomized controlled trial of antimicrobial prophylaxis among children with VUR and urinary tract infection. Each enrollment VCUG was read by a local clinical radiologist, and independently by two blinded RIVUR reference radiologists (reference radiologist disagreements were adjudicated for RIVUR trial purposes). We compared the three radiology interpretations for VUR grade and other VCUG findings.

RESULTS

Among the 607 subjects (558 females; median age at VCUG: 11 months) included in the RIVUR trial, 602 non-reference radiology reports from 91 sites were reviewed and yielded VUR grade information for 524 right and 560 left ureters. All three radiologist interpretations agreed on VUR grade in only 59% of ureters; two out of three agreed on 39% of ureters; and all three disagreed on 2% of ureters. Agreement was better ($\geq 92\%$) for other VCUG findings (e.g. bladder shape "normal"). The clinical radiologist's VUR grade differed from the adjudicated RIVUR grade by exactly one grade level in 19% of ureters, and by 2 or more grade levels in 2.6% of ureters. All 3 radiologists agreed on the VUR grade of both ureters in just 43% of patients.

CONCLUSIONS

There is significant inter-rater variability for grading VUR. This has both research and clinical implications, as study design, risk stratification, and clinical decision-making are heavily reliant on VUR grades.

PERINEAL ULTRASOUND (PU) DETECTS URETHRAL AND VAGINAL ANOMALIES IN CAH

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PURPOSE

In girls with CAH, urethral and vaginal anatomy varies considerably. Before surgery, the length of the common channel and the length of the bladder neck must be known in order to select an appropriate surgical approach. This information has traditionally been obtained from endoscopy, genitography or MRI. In this study, we explored the feasibility and accuracy of perineal ultrasound for this purpose.

MATERIAL AND METHODS

PU was carried out in 8 girls with CAH. Inverted longitudinal sections were obtained and compared to endoscopic findings of the same patients obtained preoperatively and to ultrasound findings from normal girls. The length of the common channel was measured endoscopically and compared to the ultrasound findings.

RESULTS

Ultrasound reliably distinguished normal patients from patients with CAH. It visualized the urethra, bladder neck and vagina as well as the common channel and the bulbospongiosus muscle in CAH. Measurements of bladder neck and common channel length were comparable with both techniques.

CONCLUSIONS

PU is a simple and cheap technique that reliably provides anatomic details of surgical importance in CAH. It may help to avoid the radiation exposure associated with genitography and the cost associated with endoscopy or MRI. The technique is easily repeated and is particularly suitable for follow-up examinations. PU should be considered the first line investigation in patients with CAH. Many surgeons are familiar with ultrasound and may take advantage of this technique.

UROEPITHELIAL THICKENING IMPROVES DETECTION OF VESICoureTERAL REFLUX IN INFANTS WITH PRENATAL HYDRONEPHROSIS

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PURPOSE

Uroepithelial thickening (UET) of the renal pelvis is a sonographic finding associated with inflammation, prior distention, or vesicoureteral reflux (VUR); however, the significance of this finding in association with prenatal hydronephrosis (PNH) is unknown. We sought to determine if the presence of UET on renal ultrasound (RUS) improves the ability of this study to detect VUR in infants with PNH.

MATERIAL AND METHODS

Between 2003-2013, we identified 135 infants (< 30 days old) with postnatal RUS to evaluate PNH and who also had voiding cystourethrogram (VCUG) within 90 days. Patients with neurogenic bladder, posterior urethral valve or urinary tract infection were excluded. A pediatric radiologist and urologist reviewed all imaging. Two criteria indicating a "positive" RUS were compared; 1) Society for Fetal Urology (SFU) grade 3-4 hydronephrosis or 2) at least two of the following: UET, hydroureter, collecting system duplication or renal dysmorphism. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) of RUS for any VUR and high grade VUR (HGVUR) were calculated.

RESULTS

For predicting any VUR, criteria 2 showed similar sensitivity (54% vs. 54%), but improved specificity (82% vs. 49%), PPV (55% vs. 30%) and NPV (81% vs. 72%). For predicting HGVUR, criteria 2 showed higher sensitivity (100% vs. 75%), specificity (82% vs. 51%), PPV (42% vs. 17%), and NPV (100% vs. 94%).

CONCLUSIONS

By using criteria 2 which includes UET for infants with PNH, prediction of VUR was improved and 22 of 135 (16%) VCUGs could have been safely omitted without missing any HGVUR; this may enhance patient care by decreasing radiation exposure, family anxiety and health care costs.

COMPARISON OF SUPRAPUBIC PUNCTURE AND TRANSURETHRAL CATHETERIZATION FOR VCUG

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PURPOSE

A VCUG can be performed either through transurethral catheterization (TUC) or suprapubic puncture (SPP). This study intends to compare both methods regarding anxiety, pain and complications in patients and parents.

MATERIAL AND METHODS

801 families whose child underwent a VCUG between 2006 and 2011 were asked to answer a self-designed questionnaire. Visual analogue scale (0-100) was used to rate pain and anxiety.

RESULTS

417 (52%) families responded, 204 (49%) girls and 213 (51%) boys between 0 and 157 (median 34) month could be included. 86 (21%) received the VCUG via TUC and 314 (78%) via SPP.

Anxiety level for the child before the VCUG was 40.1 and 43.5 for the parents. Median anxiety level before investigation was even in both groups (SPP: 45.35; TUC: 42), whereas younger children seemed to be less anxious than older ones (0-2y: 35.16; 3-6y: 57.74; 6-11y: 57.79; >12y: 59.98) and boys less (39.84) than girls (49.54).

Correlation of pain level (39.23) between TUC (35.55) and SPP (40.13), boys (43.17) and girls (35.54) or differentiated by age (0-2: 40.63; 3-6: 39.19; 6-11: 34.58; >12: 44.38) did not show a significant difference.

Compared to a vaccination a VCUG was rated more unpleasant or a lot more unpleasant by 61% of patients

CONCLUSIONS

As no significant difference could be shown between both methods, method should be chosen according to the individual case and intention of the investigation.

DYNAMIC CONTRAST ENHANCED MAGNETIC REASONANCE NEPHRO-UROGRAPHY IN DETERMINATION OF SPLIT RENAL FUNCTION IN PEDIATRIC OBSTRUCTIVE UROPATHY

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PURPOSE

The aim of our study was to evaluate the role of dynamic enhanced MRI and compare it to other imaging modalities in the investigation of pediatric hydronephrosis.

MATERIAL AND METHODS

Twenty-four patients (13 boys and 11 girls, mean age 4 years [2 months-14 years] with unilateral or bilateral urinary tract dilatation underwent prospective examination with combined static-dynamic MR urography. A combination examination involved use of a static T2 weighted Turbo Spin Echo sequences and a dynamic T1-weighted Gradient Echo three-dimensional sequence with a dose of 0.05-0.1mmol/kg gadopentetate dimeglumine-DTPA and furosemide application. The morphological and functional results were compared with those of ultrasonography, scintigraphy and, when available, conventional urography. Results were compared with those of diuretic renal scintigraphy (DRS) for split function (Pearson correlation coefficient) and urinary excretion (Agreement (k) coefficient).

RESULTS

pelvi-ureteric junction obstruction (n= 11), non-obstructive dilatation post-pyeloplasty (n= 5), primary megacoele (n=3) and duplex system (n=3). For split renal function, dynamic MR urography and DRS showed strong correlation (r= 0.89, P<0.0001). For urinary excretion, based on the excretory segment of the Reno graphic curve, MR urography and DRS showed strong agreement (k= 0.63), with concordant classification of urinary excretion in 21 (78%) of 27 abnormal kidney-ureter units.

CONCLUSIONS

Combined static-dynamic MR urography provides high-quality depiction of the urinary tract in infants and children, as well as accurate determination of split kidney function and reliable evaluation of urinary excretion in a single test.

S6: RENAL TRANSPLANTATION

Moderators: Wouter Feitz (Netherlands), Armando Lorenzo (Canada)

ESPU Meeting on Thursday 15, October 2015, 10:06 - 10:36

10:06 - 10:09

S6-1 (PP)

★ LONG-TERM OUTCOMES ADULT SIZE KIDNEYS IN SMALL PAEDIATRIC RENAL TRANSPLANTATION

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PURPOSE

The use of adult size kidney seems applicable to low-weight children where age and size-matched donors are so scarce. The purpose is to assess the impact of donor-recipient size mismatched on long-term renal graft survival in small recipient and optimize graft allocation.

MATERIAL AND METHODS

Between 1999 and 2010, 46 renal transplants were performed in recipient under 20 kg. Patients were stratified in two groups according to donor-recipient size: (A) 19 adult-size graft and (B) 27 size-matched graft. All transplantation was performed with similar surgery protocol and the same immunosuppressive regimen was employed. Renal size, GFR and graft survival were analyzed and compared between two groups at one-two-five-yrs, and at the end of the study. Proteinuria and acute rejection episodes also were reviewed.

RESULTS

The mean renal size was significantly different during the 1st-yr between both groups (A) 11.2±106 cm and (B) 8.6±0.8 cm, at five-yr the renal size from B increased (11.1±96 cm), but A did not change. The mean GFR (ml/min/1.73m²) was 148±47 (A) and 111±33 (B) at the beginning, at one-yr decreased in A (127±38) and increased in B (121±31), at five-yrs GFR was similar in both groups. During the mean follow-up (8.1 yrs) nine grafts were lost, two (A) and seven (B). Two patients died (B). No significant differences were observed in graft survival at one-five and ten-yrs. Neither proteinuria nor rejection.

CONCLUSIONS

Adult size kidneys in small recipients show a reduction of the function, but remain stable size. They can be safely transplanted with comparable outcomes to size-matched grafts.

RENAL TRANSPLANT IN CHILDREN WEIGHING 15 KG OR LESS: TECHNICALLY DEMANDING BUT FEASIBLE.

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PURPOSE

Pediatric renal transplantation (RT) in children with low-weight is related to potential surgical complications that may cause severe morbidity and graft loss. The aim of our study was to analyze the outcome of RT recipients weighing 15 kg or less, focused on surgical complications, associated morbidity and mortality, as well as allograft loss.

MATERIAL AND METHODS

We reviewed our retrospective institutional database for recipients of pediatric RT performed between January 2000 and December 2014 who weighed 15 kg or less.

RESULTS

There were a total of 164 pediatric RT, 45 (27.4%) weighing 15 kg or less. One patient was excluded due to lack of vascular access which precluded RT. As a result, our study population comprised 44 children. Twenty-three (52.3%) weighed 10 kg or less. Mean weight was 10.10 kg (SD: 2.96). All allografts came from deceased pediatric donors. Two patients received a liver transplant simultaneously. The allograft was implanted intraperitoneal in 2 patients (4.5%) of extremely low weight (3.2 and 3 kg, respectively) and extraperitoneal in the remaining 42 (95.5%).

Mean operative time was 190 minutes (SD: 47.32) and mean warm ischemia 51.02 minutes (SD: 17.94). Postoperative complications appeared in 10, and 8 required reintervention. Four (9.1%) allografts were lost secondary to surgical complications (3 vascular thrombosis and 1 primary graft dysfunction). Despite 3 (6.8%) patients died, only one was related to surgical complications. No significant differences in surgical complications were observed when compared with patients of > 15 kg ($p > 0.05$). Actuarial graft survival was 94% and 85%, at 1 and 5 years, respectively. No significant differences in graft survival were observed when compared with patients of > 15 kg ($p > 0.05$). Mean follow-up was 75 months (SD: 49.14).

CONCLUSIONS

RT in children weighing 15 kg or less is technically demanding but feasible without increased risk of surgical complications or graft loss.

PREDICTIVE RISK FACTORS OF RENAL GRAFT LOSS IN CHILDREN UNDER 20 KG

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PURPOSE

The aim of this study was to identify predictive risk factors of renal graft loss in children weighing less than 20 kg.

MATERIAL AND METHODS

Consecutive renal transplantations performed between 1994 and 2014 on children < 20kg were retrospectively analyzed. Data included: patient characteristics (age, original pathology, preemptive nephrectomy, type of dialysis), donor characteristics (living donor transplantation (LDT), donor to recipient weight ratio (DRWR), number of graft vessels), intraoperative parameters (intravenous expansion, hemodynamics, ischemia time, routine Doppler ultrasound after abdominal wall closure). Graft survival curve was generated. Statistical analysis: Fisher test.

RESULTS

Thirty-nine children received transplantation at median age of 41 months (18-125), median weight of 15 kg (8-20), median DRWR of 3.85 (0.6-8). Median follow-up was 78 months (15-248). Twelve patients received related-LDT. One patient was excluded because of lack of data. At five years, patient survival rate was 100% and graft survival rate was 91.3%. Three graft losses (7.9%) occurred due to arterial thrombosis in the first postoperative week. Association of DRWR > 3.85 and multiple renal vessels was significantly associated with graft loss ($p=0.04$). The presence of only one of these factors lead to one loss (4.5%) in 22 patients (ns). Five children with the association of DRWR > 3.85 and multiple vessels had four (80%) allograft compartment syndroms ($p=0.001$). Two of them lost their graft while the two remaining cases had a successful salvage procedure by abdominal wall closure using temporary Goretex plate.

CONCLUSIONS

The risk for graft loss is multifactorial. The association of high donor to recipient weight ratio and multiple vessels is a significant risk factor for renal graft loss. If allograft compartment syndrom is diagnosed, a salvage abdominal closure with Goretex plate may save the graft.

SHOULD PAEDIATRIC RENAL TRANSPLANTATION BE PERFORMED BY PAEDIATRIC UROLOGISTS AND SURGEONS?

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PURPOSE

Historically Paediatric renal transplants (PRT) were performed by adult transplant surgeons (who may have had little paediatric surgery/urology training, but a lot of adult transplant experience). Paediatric transplant surgeons and urologists (PTS&U) by definition operate on children, but the volume of paediatric renal transplantation is much smaller. Since 2009 PRT at our centre have been performed by PTS&U, supported by adult surgeons. Is PRT best delivered by a PTS&U-led multi-disciplinary team (MDT)?

MATERIAL AND METHODS

A 20-year retrospective study was performed. Age at renal transplantation, and survival of the graft until either death or graft failure (start of dialysis) was collected. Kaplan-Meier survival was calculated for the historical adult-only MDT and compared to recent paediatric-led MDT. An analysis of children 5-years and under and was also performed. Log-rank and Fisher exact test were used respectively, $p < 0.05$ taken as significant.

RESULTS

Since 1995, 204 PRT been performed at our centre (in 195 patients). Before 2009, 135 were performed by adult transplant surgeons. Subsequently 69 PRT have been performed by PTS&U-led MDT. The 5-year graft survival of the historic cohort was 83%, vs. 98% for the subsequent paediatric surgeons' cohort, $p < 0.01$.

Of 18 PRT performed in the historic cohort in patients 5-years and under, 4 had graft loss or death; whereas all 21 grafts in the recent paediatric-led cohort survived, $p < 0.05$.

CONCLUSIONS

The delivery of paediatric renal transplantation by a team led by paediatric transplant surgeons and urologists, with support by adult transplant team, has significantly improved outcome in renal transplantation, especially in smaller children.

A RETROSPECTIVE AGE-MATCHED COMPARISON ASSESSING THE VALUE OF TRANSVERSUS ABDOMINIS PLANE (TAP) CATHETERS IN REDUCING POSTOPERATIVE OPIOID REQUIREMENTS IN CHILDREN UNDERGOING RENAL TRANSPLANTATION

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INTRODUCTION

After renal transplantation (RT), children often exhibit large opioid requirements, with known side effects and complications. To address this problem, we have introduced transversus abdominis plane (TAP) catheters with continuous postoperative local anesthetic (bupivacaine) infusion, placed under direct vision at the time of RT. Herein, we present a preliminary effectiveness and safety assessment of this novel approach as part of a multi-modal pain management strategy.

PATIENTS AND METHODS

Twenty children who underwent RT with intra-operatively placed TAP catheters at our center over a two-year period (2012-2014) were age-matched to twenty patients managed only with systemic analgesics. The technique involved ipsilateral deployment of two 3-hole epidural catheters between the internal oblique and transversus abdominis muscles, at two different locations along the Gibson incision, following the direction of the nerves. Postoperative opioid utilization was compared between these two groups over the early postoperative period. Opioid use was standardized by conversion to intravenous morphine equivalents (mg/kg).

RESULTS

The TAP catheter arm demonstrated a trend towards lower postoperative opioid use as compared to the control arm, with the postoperative day (POD) 1-2 time period approaching statistical significance (see table). There were no adverse events.

	TAP catheter arm (20)	Control arm (20)	p
Weight (kg)	36.9±18.1	31.4±23.5	0.20
Age (yr)	12.8±4.9	12.0±5.6	0.34
Postop opioid (mg/kg)			
POD 0-1	0.45±0.44	0.57±0.57	0.31
POD 1-2	0.33±0.29	0.62±0.48	0.06
POD 2-3	0.30±0.33	0.31±0.21	0.47
Total	1.08±0.88	1.50±0.86	0.15

CONCLUSIONS

Our preliminary data suggest that the novel use of dual ipsilateral TAP catheters with local anesthetic infusion lowers mean opioid utilization after pediatric RT when compared to age-matched controls. Additional patient recruitment is necessary to provide a large sample size for statistically meaningful comparison.

S7: NEPHROLOGY

Moderators: Gil Rushton (USA), Goedele Beckers (Netherlands)

ESPU Meeting on Thursday 15, October 2015, 10:56 - 11:32

10:56 - 10:59

S7-1 (PP)

★ SCREENING OF DISTAL RENAL TUBULAR ACIDOSIS AND GROWTH RETARDATION IN POSTERIOR URETHRAL VALVE: IS THERE A ROLE FOR BICARBONATE THERAPY IN IMPROVING GROWTH? A PROSPECTIVE RANDOMIZED STUDY

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PURPOSE

Growth retardation is very common in children with posterior urethral valve [PUV] as a consequence of persistent renal tubular acidosis [RTA]. This study intends to screen and diagnose complete and incomplete dRTA as a consequence of PUV. We also hypothesized a therapeutic benefit from bicarbonate therapy on growth parameters in children with PUV.

MATERIAL AND METHODS

A prospective observational study comprising 100 children diagnosed with PUV were screened for dRTA and were randomized for treatment with and without bicarbonate therapy respectfully. In a study group of 50 surgically treated patients with PUV and normal estimated glomerular filtration rate (Group A), we prospectively evaluated the change in height standard deviation scores (Z score and WHO percentile score) while they were on bicarbonate therapy. Age and gender matched patients constituted the control group (n=50) Group B.

RESULTS

Complete dRTA was found in 35(70%) and 37(74%) of subjects in Group A and Group B respectively. Incomplete dRTA was found in 10(20%) and 9(18%) of patients in Group A and Group B respectively. The mean follow-up period was 24.7 ± 8.3 months. The increase in height SDS (Δ height SDS) was significantly greater in the bicarbonate group than in the patients without bicarbonate ($P < 0.001$). From the baseline values, the Δ height SDS in the PUV patients on bicarbonate and without bicarbonate therapy was 66% and 26% respectively.

CONCLUSIONS

This study emphasizes the need for treating urologist to not only correct PUV, but also to have a high index of suspicion regarding dRTA specifically Incomplete dRTA. Bicarbonate therapy improves height SDS in dRTA associated with PUV.

★ COPY NUMBER VARIATION: A NEW PROGNOSTIC FACTOR OF RENAL FUNCTION IN BOYS WITH POSTERIOR URETHRAL VALVES?

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PURPOSE

Posterior urethral valve (PUV) is the most common urological cause for chronic kidney disease (CKD) in childhood. The aim of this study was to screen copy number variations (CNV) in PUV patients in order to correlate the phenotype (renal function) to the presence or absence of CNV.

MATERIAL AND METHODS

46 children diagnosed with PUV were prospectively included (September 2012-April 2015). With provided informed consent, genomic DNA was isolated from peripheral blood samples. Medical records of patients were retrospectively reviewed. The criteria for outcomes of renal function were CKD (eGFR<60 mL/min/1.73 m²) and end-stage kidney failure-ESKF (eGFR<15 mL/min/1.73 m²).

RESULTS

CNV (5 duplications and 2 deletions) were detected in 7 patients (15.2%) with PUV. The mean follow-up was 10.5 years (2.7-17) in the group CNV+ versus 6.1 years (5months-17years) in the group CNV-. The incidence of ESKF was 57% in the group CNV+ (4/7- 3 mutations) and 20% in the group CNV- (9/39) (p=0.06). In the group CNV+, they developed ESKF at the median age of 7 months (4 months-8 years) compared to a median age of 5 years (3-8.7 years) in the group CNV-. Nine patients in the group CNV- had a CKD III and IV (23%).

CONCLUSIONS

Even not statistically significant, our data showed that CNV+ patients had an earlier ESKF. A large multicentric study is necessary in order to confirm these data. Identifying specific mutations in PUV patients could provide a crucial information and guide prenatal counselling.

★ PREDICTION OF UTI FROM URINE MICROBIOME IN CHILDREN

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PURPOSE

Individual urinary tract infection (UTI) risk estimation in children is currently not available. There is growing evidence that populations of bacteria, including pathogens, can survive long time in the urinary tract as a so-called microbiome. That microbiome may play a key role in recurrent UTI's. This encouraged us to develop a UTI prediction model based on urine microbiome composition.

MATERIAL AND METHODS

Urine microbiome composition was studied by 16S rDNA analysis in 96 children under surveillance for UTI risk. Microbiome composition was related to urine culture results obtained before and at sample collection and during 5 years follow-up.

RESULTS

For the 96 samples, urine culture outcome was positive in 13, mixed in 16 and negative in 67. All samples however contained a microbiome. Ninety-two percent of these microbiomes included potential uro-pathogens that constituted around 43% of the total microbiome. Percentages of specific pathogens were highest in those patients who earlier had a urine culture positive for that species ($p < 0.001$). This suggests pathogen survival after treatment of UTI. In 93% of the patients who developed E coli UTI during follow-up E coli was present in the microbiome. The individual risk for E coli recurrence was accurately predicted from the percentage E coli within the microbiome.

CONCLUSIONS

All urine samples harbor a microbiome, often containing pathogens that may have survived after treatment of a prior UTI or indicate bacterial growth enhancing host conditions. These pathogens might be the source of recurrent UTI. This finding has important clinical consequences. As was shown here for E coli, the individual risk for UTI recurrence can be predicted from the relative presence of E coli within the microbiome. This allows selection of high-risk patients who will benefit most from prophylactic interventions and from maintaining normal voiding function.

CONCEALED PENIS AFTER CIRCUMCISION DOES NOT LOWER PERIMEATAL UROPATHOGENIC COLONIZATION IN HEALTHY BOYS. SO CAN IT PREVENT FEBRILE URINARY TRACT INFECTIONS IN BOYS WITH URINARY TRACT PROBLEMS?

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PURPOSE

Circumcision has been shown to lower perimeatal uropathogenic colonization and can be recommended for patients with urinary tract abnormalities to prevent febrile UTIs. We aimed to investigate whether concealed-penis is effective to prevent the uropathogenic colonization in healthy children and lower febrile urinary tract infections in boys with urinary tract problems

MATERIAL AND METHODS

248 boys who were circumcised for social-religious reasons between March 2010 and September 2014 were enrolled in the study. Group-1 consisted of 144(%41.3) circumcised boys, group 2 consisted of 104(%29.8) boys with concealed penis, and group-3 (control group) consisted of 100(%28.7) uncircumcised boys without phimosis. A swab was swept circumferentially once around the periurethral meatus and glanular sulcus regions. Also records of different 123 circumcised (medical recommendation, mean age: 26±3.1 months) boys with diagnosed urinary tract problems (VUR, PUV, neurogenic bladder, etc.) were retrospectively analyzed to evaluate the post circumcision frequency of febrile UTIs between concealed and non-concealed groups.

RESULTS

The mean age for healthy boys was 6.2±0.7 years. Patients with concealed penis (group-2) and uncircumcised boys (group-3) had significant higher uropathogenic bacterial colonization than circumcised boys (group-1) both in periurethral meatus %62.6, %68.9 and %29.6; and glanular sulcus %69.2, %77.4 and %43.8 (p<0.05). The mean follow up for boys with urinary tract problems was 18.2 months and the recorded number of febrile UTIs were significantly higher in the concealed group (p<0.05). All febrile infections except one in this group occurred below the age of 1.

CONCLUSIONS

Healthy boys both with concealed penis after circumcision or non-circumcised have similar uropathogenic colonization in the periurethral and glanular regions. Strikingly if circumcision is going to be recommended to prevent febrile UTIs in boys with urinary tract abnormalities, concealed penis should be avoided. If it is inevitable or the penis not properly constructed caregivers should be informed about the ineffectiveness to prevent UTIs, especially below the age of 1 in boys with urinary tract problems.

OUTPATIENT MANAGEMENT OF PEDIATRIC UTI: RESOURCE UTILIZATION AND OUTCOMES

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PURPOSE

Most pediatric UTIs are treated in the outpatient setting. The goals of the present study were to describe the course of outpatient UTI management and resource utilization.

MATERIAL AND METHODS

We analyzed all children <18 years old who had an antibiotic prescribed for an outpatient UTI from 2002-2010 using the Truven Health MarketScan® Research Databases. We compared side effects of narrow vs. broad-spectrum antibiotic treatment. Chi2 analysis was used for descriptive statistics.

RESULTS

We identified 242,819 outpatient, antibiotic-treated, UTI episodes. During the 21-day period following presentation <20% required >1 visit for UTI management, <1% required hospital admission, and 6% had a renal bladder ultrasound. 34% were initially prescribed a broad-spectrum antibiotic. Antibiotic switching (change from empirically-prescribed antibiotic to another antibiotic) occurred in only 8% of UTI episodes, indicating that empiric prescription covered the offending uropathogen the majority of the time. Antibiotic side effects occurred in 9% of UTI episodes. The most common side effects were gastrointestinal (~3% of UTI episodes). All other side effects occurred in <1% of UTI episodes. Although there are statistically significant differences in side effects between broad versus narrow antibiotics, these differences were not clinically relevant.

CONCLUSIONS

Most UTI episodes are safely and effectively managed in the outpatient setting with >80% requiring only one total visit and >90% requiring no change in empiric antibiotic therapy. Approximately 10% of children treated for UTI will experience an antibiotic side effect.

SMEGMA IS A RISK FACTOR OF URINARY TRACT INFECTION: PROSPECTIVE COMPARATIVE CONTROL STUDY

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PURPOSE

The objective of this study is to document the common bacteria found in the smegma in the subpreputial space of asymptomatic boys, their antimicrobial susceptibility pattern, and to determine if they differ from those commonly isolated depending on smegma.

MATERIAL AND METHODS

Between August 2014 and December 2014, specimens were collected from a total of 40 boys who presented for repair of concealed penis or urethroplasty of hypospadias in our institution. Swab was done using aseptic techniques on smegma and glans in the operation room. According to the presence of smegma, we classified glans as a group S (n=20) (with smegma) and group C (n=20) (without smegma) following retraction of the prepuce. The swabs were immediately sent to microbiology laboratory for microscopy, culture, and sensitivity tests.

RESULTS

Age of 40 boys was ranged from 3 months to 9 years 11 months (mean age, 30.4± 26.4 months). In smegma, a total of 31 bacterial isolates were made. There were 12 gram-positive bacteria (41.9%) and 19 gram-negative ones (64.5%). A single isolate was found in 6 boys (30%), 9 had a mixed isolate (35%), 1 had non uropathogen (5%), while no bacteria was isolated in 4 boys (20%). The most commonly isolated gram-negative bacteria was *Escherichia coli* (25.8%), while the commonly isolated gram-positive bacteria were *Enterococcus faecalis* (16.1%) and *Enterococcus avium* (12.9%). Most of the bacterial isolates were multi-drug-resistant (61.3%).

In group S, 12 boys had 20 bacterial isolates in glans. The most commonly isolated bacteria was *Escherichia coli* (30%). In group C, 13 boys had 18 bacterial isolates in glans. The most commonly isolated bacteria was *Enterococcus faecalis* (30%).

CONCLUSIONS

Smegma in the subpreputial space of children was colonized by many kind of uropathogen in subpreputial space. *E. coli* that is known the most common uropathogen was more frequently colonized in child with smegma than one without smegma. Therefore smegma may be a risk factor of urinary tract infection in children.

S8: OBSTRUCTION & HYDRONEPHROSIS

Moderators: Marc Cendron (USA), Pedro Lopez-Pereira (Spain)

ESPU Meeting on Thursday 15, October 2015, 11:32 - 12:16

11:32 - 11:37

S8-1 (LO)

★ PREDICTING CHRONIC KIDNEY DISEASE IN INFANTS AND YOUNG CHILDREN WITH POSTERIOR URETHRAL VALVES: OBJECTIVE ANALYSIS OF INITIAL ULTRASOUND KIDNEY CHARACTERISTICS AND VALIDATION OF PARENCHYMA AREA AS FORECASTERS OF RENAL RESERVE

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PURPOSE

Uropathy secondary to posterior urethral valves (PUV) is a common cause of chronic kidney disease (CKD) in children/adolescents. There is paucity of early markers to help prognosticate an individual child's risk of renal deterioration. Based on recent data estimating renal mass by measuring the renal parenchymal area (RPA), we hypothesized that early measurement of both quantity (RPA) and quality (renal echogenicity [RE] and cortico-medullary differentiation [CMD]) of the total renal mass could help predict future function. Herein we sought to validate existing RPA data and evaluate RE and CMD as forecasters of renal reserve.

MATERIAL AND METHODS

Initial postnatal US images from serial children diagnosed with PUV at a tertiary care center were analyzed using NIH sponsored image-processing software. Echogenicity was objectively measured as a ratio relative to the adjacent liver/spleen. CMD was calculated by indexing the pixel density of identically-sized areas of the renal cortex and medulla from a single representative US image. The primary outcome, renal function at last follow up, was determined based on serum creatinine and dichotomized following need for renal replacement therapy at last follow-up (dialysis or renal transplantation: CKDV).

RESULTS

75 patients were evaluated; 16 of these had progressively developed CKDV at a mean follow-up of 64.2±38.9 months. Mean RPA was 21.41 cm² in Non-CKDV vs 16cm² in CKDV groups (p<0.001). Mean CMD was 1.77 in Non-CKDV vs 1.21 in CKDV (p<0.001). Bilateral echogenic kidneys were significantly associated with development of CKDV (p=0.004). These findings remained statistically significant on multivariable and time to event analyses. CMD index showed a trend that reflects deterioration as measured by serum creatinine at last follow-up.

CONCLUSIONS

RPA, CMD, and RE, have prognostic value for determining risk of CKDV in PUV patients. These data are promising for developing prognostic tools to help risk stratify patients, counsel parents, and plan monitoring protocols for children with PUV.

★ ISOLATED LOW INITIAL RENAL FUNCTION IN PATIENTS WITH PRIMARY NON-REFLUXING MEGAURETER SHOULD NOT BE CONSIDERED AN INDICATION FOR EARLY SURGERY: A MULTICENTRIC STUDY

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PURPOSE

Low initial differential renal function (DRF) in patients with primary non-refluxing megaureter (PNRM) is considered a current indication for surgery besides an increase of dilatation and symptoms. We conducted a multicentric study focusing on significance of low initial DRF, because relevant data are lacking.

MATERIAL AND METHODS

We reviewed data from four university centres between 1995 and 2010. Patients under 12 months of age with unilateral PNM and a DRF between 10 and 40%, and followed minimally 24 months, were included. Patients were placed in two groups based on management: group A- surgical (16 pts), group B - conservative (9 pts). Dynamics of DRF in relation to age and type of treatment was studied.

RESULTS

Initial mean DRF in group A was 32.6 % (+/-1.4), in group B 34.5 % (+/-1.5) at a mean age 3.2 (+/-0.6) and 3.6 (+/-1.1) months respectively. The final mean DRF in group A was 40.1% (+/-2.6), in group B 43.3% (+/-2.2) at a mean age 59.9 (+/-9.1) and 46.3 (+/-8.3) months respectively ($p = 0.338$). A statistically significant increase of DRF was similar in both groups ($p = 0.001$) at comparable age.

CONCLUSIONS

Low DRF in asymptomatic and anatomically stable patients with PNM should not be considered an indication for early surgery. These findings challenge current practice and should be confirmed by prospective study.

PERCENT IMPROVEMENT IN RENAL PELVIS ANTEROPOSTERIOR DIAMETER IMPROVEMENT (APDI): VALIDATION AND FURTHER EXPLORATION OF CUT-OFF VALUES THAT PREDICT SUCCESS POST-PYELOPLASTY AND SAFE MONITORING WITH ULTRASOUND ALONE

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PURPOSE

Renogram is frequently ordered post-pyeloplasty to confirm adequate drainage in patients with residual hydronephrosis (HN). Recent evidence suggests that percent AP diameter improvement (APDI) $\geq 38\%$ is predictive of pyeloplasty success. We sought to further explore APDI ranges that would allow identification of patients who would require follow-up with US alone, a post-operative renal scan and those with recurrent ureteropelvic junction obstruction (rUPJO).

MATERIAL AND METHODS

Our prospectively collected pyeloplasty database (2008-15) was reviewed (n=135). Only patients with both pre and post-operative APD measurements were included (n=125; 93%). APDI was divided into 3 categories: 0-19%; 20-39%; $\geq 40\%$. The following variables were collected post-operatively: patients monitored with US alone, renogram and US, rUPJO and minimal or resolved HN (APD < 15mm).

RESULTS

Mean minimum follow-up was 7.3 ± 7.3 months. Of 125 patients, 76 (61%) had US alone, 49 (39%) had a renogram and US, and 6 (4%) developed rUPJO. Of 76 patients who had US alone, 54 (72%; $p < 0.01$) demonstrated $\geq 40\%$ APDI. Of 49 patients with renogram and US 31 (63%; $p < 0.01$) had $\geq 40\%$ APDI. Of 78 patients with post-pyeloplasty APD < 15mm, 65 (83%; $p < 0.01$) had $\geq 40\%$ APDI. Table 1 shows descriptives for these variables.

CONCLUSIONS

Documentation of $\geq 40\%$ APDI at the first post-operative visit strongly predicts pyeloplasty success, as 84% of these patients showed minimal or resolved HN and 72% underwent non-invasive monitoring by US alone. Our data suggests that up to 63% of renograms may have been unnecessary. Finally, $\leq 20\%$ APDI permitted identification of all rUPJO cases. Stratification of patients based on APDI is a promising strategy for minimizing radiation exposure while safely detecting children at risk for rUPJO.

Table 1

APDI Ranges	0-19%	20-39%	$\geq 40\%$	p Value
US Only n=76 (%)	11(14)	11(14)	54(72)	<0.01
Renogram + US n=49(%)	11(23)	7(14)	31(63)	<0.01
Total n=125	22	18	85	
APD < 15mm n=78(%)	4(5)	9(12)	65(83)	<0.01
rUPJO n=6%	6(100)	0	0	

SUPRANORMAL RENAL FUNCTION IN CHILDREN WITH UPJO- WHAT DOES IT REALLY MEAN?

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PURPOSE

Renograms are routinely performed and indicated in children with high-grade hydronephrosis (HN) to rule out obstruction. At times, the function of the affected kidney may be greater than the contralateral unaffected side. We sought to determine if elevated function is indicative of true supranormal renal function (SNRF).

MATERIAL AND METHODS

Our prospectively collected pyeloplasty database (2008-15) was reviewed. A total of 126/135 (93%) patients had a renogram pre-operatively and 23/126 patients (18%) were found to have SNRF (differential function $\geq 55\%$). Baseline characteristics including pre and post-operative SFU grade and APD were measured. Of 126 patients, 48 (38%) had a post-operative renogram allowing determination of loss or gain of $\geq 5\%$ function. After excluding 2 patients with solitary kidneys, a total of 46 patients were included in the analysis.

RESULTS

Baseline characteristics were similar in both the SNRF and non-SNRF groups including: mean age (months) at surgery (49 ± 54.2 and 53 ± 60), time to surgery (months) (9.3 ± 11.5 and 8.8 ± 11.8), pre-operative APD ($24.6 \pm 9\text{mm}$ and $28 \pm 10.9\text{mm}$) and SFU grade (3.4 ± 0.5 and 3.6 ± 0.5). Mean pre-operative function was $62.5 \pm 13.7\%$ in the SNRF group and $44.7 \pm 8.8\%$ in the non-SNRF group ($p < 0.01$) compared to $56.7 \pm 14.4\%$ and $43.9 \pm 13.9\%$ post-operatively ($p < 0.01$). Table 1 outlines post-operative loss/gain of function in both groups. At last follow-up, HN resolved (SFU ≤ 2) in 17(77%) with SNRF and 76(78%) of patients with non-SNRF ($p = 0.86$).

CONCLUSIONS

Pre-operative SNRF does not appear to indicate true elevated function as two-thirds of these patients demonstrated a decline of $\geq 5\%$ post-operatively despite similar baseline grades of HN and time to surgery when compared to non-SNRF patients

Table 1

	SNRF n=11 (%)	Non-SNRF n=35 (%)	p Value
Decrease $\geq 5\%$	7(64)	2(6)	<0.01
Increase $\geq 5\%$	1(9)	8(23)	<0.4
No Change	3(27)	25(71)	<0.01

IS INTRAOPERATIVE INSPECTION OF THE UPJ DURING PYELOPLASTY A SUFFICIENT WAY TO DELINEATE THE UNDERLYING CAUSE OF OBSTRUCTION?

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PURPOSE

Ureteropelvic junction obstruction (UPJO) is the result of intrinsic or extrinsic causes. Recently popularized vascular hitch technique, which presumes no intrinsic narrowing, eliminates the compelling dismembering procedure in laparoscopic/robotic interventions. Inspecting the peristalsis of the ureter after relieving the extrinsic obstruction due to aberrant vessel to rule out an intrinsic component, may not be sufficient to justify that the extrinsic compression is the sole cause of obstruction. Herein, we aimed to compare the histological changes observed in intrinsic and extrinsic types of UPJO.

MATERIAL AND METHODS

We retrospectively reviewed the data of 56 patients who underwent dismembered pyeloplasty due to UPJO in our clinic. Patients with an aberrant crossing vessel constituted the extrinsic group and those without such an identifiable vessel formed the intrinsic group.

Masson's trichrome stain, CD117 and connexin 43 (Cx43) antibody were used to identify muscular hypertrophy/fibrosis, cajal cells and gap junctions, respectively.

RESULTS

The intrinsic and extrinsic groups consisted of 38 and 18 patients, respectively. The level of smooth muscle hypertrophy, CD117 positive cell count and Cx43 staining pattern did not differ significantly between intrinsic and extrinsic groups.

CONCLUSIONS

Immunohistochemical profile of the intrinsic and extrinsic UPJOs resemble each other. Intraoperative inspection of the UPJ may not be enough for an accurate discrimination. A surgical procedure that can correct only an extrinsic cause will ultimately fail in a patient whose UPJO is due to an intrinsic reason. Dismembered pyeloplasty serves well for both possible types of UPJO.

10 YEAR EXPERIENCE OF UP-FRONT URETERIC REIMPLANTATION FOR PRIMARY OBSTRUCTED MEGAURETER IN INFANTS AND CHILDREN

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PURPOSE

It is suggested that Primary Obstructed Megaureter (POM) in infants should be managed with temporising measures, delaying definitive reimplantation until after age 1 year. This study aims to show that up-front ureteric reimplantation for POM in infants and children is effective management with minimal morbidity.

MATERIAL AND METHODS

Retrospective review of children with POM (ureter >7mm, with obstructed curve on functional studies or confirmed on retrograde studies) treated with up-front ureteric reimplantation between 2003 and 2012. Patients with significant vesicoureteric reflux, posterior urethral valves, duplex ureter, or ureterocoele were excluded. Primary outcome measure was reoperation for re-stenosis. Secondary outcomes were urinary tract infection, impaired renal function, and incontinence. Median post-operative follow-up was 55.2 months (range: 1.4 – 135.2 months).

RESULTS

42 patients had POM. 21 (50%) were detected on antenatal ultrasound. 20 presented with UTI and 1 was incidentally diagnosed. 3 (7%) had bilateral POM, and 3 (7%) had POM in a solitary kidney. Median age at reimplantation was 6.7 months (range: 0.1 – 131.1 months). 19 (45%) were >12 months. 21 (50%) underwent tapering. Only 3 patients (7%) required repeat reimplantation due to recurrent VUJ obstruction, 2 of whom had the original reimplantation at ages 5 and 9 years respectively. Median time to reoperation was 3.3 years. Secondary outcomes showed that 14 (33%) patients developed post-operative UTI, 5 (12%) developed urinary incontinence, and 3 (7%) developed impaired renal function.

CONCLUSIONS

Up-front ureteric reimplantation is a safe and effective option for infants and children with POM.

DOES ENDOSCOPIC DOES ENDOSCOPIC PUNCTURE OF URETEROCELE (EP) PROVIDE NOT ONLY AN INITIAL SOLUTUION, BUT ALSO A DEFINITIVE TREATMENT IN ALL CHILDREN? OVER THE 26 YEARS OF EXPERIENCE.

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PURPOSE

We have retrospectively evaluated all patients who underwent EP of ureterocele over the last 26 years with special reference to the need in the second intervention and disease free status.

MATERIAL AND METHODS

78(69%) of the 112 patients following EP and completed follow up were included. 51 (65%) were diagnosed prenatally and 27 (35%) postnatally. 46 patients (60%) had intravesical, while 32 (40%) had ectopic ureterocele. 27 children (35%) had nonfunctioning, 19(24%) poorly, 24(31%) moderate and 8(10%) normal functioning ureterocele moiety. VUR was present in 36(46%) children (43 renal refluxing units (RRUs)). Median age at time of puncture was 4 months. Median time of the follow up was 12 years (range 1 -25 years) while 23(30%) followed over 10 years and 15 (19%) completed adolescent period.

RESULTS

Four children with ectopic ureterocele required secondary puncture. Ectopic ureterocele children had significantly more postoperative UTIs (13 (40%) ectopic vs 4 (19%) intravesical $p=0.047$). 19 RRUs (44%) showed spontaneous resolution of VUR. 14(18%) children required additional surgery: 7: endoscopic correction of VUR, 3: ureteral reimplantation and 4: partial nephrectomy. The need for additional surgery following puncture was higher in the group of children with ectopic ureterocele, however this difference did not reach a statistical significance ($p=0.716$).

CONCLUSIONS

Our data show that endoscopic puncture of ureterocele is a durable and long term effective procedure in vast majority of the children. Although the children with ectopic ureterocele are more prone to develop UTI and undergo additional surgery, major surgery is rarely indicated even in this group of patients.

HISTOLOGIC NEUROMUSCULAR DIFFERENCES IN URETEROPELVIC JUNCTION SPECIMENS FROM PEDIATRIC CASES OF URETEROPELVIC JUNCTION OBSTRUCTION OWING TO INTRINSIC STENOSIS VERSUS EXTRINSIC COMPRESSION: A PILOT STUDY

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PURPOSE

Muscle thickness at the ureteropelvic junction (UPJ) correlates with the time to radiographic improvement after UPJ repair. No such correlation has been identified for the density of interstitial cells of Cajal (ICC). Before investigating this, we sought to determine through a pilot study whether histologic neuromuscular findings at the UPJ differ significantly between cases of intrinsic stenosis and extrinsic compression.

MATERIAL AND METHODS

Retrospective review identified 197 children who underwent minimally-invasive pyeloplasty at our institution from 2008-2013. Exclusion criteria were applied and patients were case matched to select ten with intrinsic stenosis and ten with extrinsic compression. Histologic sections of their UPJ specimens were evaluated for muscularis propria hypertrophy with hematoxylin and eosin staining. Perifascicular fibrosis was assessed with Masson trichrome staining. Numbers of ICC and submucosal Schwann cells/nerve fibers were scored using C-kit and S100 antibodies, respectively. One subject was excluded due to exhaustion of the tissue block.

RESULTS

Most patient specimens with both intrinsic stenosis and extrinsic compression had smooth muscle hypertrophy (6/9 and 7/10, respectively). Severe fibrosis was only found in cases of intrinsic stenosis (4/9) while moderate perifascicular fibrosis was observed in 5/9 with intrinsic stenosis and 2/10 with extrinsic compression. The densities of ICC and submucosal nerve fibers were positively correlated with muscle hypertrophy and inversely related to perifascicular fibrosis, but did not reliably distinguish between intrinsic and extrinsic etiologies.

CONCLUSIONS

The neuromuscular distribution in cases of UPJ obstruction did not clearly vary with intrinsic versus extrinsic etiologies of obstruction in this pilot study. Therefore, evaluation of the relationship between the density of nerve cells and surgical outcome measures can include specimens of either type. Histopathologic fibrosis should also be investigated as a potential independent variable.

ULTRASOUND MARKERS IN THE FOLLOW UP OF PYELOPLASTY

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PURPOSE

There are few studies on the long term follow up of pyeloplasty. Is there a residual pelvis dilatation in all successful procedures? How is the long term evolution of the sonographic parameters and measures postoperatively (PO)? In this study, some useful sonographic parameters are highlighted to evaluate the expected evolution of renal pelvis after a successful pyeloplasty

MATERIAL AND METHODS

We reviewed all successful pyeloplasties performed on obstructed renal pelvis with an Antero-Posterior Diameter > 15 mm in the years 2001-2010. Ultrasound controls were made at 3 and 6 months postoperatively and then yearly afterwards. We pretended to describe time course of hydronefrotic changes following unilateral pyeloplasties, using three parameters: pelvic anterior-posterior diameter (APD), Pelvis/ CórteX Ratio (P/C R) and the percentage of improvement in APD (PI-APD)

RESULTS

41 patients were included. Age at intervention ranged from 2 months to 10.3 years (mean 13 months, 83% were operated in the first year of life). Median of follow up was 4 years (range 1-12 years) Mean APD preoperatively was 25 mm (range 16-54). At the third month PO, PI- APD was 28%. At the sixth month control, it was 51%, and remained stable during the next consecutive yearly controls, without statistically significant variations (50%, 57%, 60%, 51%, 39%, 46%, 38%, 42%). P/C R diminished significantly already in the third month control (4.6 vs. 1.8, p=0.03). We observed complete disappearance of hidronefrosis in 8 patients (19.5%).

CONCLUSIONS

Although early postoperative ultrasound changes occur, the ultrasound parameters remain often stable during long term follow up. We documented the complete normalization of renal pelvis (no hydronephrosis) in one of every five patients.

URETEROPELVIC JUNCTION OBSTRUCTION: IS THERE ANY BENEFIT FROM VOIDING CYSTOURETHROGRAPHY IN CHILDREN WITH NON-DILATED URETERS?

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PURPOSE

To best of our knowledge, present study may be first one assessing value of voiding cystourethrography (VCUG) in children with non-dilated ureters before doing pyeloplasty for correction of ureteropelvic junction obstruction (UPJ-O)

MATERIAL AND METHODS

Records of all cases of pyeloplasty in children with hydronephrosis (HRN) or split renal functions (SRF) <40% or deteriorating during follow-up. Dismembered pyeloplasty was done through flank incision. Post-operative follow-up was done for at least 1 year with urine analysis, US and DTPA. Any abnormality in pre-operative VCUG was recorded to assess its effect on treatment decision and any intra-operative findings

RESULTS

96 children (68 boys, 28 girls) were included. Mean age was 6.39 ± 3.57 (1-12) months. At time of pyeloplasty, mean APPD and SRF were 40.7 ± 8.7 (30-76) mm and $34.9 \pm 9.7\%$ (5-50); respectively. According to SFU grading system for hydronephrosis, 43 children had grade 3 while 53 children had grade 4. 5 children only (4 ipsilateral (4.16%), 1 contralateral) had vesicoureteric reflux during VCUG (all were grade 1). Intra-operatively, crossing renal vessels and relatively long atretic segments were detected in 3 and 4 cases; respectively. The 4 children with reflux had median SRF of 32% (26-40) which improved 1 year post-operatively to 34% (28-44). They had no fever or urinary tract infections during follow-up

CONCLUSIONS

When there are no voiding symptoms, ureteric dilatation or suspected bladder and ureteric abnormalities in pre-operative ultrasound, VCUG can be omitted as it will not affect the treatment decision or operative outcome in children with UPJ-O

FROM OPERATIONS TO OBSERVATION; THE CHANGING MANAGEMENT OF URETEROCELES.

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PURPOSE

We retrospectively review a 20 year experience of ureterocele 93 patients to compare management in the first 10 years to the most recent 10 year interval.

MATERIAL AND METHODS

All patients with a diagnosis of ureterocele were included. The clinical characteristics for a total of 35 evaluable patients in the first decade were compared to 58 evaluable patients in the most recent decade.

RESULTS

In the first decade 29/35 (83%) patients underwent surgery, with 12 (41%) undergoing transurethral incision (TUI) and 17 (59%) open surgery. Average age of TUI was 27 months and for open surgery was 42 months. 2 of the 11 TUI patients underwent further operations. In the more recent decade 48/58 patients presented prenatally. Only 27/58 (46%) patients had any surgical treatment, with 18(66%) undergoing initial TUI and only 9 (33%) initial open surgery. 31/58 (53%) had no surgery at all. Compared to the initial decade this is a statistically significant decrease in surgical intervention ($p=0.0125$). In the latter decade 6 patients treated initially with TUI required further surgery, 3 with repeat TUI and 3 with open surgery. With time, initial open surgery was elected less often and TUI preferred for simplicity and effectiveness.

CONCLUSIONS

Our experience demonstrates that observation of appropriate patients is a reasonable treatment plan with half of the recent cohort not requiring any surgical intervention. Initially large ureterocele size, significant lower pole reflux, and persistent hydronephrosis were relative indications for surgery but with time these factors were less emphasized.

SIDE-TO-SIDE URETEROCYSTOTOMY: KEEPING AN "INTACT" UVJ, SIMPLIFYING THE KAEFER TECHNIQUE AS A STRATEGY TO ADDRESS OBSTRUCTED MEGAURETERS IN CHILDREN

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PURPOSE

An obstructed non-refluxing megaureter (OM) is a common diagnosis in neonates with antenatal hydronephrosis (ANH). Although conservative management is indicated in most cases, surgery is still considered when associated with UTIs, worsening hydronephrosis or deteriorating renal function. Recently Kaefer described his technique of end-to-side refluxing ureteric reimplantation for OM, as a temporizing strategy. Herein we describe our experience with a modified non-dismembered side-to-side refluxing ureterocystotomy (UC) as a simple option for OM.

MATERIAL AND METHODS

Between 2012 and 2014, 25 consecutive side-to-side refluxing UC were performed at two large tertiary centers. Demographics, surgical indications and follow up results were collected. The procedure was performed through a small inguinal incision, with a generous refluxing side-to-side anastomosis between the distal ureter and ipsilateral bladder wall without interference with the uretero-vesical junction or dismemberment.

RESULTS

Mean patient age was 3(0-38) months at time of surgery; 9(76%) were males. All patients were initially detected with ANH and followed with US every 3 months and renal scans accordingly. Unilateral procedures were done in 23 patients. The procedure was conducted for primary OM in 24 patients and as salvage procedure for obstruction post common sheath reimplant in 1 child with a duplex system. The average follow up was 10 months (1-28). At time of last follow-up, most children experienced improvement in dilation (80%) or stable findings.

CONCLUSIONS

Our preliminary results show that side-to-side refluxing UC is a simple, feasible, safe minimally invasive procedure for primary OM, either as a temporizing or definitive intervention. Performing this technique creates a refluxing non-obstructed system, which can be managed definitively later in the child life if necessary. Considering the pattern of improvement over time in most OM cases, by virtue of not instrumenting or dismembering the distal ureter, the anastomosis may be taken down later in life preserving the native uretero-vesical junction. Clearly, close follow up is critical to document the long-term results of the procedure.

PREDICTION OF FAILURE OF CONSERVATIVE MANAGEMENT IN ANTENATALLY DETECTED HYDRONEPHROSIS: A PROSPECTIVE STUDY

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PURPOSE

Authors try to find parameters to predict which patients of antenatally detected hydronephrosis (ANH) due to ureteropelvic junction obstruction (UPJO) will eventually need surgery during conservative management.

MATERIAL AND METHODS

Prospectively data were collected by single surgeon at single centre over 10 years involving 150 renal units. Patients on conservative management were followed using a standard protocol. Patients who underwent surgery were compared with the non-operated group in terms of sex, side, grade of hydronephrosis, maximum anteroposterior diameter (APD), cortical thickness (CT) on first ultrasound and differential renal function (DRF) on first renal scan.

RESULTS

Of the 135 renal units qualified for conservative management, 42.2% had SFU grade IV hydronephrosis. Mean APD and mean CT on first ultrasound were 18.6 ± 8.6 and 7.5 ± 3.2 mm respectively. Median time to failure of conservative management was 37 weeks. Univariate analysis revealed that SFU grade, APD, CT, and preoperative DRF had significant association with surgery ($p < 0.05$). Multivariate analysis revealed APD and preoperative DRF as the only independent predictors for need of surgery. Receiver operating curve analysis showed that APD of 24.3mm can predict the need for surgery with a sensitivity of 73.1% and a specificity of 88%.

CONCLUSIONS

APD and DRF are the predictive factors for need of surgery in ANH during conservative treatment. We can reduce the burden of investigations in those with APD < 24 mm.

S9: STONES

Moderators: Bob DeFoor (USA), Serdar Tekgül (Turkey)

ESPU Meeting on Thursday 15, October 2015, 13:50 - 14:34

13:50 - 13:55

S9-1 (LO)

★ PERCUTANEOUS LITHOTRIPSY (PCNL) IN TODDLERS

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PURPOSE

To evaluate the stone clearance rate and peri and post operative blood transfusion rate after PCNL in children upto 3 years of age.

MATERIAL AND METHODS

Retrospective study of 276 renal units(RU) in children upto 3 years of age who underwent PCNL between Jan 2010 and June 2014. The records were reviewed for gender, stone size (volume measured length x width), pre and post operative Hb, approach, access site, sheath size, nephroscope size, disintegration technology, peri and post operative blood transfusion, stone clearance and peri and post operative complications.

RESULTS

276 RU were reviewed with age range 7 months to 36 months. Of them 39 were between 7–12 months (Group A), 114 were between 13–24 months (Group B) and 123 were between 25–36 months (Group C). Mean stone size was 1.4 ± 0.92 cm². In Group A stone size = 1.0 ± 0.66 cm², in group B = 1.3 ± 0.83 cm² and in Group C size was 1.6 ± 1.0 cm². Mean preoperative Hb was 10.5 ± 1.26 gm% in Group A, 10.0 ± 1.35 gm% in group B and 10.3 ± 1.13 gm% in Group C. 18–22 Fr sheath was used in 82%, 80% and 68% respectively. Supracostal approach used in 32%, 39% and 45% respectively. Ultrasound was used for stone disintegration in 68%, 81% and 62% renal units in Group A, B and C respectively. Overall blood transfusion rate was 22.4% (62/276), with 38.5% in Group A, 22% in Group B and 18% in Group C. Complete stone clearance seen in 96.2% after single session of PCNL. In Group A complete stone clearance seen in 97%, in Group B 95% and in Group C 96.6%. Overall complication rate which included fever, haematuria, pleural effusion and perinephric collection, were 16.4% (45/276). It was 13.8% in Group A, 14.4% in Group B and 19% in Group C.

CONCLUSIONS

PCNL is effective in toddlers with acceptable complications rate. It has an excellent stone clearance rate in this study with a high blood transfusion requirement which is due to low pre operative Hb and very limited allowable blood loss.

DO WE REALLY NEED A INTRAVENOUS PYELOGRAM (IVP) OR A NONCONTRAST CT SCAN FOR A SAFE PCNL IN PAEDIATRIC POPULATION? - CHALLENGING THE TRADITIONAL PROCEDURE

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PURPOSE

The purpose of this study is to analyze the success and complication rates of PCNL in children and to compare the outcomes of the patients who underwent PCNL with only a X-Ray KUB and a Ultrasound (USG) KUB (Group 1) with the group of patients who had an IVP or a non contrast CT Scan done before the procedure (Group 2).

MATERIAL AND METHODS

We retrospectively reviewed the data of 29 children (30 renal units) aged who underwent PCNL in our department from November, 2014, to March, 2015. Patient's data including age, gender, stone size and site, pre & post-operative hemoglobin levels, tract site, operating time, stone free rate, complications and hospitalization time were documented, evaluated and compared. Successful outcome was a stone free renal unit on a postoperative USG KUB or a X Ray KUB.

RESULTS

30 PCNLs (Group I = 16, Group II = 14) were performed in 29 patients. The mean age was 6.8 ± 4.85 years. There was no significant differences between the two groups regarding gender ($p=0.14$), stone size ($p=0.07$), operative time ($p=0.12$), tract site ($p=0.14$) and hospital stay ($p=0.19$). Pre and post-operative mean hematocrit levels among the two groups did not show any significant differences ($p=0.294$). The difference in stone free rates between the two groups was not statistically significant ($p=0.112$). The overall stone free rate in both the groups came out to be 90% and 7% having a 0.6 cm fragment and 3% having a 0.8 fragment.

CONCLUSIONS

PCNL has become the gold standard in treating paediatric urolithiasis. We conclude that as the expertise of performing the procedure has remarkably increased therefore in experienced hands IVP and CT scan can be omitted and conventional XRay KUB and USG KUB along with intraoperative fluoroscopy are enough to give acceptable stone free rates.

★ POSTURAL THERAPY FOR RENAL STONES IN CHILDREN: A ROLLING STONES PROCEDURE

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PURPOSE

Despite many advances, the management of lower caliceal stones (LCS) remains a challenge. The gravity-dependant location of the lower calices hinders the spontaneous clearance of fragments that can be the nidus for future growth and symptomatic recurrence. We report our preliminary experience and effectiveness of mechanical percussion diuresis and inversion (PDI) therapy for eliminating LCS.

MATERIAL AND METHODS

Since November 2013, children with residual fragments (after SWL or URS) or native symptomatic LCS were prospectively include into a protocol of 4 PDI sessions. After informed consent, according to the local ethic committee, children drank 500ml of water 1h before therapy. They then laid in a prone Trendelenburg position on a 45°-angle couch, and received continuous 10-minute mechanical percussion applied over the affected flank by a physiotherapist. Tolerance and stone clearance were documented with ultrasound 4-weeks following PDI.

RESULTS

Seventy-two PDI sessions were performed in 14 candidates at a mean age of 11.6 years (18m-18y) in 16 months. Median stone diameter was 5.4mm (3-9). Four children had bilateral stones. Nine children (64%) who experienced symptomatic episodes required PDI as the first step of management. The overall stone-free rate was 66%. Three of the 5 patients who previously underwent SWL/URS passed fragments. Patients who did not become stone-free by PDI had a decrease in stone-area of 56% (95%IC 34%-69%). No significant adverse effects were noted. Observance rate was 100%.

CONCLUSIONS

PDI is safe and effective for facilitating gravity-dependant drainage of LCS. PDI provides an opportunity to treat children in a quick, non-invasive, painless, non-radiative and diverting fashion. This therapy is a valuable alternative in the pattern of stone management.

★ WHAT HAPPENS TO THE ASYMPTOMATIC LOWER CALYX KIDNEY STONES SMALLER THAN 10 MM IN CHILDREN DURING WATCHFUL WAITING?

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PURPOSE

To present the outcomes of asymptomatic isolated lower pole kidney stones (LPKS) less than <10mm.

MATERIAL AND METHODS

242 patients with 284 renal units (RU) who presented at two referral centers between June 2004 and December 2014 with asymptomatic single LPKS <10 mm were enrolled in the study. All children were observed as first line therapy. Patients after a mean follow-up 3.4±1.7 years were categorized as follows those that required an intervention of flexible ureteroscopy (F-URS) or microPCNL in 72RU (25.4%, group1), shockwave lithotripsy (SWL) in 102RU (35.9%, group2) and remaining 110RU (38.7%) were categorized as group 3 (observation). Age, gender, stone laterality, stone size and type, associated urinary tract problems, uncontrolled metabolic status were used to determine predictive factors that require an intervention of asymptomatic LPKS less than 10mm. Mean operative and fluoroscopy time, stone free rates, hospitalization time, need for multiple interventions and complications (Clavien score) were analyzed.

RESULTS

The mean age was 9.4±1.9 years during admission and the mean time for intervention was 19.2±4.6 months. The stone free rates were 81.8% in group-1, 79.3% in group-2, 9.1% in group-3 (p=0.017). Complication rates for groups 1 and 2 were similar. In the multivariate analysis stone size larger than 7mm, accompanied renal anomalies, struvite and cysteine stones, and uncontrolled metabolic status were statistically significant predictors. Stone size and age were significantly related to complications in univariate analysis.

CONCLUSIONS

Stones larger than 7 mm, with renal anomaly and metabolic active cystine and struvite stones are more likely to require an intervention when asymptomatic LPKS less than <10 mm are under follow up. When SWL, F-URS and micro PCNL are required deliberate timing, considering age versus stone enlargement should be done to minimize complications for the management of LPKS.

MINI PERCUTANEOUS NEPHROLITHOTOMY WITH HOLMIUM YAG LASER IN PEDIATRIC PATIENTS WITH HIGH VOLUME RENAL STONES

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PURPOSE

Extracorporeal shock wave lithotripsy (SWL) is the treatment of choice for most cases of renal lithiasis in children. Some cases, however, are refractory to SWL and may be associated with anatomical or metabolic changes. In this scenario mini percutaneous nephrolithotomy (miniPCNL) constitutes an option.

Objective

To discuss our initial experience of miniPCNL with Holmium YAG laser (Ho: YAG) in children using the 0°-90°-puncture technique and to report its efficacy and outcomes.

MATERIAL AND METHODS

We retrospectively reviewed the clinical records of 35 patients who underwent miniPCNL between January 2008 and December 2012. 66.7% of patients had undergone a previous SWL (28.6% four sessions). The miniPCNL puncture technique used was through fluoroscopic guidance with the C arm at 0-90° in supine position. 18-Fr to 22-Fr tract were performed. When necessary stone fragmentation was performed with a 100 W Ho:YAG laser.

RESULTS

35 miniPCNLs were performed in 33 patients (27 boys and 6 girls) with a mean age of 7 years (range 2-20). 10 of the PCNLs (28.6%) were right sided, and 25 were left (71.4%). 24 of the patients (69%) presented with anatomical or metabolic changes. Stone location was in 64% of patients in the lower calyceal group and 50% in the renal pelvis. Mean stone size was 4.46 cm² (3-13.20). The number of stones varied between 1 and 20, and 83.3% were radiopaque. The mean surgical time was 180 min. In 78% of patients the stones disappeared completely. Overall stone free rate was achieved in 85% of cases. Residual stones were treated either with SWL or RIRS. No perioperative complications were seen.

CONCLUSIONS

In paediatric population miniPCNL is feasible and safe being the technique of choice for high volume urolithiasis refractory to SWL.

EXTRACORPOREAL SHOCK WAVE LITHOTRIPSY VERSUS MINI-PERCUTANEOUS NEPHROLITHOTOMY FOR RENAL STONES IN INFANTS AND PRESCHOOL CHILDREN: A COMPARATIVE STUDY

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PURPOSE

To compare outcomes of mini-percutaneous nephrolithotomy (Miniperc) and SWL for renal stones in preschool-children.

MATERIAL AND METHODS

From January 2010 to August 2014, renal pelvic or lower-calyceal calculi sizing 10–25mm in children (≤ 6 years) with normal creatinine treated by SWL (64 children) using Dornier electromagnetic DoLi S lithotripter or Miniperc (35 children) under general anesthesia were included. Miniperc was through 14F-renal access using 9.5Fr semirigid-ureteroscope with Holmium:YAG laser Lithotripsy. Stone-free rates (SFR), re-treatment rate and complications were compared between both groups and subgroups (renal pelvic and lower-calyceal stones).

RESULTS

Age, gender and stones parameters were similar in both groups and in pelvic (23 Miniperc and 52 SWL) and lower-calyceal (12 renal units in each procedure) subgroups. Stone size was 15 (10–25)mm and 16 (10–25)mm in SWL and Miniperc, respectively ($p=0.422$). SFR after first session, and finally in Miniperc and SWL groups were 97.1% vs 43.8% ($p<0.001$) and 97.1% vs 81.2% ($p=0.02$); respectively. In renal pelvis, they were 100% vs 50% ($p<0.001$) and 100% vs 84.6% ($p=0.09$); respectively. In lower calyx, they were 91.7% vs 16.7% ($p<0.001$) and 91.7% vs 66.7% ($p=0.02$); respectively. Retreatment rates in Miniperc and SWL were 2.9% vs 50% ($p<0.001$), 0% vs 46.2% ($p<0.001$) and 8.3% vs 66.7% ($p=0.009$), in all patients, renal pelvic- and lower calyceal stones; respectively. 12 (18.8%) patients required third SWL session. No significant difference ($p=0.159$) was found in complications in SWL (6.2%) and Miniperc (17.1%) groups and also in subgroups. Miniperc complications were bleeding with blood transfusion (2.9%), renal pelvis perforation (2.9%), leakage (5.7%) and fever (5.7%). SWL complications were Steinstrasse treated conservatively (3.1%) or by ureteroscopy (3.1%). A stent was inserted for 1 (2.9%) case of leakage following Miniperc while other case was treated conservatively. There was no recurrence during follow-up (20–45 months in SWL vs 6–31 months in Miniperc).

CONCLUSIONS

Miniperc has significantly higher SFR than SWL for renal pelvic and lower calyceal stones (10–25mm) in preschool children with lower retreatment rate and without significant increase in complications.

★ APOLIPOPROTEIN A-IV AND RENAL L-TYPE FATTY ACID BINDING PROTEIN: NOVEL BIOMARKERS OF TUBULAR INJURY IN PEDIATRIC NEPHROLITHIASIS

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PURPOSE

We assessed the differences in the urinary proteins between children with renal stones (RS), and healthy controls (HC), with particular attention to the proteins involved in oxidative stress and tubular injury.

MATERIAL AND METHODS

Prospective quantitative proteomic comparison of pooled urine from RS (N=30, 24 females, mean age 12.95±4.03 years) versus age- and gender-matched HC (N=30), using mass spectrometry. Proteins of interest were selected using the following criteria: 1) ≥5 spectral counts; 2) ≥2-fold difference in spectral counts; and 3) ≤0.05 p-value for the Fisher's Exact Test, and were confirmed by ELISA.

RESULTS

Of the 1813 proteins identified, 230 met the above criteria, with 163 proteins up-regulated in RS group. Function analysis revealed 23 inflammatory proteins, 8 proteins involved in oxidative stress, and 6 involved in tubular injury (apolipoprotein A-IV APO A4, liver-type fatty acid binding protein L-FABP, beta 2-microglobulin, retinol-binding protein 4, cystatin C, and lysozyme C). ELISA analysis revealed significantly increased urinary levels of APO A4 only in hypercalciuria (N=10) versus controls (median 341.23 ng/mg creatinine vs median 89.62 ng/mg creatinine, p=0.01). Additionally, hypercalciuric children showed significantly higher urinary levels of L-FABP compared to controls (median 30.64 ng/mg creatinine vs median 5.73 ng/mg creatinine, p=0.05).

CONCLUSIONS

We provide proteomic evidence of oxidative stress, inflammation, and tubular injury in children with renal stones. We speculate that inflammation and changes in the oxidant-antioxidant balance may cause tubular damage in these patients. Urinary Apo A4 and L-FABP represent novel biomarkers for tubular injury in children with hypercalciuria and kidney stones.

THE PREVALENCE OF URINARY STONE DISEASE IN CHILDREN OF SAMSUN AREA AND ITS RELATION WITH DIETARY HABITS

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PURPOSE

We aimed to investigate the prevalence of pediatric urolithiasis in our region by evaluating asymptomatic randomly selected children with ultrasonography (USG) in three different primary schools. Also, we tried to determine the effect of nutritional habits on the incidence of urinary stone disease (USD).

MATERIAL AND METHODS

After obtaining informed consents from the families of 1053 children (506 boys and 547 girls; mean age of 8.9 ± 2.4 (4-14) years) from three different primary schools were included in this study. In order to expose the nutritional habits in the past year, a questionnaire consisting of 84 questions were answered by the parents of the children. Then the children were examined with abdominal ultrasonography for the presence of USD. For statistical analysis, the children were divided into two groups according to presence or absence of calculi.

RESULTS

The prevalence of USD in children was found as 0.94 % (10/1053) in Samsun area. Children with family history of USD are 3.8 times more likely to have urolithiasis. In univariate analysis lemonade, coke and orange juice found to be a risk factor for USD: Consumption of water, cabbage pickle, corn, apple, rice, pasta and dried nuts were found to be protective from USD. In the multivariate analysis; consumption of lemonade was the only risk factor for development of USD in children, however consumption of pickled cabbage was the only protective factor.

CONCLUSIONS

The prevalence of pediatric USD in Samsun is lower than the other endemic areas in Turkey. Further metabolic studies are required for the protective effect of pickled cabbage consumption.

STONE COMPOSITION IN PEDIATRIC UROLITHIASIS: A PEDIATRIC STONE CONSORTIUM ANALYSIS

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PURPOSE

Scant data exists regarding stone composition in pediatric urolithiasis. We studied (1) the variation of stone composition by age and gender, and (2) gender-related differences in urinary risk factors in relationship to stone composition.

MATERIAL AND METHODS

A retrospective multicenter review of 122 children with upper urinary tract calculi was performed, analyzing both stone composition and urinary metabolic data.

RESULTS

The mean age was 12.87 ± 3.93 years, and 48.3% were males. Most stones were either pure calcium oxalate (CaOx) (44%) or CaOx mixed (44%), without significant differences in age and gender for either stone type. Calcium phosphate (CaP) was present in 85% of the CaOx mixed group. Among children with pure CaOx, there were significant differences in urinary risk factors between males and females (Table). No significant differences were seen in the CaOx mixed group. Abnormal urinary calcium excretion was found in 26% of children with pure CaOx and in 31% of CaOx mixed.

Urine Component Males (n=27) Females (n=27) p-value

Oxalate			
(mg/1.73 m ² /day)	37.81 ± 10.57	31.74 ± 11.90	0.05
Sodium			
(mmol/kg/day)	3.41 ± 1.48	2.63 ± 1.00	0.02
Magnesium			
(mg/kg/day)	2.09 ± 0.86	1.67 ± 0.79	0.06
Citrate			
(mg/gm creatinine)	398.44 ± 286.24	547.46 ± 292.48	0.06

CONCLUSIONS

CaOx, alone or in combination with CaP, was the predominant component of pediatric stones across all ages, and both genders. Approximately one third had hypercalciuria. In males with pure CaOx stones, higher urinary oxalate and sodium and hypocitraturia indicate the need for dietary evaluation/modification.

PERCUTANEOUS LITHOTRIPSY (PCNL) IN CHILDREN: A COMPARISON IN DIFFERENT AGE GROUPS

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PURPOSE

To evaluate and compare the outcome of stone clearance and blood transfusion in four age groups of children who underwent PCNL.

MATERIAL AND METHODS

We retrospectively reviewed the records of 1078 renal units (RU) of children upto 15 years of age who underwent PCNL between Jan 2010 and June 2014. Children were divided into four age groups. A: upto 3 years, B: 4 and 5 years, C: 6 – 10 years and D: 11- 15 years. Records were reviewed for gender, Pre and Post operative Hb, Serum Creatinine, stone volume, access site, sheath size, disintegration technology, stone clearance rates, peri and post operative blood transfusion and complications.

RESULTS

	Group A (upto 3 years)	Group B (4 and 5 years)	Group C (6 – 10 years)	Group D (11- 15 years)
Renal units	276	195	419	188
M:F	2.9:1	2.36:1	1.64:1	1.89:1
Mean Stone volume	1.4 ± 0.92 cm ²	1.60 ± 0.75 cm ²	2.42 ± 1.80 cm ²	2.81 ± 1.58 cm ²
Pre-Op Hb (gm%)	10.3 ± 1.25	10.7 ± 1.3	11.2 ± 1.21	12.0 ± 1.4
Post op Hb (gm%)	9.8 ± 1.23	10.1 ± 1.25	10.6 ± 1.17	11.2 ± 1.3
Blood transfusion	62 (22.4%)	29 (15%)	46 (11%)	19 (10%)
Stone Clearance	96.2%	91.5%	89%	84%
Complications	16.4%	15.6%	16.2%	14.5%

CONCLUSIONS

PCNL is an effective procedure for stone clearance in all age groups of children. There is an increasing stone burden with increasing age. Blood transfusion requirement decreases with age as preoperative Hb is relatively better and there is more allowable blood loss with increasing age.

S10: ENDOUROLOGY

Moderators: Eugene Minevich (USA), Simona Gerocarni Nappo (Italy)

ESPU Meeting on Thursday 15, October 2015, 14:34 - 15:00

14:34 - 14:39

S10-1 (LO)

★ RETROGRADE INTRARENAL SURGERY VERSUS PERCUTANEOUS NEPHROLITHOTOMY IN THE MANAGEMENT OF LARGE UPPER URINARY TRACT STONES IN CHILDREN: A RANDOMIZED CLINICAL TRIAL

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PURPOSE

To compare the outcomes of retrograde intrarenal surgery (RIRS) and percutaneous nephrolithotomy (PCNL) in the treatment of children with renal and upper ureteric calculi of more than 2 cm in maximum dimension.

MATERIAL AND METHODS

Between May 2011 and February 2014, 38 children with renal and upper ureteric calculi more than 2 cm in maximum dimension were prospectively randomized between RIRS (group A) and PCNL (group B). Age ranged from 1 year and 5 months to 16 years in the whole studied population. Sex distribution, laterality, incidence of recurrent stones and stone characteristics were comparable between the two groups.

RESULTS

The study included 43 renal units; 21 units in group A and 22 units in group B. The mean radiation time and hospital stay were longer, but the stone free rate was higher in group B (95.5% versus 80.9%, $P = 0.185$). Patients in PCNL group had a statistically significant higher complication rate compared with RIRS group ($P=0.018$). Three patients in the PCNL group received blood transfusions, whereas none of the children in the RIRS group were transfused ($P = 0.015$). One patient had a pneumothorax and one had an injury of the ileum in the PCNL group. The only complication in the RIRS group was postoperative fever (one patient).

CONCLUSIONS

This study demonstrates that RIRS is an effective, appreciably safer alternative to PCNL in pediatric patients with large-sized upper tract stones. Radiation exposure, hospital stay, and morbidities of PCNL can be significantly reduced with the RIRS technique.

★ EXTRACTABLE FRAGMENT VERSUS DUSTING DURING URETEROSCOPIC LASER LITHOTRIPSY IN CHILDREN: PROSPECTIVE RANDOMIZED STUDY

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PURPOSE

Complete eradication of stone fragments is an important goal during stone management in children. Mode of fragmentation employed to clear stone during ureteroscopic laser lithotripsy raises concerns related with operative time, associated morbidity and costs, especially by potential endoscope damage. The purpose of this study is to evaluate outcomes of fragmentation into extractable pieces and stone dusting during ureteroscopic laser lithotripsy in children

MATERIAL AND METHODS

One hundred children with ureteral stones underwent ureteroscopic holmium laser lithotripsy were prospectively randomized into two groups: group I with stone fragmented to dust (n=50), and group II with lithotripsy into extractable fragments (n=50). Double-J stent was routinely indwelled in both groups. Operating time, stone free rate and perioperative complications were compared. All patients were followed up for 3 months.

RESULTS

Mean stone volume in groups I and II were similar. Stone free rate was 98% and 96% in group I and II respectively. Mean operating time was statistically significantly lower in group II (36 versus 28 min, P=0.0069). Minor complications occurred in 8 cases (5 in group I and 3 in group II) in the form of hematuria and urinary tract infection. No major complication encountered in both groups.

CONCLUSIONS

Fragmenting stones into extractable pieces has a shorter operative time compared with stone dusting with a comparable stone free rate and complication rate. The optimal mode of ureteroscopic laser lithotripsy in children seems to be into extractable fragments.

EFFECT OF SIZE AND SITE ON OUTCOME OF MINI-PERCUTANEOUS NEPHROLITHOTOMY FOR RENAL STONES IN INFANTS AND PRESCHOOL CHILDREN: A PROSPECTIVE STUDY

Mohammed Said ELSHEEMY, Kareem DAW, Ahmed SHOUMAN, Ahmed SHOUKRY, Waseem ABOULELA, Hany MORSI, Hesham BADAWEY and Mohamed EISSA
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PURPOSE

Reports on Miniperc are still few. Nearly, all of them are retrospective. Most of them used sheath size of ≥ 18 Fr which is still relatively large for young children. To the best of our knowledge, the present study may be the first prospective study assessing safety and efficacy of Miniperc for renal stones in preschool age patients.

MATERIAL AND METHODS

From January 2012 to May 2013, Miniperc was performed for 26 children (≤ 6 years old) with renal calculi < 5 cm through 14Fr sheath using 9.5Fr semirigid ureteroscope with Holmium:YAG laser Lithotripsy. Stones > 2 cm (38.5%), resistant to ESWL (34.6%) or alkalization (11.5%), associated with moderate to severe hydronephrosis (7.7%), on top of retracted stent (3.8%) or secondary to PUJ-O (3.8%) were included. Effects of different factors on operative time, complications and stone-free rate (SFR) were recorded and compared.

RESULTS

Age and stone size were 43 ± 15 (15-72) months and 19.6 ± 11.29 (5-48) mm, respectively. Multiple stones were present in 12 (46%) patients. Stones were present in renal pelvis (61.5%) or in pelvis combined with calyces (38.5%). Operative duration, Hemoglobin loss and hospital stay were 71 ± 30 (25-150) min, 0.78 ± 0.86 (0-3.3) mg/dl and 3.8 ± 2.07 (1-10) days, respectively. Supra costal or > 1 puncture were needed in 3 (11.5%) and 1 (3.8%) patient(s), respectively. Primary-SFR, SFR after second-look Miniperc and after ESWL were 77%, 85% and 92%, respectively. Retreatment rate was 8%. Auxiliary ESWL was done in 11%. The only case with failure had 3mm clinically insignificant residual fragment. Complications were bleeding (8%), hematuria and blood transfusion (4%), renal pelvis perforation (4%), leakage (8%) and fever (15%). No patient developed hypothermia. 4 (15.4%) patients required double J stenting at end of procedure. Operative time was significantly prolonged in multiple (> 2) stones ($p=0.006$), calyceal stones ($p=0.002$) or stone size ≥ 30 mm ($p=0.022$). SFR was significantly lower in children with > 2 stones (43%) ($p=0.028$) and increased stone size ≥ 30 mm (40%) ($p=0.014$). Complications rate was not affected by technique of dilatation or number, size or site of stones ($p > 0.05$).

CONCLUSIONS

Conclusions: Miniperc is safe and effective minimally invasive procedure for pediatric renal stones using 14Fr access sheath. SFR was significantly lower in children with > 2 stones or increased stone size ≥ 30 mm.

PEDIATRIC UROLOGY RADIATION SAFETY EVALUATION (PURSE): A PROSPECTIVE ASSESSMENT OF OF PEDIATRIC RADIATION EXPOSURE DURING FLUOROSCOPY-GUIDED ENDOUROLOGIC PROCEDURES

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PURPOSE

The recommended limit of ionizing radiation exposure for children under age 18 is 5 mGy per year. We prospectively evaluated radiation exposure during fluoroscopy-guided pediatric urologic procedures at our institution with single point dosimeters.

MATERIAL AND METHODS

From 2013-2015, children undergoing fluoroscopy-guided urologic procedures were prospectively enrolled in an Institutional Review Board-approved study. Dosimeters were affixed to the skin at standardized locations during procedures. Dosimeter analysis was performed in a blinded manner.

RESULTS

There were 98 events in 80 patients. The average age was 10.7 years (median 12, range 0.3-17). Male-to-female ratio was 0.85. The dosimeter readings (i.e., absorbed dose, mGy) were correlated with the air kerma values (mGy; $r=0.75$, 95% CI 0.53-0.87) (see Figure 1). Absorbed dose was linearly dependent on body surface area ($p=0.05$); age ($p=0.04$); laterality ($p=0.04$); BMI percentile ($p<0.01$); whether the procedure was a definitive intervention or temporizing measure ($p<0.001$); and the duration of radiation administration ($p<0.001$). Linear dependence existed between the duration of radiation and when in the study the procedure was performed ($p=0.02$) whereas age, body surface area, BMI percentile, skin-to-source distance, and frames per second were not significant. Radiation exposure was <1 mGy per case in 67% (59/88) of cases, exceeded 5 mGy in 5.7% (5/88) of cases, and averaged 1.32 mGy per case (median 0.74, range 0.01-10.68). Study patients had undergone an average of 1.9 (median 1, range 1-11) fluoroscopy-guided urologic procedures at our institution in their lifetimes and had averaged 2.7 (median 1, range 0-35) episodes of diagnostic ionizing radiation over a period of 3.25 years.

CONCLUSIONS

Radiation exposure during a single pediatric urologic procedure accounts for 26% of the recommended annual limit on average. Pediatric urologists can enhance radiation safety for their patients by minimizing the duration of fluoroscopy utilization.

S10-5 (P)

PREDICTING THE NEED FOR PASSIVE URETERAL DILATION PRIOR TO URETEROSCOPIC STONE REMOVAL

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Children's hospital of Philadelphia, Surgery, division of Urology, Philadelphia, USA

PURPOSE

Ureteroscopy (URS) is a recognized first line therapy for pediatric renal stones. When URS is precluded by an inability to access the ureter, ureteral dilation can be performed actively with coaxial dilators or passively with a ureteral stent. We sought to examine predictors of pre-stenting requirement prior to URS.

MATERIAL AND METHODS

All patients undergoing URS from January 2004-December 2014 were assessed for demographic information, urologic history, and stone characteristics. Univariate analysis was performed to identify clinical factors predicting the need for pre-operative stenting.

RESULTS

279 patients underwent 372 procedures in the inclusion period. There were 170 (60%) females and 109 (40%) males. Median age in the pre-stented group was younger compared to the non-stented group (12.9 vs. 15.4 years, $p < 0.05$). Ethnicity, gender, and stone size (5 vs. 6mm, $p = \text{NS}$) did not differ between the two groups. Rates of ureteral anomalies (UPJ obstruction, etc.) did not differ between the two groups. Pre-stenting was required less often in patients with a neurogenic bladder (11.7% vs. 21%, $p < 0.05$) but was required more often in renal compared to ureteral stones (50% vs. 32.9%, $p < 0.05$). Previous ureteral surgery was not associated with an increased need for pre-stenting. Median pre-operative stent duration was 20 days.

CONCLUSIONS

Pre-stenting prior to URS was required more often in younger children and for renal stone location. Stenting was less likely in those with a history of neurogenic bladder. These findings can guide pre-operative counseling and prepare a family for multiple potential interventions for successful URS.

S11: ONCOLOGY

Moderators: Michael Ritchey (USA), Marcel Drlik (Czech Republic)

ESPU Meeting on Thursday 15, October 2015, 16:10 - 16:50

16:10 - 16:15

S11-1 (LO)

★ PROGNOSTIC FACTORS IN PATIENTS WITH BLADDER/PROSTATE RHABDOMYOSARCOMA UNDERGOING RADICAL SURGERY

Lorenzo ANGELINI¹, Gianni BISOGNO², Rita ALAGGIO³, Giovanni SCARZELLO⁴, Luisa SANTORO³, Angela SCAGNELLATO², Eleonora BASSO⁵, Paolo D'ANGELO⁶, Andrea FERRARI⁷ and Marco CASTAGNETTI⁸

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PURPOSE

We evaluated the prognostic factors in children undergoing radical surgery for bladder/prostate rhabdomyosarcoma (BP-RMS).

MATERIAL AND METHODS

Between 03/1986 and 10/2014, 108 patients aged 0,3 - 261,2 months, with a BP-RMS were enrolled in 3 subsequent national protocols (RMS 88, RMS 96 and RMS 2005) coordinated by the Italian soft tissue sarcoma committee. We reviewed the clinical and surgical data of patients undergoing radical bladder-prostate surgery, and evaluated the relative risk (RR and 95%CI) for failure of 5-year progression-free survival (5-yr PFS) associated with variables at diagnosis (age, gender, histology, location, maximum tumour size, and stage), preoperative management (treatment protocol, tumour response after 9 weeks of treatment, administration of preoperative radiotherapy), and characteristics of the excised specimen (excision margins, histological differentiation, maximum diameter, the final location of the tumour).

RESULTS

Data were available in 26 of 30 eligible patients. Of the 26 patients, 17 underwent radical cystoprostatectomy, 5 partial bladder resection, and 4 radical prostatectomy. 9 events were registered during follow-up [9/26 patients died a median of 1.76 years (range 0,97- 3.7 years) after surgery]. None of preoperative or management variables appeared to influence 5-yr PFS including preoperative radiotherapy. Instead, the presence of an undifferentiated tumour (RR: 4.85; 1.7-14.2; p=0.004), a tumour >5 cm (RR: 3.75; 0.95-14.8; p=0.05), and the simultaneous involvement of both bladder and prostate (RR: 2.75; 1.1-6.7, p=0.02) on the excised specimen appeared to negatively impact 5-yr PFS. Finally, 5-yr PFS was unrelated to the presence of positive excision margins.

CONCLUSIONS

Current study confirms that tumours characteristics at presentation do not influence long-term outcome. In patients undergoing radical bladder-prostate surgery, some characteristics of the removed specimen can influence 5-yr PFS, in particular a tumor exceeding >5cm in diameter and involving both bladder and prostate, and an undifferentiated histology are all associated with poorer 5-yr PFS.

★ IS NEPHRON SPARING SURGERY JUSTIFIED IN WILMS TUMOR WITH BECKWITH-WIEDEMANN SYNDROME OR ISOLATED HEMI-HYPERTROPHY ?

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1) Hôpital Femme Mère Enfant, Paediatric surgery, Bron, FRANCE - 2) Centre Léon Berard, Paediatric oncology, Lyon, FRANCE - 3) Hôpital Armand Trousseau, Genetic, Paris, FRANCE - 4) Hôpital Armand Trousseau, Pathology, Paris, FRANCE - 5) Centre Léon Berard, Biostatistics, Lyon, FRANCE - 6) Institut Gustave Roussy, Paediatric oncology, Villejuif, FRANCE - 7) Centre Hospitalier Régional Universitaire Hôpital Jean Minjot, Paediatric surgery, Besançon, FRANCE - 8) Hôpital de la Timone, Paediatric oncology, Marseille, FRANCE - 9) Institut Curie, Paediatric oncology, Paris, FRANCE - 10) Hôpital Armand Trousseau, Paediatric surgery, Paris, FRANCE

PURPOSE

To delineate the indications of Nephron Sparing Surgery (NSS) in patients with Beckwith-Wiedemann syndrome (BWS) or isolated Hemi-Hypertrophy (HH) treated for Wilms Tumor (WT) and/or nephroblastomatosis and to evaluate their outcome.

MATERIAL AND METHODS

All cases of BWS or HH operated on in France for a WT and treated according to the SIOP protocols from 1980 to 2013 were retrospectively reviewed. Patients were divided into two groups: isolated unilateral tumor (group 1) and bilateral tumor (group 2) with two subgroups: bilateral tumor suspected of malignancy (group 2a), unilateral tumor suspected of malignancy with contralateral nephroblastomatosis (group 2b).

RESULTS

46 patients were included: 34 in group 1, 3 in group 2a, and 9 in group 2b. Median follow up was 62 months (2m-29y). Nine NSS and 25 total nephrectomies were performed in group 1, 2 bilateral NSS and one NSS with contralateral total nephrectomy in group 2a and 8 NSS and one total nephrectomy in group 2b. The 3-year event-free survival was 92.3% (IC95% [77.9%-97.5%]). One death occurred after a local relapse following a total nephrectomy for a stade III stromal WT in group 1, and another after a combined local and distant relapse following a NSS for a stade I diffuse anaplastic WT in group 2b. There were 2 metachronous WT (4%), 3 years after a total nephrectomy (group 1) and 12 years after a NSS (group 2b).

CONCLUSIONS

NSS is recommended in bilateral WT, and could be safely performed in BWS and HH patients with good oncological outcomes.

NEPHRON-SPARING SURGERY FOR UNILATERAL UNSCREENED WILMS TUMOUR : HOW OFTEN IS IT FEASIBLE ?

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PURPOSE

In the process of writing future protocols guidelines, the SIOP-Renal-Tumour-Study-Group has defined criteria, allowing to perform partial nephrectomy (NSS) in Wilms' tumours (WT).

We aimed to investigate in what proportion of unscreened renal tumours these criteria were present.

METHODS

Inclusion criteria: Consecutive unscreened paediatric WT referred to a single institution. All children received preoperative chemotherapy (SIOP protocols). Predisposed syndromic children, and bilateral WT with diffuse nephroblastomatosis were excluded.

Retrospective blind reviews of preoperative postchemotherapy CT-scans, and postoperative pathology reports, to determine the prevalence of the following criteria : potential for sparing healthy kidney, peripheral location, invasion of calyces, surrounding organs, main vessels, or renal sinus. In potentially eligible cases, 3D-volume rendering analyses calculated tumour and renal parenchyma volumes, preservable parenchyma volume being expressed as percentage of contralateral healthy kidney volume.

RESULTS

Among 75 consecutive patients, one or more criteria excluding potential feasibility of NSS were present in 85% of cases. The main reason for ruling out NSS was central tumour location (77%), extension to surrounding organs (5.5%), or vascular thrombus (3%).

NSS was deemed feasible in 11/75 children (15%), with a volume of potentially preservable parenchyma representing 63% [34-113] of contralateral kidney volume.

Histopathology review showed perilobar and/or intralobar nephrogenic rests in 5/11 specimens (including 2/5 in distant healthy parenchyma), microscopic incomplete resection (n=1), and high risk histology (n=2).

Had NSS been performed, secondary total nephrectomy would have been recommended in at least 3/11 cases.

CONCLUSIONS

Among the population of unscreened sporadic WT, the proportion of tumours potentially amenable to NSS is <15%. Considered together with the low incidence of WT and the potential oncological risk of local relapse after NSS, this finding suggests that these cases should be centrally reviewed and discussed to determine adequate strategy.

LONG TERM RENAL FUNCTION PRESERVATION IN CHILDREN TREATED FOR BILATERAL WILMS TUMOR.

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PURPOSE

Bilateral Wilms' tumor represents a challenging situation. Our purpose was to evaluate the success of renal function preservation and cure in these patients.

MATERIAL AND METHODS

From January/1982 through March/2014, 19 children with bilateral Wilms' tumor were diagnosed. All patients received preoperative chemotherapy and were submitted to surgical procedure with nephron sparing objective. The renal function was assessed by glomerular filtration rate (Schwartz), creatinine level and microalbuminuria/creatinine index.

RESULTS

Radical unilateral nephrectomy was performed in 10 patients combined with contralateral nodulectomy in 7, associated with partial contralateral in one and two patients presented unilateral disappearing of the disease after preoperative chemotherapy on image and surgical evaluation. Six patients had bilateral nodulectomy, two had partial bilateral nephrectomy and one had partial nephrectomy plus contralateral nodulectomy.

Five patients relapsed: 3 in the remaining kidney, 1 in the tumoral bed and 1 in lungs (9mo, 1mo, 5mo and 6 mo after surgery). Two of them were rescued, achieving a second remission and three died of progressive disease.

16/19 patients are alive and with normal renal function by GFR (glomerular filtration rate), creatinine level and microalbuminuria analysis. 1/19 patients required hemodialysis support and died of progressive disease before a kidney transplant was performed. 16/19 patients are alive and free of disease for 13+ months to 30 +years.

CONCLUSIONS

The renal function was preserved in all 16/19 of surviving patients treated for bilateral Wilms' tumor, avoiding dialysis support. The overall survival was 84.2% in five years and 71% in ten years.

PEDIATRIC RENAL ANGIOMYOLIPOMAS IN TUBEROUS SCLEROSIS COMPLEX

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PURPOSE

Tuberous Sclerosis Complex (TSC) is a multisystem, genetic disorder. Renal manifestations are a major cause of morbidity. We describe the natural history of renal angiomyolipomas (AML) in children with TSC.

MATERIAL AND METHODS

We conducted an IRB approved chart review. Demographics, renal function, imaging, extrarenal manifestations, genetics, and treatments were recorded.

RESULTS

We found 193 (89 female) with TSC; 145 had renal imaging studies (range 1-18 studies per patient).

AMLs were seen in 23 (11.9%) 0-6 year olds, 29 (15%) 7-11 year olds, 20 (10.4%) 12-16 year olds, and 12 (6.2%) 17+ year olds. Measurable (>5mm) AMLs were seen in 11 (6%) 0-6 year olds, 20 (10.4%) 7-11 year olds, 13 (6.7%) 12-16 year olds, and 8 (4%) 17+ year olds.

One nine-year-old had an AML >4 cm, no other young patients had concerning AMLs. AML growth increased in patients >11 years, and in AMLs >1cm. Median AML growth in 12-16 year olds was 2.5mm/year (maximum 28.6). Median growth of AMLs 1-1.9cm was 1.4mm/year (maximum 4.6mm/year). Median growth of AMLs 2-2.9cm was 4.28mm/year (maximum 114.1).

Seven patients (3.6%) underwent a total of 13 angioembolizations or surgeries. Thirty-five patients (18.1%) took mTor inhibitors. Ninety-four of 96 with creatinine measured had normal glomerular filtration rates.

CONCLUSIONS

Larger AMLs occur mostly in patients > 11 years. Growth can be rapid and unpredictable. We recommend annual renal ultrasounds of pediatric patients with TSC, with closer follow up or MRI for patients with measurable AML >11 years, or with larger AMLs at any age.

ELEVEN YEAR PIONEER EXPERIENCE ON LAPAROSCOPIC NEPHRECTOMY FOR TREATMENT OF WILMS TUMOR: BRAZILIAN PIONEER EXPERIENCE IN A SINGLE INSTITUTION.

Ricardo DUARTE¹, Lilian CRISTOFANI², Francisco DENES¹, Vicente ODONE-FILHO² and Miguel SROUGI¹

1) *University of Sao Paulo, Urology, Sao Paulo, BRAZIL* - 2) *University of Sao Paulo, Pediatric Oncology, Sao Paulo, BRAZIL*

PURPOSE

The aim of this study was to report a 11 year retrospective analysis of the results on the videolaparoscopic nephrectomy for the treatment of Wilms tumor, regarding surgical results, immediate and long term complications and survival.

MATERIAL AND METHODS

From December 2003 to December 2014 23 children with unilateral Wilms tumor were treated with preoperative chemotherapy followed by videolaparoscopic nephrectomy. The analysis included complications, transfusion, ruptures, margins, conversions, lymph nodes, and relapse. Kaplan-Meyer method was used for survival analysis.

RESULTS

23 children were submitted to videolaparoscopic nephrectomy. Mean surgical time was 170.71 ± 26.07 minutes and there were no conversions or ruptures. Mean specimen weight was 142.02 ± 105.85 (range 80 – 515 g) . No transfusions were required. Surgical margins were positive in 1/17 cases (5.9%). Ten children were stage I, six stage II, 3 stage III and four stage IV. One patient had focal anaplasia. 2/23(8.6%) patients presented tumor relapse: 1 local (positive margins and) and 1 in lungs. The 10-year-event-free-survival was 91.3% (0.95 CI: 0.704-0.984).

CONCLUSIONS

Videolaparoscopic nephrectomy after preoperative chemotherapy for the treatment of children with Wilms tumor is safe and promotes the same long term survival results as open approach.

HOW MANY WILMS TUMORS ARE AMENABLE TO SAFE LAPAROSCOPIC TOTAL NEPHRECTOMY ?

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PURPOSE

In the process of writing future protocols guidelines, the SIOP has defined criteria, which potentially allow to perform laparoscopic total nephrectomy (MIS) in Wilms' tumours (WT).

We aimed to investigate in what proportion of renal tumours these criteria were present.

MATERIAL AND METHODS

Inclusion criteria: All consecutive WT referred to a single institution from 2005 to 2014. All children received neoadjuvant chemotherapy according to SIOP protocols.

Methods : Retrospective blind reviews of preoperative post-chemo abdominal CT-scans, and pathology reports, to determine the prevalence of the following criteria : tumour volume and location, predictable invasion of surrounding organs/main vessels, vascular thrombus, extension beyond the ipsilateral edge of the vertebral body.

RESULTS

Among 86 consecutive tumours (79 patients), one or more criteria excluding potential feasibility of MIS were present in 60% of cases.

Among 34 tumours (40%) potentially eligible for MIS, 22 also met criteria for partial nephrectomy (NSS) : either mandatory NSS in predisposed syndromic patients (n=10), or children with unilateral WT meeting the new SIOP criteria allowing elective NSS (n=12).

Analysing pathology reports of the 24 cases (28%) eligible for total nephrectomy by MIS (without SIOP mandatory indication for NSS), 25% had open incomplete microscopic resection after open nephrectomy, 25% had positive lymph nodes and 20% were high-stage histology. The overall rate of stage III in this subgroup was 37%.

CONCLUSIONS

Among a population of 86 consecutive WT, the proportion of tumours potentially amenable to MIS was 40%.

After exclusion of tumours eligible for NSS (either mandatory or elective), there remained a subset of 12/86 tumours (14%) with no contra-indication to laparoscopic total nephrectomy. Considered together with the low overall incidence of WT and the increased oncological risk, this finding suggests that these cases should be centrally reviewed, and the procedures be performed in a limited number of institutions.

S12: HYPOSPADIAS 1

Moderators: Ross Decter (USA), Pierre Mouriouand (France)

ESPU Meeting on Friday 16, October 2015, 08:00 - 09:00

08:00 - 08:03

S12-1 (PP)

★ SOCIO-ECONOMIC OUTCOMES FOR ADULT MEN BORN WITH HYPOSPADIAS; A REGISTRY-BASED STUDY

Anna SKARIN NORDENVALL¹, Louise FRISÉN², Anna NORDENSTRÖM³, Catarina ALMQVIST MALMROS⁴ and Agneta NORDENSKJÖLD⁵

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PURPOSE

The majority of long-term follow-up studies of men with hypospadias focus on cosmetic results, sexual function and fertility. Some studies have suggested that men with hypospadias report lower health-related quality of life and mental health problems to a greater extent than healthy men. It is still unknown to which extent this affects the general well-being in adulthood.

MATERIAL AND METHODS

Register-based cohort-study including men diagnosed with hypospadias, born in Sweden 1969-1993. Patients with hypospadias were matched with 100 randomly selected non-affected males by birth year and birth county. The following prospectively collected socio-economic outcomes served as proxies for well-being in adulthood: 1) marriage 2) biologic children 3) eligibility to upper secondary school 3) highest level of education achieved 4) highest level of income achieved 5) presence of disability pension. The associations between hypospadias and socio-economic outcomes were estimated with conditional logistic regression, expressed in OR (95% CI). All analyses were performed using SAS®, version 9.3.

RESULTS

4738 men with hypospadias were included. 53% were diagnosed with glandular or penile hypospadias, 4.6% were diagnosed with penoscrotal or perineal hypospadias. Men born with hypospadias were less likely to be eligible for upper secondary school, OR 0.85 (0.76-0.95), but achieved the same level of education and income as non-affected. No differences in probabilities of being married, OR 1.0 (0.89-1.12), or having children, OR 0.94 (0.86-1.04), were observed regardless the severity of hypospadias. An increased probability of obtaining disability pension was detected among all severities of hypospadias.

CONCLUSIONS

This register-based cohort study demonstrates that men diagnosed with hypospadias in Sweden achieve the same level of socio-economic outcomes as non affected men, apart from an increased risk of obtaining disability pension.

★ ELASTOSONOGRAPHY OF THE CORPUS SPONGIOSUM IN HYPOSPADIC PENIS

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PURPOSE

The aim of this study is to apply the elastosonography on normal and hypospadic penis to verify the structural differences in tissues composition and stiffness.

MATERIAL AND METHODS

56 subjects were enrolled, mean age 24 months: 34 patients with pre and post-operative follow-up for distal hypospadias (6 months) and 22 age-matched subjects as control group. Elastosonography recorded antero-posterior and transverse diameters of the cavernous corpora, urethral and corpus spongiosum diameters, elastographic index of elasticity of the corpus spongiosum. The latter was defined as soft, medium-hard or hard. We assigned the value 1 to soft tissue, 2 and 3 to medium-hard and hard respectively.

All scans were performed at the base of the penis, as far as possible from the region involved in the surgical procedure.

RESULTS

Average antero-posterior and transverse diameters of the cavernous corpora were 4.2 mm (DS 0.83) and 6.5 mm (DS 1.12) for hypospadic group and 7.3 mm (DS 1.28) and 9.0 mm (DS 1.67) for control group. These data showed statistically significant difference between the two groups for both the diameters ($p < 0.05$).

Corpus spongiosum diameter was 1.9 (DS 0.33) for hypospadic group and 2.7 mm (DS 0.73) for control group ($p < 0.05$). post-operative values were significantly reduced but not in comparison with normal penis.

Elastography showed a corpus spongiosum stiffness defined as medium-hard or hard in all cases of the pathologic group and soft in all the subjects of the control group ($p < 0.05$).

No significant difference was found for urethra diameter between the two groups.

CONCLUSIONS

Elastosonography showed how the hypospadias anatomy is deeply altered, even in an anatomical area far from meatal abnormality: cavernous corpora are less developed and corpus spongiosum in hypospadic penis seems to be globally stiffer and less elastic.

★ RISK FACTORS FOR FISTULA FORMATION AFTER DISTAL AND MIDSHAFT TIP REPAIR: A COMPREHENSIVE TIME TO EVENT ANALYSIS OF 1267 PATIENTS

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PURPOSE

To identify risk factors for urethrocutaneous fistula(UCF) after adjusting for confounders in a large multi-surgeon, prospective cohort of midshaft/distal tubularized incised plate(TIP) repairs.

MATERIAL AND METHODS

Between 2008-2014, 1267 children who underwent distal/midshaft TIP repair by 6 surgeons were prospectively followed. Proximal defects, redos and those receiving testosterone were excluded. Primary outcome was time-to-UCF rate. Eight a priori defined risk factors were explored: age at surgery [$</>1$ yr], glans groove [moderate/deep vs. shallow/no], meatal location [distal vs. midshaft], chordee correction [$>30^\circ$], suture type [polydioxanone vs. polyglactin], urethroplasty(UP) layers [1 vs. 2], coverage layer [dartos/spongioplasty vs. neither], and stent insertion. Cox-proportional hazard model was used to evaluate associations between risk factors and time-to-UCF.

RESULTS

Median age at surgery was 14(6–325)months; 15(1%)pts were post-pubertal; 1123(87%) had distal defects. Median follow-up time was 23(2–92)months. Overall, 8%(97/1267) developed UCF at median time of 6(3–55)months. Mean age at surgery was similar between patients with vs. without UCF (21.6 ± 23.2 vs. 21.3 ± 24.8 , $p=0.9$). Table 1 shows univariate analyses. Shallow/no glans groove ($HR=4.7$, $p<0.01$), 1-layer UP ($HR=1.9$, $p=0.04$), and lack of UP coverage ($HR=2.2$, $p=0.02$) were found to be independent risk factors for UCF on multivariable analysis. Older age (>1 year), midshaft defects, chordee correction and stenting were not associated with higher UCF rate.

CONCLUSIONS

This large, properly powered cohort study demonstrates important risk factors for UCF, two of which (UP layer and coverage) are modifiable and under surgeons' control.

Table 1: Univariate Analysis of Risk Factors for UCF

Risk Factor	Fistula N=97(%)	Total N=1267	p-value
Glans Groove			<0.01
Moderate/Deep	57(6)	975	
Shallow/No	40(14)	292	
Suture Type			<0.01
Polydioxanone	54(6)	869	
Polyglactin	43(11)	398	
Urethroplasty Layers			0.03
2	16(5)	328	
1	81(9)	939	
Coverage Layer			0.02
Yes	86(7)	1193	
No	11(15)	74	
Stenting			0.04
Yes	80(7)	1124	
No	17(12)	143	

★ LONG-TERM FUNCTIONAL OUTCOMES AFTER PENOSCROTAL HYPOSPADIAS REPAIR: A COMPARATIVE STUDY OF PROXIMAL TIP, ONLYAY AND DUCKETT

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PURPOSE

The aim of the study was to examine the evolution of urinary function of patients that underwent penoscrotal hypospadias repair with more than 10 years of follow-up including the adolescent period.

MATERIAL AND METHODS

Cases of hypospadias surgeries performed at our institution between 1997 and 2001 were reviewed selecting patients that underwent primary penoscrotal repair and with documented uroflowmetry data at postoperative follow-up. Patients were analyzed according to three types of surgeries: proximal tubularized incised plate (pTIP), Onlay and Duckett urethroplasty, compared with normal children using nomogram adjusted for age and BSA. All parameters including Qmax, Voiding Volume (VV), and post-void residual volumes (PVR) were collected prospectively. Comparative analysis between surgeries was performed at 1,2,3,5,8,11 and 12 years post-operatively

RESULTS

54 patients, 25(48%) pTIP, 18(35%) Onlay, and 9(17%) Duckett met inclusion criteria (median follow-up 10 years). Overall, during the first 3 years after surgery, Qmax slowly increased from 7.9 to 8.75 ml/s. In contrast, Qmax leaped from 11ml/s at 8 years post-operative to 16.2 ml/s at 12 years post-operative corresponding to the time of puberty (age≈14y). When plotted against nomogram, 36 to 82% of patients exhibit an obstructive pattern (Qmax<5th percentile) at age < 7y. This proportion was higher amongst pTIP (81.8%;p=0.02). However, by age>13y, the majority of patients normalize their Qmax (87%-100%>5th), including for pTIP without detected differences between surgeries (p=0.72).

CONCLUSIONS

Qmax below normal range is frequent after hypospadias surgeries especially in pTIP patients. However, given the remarkable improvement seen at puberty in the majority of cases, an active surveillance approach until adolescence is recommended to prevent unnecessary intervention.

★ LONG-TERM FOLLOW-UP OF ADULT MEN BORN WITH HYPOSPADIAS: PSYCHOSOCIAL RESULTS

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INTRODUCTION

Smaller studies have shown later sexual debut and fewer children in males with hypospadias. We have earlier shown that patients were less satisfied with the cosmetic result and had more urological problems. The psychosocial outcome is now presented.

MATERIAL AND METHODS

Around 1100 men above 18 years of age operated for hypospadias since 1950 were asked to participate. A questionnaire concerning the psychosocial situation, influence on the up-bringing and validated questionnaires on well-being and relationships (PGWB and Relationship Questionnaire, RQ) were used. Age-matched controls from the Swedish population registry and students answered a corresponding questionnaire.

RESULTS

Altogether 167 patients (mean age 34 years, 63% distal, 24% mid and 13% proximal hypospadias) and 169 controls (mean age 34 years of age) answered the questionnaire.

Patients lived to a higher extend with their parents and fewer had a degree from the university (<0.001). The influence on up-bringing was not related to degree of severity or number of surgical procedures. Patients were more interested in motorsport and less in cultural activities during their spare time than controls.

Patients with proximal hypospadias had lower scores for general well-being, while those with mid hypospadias were more depressed and had lower well-being.

More patients with proximal hypospadias wished to relate to other people, but were afraid to do so of fear of being hurt.

CONCLUSIONS

We found that having hypospadias generally affect life as an adult with lower education level, a lower general well-being and a risk for difficulties in relating to other people.

SEXUAL FUNCTION AND SUBJECTIVE PERCEPTION OF SEXUALITY OF MEN AFTER HYPOSPADIAS REPAIR

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PURPOSE

Besides achieving a normal penile appearance and micturition, current hypospadias treatment aims at enabling a satisfying sexuality. However, there are only few studies, all with some methodological limitations, regarding sexual long-term outcome after hypospadias repair. Therefore, the aim of the present study was to evaluate the sexuality of men with corrected hypospadias.

MATERIAL AND METHODS

In a cross-sectional study, 40 men with corrected hypospadias (18 distal, 22 proximal; mean-age: 25.9 y) and a control group of 42 circumcised men (mean-age: 25.5 y) were asked to answer 2 questionnaires: The International Index of Erectile Function (IIEF) to measure erectile function (EF), and a survey concerning sexuality.

RESULTS

Results showed that men with corrected hypospadias have the same sexual function as circumcised men. Caressing of their partners, petting and sexual intercourse were found in a similar frequency. Furthermore, they reported the same number of sexual partners and the same erectile function (EF) as circumcised men. Regarding their subjective evaluation of their sexuality, men with corrected hypospadias felt significantly less comfortable while caressing their partners and were significantly less satisfied with petting compared to circumcised men.

CONCLUSIONS

Our results showed that current hypospadias treatment concepts are very promising. Men with corrected hypospadias reported the same sexual function as circumcised men. However, regarding their subjective evaluation of their sexuality, men with corrected hypospadias felt more negative during certain sexual activities. Therefore, future hypospadias treatment should not only focus on improving surgical techniques but also on supporting young hypospadias patients and their parents psychologically to achieve a positive psychosexual development.

DISTAL HYPOSPADIAS REPAIR: COMPARATIVE UROFLOWMETRY, WHAT IS NORMAL?

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PURPOSE

Uroflowmetry is recommended for functional assessment after hypospadias repair. This consecutive series reports prospective uroflowmetry of distal hypospadias primary repairs (DHPR) and compares these to age and voided-volume matched controls from two published nomograms.

MATERIAL AND METHODS

A retrospective database of patients undergoing DHPR was created. Patients were invited for prospective functional uroflowmetry. Exclusions included: age < 2years or >13years and incomplete uroflow assessments. Maximum flowrate (QMax), average flowrate (AFR) and voiding time (VT) were compared to nomograms; Gutierrez-Segura et al. J.Urol 1997; 157,1426-1428 and Szabo et al. BJU 1995;76,16-20. Descriptive and non-parametric statistical analysis were performed.

RESULTS

Between 30/09/2011- 1/04/2014 112 patients underwent DHPR were operated on. After exclusions, 51 patients were eligible. Median age at surgery was 24.0 months [14-132]; median follow-up 22 months [6-48]. Bell-shaped uroflow curves were obtained in 48/51 at median of 4.0 [3.0-14.0] years old. Median QMax was 10 ml/s [4-24], matched median QMax from two nomograms, were 15.2ml/s [10-27.5] and 17ml/s [9-29] significantly different to the study cohort ($p < 0.001$). Median AFR and median VT were 4.0ml/s [1-9] and 21s [9-58] respectively, significantly different to matched controls; 8.8 [6-15.5] and 8.8 [6-16] ($p < 0.001$).

CONCLUSIONS

In our series, asymptomatic boys post distal hypospadias repair, had significantly different uroflowmetry results compared to nomograms in healthy populations. Uroflowmetry is an important follow-up tool, however further information is required to improve interpretation of uroflow results in order to accurately evaluate surgical outcomes and determine "normality" in the hypospadias-repaired population.

VOIDING PATTERN OF ADULT PATIENTS WITH HYPOSPADIAS REPAIRED IN CHILDHOOD.

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PURPOSE

We aimed to evaluate the voiding pattern of adult patients who underwent hypospadias repair in childhood.

MATERIAL AND METHODS

Following IRB approval 102(22.7%) of 449 adult patients who underwent hypospadias repair between 1978 -1993 responded on the following questionnaires: International Prostate Symptom Score (I-PSS) and Short Form12 questionnaire (SF-12). Uroflowmetry (UF) was suggested to all patients. All patients were divided into three groups according to the primary meatus localization. Group I of 63 (61.5%) patients with glanular, group II of 19 (18.4%) with distal and group III of the remaining 21(20.4%) children with proximal hypospadias.

RESULTS

I-PSS score was 2.3 ± 2.4 (mean + SD), UF was $21.1 \text{ ml/s} \pm 4.3$. The patients from the first and third group had less urinary symptoms compared to those of second group 1.3 ± 1.5 , 5.5 ± 2.4 , 1.6 ± 1.4 respectively ($p < 0.0001$). With regards to UF, the patients from the first and third group did better compared with those from the second group 22.1 ± 4.1 , 18.91 ± 4.2 , and 20.11 ± 3.42 respectively ($p = 0.021$). The UF was better in patients with normal vs abnormal IPSS ($p = 0.0064$). The physical component summary was 49.8 ± 10.3 , 51.1 ± 3.6 and 46.4 ± 0.3 in the first, second and third group respectively. The mental summary component was 42.64 ± 4.1 , 42.2 ± 2.4 and 39.89 ± 2.9 in the first, second and third group respectively.

CONCLUSIONS

Majority of adult patients who underwent hypospadias repair in childhood had normal voiding or mild voiding disturbance with no affection to their physical or mental status.

VALUE OF UROFLOWMETRY, URETHROSCOPY AND HIGH PRESSURE BALLOON DILATATION IN THE MANAGEMENT OF URETHROCUTANEOUS FISTULA AFTER HYPOSPADIAS REPAIR

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PURPOSE

We assessed the influence of a new clinical practice guideline (CPG) that includes uroflowmetry, urethroscopy and early high pressure balloon dilatation if needed in the outcome of the patients with urethrocutaneous fistula (UCF) after hypospadias repair.

MATERIAL AND METHODS

We performed a retrospective review of patients treated for UCF in our hospital between 2005 and 2010. Patients were treated under the conventional approach or the new CPG according to the surgeon preferences. Time for fistula resolution and number of interventions for fistula repair in the CPG group were compared with control patients treated under the conventional approach. Data were analysed with U Mann Whitney, Wilcoxon for matched pairs and Kaplan Meier curves.

RESULTS

Thirty-nine patients were treated for UCF after hypospadias repair under the conventional approach (n= 22) or the new CPG (n=17). Number of interventions for fistula repair decreased from a mean of 2,78 to a mean of 0,71 under the new CPG (p<0,01). Statistic analysis with Kaplan Meier curves revealed faster resolution of the fistula in the CPG patients (10,8 months to 37,5 months, p<0,01) (Figure 1). We also found that the patients with recurrent fistula after multiple operations that were rescued and treated under the new CPG, had associated urethral stricture in all cases and needed fewer interventions for fistula repair after high pressure balloon dilatation (mean number of fistula repairs: before dilatation= 2,39, after dilatation= 0,67, p<0,01).

CONCLUSIONS

A clinical practice guideline that includes uroflowmetry and urethroscopy in the assessment of urethrocutaneous fistula after hypospadias repair reduces number of reoperations and time for fistula resolution in our patient group. Prompt diagnosis and early high pressure balloon dilatation of associated urethral strictures is crucial in the treatment of these patients.

NORMALIZED URINARY FLOW AT PUBERTY AFTER TIPU REPAIR OF HYPOSPADIAS IN CHILDHOOD

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PURPOSE

An obstructive urinary flow pattern is frequently seen after tubularized incised plate urethroplasty (TIPU) for hypospadias.

Our aim was to describe the results after puberty.

MATERIAL AND METHODS

126 boys underwent surgery using TIPU for distal penile to midshaft hypospadias between 1999-2003. Toilet-trained boys at the time of surgery (n=48) were included in a first study. The same cohort was followed after seven years and at puberty (n=40, median age 15.0 years; 13.7-17.1).

Clinical examination, urinary medical history, uroflowmetry and ultrasound for measuring residual urine were performed. Hypospadias Objective Scoring Evaluation (HOSE) was used in addition for outcome evaluation. Maximum urinary flow was correlated to age and voided volume using nomograms by Miskolc for comparison in percentiles.

RESULTS

One year after surgery, 37.5% of the boys had a normal urinary flow (more than or equal to 25th percentile) compared with 40% after seven years and 95% at puberty (p<0.0001). Maximum flow was a median of 11 ml/s (6-25ml/s) after one year, 15 ml/s (5-36ml/s) after seven years and 26 ml/s (11-56ml/s) at puberty. A normal urinary stream was found in 82% and residual urine in 5% (two boys). At puberty, one persistent coronal urethral fistula (glandular membrane), one corrected former urethral fistula and four preputial fistulas (of 23 preputioplasties) were noted. During the follow-up time, five patients underwent a meatotomy due to obstructive symptoms and four were dilated. Three of these nine had lichen sclerosus (LS). All of the interventions, except one, occurred before the 7-year follow-up. Eighty-five percent had a HOSE score equal to or more than 14. Three boys (7,5 %) described a slight curvature during erection.

CONCLUSIONS

There is great potential for the normalization of urinary flow at puberty for boys treated for hypospadias with TIPU repair.

BIOMETRY OF THE HYPOSPADIC PENIS PRIOR AND AFTER TESTOSTERONE STIMULATION - A RANDOMIZED CONTROLLED STUDY

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PURPOSE

The use of preoperative hormonal stimulation prior to hypospadias correction aims to increase penile size and achieve better surgical results. Its rule is still not clear in the literature. We evaluated the effects of topical testosterone on the morphometry of the hypospadias penis and its side effects.

MATERIAL AND METHODS

Thirty-seven children with hypospadias were randomly divided into two groups: GT: 24 boys used 1% topical testosterone propionate twice a day for 30 days and GC: 13 children use placebo for the same period. Blood Testosterone, FSH and LH tests were done prior, 30, and 90 days after treatment. Biometric evaluation of the penis, including penile length at maximum stretch, diameter of the penile body and glans, distance from the meatus to the tip of the penis, and width of the urethral plate, were measured.

RESULTS

Hypospadias classification in GT were anterior (12), midshaft (5), and posterior (7) and in GC were anterior (9), midshaft (2), and posterior (2). Only one child in GT had increased hormone levels after 30 and 90 days of treatment. After 30 days 83% (20/24) of children in GT had pubic hair growth, and 91.6% (22/24) had darkening of genital skin. These effects were not seen in any boys of GC. After 90 days, pubic hair growth was seen in 16.6% (4/24) and darkening of the skin persisted in 4.2% (1/24). All biometric measures of the penis increased in GT but only the diameter of the glans was significant (P: 0.0355). There was no increase in these measures in GC.

CONCLUSIONS

Preoperative use of topical testosterone increases the size of the penis, especially the diameter of the glans. No significant side effects were seen and hormonal levels and virilizations signs disappear after 90 days of treatment.

ROUTINE USE OF INTRAOPERATIVE FLUID LEAK TEST REDUCES THE RATE OF RECURRENT URETHROCUTANEOUS FISTULA FOLLOWING HYPOSPADIAS FISTULA REPAIR

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PURPOSE

Recurrent urethrocuteaneous fistula remain a major cause of morbidity after hypospadias fistula repair. This study was designed to determine if intraoperative leak test would reduce the incidence of recurrent fistula.

MATERIAL AND METHODS

This is a prospective randomize study. Between 2012-2014, we performed 20 fistula repairs. Patients were evaluated in two groups: routine leak test was performed in the study group (n=10) and no leak test was performed in the control group (n=10). The patients all had fistulas <4mm, and none had evidence of meatal stenosis, defined as calibration. The single surgeon performed all the fistula repairs. Fistula size and locations were similar in both groups. The leak test was performed by a syringe. After the fistula was dissected and sutured, saline was injected through meatus during digital compression to the proximal urethra. If any leakage were observed, additional sutures were placed. Ventral dartos barrier flap was used to cover the urethral defect in both groups. Postoperative catheter drainages were not used in any cases.

RESULTS

Median age at fistula closure was 3 year (1-12), and mean follow up was 6 months. Intraoperative leak was detected and repaired in 4 patients, thus resulted in no recurrent fistula (0%) in the study group. 3 recurrent fistulas (30%) were detected in the control group. The study group had statistically significant ($p < 0.05$) low recurrence rate compared to the control group. Reported recurrence rates vary from 4-30% in the literature.

CONCLUSIONS

The leak test which is an easily reproducible test that is highly effective for intraoperative detection and repair of the leak, thus reducing the rate of postoperative recurrence in fistula repair. We highly recommend the use of this technique to avoid recurrent fistulas.

UROFLOW RESULTS BEFORE AND AFTER HYPOSPADIAS REPAIR IN TOILET TRAINED BOYS

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PURPOSE

Flow rates after hypospadias repair are generally lower than reported nomograms for normal boys. However, few studies evaluate flow parameters in toilet trained boys with uncorrected hypospadias. We now report voided volumes, and maximum (Qmax) and average (Qave) flow rates in boys before and after hypospadias repair.

MATERIAL AND METHODS

All toilet-trained patients with hypospadias undergo uroflowmetry at our center, with parameters recorded prospectively into a database. All those with uroflowmetry obtained before and after hypospadias repair were included. Patients with voided volume

RESULTS

There were 17 patients who presented at mean age 8 years (3-13; 3 pubertal) with non-operated distal (14) or proximal (3) hypospadias. No patient had preoperative meatal stenosis based on intraoperative calibration ≥ 8 Fr before repair. All had TIP urethroplasty, with postoperative uroflows obtained at 6 months (range 1.5-13). No patient had obstructive urinary symptoms or postoperative urethroplasty complications. Uroflow results are shown in the Table. There were no significant differences in preoperative versus postoperative uroflow parameters.

	Pre-op Mean (SD)	Post-op Mean (SD)	p-value
Qmax (cc/sec)	14 (7)	13 (6)	0.55
Qave (cc/sec)	9 (5)	8 (4)	0.54
Voided Volume (cc)	111 (114)	129 (88)	0.56
Plateau-shaped curve	4 (24%)	6 (35%)	0.71

CONCLUSIONS

Data in these patients provide new insight into the decreased Qmax and Qave often reported after hypospadias repair, suggesting such decreased flow parameters are present before surgery and that the native urethra in patients with hypospadias may not be normal.

ANOGENITAL DISTANCE AND INDEX/RINGFINGER RATIO IN BOYS WITH HOSPADIAS AND UNDESCENDED TESTIS - NOT SO MUCH DIFFERENCE?

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PURPOSE

Recent studies show that the anogenital distance (AGD) and the ratio of the index finger to the ring finger (IRFR) (ratio larger in female than male) is sexually dimorphic. It is believed that this represents different exposure to androgens in utero. Pathogenesis of hypospadias and undescended testis (UDT) is also closely linked to androgen action during pregnancy. In this study, we sought to determine if there are any differences in infants with hypospadias and UDT and controls (other type of elective surgery).

MATERIAL AND METHODS

Prior to surgery AGD, anopenile distance, penile length/glans diameter and left and right IRFR were measured using a standard caliper. Median age was 2.5y (0.01-16yrs). Patients: controls (C) 28, hypospadias/UDT (HU) 40 (mild hypospadias 18, severe hypospadias (SH) 9 (SIU classification)) and UDT 13.

RESULTS

Mean age C 2.3y (3.1 SD) vs. HU 2.6y (3.3 SD)(n.s.), mean AGD C 3.5cm (1.4 SD) vs. HU 3.5cm (1.3 SD) (n.s.), mean right IRFR C 0.97 (0.09 SD) vs. HU 0.98 (0.05 SD) (n.s.), Mean left IRFR C 0.98 (0.06 SD) vs. HU 0.96 (0.06 SD) (n.s.). Subgroup analysis for severe hypospadias: mean age C 2.3y (3.1 SD) vs. SH 3.6y (3.3) (n.s.), mean AGD C 3.5y (1.4 SD) vs. SH 2.6y (1.0 SD) ($p=0.04$), mean right IRFR C 0.97 (0.09 SD) vs. SH 0.98 (0.04 SD) (n.s.) and mean left IRFR C 0.98 (0.06) vs. SH 0.94 (0.04 SD) (n.s.).

CONCLUSIONS

In our infant study (mean 2.5y) we could not show significant differences in AGD and IRFR between hypospadias and UDT patients and controls. However, in severe hypospadias AGD was significantly reduced. In young age groups, IRFR does not show major variety. Therefore, in infants IRFR is not a suitable parameter for intrauterine androgen exposure.

SHORTER ANOGENITAL DISTANCE CORRELATES WITH SEVERITY OF HYPOSPADIAS IN PRE PUBERTAL BOYS

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PURPOSE

Anogenital distance (AGD) is a sensitive bio-marker of fetal androgen disruption. Animal studies have reported a critical time period during early gestation where androgen deficiency results in reduced AGD as well as cryptorchidism and hypospadias. AGD in pre-pubertal boys with hypospadias is not well studied.

MATERIAL AND METHODS

We measured AGD from the midpoint of anus to (1) ASD -bottom of scrotum, (2) AGD1 -penopubic junction (3) AGD2 - penoscrotal junction; in all boys presenting with hypospadias. We selected age-matched controls without any genital anomalies.

RESULTS

139 boys with hypospadias and 267 controls were studied. In boys with hypospadias compared to controls we found no significant difference in weight (13.6 ± 6.1 kg vs 14.8 ± 6.8 kg, $p=0.080$), height (94.1 ± 20.1 cm vs 93.5 ± 19.9 cm, $p=0.776$) and age (45.12 ± 35.53 months vs 46.79 ± 33.05 months, $p=0.637$). We found significant difference only in ASD (40.00 ± 9.68 vs 45.60 ± 9.35 , $p < 0.001$). No significant difference was observed in AGD1 (78.91 ± 12.33 cm vs 80.2 ± 14.10 cm, $p=0.367$) and AGD 2 (69.90 ± 13.06 cm vs 71.64 ± 13.81 cm, $p=0.273$).

Age, weight and length adjusted regression model showed significantly shorter ASD ($p < 0.001$) but not AGD1 ($p=0.509$) and AGD2 ($p=0.149$) in boys with hypospadias. We saw a negative correlation ($r = -0.297, -0.267, -0.327$, $p < 0.001$) with severity of hypospadias with all three measures of AGD respectively

CONCLUSIONS

AGD is significantly shorter in boys with hypospadias and decreases with severity of hypospadias. This study strengthens the utility of AGD as a non-invasive predictor of male reproductive health outcomes.

DOES FORESKIN RECONSTRUCTION AT TIME OF HYPOSPADIAS REPAIR INCREASE RISK OF COMPLICATION?

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PURPOSE

Foreskin reconstruction (FR) is now a recognised option for patients undergoing single-stage hypospadias repair. We evaluated the incidence of complications after single-stage urethroplasty in our institution.

MATERIAL AND METHODS

A retrospective review was performed of boys who had single-stage hypospadias repair. Patients were divided into group 1 (circumcision) and group 2 (FR). Urethroplasty complications and foreskin complications were recorded.

RESULTS

Between March 2008 and August 2014, 359 patients had a single-stage hypospadias repair. Seven were excluded as they were already circumcised at the time of the surgery and in 188 patients case-notes were not available at time of the review. A total of 164 patients were analysed : 113 were circumcised and 51 had FR. The median age at the operation was 18 months (10-121) and 19 months (10-103) ($p=0.26$); median follow-up was 11 months (1-60) and 8 months (2-18), respectively ($p=0.05$). Urethroplasty complications occurred in 22 (19%) patients in group 1 (12 fistulas, 5 breakdown, 2 meatal stenosis, 2 glans dehiscence, 1 urethral stricture) and in 7 (14%) in group 2 (6 fistulae, 1 meatal stenosis) ($p = 0.5$). Foreskin complications (5 fistulae, 4 breakdown, 2 stenosis) were identified in 11/51 (21%) patients. A second operation was required in a total of 22 and 16 patients, respectively ($p = 0.1$).

CONCLUSIONS

The outcome of our cohort of patients confirm that foreskin reconstruction does not significantly increase the complication rate after single stage hypospadias repair.

SHOULD WE CHANGE THE INDICATIONS OF HORMONAL INVESTIGATIONS FOR NEWBORN WITH HYPOSPADIAS?

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PURPOSE

The indications for hormonal investigations in neonatal hypospadias are not subject to validated recommendations. Testing is typically limited to cases with severe hypospadias, or if associated with a micropenis, an undescended testicle (UDT), bifid scrotum, family history or syndromic form.

MATERIAL AND METHODS

We report a prospective study about 39 newborns with hypospadias (30 distal, 6 middle, 3 proximal). Hormone assays were performed before 24 hours of life (FSH, LH, testosterone, 17OHprogesterone) and at 6 weeks of age (FSH, LH, testosterone, AMH). An hCG test and an androgen receptor mutation (AR) research have been performed in case of abnormality. One case had a syndromic form, 3 UDT, 3 family history of hypospadias. None had scrotal abnormalities or micropenis.

RESULTS

Twenty-eight were considered to have normal hormonal profiles. Among the 11 abnormal, 9 hCG tests were performed (2 lost to follow), 4 of which (10.25%) were abnormal (1 middle, 1 posterior and 1 distal hypospadias at monozygotic twins) with a AR mutation. Fourteen tests would have been indicated by the conventional indications. A non indicated test (isolated distal hypospadias) was abnormal with normal complementary hCG test.

CONCLUSIONS

No hormonal profiles done in cases of isolated or distal hypospadias were abnormal. We have one case of twins with isolated distal hypospadias and a AR mutation. In the situation where both twins have hypospadias, even if distal and isolated, this should be considered a family history and indicate neonatal hormonal investigations. From these data and the literature, we propose to follow the current guidance. The recommendations edition would harmonize practices.

THE USE OF A MID-URETHRAL STENT (CONTINENT) FOR HYPOSPADIAS SURGERY IN TOILET TRAINED CHILDREN

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PURPOSE

In this study we report our experience using a mid-urethral continent stent for hypospadias repair in toilet trained children

MATERIAL AND METHODS

Between 2009-2014, 200 children underwent hypospadias surgery in our hospital. The study group included 49 (25%) boys who were toilet trained at surgery. The medical records of these boys were retrospectively reviewed. The parents were given the option between using a mid-urethral (continent) stent (N= 10) or incontinent drainage (N=39) .

All children were seen one week after surgery to extract the drainage , one and 6 month post operatively.

Early and late complications in both groups were documented

RESULTS

Average age was 7.3 years (2.5-14.8) in the midurethral stent group and 4.5 years (2.5-16.5) in the incontinent drainage group.

Fistula formed only in the incontinent drainage group 6/39 (15%) (P=0.57).

Meatal stenosis occurred in 2 (20%) and 6 (15%) and the need for re-do surgery for cosmetic reason was 0 and 5 (13%) in the midurethral and incontinent group , respectively.

In the midurethral group 90% (9/10) voided spontaneously (through or around the stent) and returned to their normal daily activity . There was one case of urinary retention necessitating removal of the mid-urethral stent and one case of stent dislodgement.

CONCLUSIONS

Regardless of the limitation of a small study group it seems that the use of mid-urethral stent does not render the child to higher rates of early or late complications.

We routinely offer mid-urethral continent stents to all our toilet trained children undergoing hypospadias repair

SURVEY OF PARENTAL AWARENESS IN FAMILIES OF CHILDREN WITH HYPOSPADIAS

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PURPOSE

Inspite of hypospadias being a common urogenital anomaly, no surveys have assessed the knowledge level of parents regarding the anomaly. The present study was conducted to understand the level of awareness about hypospadias in families of children with hypospadias.

MATERIAL AND METHODS

125 families of children presenting to our clinic with hypospadias were offered a detailed questionnaire

RESULTS

114/ 125 (91%) families agreed for the study, 70 filled up the questionnaire in person, 36 via phone and 8 responded via email. 71 % of the parents realized at birth that child had a genital anomaly while 29% learnt it later. This did not correlate with the severity of hypospadias. When asked about primary long term concerns: 37 (32%) worried about infertility, 31 (27%) - urinary issues, 24 (21%) - results of surgery, 17 (15%) - penile size and only 4 families worried about perception in community. Concerns for community were less when mother was well educated ($p=0.006$) while it did not correlate with fathers education ($p=0.119$). 52 (46%) families planned to tell their child between 15-20 years of age, 35 (31%) between 10-15 years, 4 (3.5%) before ten years, 14 (12%) would never tell, 3 (2.5%) after 20 years, 4 were undecided and two children already knew. Primary source of information for 41 (36%) of families was internet, pediatrician -28 (24.6%), family physician- 15 (13.2%), obstetrician- 13 (11.4%) and specialists in only 7 (6%).

CONCLUSIONS

Families with hypospadias struggle to understand hypospadias and its implications. A large percentage of these families turn to internet for information. Concerted effort should be made to educate caregivers for children at all levels till adulthood.

COMPARISON BETWEEN SUBEPITHELIAL CONTINUOUS SUTURING TECHNIQUE AND INVERTING CONTINUOUS SUTURING (CONNEL TECHNIQUE) IN HYPOSPADIAS REPAIR.

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PURPOSE

Hypospadias is common congenital anomalies of the male affecting 1 in 300. Urethral meatus lies on the ventral surface of penis proximal to its normal position usually associated with defective development of ventral prepuce and various degrees of chordee . Objective of the study was to compare between subepithelial continuous suturing technique and inverting continuous suturing (connel technique) in hypospadias repair.

MATERIAL AND METHODS

A prospective study of 60 children with penile hypospadias was treated by TIP between April 2012 and August 2014. Mean patient age at the time of treatment was 3.6 years (range 1 to 10 years). The patients were divided into two groups according to the method of urethral tubularization suturing. Group 1 (26 patients) had urethral tubularization using continuous subepithelial suturing and group 2 (34 patients) using continuous inverting sutures (Connell technique). Polyglycolic acid sutures 6/0 used for suturing. Interposition barrier layer of dartose were used for all children in both groups. The patients were followed postoperatively for 6 to 24 months (mean 10 months).

RESULTS

9 (34.6%) patients had complications in group 1 (7 had urethrocutaneous fistula and 2 had meatal stenosis) while 4 (11.7%) had complications in group 2 (2 had urethrocutaneous fistula and 2 had meatal stenosis)

CONCLUSIONS

Urethral tubularization using continuous inverting sutures (Connell technique) reduce the incidence of urethrocutaneous fistula formation.

S13: DSD

Moderators: Alexander Springer (Austria), Linda Baker (USA)

ESPU Meeting on Friday 16, October 2015, 09:00 - 09:46

09:00 - 09:05

S13-1 (LO)

★ FAMILY HISTORY OF GENITAL MALFORMATION IS UNDER-ESTIMATED IN CHILDREN WITH ISOLATED HYPOSPADIAS: A CLINICAL REPORT OF 105 FAMILIES.

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PURPOSE

Severe forms of 46,XY DSD with uncertain sex may have a family history (FH) in approximately 15 to 20% of cases. On the other side of the DSD spectrum, data regarding isolated hypospadias is sparse and a FH of genital malformation is thought to be less frequent. The aims of the study were 1-to determine the frequency of genital abnormalities in families of isolated hypospadiac boys, 2-to determine whether there is a particular phenotype and 3-to evaluate the prevalence of genetic defects in familial cases.

MATERIAL AND METHODS

Prospective inclusion of hypospadiac boys screened for FH with a standardized questionnaire. Extensive clinical description, family tree, DNA sampling and sequencing of androgen receptor, 5 alpha-reductase and SF1 genes were performed.

RESULTS

Out of a series of 395 boys with hypospadias, 105 had a FH of genital malformation (hypospadias n=88, cryptorchidism: n=17). FH was thus more frequent than expected (26.6%). The familial cases were mainly unique (80%, multiple in 20%). Familial hypospadias were more frequently related to the paternal side (53.4% of cases) including the father himself (29.5%), the paternal uncles and/or cousins. Prematurity, use of ART, other congenital abnormalities and postnatal growth retardation were not more frequent in familial hypospadias. The severity of phenotype and ethnicity were not significantly different either. Intrauterine growth retardation tended to be less frequent in familial forms (p=0.07). Mutations of AR and SF1 were more frequent in familial hypospadias (n=5, 5.68% vs 1.60%, p=0.046). (for AR: P392S, Q798E, A475V, P392S; for SF1: D275N)

CONCLUSIONS

FH is more frequent in hypospadiac boys than previously reported. It involves more than a quarter of cases. Even isolated and minor hypospadias justify a full interrogation on FH. Detecting these familial forms may justify an etiologic work-up to find out the causative mutation, to improve the follow-up of these patients and to help the family counseling.

★ PREDICTION OF GERM CELL CANCER OCCURRENCE IN POSTPUBERTAL INDIVIDUALS WITH ANDROGEN INSENSITIVITY BASED ON PATHOLOGICAL FINDINGS AND CANCER PREDISPOSITION SNPS

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PURPOSE

Gonadectomy is generally postponed until early adulthood in complete androgen insensitivity syndrome (CAIS) and close surveillance of gonads in situ proposed in males with partial AIS (PAIS). Delaying gonadectomy further is controversial given the lack of data regarding germ cell cancer (GCC) development in adulthood and the absence of biomarkers for noninvasive GCC screening.

MATERIAL AND METHODS

Immunohistochemical study of 96 samples (CAIS: 72 gonadectomy, 7 biopsy; PAIS: 10 gonadectomy, 7 biopsy). All surgical procedures were performed at or after the age of 14 years (median 17, range 14-54). All AIS cases were genetically confirmed. We studied the prevalence of invasive GCC, carcinoma in situ (CIS), or signs of pre-malignancy (combined aberrant OCT3/4 and KITLG expression) and assessed the correlation with a genetic predisposition for GCC based on allele sequencing of 13 GCC-associated SNPs.

RESULTS

No invasive GCC were encountered. Changes suggestive for premalignancy were found in 8/79 (10.1%) CAIS samples from five women (5/41; 12.2%) at a mean age of 16.6 (14-21) years; three women had bilateral changes. CIS was detected in one girl with PAIS (1/10; 10%) gonadectomized at 15 years. Preliminary analysis reveals a significant association between the occurrence of (pre)malignancy and a high genetic relative risk for GCC ($p=0.003$).

CONCLUSIONS

The prevalence of premalignant lesions in postpubertal CAIS women in this cohort was 12%. Lesions are already present during adolescence and often bilateral. No prospective data exist regarding progression of such lesions to GCC. A comparable prevalence was seen in PAIS, with possibly a higher risk of malignant progression given the residual AR activity. Preliminary data suggest a significantly higher risk of (pre)malignancy in individuals with a genetic predisposition for GCC.

★ PREVIOUSLY UNDESCRIBED INTRAVAGINAL STRUCTURE CONSISTENTLY ASSOCIATED WITH LATERALITY OF DYSGENETIC TESTIS IN PATIENTS WITH DISORDERS OF SEX DEVELOPMENT

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PURPOSE

Cystourethroscopic evaluation in pediatric patients with disorders of sex development (DSD) is a safe and effective method to assess the urogenital tract. Nevertheless, vaginal anatomy has not been shown to be a consistently reliable, predictive indicator of gonadal pathology. We report a series of DSD patients who have had endoscopic identification of grossly similar and previously undescribed intravaginal structures associated with specific gonadal pathology.

MATERIAL AND METHODS

Retrospective review of the our institutional DSD database (2000-present) identified 55 patients who met inclusion criteria. The same surgeon had performed urogenital endoscopy in the index study patients, who underwent endocrine evaluation, pelvic imaging, and microarray analysis.

RESULTS

Endoscopic evaluation was performed in 25/55 (45%) DSD patients and revealed 9 vaginal ridges in 6 female patients (6/25, 24%). Four of these six had undergone bilateral gonadal biopsy and/or gonadectomies, and all four were found to have a dysgenetic testis (4/4, 100%). Moreover, the laterality of the vaginal ridge and the laterality of the dysgenetic testis were consistently associated (5/5, 100%). The absence of a dysgenetic testis corresponded with the absence of a vaginal ridge in the 8 remaining females who underwent both endoscopy and bilateral gonadal biopsies and/or gonadectomies (8/8, 100%). One male with mixed gonadal dysgenesis had a pathologic cystic prostatic utricle.

CONCLUSIONS

We have identified grossly similar, heretofore undescribed vaginal ridges in six patients with DSD and have noted a consistent association between the presence of a vaginal ridge and a dysgenetic testis of identical laterality. Therefore, our current hypothesis is that the embryologic origin of the vaginal ridge is Wolffian. Evaluation of additional cases will be necessary to determine whether this association is consistently noted in female DSD patients with a dysgenetic testis.

★ GENETIC AND CLINICAL VARIATION OF MIXED GONADAL DYSGENESIS AND THE VALIDITY OF EXTERNAL AND INTERNAL MASCULINIZATION SCORES FOR PREDICTION OF GROWTH

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PURPOSE

The aim of this study was to evaluate the role of external and internal masculinization scores (EMS and IMS, respectively) in the assessment of mixed gonadal dysgenesis and prediction of their growth.

MATERIAL AND METHODS

We retrospectively reviewed the medical records of 198 patients diagnosed with mixed gonadal dysgenesis or Turner's syndrome. A total of 10 patients with the 45XO/46XY karyotype, unilateral dysgenetic gonad, and contralateral testis were included in this study. Using a specially devised scoring system by Ahmed, the external genitalia (external masculinization score, EMS, range 0 ± 12) and internal reproductive structures (internal masculinization score, IMS, range 0 ± 10) were assessed. According to the gender assignment, we performed surgical management including gonadectomy, orchiopexy, hysterectomy, and urethroplasty as indicated. The correlation between the EMS or IMS score and the anthropometric data of the patients were analyzed.

RESULTS

The median age of the patients at surgery was 9 months (range 4–20). During the median 6 years (1–17) of follow-up, four patients were treated with growth hormone. However, six patients including three patients treated with growth hormone had a final height in or below the 25th percentile. The percentage of 45XO cells in the karyotype significantly correlated with BMI distribution in all patients (A, correlation coefficient = 0.638, $p = 0.047$, $R^2 = 0.407$), and in female patients (B, correlation coefficient = 0.974, $p = 0.026$, $R^2 = 0.948$). The correlation between EMS and the final stature was significant in male patients (A, correlation coefficient = 0.909, $p = 0.012$, $R^2 = 0.826$). In female patients, those with high IMS score tended to have a higher BMI (B, correlation coefficient = 0.926, $p = 0.074$, $R^2 = 0.857$).

CONCLUSIONS

EMS, IMS, and the percentage of 45XO cells in the karyotype are useful for the prediction of anthropometric features during follow-up of these patients.

DIFFERENT PHENOTYPES IN 45,X/46,XY MOSAICISM

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PURPOSE

45,X/46,XY phenotypes widely vary at birth. Sex attribution usually relied upon genital anatomy. Nowadays preferences of the family have gained more importance. Aims of the study were to investigate functional anatomy and life satisfaction in a cohort of patients with 45,X/46,XY mosaicism.

MATERIAL AND METHODS

Personal histories of ten patients with 45,X/46,XY mosaicism treated between 1985 and 2014 have been analyzed: five children and five young adults, four reared as females and six as males. Clinical outcome was assessed by means of a clinical scoring system considering height, genital appearance, gonad and pubertal development. To investigate life satisfaction, the Gender Identity Questionnaire for Children and the World Health Organization Quality of Life assessment were adopted.

RESULTS

The four male children were strongly identified with their assigned sex. In young adults of both sexes the clinical scores ranged between 55%-65%, being 100% the optimal adherence of phenotype to attributed sex. The reduced sexual activity and body image perception scores in the young males strongly affected their quality of life. Clinical scores of the two young female adults were not balanced with their quality of life scores. Individual traits and social-familial context should be investigated in order to explain these differences.

CONCLUSIONS

Clinical scores of 45,X/46,XY patients presented a satisfying adherence to attributed sex. Gender identity in male children was strong. After puberty impairment of quality of life was influenced by reduced sexual activity and disturbed body image perception both in males and females.

EARLY VS. LATE INTERVENTION IN PATIENTS WITH DISORDERS OF SEXUAL DEVELOPMENT (DSD)

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PURPOSE

Ideal age for genital surgery in patients with DSD continues to be intensively debated. Many authors defend surgical approach in infancy, but later surgical reconstruction has been suggested. Our aim is to present the long-term outcomes of a cohort of patients who had genital surgery in infancy and adult life treated at the same tertiary centre.

MATERIAL AND METHODS

We evaluated 162 DSD patients submitted to genital reconstruction between 1965 and 2014. All patients had clinical and psychological support. Genital reconstruction was performed in 127 patients before puberty and in 35 adults. Sixty-eight patients underwent feminizing genitoplasty and 94 masculinizing genitoplasty. Mean follow-up was 26 yrs (14 to 50) and mean age at last evaluation was 26 yrs (18 to 69). Morphological results, need for reoperation, patient's satisfaction and social aspects were evaluated according to age at surgery.

RESULTS

Masculinizing genitoplasty before two years of age resulted in better morphological results. Complications and reoperations were more frequent in older patients (70% vs. 40%). Male patients' satisfaction with surgical results was present in 87%. All adult patients who underwent surgery after puberty would rather have surgery in infancy. Fifty-one of 59 adult patients have adequate sexual intercourse. Feminizing genitoplasty had good and regular morphological results in 97% of the patients. Reoperations were necessary in 4 patients. Outcomes were similar for early and late surgery. Fifteen of 22 adult patients are sexual active, 8 are married and 5 had offspring. None of these patients regretted surgery in infancy.

CONCLUSIONS

Genital reconstruction in infancy had good outcomes in adult life and was preferable by patients.

LATE SURGICAL CORRECTION OF HYPOSPADIAS INCREASES THE RISK OF COMPLICATION: A 501 CONSECUTIVE PATIENTS SERIES.

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PURPOSE

The surgical reconstruction of hypospadias is usually performed during the first 2 years of life but little objective data is available to determine its optimal timing. Whereas the no-early surgery option in DSD management is rising, the results of late genital surgery should be evaluated before advocating this attitude. The aims of this study were to evaluate the outcome of hypospadias surgery according to age and to determine if some complications are age-related.

MATERIAL AND METHODS

Monocentric retrospective study including 501 hypospadiac boys undergoing primary repair. Hypospadias was glandular or penile anterior in 63% (n=298), midpenile in 19.5% (n=91), penile posterior in 8% (n=38), perineoscrotal in 8% (n=38). Fistulae, stenosis, dehiscence, hematoma, healing troubles, infection, postoperative detrusor-sphincter dyssynergia and curvature recurrence were noted. 37 patients were lost to follow-up. Univariate and multivariate logistic regressions were performed.

RESULTS

The median age was 4 years (1-16y). The overall rate of re-intervention was 22%. The rate of complication was significantly increased after 24 months of age (39% vs 26%, OR=2.24, p=0.0007). Postoperative detrusor-sphincter dyssynergia was more frequent when surgery was performed close to the age of toilet-training (2-3y) (13%.vs.1.3%, p=0.003). Healing troubles were particularly frequent in peri-pubertal patients (14% above 10 years). Recurrence of curvature was more frequent after 8 years (2.3% vs 6.8%, OR=3, p=0.056). Beside age, the severity of hypospadias (perineo-scrotal) was also associated with an increased risk of complication (61% vs 31%, p=0.0006).

CONCLUSIONS

Late surgery may be detrimental for patients. Factors related to age may influence the rate of complication. Above 2 years, urethral surgery may interfere with the normal toilet-training process inducing urinary functional troubles. During puberty, endogenous testosterone may alter healing. Even if no specific data exist for severe hypospadias, it may be prudent to continue to advocate for early surgery in DSD patients.

DIGIT LENGTH IN HYPOSPADIAS AND UNDESCENDED TESTES

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PURPOSE

Digit length ratio has been reported to differ between sexes, and hypothesized to correlate with in utero testosterone exposure. Since in utero hormone levels are difficult to obtain, we examined digit and anogenital ratios in boys with hypospadias and undescended testes as a potential surrogate measure.

MATERIAL AND METHODS

With institutional approval, boys undergoing hypospadias, orchiopexy, circumcision, hernias, and hydroceles were identified. Under anesthesia before operation, digital calipers measured the lengths of 2nd and 4th digits of both hands (L24, R24) and the anogenital distance (AS anoscrotal, AP anopenile). Inter and intraobserver measurement variables, L24, R24 and AS:AP ratios were determined.

RESULTS

204 patients were entered with 130 evaluable; circumcision, hydrocele/hernia (N=31), undescended testes (N=52) and hypospadias (N=47). Intraobserver variation for boys <2 years age was 4.4%, >2 9%; interobserver variation was 16.4% and 9% respectively. For overall groups (circumcision, hydrocele/hernia vs. undescended testes vs hypospadias) there were no differences in digit ratio or anogenital length. When stratified by age and severity, boys with mid to penoscrotal or proximal hypospadias had shorter anogenital ratio (AS:AP) than boys with hydroceles/hernias (midhypospadias 0.301 ± 0.091 , penoscrotal and lower 0.318 ± 0.125 vs 0.404 ± 0.076 $p=0.006$, $p=0.047$ respectively), but no difference among digit ratios.

CONCLUSIONS

We were unable to determine differences between digit ratios among boys with circumcision, hydroceles, undescended testes, or hypospadias. In hypospadias > 2 years the AS:AP ratio was decreased compared to those with undescended testes or hydroceles and hernia. Whether factors such as prematurity or in vitro fertilization, affect the digit ratio need further evaluation.

ANATOMIC MEASUREMENTS OF PEDIATRIC ANTERIOR FEMALE GENITALIA

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PURPOSE

Pediatric female genitalia size and morphology has not been previously well-described. Our aim was to create a standard reference for the anterior vulval structures and examine the relationship between the clitoral hood and labia minora.

MATERIAL AND METHODS

Girls between 2 months and 16 years of age, with normal external genitalia, had the following measurements taken: length of clitoral hood, length of sides of clitoral hood, clitoral diameter, apex of clitoral hood to base of pubic symphysis, apex of clitoral hood to urethral orifice, length and depth of labia minora. Qualitative descriptors of the clitoral hood and labia were recorded. Patients were grouped into age ranges for analysis (12 years).

RESULTS

58 girls (Tanner stage 1-5) were examined. There was a linear relationship between age and genital structure size. For each age group, the mean length of the clitoral hood was 8.7, 14.3, 16.9, 20.9 mm. Mean clitoral diameter was 2.5, 3.4, 3.9, 4.5 mm. Mean length of labia minora was 9.4, 10.7, 15.2, 40 mm. Mean depth of labia minora was 3.5, 3.6, 3.9, 12.2 mm. Mean clitoral-urethral orifice distance was 12.4, 17.1, 24.8, 39.4 mm. In 95% of patients, the labia minora converged under the clitoral glans, separate to the clitoral hood.

CONCLUSIONS

External genitalia size and morphology is varied in the pediatric female population. The clitoral hood and labia minora were observed to be distinctly separate structures. This study provides a reference for surgeons undertaking genital reconstruction procedures.

A NOVEL SURGICAL TECHNIQUE FOR THE MANAGEMENT OF TRANSVERSE VAGINAL SEPTUM USING BALLOON DILATION

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PURPOSE

Transverse vaginal septum is a structural abnormality of the vagina, which arises from a failure of complete canalization of the urogenital sinus and müllerian ducts. Patients typically present with amenorrhea and a distended upper vagina. A septum may be located in the upper (46%) middle (40%) or lower (14%) vagina. Surgical treatment involves drainage of the hematometrocolpos and resection of the septal tissue. Safe entry into the distended vagina can be challenging in the nulliparous patient. We describe a percutaneous technique that serves to improve the ease and safety of disruption of the transverse vaginal septum.

MATERIAL AND METHODS

Three consecutive patients presenting with symptoms of cyclic abdominal pain, amenorrhea and progressive lower abdominal distension were treated with this technique. CT scan revealed hydrometrocolpos. The patients were taken to the operating room and under ultrasound guidance a 14-gauge angiocatheter was placed through the thick transverse vaginal septum. After aspiration revealed thick blood a 0.35 mm Sensor™ wire was placed through the angiocatheter and a Nephromax™ Balloon Dilating System placed over the wire. The balloon was insufflated and subsequently removed providing a generous aperture (36 French) through which the remainder of the septum could be readily visualized and excised.

RESULTS

All three patients tolerated the procedure well. Follow up endoscopic evaluation revealed a normal caliber vagina with no residual obstructing tissue and smooth transition between the proximal and distal vaginal segments. All patients are asymptomatic at an average follow up of 4 years.

CONCLUSIONS

Percutaneous dilation of the transverse vaginal septum allows for safe entry into the dilated vaginal segment with excellent visualization of the membrane, facilitating the safe, straightforward resection of all obstructing tissue.

LONG TERM FOLLOW UP OF FEMALE PATIENTS WITH CONGENITAL ADRENAL HYPERPLASIA

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PURPOSE

To evaluate clinical outcomes, including physical growth and metabolic syndrome complications, during long-term follow-up of female patients with congenital adrenal hyperplasia (CAH) who had reached adolescence.

MATERIAL AND METHODS

This was a retrospective study of 27 patients who were diagnosed with CAH due to 21-hydroxylase deficiency, who had reached adolescence with a 46XX genotype. We investigated the type of external genital surgery, puberty onset, final height, medication status, and complications, and compared patients with saltwasting (SW) CAH and those with simple virilizing (SV) CAH.

RESULTS

The mean age of patients was 17.5 ± 5.1 years and the mean follow-up period after surgery was 141 (47-277) months. In total, 16 out of 27 patients underwent external genital surgery; 16 underwent clitoris reduction, 11 underwent clitoris relocation, 10 underwent vaginoplasty, 2 underwent labia minora molding, and 1 underwent labia majora molding. The mean body weight was 51.6 ± 5.8 kg, the mean final height was 154.8 ± 3.2 cm, and the mean body mass index (BMI) was 25.4 ± 10.2 kg/m². The mean age of first menarche was not different between the SV group (13.5 ± 2.5 years) and in the SW group (12.3 ± 1.9 years). The mean final height of patients was 153.5 ± 2.3 cm (-1.5 ± 0.6 SD) in the SW group and 151.1 ± 5.9 cm (-2.0 ± 1.3 SD) in the SV group, and these were shorter than the corresponding mid parental heights (5.1 ± 1.9 cm and 7.4 ± 8.7 cm, respectively). Although 76.2% of patients at adolescence had normal BMI, 13 patients (48.1%) were obese at adult age. Two out of 6 patients of child-bearing age tried to become pregnant naturally; however, both failed.

CONCLUSIONS

Adults with CAH tend to be short and are often obese, which might predispose to the metabolic syndrome and adverse cardiovascular risk.

S14: HYPOSPADIAS 2

Moderators: Marco Castagnetti (Italy), Pippi Salle (Qatar)

ESPU Meeting on Friday 16, October 2015, 10:26 - 11:26

10:26 - 10:29

S14-1 (PP)

★ PROSPECTIVE STUDY OF A COHORT OF HYPOSPADIAS IN PICARDY REGION (FRANCE): INCIDENCE AND ANALYSIS OF SYSTEMATIC HORMONAL EXPLORATIONS, RISK FACTORS AND IMPACT ON THE SEVERITY

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PURPOSE

To evaluate incidence and risk factors for hypospadias in a region of France and to specify their impact on severity of the malformation.

MATERIAL AND METHODS

Between 2011 and 2014, 57 hypospadias (Hypospadias group (HG), 48 distal (DHG), 9 proximal (6 middle, 3 posterior) (PHG)) and 162 controls (Control group (CG)) were enrolled in the study. We collected prospectively neonatal and parental data. We proceeded to hormonal evaluation (FSH, LH, Testosterone, 17OHP at day 1; FSH, LH, AMH, T in minipuberty) in HG only. We studied with univariate and multivariate analysis risk factors for HG vs CG. Analyze of the severity of the malformation was also made.

RESULTS

An undescended testis was present on 10.5% of HG vs 2.0% in the CG (OR=5.8 [1.4-8.2]). Eleven of the 39 interpretable blood tests were abnormal. Four hCG tests were abnormal with a 46 XY karyotype and a AR (androgen receptor) mutation. Two were homozygous twins with distal hypospadias.

In univariate analysis, significant factors comparatively to CG were primiparity in the HG, lower birth weight and length, higher paternal BMI for the HG and DHG, and low birth weight in PHG group respectively. In multivariate analysis, low birth weight, paternal medical history, family history of hypospadias and living with pets were significantly more frequent in HG than in CG.

CONCLUSIONS

Incidence of hypospadias is at least 0.4% of male newborns in our region. In our cohort, 4 newborns had AR mutation. Our results support the hypothesis of a multifactorial pathology with placental insufficiency and genetic and environmental disruptions.

★ THE APPLICATION OF TOPICAL EXTRACT OF ALLIUM CEPAE, ALLANTOIN AND HEPARIN GEL IMPROVES THE GRAFT SITE IN BRACKA'S METHOD OF PROXIMAL HYPOSPADIAS

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PURPOSE

The aim of the present study is to evaluate the efficiency of application of topical extract of allium cepae, allantoin and heparin gel use at the graft site at two staged Bracka's method in proximal hypospadias.

MATERIAL AND METHODS

Between 2012-2014, 20 patients were operated with two-staged Bracka's procedure. In this prospective randomized study, in the first stage of the operation, urethral plate was excised and preputial free graft was applied. In the treatment group (n=14) patients were advised to apply the topical scar gel (Contractubex®) once daily and the control group (n=6) received no treatment. In the treatment group, topical gel was applied between postoperative 2nd -5th months. The ventral penile graft was evaluated by validated Patient and Observer Scar Assessment Scale (POSAS) during the second stage urethroplasty by thickness, irregularity and pliability criteria. POSAS is evaluated as normal skin (min=1), bad scar (max=10). Results are given as median (25-75 quartile) values. Statistical analysis was performed by Mann Whitney-U test.

RESULTS

In all cases of the control group, scalpel hole area scars were evident. Additionally in 2 cases quilting stitch areas are observed irregular. In the treatment group no scar formation was seen at the scalpel hole area; the graft thickness, irregularity and pliability was improved. POSAS thickness (2.00 (1.00-3.00) vs 4.00 (3.00-4.25) (p=0,001); irregularity (2.00 (1.00-2.00) vs 3.00 (3.00-4.00) (p=0.002); pliability (2.00 (1.00-3.00) vs 4.00 (3.75-4.25) (p=0.001) and overall scores (2.00 (1.00-3.00) vs 4.00 (3.75-4.00) (p=0.001) in the treatment and control groups, respectively.

CONCLUSIONS

Topical gel containing extract of allium cepae, allantoin and heparin application lead to statistically significant improvement in thickness, irregularity and pliability scores of the graft tissue. Thus, gel application results in more convenient graft tissue leading to surgical comfort at the second stage urethroplasty in proximal hypospadias.

★ THE DUTCH HYPOSPADIAS STUDY: COMPLICATIONS AND PROGNOSTIC FACTORS AFTER DISTAL- AND MID-TYPE HYPOSPADIAS REPAIR.

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PURPOSE

In 2009 our study group initiated a national prospective multicenter study to evaluate and possibly improve the outcomes of hypospadias surgery. The aim of the current study is to evaluate the short term complications and prognostic factors in the subgroup of mid- and distal type hypospadias.

MATERIAL AND METHODS

Data of the patient, disorder, surgical technique, pictures of cosmetic appearance and complications are prospectively documented in a "web based" database. Complication rates, type complications, urethroplasty complications and possible prognostic factors of the subgroup (sub)coronal, distal- and mid-shaft type hypospadias were evaluated six months postoperatively. Annual reports inform the surgeons about their own results, mean outcomes of their department and of the national study population.

In the near future, the surgical procedure(s) related to the prognostic factors and "best practices" will be recorded anonymously and distributed on DVD enabling the participating surgeons to adapt their operative technique if necessary.

RESULTS

In march 2015 a total of 1519 patients are enrolled in this national study, 1426 patients were surgically corrected of whom 977 had a distal- or mid-type hypospadias of whom 781 can be evaluated six months postoperatively. Mean total complication rate and urethroplasty complication rate were 23.3% and 16.4% respectively with a variation of 9%-75% and 4%-63% between the surgeons. Preliminary multivariate analysis identified optical magnification and subepithelial urethroplasty suture technique as prognostic factors for a lower complication rate.

CONCLUSIONS

Our national hypospadias study demonstrates a wide variation in complication rates between the surgeons. These complication outcomes may improve by reporting surgical details of prognostic factors and "best practices".

CAN SEPARATION OF THE SCROTAL SAC PREDICT THE NEED FOR URETHRAL PLATE TRANSECTION IN PROXIMAL HYPOSPADIAS?

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PURPOSE

The main challenge in proximal hypospadias repair is correcting curvature, which in some cases requires urethral transection. Some authors report extensive dissection of the urethral plate before deciding whether the plate needs to be transected or not, whilst techniques such as the Koyanagi, commit to urethral plate transection from the start. Having a reliable pre-dissection marker of the need for urethral transection would be useful in choosing a technique. Meatal position alone is unreliable and correct assessment of division of the corpus spongiosum requires complete degloving. We wanted to determine if presence of marked separation of the scrotal sac (SSS), also known as bifid scrotum, could help predict the need for urethral plate transection.

MATERIAL AND METHODS

We prospectively enrolled a series of boys with severe proximal hypospadias. We noted the presence of SSS. During surgery, we fully degloved the penile skin shaft, freeing all ventral tissues, and radically dissected the more proximal bulbar urethra. We then performed an erection test. If there was residual curvature $<30^\circ$ we performed a dorsal plication, if it was $>30^\circ$ we transected the urethral plate.

RESULTS

Twenty-nine patients, of which 18 presented SSS, were included. Using our methodology, we estimated transection of the urethral plate to be necessary in 15 out of the 18 children with SSS, and 2 out of the 11 children without SSS. The relative risk for requiring urethral plate transection in presence of SSS was 4.6.

CONCLUSIONS

We believe presence of SSS reflects the degree of ventral tissue hypoplasia and could be a marker for the need for urethral plate transection.

USE OF A NOVEL DIGITAL PHOTOGRAPHY BASED SMARTPHONE APP (MEDMEASURE!) TO MAKE PENILE LENGTH MEASUREMENTS BOTH DURING AND AFTER PENILE RECONSTRUCTION SURGERY: A VALIDATION STUDY

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PURPOSE

Stretched penile length (SPL) is the standard measurement used in reconstructive penile surgery (RPS), but is associated with high inter-rater variability, and is seldom reported. Furthermore, ruler-based measurements require all measurements to be made intraoperatively ; post-hoc measurements are difficult to impossible. We used a novel smartphone application to assess the correlation of post-op digital photography (DP) based length measurements to intraoperative ruler measurements (IORM).

MATERIAL AND METHODS

Intraoperative SPL (SPL-IO) was measured in a consecutive series of patients undergoing RPS. A DP was taken as proof with the ruler from a true lateral view. A second DP was taken at the same time, with a reference object (OBJ) (object whose dimensions are known and constant). SPL was measured post-operatively using the MedMeasure! App for iPhone and iOS Android, using the DP with OBJ, by two different surgeons blinded to SPL-IO. The three different measurements (SPL-IO, and post-op using the App (SPL-S1 – SPL-S2)) were compared to assess overall correlation and correlation to ruler measurements using SPSS 20.0 .

RESULTS

20 consecutive patients underwent surgery for hypospadias (n=15), buried penis (n=1), epispadias (n=3) and circumcision accident (n=1). Median age at surgery was 18 months [6-301]. Median penile SPL-IO was 3.8 cm [2.4 - 8.9]. When SPL-IO, SPL-S1 and SPL-S2 were treated as independent measurements, there was no statistical difference between any of the three groups (p 0.51-0.81). Even with SPL-IO measurements treated as the gold standard, by Bland-Altman Limits of Agreement analysis, the correlation factor of SPL-IO to SPL-S1 & SPL-S2 was >99%.

CONCLUSIONS

When compared with IORM, digital measurements using MedMeasure! are reliable and precise. Because measurements are made based on DP limitless length measurements can be made post-hoc. Use of DP and this smartphone App has the potential to aid in surgical planning, improve documentation, and facilitate clinical research.

IS GLANS PENIS WIDTH PREDICTIVE OF COMPLICATIONS AFTER HYPOSPADIAS REPAIR?

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PURPOSE

Recent research has suggested that glans penis size may be inversely associated with the likelihood of complications after hypospadias repair and should therefore be included in prognostic models for surgical outcomes. Our aim was to further evaluate whether objective measurement of glans penis width is predictive of complications, with subgroup analyses based on preoperative testosterone use.

MATERIAL AND METHODS

We reviewed clinical data recorded at the time of prepubertal primary hypospadias repairs between July 2011 and August 2014, as well as postoperative follow-up. Urethroplasty complications were defined as meatal stenosis, dehiscence, fistula, or urethral stricture or diverticulum. The subset of meatal stenosis and dehiscence were regarded as glanular complications. We performed logistic regression to determine association between glans width and complications, with stratification by preoperative testosterone use.

RESULTS

Glans width was measured on 159 patients (median, 15 mm; range, 10–22 mm). Median postoperative follow-up was 6 months (interquartile range, 1–9 months). Twenty-two patients (14%) had one or more urethroplasty complications, including 10 (6%) with glanular complications. Glans width was not significantly predictive of urethroplasty complications overall ($p=0.23$) or glanular complications in particular ($p=0.77$). Lack of significant association between glans width and complications was noted both in patients who did ($n=84$) and did not ($n=75$) receive testosterone preoperatively (see Table).

Table. Odds Ratios (95% confidence interval) for Association of Glans Width (mm) and Complications after Hypospadias Repair.

(T = testosterone)

	All Urethroplasty Complications	Glanular Complications
Overall (n=159)	1.13 (0.93-1.37)	1.04 (0.79-1.38)
With Preoperative T (n=84)	1.03 (0.78-1.34)	1.04 (0.72-1.51)
Without Preoperative T (n=75)	1.17 (0.84-1.64)	0.87 (0.49-1.54)

CONCLUSIONS

Objective measurement of glans penis width was not predictive of complications after hypospadias repair, regardless of preoperative testosterone use. These findings call into question whether glans size should be included in prognostic models for outcomes of hypospadias repair.

2-STAGE GRAFT REPAIR FOR PROXIMAL HYPOSPADIAS WITH >30° VENTRAL CURVATURE: MODIFICATION TO IMPROVE OUTCOMES

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PURPOSE

Few articles report outcomes from 2-stage primary proximal hypospadias repair using grafts for urethroplasty. We report results in consecutive patients with penoscrotal to perineal hypospadias and ventral curvature >30°, with modification to improve outcomes.

MATERIAL AND METHODS

2-stage graft repair was used in all cases when curvature >30° after degloving resulted in urethral plate transection. Persistent curvature >30° thereafter was straightened by 3 ventral corporotomies without corporal grafting. Urethroplasty grafts were taken from inner prepuce or lower lip (when prepucioplasty was requested), with 2-layer tubularization and tunica vaginalis coverage in all cases at the 2nd stage done 6 months later. Patients were divided into 2 consecutive groups : Group 1 - "standard" glans wings dissection opening laterally along the corpora to 3 and 9 o'clock by a surgeon and trainee; Group 2 - "extended" glans dissection to 3 and 9 o'clock, then freed another 4mm cephalad from the corpora, by a co-surgeon team. Data was prospectively recorded in a database.

RESULTS

65 patients had 1st stage repair, of which 47 (72%) had ventral corporotomies. 49 (75%) had prepucial urethroplasty grafts. Graft contracture occurred in 6%, with no difference between graft types or in those with vs without ventral corporotomies. The 2nd stage was completed in 22 Group 1 and 28 Group 2 patients with average follow up of 7m and 6m, respectively. Urethroplasty complications (UC) occurred in 10 (45%) Group 1 versus 4 (14%) Group 2 patients, $p=0.02$, comprising 12 glans dehiscences, 1 fistula and 1 recurrent curvature >30°.

CONCLUSIONS

3 ventral corporotomies without corporal grafts straightened curvature >30° with 2% recurrence. Graft take was successful in 94%, with no difference when placed over corporotomies vs intact corpora. Glansplasty modification increasing mobilization of the glans wings significantly reduced UC. Success can be achieved in 85% of patients with the most severe hypospadias using 2-stage graft repair.

EXPERIENCE WITH THE USE OF ACELLULAR MATRICES (ACMS) IN COMPLEX URETHROPLASTY.

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PURPOSE

Management of complex hypospadias and related complications remains challenging, with complication rates reported at 39.7% (Castagnetti et al. J.Urol.2010; 184, 1469-1475). Many complications arise due to lack of good quality tissue at the repair site. We have utilised a cross-linked ACM to support the tissues in difficult urethroplasty cases and here we report our outcomes.

MATERIAL AND METHODS

From 2008 to 2014, in a tertiary centre, 24 boys (median age 5.34 years) underwent urethral reconstruction utilising Pelvicol® as a periurethral splint. Surgical indications included: complex hypospadias, urethral fistulae, redo-urethroplasty and urethral diverticulum. Outcome data was collected prospectively, independent from the surgeon and included complications, uroflowmetry and parental perception.

RESULTS

All 24 boys made a good recovery. Median follow-up was 1.84 years (range 3 months – 3.8 years). One child, at four months, required removal of the graft for late infection; another case reported skin tethering. Uroflowmetry was performed in 17/24 (70.8%) boys. QMax ($r= 0.56$, $p= 0.018$) and average flow ($r=0.52$, $p =0.03$), which correlated with age. Parental satisfaction with outcome was reported as excellent in 11 boys (64.7%), good in 4 (23.5%), satisfactory in 1 (5.9%) and poor in 1 (5.9%).

CONCLUSIONS

These results support the use of periurethral Pelvicol® in primary second stage and redo-hypospadias surgery. A long-term study will be required to support these findings. Ongoing animal studies will help identify the most suitable biomaterial for the support of urethra repairs and may open further opportunities for progress in reconstructive urology.

VENTRAL BUCCAL MUCOSA GRAFTING FOR SIMOULTANEOUS CURVATURE REPAIR AND URETHROPLASTY IN THE TREATMENT OF PROXIMAL HYOSPADIAS: A NOVEL TECHNIQUE

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PURPOSE

Penile straightening with urethral reconstruction present a great challenge in severe hypospadias repair. We evaluated a novel method of using ventral buccal mucosa grafting for simultaneous curvature repair and urethroplasty in the treatment of severe hypospadias.

MATERIAL AND METHODS

Between March 2013 and October 2014, 15 patients (aged from 10 to 22 months) underwent severe hypospadias repair (11 penoscrotal and 4 scrotal forms). Short urethral plate is mobilized and divided at the point of maximal curvature in all cases. Tunica albuginea is opened ventrally to straighten and lengthen the curved penis. Appropriate sized and shaped buccal mucosa graft is harvested from inner cheek and fixed to the ventral side of corpora cavernosa to cover tunical defect and create dorsal part of the neourethra, simultaneously. Longitudinal dorsal island skin flap is created and buttonholed ventrally. It is sutured together with buccal mucosa graft to form the neourethra. Abundant pedicle of the skin flap is fixed laterally to cover all suture lines of new created urethra. Penile skin reconstruction is done using available penile skin.

RESULTS

The mean (range) follow-up was 14 (4 - 21) months. Satisfactory results have been achieved in 13 patients. There was no report of residual curvature. Only two urethral fistulas occurred and successfully corrected three months after surgery.

CONCLUSIONS

Buccal mucosa graft could be a good choice for simultaneous ventral penile straightening and urethral reconstruction in most severe hypospadias repair. This way, mobilization of the neurovascular bundle and dorsal plication is avoided.

FORESKIN RECONSTRUCTION VERSUS CIRCUMCISION IN DISTAL HYPOSPADIAS

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PURPOSE

The goal of this study was to determine if there is an influence of the management of the foreskin (foreskin reconstruction-FR or circumcision- CIRC) on the incidence of complications after surgical correction of distal hypospadias .

MATERIAL AND METHODS

After approval by the local ethics committee, the data of distal hypospadias operated between 2005 and 2013 were retrospectively reviewed. The inclusion criteria were coronal and sub-coronal hypospadias; no significant chordee (<200) after degloving; urethroplasty by a TIP or Mathieu procedure. The exclusion criteria were: incomplete data; glanular hypospadias; redo procedures; follow-up<1 year. The primary endpoint was the incidence of urethrocutaneous fistula (UF). Secondary endpoints included reoperation rate and type of complications.

RESULTS

283 patients were included (127 FR and 156 CIRC). The 2 groups were comparable for age at surgery: 18.2 months in FR and 15.1months in CIRC. The Mathieu were more common in FR (58/127-45.7%) than in CiRC (56/156-35.9%). The incidence of UF was 5.5% (7/127) in FR and 20.5% (32/156) in CIRC ($p<0.01$). The incidence of patients requiring reoperation was 15.7% (20/127) in FR versus 35.9% (56/156) in CIRC ($p<0.01$). The total subsequent procedures required were 27 in FR (9 catheterisations, 7 urethral fistula, 4 breakdowns, 1 abscess, 2 circumcisions, 3 preputial fistulas, 1 preputioplasty) and 65 in CIRC (35 urethral fistula, 15 redo-urethroplasty, 6 catheterisations, 4 redo-circumcisions, 2 scar releases, 2 dilatations, 1 haematoma).

CONCLUSIONS

In this study , the incidence of UF and the reoperation rate were significantly lower after FR.

HYPOSPADIAS REDO, WHAT TO DO? A COMPARATIVE STUDY BETWEEN TIP URETHROPLASTY AND SINGLE STAGE DORSAL INLAY BUCCAL MUCOSA GRAFT WITH TUBULARIZED INCISED URETHRAL PLATE TECHNIQUE FOR COMPLEX HYPOSPADIAS REOPERATIONS.

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PURPOSE

In current practice hypospadias repairs are performed as outpatient procedures with high success rate but treatment of patients with failed hypospadias repairs can be challenging.

The study was designed to compare the tubularized incised plate (TIP) urethroplasty and single stage dorsal inlay buccal mucosa graft with tubularized incised plate technique (Snod – graft) for complex hypospadias re-operations.

MATERIAL AND METHODS

Fifty-nine patients with previous 1 – 5 failed hypospadias repair were enrolled in the study, age ranging from 38 months to 29 years. Complete dehiscence was seen in 40 cases while urethral stricture was seen in 19.

Group 1 included 37 patients TIP procedure was done to all of them and 22 patients in group 2 were operated using single stage dorsal inlay BMG with tubularized incised plate technique.

RESULTS

Success rate was 86.5% in group 1 with 3 fistulas and 2 urethral strictures, and 90.9% in group 2 with only 1 fistula and 1 stricture, which were related to the type of primary repair and the number of failed previous repairs.

CONCLUSIONS

- Previously failed hypospadias repair continues to be a challenge to the Urologist.
 - TIP is a satisfactory choice for the repair of failed hypospadias, but can't replace all other hypospadias repair techniques. There is still no single universally applicable technique for the secondary repair of all failed hypospadias. And it is nearly inapplicable in cases of severe fibroses and scarred urethral plate.
 - The single stage dorsal inlay BMG approach combines the excellent cosmetic and functional results of the Snod grass technique with BMG. Given its simplicity, versatility, and the low complication rate, it's a valuable option for complex hypospadias reoperations.
-

PATIENT RACE DOES NOT IMPACT THE INCIDENCE OF HYPOSPADIAS COMPLICATIONS IN PATIENTS STANDARDIZED BY GLANS-URETHAL MEATUS-SHAFT (GUMS) SCORE

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PURPOSE

The GUMS score reliably correlates with hypospadias severity and postoperative complications. Racial differences in postoperative wound healing have been described in non-urologic surgery. We aimed to determine whether 1) racial differences exist in hypospadias severity (GMS score), and 2) patient race predicts postoperative complications.

MATERIAL AND METHODS

Patients undergoing primary hypospadias repair (2011-2014) were prospectively classified by GUMS score, a 4-point scale (higher score=increased severity): G- glans size/urethral plate quality, M- meatal location, S- shaft curvature. Demographics, complications (urethrocutaneous fistula(UCF), stricture, glans dehiscence, recurrent chordee, meatal stenosis), and parent self-reported race (white, black/African-American(AA), Asian(A), Hispanic(H), unknown(U)) were recorded. Asians/Hispanics were combined for analysis. The impact of race on postoperative complications was evaluated by uni/multivariate analysis.

RESULTS

299 boys, mean age 12±13 months, underwent primary hypospadias repair with mean GMS 7±2.3 (G 2.2±0.9, M 2.4±1.0, S 2.4±1.0). A/H group included 11-A, 17-H, and 5-U. Mean GMS score by race included 133 white patients, 6.5±2.2 (G 2.1±0.8, M 2.2±0.9, S 2.3±0.9), 133 AA, 7.2±2.3 (G 2.2±0.8, M 2.5±1.0, S 2.5±1.0), and 33 A/H, 7.6±2.6 (G 2.3±1.0, M 2.6±1.0, S 2.7±1.0). Meatus(p=0.007), curvature(p=0.04) and total GMS(0.008) were significantly higher in A/H patients.

At least one complication occurred in 40 boys(13.7%) and correlated with total GMS(p< 0.001), however not with AUH(p=0.70) or AA race(p=0.06). UCF occurred in 23(7.7%), and correlated with total GUMS(p=0.005), but not A/H(p=0.74) or AA race(p=0.12).

	Beta(SE)	OR	95%CI	p-value
ANY COMPLICATION				
GUMS	0.39(0.09)	1.48	(1.25,1.76)	<0.001
Race				
-White(ref)				
-AA	-0.87(0.45)	0.42	(0.17,1.02)	0.06
-AUH	-0.23(0.60)	0.79	(0.25,2.55)	0.70
URETHROCUTANEOUS FISTULA				
GUMS	0.27(0.10)	1.31	(1.09,1.59)	0.005
Race				
-White(ref)				
-AA	-0.84(0.54)	0.43	(0.15,1.24)	0.12
-AUH	-0.23(0.69)	0.79	(0.21,3.05)	0.74

CONCLUSIONS

GUMS reliably correlates with postoperative complications and UCF. Our findings suggest postoperative hypospadias complications cannot be predicted by patient race.

INCIDENCE OF HYPOSPADIAS: SPATIAL ANALYSIS BY CLUSTER DETECTION.

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PURPOSE

The incidence of hypospadias seems to be in progression (actual prevalence =1/250 boys). Genetic or endocrine factors have been described. Actual hypothesis involve environmental factors in endocrine disorder. Geographical distribution of hypospadias' incidence in our region was analyzed in order to highlight high-incidence areas.

MATERIAL AND METHODS

A retrospective analysis (1992-2012) including all cases of hypospadias collected in our Department was led in a highly populated area of 4.10^6 inhabitants. We calculated a Standardized Incidence Rate (SIR: observed/expected) for each of the 170 counties. Areas with atypical incidence, named clusters, were revealed with the scan statistic. The Relative Risk (RR) for each cluster was calculated using SIR inside-cluster compared to SIR outside-cluster.

RESULTS

Of the 390341 boys born on the period, 1003 cases of hypospadias were identified in our reference center. Regional incidence for hypospadias was 2.5/1000 male newborn. Two high-incidence clusters (C+), and two low-incidence clusters (C-) presented a significant RR (respectively 1.79, 2.09, 0.21, 0.19; $p < 0.001$). Both C+ were found in rural and semi-rural area, especially close to major highways, whereas both C- were situated at the borders of our region. C- could be the consequence of patients consulting outside the region.

CONCLUSIONS

This innovative approach regarding the geographical distribution of incidence could show areas with abnormal high-incidence for hypospadias. This kind of analysis seems suitable for comprehensive registry (no subclinical form, no missed diagnosis). Further research will compare those clusters to the rest of the region on specific parameters such as environmental exposure.

THE SIGHT QUESTIONNAIRE - ACCESSING SATISFACTION IN GENITAL HYPOSPADIA REPAIRS

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PURPOSE

Patient satisfaction after hypospadias repair is a complex interaction of functional, cosmetic and psychosexual aspects. Most studies focus on objective items, such as functionality and cosmetics. Few studies investigate the psychosexual long-term satisfaction. The purpose of this study was to establish a questionnaire addressing the psychosexual long-term satisfaction of patients after hypospadias repair.

MATERIAL AND METHODS

In a multistep approach we first identified key interests of adolescent hypospadias patients. Next, with these a questionnaire addressing the psychosexual satisfaction was established. A population of 109 former hypospadias patients was then assessed using this questionnaire. Furthermore, functional and cosmetic aspects were investigated. Age matched patients undergoing circumcision served as control. Possible influence factors on the satisfaction were investigated.

RESULTS

Key interests of adolescent patients were normal appearance and function of the penis, sexual activity, and masculinity. The "Satisfaction In Genital Hypospadias Treatment" (SIGHT) questionnaire was developed with these items. Nine questions address the psychosexual aspects and two additional questions the current sexual activity. Internal consistency was high and retest reliability acceptable. The patient population showed a normal strength and difficulties score (SDQ). Overall satisfaction was high and similar to that of the control group. In a regression analysis a high SDQ value, erectile problems and any impairment of penile functions correlated negatively with the satisfaction.

CONCLUSIONS

The SIGHT questionnaire allows a relevant and objective measurement of psychosexual satisfaction after hypospadias repair.

S14-15 (P)

IS TUNICA VAGINALIS FLAP BETTER THAN DARTOS FLAP AS SECOND LAYER FOR TUBULARIZED INCISED PLATE URETHROPLASTY?

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PURPOSE

There is no consensus regarding the best procedure in hypospadias repair, and surgical methods continue to evolve, with introduction of details and techniques to improve the results. This study aims to compare the overall complication rates and incidence of urethrocutaneous fistula between use of dartos and tunica vaginalis barrier flap in urethroplasty.

MATERIAL AND METHODS

Chart review of all patients undergoing repair for mid and distal penile hypospadias was performed. All patients underwent tubularized incised plate technique, with 2-layer polyglactin subepithelial closure for the neourethra. One hundred and twenty patients had a dartos flap barrier and 62 had tunica vaginalis flap barrier. Spongioplasty and skin closure was then performed. Complications (meatal stenosis, meatal regression, chordee, and penile skin necrosis) and incidence of fistula were noted.

RESULTS

From 2012-2014, a total of 182 consecutive patients with mid and distal penile hypospadias underwent repair by a single surgeon. The overall complication rate were 45% and 22.5%, and incidence of fistula were 17.5% and 4.8% for the dartos and tunica vaginalis barrier flap, respectively.

CONCLUSIONS

Tubularized Incised Plate in with tunica vaginalis flap appear to be superior to dartos flap as a second layer, improving overall complication rates, and in particular, decreasing incidence of urethrocutaneous fistula.

CAUDAL BLOCK VS DORSAL PENILE BLOCK IN HYPOSPADIAS REPAIR: COMPARISON OF COMPLICATION RATES

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PURPOSE

It has recently been suggested that caudal block may increase the complication rates in hypospadias through swelling of the corpus cavernosum and decrease in oxygenisation during surgery. In this study we compared the complication rates of children undergoing hypospadias repair according to whether they received caudal or penile block during surgery.

MATERIAL AND METHODS

The medical files of patients undergoing distal hypospadias repair from January 2011 to December 2014 were retrospectively reviewed. Age at surgery, followup time, complications and peroperative analgesia (caudal block vs dorsal penile block) were noted. Patients were grouped according to peroperative analgesia type and complication rates of two groups were compared.

RESULTS

A total of 280 patients (156 caudal block and 124 penile block) were included in the study. For caudal block and penile block groups, the average age at surgery was 42.9m and 56.2m and the average followup time was 27.2m and 21.6m respectively. There were a total of 23 patients (14.7%) with complications in the caudal block group. Complications were fistula in 13 (8.3%), glans dehiscence in 9 (5.8%) and meatal stenosis in 1 patient (0.6%). For the penile block group, complications were seen in 10 patients (8.1%). The complications were fistula in 7 (5.6%), glans dehiscence in 2 (1.6%) and meatal stenosis in 1 patient (0.8%). Statistical significance was not observed the difference between for fistula, glans dehiscence, meatal stenosis or total complication rates.

CONCLUSIONS

This study has demonstrated no significant difference in complication rates of children undergoing distal hypospadias repair when receiving either caudal or penile block as peroperative analgesia.

A COMPARISON OF THE FUNCTIONAL OUTCOMES AFTER HYPOSPADIAS REPAIR IRRESPECTIVE OF COMPLEXITY.

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PURPOSE

To compare the functional outcomes after hypospadias repair irrespective of original complexity.

MATERIAL AND METHODS

Sixty-seven consecutive uroflow assessments, done after hypospadias repair performed by a single surgeon, were collected and divided into two groups based on the complexity of the original hypospadias. Group A: Primary distal hypospadias; (n=35) and Group B: complex hypospadias (primary proximal hypospadias repair and redo urethroplasties) (n=32). Functional assessment for the entire cohort was done at a median of two years after surgery (6 months-8 years). Qmax, average flow rate, voided volume, post-void residual and uroflow-curve analysis were assessed and compared to nomograms. Mann Whitney U or Wilcoxon-matched pairs test and unpaired t-test were used for statistical analysis.

RESULTS

The median age at surgery for Group A and B was 2 yrs (1-13) and 4 yrs (2-15) respectively. The median age at uroflow assessment was 4yrs (3-14) in Group A and 6.5yrs (3-16) in Group B. Uroflow rates correlated with age. No significant difference in Qmax or average flow rate existed between the groups, despite significant differences in age ($p=0.001$) and voided volume ($p=0.007$). Both Qmax and average flow rates in both the groups were significantly lower than matched values from nomograms. All the boys in Group B were asymptomatic. Two of the children in Group A reported frequency and nocturnal enuresis.

CONCLUSIONS

There was no significant difference in the uroflow rates between the distal and complex groups. Uroflow rates after hypospadias repair were significantly lower than controls despite the majority being asymptomatic. New nomograms for hypospadias may identify outliers at risk of future problems.

EXPRESSION OF SEX HORMONE RECEPTORS (ANDROGEN, ESTROGEN, PROGESTERONE) IN UROGENITAL TRACK OF THE CHILDREN: TARGET HYPOSPADIAS

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PURPOSE

Androgen (AR) and Estrogen (ER) hormones effect and play an important role in the development of penis and hypospadias. In this study we aimed to investigate the sex hormone receptor expression - AR, ER and Progesterone(PR) - in different types of hypospadias.

MATERIAL AND METHODS

This study was done in patients operated due to hypospadias. The biopsies were obtained from the anterior and posterior preputium and the lateral paramental tissue at the edge of urethral plate. The presence of AR, ER and PR receptors were investigated. For this an avidin-biotin horseradish peroxidase technique was used to localize the expression of AR, ER and PR receptors under a light microscope.

RESULTS

33 biopsies from 18 patients were included. There were subcoronal (n:5), penile (n:7) and penoscrotal (n:6) hypospadias. 13 lateral paramental tissue, 13 anterior and 7 posterior preputial biopsies investigated respectively. 16 patients underwent TIPU and 2 patients ONLAY repair. The mean age was 5.4 years. ER receptor was positive in 87.8%, AR positive in 36.4%. Progesterone receptor was negative in all. Lateral paramental tissue were ER positive 69.2%, AR positive 38.5%, anterior preputium biopsy were ER positive in 100%, AR positive 30.8%, posterior preputium biopsy were ER positive 100% and AR positive 42.8% respectively. Hypospadias Type: In subcoronal hypospadias ER were positive 80%, AR in 40%, in penile hypospadias ER was positive in 86.7%, AR 33.3%, in penoscrotal hypospadias ER was positive in 84.6%, AR positive 38.5% respectively.

CONCLUSIONS

PR receptor was not demonstrated in sampled tissues. AR receptors were less positive than ER. There was not a manifest correlation of AR absence in regard to the severity of hypospadias. The ER presence in penile and preputial tissues were remarkable. As this study emphasized the dominant expression of ER receptors in children with hypospadias, we suggest that the disrupted AR and ER receptor interaction and/or balance could play a role during the development of external genitalia in hypospadias patients.

ANALYSIS OF PREOPERATIVE ANTIBIOTIC THERAPY IN STENTED, DISTAL HYPOSPADIAS REPAIR

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PURPOSE

Even though preoperative antibiotics have not been shown to effectively reduce surgical site infections (SSIs) for stented, distal hypospadias repair, 77% of pediatric urologists use antibiotics in this setting (Hsieh et al. JPU 2011; 7.2: 192-197). In light of variation in use of preoperative antibiotics at our institution, we sought to determine whether preoperative antibiotic utilization impacted the prevalence of SSI.

MATERIAL AND METHODS

We retrospectively reviewed all boys treated with stented, distal hypospadias repair from 2011-2014. Consecutive patients with primary distal penile, subcoronal, coronal, and glanular hypospadias repair using urethral stent drainage were included with all hypospadias revisions excluded. Variables included were utilization of preoperative antibiotic therapy (Cefazolin) and presence of SSI (defined by the presence of postoperative penile erythema and/or purulence treated with therapeutic antibiotics). The two cohorts were compared using the Fisher exact test.

RESULTS

We queried the clinical hypospadias database at our institution with 229 consecutive patients identified in these 2 groups: 138 patients treated with preoperative antibiotics and 91 patients treated without preoperative antibiotics. While no patients in the preoperative antibiotic therapy group were found to have SSI, one patient treated without preoperative antibiotic therapy was found to have an SSI (p-value of testing association = 0.4).

CONCLUSIONS

The overall incidence of surgical site infections in patients treated with stented, distal hypospadias repair observed was very low. We observed no difference in the rate of surgical site infections for the two groups treated with or without preoperative antibiotic therapy. Further prospective study with randomization is recommended.

S15: MISCELLANEOUS

Moderators: Chris Cooper (USA), Emilio Merlini (Italy)

ESPU Meeting on Friday 16, October 2015, 11:26 - 12:00

11:26 - 11:29

S15-1 (PP)

★ QUALITY ASSURANCE PRACTICE FOR THE PLASTIBELL MALE NON-THERAPEUTIC CIRCUMCISION IN INFANT UNDER 6 MONTHS IMPROVES THE OUTCOME AT COMMUNITY CIRCUMCISION CLINIC

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PURPOSE

Non-therapeutic infant male circumcision (IMC) is practised in the country by many clinics, religious venues and peoples' home. There is no strict national policy for these providers. Our aim is to review the implementation of quality assurance (QA) criteria under the supervision of trained paediatric surgeon for the outcome of the Plastibell IMC under 6 months of age.

MATERIAL AND METHODS

We reviewed the outcome of 5661 Plastibell IMC's under 6 months of age over a 4 year period (April 2007 to March 2011) in a community clinic under local anaesthesia. Data were collected retrospectively in first two years (group A) and prospectively in next two years (group B). We compared before and after adaptation of 12 standards of QA modified for IMC from WHO's QA which includes the clinic settings, infection control, informed consent, training in performing IMC, maintenance of competency, pain relief, postoperative management, follow up, audit of the complications, safeguarding/resuscitation training, complaints process and registration with regulator of health and social care. Training for doctors is held every 6 months under supervision of paediatric surgeon and clinical governance meeting held 4 monthly. Complications were compared between two groups.

RESULTS

Incidence of complications were significantly lower in group B (2.1% n=66/3095) versus group A (4.4% n=114/2566) after implication of QA standards ($p = 0.03$). Post-operative bleeding (0.2% vs 0.6% n= 8 vs 16), clinical wound infection (0.3% vs 0.4% n=9 vs 9), ring impaction/migration (0.8% vs 2.3% n= 24 vs 60) and redo circumcision (0.3% vs 0.8% n= 8 vs 20) were significantly lower in group B versus group A respectively ($p < 0.5$). There is no significant difference in complaints in these periods.

CONCLUSIONS

Application of strict criteria of QA has significantly improve the outcome of the non-therapeutic Plastibell IMC under 6 months at community circumcision clinic.

★ CHECKLIST ASSESSMENT TOOL TO ASSESS SUITABILITY AND SUCCESS OF NEWBORN CLAMP CIRCUMCISION - A PROSPECTIVE STUDY

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PURPOSE

We are responding to the American Academy of Pediatrics Task Force on Circumcision call to establish standards for Newborn Clamp Circumcision (NCC). Therefore, the authors collaborated to develop checklist criteria to assess which newborns are suited to NCC and also to assess NCC success.

MATERIAL AND METHODS

A national multi-institutional collaboration was created to obtain consensus on criteria to be used to assess patient suitability for NCC and to assess success outcomes. Criteria include elements from detailed medical history, bedside physical examination, and post-circumcision follow-up. All checklist criteria must be met to suffice suitability and success.

Patients desiring NCC were enrolled consecutively and prospectively. The checklist was followed to determine which newborns were suited to NCC, and NCC was done in those cases. At follow-up, the checklist was followed to assess if NCC resulted in success, and if there were complications.

RESULTS

A total of 199 cases were enrolled prospectively and consecutively. Mean age was 16 days old (range 1 – 117). There were 134 (67%) cases deemed suited to NCC and underwent NCC. Post-circumcision assessment was done at mean interval of 8 days (range 4 – 25) and showed 100% success rate without complications. There were 65 (23%) cases deemed unsuited for NCC: penile torsion (n=20), chordee (n=16), buried penis syndrome (n=15), hypospadias (n=7), penoscrotal web (n=5), and bleeding diathesis (n=2).

CONCLUSIONS

We have created and used a checklist assessment tool to identify which newborns are suited for NCC and to assess NCC success. We found about 65% of newborns are suited for NCC and show a 100% success rate without complications in this study. We believe following a NCC Checklist will reduce the incidence of NCC in unsuitable cases and thereby decrease the likelihood of NCC complications.

UROLOGICAL ANOMALIES, RECONSTRUCTION & CHALLENGES ENCOUNTERED IN CONJOINED TWINS SEPERATION.

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PURPOSE

To review the spectrum of urogenital anomalies in conjoined twins and the urological procedures performed for separation and reconstruction of urogenital tract.

MATERIAL AND METHODS

A retrospective review of 15 sets of conjoined twins with urogenital anomalies from January 1990 to March 2015.

RESULTS

Thirteen sets of complete conjoined twins and two set of parasitic twin were successfully separated. There was only one death in an ischiopagus female set, as it underwent EXIT procedure soon after birth. There were 5 cases of ISCHIOPAGUS TRIPUS twins, 5 ISCHIOPAGUS TETRAPUS, 3 PYOPAGUS TETRAPUS and 2 PARASITIC twins. Urogenital reconstruction was carried out in 14 sets of twins at the time of separation, while was delayed in one set because of the precarious condition of the surviving twin.

Urological anomalies in kidneys ranges from a twin set having only single functioning kidney each to malrotated ectopic, duplex, dysplastic nonfunctioning kidneys, one horseshoe kidney to all four kidneys being horseshoe. The bladder anomalies ranges from single commonly shared bladder to two separate bladders, two bladders in one twin to bladder exstrophy. In females the internal genitalia varied from twins sharing single common vagina and uterus, fused vagina and uterus, double vagina and uterus to complete duplication of whole internal genitalia. The external genitalia ranged from completely separated two introitus to single fuse external genitalia. In males the internal genitalia ranges from unilateral undescended testis to bilateral undescended to only one testis in twin set. The external genitalia ranged from two sets of external genitalia to single set of external genitalia with two phalluses joined by skin to single fused phallus with epispadiasis, to severe penoscortal hypospadiasis.

CONCLUSIONS

With extensive pre-operative planning and a multidisciplinary team approach, separation was feasible in all twins and reconstruction aimed for renal conservations, urinary continence and functionally and cosmetically acceptable genitalia can be safely achieved.

VOIDING OUTCOME OF POSTERIOR URETHROPLASTY IN BOYS

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PURPOSE

To evaluate the voiding outcome of Bulboprostatic Urethroplasty in boys with traumatic stricture urethra.

MATERIAL AND METHODS

Retrospective records of 59 boys who had post traumatic posterior urethral strictures with pelvic fracture and distraction injuries underwent delayed single stage Bulboprostatic End to End Anastomotic Urethroplasty between 2005 to 2014. Urethroplasty was performed through perineal or abdominoperineal approach. Postoperatively urethral catheter was removed at 3–4 weeks and VCUG was performed. Voiding outcome was assessed by postoperative VCUG, able to achieve per urethral voiding, uroflowmetry, any element of urge and/or stress incontinence, dribbling of urine and need to wear diapers/pads.

RESULTS

Fifty nine boys, mean age 10.73 ± 2.3 years. Of them 31 (52%) had RTA, 16 (27%) had history of fall and 12 (20%) had crush injury. All patients had supra pubic cystostomy. Eighteen boys had failed urethroplasty, seven railroad catheterization before presenting to us. Preoperative cystoscopy and cystogram revealed normal bladder neck in 30 (51%), others had open and or fixed bladder neck, normal veru and posterior urethra was seen in 49 (83%). Approach was perineal in 43 (73%) and abdominoperineal in 16 (27%). All 59 (100%) boys had catheter removal, VCUG and per urethral voiding at 3 to 4 weeks postoperatively. Of them 43 (73%) achieved normal per urethral voiding with day and night continence and a mean Q-max 13.1 mls/sec. Other 13 (22%) patients had some element of incontinence with mean Q-max of 12.0 mls/sec. Two has some urge incontinence and two has stress incontinence. Four patients dribbles occasionally. None of the patient required diapers or pads. Three patients (5%) were wet all the time and were subjected to bladder neck deflux, 2 became continent day and night and one for day time only.

CONCLUSIONS

Majority of our patients were able to achieve per urethral voiding with adequate flow rates and day and night continence. Majority of these patients were managed through perineal approach only. Fixed and open bladder neck may be contributory factors to some element of residual incontinence.

★ PEDIATRIC SUB-SPECIALIZATION AND INPATIENT COMPLICATION RATES FOR PEDIATRIC UROLOGY PROCEDURES

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PURPOSE

Improved surgical outcomes have been associated with increased pediatric case volumes and training for pediatric general surgery. However, the impact of pediatric urology sub-specialization and surgical volume on inpatient urologic surgical complication rates is unknown. We queried a nationwide database to determine if surgeon sub-specialization in pediatric urology was associated with improved complication rates.

PATIENTS AND METHODS

We retrospectively reviewed the Nationwide Inpatient Sample (1998-2009) for pediatric (≤ 18 years) admissions. We used ICD-9-CM codes to identify urologic surgeries and National Surgical Quality Improvement Program (NSQIP) in-hospital post-operative complications. We calculated a Pediatric Proportion Index (PPI) as the ratio of children to all patients operated on by each individual urologist. We performed a weighted multivariate analysis adjusting for clusters, strata, age, gender, and race to test for an association between PPI and the probability of a surgical complication.

RESULTS

Our final cohort included 71,480 weighted inpatient admissions. Pediatric sub-specialty admissions were younger than non-sub-specialty admissions (4.6 vs. 6.4y, $p < 0.001$). Groups did not differ by race ($p = 0.9$) or gender ($p = 0.09$). Mortality rates were slightly lower for pediatric sub-specialized urologists than non-sub-specialists (0.9 vs. 0.4%, $p = 0.009$). Likewise, non-subspecialized urologists had a significantly higher complication rate than pediatric urologists (13 vs. 11%, $p = 0.02$). After adjusting for other confounders, PPI, as a continuous variable, was significantly associated with a decreased probability of a postoperative complication (OR 0.7, 95% CI 0.59-0.98, $p = 0.03$).

CONCLUSIONS

Increased pediatric sub-specialization among urologists is associated with a decreased risk of surgical complications in children undergoing inpatient urologic procedures.

CIRCUMCISION WITH A NOVEL DISPOSABLE RING - CIRCUMPLAST®. DOES THIS NEW DESIGN PREVENT RING MIGRATION AND GLANS PENIS INCARCERATION?

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PURPOSE

Ring impaction/proximal migration of Plastibell is the most common complication in male circumcision. This can cause incarceration of the glans and urethral damage. This study evaluates our experience using Circumplast® device for male circumcision.

MATERIAL AND METHODS

Circumplast® was used to perform non-therapeutic circumcisions on 112 male children between April 2013 and March 2014. The procedures were performed at a community clinic under local anaesthesia by the trained paediatric surgeon. Data were prospectively collected to determine the post-operative complications. All patients were contacted on 10th and 15th day to determine ring separation. A similar study was conducted using the Plastibell® method on 1883 patients over a one year period in the same clinic. All calls/visits from parents were registered on the Audit Monitoring system.

RESULTS

Average age of patients was 2.9 years (range, 7 days to 11 years) and median age was 5 months. Patients (n=111) had spontaneous ring separation. Delayed separation of the ring in a 9 year old patient required ring removal as the ring had not come off on day 15 post-operatively due to inadequate size of ring when compared to glans penis. Using the Plastibell® method on 1883 patients over a one year period resulted in delayed/partial ring separation or proximal migration in 2.1% (n=40) of patients. Due to Circumplast's® cylindrical design, there is no risk associated with the glans moving distally as there are no obstructions. In contrast, the Plastibell™ ring is conical with a narrowed distal end and the glans is held against the distal opening which causes the glans to protrude through this opening. Circumplast allows for multiple locations to secure the ligature and easy access to the glans and frenulum postoperatively.

CONCLUSIONS

The Circumplast® device with a cylindrical design virtually eliminates the risk of migration/impaction of the ring to the shaft of the penis in our experience of 112 circumcisions.

OPPORTUNITIES FOR QUALITY IMPROVEMENT AND OUTCOME MEASUREMENT IN PEDIATRIC UROLOGY

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PURPOSE

Quality assessment in surgical care is increasingly emphasized. We assessed 30-day adverse event rates and relative contributions to morbidity for procedures in pediatric urology surgery.

MATERIAL AND METHODS

The American College of Surgeons' National Surgical Quality Improvement Program Pediatric database contains perioperative records from 2012-2013 from over 50 participating hospitals. Individual 30-day adverse events, composite morbidity, composite serious adverse events, and composite hospital-acquired infections were compiled. Clinically-related procedure groups were evaluated for incidence of complications.

RESULTS

A total of 5437 patients underwent 1 of 40 selected urologic procedures, grouped into procedures related to bladders, kidneys, ureters, penis/urethras, testicles, and urinary diversions. Overall complication rate was 3.5%. Individual 30-day adverse event rates were highest for unplanned hospital readmission (3%), urinary tract infection (1.9%), reoperation (1.4%), and surgical site infection (1%). The highest rates of composite morbidity were seen for patients undergoing bladder-related procedures (19.6%) followed by urinary diversions (11.1%). The highest rates of serious adverse events were seen in patients undergoing urinary diversion (15.9%) followed by ureteral procedures (15.1%). Hospital-acquired infection rates were highest in patients undergoing bladder procedures (12.5%) and urinary diversions (11.1%). The single procedure with the greatest complication rate (61% composite morbidity) was closure of bladder exstrophy.

CONCLUSIONS

In pediatric urology, postoperative complication rates are overall low. Measurement of outcomes specific to pediatric urology procedures should center on reduction of unplanned hospitalizations and urinary tract infections. Closure of bladder exstrophy represents a specific procedure with the greatest potential for improvement.

THE INCIDENCE OF INCARCERATED INGUINAL HERNIA IN CHILDREN AND ITS ASSOCIATED RISK FACTORS: A NATION-WIDE LONGITUDINAL POPULATION-BASED STUDY

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PURPOSE

To evaluate the incidence of inguinal hernia and incarcerated hernia in children aged 0 to 15 years and associated risk factors using a national wide database.

MATERIAL AND METHODS

Children born from 1997 to 2005 were selected from a randomly selected cohort of 1,000,000 from an insured population of 23 millions. Children with International Classification of Diseases [ICD], 9th revision, code 550 and code of hernia surgery were regarded as having inguinal hernia. The chi-square test and logistic regression modeling were used for statistical analyses.

RESULTS

Totally, 79794 children (41767 boys and 38027 girls) were enrolled in the study period. The cumulative incidence of inguinal hernia in boys and girls from birth to 15 years old were 6.62% and 0.74%, separately ($p < 0.01$). The peak incidence of inguinal hernia was 0 year for boys and 5 years for girls, respectively. The ratio of unilateral vs. bilateral repair was 5.54:1. Girls tended to have more bilateral inguinal hernia than boys (25.4% vs. 12.9%, $p < 0.01$). Incarcerated hernia occurred in 4.19% children with inguinal hernia without significant gender discrepancy. We did not find significant correlation between waiting time to hernia repair was not related to incarceration.

CONCLUSIONS

The cumulative incidences of inguinal hernia from birth to age of 15 years old were 6.62% and 1.74% in boys and girls, respectively. Incarceration occurred in 4.19% of children with inguinal hernia and was not related to waiting for surgery. The risk factors of girl inguinal hernia require more investigations.

CLINICAL COMPARISON OF DRESSING CHLORHEXIDINE PARAFFIN GAUZE WITH CONVENTIONAL ANTIBACTERIAL DRESSING MATERIAL IN PEDIATRIC CIRCUMCISION YOUNGER THAN 2 YEARS OLD

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PURPOSE

Circumcision is the surgical removal of the foreskin that covers the tip of the penis. After circumcisona standard penile dressing technique is placed a sterile dry gauze. The aim of this study was to compare the results of dressing chlorhexidine paraffin gauze and antibacterial dressing material.

MATERIAL AND METHODS

Patients who underwent circumcision in our clinic between January 2014 and January 2015 were included in this study Group 1 (n = 32) were conventional Nitrofurazone dressing cases and group2 (n = 31) patients were chlorhexidine paraffin gauze ones. The method of treatment was chosen randomly. The dressing was changed at the 3thday. The patients follow-up visit within 7 days of surgery were compared for epithelialization of the wound, the presence of infection. Statistical significance was evaluated with the Mann-Whitney-U test.

RESULTS

During the study period circumcision was performed on 63 patients with a mean age of 2.2 ± 1.2 years. Preoperative urinary tract infection was identified in 29 patients (60%). Wound infection was the most frequent complication in patients undergoing to surgical circumcision (group 1; n = 12, 37.5%), (group 2; n=8, 25.8%); bleeding (n = 3, 0.4%). There was no statistically significant difference between the two groups in terms of dressing.

CONCLUSIONS

We think that different dressings no benefit of circumcision in wound healing. Sterile antimicrobial materials dressing appears to be sufficient to cover circumcision wound.

THE COMPARISON OF POSTOPERATIVE COMPLICATIONS OF PARTIAL AND TOTAL CIRCUMCISION IN CHILDREN

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PURPOSE

To compare the rate and types of complications in boys who underwent partial and total circumcision for pathological phimosis.

MATERIAL AND METHODS

We retrospectively reviewed the records of patients under 18 years of age operated for phimosis from 2009 to 2012. Out of 419 identified boys, the following were excluded: all after preputioplasty (37), lost to follow-up (31) and circumcised for religious reasons (4). Out of 347 patients included in the analysis, 273 underwent partial (group P) and 74 total (group T) circumcision. The complications were divided into short-term (within the first month), long-term, mild and severe with the need of re-operation. The data were analysed by the Fisher's exact test using R statistical package, version 3.1.1. P-values less than 5% were considered as statistically significant.

RESULTS

The age distribution in groups P and T was similar with the mean 6.5 and 5.7 years, respectively. The short-term complication rate was significantly higher in P compared to group T (23% to 11%, p-value 0.022) and also higher in the long-term (22% to 9%, p-value 0.013), making the overall complication rate 36% to 19%, p-value 0.005. Of all the complications 97% were mild (painful swelling, scarring, adhesions, infection and haemorrhage). They all resolved during the follow-up 0.2 to 47.3 months after the operation (the mean 2.7 months). 3% were severe, all in group P (scarring 8x, paraphimosis 2x, poor cosmesis 1x).

CONCLUSIONS

Partial circumcision (excision of the distal fibrotic ring) is preferred due to cultural habits in our country. The boys and their parents should be warned about the high rate of expected complications that is the double compared to total circumcision.

THE COLOGNE COURT DECISION ON CIRCUMCISION RATES IN GERMAN SPEAKING EUROPE

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PURPOSE

In 2012, a Court in Cologne/Germany ruled that circumcision (CC) for religious reasons amounted to grievous bodily harm, and was therefore a criminal act, prohibited by law. In this study, we sought to determine the influence of the Cologne court decision (CCD) on the frequency of CC in Austria, Germany and Switzerland.

MATERIAL AND METHODS

Austrian CC data (2002-2013) were obtained from Gesundheit Österreich GmbH, German CC data (2002-2013) from the Institute for Hospital Remuneration System, and Swiss CC data (2001-2013) from the Swiss Federal Statistical Office.

RESULTS

Austria: Between 2002-2013, an average of 5.000-6.000 pediatric CC/year were performed. After the CCD in 2012, there is a negative nationwide trend with significant geographical differences. Germany: Between 2004-2013, an average of 20.000-21.000 inpatient pediatric CC/year were performed. There was a significant decrease in the frequency of CC in 2005 and 2006, since then CC rates remain stable. In 2012, the CCD did not influence CC rates. Switzerland: Between 2001-2013, an average of 200-250 pediatric CC/year (in hospital) were performed. There was a significant increase in the frequency of CC between 2002 and 2004, followed by a substantial decline in 2005 and 2006, a trend that continues since then.

CONCLUSIONS

Circumcision is a highly controversial topic with different cultural, religious, philosophical, and legal implications. In Austria, Germany and Switzerland there has been a declining incidence of circumcision over the last decade with no significant decrease after the CCD in 2012.

NON-RADICAL CIRCUMCISION IN CHILDREN. A SINGLE CENTER EXPERIENCE

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PURPOSE

Circumcision involves the removal of the foreskin either in whole or in part (non-radical). The present study aimed to assess the effectiveness and morbidity of non-radical circumcision.

MATERIAL AND METHODS

A retrospective analysis of children submitted to non-radical circumcision between 01/2012 and 12/2013 was performed. Data was collected from hospital records and telephone interviews. Early (<1 month) and late postoperative complications, and need for further medical or surgical treatment were assessed.

RESULTS

688 children that underwent non-radical circumcision by a standardized sleeve resection technique as an outpatient procedure were enrolled; 46 patients were excluded because they were only assessed at the first and unique postoperative evaluation. The remaining 642 children (age, $8,7 \pm 3,7$ years) were operated on because of: phimosis (90,8%); posthitis/balanitis (2,8%); pain (1,9%); paraphimosis (1,3%); and balanite xerotica obliterans (1,1%). At a follow-up of 813 ± 231 days, there was a 15,0% complication rate. Early complications occurred in 31 (4,8%) patients: 21 residual phimosis; 5 hematomas; 3 infections; 1 partial dehiscence; and 1 bleeding requiring re-intervention. Late complications occurred in 64 (10,0%) patients: 37 mild prepuccial stenosis; 21 phimosis; 1 infection; 4 mucosal redundancy; and 1 meatal stenosis that required meatal dilation. The majority of cases with postoperative phimosis or mild prepuccial stenosis recovered with topical steroid treatment. Re-intervention for removal of the remaining foreskin was required in 2.5% (16/642) of patients.

CONCLUSIONS

Non-radical circumcision is effective and safe with low morbidity and minimal recurrence rates. However, child and parental evaluation of functional and cosmetic outcomes deserve further studies.

THE CLAVIEN-DINDO CLASSIFICATION OF SURGICAL COMPLICATIONS IS NOT A STATISTICALLY REPRODUCIBLE WAY TO GRADE MORBIDITY IN PEDIATRIC UROLOGY

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PURPOSE

Use of the Clavien-Dindo Classification of Surgical Complications is becoming more widespread in urology and has been "highly recommended" by the European Association of Urology since 2012. The system was initially evaluated using a cohort of 6,336 adult general surgery patients and we hypothesized that it is not well-suited to pediatric cases. We set out to formally assess the grading system for use in pediatric urology.

MATERIAL AND METHODS

We modified the 14 adult surgical cases in the "Survey to Assess Acceptability and Reproducibility of the Classification" to pediatric urology cases of similar Clavien-Dindo Classification grades. We used REDCap electronic data capture tool to distribute the survey and preserve respondent anonymity.

RESULTS

There were 51 respondents and 40 complete responses. The Clavien-Dindo Classification was significantly less accurate when applied to pediatric urology cases (75%, 410/550) than adult surgical cases (90%, 1816/2016; $p < 0.0001$). The mean intercoder reliability, bootstrapped, ($\alpha = 0.461$, CI 0.370-0.547) was below the minimum level of acceptable agreement ($\alpha = 0.667$) even when the analysis excluded the disability suffix ($\alpha = 0.617$, CI 0.507-0.698). The Clavien-Dindo Classification was not perceived to be as simple, logical, or useful as it had been with adult surgical cases ($p = 0.001$, 0.02, 0.001, respectively). While 89% of respondents (32/36) thought that the system is appropriate for the adult population, only 49% thought that it is appropriate for pediatrics (17/35, $p < 0.001$).

CONCLUSIONS

The accuracy of the Clavien-Dindo Classification of Surgical Complications is decreased in pediatric urologic cases. This system is not a statistically reproducible way to grade morbidity in the pediatric urologic population and findings suggest it should not be used for this purpose.

S16: ADOLESCENT UROLOGY

Moderators: Piet Hoebeke (Belgium), Elizabeth Yerkes (USA)

ESPU Meeting on Friday 16, October 2015, 13:30 - 13:56

13:30 - 13:35

S16-1 (LO)

BARRIERS TO TRANSITION IN ADULT PATIENTS WITH NEUROGENIC BLADDER

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PURPOSE

Children with complex anomalies such as spina bifida are often ill-equipped for transition to adult care. The goal of this study was to identify barriers for young adults with neurogenic bladder transitioning to independent care.

MATERIAL AND METHODS

A prospective IRB approved study was performed of patients with neurogenic bladder ages 18-26 referred to our transitional clinic. After informed consent, cognitively intact patients completed the Transition Readiness Assessment Questionnaire (TRAQ) questionnaire in private prior to an appointment. TRAQ is a validated tool to measure the readiness for transition to self-care for patients with special health care needs. Responses included: 1) I don't need to do this 2) I don't know how but I want to learn 3) I am learning to do this 4) I have started doing this 5) I always do this when I need to.

RESULTS

56 (76%) of 74 patients referred to the transitional clinic came to their appointment. 35 completed the TRAQ questionnaire at a mean of 19 years old. 89% had spina bifida and 40% are ambulatory. The highest scores were related to taking/ordering medications, communicating with health care providers, and household duties. The lowest scores regarded health coverage, payments/financial help, and utilization of community services.

TABLE 1: TRAQ SCORES IN ADULTS WITH NEUROGENIC BLADDER

TRAQ Domain 1: Skills for Chronic Condition Self-Management	Mean
Do you take meds correctly and on your own?	4.24
Do you use and take care of medical equipment/supplies?	3.85
Do you reorder meds before they run out?	3.32
Do you fill a prescription if you need to?	3.29
Do you know the side effects of each med and what to do if you have a bad reaction?	3.03
Do you call suppliers when there is a problem with the equipment?	2.89
Do you call the doctor's office to make an appointment?	2.83
Do you arrange for your ride to medical appointments?	2.83
Do you order medical equipment before they run out?	2.82
Do you call the doctor about changes in your health?	2.71
Do you manage your money and household expenses?	2.69
Do you know what your health insurance covers?	2.65
Do you follow up on referral for tests, checkups, or labs?	2.56
Do you pay/arrange payments for your meds?	2.17
Do you apply for health insurance if you lose your coverage?	2.15
Do you arrange payment for the medical equipment and supplies?	2.06
TRAQ Domain 2: Skills for Self-Advocacy and Health Care Utilization	Mean
Do you answer questions that are asked by the doctor/nurse?	4.20
Do you tell the doctor/nurse what you are feeling?	4.14
Do you keep home/room clean or clean up after meals?	4.03
Do you ask questions of the doctor/nurse?	3.89
Do you use neighborhood stores and services?	3.83
Do you fill out the medical history form with your list of allergies?	3.43
Do you help plan or prepare meals/food?	3.14
Do you keep a calendar or medical and other appointments?	3.12
Do you request and get the accommodations/support you need at school/work?	2.97
Do you apply for a job/work/vocation services?	2.71
Do you get financial help with school or work?	2.24
Do you call on and use community support/advocacy services when you need them?	2.20
Do you make a list of questions before a doctor visit?	1.85

CONCLUSIONS

Young adults with neurogenic bladder needed the most guidance during transition to independent care with management of health insurance and finances. Based on these findings we now include dedicated social worker and nurse visits in the transition process.

★ A CASE OF BASE RATE BIAS, OR ARE TEENAGERS REALLY AT A HIGHER RISK OF DEVELOPING COMPLICATIONS AFTER CATHETERIZABLE URINARY CHANNEL SURGERY?

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PURPOSE

Teenagers are considered at high risk for complications after genitourinary reconstruction. This impression may be due to base rate bias, where clinicians favor specific information ("numerator:" number of teenagers with complications), while ignoring more general information ("denominator:" overall number of teenagers being followed). We previously reported long-term results with appendicovesicostomy (APV) and Monti techniques. We aimed to assess whether age was a risk factor for subfascial revision after catheterizable channel procedures.

MATERIAL AND METHODS

We retrospectively reviewed consecutive patients <21 years old undergoing APV and Monti surgery at our institution (1990-2013), collecting demographic and surgical data. Time to major revision was assessed by age stratification (<8, 8-13, 13-18, ≥18 years old) and Cox proportional-hazards regression. Two secondary analyses used another age stratification (<8, 8-12, 12-16, ≥16 years old) and age as a continuous variable.

RESULTS

Of 510 patients with catheterizable channels (median age at surgery: 7.9 years), 63 (12.4%) had a subfascial revision (median follow-up: 6.8 years). Most revisions (61.9%) occurred in 8-18 year olds. Study participants were 8-18 years old for 62.9% of 3263.9 person-years of the study. Over 4/5 of revisions occurred within 5 years of surgery, regardless of age at surgery ($p=0.57$). On multivariate analysis, no age group had increased risk of revision ($p\geq 0.70$). Overall stomal location, concomitant surgeries, gender and date of surgery were not associated with risk of subfascial revision ($p\geq 0.23$). Montis were 2.1 times more likely than APV to undergo revision ($p=0.03$). Findings were similar on secondary analyses.

CONCLUSIONS

While the risk of complications was twice as high in Monti channels than APV, no age group was at increased risk. The impression that teenagers are a high-risk group appears to be due to base rate bias.

★ CHANGES OF BLADDER FUNCTION DURING PUBERTY IN PATIENTS WITH SPINAL DYRAPHISM

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PURPOSE

The aim of this study was to investigate the changes of bladder function in children with spina dysraphism during puberty.

MATERIAL AND METHODS

From our database of spina bifida clinic, patients aged older than 16 years were included following exclusion criteria below : patients who had spinal surgery older than 2 years, follow up loss, no proper evaluation of bladder or renal function during follow up over 3 years. Thirty-seven patients were included finally. Hostile bladder was defined as high end filling pressure (40 cmH₂O or greater), poor compliance (less than 10 ml/cm H₂O) and high detrusor leak point pressure (40 cmH₂O or greater) was seen together. Impaired renal function was defined as relative function loss 10% or greater or renal scarring on DMSA scan.

RESULTS

Of 37 patients included, 13 were diagnosed as myelomeningocele (MMC) and 24 were lipomyelomeningocele (LMMC). Mean follow up duration was 210.75±52.54 months and 33 patients (89.2%) used CIC on their last follow up. In a serial follow up period, the prevalence of hostile bladder was sharply increased during puberty in patients with LMMC while gradual increase was seen in patient with MMC (Log-rank, $p < 0.001$). Impaired renal function on DMSA scan was seen in 6 patients, 4 of these were demonstrated after their puberty. Of 14 patients showing incontinence before puberty, 10 patients (71.4%) demonstrated improvement of incontinence after puberty. The prevalence of hostile bladder was significantly increased after pubertal period (35.1% to 62.2%, $p = 0.003$), which was more obvious in patients with LMMC (12.5% to 45.8%, $p = 0.002$) than MMC (76.9% to 92.3%, $p = 0.399$).

CONCLUSIONS

This study demonstrates that the prevalence of hostile bladder in patients with spinal dysraphism was significantly increased following puberty. Also, a significant number of patients showed impaired renal function on DMSA scan during puberty, suggesting attentive monitoring is required on their pubertal period to prevent deterioration of bladder and renal function .

URINARY FLOW RATES AFTER HYPOSPADIAS REPAIR INCREASE DURING PUBERTY

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PURPOSE

It was recently published that maximum (Qmax) and average (Qave) flow rates significantly increase during puberty in normal boys (Gupta et al. JUrol 2013; 190:1008-13). We compared uroflow parameters in hypospadias patients with prepubertal and pubertal uroflows to determine changes in neourethra function during pubertal growth.

MATERIAL AND METHODS

Uroflowmetry was systematically obtained in toilet trained patients following hypospadias repair, with results recorded prospectively. The database was reviewed to identify those with both prepubertal and pubertal studies, with mean Qmax, Qave, and voided volumes compared using paired t-tests.

RESULTS

There were 14 patients who underwent 12 TIPs (4 reoperative), 1 reoperative oral graft inlay and 1 primary 2-stage preputial graft. The meatus was distal in 6 and proximal in 8. Mean age at prepubertal testing was 9 years (4-11), versus 13 years (10-18) during puberty. Tanner stage during puberty was 2 (n= 5), 3 (n=3), and ≥4 (n=6).

Uroflow parameters significantly increased during pubertal assessment (mean Qmax 9→17cc/sec, p=0.001; Qave 6→11cc/sec, p=0.003; voided volume 71→158cc, p=0.036). While mean Qmax in patients (9pre→17cc/sec post-pubertal) was lower than reported in normal boys (15pre→22cc/sec post-pubertal), mean Qave was similar (6 vs. 8cc/sec prepubertal and 11 vs 11cc/sec postpubertal). No hypospadias patient had obstructive voiding symptoms, and all post-void residual measurements were <20cc (both pre-pubertal and pubertal). Flow patterns were unchanged in 9, improved in 2 (plateau to bell), and worsened in 3 despite increases in Qmax (2 bell to plateau, 1 bell to interrupted).

CONCLUSIONS

Qmax and Qave significantly increase during puberty in boys after childhood hypospadias repair, following the same pattern observed in boys without hypospadias. These data suggest urethral plate and graft urethroplasties behave similarly to native urethras during puberty. Pubertal status should be reported for better interpretation of uroflow data.

S17: TESTIS 1

Moderators: Magdalena Fossum (Sweden), David Diamond (USA)

ESPU Meeting on Friday 16, October 2015, 14:26 - 15:14

14:26 - 14:29

S17-1 (PP)

★ PROSPECTIVE STUDY OF HISTOLOGICAL AND ENDOCRINE PARAMETERS OF GONADAL FUNCTION IN BOYS WITH CRYPTORCHIDISM

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PURPOSE

To evaluate relationship between hormonal parameters and histological findings on testicular biopsy during orchidopexy in boys with cryptorchidism.

MATERIAL AND METHODS

72 boys operated for cryptorchidism were included prospectively. Serum samples were drawn at the start of anesthesia. Measurements of LH, FSH, testosterone and Inhibin B were performed. Biopsies of the ipsilateral testis were performed during orchidopexy. At the histological examination by light microscopy of semi thin sections tubular fertility index (TFI), Ad spermatogonia count and Ad /tubular index (Ad/T) were evaluated. The results were compared in several groups – under 18 months of age and older, with and without Ad spermatogonia, unilateral and bilateral cryptorchidism. Moreover, two extreme groups according to TFI (high infertility risk group (HIR) with TFI <0.15% and low infertility risk group (LIR) with TFI >95% were compared.

RESULTS

The median age was 15 months (7-65). 62% were under 18 months of age, 24% had bilateral cryptorchidism, and 42% had no Ad spermatogonia on histology. There was significantly higher median TFI and Ad/T in the group under 18 months of age. LIR group had median LH values 1.14 IU/l while HIR group had median LH 0.2 IU/l ($p < 0.02$). FSH level was significantly higher in older patients group. There was significant negative correlation between age and TFI and Ad/T index. There was no significant difference in unilateral and bilateral groups in TFI, Ad/T and hormonal concentration.

CONCLUSIONS

Lack of the Ad spermatogonia in biopsies of undescended testicles was a frequent finding in our series. High infertility risk group had significantly lower basal LH values indicating a hypogonadotropic hypogonadism. Fertility parameters appeared to worsen with age. Hormonal levels in the serum of cryptorchid boys could not predict the histological findings of a single biopsy.

★ IS "COMPENSATORY HYPERTROPHY OF CONTRALATERAL TESTIS" IN CRYPTORCHIDISM INFLUENCED BY "MINI-PUBERTY"? : A PROSPECTIVE STUDY

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PURPOSE

Compensatory hypertrophy of contralateral testes (CHCT) can be observed in unilateral cryptorchidism especially in case of atrophied testis. It is a predictive factor for the existence of viable affected testis in non-palpable testis patients. However, during infant period, there is fluctuation of testicular size by the effect of mini-puberty. We performed prospective analysis whether the CHCT also exists in this period and, whether the predictable hypertrophy is obscured by mini-puberty.

MATERIAL AND METHODS

Total 80 testes at their age of 6-18 months were divided into 3 groups; contralateral 23 testes of atrophied testes (Group1), 23 contralateral testes of undescended testes (Group 2), and 34 testes of 17 normal children (Group 3). The testicular size measured with ultrasonography was compared among groups. We also evaluated the variation of testicular size with age, by subdividing each group with 6-10, 10-14, and 14-18 months.

RESULTS

In all three periods, the length and volume of Group 1 were greater than that of Group 2; In each group, the difference was statistically significant, except the volume difference in the 10-14 months age group. In terms of infantile testicular size change with time, there were no variation in length or volume with age, in Group 1 and 2. However, fluctuations of length and volume were observed in Group 3; the greatest values were found during 6-10 months in both length ($p=0.014$) and volume ($p=0.066$).

CONCLUSIONS

This prospective study showed that the CHCT is valuable factor predicting non-viable testis, even in mini-puberty period. The effect of mini-puberty was observed not in atrophied or undescended testes, but only in normal testes.

★ SUPERB MICROVASCULAR IMAGING FOR THE DETECTION OF PARENCHYMAL PERFUSION IN UNDESCENDED TESTES IN YOUNG CHILDREN

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PURPOSE

Superb Microvascular Imaging (SMI) is a novel, highly sensitive technique that can detect low velocity microvascular flow. The purpose of this study was to evaluate differences in perfusion of undescended testes (UDT) compared with normal testes in young children using this technique.

MATERIAL AND METHODS

We prospectively performed testicular ultrasonography including Power Doppler Imaging (PDI) and SMI in young children. Testicular size, volume, and microvascular flow for each testis were evaluated by both PDI and SMI. Microvascular flow was categorized into four grades: grade 0, no detectable intratesticular flow; grade 1, one or two focal areas of flow; grade 2, one linear or more than two focal areas of flow; and grade 3, more than one linear flow.

RESULTS

We imaged 40 testes from 20 boys (age, 2-29 months). Eleven boys had normal testes, seven had unilateral UDT, and two had bilateral UDT. The mean age was younger in boys with UDT (7.8 vs. 15.9 months, $p < 0.001$). Testis sizes and volumes were similar between the 29 normal and 11 UDT. However, SMI, but not PDI, detected differences in flow grades between the groups ($p < 0.001$). In univariate analysis, age (odds ratio [OR], 0.829; $p = 0.012$) and low grade flow on SMI (OR of grade 0, 51.886 with $p < 0.001$ and OR of grade 1, 14.29 with $p = 0.017$) were associated with UDT. These parameters were also significant in multivariate analysis (area under the curve, 0.892).

CONCLUSIONS

This study demonstrated decreased perfusion in the UDT in young children using SMI, which can be helpful for visualizing microcirculation and informing prognosis.

STANDARDIZED PROCESS TO IMPROVE PATIENT FLOW FROM THE EMERGENCY ROOM (ER) TO THE OPERATING ROOM (OR) FOR PEDIATRIC PATIENTS WITH TESTICULAR TORSION

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PURPOSE

While delay in seeking medical attention is a common cause of testicular loss in pediatric patients with testicular torsion, delays in diagnosis and treatment can be preventable causes of testicular loss. Our aim was to develop a standardized process to improve the patient flow from the ER to the OR for these patients.

PATIENTS AND METHODS

30 consecutive pediatric patients with acute torsion between November 2013 and July 2014 served as the control group. A scrotal pain checklist was implemented in July 2014, and 30 consecutive patients from July 2014 until April 2015 served as the study group. Perioperative parameters including times, ultrasound (US) findings, and surgical results were reviewed.

RESULTS

The mean ages of the control group and the study group were similar (12 ± 4.9 and 11.7 ± 5 , respectively) ($p=0.799$). ER arrival to OR time, triage completion to OR time, and scrotal US to OR time were significantly decreased in the study group ($p<0.001$). Although triage time and ER arrival to scrotal US times were decreased in the study group, the differences were not significant ($p=0.058$, $p=0.243$, respectively).

CONCLUSIONS

A standardized process with use of a scrotal pain checklist and prompt communication between ER, urology and radiology teams led to significantly reduced times from ER to the OR. Although increased awareness of the time sensitivity (Hawthorne effect) may be contributory, standardized processes for pediatric patients with testicular torsion should help to improve testicular survival rates.

ACQUIRED CRYPTORCHIDISM - MORE HARN THAN THOUGHT?

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PURPOSE

Since the beginning of this century the acquired cryptorchidism (AC) has been recognized as subgroup of undescended test. There is growing evidence that the compromising effect equals that of congenital UDT. We performed an extensive histological examination of biopsies taken from AC in a prospective study.

MATERIAL AND METHODS

From 08/2013 to 12/2014, 21 boys (3-13 years) underwent testicular biopsy during orchidopexy for AC. Germ cell index was determined by electron-microscopy (GC), as well as the ratio of adult dark spermatogonia (Ad-S) and primary spermatocytes (PS) per tubule (T). We also scanned for ring-like tubules as a marker for malformation. Immunohistochemical stains (PLAP, OCT 4) as marker for dystrophy were performed.

RESULTS

Nine (43%) boys had a positive family history for UDT, and 21 (57%) had a patent processus vaginalis. The median for GC/T, Ad-S/T, and PS/T was 0.7, 0.08, and 0, respectively. Boys below the age of 9 (n= 10) had a significantly higher number of Ad-S/T and a significantly lower number of PS/T than older boys. There were no ring-like tubules and no atypic cells. PLAP and OCT 4 stains were negative in all specimens.

CONCLUSIONS

Extensive histopathological examination of AC revealed a significant reduction of germ cell count and fertility markers, compared to normal values, which worsens with age at surgery. A positive family history appears to be more common in this group, suggesting the necessity for close follow-up and early surgical intervention, in particular in children with positive family history.

TESTICULAR PROSTHESES: IS EARLIER BETTER?

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PURPOSE

Testicular prosthesis implantation in children is uncommon; its optimal time for placement is still unclear. The aim of this study was to determine risk factors of complications.

MATERIAL AND METHODS

A monocentric retrospective review of patients implanted with a testicular prosthesis between 2008 and 2014 was performed. All implantations were performed through an inguinal incision. Children were divided into two groups depending on the interval after orchiectomy, (A) early implantation (< 1 year), and (B) delayed surgeries (> 1 year). Statistical analysis: Student and Fisher tests.

RESULTS

Twenty-six patients (A, 15; B, 11) had a total of 38 testicular prostheses placements. Mean follow up was 36.2 months. First surgery was done at the mean age of 11.8 years (0-17.9) (A, 14.1; B, 8.1) and testicular prosthesis implantation at the mean age of 14.7 years (9-18) (A, 14.3; B, 14.6) with a mean delay of 36.1 months (A, 1.3; B, 80.3). Indications were mainly testicular torsion (27%), bilateral anorchia (27%), and testicular atrophy after cryptorchidism surgery (19.2%). Complications (10.5%) included two cases of extrusion, one infection and one migration. Complication rate was significantly higher if the delay between the two surgeries exceeded one year ($p=0.04$). Indications of orchiectomy, scrotal approach and prosthesis size were not risk factors.

CONCLUSIONS

Testicular prosthetic implantation is relatively safe in children. However a delay exceeding one year between the orchiectomy and the prosthetic placement may lead to complications. Our results suggest that reducing the delay between orchiectomy and prosthesis implantation may lead to fewer complications.

PROSPECTIVE EVALUATION OF ASSUMED PREDICTORS OF ATROPHY AFTER TESTIS TORSION

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PURPOSE

Assumed predictors for testis atrophy after acute torsion include intra-operative testis color, pain duration, and red scrotal skin. We prospectively correlated these factors to testis atrophy.

MATERIAL AND METHODS

Children 2 months-18 years with acute scrotum were enrolled in a NIH study of trans-scrotal near infrared spectroscopy as a diagnostic test for testicular torsion. Per study protocol, no orchiectomies were performed. Intra-operative testis color 5 minutes after detorsion [photographic scale: 1-pink, 2-mottled pink, 3-light blue, 4-purple, 5-black, 6-hemorrhagic/necrotic], pain duration, and presence/absence of red scrotal skin were recorded. Percent volume difference between normal and affected testis on follow-up ultrasound was compared between patients with and without risk factors.

RESULTS

Excluding 18 patients lost to follow up, 28 patients underwent ultrasound at mean 115 days (41-319) post-operatively. Patients who had $\geq 80\%$ torsed testicle volume loss included 100%(5/5) who had a 5 minute black/hemorrhagic color, 90%(9/10) with pain duration over 12 hours, and 60%(6/10) with preoperative red scrotal skin. Overall, there was no significant difference in testicular volume loss between patients with and without red scrotal skin, Table 1.

Table 1

	Mean volume difference from normal testis (Range)	P-value
Color scale		
1-4 (n=23)	-36% (-100% to 25%)	0.005
5-6 (n=5)	-84% (-90% to -80%)	
Pain duration (hrs)		
0-6 (n=10)	-15% (-44% to 25%)	<0.001
6-12 (n=7)	-34% (-80% to 12%)	
>12 (n=10)	-79% (-100% to -7%)	
Red skin		
Yes (n=10)	-54% (-92% to 25%)	0.2
No (n=14)	-33% (-90% to 12%)	

CONCLUSIONS

Black/hemorrhagic testis 5 minutes after detorsion and pain greater than 12 hours were associated with testis atrophy. Red scrotal skin was not a reliable predictor of future atrophy and is not a reason to delay exploration.

NON PALPABLE TESTIS: CONTROVERSIAL AUA GUIDELINES

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PURPOSE

Recent American Urological Association guideline on management of Non Palpable Undescended Testis (NP-UDT) highlights the need of inguinal exploration when no testis is visualized in the abdomen and normal vessels are seen entering the inguinal ring. Aim of this study was to collect this subtype of patients and analyze residual tissue after inguinal exploration.

MATERIAL AND METHODS

From 2010 to 2014, 31 cases of NP-UDT (confirmed under anaesthesia) were managed in our Center. In 13 of them a viable testis was found and an orchiopexy performed. Intra-abdominal hypo-throphic or atrophic vessels were seen in 7 and no inguinal exploration was carried on. In 11 cases where normal vessels were seen entering the inguinal ring, an inguinal exploration was performed and residual tissue removed. Specimens were analyzed with Hematoxylin-eosin, Masson trichrome and Immunohistochemistry for CD117.

RESULTS

Severe fibrosis, absence of tubules, germinal cells and spermatogenesis were seen while ITCGN (Intratubular Testicular Gonadic Cell Neoplasm) was not present in any sample.

CONCLUSIONS

Our study reveals that in cases of NP-UDT where no testis is visualized in abdomen there is no need for further inguinal exploration. No atypical ectopia (pre-peritoneal or interstitial) was seen in our series. Even when residual tissue is present at inguinal level, it does not contain any potential for future malignization. Moreover, reports on orchiectomy for untreated inguinal testis explored in adulthood revealed similar findings.

S18: TESTIS 2

Moderators: Jorgen Thorup (Denmark), Anthony Caldamone (USA)

ESPU Meeting on Friday 16, October 2015, 15:34 - 16:16

15:34 - 15:37

S18-1 (PP)

PATHWAY ANALYSIS SUPPORTS ASSOCIATION OF NONSYNDROMIC CRYPTORCHIDISM WITH GENETIC LOCI LINKED TO CYTOSKELETON-DEPENDENT FUNCTIONS

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PURPOSE

As familial studies suggest moderate heritability of cryptorchidism, we designed the present studies to identify genomic loci associated with the nonsyndromic form of the disease.

MATERIAL AND METHODS

We analyzed data from 844 cases and 2718 control males of European ancestry. Genotyping was performed using the Illumina HumanHap550 and Human610-Quad (Group 1) or OmniExpress (Group 2) platform. We imputed genotypes genome-wide, and combined single marker association results in meta-analyses for all cases and for secondary subphenotype analyses based on testis position, laterality and age. Selected markers were genotyped in an independent European case (n=306) and control (n=324) replication group. We used several bioinformatics tools to analyze top ($p \leq 10^{-6}$) and suggestive ($p \leq 10^{-4}$) signals for enrichment of signaling pathways, cellular functions and custom gene lists.

RESULTS

In the full analysis, we identified 21 top signals, none reaching genome-wide significance, but one passed this threshold in a subgroup analysis of proximal testis position (rs55867206, near SH3PXD2B, OR=2.2 (95% CI 1.7, 2.9; $p=2 \times 10^{-9}$). An additional 129 top loci emerged in at least one subphenotype analysis. Cytoskeleton-dependent molecular and cellular functions were prevalent in pathway analysis of suggestive ($p \leq 1 \times 10^{-4}$) signals after multiple testing correction. Cryptorchidism- and hypogonadism-associated genes, and gubernacular hormone-responsive and/or differentially expressed genes were also significantly overrepresented. Markers in FMN1, encoding an actin-binding protein, and near PAX3, involved in myogenesis, showed suggestive replication in the independent case-control population.

CONCLUSIONS

These data suggest that cryptorchidism susceptibility is highly heterogeneous and/or not due to common variants, and may overlap with the many known syndromic etiologies of the disease. Association with genes involved in cytoskeletal pathways suggests a potential role for tissue specific effectors of androgen signaling.

TESTICULAR ATROPHY AND CATCH-UP GROWTH RATES FOLLOWING PAEDIATRIC PRIMARY ORCHIDOPEXY: A PROSPECTIVE STUDY

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PURPOSE

To prospectively assess testicular atrophy and catch-up growth rates following primary orchidopexy of undescended testicles in a paediatric population.

MATERIAL AND METHODS

A prospective database from August 2008 to December 2012 was established registering age at operation, classification of the undescended testicle, length of follow-up, and subjective comparison of intra-operative and post-operative testicular volumes as compared to the contralateral testicle. Testicular atrophy was defined as more than 50% loss of testicular volume or a post-operative testicular volume less than 25% of the volume of the contralateral testicle. Patients were excluded for incomplete data and follow up less than six months.

RESULTS

From 366 entries into the database, data regarding 234 patients met the inclusion criteria. All secondary acquired cases underwent a previous ipsilateral hernia repair. Overall, testicular atrophy occurred in 2.6% of cases, whereas catch-up growth was experienced in 20.1%. The following table includes atrophy rates and quartile catch-up growth rates with respect to the classification of the undescended testicle.

Classification of undescended testicle	Age at operation in years (median)	Length of follow up in months (median)	Atrophy Rate	Increase in growth (0-25%)	Increase in growth (25-50%)	Increase in growth (50-75%)
Overall	2.2	6.9	2.6%	16.7%	3.0%	0.4%
Congenital	1.8	7.1	2.6%	15.0%	2.6%	0.4%
Primary Acquired	8.7	6.5	0%	1.3%	0.4%	-
Secondary Acquired	4.5	6.4	0%	0.4%	-	-

CONCLUSIONS

This study represents one of the larger collections of prospective assessments of outcomes following primary orchidopexy in a paediatric population. Although there is a 2.6% risk of undergoing testicular atrophy, we report greater than 20% of cases with testicular catch-up growth. We acknowledge that subjectively assessing testicular volume is not ideal. However, this data can help during counselling for orchidopexy and may prompt further studies using more robust means of volume calculation.

TESTICULAR VOLUME DYNAMICS AFTER BIANCHI AND SHOEMAKER ORCHIOPEXY

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PURPOSE

Increasingly popular use of scrotal access during orchiopexy determines the interest towards analysis of the collected results of method application, especially in comparison with traditional Shoemaker's orchiopexy. We sought to establish the effectiveness of orchiopexy based on Bianchi and Shoemaker techniques used for correction of palpable cryptorchid testes.

MATERIAL AND METHODS

During 2009-2013 154 children with unilateral cryptorchidism were operated (right - 74 (48%), left - 80 (52%)). Testes were palpable in the inguinal canal projection and at the superficial inguinal ring; we excluded from the study patients with obliterated Nuck's diverticulum. Group I - 60 patients, average age $61,41 \pm 22,90$ months, operated using Bianchi technique. Group II - 94 boys, average age $66,06 \pm 18,18$ months - Shoemaker's orchiopexy. Testicular volume of the normal and undescended testicles was determined during the operation and in a year after it. Testicular atrophy index (Iatr) was calculated using the formula: $Iatr = \frac{HEALTHY\ TESTICLE\ VOLUME - UNDESCENDED\ TESTICLE\ VOLUME}{HEALTHY\ TESTICLE\ VOLUME} \times 100\%$. Statistical evaluation of obtained results was carried out as Student's t-test.

RESULTS

Patients in Group I had during the operation Iatr of $58,1 \pm 12,2\%$, in Group II - $69,7 \pm 9,7\%$ ($p > 0,05$). After orchiopexy boys of Group I had Iatr - $36,2 \pm 16,5\%$, Iatr in Group II was $39,3 \pm 17,3\%$ ($p > 0,05$).

CONCLUSIONS

Scrotal access is less traumatic and offers better cosmetic effect, at the same time offering results comparable with the dynamics of testicular volume after an operation using Shoemaker's technique, which makes it preferable for corrective bringing down of palpable testes.

IS THERE A DIFFERENCE IN OUTCOMES BETWEEN STAGED FOWLER-STEPHENS AND SINGLE STAGED LAPAROSCOPIC ORCHIOPEXY FOR INTRA-ABDOMINAL TESTES?

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PURPOSE

Standard treatment for intra-abdominal testes includes either single staged laparoscopic orchiopexy (SSLO) or staged Fowler-Stephens (SFS). Empirically, neither has been a decidedly superior approach. We compare these two methods, analyzing post-operative testicular atrophy and mal-positioning.

MATERIAL AND METHODS

A retrospective chart review identified 167 intra-abdominal testes corrected by laparoscopic orchiopexy between November 2006 and November 2014; 94 testes(82 patients) were analyzed, comparing patient characteristics and outcomes, e.g. age, intra-abdominal location and size, atrophy, and positioning.

RESULTS

Of the 94 testes, 37 underwent SFS orchiopexy, and 57, SSLO. The median age at surgery was 12 months (range: 6-154): SFS median 16 (range 6-121) and SSLO median 11 (range 6-154). Median follow-up was 8.7 months (range: 1-87). No post-SFS testes were mal-positioned, a significantly less likely result compared to 11 (19.3%) mal-positioned SSLO testes (OR 0.05, 95% CI 0.01 - 0.43). SFS and SSLO each resulted in four atrophic testes (10.8% and 7.0%, respectively), a statistically insignificant difference. Age and testicular position were not associated with outcome, but preoperative smaller testes may predict post-operative atrophy (OR 4.38, 95% CI 0.99 - 19.384). There were no recurrent undescended testicles.

CONCLUSIONS

Data from our institution indicates no difference between the two approaches in terms of post-operative atrophy; however, SFS appears more successful in securing a prognostically favorable scrotal position. Atrophy does not seem associated with other patient factors, i.e. age, testicular position, or comorbid anomalies, but it is likely linked to small pre-operative testes.

INTERMITTENT TESTICULAR PAIN: SURGICAL FINDINGS AND FOLLOW-UP

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PURPOSE

To determine the natural history of children undergoing surgical exploration for intermittent testicular pain.

MATERIAL AND METHODS

We retrospectively reviewed 41 consecutive patients who underwent scrotal exploration and orchidopexy for intermittent testicular pain. Patients who were taken to the operating room for acute torsion were excluded. Physical exam findings and radiology results were included for analysis. Intraoperative surgical findings were recorded. Resolution of pain on postoperative follow-up was our primary endpoint.

RESULTS

39 patients with follow-up were included for analysis. Mean age was 15.2 years (range: 10.6 - 20.8 years). Of the 39 patients, 2 had intraoperative findings of true testicular torsion. Surgical findings for the remaining patients included 12 (31%) with bell clapper deformity, 5 with hydrocele, 1 with torsion of the appendix testicle/epididymis, and 8 with nonspecific findings. Twelve of 39 patients (31%) had no resolution of pain on follow-up. Of these 12, 1 had an intraoperative finding of true testicular torsion. The remaining 27 (69.2%) had complete resolution of pain on follow-up.

CONCLUSIONS

Almost one third of patients explored were noted to have a bell clapper deformity, perhaps indicative of true intermittent torsion. Only 5% of children who underwent orchidopexy had true testicular torsion at the time of surgery. The remainder of patients had no discernible surgical indication at the time of surgery other than their recurrent intermittent pain. The majority of patients were found to have resolution of pain on postoperative follow-up. This was especially true for patients with bell clapper deformity.

THE ROLE OF ELASTOSONOGRAPHY IN THE EVALUATION OF TESTIS FOR PEDIATRIC VARICOCELE

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PURPOSE

The aim of this study is to evaluate the role of elastosonography in the evaluation of testicular elasticity as predictive sign of testicular damage, and to evaluate this results at follow-up.

MATERIAL AND METHODS

26 boys (9-13 years old) with untreated varicocele (bilateral in 6 boys and left unilateral in 20) and 24 age-matched healthy subjects underwent elastosonography. A third group (15 patients) treated for varicocele and testicular hypotrophy were evaluated before surgery and 6 months later. Varicocele was classified following the Dubin and Amelar classification and spermatic vein reflux was classified following a modified Hirsch classification. The testicular elasticity was expressed as a three-point scale (1: normal; 2: slightly to moderately stiffer than normal; 3: severely stiffer than normal).

RESULTS

4 patients had grade I varicocele, 18 patients had grade II varicocele and 10 patients had grade III varicocele; 6 cases had "short" spermatic vein reflux, 12 patients had "medium" spermatic vein reflux and 17 patients had continuous spermatic vein reflux. The elasticity was 1 in all 64 normal testes; in the testes with varicocele it was graded 2 in 18 cases and 3 in 14 cases. The differences in the degree of elasticity between normal testes and testes with varicocele and between continuous and medium/short spermatic vein reflux were highly significant ($P < 0.001$ in both cases); patients without varicocele didn't showed differences between testes; patients treated for varicocele had a recovery of elasticity at 6 months after surgery.

CONCLUSIONS

Testes with varicocele are significantly stiffer than normal ones, with a positive correlation to the clinical grade and significantly to the grade of spermatic vein reflux.

THE NATURAL HISTORY OF SEMEN PARAMETERS IN UNTREATED VARICOCELE PATIENTS

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PURPOSE

We assess the natural history of semen parameters in adolescent boys with a left varicocele followed nonsurgically.

MATERIAL AND METHODS

We reviewed adolescents with a unilateral left varicocele prior to surgery. Each had bilateral testicular volume measurement through puberty. We followed boys nonsurgically if they were asymptomatic and had normal testicular volumes (total and differential <20%). We obtained a semen analysis (SA) and measured total motile count (TMC) after Tanner 5 development. We collected the SA after 2 days of abstinence and at least 3 months apart. We defined the SA as "poor" if TMC was <20million. We excluded boys with history of inguinal/scrotal pathology, endocrinopathy, or missing SA data.

RESULTS

217 consecutive patients had an initial SA. The average age was 17.8 years (14.8-21.4). We excluded 16 for history of cryptorchidism or incomplete SA data. 111 had an initial "good" SA and 90 had a "poor" SA regardless of varicocele grade or testicular volumes. Of those with an initially "poor" SA, 52 had repeat SA and 23 patients improved to "good". Of the 29 with "poor" SA on 2 successive samples, 13 had one more SA and 7 improved to "good". Thus, 55% had a normal TMC after an initial SA, 66% after a second, and 68% after a third SA.

CONCLUSIONS

Two-thirds of Tanner 5 boys with an uncorrected varicocele achieve a normal TMC regardless of varicocele grade or testicular volumes. Despite Tanner 5 development, 46% with an initial "poor" SA will improve to "good" status without surgery.

'STRAIGHT TO THE OPERATING ROOM' TRANSFER FOR TESTICULAR TORSION DIAGNOSED AT OUTSIDE FACILITIES: BYPASS THE EMERGENCY ROOM TO SAVE TESTES

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PURPOSE

Testicular torsion is one of the few emergencies where delays can result in organ loss. At our institution nearly 25% of patients are diagnosed with torsion at an outside emergency room (ER). In order to improve the quality of care, we instituted a 'straight to the OR' (STOR) initiative which would bypass the ER thereby decreasing the 'arrival to OR time' for emergent torsion.

MATERIAL AND METHODS

Pediatric urologists activated the STOR initiative after telephone diagnosis of torsion on outside ultrasound. A coordinated transfer brought the child from the outside ER directly to the preoperative area permitting STOR. An IRB approved retrospective database was compiled from 1/2012 to 1/2014; records were reviewed for repeat ultrasounds, 'arrival to OR time', and surgically confirmed torsion.

RESULTS

There were 46 patients transferred with a torsion diagnosis, 18 of whom underwent the STOR initiative. When compared to non-STOR patients (n = 28), STOR patients were less likely to have repeat ultrasound (0/18 vs 6/28, p=0.07), as likely to have surgically confirmed torsion (17/18 vs 27/28, p = 0.9), and had an average 'arrival to OR time' of 59 minutes versus 124 minutes for the non-STOR group (p<0.001).

CONCLUSIONS

In this experience, testicular torsion was accurately diagnosed at outside ERs. The STOR initiative maximized the chance of testicular salvage by decreasing time until surgical intervention by over one hour. Given the significant time savings, it is rational to propose this initiative at other referral centers.

FEASIBILITY OF LAPAROSCOPIC ORCHIOPEXY FOR INTRACANALICULAR TESTES IN COMPARATIVE STUDY OF SURGICAL OUTCOME WITH OPEN TRANSINGUINAL ORCHIOPEXY

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PURPOSE

Laparoscopic surgery for nonpalpable testes occasionally results in the discovery of the undescended testis in a lower position than expected. According to our strategy (J Endourol., 2011), in that case, we usually perform laparoscopic dissection into inguinal canal. In order to evaluate the efficacy of this procedure, we reviewed our surgical outcomes.

MATERIAL AND METHODS

Thirty patients underwent laparoscopic orchiopexy for unilateral intracanalicular testes among 115 patients who underwent laparoscopic surgery for a nonpalpable testis from September 2009 to August 2014. If the vas and vessels exited from the internal ring on the side of the nonpalpable testis, the posterior parietal peritoneum was incised and the gonad was pulled into the abdominal cavity with traction of the whole cord. If a testis was found, laparoscopic orchiopexy was simultaneously performed. Patients who underwent open trans-inguinal orchiopexy around the same time were considered the control group for the comparison of surgical outcomes.

RESULTS

Surgical outcomes including the mean operative time were not significantly. The postoperative testicular position was intrascrotal for all patients in both groups. Among the patients who we could follow up, the testicular size in 16/17 (94.1%) and 15/16 cases (93.8%) were increased in laparoscopic and trans-inguinal orchiopexy group, respectively.

CONCLUSIONS

Even if a testis was located at intracanal, laparoscopic orchiopexy could be performed as safely as for an abdominal testis, without additional inguinal incisions. We consider the laparoscopic procedure to be feasible for both intraabdominal and intracanalicular testes when the contra-lateral testis has completely descended into scrotum.

DOES VARICOCELECTOMY IMPROVE ADOLESCENT SEMEN PARAMETERS?

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PURPOSE

The main indication for adolescent varicocelectomy has been left testicular hypotrophy. However, we have previously shown that both total testicular volume and volume differential have a small to moderate predictive ability for semen quality. While the ultimate patient goal is paternity, semen analysis is critical to appropriate management of these patients. We examine the success of varicocele repair and hypothesize that varicocelectomy will significantly improve adolescent semen parameters.

MATERIAL AND METHODS

We prospectively followed adolescent males with a clinical left varicocele. Each patient had bilateral testicular volume measurement through puberty. For patients without pain or sustained volume differential (>20%), a semen analysis (SA) measuring total motile count (TMC) was obtained after Tanner 5 development. Those with at least two abnormal semen analyses three months apart (TMC

RESULTS

20 consecutive Tanner 5 patients underwent surgery. Six subjects were excluded (refused post-op SA-5, cryptorchidism-1) for a final cohort of 14. Mean age (years) at diagnosis was 12.7 (9-17) and at surgery was 16.2 (15-19). Mean pre-op TMC= 3.6 million (0-16.9) and mean post-op TMC= 24.2 million (0.23-84.4). 11/14 patients (78.6%) showed significant improvement in TMC with seven patients moving into the normal range ($p=0.01$, paired t-test).

CONCLUSIONS

Adolescent varicocele patients should undergo semen analysis after Tanner 5 development. Varicocelectomy has a high success rate for improving semen parameters in adversely affected youths.

S19: PRENATAL UROLOGY

Moderators: Antoine Herndon (USA), Abraham Cherian (UK)

ESPU Meeting on Friday 16, October 2015, 16:16 - 16:52

16:16 - 16:19

S19-1 (PP)

★ THE URINARY IP-10, MCP-1, NGAL, CYSTATIN-C AND KIM-1 LEVELS IN PRENATALLY DIAGNOSED UNILATERAL HYDRONEPHROSIS: THE SEARCH FOR AN IDEAL BIOMARKER

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PURPOSE

To investigate the urinary IP-10, MCP-1, NGAL, cystatin-C and KIM-1 levels in the management of the children with prenatally diagnosed unilateral hydronephrosis.

MATERIAL AND METHODS

A total of 27 children with antenatally diagnosed hydronephrosis were enrolled into the study. The controls consisted of 9 healthy children (6 boys, 3 girls; mean age: 41.77±5.30 mos). Of the 27 children, 13 (9 boys, 4 girls; the mean age: 48.46±21.11 mos) underwent pyeloplasty on follow-up and constituted the study group and the remaining 14 (13 boys, 1 girl; mean age: 36.57±14.02 mos) were followed up after being diagnosed as having non-obstructive dilation (NOD). The urinary IP-10, MCP-1, NGAL, cystatin-C and KIM-1 levels were measured in the study (preoperative and postoperative), NOD and control groups.

RESULTS

The preoperative concentrations of urinary IP-10, MCP-1, NGAL and KIM-1 were significantly higher in the pyeloplasty group compared with the controls ($p=0.024$, $p=0.002$, $p=0.032$, $p=0.001$, respectively). The urinary IP-10, MCP-1 levels were also significantly higher in the study group compared with the NOD group ($p=0.038$, $p=0.037$, respectively), but there was no significant difference between the study and the NOD groups regarding urinary NGAL and KIM-1. In the study group, the urinary IP-10, MCP-1, NGAL and KIM-1 levels were significantly decreased in the postoperative period. No significant difference was detected between the study and the control groups with regard to the urinary cystatin-C levels.

CONCLUSIONS

Based on these results, the urinary IP-10, MCP-1, NGAL and KIM-1 levels can be used as non-invasive biomarkers for differentiating between obstruction and non-obstructive dilatation. A decrease in urinary IP-10, MCP-1, NGAL and KIM-1 levels after pyeloplasty may be used as a predictor of surgical outcome.

★ SIX OF ONE, HALF A DOZEN OF THE OTHER: A MEASURE OF MULTIDISCIPLINARY INTER/INTRA-RATER RELIABILITY OF SFU AND UTD GRADING SYSTEMS FOR HYDRONEPHROSIS

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PURPOSE

The hydronephrosis Urinary Tract Dilation (UTD) grading system was introduced to address shortcomings of the SFU classification. Herein we compare the intra/inter-rater reliability of both grading systems.

MATERIAL AND METHODS

SFU (I-IV) and UTD (I-III) from 50-transverse ultrasonographic views of hydronephrotic kidneys were independently assigned by 13 raters (9 pediatric urology staff, 2 nephrologists, 2 radiologists), twice, 3 weeks apart. Ureteral diameter and bladder images were also reviewed to allow proper UTD categorization. Ten images were repeated to assess intra-rater reliability. Krippendorff's Alpha was used to measure overall and by grade intra/inter-rater reliability of both classifications. Agreement between specialties was also analyzed.

RESULTS

Overall inter-rater reliability was slightly higher for SFU (0.92/0.90) compared to UTD (0.86/0.72). Intra-rater reliability for SFU and UTD was 0.92/0.90 and 0.86/0.72. Test/retest for SFU and UTD were 0.91 and 0.83 respectively. Table 1 shows agreement results segregated by grades and classification systems for each session. Urology agreement for SFU classification was 0.87/0.85, similar to 0.83/0.87 for radiology and 0.87/0.78 for nephrology. UTD classification agreement was lower for urologists at 0.76/0.74, radiologists at 0.79/0.66 and nephrologists at 0.66/0.69.

CONCLUSIONS

SFU grading system showed a higher overall intra/inter-rater reliability regardless of rater specialty compared to UTD classification. Inter-rater reliability for SFU grades II/III and UTD II was low, highlighting the limitations of both classifications in regards to properly segregating moderate HN grades. Urologists and radiologists showed overall higher agreement than nephrologists, probably reflecting their greater familiarity with these grading systems.

Classification	Initial Rating	95%CI	Second Rating	95%CI
SFU1	0.71	0.53-0.87	0.69	0.50-0.85
SFU2	0.40	0.19-0.60	0.34	0.12-0.55
SFU3	0.44	0.25-0.64	0.35	0.15-0.56
SFU4	0.80	0.65-0.92	0.73	0.57-0.87
UTD1	0.65	0.50-0.80	0.52	0.35-0.70
UTD2	0.46	0.28-0.64	0.27	0.05-0.47
UTD3	0.73	0.57-0.87	0.67	0.51-0.85

★ URINARY TRACT INFECTIONS IN CHILDREN WITH PRENATAL HYDRONEPHROSIS: AN ASSESSMENT FROM THE SOCIETY FOR FETAL UROLOGY HYDRONEPHROSIS REGISTRY

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PURPOSE

Risk factors for urinary tract infections (UTI) in children with prenatal hydronephrosis (PNH) have yet to be clearly defined. The study aim was to describe the incidence and identify factors associated with UTI amongst a cohort of children diagnosed with PNH.

MATERIAL AND METHODS

Patients with confirmed PNH from three medical centers were prospectively enrolled in the Society for Fetal Urology (SFU) hydronephrosis registry 10/2008-3/2015. Exclusion criteria included enrollment due to UTI or less than 1 month of follow-up. Univariate analysis was performed using Fisher's Exact Test or Mann-Whitney U. Probability for UTI was determined by Kaplan-Meier curve.

RESULTS

Median follow up was 10 months (1-60) in 168 patients (n=120 male). UTI developed in 9.5% (n=16) of patients. Of these, 46% were febrile, and 46% were breakthrough. Probability of UTI in the first year of life was 11.5%. UTI occurred more frequently in females ($p < .001$), uncircumcised males ($p = 0.054$), and subjects with high grade (3-4) hydronephrosis (HGH) versus low grade hydronephrosis (LGH) ($p < 0.05$). Renal cysts were also associated with UTI ($p < 0.05$). Use of prophylactic antibiotics (PA), presence of vesicoureteral reflux (VUR), dilated ureter, and renal duplication were not significantly associated with UTI.

Characteristic	UTI Yes	UTI No	p-value
Patients	16(10%)	152(90%)	
Follow-up (months)	11.5(2-49)	10(1-60)	0.574
Gender			
Male	3(2%)	117(98%)	
Female	13(27%)	35(73%)	<0.001
Uncircumcised	2(8%)	22(92%)	0.054
SFU Grade			
High (SFU 3-4)	9(16%)	46(84%)	<0.05
Low (SFU 0-2)	7(6%)	104(94%)	
VUR	5(23%)	17(77%)	0.125
Prophylactic Antibiotics	13(12%)	94(88%)	0.100
Renal Cyst	2(40%)	3(60%)	<0.05

CONCLUSIONS

Significantly associated characteristics for UTI in patients with PNH included female gender, HGH, and renal cysts. Uncircumcised status approached significance. Use of PA, VUR status, presence of dilated ureter, and duplication status did not impact UTI in this population.

★ SFU VERSUS UTD GRADING SYSTEMS FOR PRENATAL HYDRONEPHROSIS: A TIME TO RESOLUTION ANALYSIS

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PURPOSE

The Urinary Tract Dilation (UTD) grading system for hydronephrosis (HN) was recently released to address potential shortcomings of the current SFU classification. HN resolution is an important patient outcome and frequently discussed with families during counselling. We sought to compare these 2 grading systems and their capability to predict the natural progression of prenatal HN.

MATERIAL AND METHODS

565 patients with prenatal HN (UPJO, megaureter, VUR) have been prospectively screened between 2009-15; with 254 being excluded due to surgical procedures (n=75) and other anomalies (n=179). SFU and UTD HN grades collected at baseline and last follow-up were compared to identify resolution trends in 311 eligible patients. HN resolution was defined as APD \leq 10mm at last follow-up. Time to resolution was analyzed using Kaplan-Meier curves and log-rank tests.

RESULTS

Of 311 (80% male) patients, 226 (73%) resolved over a mean follow-up of 25.7 \pm 1.05 months. Average HN resolution rate for SFU I and II was equivalent to that for UTD I (87%). Resolution rate for SFU III was similar to that of UTD II (62% vs. 65%, p=0.9). HN resolution rate for SFU IV was not significantly different from that of UTD III (38% vs. 45%, p=0.6) (Table). Kaplan-Meier curves showed that patients with distinctive baseline SFU and UTD grades had significantly different resolution times for HN (p<0.001).

CONCLUSIONS

Resolution rates based on UTD grading system were not significantly different from those according to SFU classification. This new grading system should not impact how families are counselled regarding the natural progression of prenatal HN.

Grading System	# of patients with resolved HN (%)	Total	Time to Resolution (Months)
SFU I	44(92)	48	17.3 \pm 1.5
SFU II	97(82)	119	23.1 \pm 1.5
SFU III	78(62)	126	30.8 \pm 1.8
SFU IV	7(38)	18	35.7 \pm 4.3
UTD I	115(87)	133	19.8 \pm 1.1
UTD II	102(65)	158	27.9 \pm 1.8
UTD III	9(45)	20	34.2 \pm 3.9

INTERRATER RELIABILITY OF FETAL SONOGRAPHY VS MRI

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PURPOSE

Sonography is commonly used to screen for antenatal fetal anomalies, including obstructive uropathy. Fetal Magnetic Resonance Imaging (MRI) is an emerging tool to further define complex pathology. We hypothesized that the superior anatomic detail of fetal MRI would improve the inter-rater reliability of antenatal hydronephrosis grading.

MATERIAL AND METHODS

After IRB approval, we retrospectively reviewed a database of paired fetal sonography and MRI studies from a single institution. MRI and sonography were performed within 24hrs. 2 pediatric urologists and 1 pediatric radiologist independently graded all renal units using three grading systems: anterior-posterior diameter (APD), Society for Fetal Urology (SFU) hydronephrosis grading system, and the Urinary Tract Dilation (UTD) grading system. Cohen's kappa statistic was calculated to determine the inter-rater reliability of each scoring method and imaging modality combination. Intraclass correlation was used to assess the consistency of APD measurements.

RESULTS

A total of 49 patients with 87 renal units were analyzed. The overall kappa values for the SFU grading system indicated "moderate" inter-rater reliability for both sonography ($R=0.55/L=0.43$) and MRI ($R=0.52/L=0.56$). The overall kappa values for the UTD grading system indicated "substantial" inter-rater reliability for both sonography ($R=0.80/L=0.67$) and MRI ($R=0.66/L=0.65$). The intraclass correlation coefficient of the APD was significantly improved with the use of MRI ($R=0.93/L=0.6$) vs sonography ($R=0.50/L=0.56$)

CONCLUSIONS

Fetal hydronephrosis grading, and the body of evidence supporting it, has been established using sonography. As the role of fetal MRI is further defined, the interpretation of fetal hydronephrosis must be understood in this new context. Our results indicate that imaging modality does not significantly affect inter-rater reliability using the SFU or UTD grading systems. The consistency of APD measurement is improved with the use of fetal MRI.

WHEN TO INTERVENT AND WHEN NOT TO INTERVENT A MALE FETUS WITH SEVERE PROGRESSIVE MEGACYST: AN ONGOING CHALLENGE

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INTRODUCTION

To determine possible criteria and indications for prenatal intervention in fetuses with severe progressive megacyst in an attempt to improve postnatal outcome.

PATIENTS AND METHODS

A total of 56 male fetuses who diagnosed persistent severe progressive megacyst were prenatally followed prospectively between 2001-2013. All of 26 fetuses who underwent prenatal intervention were matched with 30 fetuses who had similar findings but did not undergo intervention as a control group. Our indication for prenatal intervention was persistent severe megacyst associated with severe upper urinary dilation and oligohydroamnios.

RESULTS

Of 56 fetuses, 46 had severe PUV, 10 had urethral atresia. 33 patients had oligohydroamnios. Mean intervention age was 25(18-29)weeks. Of 26 fetuses underwent prenatal intervention, 15 underwent needling alone, 11 underwent fetal vesico-amniotic shunt placement one week after needling. Fetal urine parameters level was variable. Mean age of delivery was 36(32-38)weeks. Of 30 control patients, 6 were normal, 10 died, 14 had CRF. Of 15 needling patients, 5 were normal, 4 died, 6 had CRF. Of 11 prenatal shunts patients, 4 were normal, 2 died, 4 had CRF.

CONCLUSIONS

Mortality rate was high in children associated with megacyst; it was particularly true for untreated cases. A significant number of survivors develop CRF postnatally. Oligohydroamnios appears to be a predictive factor of irreversible renal impairment. Fetuses with megacyst should be followed in every 2 weeks, those with bilateral grade-4 cases in every week. Timely prompt prenatal intervention before the presence of oligohydroamnios may prevent permanent renal damage, and thus improve postnatal outcome.

ASSOCIATION OF FETAL MRI FINDINGS WITH ELECTROLYTE ABNORMALITIES AND OUTCOMES IN SUSPECTED BLADDER OUTLET OBSTRUCTION

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PURPOSE

The objective of this study was to examine the association of fetal magnetic resonance imaging (MRI) and ultrasound (US) findings with electrolytes and outcomes in fetuses with suspected bladder outlet obstruction (BOO).

MATERIAL AND METHODS

We conducted a retrospective cohort study of patients with a prenatal diagnosis of BOO from 9/1/2012 to 10/1/2014. MRI and US images were independently reviewed by two pediatric radiologists who were blinded to outcome. Imaging findings assessed included renal cortical thickness, renal cysts, hydronephrosis, urinary ascites, and amniotic fluid level. Electrolytes were classified as normal or abnormal based on published thresholds. Outcome was classified as no treatment/live birth, fetal intervention (valve ablation, amnioinfusion, vesicoamniotic shunt), and fetal demise/termination. Analyses were conducted using Fisher's exact test.

RESULTS

26 patients meeting study criteria were identified. 65% of patients had electrolytes, of which 52.9% were abnormal. Oligohydramnios by MRI was associated with electrolyte abnormalities ($p=0.036$). 34.6% of patients underwent intervention, 30.8% were observed, and 34.6% were terminated. Fetal intervention or demise were associated with oligohydramnios by MRI ($p<0.001$) and US ($p=0.007$) and renal cysts by MRI ($p=0.009$). No other US or MRI findings were associated with abnormal electrolytes or treatment.

CONCLUSIONS

In this series, oligohydramnios by MRI or US and renal cystic changes by MRI were associated with fetal intervention or demise. Oligohydramnios by MRI was also associated with abnormal electrolytes. These findings suggest that fetal MRI may provide additional information as compared to US when considering the potential prognosis in fetuses with suspected BOO and may help guide prenatal treatment decisions.

S20: LAPAROSCOPY / ROBOTICS 1

Moderators: Duncan Wilcox (USA), Yves Heloury (Australia)

ESPU Meeting on Friday 16, October 2015, 16:52 - 17:30

16:52 - 16:57

S20-1 (LO)

★ ROBOT-ASSISTED LAPAROSCOPIC URETERONEOCYSTOSTOMY CARRIES HIGHER RISK OF SURGICAL COMPLICATIONS THAN OPEN REIMPLANT: A RETROSPECTIVE ANALYSIS OF 6,090 CASES FROM 44 CHILDREN'S HOSPITALS

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PURPOSE

Although robot-assisted laparoscopic ureteroneocystostomy is being more commonly used, no multi-center reports have validated this approach through comparison with the gold standard of open ureteroneocystostomy. We set out to compare these procedures using a nationwide database.

MATERIAL AND METHODS

We retrospectively queried the Pediatric Health Information System (PHIS), which keeps information from 47 contributing American children's hospitals.

RESULTS

From 2008 through 2013, urologists performed inpatient ureteroneocystostomies on 10,277 patients with vesicoureteral reflux under age 18. Of these, 2.11% were robotic (217/10,277) excluding 10 that were converted to open (4.4%, 10/227). There were 5,940 open cases (59.05%) and 150 robotic procedures (69.12%) that met exclusion criteria. Average patient age by year was 4.40 (median 4, range 0-17) and 5.67 (median 5, range 0-17), respectively ($p < 0.0001$). Male-to-female ratio was 0.23 and 0.19, respectively ($p = 0.52$). Average postoperative length of stay by day was 1.82 (median 2, range 1-13) and 1.53 (median 1, range 1-8), respectively ($p < 0.001$). The robotic cohort had significantly more surgical complication flags (1.5% [87/5,940] open vs. 4.7% [7/150] robotic, $p = 0.008$), urinary surgical complications (0.3%, 19/5,940 open vs. 3.3%, 6/150 robotic; $p = 0.0002$), complicating urinary retention (0.1%, 6/5,940 open vs. 1.5%, 2/150 robotic; $p = 0.02$), acute renal failure (0.5%, 21/5,940 open vs. 1.5%, 2/150 robotic; $p = 0.02$), and accidental operative lacerations ($< 0.001\%$, 5/5,940 open vs. 0.7%, 1/150 robotic; $p = 0.009$). Also, significantly more procedures were performed for genitourinary imaging in the robotic cohort (retrograde pyelograms: 0.1%, 54/5,940 open vs. 6.0%, 9/150 robotic, $p < 0.0001$; other: 0.7%, 44/5,940 open vs. 3.3%, 5/150 robotic, $p = 0.007$). There were no significant differences in proportions of readmissions at 30 or 90 days ($p = 0.55-0.74$).

CONCLUSIONS

In a large, hospital-based statistical analysis, pediatric robot-assisted laparoscopic ureteroneocystostomy had a greater risk of surgical complications compared to open ureteroneocystostomy.

★ COMPARATIVE OUTCOMES & COMPLICATIONS OF ROBOTIC VS OPEN CYSTOPLASTY

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PURPOSE

To compare perioperative and surgical outcomes in a two center two surgeon open vs. robotic augmentation ileocystoplasty (with catheterizable channels and bladder neck procedures as required). We previously demonstrated the feasibility and safe application of robotic laparoscopic approach for cystoplasty and complex reconstructions; herewith we are further critically appraising the outcomes.

MATERIAL AND METHODS

We reviewed patients undergoing augmentation ileocystoplasty open vs. robotically by two similarly trained and experienced surgeons between 2008 and 2014 at two centers. The groups were compared in respect to preoperative characteristics, perioperative outcomes, complications, and interim functional outcomes.

RESULTS

The cohort consisted of 17 and 15 patients with median follow up 45 and 32 months, in open and robotic groups, respectively. See data table. In addition to morphine equivalents, 4/17 (23.5%) of the open cohort had an epidural for average of 93 hours versus 0 in the robotic cohort. All patients had stable or improved postoperative hydronephrosis by ultrasound.

Characteristic	Open (n=17)	Robotic (n=15)	p value
Age, years (range)	8.0(3.0-20)	11.7(7.4-25.6)	0.052
Body mass index (kg/m ²) (95%CI)	18.8(16.0-21.7)	22.0(17.8-26.1)	0.219
Concomitant Procedures	17(100%)	14(93%)	-
Operative Time, min (IQR)	265(232-304)	683(635-713)	<0.001
Estimated Blood Loss, mL (95%CI)	84.5(49.5-119.5)	113 (66-160.6)	0.338
IV Morphine Equivalents, mg/kg (95%CI)	1.23(0.55-1.9)	0.56(0.328-0.79)	0.091
Return to Full Diet, days (IQR)	4(3-6)	4(3-5)	0.834
Median length of stay (IQR)	7(5.5-8.5)	(5-8)	0.675
Major Reoperations	2(11.7%)	0	-
Stomal Complications	0	4(23.5%)	-

CONCLUSIONS

While incurring longer operative times, robotic augmentation ileocystoplasty demonstrates similar post-operative recovery and complications. More study is needed prior to widespread adoption of this robotic technique.

SELECTIVE ARTERIAL MAPPING USING NEAR INFRARED FLUORESCENCE IMAGING IN PEDIATRIC ROBOT-ASSISTED LAPAROSCOPIC HEMINEPHRECTOMY

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PURPOSE

Selective arterial mapping (SAM) using near-infrared fluorescence (NIRF) imaging with IV administration of Indocyanine green (ICG) is used during robot partial nephrectomy to determine regional renal perfusion. Injury to the innocent moiety in pediatric heminephrectomy occurs in ~ 4-5% of cases. We hypothesize that SAM may prevent vascular complications in pediatric robotic laparoscopic heminephrectomy (RALHN) by determining or confirming the area of excision. Our objective was to provide clinical outcomes of SAM in pediatric RALHN.

MATERIAL AND METHODS

We have performed SAM in 5 RALHNs using NIRF. In each case, 0.5 to 1 ml of ICG was infused IV after soft bulldog occlusion of a candidate segmental renal artery. After 60 seconds, NIRF imaging was used to determine the regional perfusion deficit. Heminephrectomy was completed when ischemia was confirmed. Patient characteristics, perioperative outcomes, and complications were analyzed. Post-operative ultrasound at 6 weeks was used to determine innocent moiety integrity.

RESULTS

SAM was completed successfully in all 5 children. There were no complications or adverse reactions associated with IV ICG. There were 3 males and 2 females. The mean age was 5.4 years (2.2 to 10 years). Diagnosis was duplex ureterocele (n=3) and duplex ectopic ureter (n=2). Average pre-operative excised moiety function was 4% (0-9%). In 3 of 5 cases, SAM confirmed the candidate vessel(s) perfusing the moiety to be excised. In 2 cases SAM guided additional arterial ligation, and an alternative dissection and moiety removal than that suspected by dissection alone. This study is limited by the lack of a comparative cohort.

CONCLUSIONS

In pediatric RALHN, SAM was feasible and safe, and provided real-time intraoperative confirmation of selective ischemia in the moiety to be excised. SAM also safely guided arterial ligation in complex duplex renal anatomy. Long term studies with a matched cohort are needed.

PERI-OPERATIVE AND SHORT TERM OUTCOMES OF ROBOTIC VERSUS OPEN BLADDER NECK PROCEDURES IN PATIENTS WITH NEUROGENIC INCONTINENCE

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PURPOSE

Complex urologic reconstruction may be facilitated by the improved magnification and dexterity provided with a robotic approach. Minimally invasive surgery also has the potential advantages of decreased length of stay (LOS) and improved convalescence. This study reviewed peri-operative and short term outcomes between robotic assisted and open bladder neck sling/repair with catheterizable channel (BNR) in patients with neurogenic bladder (NGB).

MATERIAL AND METHODS

An IRB approved retrospective chart review was performed of all patients who underwent open or robotic BNR without augmentation cystoplasty for urinary incontinence refractory to CIC and anticholinergic therapy from 2010-2014. Age at surgery, operative time, LOS, complications within 30 days of surgery, and future continence procedures (injection of bladder neck/catheterizable channel, additional bladder neck surgery, Botox injection) were compared between groups.

RESULTS

44 patients underwent BNR (25 open, 19 robotic) with a mean follow up of 2.8 years. There was no difference in age at surgery (8.5 vs 9.9 years, $p=0.2$) or LOS (median 4 days in each group, $p>0.9$) between groups. Operative time was significantly longer in the robotic cohort (8.1 vs 4.5 hours, $p<0.001$). 3 (16%) robotic and 3 (12%) open patients had a complication within 30 days ($p>0.9$). 14 (56%) open patients underwent a total of 23 future surgeries for incontinence compared with 8 (42%) robotic patients undergoing 12 additional procedures ($p=0.5$).

CONCLUSIONS

Although a robotic approach may take longer to perform, it is not at the cost of increased complications, LOS, or worsened continence outcomes.

ROBOTIC SURGERY START-UP WITH A FELLOW AS THE CONSOLE SURGEON

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PURPOSE

Certification as DaVinci Robotic console-surgeon for a new starting center requires fulfillment of standard simulator program including one day training on pigs. First operation is supervised by an experienced visiting robotic console-surgeon. Also for experienced open/laparoscopic surgeons simulator training is mandatory. Aim of the study was to test the feasibility of starting up a paediatric urology robotic service using a first year paediatric urology fellow as console-surgeon though having almost no experience with the open or laparoscopic procedure.

MATERIAL AND METHODS

The operative parameters and clinical outcome of the first 17 robotic anderson-hynes pyeloplasties performed in our department are presented. In all cases the fellow was the only console-surgeon. An experienced non-robotic paediatric urologist was at patient site - shifting sitecards, supervising etc. Consecutive data from the previous 5 year-period with age-matched open(23) and laparoscopic(13) procedures were used for comparison.

RESULTS

Mean total operating time: Open 116 minutes, laparoscopic 254 minutes, robotic 179 minutes (mean console-time 138 minutes (first 9 cases: mean 156 minutes and last 8 cases: mean 117 minutes)). Postoperative mean length of stay: open 5 days, laparoscopic 4 days, robotic 1 day. For robotic cases a one month postoperative renography showed either stable or increased functional share of total renal function for the hydronephrotic kidney. Ureteral orifice edema after double-J removal in one case was the only complication.

CONCLUSIONS

When introducing new robotic technical equipment and skills in paediatric urology it may be proactive for continuity to invest in fellowship training in favour of senior training. Results were excellent with a short learning-curve.

COMPARISON OF AIRWAY METHODS AND ANESTHESIA REGIMES IN PEDIATRIC LAPAROSCOPIC INGUINAL HERNIA SURGERY

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PURPOSE

Several studies report safe use of laryngeal mask (LMA) in children undergoing laparoscopic surgery. In this study, we compared different methods of airway devices and anesthesia regimes in children undergoing laparoscopic inguinal hernia repair.

MATERIAL AND METHODS

Children, aged 1-15y, undergoing unilateral laparoscopic repair for inguinal hernia from August to December 2014 were prospectively included in this study. Patients were randomised into 4 groups: paralytic dose rocuronium and endotracheal intubation (ETT) (Gr 1, control), ETT with remifentanyl (Gr 2), LMA without muscle relaxant (Gr 3) and LMA and subparalytic dose rocuronium (gr 4). Insufflation was set at 8mmHg and intragastric pressure (IGP) monitorization was performed in all patients.

RESULTS

Twenty-eight patients (n=7 each group, average age: 5.5y, weight 19.2kg) were included. Time from beginning of induction to modified Aldrete score of 9 or above was 41.4m for Gr 1, 29.2m for Gr 2, 33.4m for Gr 3 and 30.5m for Gr 4. Basal Ppeak, end-tidal pCO₂ and IGP were similar for all groups. We observed increase in Ppeak and IGP at beginning of insufflation in all patients in gr 3 and 2 patients in gr 2. Propofol (1mg/kg) was administered to these patients bringing pressures back to normal. IGP did not increase over 18mmHg in any patient throughout surgery. No surgical, anesthesiological or hemodynamic complications were observed.

CONCLUSIONS

In children undergoing laparoscopic surgery with low insufflation pressure, anesthesia without nondepolarizing muscle relaxants or with subparalytic doses with use of LMA for airway management and is safe and effective.

OPEN VERSUS MINIMALLY-INVASIVE URETERONEOCYSTOSTOMY: A NATIONAL POPULATION-LEVEL DATABASE ANALYSIS

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PURPOSE

Open ureteroneocystostomy (UNC) is the gold standard for surgical correction of vesicoureteral reflux (VUR). Beyond single-center reports, there is little published data on minimally-invasive (MIS) UNC. Our objective was to compare post-operative outcomes of open and MIS UNC using national, population-level data.

MATERIAL AND METHODS

We reviewed the 1998-2012 Nationwide Inpatient Sample to identify pediatric (≤ 18 y) VUR patients who underwent either open or MIS UNC. Demographics, National Surgical Quality Improvement Program (NSQIP) complications, length of stay (LOS), and cost data were extracted. Statistical analysis was performed using weighted, hierarchical multivariate logistic regression (complications) and negative binomial regression (LOS, cost).

RESULTS

We identified 780 MIS and 75,976 open UNC admissions. Compared with patients undergoing open UNC, patients who underwent MIS UNC were likely to be older (6.2 v. 4.8 years, $p < 0.001$), publically insured (43 v. 26%, $p < 0.001$), treated in recent years (90 v. 46% after 2005, $p < 0.001$). MIS admissions were associated with a significantly shorter length of stay (1.0 v. 1.8 days, $p < 0.001$) and higher cost (\$9,230 v. \$6,304, $p = 0.002$).

After adjusting for patient-level confounders (age, gender, insurance, treatment year, and comorbidity), and hospital-level factors (region, bedsize, and teaching status), MIS UNC was associated with a significantly higher rate of postoperative urinary complications such as UTIs, urinary retention, and renal injury (OR=3.1, $p = 0.02$), shorter LOS (RR=0.8, $p = 0.02$), and higher cost (RR=1.4, $p = 0.008$).

CONCLUSIONS

Compared to open surgery, MIS UNC was associated with shorter LOS but significantly higher costs and higher urinary complication rates.

PERCUTANEOUS INTERNAL RING SUTURING IS A SAFE AND EFFECTIVE METHOD FOR TREATMENT OF PEDIATRIC INGUINAL HERNIA

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PURPOSE

First described in 2006, percutaneous internal ring suturing (PIRS) is a method of laparoscopic herniorrhaphy, providing a minimal invasive method for closure of the internal inguinal ring under the control of a telescope placed in the umbilicus. In this study we present our experience and results of pediatric inguinal hernia repair using PIRS technique.

MATERIAL AND METHODS

All patients undergoing herniorrhaphy for inguinal hernia or communicating hydroceles at our institute from June 2013 - March 2015 underwent laparoscopic PIRS and were prospectively included in this study. Patients age, gender, surgery times plus operative and follow-up findings were noted.

RESULTS

Two-hundred and thirteen patients (134 male, 79 female, average age 5.6y and weight 20.4kg) undergoing PIRS were included in this study. A total of 248 PIRS were performed. Preoperative findings/history demonstrated patent processus vaginalis on right side in 113 (53.1%), left side in 75 (35.2%) and bilateral in 25 (11.7%) patients. Intraoperatively, 35 patients (16.4%) were found to have contralateral hernia that was repaired during the same session. Average surgical time for unilateral PIRS was 14.3m and bilateral PIRS was 20.4m. During average follow-up of 5.6m, complications were seen in 3 patients (1.4%, keloid scar formation, omental eversion and postoperative hydrocele). Recurrence was observed in 3 patients (1.4%). Apart from one patient that developed keloid scar of the umbilical incision, cosmetic results were excellent.

CONCLUSIONS

PIRS is a safe, fast and effective method for herniorrhaphy in children with inguinal hernia or communicating hydroceles with excellent results.

A COMPARATIVE STUDY OF PEDIATRIC OPEN PYELOPLASTY, LAPAROSCOPY-ASSISTED EXTRACORPOREAL PYELOPLASTY AND ROBOT-ASSISTED LAPAROSCOPIC PYELOPLASTY

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PURPOSE

We perform open, laparoscopy assisted extracorporeal and robotic-assisted pyeloplasty and have compared these techniques regarding the per-operative variables and post-operative outcomes.

MATERIAL AND METHODS

We retrospectively reviewed the age-matched cohort of 30 children who underwent open pyeloplasty (OP), 30 children who underwent laparoscopy-assisted extracorporeal pyeloplasty (LEXP), and 10 children who underwent robot-assisted laparoscopic pyeloplasty (RALP) at a single institution. Successful surgery was defined as resolution of symptoms, improvement of hydronephrosis on follow-up ultrasound, and improvement of drainage on diuretic renal scan without history of ureteral stent re-insertion or re-do pyeloplasty.

RESULTS

The mean value of age was 120.2 months, SFU grade was 3.6, anteroposterior diameter was 3.1cm, and relative function was 44.0%. Aberrant vessel compressing the ureteropelvic junction was identified in 10% in OP, 23.3% in LEXP, and 50% in RALP ($p=0.031$). Mean length of stay was significantly shorter in RALP (3.2 days) than in OP (6.6 days) or in LEXP (5.8 days) ($p<0.001$). Duration of analgesics use was also shorter in RALP (1.1 days) than others ($p<0.001$). Complications after surgery was noted in 4 cases of OP and LEXP group. Malfunction of the robot arm was once reported in RALP group. During the mean follow up period of 49.0, 20.1, and 6 months, success rate was 96.7%, 89.7%, and 100%, which was not statistically different in OP, LEXP, and RALP group, respectively ($p=0.499$). In multivariate regression analysis, presence of aberrant vessel was the only factor that deteriorates successful outcome (Hazard ratio=46.09, 95% CI 2.41-879.6, $p=0.011$). In 3 patients (20.0%) of those 15 with aberrant vessel, hydronephrosis improved after endopyelotomy or re-do pyeloplasty.

CONCLUSIONS

Robotic pyeloplasty showed a decreased length of hospital stay and use of pain medication, however, there was no difference in success rate between the open, laparoscopic and robotic surgery.

LAPAROSCOPIC CRYOABLATION OF ANGIOMYOLIPOMAS IN ADOLESCENTS AND YOUNG ADULTS: A REPORT OF 4 CASES ASSOCIATED WITH TUBEROUS SCLEROSIS AND 1 CASE OF SPORADIC ORIGIN.

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PURPOSE

The present study reports the first series of laparoscopic cryoablation of renal angiomyolipomas (AML) in adolescents and young adults.

MATERIAL AND METHODS

From October 2009 to September 2013 five patients at our institution were diagnosed with AML requiring treatment. Four patients had tuberous sclerosis (TS) and one had AML of sporadic origin, all five patients underwent laparoscopic cryoablation. Perioperative data were prospectively registered in a nation-wide laparoscopy database, follow-up data collected from the patients' chart, all imaging was reassessed by independent radiologists.

RESULTS

Median age was 16 (13-27) years. Eight AMLs in five patients, with a median size of 3.9 (2.1-7.7) cm were treated. Indication for intervention within the TS group was prophylactic due to tumor size and rapid growth. The patient with sporadic AML was treated due to tumor size and a former bleeding episode. From time of diagnosis until intervention the patients with TS were followed with renal imaging for a median time of 117 (1-140) months. After cryoablation AML status was followed by CT and MRI for a median follow up time of 37 (6-59) months. On follow-up imaging, all lesions showed a reduction in tumor size, and no regrowth was recognized.

The procedure was well tolerated, with few minor intraoperative complications and all patients scored zero in the Clavien-Dindo classification as no postoperative complications occurred.

CONCLUSIONS

Treating AMLs with laparoscopic cryoablation appears to be a safe and feasible nephron-sparing approach in adolescents and young adults, thus supporting the future use of cryoablation in this patient Group.

WHICH IS THE APPROPRIATE PNEUMOPERITONEUM PRESSURE IN PAEDIATRIC POPULATION UNDERGOING LAPAROSCOPIC RENAL SURGERY?

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PURPOSE

Our aim is to evaluate the tolerance to pneumoperitoneum of pediatric patients during laparoscopic renal surgery and to determine the risk factors of perioperative complications.

MATERIAL AND METHODS

From January to November 2013, we collected ventilatory, hemodynamic and temperature data, before and during insufflation, of all patients undergoing laparoscopic renal surgery. Paired data were analyzed using the Wilcoxon test and independent data with U-Mann-Whitney test.

RESULTS

We studied 21 patients with a mean age of 47.2 months and mean weight of 20.8Kg. All patients had a good preoperative status. Mean operative time was 135.24 minutes. Mean insufflation pressure was 12.1mmHg at an average speed of 3L/min.

Volume-controlled ventilation was set in 81% of patients. Respiratory rate was increased in 71% of patients with a mean of 1.6 ± 2.6 rpm. Recruitment manoeuvres were performed in 57% patients. PEEP was applied in all patients. Compliance decreased in all patients ($p < 0.05$). Peak inspiratory pressure and platteu pressure increased in 90% of patients ($p < 0.05$).

ETCO₂ increased in 90% of patients by an average of 3.95 ± 2.7 mmHg ($p < 0.05$). The increased was considered mild, always < 10 mmHg. The greater variations were in cases of lower values of ETCO₂ before the insufflation ($p = 0.001$). Oxygen saturation was over 97% in all patients.

Mean arterial pressure increased in 90% of patients by an average of 8.10 ± 9.5 . Heart rate decreased in 76% of patients by an average of 7.76 ± 8.7 ($p < 0.05$).

The evolution of hemodynamic and respiratory parameters was not related to the length of surgery, the pressure applied to the pneumoperitoneum, the weight of the patient nor the ventilation mode applied ($p > 0.05$).

Warming measures were applied in 81% of patients. Temperature decreased an average of 0.15°C .

There were no surgical or anaesthetic complications and postoperative critical care was not required in any case.

CONCLUSIONS

In our study there was a good tolerance to higher insufflation pressures. Hemodynamic, respiratory and temperature parameters remained within physiological ranges.

COMPARISON OF COST AND COMPLICATIONS IN OPEN VERSUS ROBOTIC URETERAL REIMPLANTATION IN AMERICAN CHILDREN'S HOSPITALS

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PURPOSE

Pediatric robotic-assisted laparoscopic ureteral reimplantation (RALUR) may have advantages over open ureteral reimplant (OUR), but most analyses have shown robotic approaches to be substantially more expensive and a increased complication rate with RALUR. We sought to investigate a large national cohort of OUR to compare to RALUR to assess cost and outcomes.

MATERIAL AND METHODS

We used the PHIS (Pediatric Health Information System) database to query all pediatric ureteral reimplants performed from 2004-2013 in 44 large, tertiary American children's hospitals. We restricted comparisons between OUR and RALUR to children over the age of 1 year, and to institutions that regularly employed robotic techniques.. We performed multivariate analysis using linear regression to compare OUR versus RALUR procedures in relation to multiple outcomes: length of stay, rate of complications, and cost.

RESULTS

When we compared OUR versus RALUR in the 18 PHIS hospitals that commonly performed robotic cases, we identified 464 RALUR and 11,471 OUR. The age distribution was similar. Robotic cases had shorter mean length of stay (1.52 days for RALUR, 2.41 for OUR) and similar rates of surgical complications (3.9% for RALUR, 3.9% for OUR). Robotic cases were more expensive (median cost of US\$13648 for RALUR, US\$7750 for OUR). Operating room charges and anesthesia charges accounted for the majority of the cost difference.

CONCLUSIONS

RALUR is more expensive, but has a similar rate of complications and a significantly shorter length of stay. Charges for OR and anesthesia time dominate the cost difference. Efforts to reduce these should be the focus of future cost-containment efforts.

S21: LUT DYSFUNCTION

Moderators: Paul Austin (USA), Anju Goyal (UK)

ESPU Meeting on Saturday 17, October 2015, 08:15 - 09:03

08:15 - 08:18

S21-1 (PP)

★ COMPARISON OF THREE SYMPTOM SCORING SYSTEMS IN EVALUATION OF LOWER URINARY TRACT DYSFUNCTION (LUTD) IN CHILDREN

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PURPOSE

To investigate diagnostic properties of 3 different scoring systems [Dysfunctional Voiding Symptom Score (DVSS), Dysfunctional Voiding and Incontinence Symptoms Score (DVISS), Incontinence Symptom Index-Pediatric (ISI-P, for children older than 11 years)] which are used to evaluate lower urinary tract symptoms in pediatric population.

MATERIAL AND METHODS

Eighty-four participants were evaluated by detailed history, physical examination, 3 different scoring systems (DVSS, DVISS, ISI-P), ultrasonography and uroflowmetry. Depending on the tests, cases were stratified as healthy or LUTD by 2 urologists who were blinded to the questionnaires. Patients were re-evaluated by the same tests and questionnaires 1-3 months after treatment. Diagnostic properties of questionnaires were calculated. Additionally, parents were asked to scale the improvement of symptoms subjectively from 0 to 100% in order to correlate to each three scoring systems.

RESULTS

Mean age of normal and LUTD groups were 9.1 ± 2.6 years and 10.1 ± 2.8 years respectively ($p=0.301$). Gender (male/female) distribution was 21/21 in LUTD group and 25/17 in control group ($p=0.381$). In terms of diagnosis, DVISS has the highest accuracy (sensitivity:81%, specificity:97.6%, accuracy:89%) followed by ISIP (sensitivity:55.6%, specificity:100%, accuracy:82%) and DVSS (sensitivity:54.8%, specificity: 97.6%, accuracy:76%). The similar order was valid for the 23 patients older than 11 years (accuracy for DVISS:87%, ISIP:82%, DVSS:78%). In terms of response to treatment, all three tests showed good correlation with parents' rating (DVSS: $p<0.001$, DVISS: $p=0.005$, ISIP: $p=0.042$).

CONCLUSIONS

Although, DVISS had the highest accuracy in distinguishing the patients from healthy controls, all three questionnaires seem to be equivalent for the evaluation of response to treatment.

A NEW SCORING SYSTEM TO DETERMINE THE SEVERITY AND THERAPEUTIC SUCCESS OF BLADDER BOWEL DYSFUNCTION IN CHILDREN

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INTRODUCTION

There is still a lack in determining the detailed association of bladder bowel dysfunction(BBD). The evaluation and follow-up of the patients are mainly based on DVSS, which has been modified from prostate symptom scale for adults. Here, we aimed to assess the effectiveness of our BBD symptom scale in determining the severity and therapeutic success and follow-up of these children.

PATIENTS AND METHODS

A total of 214 children treated for BBD between 2011 and 2014 were reviewed prospectively. 164 completed study. The severity of BBD was determined according to a new BBDSS, Ferhat's DVSS, DESscale, ultrasound and uroflow-EMG. The patient receives interpretation of data in regards of voiding and defecation habits such as bladder and bowel storage dysfunction, nocturnal polyuria, constipation and additional symptoms. A score of <10 was accepted as mild, 10-20 as moderate, and >20 as severe BBDSS score. Non-invasive tests were repeated in the 3rd, 6th month and 1st year of treatment. Mean follow-up was 2.1 years.

RESULTS

Mean age was 8.1 years, 94 were girl and 72 were boy. Total BBD symptom score was 17.2, while it decreased to 4.7 after one-year-treatment. Bladder ultrasound and uroflow-EMG findings were parallel to that of our BBDSS. BBDSS was <5 in 126 children, 5-10 in 30, and >10 in the remaining 8 patients after one-year-treatment.

CONCLUSIONS

The Onen BBDSS, which is a simple non-invasive diagnostic tool to patients and their parents, supports diagnosis and severity of lower urinary tract disorders and association of defecation disorders in a time-effective manner. Not only our scale promises an effective treatment and high success accordingly but also it determines the effectiveness of urotherapy during the follow-up period of such patients.

★ SUBJECTIVE AND OBJECTIVE OUTCOMES OF SACRAL NEUROMODULATION IN CHILDREN WITH REFRACTORY LOWER URINARY TRACT DYSFUNCTION AND ATTENTION DEFICIT HYPERACTIVITY DISORDER

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PURPOSE

Children with attention deficit hyperactivity disorder (ADHD) have significantly higher rates of lower urinary tract dysfunction (LUTD). These children have decreased success rates of LUTD treatment compared to non-ADHD children. Our aim is to measure subjective and objective outcomes of sacral neuromodulation (SNS) in children with refractory LUTD and ADHD.

MATERIAL AND METHODS

Eight children diagnosed with ADHD underwent placement of a sacral nerve stimulator for refractory LUTD and were followed prospectively. Our protocol approach includes pre- and post-operative NLUTD/DES questionnaires, urodynamic testing, and spinal MRI. Inclusion criteria was failure of two or more anti-cholinergics, behavioral modification, biofeedback, and/or percutaneous tibial nerve stimulation.

RESULTS

All patients had symptoms of daytime incontinence, enuresis, and urinary frequency pre-operatively. The overall NLUTD/DES symptom score trended toward significance with a pre-operative mean score of 21.88 compared to 14.13 post-operatively ($p=0.06$). Urinary incontinence (pre- mean 3.25, post- mean 1.38; $p=0.017$) and urinary frequency voiding scores (pre- mean 2.875, post- mean 1.875; $p=0.05$) did improve significantly post-operatively. One child had complete resolution of enuresis (12.5%). Three children (37.5%) stopped anticholinergic medications without symptom recurrence. There was no statistically significant improvement in number of uninhibited contractions or maximum detrusor pressure during filling phase on urodynamics.

CONCLUSIONS

Children with ADHD and LUTD pose a significant treatment problem for pediatric urologists. We present a cohort of ADHD patients with refractory LUTD treated with SNS. We demonstrate significant symptom improvement in daytime incontinence and urinary frequency. SNS is a treatment option that should be considered to treat refractory LUTD in children with ADHD.

★ ACCEPTABILITY AND EFFICACY OF POSTERIOR TIBIAL NERVE STIMULATION IN PAEDIATRIC OVERACTIVE BLADDER: A PROSPECTIVE STUDY

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PURPOSE

Various methods of neuromodulation have been reported to treat refractory lower urinary tract dysfunction. Most of these techniques are invasive, hence less applicable in children. We evaluated the effectiveness of transcutaneous posterior tibial nerve stimulation (PTNS) to treat overactive bladder (OAB) in children. We designed a prospective randomized trial with sham control for this evaluation.

MATERIAL AND METHODS

All the children enrolled easily accepted the PTNS in both the groups. This study was single-blinded, prospective, sham controlled randomized trial. 40 children with non-neurogenic OAB refractory to behavioural and anticholinergic therapy were randomized either to test group or sham group. A total of 12 sessions, 30 minutes each were performed weekly. The OAB symptoms, severity of incontinence, number of voids daily (NV), average voided volume (AVV) and maximum voided volume (MVV) were evaluated before and after the treatment. Statistical analysis was done using SPSS version 22.0.

RESULTS

On assessment of subjective improvement of OAB symptoms, 66.66% patients reported cure and 23.81% patients reported significant improvement of symptoms in test group whereas in sham group only 6.25% patients reported significant improvement. In test group 71.42% patients reported complete improvement in incontinence and 23.81% patients reported mild incontinence only, whereas in sham group only 12.5% patient reported complete improvement. The AVV, MVV and NV improved significantly in test group ($p < 0.001$) as compared to sham group.

CONCLUSIONS

Transcutaneous PTNS is easily acceptable and highly effective in children with OAB refractory to behavioral and anticholinergic therapy.

★ THE EFFICACY OF BIOFEEDBACK THERAPY ON HYDRONEPHROSIS SECONDARY TO DYSFUNCTIONAL VOIDING IN CHILDREN

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PURPOSE

The aim of this study is to assess the potential efficacy of biofeedback therapy and home pelvic floor exercises in children with dysfunctional voiding (DV) associated with mild to moderate hydronephrosis.

MATERIAL AND METHODS

This prospective study comprised fifty seven children (35 boys, 22 girls; mean age 8.9 ± 2.6) with mild to moderate hydronephrosis secondary to DV. All children were regularly visited at our pediatric urology clinic. DTPA, US and uroflowmetry/EMG were performed in all study participants at baseline. Children with evidence of complete obstruction in DTPA scan were excluded from enrollment. Children were randomly allocated into two groups including control group who underwent standard urotherapy (diet, hydration, scheduled voiding) and case group who received biofeedback therapy in addition to standard urotherapy. A complete 3-day voiding diary was recorded by parents before and after treatment. Re-evaluation with kidney and bladder ultrasound and uroflowmetry/EMG was also performed 6 months and one year after completion of treatment.

RESULTS

We noted a more significant decline in APD diameter in case group compared to control group ($P < 0.05$, Table 1). The mean maximal flow rate prior to treatment was 22.8 ± 6 and 23 ± 7 ml/sec in case and control groups, respectively. This finding decreased significantly one year after the treatment in case group compared to controls (32 ± 7.9 ml/sec vs. 24 ± 12 ml/sec, respectively; $P < 0.04$). Improvement of various parameters in voiding diary was also more significant in the case group. Right and left APD prior and after biofeedback are as follow:

Right APD Left APD Right APD Left APD
before treatment at follow-up
Case 14.9 ± 6 17.6 ± 6.8 7.1 ± 4.3 8.1 ± 5

Control 13.8 ± 5.2 14.4 ± 4.9 12 ± 3.3 13 ± 4

CONCLUSIONS

Biofeedback therapy should be considered as a potential effective modality in treating hydronephrosis secondary to DV in children.

THREE MONTHS OF ADEQUATE FLUID INTAKE RESULTS IN THE SAME INCREASE OF BLADDER CAPACITY AS THREE MONTHS OF ANTIMUSCARINIC THERAPY.

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PURPOSE

Adequate fluid intake is considered important in the treatment of small bladder capacity (SBC) for age without knowledge of its real effect on bladder growth. We hypothesized an equal increase in bladder capacity after three months of adequate fluid intake as part of nonpharmacological treatment (NPT), compared to adequate fluid intake combined with antimuscarinic therapy (AMT).

MATERIAL AND METHODS

A retrospective chart analysis of all children presenting with SBC was conducted between October 2004 and June 2013. Children with congenital or neurological anomalies, previous medical treatment or urinary tract surgery were excluded. Children receiving NPT were age-matched to children with NPT + AMT. Voiding chart parameters and fluid intake were recorded at time of diagnosis and after three months of treatment.

RESULTS

67 children were included. NPT was started in 32 children after diagnosis. NPT was combined with AMT (oxybutynin 0,1mg/kg tid) in 35 children. Initial patient demographics, voiding chart parameters and fluid intake were not significantly different between groups. After three months, bladder capacity and fluid intake significantly increased in both groups (resp. $p < 0.001$, $p = 0.001$) without a significant difference in increase of bladder capacity between groups ($p = 0.600$). Bladder capacity increased with an average of 41 cc in the NPT group and 53 cc in the AMT + NPT group.

CONCLUSIONS

After three months of NPT no significant difference was seen in increase of bladder capacity compared to a combination of NPT and AMT. In our opinion, the role for AMT at start of treatment of SBC can be discussed.

COMBINED LOW DOSED ANTIMUSCARINICS FOR REFRACTORY DETRUSOR OVERACTIVITY IN CHILDREN

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PURPOSE

Primary goal in treatment of detrusor overactivity (DO) is to achieve a low pressure reservoir to protect upper urinary tract and renal function. Anticholinergic agents are recommended as first line treatment for achieving this goal. We report the results of combined use of low dose antimuscarinics in DO refractory to high dosage of a single drug in children.

MATERIAL AND METHODS

Seventy two children with DO were enrolled after sub-optimal results with maximal dosage of monotherapy. Mean age was 9.2 ± 4.5 years. All patients demonstrated DO at bladder diary and urodynamic and started on oxybutynin and trospium chloride at lowest weight adjusted dose (5-10 mg / day for oxybutynine and 20-40 / day for trospium chloride). Bladder diary on the basis of 3 days was recorded and urodynamic was repeated at 3 and 6 months.

RESULTS

Sixteen children become dry. 33 patients attained a significant decrease of incontinence from an average of 5 to 1 episode per day. Mean bladder capacity at bladder diary increased with combined treatment of 95 ml from the value with monotherapy. Cystometric capacity increased from 122 ± 59 ml to 246 ± 85 ml and maximal pressure contractions decreased from 56 ± 16 cmH₂O to 28 ± 14 cmH₂O ($p < 0.001$). Overall success rate was 68 %, since 23 patients discontinued treatment for suboptimal response or intolerable side effects.

No side effects were reported by 41 patients, mild side effects by 25, moderate side effects by 6; two patients withdrew from the study due to their side effects.

CONCLUSIONS

A combination of antimuscarinic agents at low dosage is an effective and safe treatment approach in children with DO who are refractory to high dosage monotherapy. Different combinations with different antimuscarinics drugs could be evaluated in the future.

OPEN AND LAPAROSCOPIC BLADDER NECK SUSPENSION IN CHILDREN WITH REFRACTORY URINARY INCONTINENCE BASED ON BLADDER NECK INSUFFICIENCY

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PURPOSE

To present the results of open and laparoscopic (lap) colposuspension in children.

MATERIAL AND METHODS

18 open and 18 lap consecutive procedures with a follow up > 1 year were analysed. All patients had urinary incontinence (UI). In 39% constipation was treated. 8/18 in open and 6/18 in lap group had history of recurrent UTI's. All patients failed urotherapy for at least 3 years. Bladder neck insufficiency was proven by repeated perineal ultrasound and video-urodynamic study. The lap procedure was performed preperitoneally by means of three 5-mm ports, and the open one via a transverse lower abdominal incision. The anterior wall of the vagina, lateral to the bladder neck, was mobilized and bilaterally sutured to Cooper's ligament. The same postoperative protocol was used. The mean age was 11.5 and 13.5 years (open vs lap). The Fisher's exact test was used for the statistical analysis.

RESULTS

The mean operation time was 65 min for the open and 90 min for the lap procedure. Intraperitoneal CO₂ leakage occurred in 1 patient without need for conversion. 2 patients in open and 1 in lap group needed temporary CIC due to urinary retention. Full success (dryness) was achieved in 7/18 in open and in 8/18 in lap group and partial response was seen in 2/18 and in 5/18, respectively (p=0.64). 66% in both groups were free of UTI's and antibiotic prophylaxis was ceased.

CONCLUSIONS

Both open and laparoscopic colposuspension can be used to treat refractory UI in children with bladder neck insufficiency when non-invasive methods fail. Laparoscopy can be preferable by the patient due to a superior cosmesis.

IMPACT OF INITIATING A PRACTICE WIDE LOWER URINARY TRACT DYSFUNCTION PROGRAM

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INTRODUCTION

In 2012 our group initiated a protocol based, practice-wide incontinence program. Referring primary care providers were educated on the protocol. It consisted of initial extensive patient education focused on elimination education. If no improvement occurred, then non-invasive screening was initiated. There was delayed use of medications and treatment was based on the non-invasive screening. We assessed our practice before and after initiating the program in regards to urinary tract infections (UTIs), surgical treatment of vesicoureteral reflux (VUR), and prescribing of medication.

METHODS

A retrospective chart review was performed on 4-18 y.o. patients with LUTD who were treated in the protocol driven program (N=341) and who were treated previously (N=415). Rates of UTIs, VUR surgery, and prescribing of medications were assessed in each program using the methods of Kaplan & Meier and compared between programs with a logrank test. P-values < 0.05 were considered significant.

RESULTS

By 3 months post 1st clinic visit, UTI rates were significantly less in the protocol program ($p < .01$). By 12 months post 1st clinic visit, VUR surgery rates were significantly less in the protocol program ($p < .01$). By 12 months post 1st clinic visit, prescribing of medication rates were significantly less in the protocol program ($p < .001$).

CONCLUSIONS

The data suggest that the protocol driven program successfully decreased rates of UTIs, surgical treatment of VUR and prescribing of medication in children with LUTD since its initiation in 2012. This non-invasive and less pharmaceutically inclined program could be a useful model for other continence programs.

FUNDING SOURCE: None

200 I/U OF BOTULINUM TOXIN IS EFFECTIVE IN THE TREATMENT OF NON-NEUROGENIC BLADDER OVERACTIVITY(OAB)

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PURPOSE

Optimum indications for and use of botulium toxin for childhood OAB remain unclear. This study reports results of injection of 200i/u in 20 detrusor locations in children with OAB.

MATERIAL AND METHODS

98 children (8-16 years) were prospectively studied from 2011-2015.

All children underwent complex multidisciplinary continence assessment including non-invasive urodynamics in all, and selective video-urodynamics (n=10).

All children had documented treatment and results including , voiding/fluid retraining, bowel management, anticholinergics and sacral TENS.

Indication for the procedure included severe and therapy resistant diurnal bladder overactivity (n =73) , isolated giggle incontinence (n= 10), severe bladder pain and spasms (n =5) and monosymptomatic enuresis (n=10).

Following injection as described above, all children underwent clinical review, renal /bladder ultrasound and post void residual measurement at 3-6 months.

RESULTS

	Asymptomatic at 12-18/12	Additional medical therapy	Second botox @ 9-12/12
DiurnalOAB (73)	49	32	35
Giggle(10)	8	0	3
Pain + spasms (5)	1	0	4
Noct enuresis (10)	4	6	6

Complications : urinary infection (n= 3), increased PVR (n=1), severe pain(n=2)

CONCLUSIONS

200 i/u of intravesical botulium toxin is safe for many non-neurogenic OAB. 63% require one treatment. Symptoms may recur 9-12 months after injection and necessitate repeat therapy. Weight based dosage may not be required in children over 8 yo.

PAEDIATRIC SACRAL NERVE STIMULATION; THE SOUTHAMPTON EXPERIENCE.

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PURPOSE

Sacral Nerve Stimulation (SNS) is an established modality for the treatment of lower urinary tract symptoms in adults, particularly related to overactive bladder (OAB). Its use in children is being slowly established, though evidence is largely based around single-centre experiential studies on children with mixed urinary and faecal symptoms.

MATERIAL AND METHODS

We present our 4 year, prospectively collected, experience of the SNS use, for a series of 9 children aged 7-15 with urodynamically proven detrusor overactivity. 7/9 of the group were female and 2/9 male. 7/9 patients had a diagnosis of idiopathic detrusor overactivity and 2/9 had neuropathic detrusor overactivity. All patients had failed medical treatment with at least 2 anticholinergics and desmopressin. All had tried Transcutaneous Electrical Nerve Stimulation (TENS) and intravesical botulinum toxin injection as second and third-line treatment.

RESULTS

9 patients had temporary test wires inserted. 6/9 patients experienced a "good" response, classed as significant ($\geq 50\%$) improvement of symptoms or complete cure. They went on to permanent box insertion. 2/6 patients required revision surgery in the form of minor wire adjustments. 1 patient requested removal of her system due to lack of response. Of the 3/9 who did not respond to the test wire. 1/9 was cured on wire removal, 1/9 progressed to augmentation and 1/9 continued on medical therapy.

CONCLUSIONS

Our data confirms a success rate consistent with the literature available for adult and mixed symptom paediatric groups. It is one of the larger series specifically looking the application in paediatric urinary incontinence.

The data is limited by the lack of sensible validated questionnaires, the vast differences in expectations and issues with compliance that make urinary incontinence such a challenging problem in this age group. The high success rate, combined with low side-effect and complication profile make this an attractive alternative before augmentation is considered.

S22: NEUROPATHIC BLADDER

Moderators: Raimund Stein (Germany), Linda Shortliffe (USA)

ESPU Meeting on Saturday 17, October 2015, 09:03 - 09:51

09:03 - 09:06

S22-1 (PP)

★ CAN 4-HOUR VOIDING OBSERVATION DETECT NEUROGENIC BLADDER DYSFUNCTION IN NEONATES WITH ANORECTAL MALFORMATION ?

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PURPOSE

Neurogenic bladder dysfunction (NBD) is present in about 25% of patients with anorectal malformation (ARM). The aim was to determine if non-invasive investigation of bladder function with 4-hour voiding observation (FVO) can replace cystometry in diagnosing NBD.

MATERIAL AND METHODS

FVO was performed in 34 patients pre- and post anorectal surgery (median age 4 and 14 months respectively), including registration of voiding pattern, number of voiding (≤ 8), leakage, bladder capacity ($\geq 50\%$ of expected) and mean residual (ultrasound, ≤ 10 ml). For diagnosis of NBD, cystometry was performed. Bladder function was also followed longitudinally with a structured questionnaire and flow-residual measurements.

RESULTS

All patients with cystometric diagnosed NBD (n=9) or non-neurogenic neurogenic dysfunction (n=1) presented abnormal voiding variables. Mild abnormalities were registered in 3 girls with tethered cord: Voiding frequency (10-13) and residual (mean 10-14 ml) were increased and bladder capacity $< 50\%$. A pathologic voiding pattern was seen in 5 boys with spinal cord malformation: Urinary leakage, small voided volumes, frequent voiding (13-22) and incomplete emptying. High bladder capacity and large residual were recognized in the remaining two patients.

The majority of patients, without known NBD or severe functional disturbance (n=24), had normal voiding pattern. A moderate increase in residual was seen in 5 patients and with high bladder capacity in two. These 5 patients had periods with bladder dysfunction during follow-up.

CONCLUSIONS

4-hour voiding observation can detect NBD in patients with ARM, especially severe dysfunction, and can therefore be used for screening of NBD. However, it cannot replace cystometry in follow-up of patients with NBD.

★ THE VALUE OF URINARY NGF, TGF BETA-1, TIMP-2 LEVELS ON BOTULINUM TOXIN TYPE A TREATMENT FOR NEUROGENIC DETRUSSOR OVERACTIVITY IN CHILDREN WITH MYELODYSPLASIA

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PURPOSE

The aim of this study is to address the influence of BoNTA treatment on urinary NGF, TGF Beta 1, TIMP-2 levels in children with myelodysplasia.

MATERIAL AND METHODS

15 patients who have NDOA due to myelodysplasia and treated with intradetrusor BoNTA injection were included in this prospective one sided Cohort study. Urines of these patients were collected preoperatively and at postoperative first and third month after BoNTA injection. Urine samples were stored at - 80° C after centrifugation (3000 rpm for 10 minutes). Urine NGF, TGF-β1 ve TIMP-2 levels were measured by using ELISA method with commercial kit (RayBiotech Inc., ABD). Results of urodynamic studies, urinary ultrasound and DMSA scintigraphy findings of these patients were analyzed both before and after BoNTA injection. Simultaneously NGF, TGF Beta 1 and TIMP-2 levels on urine samples were measured. Influences of BoNTA treatment were evaluated with these parameters.

RESULTS

Mean age of the patients were 7.1 ± 2.5 (5 boys 33 % and 10 girls 66 %, min:2.5-max:11). Urinary TGF Beta 1 and NGF levels were found significantly decline after BoNTA treatment when compared to preoperative levels ($p < 0.05$). TIMP-2 levels were also decline but the results were not significant (Table-1).

Table-1

	Before Treatment	Postoperative 1st Month	Postoperative 3rd Month	p Value
NGF (ng/mg Cr) \pm Sd (n:15)	1.62 \pm 1.63	0.6 \pm 0.43	0.73 \pm 0.66	0.002
TGF beta 1 (ng/mg Cr) \pm Sd (n:15)	3.5 \pm 3.6	1.2 \pm 0.79	1.1 \pm 0.71	0.001
TIMP-2 (ng/mg Cr) \pm Sd (n:15)	8.9 \pm 5.6	8.2 \pm 7.3	7.3 \pm 3.2	0.63

CONCLUSIONS

These markers may provide easy follow up of patients with myelodysplasia and decrease the need for further invasive and expensive procedures.

★ CYSTATIN C CALCULATED GFR- A MARKER OF EARLY RENAL DYSFUNCTION IN PATIENTS WITH NEUROPATHIC BLADDER

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PURPOSE

Wheel chair bound meningomyelocele (MMC) patients inherently have low muscle mass, and assessing renal deterioration based on creatinine based glomerular filtration rate is imprecise. MMC patients are also at risk for end stage renal disease (ESRD). We have previously reported that based on cystatin based GFR, 18% of children with MMC were upstaged to a higher stage of end stage renal disease. We hypothesize that cystatin c calculated GFR can reveal ESRD not detected by creatinine-based calculations in a larger prospective cohort of children with MMC.

MATERIAL AND METHODS

Prospectively enrolled patients with MMC underwent annual serum creatinine and cystatin c testing. The anthropometric measurements were obtained from clinic visit. Modified (bedside) Schwartz formula for creatinine based GFR and Zappitelli cystatin C formula was utilized for calculation. The exclusion criteria were patients with reduced GFR (CKD stage 2) or chronic CKD (CKD stage 3 and greater), these patients were excluded from analysis on the premise that they had already been identified for closer renal monitoring.

RESULTS

A total of 117 patients were included in the analysis. The median creatinine based estimated glomerular filtration rate was [131] ml per minute/1.73 m² (range [93] to [466]). The median cystatin C based estimated rate was [102] ml per minute/1.73 m² (range [58] to [171]) yielding an absolute median rate reduction of [34%]. Using cystatin c-calculated GFR, chronic kidney disease stage was upgraded from stage 1 to 2 in [34] patients (29%).

CONCLUSIONS

In MMC patients with poor muscle mass, Cystatin C based GFR is more sensitive than creatinine-based GFR in detecting early ESRD . In this high-risk population, serial Cystatin C estimation is a valuable tool in identifying children who may benefit from early nephrology referral and intervention.

DOES ENDOSCOPY OF DIFFICULT TO CATHETERIZE CHANNELS SUBSEQUENTLY LEAD TO FORMAL OPEN REVISION?

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PURPOSE

Patients with continent catheterizable channels (CCCs) may develop difficulty catheterizing postoperatively. To address this we typically perform endoscopic evaluation and, if necessary, leave a catheter in the CCC for several weeks. The purpose of this study was to evaluate whether endoscopic management is predictive of the need for formal open revision of the CCC.

MATERIAL AND METHODS

We performed an IRB-approved retrospective review of pediatric (<21 years old) patients undergoing CCC construction at our institution between 2000-2015 to identify patients who underwent endoscopy for difficulty catheterizing. Fisher's exact test was used for categorical data and Mann-Whitney U-test for continuous variables.

RESULTS

14.5% (63/434) underwent at least one endoscopy for reported difficulty catheterizing their CCC, with 77.8% requiring additional intervention during endoscopy (catheter placement, dilation, etc.). Of these, almost half (29/63, 46.0%) were managed successfully with endoscopy without formal revision; six (20.7%) of which underwent more than one endoscopy. These 29 patients continued to catheterize well at a median follow-up of 3.0 years (interquartile range 1.9-5.3). 82.3% of those subsequently revised vs. 72.4% of those not revised needed intervention during endoscopy ($p=0.38$). Patients who were revised had a median of 1.6 years between CCC creation and first endoscopy vs. 1.7 years in those who were not revised ($p=0.53$).

CONCLUSIONS

The need for endoscopic management of CCCs is not predictive of eventual formal revision, as almost half of our patients have avoided for formal revision. We recommend performing at least one endoscopic intervention prior to proceeding with formal open revision; the tolerable number of endoscopic interventions prior to converting to formal revision should be determined by the individual surgeon.

FIVE YEARS FOLLOW-UP OF INTRAVESICAL ELECTROMOTIVE BOTULINUM TOXIN TYPE A ADMINISTRATION FOR MANAGEMENT OF NEUROPATHIC DETRUSOR OVERACTIVITY IN CHILDREN

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PURPOSE

To investigate the long-term efficacy and success rate of intravesical electromotive botulinum toxin type A (BTX-A) administration in myelomeningocele (MMC) patients who had urinary incontinence due to neuropathic detrusor overactivity (NDO).

MATERIAL AND METHODS

Twenty four MMC patients (mean age: 8.8 years, range: 3-18) were included in the study and followed up for 5 years. Using an electrode bladder catheter, 10 IU/kg of BTX-A was inserted into the bladder for electromotive drug administration (EMDA) without anesthesia and as outpatient basis. The EMDA equipment was connected to the electrode of indwelling catheter and 2 dispersive electrodes, a pulsed current generator delivered 10 mA for 20 minutes. The preliminary assessments were voiding diary, urodynamic study (UDS), kidney, bladder ultrasound and cystourethrography then annually.

RESULTS

Prior to the treatment, all patients had refractory NDO and urinary incontinence. During the follow up, 6/24 (25%), 7/24 (29.1%) and 3/24 (12.5%) of patients needed to repeat EMDA after 1, 2 and 3 years, respectively, while remaining 8 (33.3%) patients were completely dry between CICs at 5 years follow-up. Mean maximum detrusor pressure significantly decreased and mean maximum bladder capacity increased at follow-up ($P < 0.05$). Reflux was resolved in 80% of patients.

CONCLUSIONS

The results of present study have shown that EMDA/BTX-A is a feasible, safe, reproducible, cost benefit and pain free method as an outpatient's basis with long-term effects and no need for anesthesia and cystoscopy. This novel delivery system resulted in considerable improvement in the UDS parameters, urinary incontinence, and VUR in patients with refractory NDO.

LONG TERM OUTCOMES OF BLADDER NECK RECONSTRUCTION WITHOUT BLADDER AUGMENTATION FOR NEUROGENIC INCONTINENCE

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PURPOSE

To avoid risks associated with augmentation cystoplasty (AC), a bladder neck reconstruction (BNR) may be performed alone for management of incontinence in patients with neurogenic bladder (NGB). This study reviewed outcomes following BNR without AC.

MATERIAL AND METHODS

An IRB approved retrospective chart review was performed of all patients with NGB who underwent BNR without AC for urinary incontinence refractory to CIC and anticholinergic therapy from 2000-2014. Given variable length of follow up, the cumulative incidence and proportion of patients with hydronephrosis, VUR, renal scarring, CKD diagnosis, urodynamic findings, AC, and secondary incontinence procedures (additional bladder neck surgery, bladder neck/catheterizable channel injection, Botox injection) were calculated.

RESULTS

109 patients underwent BNR without AC at a mean age of 8.5 years old (3-18) with a mean follow up of 4.9 years. Table 1 displays the 10 year cumulative incidence of upper tract and urodynamic changes and secondary surgeries.

Table 1:

	10 year cumulative incidence	Proportion
Additional Surgery		
Continence procedure	70.7% (58.0-83.2%)	59/109 (53.2%)
VUR procedure	35.9% (20.1-58.5%)	19/109 (17%)
Augmentation Cystoplasty	32.2% (20.0-49.2%)	20/109 (18.3%)
Renal Outcomes		
VUR/Hydronephrosis	74.6% (58.9-87.9%)	50/109 (45.9%)
Renal scarring	46.1% (30.0%-65.6%)	24/109 (22.0%)
CKD	23.8% (12.8-41.7%)	13/109 (11.9%)
Urodynamic Outcomes		
Detrusor EFP >40 cm H2O	79.2% (63.8%-91.2%)	52/109 (47.7%)
Capacity <50% of predicted	85.4% (70.5-95.2%)	61/109 (56.0%)

CONCLUSIONS

Ten years following BNR without AC, an estimated 30% of patients will undergo AC and 70% an additional continence procedure; over 50% will develop upper tract changes and 20% CKD. Until we can categorize which patients will be at risk for these morbidities, careful patient selection and close follow up is essential if considering BNR without AC.

★ USE OF A DIURNAL INDWELLING CATHETER TO IMPROVE QUALITY OF LIFE FOR PATIENTS WITH SPINAL CORD DISORDERS

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PURPOSE

As children with neurogenic bladder managed by CIC transition to adulthood, an option is needed to increase independence and privacy. We hypothesized that placement of an indwelling urethral catheter during the daytime that is emptied on a regular schedule would be a safe alternative leading to improved quality of life.

MATERIAL AND METHODS

Ten to twenty-one year olds with spina bifida or spinal cord injury using CIC were screened prospectively at clinic appointments. Exclusion criteria included frequent UTIs, urologic surgery, urolithiasis, reflux, hydronephrosis or poor bladder compliance. During the 24-week intervention, a foley was placed each morning and plugged between bladder drainages. After eight hours maximum, CIC was resumed. Evaluations at baseline, 4-, 12-, 24-weeks and post-intervention crossover included scheduled SF-36, KHQ, PedsQL questionnaires, labs, imaging and urodynamics.

RESULTS

Twelve patients have enrolled. All five who completed the 24-week intervention to date have requested continued use. Early discontinuation occurred due to urethral trauma, incontinence and spinal cord retethering. There has been no increase in UTI frequency. The SF-36 demonstrated improvement in 24-week physical role ($p=0.04$) and general health ($p=0.02$) scores. The physical role finding remained significant when girls but not boys were evaluated. PedsQL 4-week parental assessment of school functioning ($p=0.05$) improved and KHQ 12-week bladder/continence scores ($p=0.08$) approached significant improvement.

CONCLUSIONS

This prospective interventional study demonstrated that combining CIC and a closed, indwelling catheter for daytime use is safe and may improve quality of life. The diurnal indwelling catheter is a novel alternative in the management of neurogenic bladder.

SEXUAL FUNCTION IN YOUNG MEN WITH SPINA BIFIDA AND QUALITY OF LIFE

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PURPOSE

We evaluated sexual function in young men with spina bifida and its impact on quality of life.

MATERIAL AND METHODS

We collected data from 36 young men with spina bifida between June 2013 and June 2014. We assessed their sexual function and quality of life using a self-administered questionnaire (International Index of Erectile Function and SF-36).

RESULTS

Their mean age was 26.5 years and 27(75%) patients were born with lipomeningomyelocele. Of the 36 patients 23(63.8%) had experienced sexual intercourse at least once in the last 1 months. There was no difference regarding age, voiding methods, ambulatory status and shunt status. In sexually active group had significantly better sexual function including erectile function ($p < .001$), sexual intercourse satisfaction ($p < .001$), orgasmic function ($p = .006$), and overall satisfaction ($p = .011$) than not sexually active group. However, there was no difference in sexual desire between two groups. In erectile function, all not sexual active patients had mild to severe grade dysfunction, whereas in 65.2% of sexually active patients had normal erectile function. When evaluating SF-36 for QoL, there was no difference in physical and mental health subscores between the sexually active and not sexually active groups.

CONCLUSIONS

In 63.8% of young men with spina bifida were sexually active. Not sexually active patients had more sexual dysfunction than sexually active patients. Sexual function seems not to affect health related quality of life in these patients.

AMBULATORY STATUS IS ASSOCIATED WITH LOWER URINARY TRACT OUTCOMES IN CHILDREN WITH OPEN SPINAL DYSRAPHISM

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PURPOSE

Veenboer et al reported clinical determinants for lower urinary tract deterioration in adults with spinal dysraphism (SD) (J Urol 2014; 192: 477-82). They concluded that being wheelchair bound (non-ambulatory) was a significant determinant, whereas open SD and hydrocephalus were not. Whether this tendency is seen in pediatric cohorts was investigated.

MATERIAL AND METHODS

Children with open SD, who underwent videourodynamics (VUDS) at the age of 5 to 18 years between 2005 and 2014, were retrospectively investigated. High MDP (maximum detrusor pressure during filling or at least 40 cm H₂O or greater), low bladder compliance (less than 10 ml/cm H₂O), bladder trabeculation and VUR were defined as unfavorable findings on VUDS. Logistic regression analysis was done in which 2 clinical determinants, i.e. mobility and having ventriculoperitoneal shunt, were separately associated with each unfavorable finding on VUDS. Additionally, to dichotomize patients as the prepubertal cohorts (under 12 years old) and the postpubertal cohorts (12 years of age and older), analysis was done.

RESULTS

A total of 93 patients (41 males, 52 females; median age, 12.1 years) met the inclusion criteria. Patients with wheelchair and ventriculoperitoneal shunt were 32 and 66, respectively. Being ambulatory was significantly associated with bladder trabeculation and VUR in the postpubertal cohorts ($p= 0.001$, $p= 0.001$, respectively). Having ventriculoperitoneal shunt was significantly associated with high MDP in the postpubertal cohorts ($p= 0.008$).

CONCLUSIONS

In contrast to the adult report, being wheelchair bound was not associated with lower urinary tract deterioration in children with open SD. In pediatric cohorts, being ambulatory and having ventriculoperitoneal shunt were significant determinants for lower urinary tract deterioration, especially after puberty.

MULTIDISCIPLINARY CARE IS A PROTECTIVE FACTOR AGAINST UNCERTAINTY IN PARENTS OF CHILDREN WITH SPINA BIFIDA

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PURPOSE

Parental uncertainty exists when a child's illness is ambiguous, complex, unpredictable, or with unavailable or inconsistent information. This study was conducted in a multidisciplinary clinic to determine whether this care affects levels of parental uncertainty.

MATERIAL AND METHODS

Parents of children in our multidisciplinary myelomeningocele clinic were recruited during outpatient appointments. Parents completed Parental Perception of Uncertainty Scale. Medical data was abstracted from patients' charts.

RESULTS

One hundred parents (76 mothers, 24 fathers) of 85 patients ($M=9.02+5.28$; range:0.5-17) participated. There were no significant relationships between uncertainty and demographics (all $p>.05$), but child age was included as a covariate. For illness-related factors, number of hospitalizations over the past year was positively correlated with levels of: ambiguity ($p=.009$), lack of clarity ($p=.028$) and information ($p=.015$), and total level of uncertainty ($p=.012$). Level of lesion, mobility status, bladder/bowel continence, number of UTIs or ER visits over the past 2 years, and surgical procedures were all unrelated to level of uncertainty.

Comparisons to previously published samples of parents of children with spina bifida ($N=50$) were all significant; with parents in current sample having significantly lower levels of: total uncertainty, unpredictability, lack of clarity, and lack of information (all $p<.001$).

CONCLUSIONS

Overall, parents in our sample reported lower-than-expected uncertainty about their child's diagnosis. Multidisciplinary clinic environment appears to protect parents of children with spina bifida from experiencing high levels of uncertainty. Protecting parents from unnecessary levels of uncertainty can have significant effects on overall psychological functioning as well as functioning of their children.

URODYNAMIC PREDICTORS OF ADVERSE OUTCOMES AFTER BLADDER NECK RECONSTRUCTION WITHOUT AUGMENTATION CYSTOPLASTY

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PURPOSE

Bladder neck reconstruction (BNR) without augmentation cystoplasty (AC) for children with neurogenic bladder is controversial. Adverse outcomes include additional procedures for incontinence or upper tract changes such as hydronephrosis, vesicoureteral reflux, and renal scarring. This study evaluated pre-operative urodynamic parameters as predictors of additional incontinence surgery, AC, or upper tract changes after BNR without AC.

MATERIAL AND METHODS

An IRB approved retrospective database was created for children who underwent BNR without AC from 2000-2014. Subsequent incontinence surgery, AC, and upper tract changes were identified. Preoperative urodynamic parameters including compliance, percentage predicted capacity (PPC), and detrusor end fill pressure (EFP) were compared between those with and without adverse outcomes using Wilcoxon rank sum, Fisher's exact test, and cox proportional hazards. PPC was calculated as estimated capacity [(age+2)x30] divided by actual capacity.

RESULTS

Preoperative urodynamic data was available in 106/109 patients. Post BNR without AC, 59/109 had subsequent continence surgery, 20/109 underwent AC, 50/109 developed VUR or hydronephrosis, and 24/109 had renal scarring. Preoperative PPC was lower in the group with renal scarring (57% vs. 70%, $p=0.049$; HR = 0.4, 95% CI 0.1-1.5) as was bladder compliance (10.5 vs 18.8, $p=0.03$; HR = 0.7, 95% CI 0.5-1.1). No children (0/15) with compliance ≥ 30 mL/cmH₂O underwent AC compared to 19/91 (20%) with compliance < 30 mL/cmH₂O ($p=0.067$). There were no preoperative urodynamic parameters associated with additional continence surgery.

CONCLUSIONS

Preoperative compliance is associated with renal scarring in patients undergoing BNR without AC. In addition, no patients with a compliance ≥ 30 mL/cmH₂O underwent subsequent AC.

ENDOSCOPIC BOTULINUM TOXIN INJECTION FOR NEUROPATHIC BLADDER DYSFUNCTION: IS INTRA-DETRUSOR DELIVERY TRULY HAPPENING?

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PURPOSE

Botulinum neurotoxin A (BoNT/A) treatment has become a viable option for patients with neuropathic bladder dysfunction (NPBD) who fail medical management. Bladder BoNT/A injection mechanism of action is thought to be mediated by chemodenervation of the bladder muscle. Intra-detrusor (ID) and submucosal (SM) injections techniques has been described. By creating a SM bleb, visual confirmation of insertion depth provides assurance, in contrast to the ID delivery, which relies solely on estimated depth of injection. In the present study we describe concurrent ultrasound (US) assessment at the time of BoNT/A bladder injection and correlate sonographic with endoscopic findings.

MATERIAL AND METHODS

Between January and May 2014 we performed cystoscopy and BoNT/A injection with US surveillance in a total of 8 patients with NPBD who were on maintenance BoNT/A program. All procedures were done under general anesthesia, by one surgeon, and trans-abdominal US was performed. When feasible, we employed the US images to determine depth and position of the injection, segregated based on the surgeon's impression of a SM and the ID delivery by endoscopy (blinded to findings on US). We only included data for injection sites with visualization on both modalities.

RESULTS

We included 8 patients with an age range of 5-12 years. There were no reported complications and all patients reported stable response on follow-up. We confirmed the injections site accurately with US in 39/40 (97%) and 5/23 (22%) in the SM and ID space respectively. No cases of intra-peritoneal delivery were encountered.

CONCLUSIONS

This study demonstrates that trans-abdominal US-guided bladder BoNT/A injection may provide additional information regarding depth. By US evaluation, it appears that SM delivery is reliable based on visual cues, whilst ID attempts often result in delivery outside of the detrusor muscle. If accurate ID delivery is preferred, intra-operative US provides a novel, non-invasive way of obtaining real-time feedback.

PREVALENCE OF NEURAL TUBE DEFECTS CORRELATES WITH ENVIRONMENTAL EXPOSURE TO AGRICULTURAL HERBICIDES AND PESTICIDES

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PURPOSE

Despite a reduction in neural tube defects after folic acid supplementation, the number of new cases remains at 69% of the pre-folic acid supplementation era. This has prompted us to hypothesize that agricultural pesticide and herbicide exposure may play a role in the pathogenesis of this disorder.

MATERIAL AND METHODS

After obtaining internal review board approval we retrospectively collected data on all patients from 2000-2013 who presented with a diagnosis of spina bifida. Charts were reviewed for the variables of patient date of birth, gender, race and geographic region of birth. To determine prevalence in each region we utilized published statistics of live births for the same fourteen-year period. Mean kg of agricultural pesticides applied per region were divided into low, medium and high terciles. Spina bifida rates/region were calculated by dividing cases by live births for the study period. Spina bifida rates were analyzed by year, by region and by pesticide use tercile.

RESULTS

A total of 298 patients with neural tube defects were identified in the study period. An overall prevalence of 3 per 10,000 live births was noted. Overall prevalence of neural tube defects correlated directly with the levels of exposure to herbicides and pesticides. The prevalence for low, moderate and high exposure regions was 2.4, 3.25 and 3.2 (per 10,000 births) respectively. In contrast, fungicide application did not appear to correlate with spina bifida prevalence. Due to small case numbers (less than 30/year) our study fell just short of reaching statistical significance.

CONCLUSIONS

The prevalence of spina bifida in the post folic acid supplementation era may correlate with the degree of exposure to agricultural herbicides and pesticides. In contrast, this correlation was not seen with fungicide application. The relationship between pesticide/herbicide exposure and spina bifida risk must now be verified using larger data sets which is now being planned.

LONG-TERM FOLLOW-UP OF CONTINENT CATHETERIZABLE CHANNELS IN CHILDREN, A COMPARISON OF DIFFERENT TECHNIQUES

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INTRODUCTION

Since 1980 different techniques for creating a continent catheterizable channel (CCC) have been described. The objective of this study was to compare long-term results of the different techniques used to create CCC's in a single institution.

PATIENTS AND METHODS

Data of 112 children who had a CCC created between December 1995 and December 2013 was collected retrospectively. All cases, with minimum follow-up of 12 months post-surgery, where appendix, bladder flap, or ileum was used, were included. Primary outcomes were revision free survival, stenosis and incontinence.

RESULTS

A total of 117 CCC's (Appendix 67, Bladder flap 31, Ileum 19) with a median stoma follow-up of 85 months (range 3-229) were analyzed. Underlying diagnosis was neurogenic bladder (77%), urethral pathology (11%), neuromuscular disease (6%) and bladder exstrophy (6%). Surgical revision was required in 52% (Appendix 52%, Bladder flap 48%, Ileum 58%). Laparotomy was required in 27% (Appendix 22%, Bladder flap 23%, Ileum 53%). Stenosis requiring revision was seen in 33% (Appendix 40%, Bladder flap 29%, Ileum 16%). At the end of follow-up 12% was considered incontinent (Appendix 12%, Bladder flap 3%, Ileum 32%). Differences in Kaplan-Meier survival analysis were not significant.

CONCLUSIONS

A CCC is an elegant solution for children who experience problems with urethral catheterization. However, 52% requires surgical revision. We found no significant differences in outcome between CCC's from appendix or bladder flap leading us to conclude that a bladder flap CCC is a good alternative solution if the appendix is not available and bladder volume is sufficient.

INTRAVESICAL ABOBOTULINUMTOXINA IMPROVES URODYNAMIC PARAMETERS IN CHILDREN WITH NEUROPATHIC BLADDER

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PURPOSE

There is limited published urodynamic data demonstrating the effect of intravesical abobotulinumtoxinA (Dysport[®]) in children with neuropathic bladder overactivity. We investigated urodynamic outcomes in these children treated with Dysport[®] and aimed to determine whether the effect is sustained over multiple administrations.

MATERIAL AND METHODS

A retrospective review of all children treated with intravesical Dysport[®] was performed (40iU/kg, max 1200iU). Data was collected on Cystometric capacity (CC), compliance and maximum neurogenic detrusor overactivity (Max NDO) prior and post injection. Patients were divided into two groups. Group 1 had only one injection and group 2 had multiple injections. Results are presented as median (range).

RESULTS

Between July 2008 and July 2014 37 patients (19 boys) had a total of 73 intravesical Dysport[®] injections; age at injection was 92 months (13-206). Fifteen patients had only one injection, 22 patients had 2 (2-5). The 2 groups were homogeneous for age and underlying pathology. Significant improvement was observed in CC and max NDO. Improvement in compliance did not reach significance (see table). Comparing the 2 groups, there was no difference in CC (p=0.59), max NDO (p=1) or compliance (p=1).

	Group 1			Group 2		
	pre	post	p	pre	post	p
CC (mL)	130 (12-375)	264 (20-550)	<0.0002	131 (45-406)	245 (64-640)	0.02
max NDO (cmH2O)	47 (0-200)	0 (0-86)	0.003	43 (0-161)	0 (0-88)	0.002
Compliance (mL/cmH2O)	7.5 (1.5-29.5)	13.7 (1-151.5)	0.1	6.9 (0.27-105)	12.9 (2.6-128)	0.8

CONCLUSIONS

Intravesical Dysport[®] significantly increases CC and reduces max NDO in children with neuropathic bladder. The effect is maintained over subsequent injections. Compliance is not significantly changed by Dysport[®].

HIGHLY ELEVATED CYSTATIN C GFR IN PEDIATRIC MYELOMENINGOCELE PATIENTS: DOES IT INDICATE NEPHROPATHY?

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PURPOSE

Serum Cystatin C is becoming widely used to estimate Glomerular Filtration Rate (GFR) in complex pediatric urology patients with neurogenic bladder. A highly elevated GFR has been suggested to indicate hyperfiltration injury to the kidneys. It has been our practice to assess for proteinuria in this patient population. The purpose of this study is to review the results of this practice to see if nephropathy is a concern with an elevated Cystatin C GFR.

MATERIAL AND METHODS

A retrospective cohort study was conducted of all MM patients with an available Cystatin C GFR at a single pediatric institution between the ages of 2 and 12 years. Data abstracted included patient demographics, Cystatin C GFR, urine protein data, and urine specific gravity. High GFR was defined as greater than 150 ml/min. Proteinuria was defined as presence of greater than trace protein on urine dipstick or a quantitative urine protein to creatinine ratio exceeding 0.21. Patients were excluded if the urinalysis had a low specific gravity that could possibly cause a false negative for proteinuria.

RESULTS

A total of 261 patients with MM were identified. Median age was 7 years. 54 patients (21%) had a Cystatin C GFR greater than 150 ml/min. 18 had a specific gravity less than 1.010. Thus, 36 patients were included in the study group. Of these patients, 30 (83%) had a negative urinalysis for protein and/or a negative quantitative protein to creatinine ratio. Only 6 patients (17%) had evidence of proteinuria.

CONCLUSIONS

An elevated Cystatin C GFR (CGFR) is not uncommon in the myelomeningocele population. Our preliminary data shows that the vast majority do not show evidence of proteinuria or hyperfiltration injury. Further evaluation is necessary to assess if those patients with proteinuria or a dilute urinalysis have evidence for hypertension, upper tract deterioration, and/or worsening bladder dynamics.

FETAL MYELOMENINGOCELE REPAIR: THREE YEARS OF ACTIVE UROLOGICAL FOLLOW UP. CAN WE PREDICT BLADDER FUNCTION?

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PURPOSE

The MOMS study (2011) reported benefits of neurological and orthopedic aspects of patients undergoing fetal myelomeningocele repair. However, urological aspects were not evaluated in this study. A prospective study of urologic evaluation was initiated in November 2011 at our institution. The aim of this study is to describe the urological scenarium of 16 patients who had completed three years old.

MATERIAL AND METHODS

Since November 2011, 60 patients started urological evaluation and 16 of these had completed three years old. We performed clinical evaluation, ultrasound of the urinary tract, voiding cystourethrogram and urodynamic study. Patients were categorized into 4 groups: normal, high risk (overactive bladder with detrusor leak point pressure grater than 40 cmH2O or high filling pressure also greater than 40 cmH2O), incontinent and underactive bladder.

RESULTS

One patient was initially classified as underactive bladder, six patients as incontinent and nine as high risk. By 5 of the high risk group patients, hydronephrosis or VUR were present, as well as, febrile UTI (one of this without hydronephrosis or VUR). Patients classified as incontinent pattern were only kept in surveillance, while those classified with underactive bladder and righ risk initiated clean intermittent catheterization (CIC) without and with anticholinergic respectively. After the initial treatment, two patients changed the high risk bladder pattern to normal one and one shifted into incontinent pattern. Three patients remained at righ risk pattern, but without UTI. One patient underwent vesicostomy and two patients haven't got the second urodynamic study. One patient presented initially an incontinent pattern but changed into high risk.

CONCLUSIONS

We confirmed the need of active surveillance by this group, in order to categorize bladder patterns and evaluate response. As shown in the initial set of exams, bladder pattern remains unpredictable.

WILL I HAVE NORMAL ERECTIONS? HYDROCEPHALUS, MOBILITY AND ERECTION QUALITY IN MEN WITH SPINA BIFIDA.

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PURPOSE

Little is known about erectile dysfunction in men with spina bifida (SB), specifically whether it is associated with ambulatory status or ventriculoperitoneal shunting (VPS). We aimed to determine erection quality and if it varied with these factors.

MATERIAL AND METHODS

An international sample of men with SB were surveyed online (January 2013-August 2014). We collected data on demographics, bladder/bowel surgeries and function. Ambulation was assessed on the Hoffer 5-point scale: normal, community, household, non-functional and none. Erections were assessed using a question from the validated EPIC questionnaire (4-point scale: normal being "firm enough for intercourse"). Logistic regression was used for analysis.

RESULTS

Mean age of 122 participants was 33.8 years (VPS: 70.5%, community ambulators: 45.1%). Those without a VPS were more likely to report normal erections (60.5% vs. 31.7%, $p=0.004$). Normal, community and household ambulators reported normal erections more commonly (63.6%, 60.6% and 72.7%, respectively) than non-functional ambulators or non-ambulators (25.0% and 15.4%, respectively, $p<0.001$). Age, race, country of residence and continence were not associated with normal erections ($p\geq 0.16$). On multivariate analysis, VPS status and age were not correlated with normal erections ($p=0.71$ and $p\geq 0.34$, respectively). Patients who ambulated at least at home were more likely to have normal erections after correcting for age and VPS status ($OR\geq 9.30$, $p\leq 0.0005$).

CONCLUSIONS

Only two in five men with SB report erections suitable for intercourse. Ambulatory status, rather than hydrocephalus, appears to be the primary factor associated with erectile function, with normal erections reported by 2/3 of those who walk at least at home and only 1/6 of those who do not.

HOW MUCH, NOT HOW OFTEN: PREDICTORS OF BOTHER WITH URINARY INCONTINENCE AND ITS IMPACT ON QUALITY OF LIFE IN OVER 500 ADULTS WITH SPINA BIFIDA.

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PURPOSE

The effect of urinary incontinence (UI) on health-related quality of life (HRQOL) in adults with Spina Bifida (SB) is poorly understood. We aimed to determine which quantification method best captures bother with daytime UI, and to quantify the impact of UI on HRQOL.

MATERIAL AND METHODS

We surveyed an international sample of adults with SB (January 2013-September 2014). We evaluated daytime dry intervals (≥ 4 h: social continence), quantity of UI ("a lot", "medium", "a little", none) and number of undergarments worn daily (pads/pull-ups/disposable underwear). Bother was assessed on a 5-point Likert scale. We employed validated instruments: QUALAS-A (SB-specific HRQOL) and generic WHOQOL-BREF. We analyzed data using linear regression (all outcome ranges: 0-100).

RESULTS

Mean age of 518 participants was 32 years (33.0% male). Overall, 25.9% were dry for < 4 h, 50.4% for ≥ 4 h, 23.7% were always dry. On multivariate analysis, worse bother was predominantly determined by quantity of UI ("a lot:" +35.1, "medium:" +17.0 vs. "little," $p < 0.0001$), rather than dry intervals < 4 h (+8.1, $p = 0.04$) or number of undergarments (-8.0 to -0.1, $p \geq 0.11$). Looking at QUALAS-A scores, we observed lower Bladder and Bowel HRQOL with higher quantities of UI ("a lot:" -30.5, "medium:" -21.4, "little:" -15.0 vs. none, $p < 0.0001$), but not for dry intervals < 4 h (-4.9, $p = 0.06$). Use of undergarments, regardless of number, was associated with lower HRQOL (-10.0 to -12.8, $p \leq 0.0003$). Quantity of UI was the main independent predictor of lower WHOQOL-BREF scores.

CONCLUSIONS

We demonstrate that adults with SB and UI have lower HRQOL than those who are dry. Self-reported quantity of UI was the best predictor of bother and HRQOL.

PREVALENCE OF PATIENT-REPORTED LOWER URINARY TRACT SYMPTOMS AND BOTHER IN MUSCULAR DYSTROPHY

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PURPOSE

Duchenne and Becker muscular dystrophies (DMD/BMD) are due to mutations in the dystrophin gene, essential for skeletal muscle functioning, and characterized by progressive muscle weakness and loss of ambulation. The role of dystrophin in smooth muscle function, however, is unclear. In a prior retrospective review, we demonstrated roughly 50% of DMD/BMD patients have at least one urologic diagnosis, most commonly lower urinary tract symptoms (LUTS). In order to better understand the frequency of LUTS and the degree to which they impact quality of life (QOL), we performed a prospective evaluation.

MATERIAL AND METHODS

Surveys, which contained questions derived from multiple validated questionnaires, including the AUA Symptom Score and the Dysfunctional Voiding Symptoms Score, were distributed to DMD/BMD patients to assess the frequency of LUTS (i.e. urgency, frequency, enuresis and dysuria) and how bothersome patients found these symptoms.

RESULTS

Of the 56 respondents (mean age 15.3), forty (71.4%) reported at least one LUTS, most commonly urgency (n = 31, 55%) and hesitancy of stream (n = 32, 57%). Although the majority of the patients reported being happy with their symptoms, 16% (n = 9) expressed dissatisfaction. We did not find any correlation between LUTS and disease progression, as measured by years non-ambulatory, on χ^2 analysis.

CONCLUSIONS

In this first prospective study on the frequency and degree of bother of LUTS in DMD/BMD patients, we found a high percentage experience LUTS. Despite this high prevalence, the majority report these symptoms do not negatively impact their QOL, however, 16% express dissatisfaction with their LUTS. Screening for bothersome LUTS should be a part of disease management with referral to a urologist for those bothered by their symptoms in order to improve their QOL.

TEN YEARS OF EXPERIENCE WITH INTRAVESICAL AND INTRASPINCTERIC BOTULINUM TYPE-A TOXIN IN CHILDREN

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PURPOSE

We reviewed our 10 year experience with both intravesical and intrasphincteric botulinum toxin (Botox) injections in children to assess long term therapeutic efficacy and duration of response after multiple injections.

MATERIAL AND METHODS

Data was reviewed on 53 children, aged between 1 – 18 years at time of first injection, who had 134 injections (106 intravesical, 23 intrasphincteric and 5 combined) between January 2004 and December 2013 at a single paediatric tertiary hospital. Follow-up occurred 3 months post procedure, and then 3-6 monthly.

RESULTS

Median time until return of symptoms remained stable (ranging from 5-10 months) for children undergoing Botox for detrusor overactivity (DO) up to a seventh injection. Two patients had ongoing response to Botox for a tenth and eleventh injection respectively. 45% of patients receiving intrasphincteric Botox for chronic dysfunctional voiding or detrusor sphincter dyssynergia had resolution of their symptoms with no recurrence. In patients who had symptom recurrence this occurred sooner than in DO (median 4 months). Symptom resolution was seen in patients undergoing Botox for novel indications including: new onset hydronephrosis, trigonal hypersensitivity and autonomic dysreflexia. 13 of 134 Botox injections (9.7%) had a culture positive urinary tract infection (UTI) in the two weeks following injection, of whom all had a history of prior UTIs and three patients (2.8%) developed urinary retention.

CONCLUSIONS

This retrospective study demonstrates that intravesical Botox can remain effective in children up to an eleventh injection. It is one of the very few longer term follow-up studies in children presented to date. Further study is required into the role for Botox in trigonal hypersensitivity, new onset hydronephrosis and autonomic dysreflexia.

S23: AUGMENTATION / DIVERSION

Moderators: Mark Cain (USA), Antonio Macedo (Brazil)

ESPU Meeting on Saturday 17, October 2015, 10:09 - 10:39

10:09 - 10:12

S23-1 (PP)

★ PATIENTS WHO BECOME OBESE FOLLOWING CONTINENT CATHETERIZABLE URINARY CHANNEL PLACEMENT ARE NOT AT INCREASED RISK FOR SUBFASCIAL REVISION

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PURPOSE

We previously reported that Monti catheterizable channels were two times more likely than appendicovesicostomy (APV) to undergo revision and that spiral Monti to the umbilicus was four times more likely than APV to undergo revision. The purpose of this study was to evaluate whether the development of obesity postoperatively was a risk factor for subfascial revision in patients undergoing continent catheterizable channel (CCC) placement.

MATERIAL AND METHODS

We retrospectively reviewed an institutional database of patients born in or after 1972 who underwent CCC placement between ages 2 and 21 years from January 1990-May 2013 excluding those with continent urinary reservoirs, continent vesicostomies and those without body mass index (BMI) data available. We collected data on patient/procedure characteristics, baseline and most recent BMI, subfascial revisions, and follow-up duration. We used Fisher's exact test to compare rates of subfascial revision between those who became overweight/obese (BMI greater than or equal to 25) versus those who had stable low/normal BMI, stable overweight/obese BMI and those with overweight/obese BMI who became low/normal.

RESULTS

332/507 (65.5%) patients had baseline and post-baseline BMI data (53.0% male, 90.4% white, median age 7.4 years, 41.0% appendicovesicostomy, 59.0% Monti). Median follow-up was 76.4 months. 59.6% had spina bifida. 38/332 (11.4%) had subfascial revisions. 53/332 (16%) developed obesity postoperatively. 7.6% of those who developed obesity had a subfascial revision vs.12.2% of those whose weight remained stable or decreased (p=0.48).

CONCLUSIONS

This study suggests that development of postoperative obesity is not a risk factor for subfascial revision.

RISK ANALYSIS OF THE PROGNOSTIC FACTORS FOR THE DEVELOPMENT OF STOMAL STENOSIS WITH THE MACE PROCEDURE

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PURPOSE

We hypothesize that stomal stenosis (SS) is associated with the type of efferent limb used for MACE construction. We performed a risk analysis and evaluated factors associated with the development of cecostomy SS.

MATERIAL AND METHODS

We reviewed 43 consecutive patients undergoing a MACE procedure by a single surgeon. Data collection included the type of channel construction, stoma site, preoperative Z-score BMI, pre-operative diagnosis and development of SS. We defined SS as those requiring surgical revision, Chait tube placement or clinical documentation of inability to catheterize. We performed an Odds Ratio (OR) analysis to evaluate the association with the development of SS.

RESULTS

SS developed in 21 patients (49%) with an average follow-up of 4.2 years. The majority of patients had a diagnosis of myelomeningocele (84%) and there was no significant difference in gender distribution (51% males:49% females). Nearly one third of the patients (28%) were obese (BMI \geq 95th percentile). The distribution types of MACE efferent limbs consisted of 53% appendicocecostomy, 42% cecal-wall flap and 5% ileocecostomy. The OR analysis revealed that obesity was the only variable that was associated with SS (OR 4.8 95% CI, $p=0.05$).

CONCLUSIONS

The type of efferent limb or the selection of stoma site did not contribute to the SS rate. The only statistically significant factor associated with SS was the patient's age and sex-adjusted BMI. Obesity is associated with a higher risk for SS in MACE channels.

★ ENTEROCYSTOPLASTY: THE LONG TERM EFFECTS ON BONE MINERAL DENSITY

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PURPOSE

Studies have shown that bone mineral density is adversely effected by enterocystoplasty. It was our goal to look at the long term effects of enterocystoplasty on bone mineral density. Using the DEXA scan as a marker for BMD, we attempted to identify the long term effects of enterocystoplasty. We hoped to identify patients at risk for the development of both osteopenia and osteoporosis and the potential for long term fracture risk.

MATERIAL AND METHODS

We reviewed our database of enterocystoplasty in children and young adults. We were able to identify 23 individuals who had undergone these procedures and been followed for more than 15 years.

RESULTS

Using DEXA scan technology, the identification of both osteopenia and osteoporosis were made on the basis of T scores and Z scores. There were 11 of the 23 patients in our series with normal DEXA scans and normal T and Z scores. There were 7 individuals with identifiable osteopenia and increased fracture risk. There were 5 individuals classified as having osteoporosis. Three in this group of 5 individuals also had reduced GFR.

CONCLUSIONS

The loss of BMD can be seen in individuals who have undergone enterocystoplasty during childhood. The loss does not seem to be related to the long term enterocystoplasty alone. The loss is more pronounced in individuals who have other risk factors such as reduced GFR. We believe the identification of BMD loss is important in order to intervene before osteoporosis occurs and leads to pathologic fracture.

LONG-TERM OUTCOME AFTER URINARY DIVERSION USING THE ILEOCECAL SEGMENT IN CHILDREN AND ADOLESCENTS - THE EFFERENT SEGMENT

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PURPOSE

To evaluate the long-term outcome after urinary diversion using the ileocecal segment in children and adolescents with special respect to the complication of the efferent segment.

MATERIAL AND METHODS

Between 1984 and 2008, the ileocecal segment was used in 125 children and adolescents for urinary diversion. Indications: neurogenic bladder n=64, exstrophy-epispadias-complex n=34, malignancy n=16, various indications n=11. In 30 patients the bladder augmentation / substitution was carried out (in 12 an additional continent cutaneous stoma was performed) and in 95 a continent cutaneous diversion. For the efferent segment, the in situ submucosally embedded appendix was used in 55 patients, an intussuscepted ileal nipple in 4 and other techniques in 7 patients.

RESULTS

The median follow-up was 15.8 years (0.4-28.5y). 4 patients died tumor-related, 4 due to complications from the meningomyelocele. 41/107 patients with a continent cutaneous stoma developed a total of 81 stomal stenosis, 17 patients had multiple stenosis (2-6x). Of those with an appendiceal stoma 49% had a stenosis in contrast to 20% of those with an intussuscepted ileal nipple ($p < 0.001$); and 5 of the 7 with other continence mechanisms. In 37 cases excision of the scar with reanastomosis of the bowel with the skin (recurrence rate 38%) and in 44 cases an endoscopic incision (recurrence rate 60%) was performed. At the last follow-up 89% of the patients with an appendiceal stoma and 82% of those with an intussuscepted ileal nipple were completely continent.

CONCLUSIONS

The in situ submucosally embedded appendix and the intussuscepted ileal nipple are reliable continence mechanism in the long term follow-up. The higher rate of stomal stenosis with the appendiceal stoma is most likely due to the smaller diameter of the appendix. Excision of the scar is better than incision of the scar.

ANALYSIS OF AUGMENTATION CYSTOPLASTY COMPLICATION RATES USING CLAVIEN-DINDO GRADING SYSTEM

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PURPOSE

Application of Clavien-Dindo grading system for augmentation cystoplasty procedures in 200 children.

MATERIAL AND METHODS

Two hundred patients (103 male, 97 female) who underwent augmentation cystoplasty between 1991-2015 were analyzed retrospectively. Complications were evaluated according to the Clavien-Dindo grading system and grouped as minor (Clavien 1-2) and major (Clavien 3-4-5). Gender, age, indications, preoperative renal function, VUR, augmentation technique, associated procedures (apendicovesicostomy, sling-bladder neck reconstruction, ureteral reimplantation) were studied to predict complications.

RESULTS

The mean age at the time of surgery was 10.8 ± 2.3 years. Cystoplasty indications were neurogenic bladder, bladder extrophy, PUV and others (74.5%, 12.5%, 5.5%, 7.5% respectively). Augmentation procedures were 116 (58%) ileocystoplasty, 63 (31.5%) autoaugmentation, 8 (4%) ureteral augmentation, 8 (4%) colcystoplasty, 5 (2.5%) gastrocystoplasty. 30 (15%) patients had chronic renal failure (CRF) preoperatively and 9 of them underwent renal transplantation in the long-term. Complications occurred in 69 (34.5%) patients (23 grade 1, 31 grade 2, 14 grade 3B, 1 grade 4A) during follow up. One patient died from ileus and gastric perforation at 12 months postoperatively.

Preoperative CRF, bladder extrophy, ileocystoplasty surgery and techniques other than autoaugmentation were significant predictors of major complications on univariate analysis where multivariate analysis revealed preoperative CRF, bladder neck procedures, bladder extrophy were significant factors of major complications respectively ($p=0.004$, 0.020 , 0.020).

CONCLUSIONS

Use of this Clavien-Dindo reporting system objectively evaluates the complications and allow surgeons to stratify complications and properly inform parents.

LONG-TERM FOLLOW-UP OF COMPOSITE BLADDER AUGMENTATION INCORPORATING SOMTACH IN A MULTI-INSTITUTIONAL COHORT OF PATIENTS WITH CLOACAL EXSTROPHY

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PURPOSE

Composite bladder augmentation (CBA), incorporating gastric and bowel segments, has the theoretical advantage of metabolic neutrality while potentially avoiding the morbidities of gastrocystoplasty, such as hematuria dysuria syndrome (HDS). The most common indication for this operation is a paucity of bowel, such as in cloacal exstrophy (CE). Despite several early descriptive studies of this technique, there are no reports of long-term follow-up in this population.

MATERIAL AND METHODS

We performed a retrospective review of CE patients ≤ 21 years old who underwent CBA from 1984-2006 at two institutions. We evaluated the incidence of mortality and morbidities related to augmentation.

RESULTS

11 patients with CE underwent CBA. Median age at initial augmentation was 6.4 years (interquartile range (IQR) 4.4-9.1). Median follow-up was 11.9 years (IQR 8.3-24.1). Two patients underwent gastrocystoplasty onto hindgut incorporated during initial bladder closure, two underwent gastrocystoplasty with subsequent ileocystoplasty, five underwent initial CBA with both stomach and ileum, and two underwent multiple augmentations with a final composition of stomach and ileum. Of the three patients (27.3%) with preoperative metabolic acidosis, two improved with CBA and one developed metabolic alkalosis. Three (27.3%) developed HDS; one improved with staged ileocystoplasty, and two were successfully treated with H₂ blockers. Two (18.2%) developed symptomatic bladder stones. There were no reported bladder perforations, bladder malignancies, urinary diversions or deaths.

CONCLUSIONS

With long-term follow-up, very few patients developed metabolic acidosis/alkalosis after CBA. We continue to use the CBA in patients with CE in order to minimize the impact on the pre-existing short gut in these patients.

PERIOPERATIVE RISK FACTORS PREDICTING COMPLICATIONS RATES OF AUGMENTATION CYSTOPLASTY USING THE MODIFIED CLAVIEN CLASSIFICATION SYSTEM IN PEDIATRIC POPULATION

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PURPOSE

To evaluate preoperative predictive factors for postoperative complications of augmentation cystoplasty in children by using the modified Clavien classification system (MCCS), which has been widely used for complication rating of surgical procedures.

MATERIAL AND METHODS

A retrospective review of medical records between 1994 and 2014 identified 117 children (64 males and 53 females) who underwent augmentation cystoplasty at two major institutions. Complications were evaluated according to the MCCS. Univariate and multivariate analyses were used to determine predictive factors affecting complication rates.

RESULTS

The mean (SD) age was 9.3 (1.9) years and the mean (SD) follow-up was 5.4 (1.1) years. The mean (SD) hospitalization time was 9.7 (3.6) days. Complications occurred in 29 (24.7%) children; 13 (11.1%) were MCCS grade I, 8 (5.1%) were grade II, 5 (4.2%) were grade III and 3 (2.5%) were grade IV.

Anti-reflux surgery, outlet resistance increasing procedures (sling, bladder neck reconstruction), Society of Fetal Urology (SFU) grade 3–4 hydronephrosis, posterior urethral valves, scoliosis and serum creatinine greater than 1.0 mg/dl were statistically significant predictors of complications on univariate analysis. Prior Botox injection history, Mitrofonof Procedure, previous surgery, gender and age were not significant predictors of complications. In the multivariate analysis Society of Fetal Urology (SFU) grade 3–4 hydronephrosis, bladder neck reconstruction and serum creatinine greater than 1.0 mg/dl were statistically significant independent predictors of complications.

CONCLUSIONS

Augmentation cystoplasty remains a valid method of treating severe bladder dysfunction in children. Society of Fetal Urology (SFU) grade 3–4 hydronephrosis, bladder neck reconstruction and serum creatinine greater than 1.0 mg/dl were the main predictive factors for postoperative complications. Use of a standardized complication grading system, such as the MCCS, should be encouraged to allow the valid comparison of complication rates between series.

LIVING WITH AN AUGMENTED BLADDER: THE EXPERIENCES OF YOUNG PEOPLE FOLLOWING THEIR SURGERY.

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1) Alder Hey NHS Foundation Trust, Department of Surgery, Liverpool, UNITED KINGDOM - 2) University of Central Lancashire & Alder Hey NHS Foundation Trust, School of Health & Children's Nursing Research Unit, Preston, UNITED KINGDOM - 3) Edge Hill University & Alder Hey Children's NHS Foundation Trust, Evidence-based Practice Research Centre & Children's Nursing Research Unit, Ormskirk, UNITED KINGDOM - 4) Alder Hey NHS Foundation Trust, Department of Surgery & Children's Nursing Research Unit, Liverpool, UNITED KINGDOM

PURPOSE

The personal experiences of young people (YP) following bladder augmentation (BA) is under researched. The aim of this study was to explore YP's life following BA. This presentation will share early concepts, which explore the experiences of life with a BA.

MATERIAL AND METHODS

A qualitative study was undertaken from 2012-2014 using interpretative phenomenological analysis (IPA). Recruitment was from one paediatric and one adult hospital, written informed consent was obtained. Face-to-face interviews were organised at a date, time & venue negotiated between the YP and researcher. Interviews were audio recorded and transcribed verbatim. Analysis was undertaken using IPA, initially case by case then by cross case analysis to identify themes.

RESULTS

Eight YP (aged 14-25 years; mean 19 years) who had a BA performed 3-14 years previously were interviewed. The findings show that prior to BA surgery, living with the unpredictable nature of their bladder was challenging and limited their engagement in social activities. Involvement in the BA surgical decision-making varied and was influenced by their age, understanding and motivation. Following surgery for some YP noticeable restrictions persisted such as regular catheterisation. Despite this YP believed that surgery had offered a sense of freedom that was previously not achievable. This is evidenced in how they talked about independence and their flexibility in their bladder management.

CONCLUSIONS

While small, this study emphasises the impact having a BA has on these YP in many aspects of their life. Surgery enhanced their wellbeing and provides them with the opportunity to normalise their lives.

S24: NOCTURNAL ENURESIS

Moderators: Guy Bogaert (Belgium), Joseph Ortenberg (USA)

ESPU Meeting on Saturday 17, October 2015, 10:59 - 11:25

10:59 - 11:04

S24-1 (LO)

★ PATIENTS WITH NOCTURNAL ENURESIS MAY HAVE BALANCE DISORDERS

Marcos Giannetti MACHADO¹, Rita Pavione Rodrigues PEREIRA², Vera KOCK³, Simone FAGUNDES³, Adriene LEBL³, Leticia AZEVEDO⁴, Francisco DENES¹ and Clarice TANAKA²

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INTRODUCTION

Balance is the ability to maintain body stability, even under disturbance. Balance requires integration of visual, somatosensory and vestibular systems. Children with enuresis have delayed maturation of motor cortex with changes in sensory and motor systems that comprise the basis of balance. Thus, we hypothesized: enuretic patients may have balance disorders.

PATIENTS AND METHODS

One hundred eleven kids with nocturnal enuresis (EG) from 7-16 years old were paired with 60 asymptomatic kids (CG) for gender, age and body mass. Two age groups were subdivided: A: 7-11 years (EG/A, N=77; CG/A N=38) and B: 12-16 years (EG/B, N=34; CG/B N=22). Balance is assessed using an electronic force plate (60 Hz) measuring the Area (A) and Velocity (VM) of Center of Pressure Displacement, which is the point of application of the resultant of vertical forces acting on the supporting surface. Sensory Integration was measured by a 60-second trial standing in four conditions: (1) open eyes, stable surface; (2) closed eyes, stable surface; (3) open eyes, unstable surface; (4) closed eyes, unstable surface. Postural adjustment was assessed using belt traction with 4% of body weight and unexpected release of it to produce a controlled postural perturbation followed by adjustments observed during 10 seconds.

RESULTS

EG/A group showed greater Area and VM compared to CG/A in all 4 sensorial conditions and greater VM with delayed recover for postural adjustment.

EG/B group only showed greater Area compared to CG/B in sensorial conditions 1, 2 and 4.

CONCLUSIONS

Enuretic patients showed worse balance compared to control group.

NOCTURNAL ENURESIS BY AGE GROUP - CHARACTERISTICS AND RESPONSE TO TREATMENT

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PURPOSE

Prior publications conclude that older children and adolescents with EN have a higher rate of additional urinary complaints mainly storage symptoms and a higher percent of concomitant conditions: constipation, soiling and ADHD. It is widely believed that treating the older child with ED is more complex and challenging. In this study we compared the characteristics of EN and response to treatment in different age groups

MATERIAL AND METHODS

All children presented to our clinic with primary or secondary, monosymptomatic or polysymptomatic EN were included. Each answered a detailed questioner to assess bedwetting. A voiding diary was filled for three days. Children categorized by age group: young (5-10 years), young-adolescents (10-13 years) and adolescents (> 13 years)

RESULTS

260 children met the inclusion criteria and were included in this study

Significant EN (more than 3 wet nights) was observed in over 90% of all cases.

There was no statistical significance between the groups regarding ADHD, deep sleepers, constipation/soiling or family history of EN,

Nocturnal polyuria (defined if nocturnal urinary volume > average functional bladder capacity) was seen in 65%, 68%, 85% in the young, young-adolescent and adolescent, respectively (P=0.058)

Overall 60% of children responded to Desmopresine as monotherapy. There was 50% response in the young, 56% in young-adolescent and 83% in the adolescent group (P=0.053).

CONCLUSIONS

It appears from our data that children in all age groups have similar severity and concomitant co-morbidities.

Older children with EN predominantly have nocturnal polyuria. A high response rate to Desmopresine as monotherapy is seen in the older children even exceeding that of younger children

HIGH SHORT-TERM EFFECTIVENESS OF MODULATED DRY BED TRAINING IN ADOLESCENTS AND YOUNG ADULTS WITH TREATMENT-RESISTANT ENURESIS

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PURPOSE

Enuresis has a considerable impact on quality of life. Two percent of the adult population suffers from enuresis. The effect of a Modulated Dry Bed Training (MDBT) in a previously therapy-resistant group of adolescents and adults with enuresis, provided by a specialized enuresis-centre, was evaluated.

MATERIAL AND METHODS

Descriptive, retrospective cohort study. Between January 2003 and July 2013, 907 patients were treated by MDBT: a 5-days/4-nights in-hospital training in small groups consisting of enuresis-anamnesis, explanation, alarm treatment and day-time activities with the purpose of increasing self-esteem. A database was filled with patient data, derived from medical files. Success of treatment was determined using ICCS-definitions, at 6 weeks and 6 months. Sensitivity analyses were performed to control for missing values.

RESULTS

Patients were aged 11–42 years (median 15, IQR 3.5), 34% female. At baseline, 65% had primary, 81% non-monosymptomatic, and 46% frequent enuresis (≥ 4 days/week). Outcome and sensitivity analysis are shown in the table.

Response category (ICCS)	6 weeks, % (n)			6 months, % (n)		
	No	Partial	Full	No	Partial	Full
Worst case scenario*	42 (381)	27 (249)	31 (277)	42 (378)	16 (141)	43 (388)
Available data	13 (76)	41 (249)	46 (277)	7 (39)	25 (141)	68 (388)
Best case scenario*	8 (76)	27 (249)	64 (582)	4 (39)	16 (141)	80 (727)

Table. Treatment results after 6 weeks, 3 and 6 months, including sensitivity analysis
 * Assumption worst-case/best-case scenario: patients with missing values had no response/full response

CONCLUSIONS

In therapy resistant adolescents and adults with enuresis, MDBT had a good short term effect.

★ SHOULD ENURETIC CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) BE TREATED DIFFERENTLY?

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PURPOSE

We aimed to study (1) whether children with ADHD exhibited greater severity of enuresis and associated symptoms as compared to age- and gender-matched children without ADHD, and (2) whether children with ADHD were more resistant to treatment than controls.

MATERIAL AND METHODS

Retrospective data review of all children seen with nocturnal enuresis (NE) and ADHD (study group) and age- and gender-matched children with NE without ADHD (control group) between 2010-2014. Presenting voiding complaints (number of weekly wet days and/or nights, daily voids, urgency), and the Bristol and Dysfunctional Voiding Symptom (DVSS) scores were compared between study and control groups before and after the initiation of enuresis treatment (ANOVA).

RESULTS

Each group consisted of 95 children (67 boys), age range 5-16 years. Study patients had significantly more severe nocturnal enuresis ($p=0.047$), associated diurnal incontinence (47.9% vs 28.4%, $p=0.006$), DVSS score (11.53 +/- 4.53 vs 9.84 +/- 3.82, $p=0.008$), and Bristol score (2.92 +/- 0.95 vs 3.23 +/- 0.87, $p=0.02$) than controls. Thirty-four study children and 26 controls were treated with behavioral modification and showed similar response (14.7% vs 19.2% , $p=0.73$). Nineteen patients and 27 controls received pharmacological treatment for NE. Response to treatment was seen in 9 (47.4%) and 6 (22.2%) respectively, with no significant statistical difference.

CONCLUSIONS

Children with ADHD had more severe voiding dysfunction and bedwetting than those without ADHD. However, the presence of ADHD did not affect the response to treatment of NE. Similar treatment strategies could be used in enuretic children with and without ADHD.

POSTURE AND MOBILITY CHANGES IN PATIENTS WITH NOCTURNAL ENURESIS

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INTRODUCTION

Posture refers to body alignment maintaining proper conditions to perform movements. Neuro-muscular system integration is required for maintenance of posture as well for adequate voiding function. Patients with enuresis were assessed for changes of posture and hip and spine mobility.

PATIENTS AND METHODS

97 patients with nocturnal enuresis (EG) ranging from 7-16 years were paired with 60 asymptomatic kids (CG) for gender, age, and body mass index. Posture was assessed placing anatomical land markers in the process mastoid (PM); 7th cervical vertebrae (C7); anterior superior iliac spines (ASIS); posterior superior iliac spines (PSIS); greater trochanter (GT) and lateral maleolus (LM). A photograph was acquired while quiet standing. Angles and distances were obtained from landmarks connections using a software to assess the posture variables: ante/retroversion of pelvis, ante/retropulsion of pelvis, and protusion/retraction of head. The mobility of hip flexion, extension and spine flexibility were measured using goniometry, index of Schober/Stibor and Bank of Wells.

RESULTS

EG showed higher angles of anterversion of pelvis than CG ($p < 0.001$). EG presented 76% protraction of head while 61% of CG presented retraction of head. EG showed less spine mobility than CG ($p = 0.001$); goniometry showed lower hip extension in EG than CG ($p < 0.001$).

CONCLUSIONS

Kids with enuresis presented alterations in posture with anterversion of pelvis and head protraction. Diminished mobility and motion extension range of hip was also observed.

TREATMENT REFRACTORINESS OF PRIMARY NONMONOSYMPTOMATIC ENURESIS IS ASSOICATED WITH SPINA BIFIDA OCCULTA AND RECTAL STOOL IMPACTION

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PURPOSE

To evaluate the effects of the spina bifida occulta (SBO) and stool length in rectum (SLR) on treatment response in primary nonmonosymptomatic enuresis (PNME)

MATERIAL AND METHODS

We retrospectively analyzed 151 children with PNME who had been treated by a single pediatric urologist between July 2010 and July 2014. A simple abdominal radiograph was conducted to examine SBO and SLR. The average voided volume by estimated bladder capacity (AVV/EBC) ratio was calculated using frequency volume chart. Insufficient response was defined as no response or partial response. The logistic regression analysis was used to clarify a significant parameter for affecting insufficient response. Cumulative response rate was analyzed using Kaplan-Meier curve.

RESULTS

Mean age of children was 6.9 years. Of these patients, SBO was detected in 28.5%. A mean SLR was 6.8cm, and a mean AVV was 107 ml. During a mean follow-up of 12.5 months, insufficient response had occurred 63.3% at 6 months and 39.8% at 12 months. In the logistic regression analysis, SBO (OR 2.78, $p=0.025$) and $SLR \geq 8\text{cm}$ (OR 4.62, $p=0.008$) were only significant parameters for affecting insufficient response in 6 months. The SBO (OR 6.71, $p<0.01$), $SLR \geq 8\text{cm}$ (OR 7.97, $p<0.01$), and AVV/EBC ratio ≤ 0.25 had significant correlation with insufficient response in 12 months. In Kaplan-Meier curve, a risk group consist of SBO or $SLR \geq 8\text{cm}$ had worse response rate than another ($p=0.008$).

CONCLUSIONS

The results highlight clinical importance of SBO and SLR for predicting treatment refractoriness. These parameters would be applied for stratification of children with PNME.

S25: VIDEO SESSION 1

Moderators: Kirstin Meldrum (USA), Margaret Baka-Ostrowska (Poland)

ESPU Meeting on Saturday 17, October 2015, 12:55 - 13:35

12:55 - 13:00

S25-1 (VP)

★ THE MULTI-INSTITUTIONAL BLADDER EXSTROPHY CONSORTIUM: TECHNICAL STANDARDIZATION OF COMPLETE PRIMARY REPAIR OF EXSTROPHY IN THE BOY

Joseph G. BORER¹, Evalynn VASQUEZ¹, Douglas A. CANNING², John V. KRYGER³, Dana WEISS², Travis GROTH³, Aseem SHUKLA², Alexandra BELLOWS¹ and Michael E. MITCHELL³

1) Boston Children's Hospital, Urology, Boston, USA - 2) Children's Hospital of Philadelphia, Urology, Philadelphia, USA - 3) Children's Hospital of Wisconsin, Urology, Milwaukee, USA

INTRODUCTION

To increase experience and proficiency in the care of bladder exstrophy (BE), the Multi-Institutional BE Consortium (MIBEC) was formed in February 2013. Our objective is to describe the technical standardization of complete primary repair of BE (CPRE) in boys developed through this collaborative effort.

MATERIAL AND METHODS

Three institutions alternately served as hosts with observation, commentary, and critique by the collaborating surgeons either present in person or via real-time video conferencing. Employing the MIBEC method and protocol, CPRE with bilateral iliac osteotomy was performed at between 1-3 months of age. Patients were prospectively followed for outcomes.

RESULTS

From February 2013-February 2015, MIBEC surgeons performed CPRE in 15 consecutive boys at median age of 2.9 months (0.4-28.8 months) for 13 boys with classic BE and 2 with penopubic epispadias. One boy had a midshaft hypospadiac meatus at CPRE completion. There was no dehiscence. Mild hydronephrosis was present in 2 boys with dilated distal ureters in 1, pyelonephritis occurred in 1 boy, and 2 boys developed urethrocutaneous fistula. Periods of dryness with normal urinary stream have been observed in 5 boys. Techniques employed include initial ventral dissection of urethra using bipolar electrocautery, a deliberate attempt to tailor the bladder neck with proximal urethral lengthening, and interrupted suture technique for urethral and bladder closure.

CONCLUSIONS

CPRE technique in the boy was standardized through this MIBEC. We noted a low complication rate and are encouraged by early signs of continence and spontaneous voiding in some. Technical refinement of CPRE and standardization of postoperative care are ongoing.

★ THE STEP-BY-STEP TECHNIQUE OF RADICAL SOFT TISSUE MOBILISATION (KELLY PROCEDURE) IN MALE BLADDER EXSTROPHY

Marc-David LECLAIR, Thierry VILLEMAGNE, Sébastien FARAJ and Etienne SUPLY
Children University Hospital, Pediatric Surgery, Nantes, FRANCE

PURPOSE

The Radical-Soft Tissue Mobilization (RTSM, Kelly procedure), has been described as an alternative to staged reconstruction and to Complete primary repair in bladder exstrophy and incontinent epispadias.

We aimed to demonstrate and illustrate the different steps of this technique.

MATERIAL AND METHODS

A 12 month-old boy, with classic bladder exstrophy, underwent bladder closure without osteotomy at birth. Bladder assessment at 12 months showed small 30mL bladder, early bilateral VUR, and uncorrected proximal epispadias.

A RSTM mobilization is performed, as described by KELLY-JH. *Pediatr Surg Int* 1995;10:298-304 :

- dissection of the bladder and internal pelvic ring
- incision of the internal obturator fascia, and division of the levator ani fibers
- ventral dissection of the penis
- detachment of the corpora from the ischio-pubic branches, in a superosteal plan
- dissection of the pudendal pedicle, at the exit of the Alcock's canal
- dissection of the urethral plate from the corpora cavernosa

Reconstruction :

- ureteric reimplantation
- urethro-cervicoplasty
- urethral transposition in hypospadias
- re-approximation of mobilized structures around the bladder-neck and the neo-urethra
- corpora derotation and attachment to the neo-symphysis
- penile skin reconstruction

The video recording is shown in a step-by-step editing, with drawings.

An abdominal CT-scan with angiogram, performed at day 10 postoperatively for another reason, allowed to perform 3D-Volume rendering reconstruction of the corpora cavernosa, showing their anterior translation.

CONCLUSION

The Kelly procedure is a reproducible technique of urethro-cervicoplasty in patients with bladder exstrophy or incontinent epispadias, potentially providing active infra-cervical resistances, and optimizing penile length for epispadias reconstruction

★ A NOVEL PERINEAL SLING TECHNIQUE USING ANTERIOR TIBIALIS TENDON ALLOGRAFT AND ORTHOPEDIC ISCHIAL BONE ANCHORS

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PURPOSE

Management of urinary symptoms in pediatric patients with neurogenic bladder and incompetent bladder neck offers a complex challenge to pediatric urologists. In our experience with manufactured bulbar urethral compressive sling kits to treat urinary incontinence of these patients we have recognized bone anchor displacement due to "pull-back" effect, resulting in failure of the sling and persistent incontinence. An alternate combination of sling material and bone anchor to reduce anchor failure was sought. We describe a novel perineal sling technique utilizing more robust materials typically used in orthopedic reconstructive surgery including anterior tibialis tendon allograft and ischial bone anchors.

MATERIAL AND METHODS

Our technique was performed on an 11-year-old male with neurogenic bladder and open bladder neck. Patient is placed in lithotomy position. An incision was made in the perineum followed by lateral subcutaneous tissue dissection towards the ischium. Once fluoroscopy confirmed pelvic bone landmarks, Arthrex® Corkscrew FT II Suture Anchors with a 5.5 x 15mm Titanium screw and double loaded #2 Fiberwires were used under fluoroscopic guidance to place bilateral, single ischial bone anchors. Anterior tibialis tendon allograft was sutured in place by taking wide bites perpendicular to the grain of the tendinous fibers and securely tied down to the bone anchor. Proper tension of the allograft and compression of the urethra was obtained and confirmed by catheter placement and cystoscopy. The catheter was easily inserted, cystoscopy demonstrated coaptation of the bulbar urethra.

RESULTS

Operative time for our index case was 185 minutes with minimal blood loss. The patient was discharged home on post-operative day one. At five-week follow-up, patient was dry in between catheterizations. There were no peri-operative complications and no post-operative complications to date.

CONCLUSIONS

Use of anterior tibialis tendon allograft in conjunction with Arthrex® ischial bone anchors to treat incompetent bladder neck is a safe and feasible technique.

★ SURGICAL MANAGEMENT OF COMPLETE PENILE DUPLICATION: CASE REPORT

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PURPOSE

Penile duplication is a very rare anomaly and seen once in every 5.5 million live births. It can be isolated, or accompanied by other congenital anomalies. We present the surgical management of a 4,5 years old patient with complete penile duplication.

MATERIAL AND METHODS

The video of the surgical technic of penile duplication was edited and the patient data was reviewed retrospectively.

RESULTS

The physical examination in newborn period revealed complete penile duplication, urine flow from both penis, meconium flow from right urethra and anal atresia. After evaluations, double rectum and double bladder detected and diagnosis was caudal duplication syndrome. Anterior lypomeningomyelocell, syringohydromyeli cavity and tethered cord were detected by spinal magnetic resonance imaging. Erection of both penises were observed.

Grade 5 vesicoureteral reflux were established to left kidney. Reduced compliance and nearly normal capacity were determined by urodynamic study. Two cavernous body and one spongious body were detected in each penile body by ultrasound.

Ileostomy and than Stephens abdominoperineal pull through were performed in neonatal period. One of the double colon exised by total colectomy. Left total penectomy and right to left, end to side urethro-urethroostomy were performed.

There was no trouble on follow up of 6 months postoperatively. On observation, his voiding was normal. On evaluation of upper urinary system, no dilation was determined, but only minimal residual urine was detected in both bladder.

CONCLUSIONS

Penil duplication is a rare anomaly which has different features for each patient. Because of this, the treatment of anomaly is sophisticated and requires experience.

★ PENILE PROSTHESIS IMPLANTATION IN A PATIENT WITH CONGENITAL APHALIA TREATED BY DE CASTRO TECHNIQUE TEN YEARS AGO. IS IT FEASIBLE?

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PURPOSE

Penile agenesis is a rare congenital abnormality with an incidence of 1 in 30 million births. The aim of this video is to demonstrate penile prosthesis implantation in a young adult, born with aphalia that underwent De Castro neophalloplasty in childhood.

MATERIAL AND METHODS

A boy born with aphalia underwent at age of 11 years a De Castro neophalloplasty at our institution. He had a satisfactory clinical outcome, reported no psychological complaints and other findings. After nine years of surgery, he looked for alternatives to start sexual activity. After measuring his neo-phallus we found 13 cm of length. We proposed him penile prosthesis implantation. Through a perineal incision we constructed a tunnel up to the distal portion of the neophallus. We encircled one semi-rigid component of the prosthesis into a polypropylene mesh, that was sutured to periosteum of inferior pubic arch to give support to the prosthesis.

RESULTS

The patient had an excellent outcome and awaits longer followup to start sexual intercourse.

CONCLUSIONS

We were able to attest clinical feasibility of prosthesis implantation by neophalloplasty at infancy due to congenital aphalia. We believe that this procedure will confirm the hypothesis that this rare abnormality can be treated accordingly without promoting gender reassignment. Further psychological analysis will confirm if those patients can have also a pleasant sexual history.

S26: EXSTROPHY-EPISPADIAS COMPLEX

Moderators: Rosalia Misseri (USA), Wolfgang Rösch (Germany)

ESPU Meeting on Saturday 17, October 2015, 13:35 - 14:35

13:35 - 13:40

S26-1 (LO)

★ LONG-TERM CONTINENCE OUTCOMES IN CLASSIC BLADDER EXSTROPHY

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PURPOSE

A major goal of bladder exstrophy (BE) surgery is to achieve micturating urinary continence or controlled dryness. This study aims to quantify continence outcomes in classic BE managed using neonatal or delayed closure in a single institution.

MATERIAL AND METHODS

Patients with classic BE were identified from the authors' prospectively maintained database 1999-2015. The following outcomes were measured: timing of closure (neonatal vs delayed), continence procedures (bladder neck repair, urinary diversion), actual urinary continence according to a nationally agreed continence score (see below). Only patients 5 years of age or older were included in the study. Fisher's Exact Test was used to compare the proportion of patients able to void per urethra in each group, with $P < 0.05$ considered significant.

RESULTS

Forty seven patients with classic bladder exstrophy were identified. 35 are voiding urethrally, 11 perform intermittent self-catheterisation, 10 underwent bladder neck reconstruction; 12 patients required a continent diversion. Of the 35 patients voiding per urethra, 7 remain wet (Score 0), 10 have dry intervals but still required protection (Score 1), 5 are dry during the day but wet at night (Score 2), 16 are dry day and night (Score 3), 1 is dry during the night but wet during the day (Score 4). 15/25 and 13/22 patients respectively in the neonatal and the delayed group demonstrated a continence score between 1 and 4 ($P=0.592$).

		Primary neonatal closure	Delayed closure
Number		25	22
Mean age (SD) years		11 (2)	7 (1)
Bladder neck reconstruction		6	4
Intermittent urethral catheterisation		8	3
Continent diversion		7	5
Continence Score	0	3/18	4/17
	1	2/18	8/17
	2	4/18	1/17
	3	9/18	3/17
	4	0/18	1/17

CONCLUSIONS

In the authors' experience, delaying exstrophy closure has so far not resulted in a different proportion of patients achieving urinary continence compared to neonatal closure. Longer follow-up may alter the findings of this study.

★ THE MEDIUM TERM CONTINENCE OUTCOMES OF THE KELLY PROCEDURE FOR BLADDER EXSTROPHY REPAIR

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PURPOSE

Spontaneous voiding continence is the functional goal in the management of bladder exstrophy. We present our medium term results with the Kelly procedure, which incorporates a radical soft tissue dissection and reconstruction of the bladder neck and penis.

MATERIAL AND METHODS

Medical notes of patients with classic bladder exstrophy who underwent a Kelly procedure at our institution between 2000 and 2014 were reviewed. Bladder exstrophy variants and those who had a primary closure elsewhere were excluded. Continence was defined using a 4 level scoring-system and was assessed at 1, 3, 5 and 7-10 years post Kelly procedure. Patients achieving levels 2/3(dry by day/dry day and night) were considered to have a good outcome. Ultrasound imaging was used to monitor the upper renal tracts.

RESULTS

One hundred and ten consecutive patients(66-male, 44-female) were identified. All underwent the Kelly procedure, regardless of bladder capacity. Mean follow-up was 4.74 years(range 0.3-13.6 years). Level 2/3 continence was achieved in 64% of male and 79% of female patients at 5 years (60 patients in total) and 59% of male and 67% female patients at 7-10 years(30 patients in total) post-Kelly. Statistical analysis showed significantly improved continence over the first 5 years(Friedman test, $p < 0.005$). Female patients had better continence levels at year 1 and comparable levels with male patients after year 3(Mann-Whitney U-test, $p = 0.044$ (year 1), $p = 0.535$ (year 3), $p = 0.569$ (year 5)). Seven patients required augmentation cystoplasty, one a mitrofanoff only and four are urethral clean intermittent catheterization dependent.

CONCLUSIONS

The Kelly procedure can achieve high levels of spontaneous voiding continence in bladder exstrophy.

★ A CRITICAL APPRAISAL OF CONTINENCE IN BLADDER EXSTROPHY: LONG-TERM OUTCOMES OF THE COMPLETE PRIMARY REPAIR

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PURPOSE

Complete primary repair of bladder exstrophy (CPRE) is widely used for classic bladder exstrophy (CBE) closure. Studies are limited given lack of long-term follow-up. We present our long-term experience with CPRE hypothesizing that, if more stringent reporting criteria are employed, long-term continence rates following CPRE are lower than previously reported

MATERIAL AND METHODS

We conducted a retrospective chart review on all patients with CBE undergoing initial CPRE at our institution from 1990 to present. We excluded patients with follow-up less than 7 years, age at last follow-up younger than 7, or incomplete documentation. Continence was defined by volitional voiding at least every 3 hours and daytime dryness regardless of nighttime continence status. Number of secondary continence procedures was assessed.

RESULTS

Of 60 patients with CBE followed at our institution, 25 met inclusion criteria with a median follow-up of 11.7 years (range 7-20 years). Eight patients (32.0%) were continent, including 4 of 14 males (28.6%) and 4 of 11 females (36.3%). Secondary continence procedures in continent and incontinent patients are shown in theTable. Six of 17 incontinent patients (35.3%) were on intermittent catheterization at last follow-up.

	Continent	Incontinent
CPRE Alone	4	3
Bladder Neck Reconstruction (BNR)	1	2
Bladder Neck Injection (BNI)	1	6
BNR + BNI	2	6

CONCLUSIONS

Within the limitations of retrospective chart review, 16% of patients achieved continence by CPRE alone. Surgeries to gain continence following CPRE are common. Strictly-defined long-term continence is achieved in one-third of patients. Improved reporting strategies and assessments on patient impact are needed.

SEXUAL FUNCTION AND FERTILITY OF WOMEN WITH BLADDER EXSTROPHY AFTER URINARY DIVERSION

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PURPOSE

To evaluate female patients born with classic bladder exstrophy having undergone continent urinary diversion (CUD) for sexual function, social integration and fertility.

MATERIAL AND METHODS

The medical records of female exstrophy patients having undergone CUD in our department were reviewed. Patients were asked to complete questionnaires relating to sexual function, psychosocial integration and maternity.

RESULTS

29 patients were included in the study. Follow-up was 22.3 years. 62% had undergone primary and 38% secondary CUD after failed reconstruction of the exstrophic bladder. Except for desire, sexual function as measured by the Female Sexual Function Index (FSFI) was only little affected in all domains, with a mean total score of 28.4. 72% had a stable relationship and 41% were married. 31% achieved a high level of education. Pelvic organ prolapse requiring surgical repair occurred in 38%. 12 patients conceived a total of 16 healthy children. Pregnancy rates were significantly higher in patients with primary compared with secondary CUD

CONCLUSIONS

Sexual function, fertility and social integration of female exstrophy patients having undergone CUD appears to be comparable with previously reported series of patients in whom the bladder had been preserved. Evaluation of sexual function, gynecologic pathologies and fertility should be part of the long-term follow-up and treatment options should be discussed if required. Nowadays, modern concepts of exstrophy repair should be applied whenever possible to improve the cosmetic and functional results of reconstructive surgery.

THE PATIENT REPORTED IMPACT OF PELVIC ORGAN PROLAPSE ON CONTINENCE AND SEXUAL FUNCTION IN WOMEN WITH EXSTROPHY-EPISPADIAS COMPLEX

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PURPOSE

Bladder exstrophy is a major congenital anomaly that involves pelvic deformities and abnormal pelvic floor musculature, resulting in a "box-like, open book" pelvis with an anteriorly positioned bladder. The authors reviewed long-term urogynecologic issues faced by adult women born with exstrophy-epispadias complex (EEC) that developed pelvic organ prolapse (POP).

MATERIAL AND METHODS

The authors retrospectively reviewed medical records of identified patients. Information regarding sexual function, continence status, and quality of life was assessed through surveys, including the POP-Urinary Incontinence Sexual Questionnaire (PISQ-12) and the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF). Higher scores indicated higher function/

RESULTS

Eleven patients (46%) of 24 identified patients, ages 21 to 54 years old, 10 with Classic Bladder Exstrophy and 1 with cloacal exstrophy, completed surveys. Patients underwent first correction of POP at a median age of 19.5 (6-46) years and median time since correction was 7.5 (6-18) years. Eight (73%) patients reported reductions in quality of life resulting from incontinence. Correction of POP improved mean ICIQ-UI SF (0-21) from 18.3 to 7.0, with a lower score indicating better function. Sexual function was assessed for the time period prior to correction of prolapse as well as the most recent six months. Seven (64%) of our patients were sexually active prior to prolapse surgery. For those seven, mean PISQ-12 scores for the Behavioral-Emotive Domain and Physical Domain were 7.5 and 11.2, respectively. Following correction of prolapse, mean scores for the Behavioral Domain and Physical Domain were 5.40 and 3.10, representing improvements in both areas. The mean total PISQ-12 score (0-48) before correction of POP was 21 which improved to 10.4 post-operatively.

CONCLUSIONS

Identification and correction of pelvic organ prolapse may offer notable improvements in the lives of adult female EEC patients.

★ A NATIONWIDE REGISTER STUDY ON MATERNAL AND FOETAL FACTORS IN BLADDER EXSTROPHY

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PURPOSE

Bladder exstrophy is a rare congenital complex malformation where the underlying cause is largely unknown with both environmental and genetic mechanisms involved.

The aim of this study was to conduct a nationwide epidemiological study related to maternal and foetal risk factors of bladder exstrophy in Sweden 1973-2011.

MATERIAL AND METHODS

120 patients were identified in the Medical Birth Register with ICD codes; 753.50, 753F and Q64.1, 1973-2011. The cases were matched with 5 controls per patient for calendar year and sex, and a case-control study was performed by linkage between several national registers.

RESULTS

The study showed a total live-birth prevalence of 2.98:100 000 with a male-to-female ratio of 1.14:1. We found a higher risk among mothers with Nordic origin of birth, higher age, extremes of BMI and smoking. Neither maternal disease, parity nor assisted conception were identified as risk factors for bladder exstrophy. Delivery mode, birth weight, gestational week at birth, Apgar and survival rate did not differ from controls. Associated malformations were present in 7.5% of the cases, including anal atresia, esophageal atresia, CDH, cardiac malformations, cleft palate and malformations of extremities. 41% underwent surgery for congenital inguinal hernia and 11% of the boys had surgery for retentio testis.

CONCLUSIONS

This national register study on bladder exstrophy demonstrated a prevalence of 2.98:100 000 live-births with an almost equal sex ratio. The majority of the cases were isolated without major associated malformations. Nordic maternal origin of birth, higher age, extremes of BMI and smoking were associated with higher risk.

★ PREOPERATIVE CARE OF POLYPOID EXPOSED MUCOSAL TEMPLATE IN BLADDER EXSTROPHY: THE ROLE OF HIGH-BARRIER PLASTIC WRAPS IN REDUCING INFLAMMATION AND POLYP SIZE

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PURPOSE

Little attention has been dedicated to the preoperative management of bladder polyps in exstrophy patients. When delayed closure is planned, non-adherent films (plastic wraps) are recommended for covering the exposed mucosa preoperatively. This study aims to assess the role of high-barrier plastic wraps in reducing polyps' size and number, and decreasing the inflammation and allergic reactions in exstrophy cases.

MATERIAL AND METHODS

Twelve patients with polypoid exstrophic bladders were randomized into two groups to receive preoperative care with polyvinylidene chloride (PVDC) traditional wrap A (n=5) or high-barrier wrap B (n=7). The wraps were applied for six months before surgery. Polyp size and number, and incidence of infection and skin allergy were assessed every 2-month. The characteristics of the wraps were also evaluated by Fourier transform infrared spectroscopy (FTIS), scanning electron microscopy, evaporation tests and bacterial culture tests.

RESULTS

Polyps' size and number decreased in patients who applied the high-barrier wrap B after 6 months. Two of five patients using wrap A suffered skin allergy while no allergic reaction was detected in group B. Better results were obtained in the entire laboratory evaluations performed on wrap B regarding evaporation tests and microbial culture tests. Wrap B had higher integrity and smaller pores in scanning electron microscopy.

CONCLUSIONS

Application of an appropriate wrap may result in lower rates of complications preoperatively. Polyps' size and number and morbidity may significantly decrease by application of a high-barrier wrap. Certain PVDC wraps with more integrity and less evaporative permeability may be more "exstrophy-friendly".

BLADDER POLYPOSIS IN THE SETTING OF BLADDER EXSTROPHY-EPISPADIAS COMPLEX (EEC)

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PURPOSE

Bladder polyposis is common in the exstrophy-epispadias complex(EEC). Polyps usually lead to a delay in closure when encountered at primary or secondary closure due to the altered quality of the bladder plate. The authors sought to understand the outcomes of bladder closure, longitudinal bladder growth, continence rate, and factors that impact continence outcomes in these patients.

MATERIAL AND METHODS

A prospectively kept database of 1212 patients with EEC was reviewed for bladder exstrophy (BE) and cloacal exstrophy (CE) closed at the author's institution with the diagnosis of bladder polyposis. Patients' demographics, use of osteotomy, other reconstructive operations, continence procedures, and ultimate urinary continence were recorded.

RESULTS

Thirty-three patients had primary polyps (Group 1) and 22 patients had secondary polyps(Group 2). The mean age at closure of Group 1 and 2 were 6.06 ± 8.07 months and 11.85 ± 7.16 months, respectively. Polyp reoccurrence was observed in just one patient. Primary polyp was significantly less frequent in females than males . Mean number of polyps was significantly higher in male patients(p -value=0.008). Of these 55 patients with bladder polyposis, 50 had more than 2 years of follow-up and were selected for further analysis. Forty-one percent of patients in Group 1 had delayed closure due to polyposis. Of the patients who had undergone continence procedures, 66.7% of Group 1 and 69.2% of Group 2 were continent. On multivariate analysis, female gender was the only factor significantly associated with continence . In Group 1, children who had delayed closure had similar bladder growth and capacity to those who had neonatal closure.

CONCLUSIONS

This study suggested that primary polyps are more frequent in male patients and that continence after closure of a polypoid bladder may be more successful in females. Importantly, delaying primary closure in the presence of polyps does not influence the chances of successful bladder growth, capacity, or continence.

★ A NOVEL METHOD FOR EARLY DETECTION OF DEEP WOUND INFECTION/DEHISCENCE IN BLADDER EXSTROPHY: POSTOPERATIVE SERIAL NON-CONTACT INFRARED TEMPERATURE MEASUREMENT OF SURGICAL WOUND

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PURPOSE

Surgical wound infection is a major risk factor for bladder dehiscence (BD) after bladder exstrophy surgery. This study aims to introduce a practical method for early detection and management of surgical site infection and impending BD after exstrophy surgery.

MATERIAL AND METHODS

Eleven exstrophy patients who underwent single stage reconstruction were enrolled. A non-contact digital infrared temperature measurement device was used to measure temperatures on forehead and the surgical wound site prior, during and after reconstruction. Temperatures were documented every 8 hours for 12 days postoperatively. Parents were trained to measure the temperatures for two weeks following discharge. The same postoperative protocol was applied for 13 hypospadias patients (group II) as the control group.

RESULTS

None of the patients in the hypospadias group developed local temperature rise during the postoperative follow-up. However, two children with exstrophy developed temperature rise in the surgical wound area without rise in forehead temperature. The wound site temperature reached 39.2°C in one case and 39.4°C in another at 12 and 16 days postoperatively, respectively. Urine and wound cultures obtained at the time of temperature rise confirmed gram-positive infection. After starting the appropriate antibiotic regimen, the wound temperatures gradually decreased.

CONCLUSIONS

Serial measurement of the surgical wound site temperature may be a promising method following exstrophy surgery. This feasible technique might predict the occurrence of deep wound infection and help surgeons to prevent consequent dehiscence and total wound opening before classic and visible signs and symptoms of wound infection occur.

IMPACT OF CONCOMITANT INGUINAL HERNIA REPAIR AT THE TIME OF INITIAL EXSTROPHY REPAIR

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PURPOSE

Patients with classic bladder exstrophy have a reported 81% (male) and 10% (female) incidence of inguinal hernias that present either during the newborn period or later in life. In 2006, we modified our approach to this condition by performing concomitant inguinal hernia repair at the time of initial exstrophy repair in the vast majority of patients undergoing initial surgery at our institution to test the hypothesis that simultaneous inguinal hernia repair will reduce the later incidence of inguinal hernias in this high risk group.

MATERIAL AND METHODS

We conducted a retrospective chart review comparing patients with bladder exstrophy initially treated with initial complete primary exstrophy repair (CPRE) alone at our institution from 1990 to 2005 to those undergoing simultaneous CPRE and inguinal hernia repair between 2006 and 2014 . We excluded patients with incomplete follow-up.

RESULTS

Between 1990 and 2006, 30 patients underwent initial exstrophy repair. Of these patients, 11 presented later for repair of a symptomatic inguinal hernia or undescended testis at a median age of 19 months. After 2006, 15 patients underwent simultaneous hernia repair at the time of initial CPRE. None of these patients has presented with a clinically symptomatic inguinal hernia with a median follow-up of 52 months.

CONCLUSIONS

Simultaneous inguinal hernia repair at the time of initial exstrophy repair appears associated with decreased incidence of later inguinal hernia in this high-risk patient population.

STRIVING FOR EXCELLENCE IN BLADDER EXSTROPHY CARE: WHAT DOES IT COST TO COLLABORATE?

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PURPOSE

Successful primary closure is critical for optimal long-term results in children with bladder exstrophy. We developed the Multi-Institutional Bladder Exstrophy Consortium (MIBEC), joining three institutions in order to improve the care of children born with this rare defect. This effort increases each surgeon's experience and enhances learning by a collective input of expertise. However, this commitment has required considerable investment in time and dollars.

MATERIAL AND METHODS

MIBEC teams travel to the host institution for observation and coaching during complete primary repair of bladder exstrophy. Costs included: start-up, home and visitor travel, lodging and food, and opportunity. We defined the opportunity cost (OC) per day, the amount that would have been generated as revenue if the surgeon was not traveling, as annual collections of the surgeon/annual clinical days worked. Total OC = OC per day x work days spent in travel and on-site observation.

RESULTS

Complete cost data was available for 20/23 site visits. The total cost of collaboration was \$354,095 over 24 months. This figure is the sum of \$6,873 for startup costs, \$24,303 for the hosting sites, and \$22,773 for the visitors, plus OC's. On average, each operating event cost \$17,585, with \$15,007 of that being OC. The most valuable commodity was time, with total OC of \$300,146.

CONCLUSIONS

Value in medicine has been defined as outcome divided by cost. Each MIBEC institution invested a significant sum to execute this collaborative experience. A future challenge will be to assess whether this investment leads to downstream cost savings and improved outcomes.

SHORT-TERM OUTCOMES OF THE MULTI-INSTITUTIONAL BLADDER EXSTROPHY CONSORTIUM: SUCCESSES AND COMPLICATIONS IN THE FIRST TWO YEARS OF COLLABORATION

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PURPOSE

To increase experience and proficiency in the care of patients with bladder exstrophy (BE), the Multi-Institutional BE Consortium (MIBEC) was formed. We report short-term outcomes and lessons learned from this unique model of continuing surgical education.

MATERIAL AND METHODS

Three institutions alternately served as hosts with observation, commentary and critique by collaborating surgeons. Employing the MIBEC method and protocol, we performed complete primary repair of BE (CPRE) with bilateral iliac osteotomy at 1-3 months of age. Patients were prospectively followed for outcomes including complications.

RESULTS

From February 2013-February 2015, MIBEC surgeons performed CPRE in 28 consecutive patients (23 classic BE and 5 epispadias). Thirteen girls and 15 boys underwent CPRE at median age of 2.27 months. There were no dehiscences. 18 patients are without complications. One boy had a hypospadiac urethral meatus at CPRE completion. Hydronephrosis of mild or moderate grade was present in 8 girls and 2 boys. One or more episode(s) of pyelonephritis occurred in 5 girls and 1 boy. Two boys developed urethrocutaneous fistula, and 4 girls had varying degrees of urinary retention requiring temporary clean intermittent catheterization (CIC). Complete retention developed in 2 of these 4 girls; 1 with a stenotic bladder outlet will require diversion to vesicostomy, and 1 with meatal stenosis resulting in bladder rupture continues CIC after repair.

CONCLUSIONS

Several girls had significant complications following CPRE. We noted a low complication rate in the boys, and are encouraged by early signs of continence and spontaneous voiding in some boys and girls. Technical refinement of CPRE is ongoing.

RADICAL SOFT TISSUE MOBILISATION AND EXTENSIVE TOTAL PENILE CORPORAL DISSECTION FOR THE REPAIRMENT OF THE BLADDER EXTROPHY AND EPISPADIAS

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PURPOSE

To evaluate early postoperative period after radical soft tissue mobilization(RSTM) and total penile corporal dissection for bladder exstrophy epispadias complex(EEC).

MATERIAL AND METHODS

The medical records of EEC patients who were operated between 2010-2015 were analyzed, retrospectively. The operative technique consisted of the RTSM, bilateral extensive penile corporal dissection from the pubic arms and a tension free bladder neck reconstruction as in Kelly procedure. Excision of excessive polyps and dorsal detrusorotomy if the bladder is too small. Urethroplasty and epispadias repair If the urtehral plate is healthy and long enough, creation of penoscrotal hypospadias and epispadias repair, if not. Genital reconstruction with the use of anatomical repositioning of the vagina including clitoral and corporal plasty over the neourethra in girls.

RESULTS

The technique was performed in 62 patients(F:15,M:47), mean age of was 58(r:4-336) months. The preoperative status was primary EEC in 20pts., EEC with closed bladder in 15pts., repaired EEC with total urinary incontinence in 7pts.(epispadias:1,EEC:6), failed EEC repairs in 14pts.(epispadias:3, EEC:11), epispadias in 6pts. Early surgical complications were catheter dislodgement(n: 4), bladder neck fistula(n:2), urethrocutaneous fistula(n:1), skin dehiscence(n:2), fascial dehiscence(n:2), perirenal urinoma(n:1), urosepsis(n:2), urethral stricture(n:1).The patients developed neither corporal-glandular tissue loss nor ischemia. Bladder neck fistulas disappeared after local care. Transurethral voiding was established in 45 patients. CIC was started in 17 patents.

CONCLUSIONS

RSTM and extensive penile corporal release from the pubic arms allow a tension free urogenital reconstruction in EEC with an acceptable complication rate. Even small bladders can be successfully closed using RTSM, excision of the polypoid mucosal tissue and dorsal detrusorotomy. This surgical approach might decrease the need of augmentation procedures in this group of patienti. Changes in the upper urinary tract and urinary continence should be closely followed up.

COMBINING ROUTINE DELAYED, STAGED CLOSURE WITH PELVIC OSTEOTOMIES AND EXTERNAL PELVIC FIXATION IS A SUCCESSFUL STRATEGY IN THE TREATMENT OF BLADDER EXSTROPY

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PURPOSE

A successful primary bladder exstrophy closure (BEC) represents the initial fundamental step to obtaining micturating continence in patients with bladder exstrophy. Every described technique to date carries a risk of significant complication including wound dehiscence, suprapubic fistula formation and bladder prolapse. The authors aim to assess whether these complications may be avoided by adopting a routine delayed, staged BEC in combination with bilateral osteotomies and external pelvic fixation.

MATERIAL AND METHODS

Since 2007 the authors have routinely delayed BEC to 3-6 months of age, regardless of the size and quality of the bladder template. Bladder pseudo-polyps, if present, are removed prior to closure. During BEC bilateral ureteric stents and a suprapubic catheter are placed and left in situ for 4 weeks. BEC is combined with bilateral oblique pelvic osteotomies, performed by the orthopaedic team, and an external fixator is placed for 3-4 weeks. A mermaid bandage is applied to the legs without traction for 5-6 weeks. Gender, age at closure and post-operative complications were the outcomes prospectively collected on consecutive patients undergoing exstrophy closure at one institution between 2007 and 2014.

RESULTS

Forty-four patients were treated during the study period (31 male), including one redo surgery after complete dehiscence of the original closure performed at another institution. Median age at time of bladder closure was 4 months (IQR 2.75-6 months). All patients had a successful closure. No patients developed wound dehiscence, suprapubic fistula or bladder prolapse. Patients have been followed up for a median duration of three years (IQR 1-5 years).

CONCLUSIONS

Delayed, staged bladder exstrophy closure in combination with bilateral osteotomies and external fixation application provides a successful and reliable treatment without the risk of developing wound dehiscence, suprapubic fistula or bladder prolapse.

CONGENITAL RENAL ANOMALIES IN CLOACAL EXSTROPHY: IS THERE A DIFFERENCE?

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PURPOSE

Patients with classic bladder exstrophy are at an increased risk of having congenital renal anomalies. We questioned the incidence of renal anomalies in children with cloacal exstrophy.

MATERIAL AND METHODS

IRB-approved retrospective review of 112 patients with cloacal exstrophy. Data points included renal and Müllerian anatomy. Abnormal renal anatomy was defined as a solitary kidney, malrotation, renal ectopia, congenital cysts, duplication and/or proven obstruction. Abnormal Müllerian anatomy was defined as uterine or vaginal duplication, obstruction, and/or absence. Statistical analysis included two-tailed Fisher's exact probability test.

RESULTS

Of 66 genetic males and 46 genetic females, complete data was available for 40 males and 35 females. Average age at analysis was 18.6 ± 1.29 years. Renal anomalies were identified in 48% of patients. They occurred more commonly in males than females (60% of males vs 34.3% of females, $p=0.037$). Males were more likely to have a solitary kidney than females (32.5% of males vs 8.6% of females, $p=0.022$). Table 1 lists incidence of renal anomalies by genetic sex. Multiple anomalies were identified in five patients, four of which had solitary kidneys. Female patients with renal anomalies were significantly more likely to have abnormal Müllerian structures than those with two normal kidneys (47.8% vs 8.3%, $p=0.027$).

Sex	Normal Kidneys	Solitary Kidney	Malrotated Kidney	Ectopic Kidney	Congenital Cysts	Duplicated Collecting System	UVJ Obstruction
XY	16	13	6	7	0	1	1
XX	23	3	4	5	1	1	0

UVJ = ureterovesical junction

CONCLUSIONS

Although renal anomalies are common in male and female patients with cloacal exstrophy, they seem to be more prevalent in males. Female patients with aberrant renal anatomy are at a higher risk of Müllerian abnormalities.

PERIOPERATIVE TRANSFUSION RISK IN CLASSIC BLADDER EXSTROPHY CLOSURE: RESULTS FROM A NATIONAL DATABASE REVIEW

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PURPOSE

Blood transfusions have known risks, and emerging evidence suggests systemic immunomodulatory effects from transfusion. We sought to determine risk factors for perioperative transfusion in patients undergoing closure for classic bladder exstrophy (CBE).

MATERIAL AND METHODS

Patients undergoing CBE closure between 2012 and 2013 were identified by Current Procedure Terminology codes from The National Surgical Quality Improvement Program Pediatric database, which encompasses 61 participating hospitals. Patient demographics, comorbidities, and operative characteristics were analyzed for associations with transfusion requirement intraoperatively or in the first 72 hours postoperatively.

RESULTS

Fifty-eight patients met our criteria. Thirty-four patients (58.6%) underwent transfusion. Patients who underwent transfusion were more likely to be over three days of age than those who did not (94.1% versus 74.8%; $p=0.026$). Transfused patients were also more likely than those not transfused to have undergone osteotomy, (82.4% versus 54.2%; $p=0.020$), had an external fixation (47.1% versus 8.3%; $p=0.002$), had longer median operative times (446 versus 324 minutes; $p<0.001$), and had longer average postoperative lengths of stay (LOS) (40 versus 18 days; $p=0.019$).

CONCLUSIONS

A significant number of patients undergoing CBE closure required transfusion in the perioperative period (58.6%), increasing to 82.4% in patients undergoing osteotomies. Further risk factors for transfusion (external fixation, increased operative times, and longer LOS) may also be related to osteotomy. In light of the risks associated with transfusion, our data adds to the ongoing debate regarding osteotomy in CBE closure and emphasizes the need for proper family counseling to address this concern at the time of surgical planning.

THE EFFECT OF TIMING OF COMPLETE PRIMARY REPAIR OF BLADDER EXSTROPHY ON THE NEED FOR INGUINAL HERNIA REPAIR

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INTRODUCTION

Patients with bladder exstrophy (BE) have an increased incidence of inguinal hernia. We determined whether inguinal hernia occurs more frequently in infants who undergo immediate (≤ 72 hours of life) versus delayed complete primary repair of bladder exstrophy (CPRE).

MATERIAL AND METHODS

We performed a multi-institutional retrospective chart review on children with BE repaired by CPRE. Data collected included preoperative characteristics, age at CPRE, operative details and postoperative course including whether or not inguinal hernia occurred following CPRE. Logistic regression was used to examine the effect of gender and timing of closure on the need for inguinal hernia repair.

RESULTS

Ninety-eight children with BE from 3 institutions were closed by CPRE with a median follow up of 68 months (0 – 240 months). Forty-nine patients were closed within 72 hours of birth, of which 28 patients (57%) underwent repair of inguinal hernia within a median time of 2.5 months (0-49.4 months). In comparison, of the 49 patients closed more than 72 hours after birth, only 17 patients (34%) had inguinal hernias repaired within a median time of 1.15 months (-9.7-26.6 months). Female gender and delayed repair were shown to be protective factors against inguinal hernia ($p < 0.05$). Osteotomies were performed in all patients closed beyond 72 hours of life, but in only 7 cases of early closure, 3 of whom developed a hernia.

CONCLUSIONS

Bladder exstrophy patients with delayed CPRE had decreased incidence of inguinal hernias after closure compared to those that were closed within 72 hours of age.

QUALITY OF LIFE IN BLADDER EXSTROPHY-EPISPADIAS IN FEMALE PATIENTS

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PURPOSE

The aim of this study is to examine the quality-of-life (QoL), urinary continence, sexual function and overall health in a long term series of female patients with bladder exstrophy-epispadias complex.

MATERIAL AND METHODS

A retrospective review of 33 female patients with bladder exstrophy-epispadias complex born between 1964 and 1996 was performed. The patients were asked to complete four validated questionnaires to evaluate their QoL regarding urinary continence and sexual activity (ICIQ, Potenziani-14 and PISQ-12 questionnaires). The overall QoL was assessed with the SF 36 questionnaire. Demographics were evaluated. Statistical analysis was performed to compare the general QoL to the general population.

RESULTS

Median age of our patients was 26 years (range 18-50). 30% of patients had urinary incontinence at the ICIQ with a low to moderate repercussion on their QoL. 84% had active sexual lives with a moderate to severe repercussion due to the urinary incontinence. 12 patients got married with 8 gestations and 5 births. SF-36 reported general QoL comparable with the general population in 5 out of 8 items. Differences were seen in the mental health, emotional role and physical functioning items ($p=0.005$) the main factors for those differences were the poor body image, anxiety and the urinary incontinence. 70% presented a satisfactory social life.

CONCLUSIONS

Female patients with bladder exstrophy-epispadias complex reported a normal QoL in 5 of 8 items in the SF-36 questionnaire. Urinary incontinence was the main factor for the moderately decreased QoL according to specific questionnaires. 70% had a satisfactory social life.

DELAYED VERSUS EARLY EXSTROPHY CLOSURE - ANALYSIS OF COMPLICATIONS RATE

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PURPOSE

The aim of the study is to analyse the influence of osteotomy and time of primary bladder extrophy closure in regard to early postoperative complications.

MATERIAL AND METHODS

We analyzed retrospectively documentation of 46 patients after primary bladder closure operated in our institution between 2004 and 2014. Patients were randomized in three groups: group A - 12 newborns operated in the first 3 days of life (without osteotomy), group B - 12 newborns operated between 4th and 28th day of life (with posterior iliac osteotomy), group C - 22 patients operated after 28th day of life (with posterior iliac osteotomy), median 46 days. Occurrence of the wound dehiscency, bladder fistula or re-exstrophy of the bladder was analyzed. Results were statistically evaluated with the chi-square test.

RESULTS

In group A complications were observed in 3 patients (25%): 1 bladder outlet dehiscency and 2 bladder re-exstrophy. In group B complication rate was 42% - 5 patients with bladder outlet dehiscency. The lowest complication rate was observed in the group C. There was only 1 patient with bladder outlet dehiscency in this group. None bladder fistula was observed. The chi-square test shows statistical importance.

CONCLUSIONS

Bladder exstrophy closure with posterior iliac osteotomy diminished the complications rate when done after 28th day of life.

SEXUAL FUNCTION IN FEMALES WITH EXSTROPHY-EPISPADIAS COMPLEX - A SURVEY OF THE GERMAN CURE-NET

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PURPOSE

Few data are available referring to sexual function in female patients with exstrophy-epispadias complex (EEC). To investigate this, data of adult female patients of the German multicenter network for congenital uro-rectal malformations (CURE-Net) were assessed.

MATERIAL AND METHODS

61 adult females (≥ 18 years) recruited by CURE-Net between 2009 and 2012 were contacted and asked to fill out two questionnaires, one about their current sexual life and the other one about medical data like malformation classification, operation procedures, relationship status and child wish/previous pregnancies. Sexual function was assessed using the validated German version of the Female Sexual Function Index (FSFI).

RESULTS

20 females (33%) filled out both questionnaires (median age 28 years, IQR 23-30 years). The majority of them lived in a committed partnership (60%). 55% had a classical bladder exstrophy. 65% had regularly sexual intercourse, further 20% less frequently and with pain. Introitus plasty was done in 45%. 40% were reconstructed with primary or secondary urinary diversion, further 40% were reconstructed in a staged or single-staged approach with their bladder in place. Mean total FSFI for all participants was 22.3 (IQR 11.5-32.6). Mean individual domain scores were each 3.81 in desire and arousal, 4.16 in lubrication, 3.50 in orgasm, 3.28 in satisfaction and 3.70 in pain. Comparison of mean individual domain scores between the two operations approaches were similar with a slightly higher trend to a better sexual function for those reconstructed with primary or secondary urinary diversion.

CONCLUSIONS

Most of the participants lived in a committed partnership and had regularly sexual intercourse. However, moderate FSFI values show a need in improving sexual function and thereby quality of life.

S27: LOWER URINARY TRACT

Moderators: Rafal Chrzan (Netherlands), Pat McKenna (USA)

ESPU Meeting on Saturday 17, October 2015, 15:15 - 16:07

15:15 - 15:20

S27-1 (LO)

★ RANDOMIZED CLINICAL TRIAL OF LIDOCANE ANALGESIA FOR TRANSURETHRAL BLADDER CATHETERIZATION IN YOUNG CHILDREN

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PURPOSE

Transurethral bladder catheterization (TUBC) is frequently performed for the collection of sterile urine. Intraurethral lidocaine (IL) reduces pain from TUBC in older children, but efficacy is established in younger patients. We performed a randomized clinical trial of children in our pediatric emergency department hypothesizing that IL reduces TUBC-associated pain.

MATERIAL AND METHODS

Children aged 0-36 months undergoing TUBC were randomized to receive 2% IL 5 minutes before procedure or no analgesia. We filmed baseline infant state, lidocaine application, TUBC, and infant state one minute post-TUBC. Parents assigned a Visual Analog Scale (VAS) pain score following TUBC. Independent, blinded reviewers assigned pain scores using Faces, Legs, Arms, Cry, and Consolability (FLACC) and Modified Behavioral Pain Score (MBPS) scales. Pain scores were compared using the Wilcoxon rank-sum test.

RESULTS

Seventy-three of 80 enrolled patients had analyzable data. Intervention and control groups were similar in mean age (13 vs 12 mo, respectively) and gender (62% vs 59% female, respectively). No differences were detected in pain by FLACC or MBPS scores between groups (Table). Results were similar between males and females.

	IL (N = 35)	No Analgesia (N = 41)	P-Value
FLACC Score post-TURC (median, 95% CI)	8, 7-9	9, 8-10	.09
MBPS score post-TURC (median, 95% CI)	9, 8-9	9, 9-9	0.89
Parental VAS Score, post-TURBC (median, 95% CI)	5, 4-6	7, 6-8	<0.001
FLACC score, IL application (median, 95% CI)	9, 7-9	-	-

CONCLUSIONS

Intraurethral lidocaine instillation before TUBC did not improve independently assigned procedural pain scores although parental perception of pain scores were lower with IL. Further study should be performed to improve analgesia for this highly painful procedure.

★ THE EFFECT OF URODYNAMICS CATHETER ON UROFLOW AND VOIDING PATTERNS IN CHILDREN

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PURPOSE

Uroflow and urodynamics are commonly used for demonstrating bladder functions. In this study we aimed to demonstrate the effect of urodynamics catheter on uroflow parameters.

MATERIAL AND METHODS

This prospective study was performed from May 2014 until January 2015 on patients presenting to our pediatric urology clinic with daytime or day and nighttime incontinence in whom urodynamics were indicated. Patients with neurogenic or anatomic problems were excluded. Patients were chosen through simple randomisation and each patient had uroflow measurements with urodynamics catheter (after 3rd filling), immediately after catheter removal and 1 week after catheter removal. Uroflow parameters were compared between groups. Statistical analysis between groups was performed using ANOVA and post-hoc Tukey analysis and $p < 0.05$ was considered as significant.

RESULTS

Forty patients (18 male, 22 female) with an average age of 10.1 were included in this study. A statistically significant difference between groups was observed for maximum flow (Q_{max}), time to reach maximum flow, flow time, voiding time, average flow (Q_{ave}) and pelvic floor muscle activity while no difference was observed for voided volume or postvoiding residue. While there was a difference between voiding patterns, this was not statistically significant.

CONCLUSIONS

This study has demonstrated a statistically significant effect that urodynamics catheter has on nearly all uroflow parameters. Therefore, EMG-uroflow studies should be performed at a separate time for patients undergoing urodynamic studies.

WHAT IS THE RISK OF URINE CONTAMINATION FOR NON-TOILET-TRAINED AND UNCIRCUMCISED BOYS?

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PURPOSE

Contamination during urine collection makes diagnosing urinary tract infections (UTI) difficult, particularly for young children. Few studies are available for uncircumcised and non-toilet-trained boys. The aim of this study was to evaluate urine contamination and to assess any differences in the initial and midstream urine samples from non-toilet-trained, uncircumcised boys.

MATERIAL AND METHODS

A prospective diagnostic study between early and midstream urine samples was conducted on asymptomatic patients in a pediatric surgery department. The clean void method was performed in non-toilet-trained boys under general anesthesia. The exclusion criteria were circumcision, older than three years of age, recent antibiotics treatment, and recent UTI. A urinalysis and quantitative culture were taken and compared between early and midstream urine samples. A positive culture was defined as a colony count of more than 5×10^4 CFU/mL.

RESULTS

Forty-four patients were enrolled in the study, and 31 satisfactory samples were obtained. The high contamination rate found in the early stream (n = 16; 51%) versus midstream (n = 5; 16%) was statistically significant (p < 0.01 by Fisher's exact test). The positive culture from the early stream sample was statistically associated with a lower age (p = 0.02).

CONCLUSIONS

The clean void method in non-toilet-trained, uncircumcised boys provides high-contaminated urine samples for both early and midstream urine samples. Therefore, caution is required for the positive diagnosis of UTI in this population with the use of bag samples or clean void method.

THE USE OF ANTICHOLINERGIC MEDICATION IN BOYS WITH POSTERIOR URETHRAL VALVES

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PURPOSE

To review the efficacy of Anticholinergic medication (AC) in boys with Posterior urethral valves (PUV) with particular reference to urodynamic outcomes.

MATERIAL AND METHODS

Retrospective review of invasive (IUD) and non-invasive (NIUD) urodynamics of PUV boys who were commenced on AC between 2006 and 2015. Data presented as median (range).

RESULTS

Twenty boys, age 48.5 months (15-67), were commenced on AC for incontinence (n=10, 50%) and renal impairment (n=10, 50%). In 14 IUD were available pre- and post-AC, in 5 a combination of IUD/NIUD and in 1 NIUD only, an average of 7months (1-39) post AC commencement. Oxybutynin was used in 16, modified-release oxybutynin in 2 and tolterodine in 2. Bladder capacity (BC) increased by an average of 75mls (p=0.004), and PVR by 40mls (p=0.17). Clean Intermittent Catheterisation was used by 6 boys prior AC and required in a further 3 after AC was commenced. Maximum detrusor overactive (max DO) pressure decreased by an average of 40cmH₂O (p=0.001) and voiding max pdet by 58cmH₂O (p=0.007). Presence of vesicoureteric reflux was demonstrated in 8 renal units (n=6) before AC treatment and only in 3 post AC. There was no significant change in detrusor pressure rise at end-fill (p det end-fill) or post treatment serum creatinine. (See table). Continence parameters were improved in 6/10 (60%) boys. 1 boy each reported constipation, difficulty initiating stream and abdominal pain.

	Pre- and post-AC treatment		
	Pre(range)	Post(range)	P value
BC (mls)	135(24-327)	210(59-571)	0.004
Max DO (cm H ₂ O)	56.8 (0-117)	16.9(0-59)	0.001
max p det (cm H ₂ O)	123(83-229)	65(34-127)	0.007
p det end-fill (cm H ₂ O)	14.7(0-40)	14.9(0-33)	0.9
PVR (mls)	25(0-70)	65(0-290)	0.17
Creatinine (umol/l)	117(28-439)	124(33-451)	0.09

CONCLUSIONS

AC in boys with PUV is associated with favourable improvements in urodynamic parameters, clinical status and manageable adverse effects, however an increased PVR may necessitate commencement of CIC.

★ SECONDARY BLADDER NECK OBSTRUCTION (2°BNO) IN BOYS WITH A HISTORY OF POSTERIOR URETHRAL VALVES - REVISITED

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PURPOSE

The diagnosis of 2°BNO in boys with a history of posterior urethral valves (PUV) is complicated given that radiographically the bladder neck typically appears narrow and uroflow parameters may appear grossly normal in the face of a powerful detrusor contraction. We have been evaluating various combinations of uroflow and detrusor pressure measurements to diagnose 2°BNO and herein wanted to test their usefulness.

MATERIAL AND METHODS

We analyzed the findings in 132 boys with a history of PUV who had undergone urodynamics and who were able to void on command for a uroflow/EMG. The following 3 empirically developed combinations were used to determine the presence of unequivocal 2°BNO: 1. Pdet>100cmH₂O regardless of flow; 2. Pdet>80cmH₂O and Qave<10cc/sec; and 3. Pdet>60cmH₂O and Qave<5cc/sec. Absence of 2°BNO was considered when voiding Pdet was <40cmH₂O, Qmax>15cm/sec and Qave>10cm/sec. In between values were considered equivocal.

RESULTS

Based on the above criteria, 58 (44%) were categorized as unobstructed, 42 (32%) as equivocal and 32 (24%) as unequivocal. 14 boys with unequivocal and 14 with equivocal obstruction were treated with alpha-blockers. Those thought to have 2°BNO were placed on alpha-blockers. In the unequivocal group on alpha-blockers, mean voiding Pdet decreased from 107.3 to 41.2cmH₂O, Qave increased from 6.1 to 16.4cm/sec and Qmax from 12.5 to 24.7cm/sec. Similar though less improvement occurred in the equivocal group.

CONCLUSIONS

Our findings not only identified dramatic and statistically significant improvement in pressure/flow studies with alpha-blocker therapy thus validating the above cut-off values, they also help to confirm that 2°BNO is a real finding and that improvement in pressure flow studies can be accomplished without bladder neck incision. The diagnosis of 2°BNO should be considered in boys with a history of PUV who have persistent hydronephrosis, non-resolving LUTS, increased detrusor voiding pressures, and/or impaired uroflow or emptying. While using combinations of values at first may appear cumbersome, their value in predicting alpha-blocker therapy success makes them very useful.

PRESSURE AT PRESENTING VOLUME (PPV) TO EVALUATE THE VALIDITY OF URODYNAMIC TESTING

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PURPOSE

Urodynamic evaluation plays a key role in the evaluation and treatment of patients with bladder dysfunction. However, due to the artificial nature of filling, pressures can at times be falsely elevated and hence not accurately reflect bladder behavior. Using the initial bladder pressure at the time of patient presentation provides a natural fill data point that can be used to assess the validity of this clinically important test.

MATERIAL AND METHODS

Patients presenting for cystometry between January 2010 and December 2013 underwent measurement of bladder pressure upon insertion of the urodynamic catheter. Presenting volume and the pressure measured before draining this urine (Pressure at Presenting Volume: PPV) were recorded. When a volume equal to the presenting volume had been instilled during cystometry, this point on the tracing was labeled filling pressure (FP).

RESULTS

A total of 309 patients were evaluated. Indications for the urodynamic evaluation included neurogenic bladder (133), bladder dysfunction (84), evaluation for tethered cord (53), cerebral palsy (16), pathology related to bladder outlet obstruction (9), and other (14). In one-third of cases the PPV recorded prior to initiating the study was significantly lower than the FP measured during the study (34%, N=104). Patients presenting with their bladder containing 75%-100% of expected bladder capacity were significantly more likely to have a PPV lower than the FP measured during the cystometrogram (relative to patients who presented with a less distended bladder) ($p = 0.03$).

CONCLUSIONS

Pressure at Presenting Volume (PPV) provides a simple means of assessing the validity of urodynamic pressures. This may be most useful when the patient presents with a nearly full bladder. Use of this simple measurement has the potential to limit the number of children who might otherwise undergo unnecessary intervention such as enterocystoplasty.

POSTVOIDAL RESIDUAL URINE IS THE SINGLE PROGNOSTIC FACTOR TO PREDICT THE TREATMENT OUTCOME IN CHILDREN WITH LOWER URINARY TRACT DYSFUNCTION

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PURPOSE

To investigate the prognostic values of noninvasive diagnostic tools (uroflowmetry, postvoiding residue measurement, dysfunctional voiding and incontinence symptom scale(DVISS), urinary ultrasound) on the response of lower urinary tract dysfunction treatment.

MATERIAL AND METHODS

We analyzed the data of 116 patients between ages of 5-14, who were treated for voiding dysfunction from November 2006 to September 2013 retrospectively. All patients with neurogenic conditions were excluded from the study. DVISS questionnaire was filled by patients' parents. In addition, uroflowmetry, post voiding residual urine(PVR) measurement and urinary tract ultrasound were performed. All patients received urotherapy as primary treatment. In addition, some patients were treated with pharmacotherapy and/or other treatment options. During follow-up(mean 7,27 months), DVISS, uroflowmetry, PVR and urinary ultrasound tests were repeated.

RESULTS

Mean age value was 7.68 years. Mean follow up period was 7.27 months. Type or number of complaints($p=0,0736$ and $p=1,000$ respectively), age($p=0,884$), UTI status($p=1,000$), bladder wall thickness($p=0,514$), hydronephrosis($p=0,776$), uroflowmetry pattern($p=0,653$), constipation($P=0,678$) and DVISS($p=0,321$) were not found to have any significant effect to predict the treatment outcome. The pretreatment presence of residual urine more than 10% of expected bladder capacity was the single prognostic factor ($p=0.041$). DVISS improvement was worse amongst the patients who had increased PVR(75%), as opposed to the patients who hadn't(%93,9).

CONCLUSIONS

Non-invasive diagnostic tools are sufficient in first line evaluation of children with voiding dysfunction. Amongst these tests, presence of post voiding residual urine is the single risk factor for worse prognosis.

EVALUATION OF SUBJECTIVE AND OBJECTIVE IMPROVEMENT AFTER MEATOTOMY- LONG TERM FOLLOW UP

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PURPOSE

Meatal stenosis affects 3% of circumcised neonates and is associated with bothersome symptoms. Our aim was to assess the subjective and objective improvement after surgical correction of meatal stenosis

MATERIAL AND METHODS

After institutional review board approval, 25 children were prospectively enrolled. All children were evaluated subjectively (symptoms questionnaire and physical exam) and objectively (uroflow) before surgery, 1 month after surgery and after a long follow-up period (median 43 months).

Continuous variables were compared using the Wilcoxon (Mann-Whitney) test and dichotomous variables were compared using Fisher's exact test

RESULTS

Long-term follow-up was available for 15 children, on which this report will focus.

All children were symptomatic before surgery, most with multiple symptoms. After surgery 13/15 were symptom-free and 12/15 remained symptom free at long-term follow-up.

Eight of fifteen (53%) children had a flat uroflow curve before surgery, 14/15 had a normal uroflow curve after surgery and 12/15 had a normal curve at long-term follow-up.

Maximal flow (Q_{max}) was 11.5, 15.3 and 12.6 ml/s before surgery, one month after surgery and at long-term follow-up, respectively. While the immediate improvement was statistically significant (p=0.02) the long-term improvement was not (p=0.4). Six of 15 children had a normal Q_{max} before surgery. Normal Q_{max} was seen in 11/15 and 12/15 children one month and long-term after surgery, respectively (p=0.057). Postvoid residual was 35.6ml, 14.5ml and 11.5ml before surgery, one month after surgery and at long-term follow-up, respectively. (p=0.045)

CONCLUSIONS

The symptomatic improvement after surgery is almost uniform and sustainable after long-term follow-up. Our results imply objective improvement as well, but a larger study is needed to confirm this finding.

IS IT NECESSARY TO REPEAT THE UROFLOWMETRY IN CHILDREN?

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PURPOSE

The goal of this study was to evaluate the necessity of a repeated UF in children by comparing the parameters of repeated UF.

MATERIAL AND METHODS

Medical records of the children who first visited our hospital between August 2013 and May 2014 for lower urinary tract symptoms were obtained retrospectively. During this period, 120 children with age of 6-10 years who underwent UF were included in the study. Of these, 58 children underwent repeated UF. UF was repeated under the conditions below: abnormal shape, including staccato or irregular, tower, interruption or plateau and too small volume for evaluation (less than 30% of estimated bladder capacity).

RESULTS

Average values of the voided volume (87.8 ± 63.9 vs 141.9 ± 72.1 , $p < 0.001$), maximal (14.5 ± 9.0 vs 19.3 ± 6.8 , $p < 0.001$) and average flow rate (8.4 ± 5.3 vs 12.5 ± 4.4 , $p < 0.001$) were lower in repeated UF group than 62 single UF children, while other parameters demonstrated no significant differences. On 2nd UF, voided volume was significantly increased (87.8 ± 63.9 to 136.7 ± 74.7 ml, $p < 0.001$), followed by increased maximal flow rate (14.5 ± 9.0 to 18.6 ± 9.6 ml/s, $p < 0.001$) and average flow rate. After classification according to the amount of increased voided volume, the group showing more increase of voided volume on 2nd UF (Group 2) demonstrated less residual volume (12.2 ± 17.2 vs 0.67 ± 2.0 ml, $p = 0.002$) and voiding time (16.7 ± 9.2 vs 9.5 ± 5.2 , $p = 0.002$) on 1st UF than Group 1 (less increase of voided volume on 2nd UF). Children showing small voided volume and tower shape uroflow curve on 1st UF were more prevalent in group 1. Children showing small voided volume and tower shape uroflow curve on 1st UF demonstrated significant increase of voided volume on 2nd UF (20.7 ± 9.0 vs 48.6 ± 22.0 ml, $p < 0.001$; 27.9 ± 18.7 vs 59.0 ± 20.0 ml, $p = 0.008$).

CONCLUSIONS

Repetition of uroflowmetric study seems to increase voided volume, consequently maximal flow rate and these changes were demonstrated more clearly in children showing small voided volume or tower shape of uroflow curve in the 1st test.

POSTERIOR URETHRAL VALVES: IS VESICoureTERAL REFLUX A RISK FACTOR FOR PROGRESSION TO RENAL FAILURE?

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PURPOSE

To assess outcomes of patients with posterior urethral valves (PUVs).

MATERIAL AND METHODS

We conducted a retrospective analysis of patients presenting to our institution for management of PUVs from 2006-2014. Univariate and multivariate analysis was performed to determine risk factors for endpoints of chronic kidney disease (CKD), end-stage renal disease (ESRD), and need for multiple surgeries.

RESULTS

Of 104 patients identified, 42.3% (44/104) were diagnosed prenatally, and 31.8% (14/44) of those underwent prenatal intervention. Postnatally, 90.4% underwent transurethral resection of PUVs (TUR-PUVs) as the initial operation. Vesicostomy in 4.8% was the next most common index surgery. At last follow-up, 20.2% CKD of at least stage IIIA, and 8.6% had progressed to ESRD. Antenatal diagnosis, prematurity, abnormal initial RUS, and elevated creatinine on presentation and at nadir were significantly associated with progression to CKD and ESRD on univariate analysis. Nadir creatinine was the only independent predictor of final renal function on multivariate analysis. Pre- and postoperative VUR and recurrent UTIs were associated with the need for multiple surgical interventions, but not with poor renal outcomes.

CONCLUSIONS

The majority of patients with PUVs (56.7%) required a single surgery and maintained renal function with CKD II or better (79.8%) up to 2 years after initial operative intervention. While multiple factors were associated with poor renal outcomes, nadir creatinine was the only independent predictor. VUR and recurrent UTIs were associated with need for more than one operation, but were not associated with poor renal outcomes. Longer follow-up is necessary to identify patients at risk for delayed progression to CKD or ESRD.

EVALUATING THE METHODS FOR POSTVOIDING RESIDUAL VOLUME ASSESSMENT AND FACTORS THAT CAN INTERFERE WITH THE RESULTS

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PURPOSE

Postvoiding residual (PVR) urine assessment is an important tool in the evaluation of patients with lower urinary tract symptoms. In this study we evaluate the three methods used to assess postvoiding residual urine and factors that can interfere with the results.

MATERIAL AND METHODS

A total of 32 patients, 18 with spina bifida and 14 with overactive bladder syndrome are enrolled in the study. PVR evaluation with urethral catheterisation, Caresono PadScan HD5® ultrasound and visual residual urine assessment on micturition cystourethrogram are compared. The relation of postvoiding residual urine with VUR status, kidney scarring on DMSA scan, bladder trabeculation on cystourethrogram are evaluated.

RESULTS

Mean PVR values are not significantly different between groups for any method.

In overactive group, ultrasound and catheterisation correlate well for PVR determination while catheterisation with cystourethrogram and ultrasound with cystourethrogram did not.

In spina bifida group, all three methods correlate well with each other for PVR determination.

In both spina and overactive group, presence of renal scarring did not demonstrate any significant relation with PVR. PVR values are higher in the presence of VUR even though not statistically significant. Similarly higher PVR values are observed with higher VUR grades even though not statistically significant.

CONCLUSIONS

PVR assessment with ultrasound is a reliable method as urethral catheterisation. Although, PVR evaluation on cystourethrogram is less reliable than others, it can provide additional information in certain circumstances (VUR, bladder trabeculation etc.). Although statistical significance could not be demonstrated, higher residual volume is observed in the presence of renal scarring, VUR and bladder trabeculation.

SINGLE-STAGE URETHROPLASTY WITH BUCCAL MUCOSAL INLAY GRAFT FOR STRICTURE DUE TO BALANITIS XEROTICA OBLITERANS IN BOYS

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PURPOSE

Balanitis Xerotica Obliterans (BXO) is a common foreskin pathology but in severe cases affects urethra causing stricture with sequelae including bladder dysfunction and upper tract compromise. Repeated urethral dilatation or steroid therapy temporizes definitive surgical management. We present data from our prospective study using single-stage buccal mucosal inlay graft (BMIG) following stricturotomy.

PATIENTS AND METHODS

Five patients with histologically proven urethral BXO were identified. Pre-operative uroflowmetry measurements were taken, including flow rates and voiding duration. The same surgeon performed the procedure in all patients. Cystoscopy confirmed the location of the stricture. The stricture was excised to expose tunica albuginea. BMG was harvested, prepared and placed as an inlay graft and sutured to the native urethra. The urethra was tubularised around a Ch12 Foley catheter and a cystostomy button placed. Uroflowmetry was repeated after 2,4 and 6 months post-operatively. Student's t-test was used to compare mean values.

RESULTS

Median age at time of BMIG urethroplasty was 13 years 5 months (range 10yr 7mo-17yr 8mo); median follow-up of seven months (range 2-11mo). All the boys had a successful outcome; mean maximum urinary flow rate improved significantly from 4.2ml/s to 26ml/s ($p=0.0002$). Voiding time reduced from 65.2 to 15.8 seconds ($p=0.0012$) with no significant change in voided volume. The table below shows the results obtained. One boy has a fistula in distal penis, awaiting closure but has good stream from tip.

	Pre-BMIG (mean)	Post-BMIG (mean)	p value
Max flow rate (ml/s)	4.2	26	0.0002
Mean flow rate (ml/s)	1.6	12.2	0.0023
Time to max flow (s)	23.4	5.6	0.224
Total voiding time (s)	65.2	15.8	0.0012
Total volume voided (ml)	151.8	197.4	0.4139

CONCLUSIONS

We show that single-stage BMIG placement is successful, resulting in excellent functional results.

IN WHAT AGE CHILDREN TREATED FOR POSTERIOR URETHRAL VALVES BECOME CONTINENT?

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PURPOSE

To evaluate the age at which patients with PUV achieve continence and the factors contributing to this.

MATERIAL AND METHODS

Hospital records of consecutive 72 PUV patients treated from 1990 to 2008 were reviewed. Continence was defined by the absence of weekly wetting episodes. The age having gained daytime and nighttime continence was registered in the patient files in 50 and 51 patients respectively. Patient characteristics were evaluated.

RESULTS

The patients achieved daytime and nighttime continence at the age of 5.36 ± 3.3 and 5.21 ± 3.0 years respectively. This was later than in a recent national study with unselected child population (2.3 ± 0.5 and 2.9 ± 1.2 years resp, $p < 0.001$). Patients diagnosed at early age (antenatally or neonatally) stopped daytime wetting significantly later than those diagnosed as older (5.9 vs. 4.1 years, $p = 0.019$). The patients with abnormally high s-creatinine values at the age of 5 years became continent at an older age compared to those with normal creatinine (daytime 6.0 vs. 4.1 years, $p = 0.055$; nighttime 5.5 vs. 3.7 years, $p = 0.032$). The patients who had temporary ring-type supravescical diversion done primarily did not differ from their counterparts without diversion in respect to the age of gaining continence. The patients who had $>10\%$ residuals of the expected bladder volume at the age of 5-7 years had significantly higher s-creatinine values ($p = 0.011$).

CONCLUSIONS

Patients with posterior urethral valves achieve continence remarkably late. Delayed continence is especially prominent in patients with early diagnosis and high serum creatinine values. Polyuria as a feature of renal injury may be involved.

S28: LAPAROSCOPY / ROBOTICS 2

Moderators: Mohan Gundeti (USA), Henning Olsen (Denmark)

ESPU Meeting on Saturday 17, October 2015, 16:07 - 16:49

16:07 - 16:10

S28-1 (PP)

★ PYELOPLASTY IN ROBOTIC SURGERY (PIRS): VALIDATION OF A NOVEL SURGICAL TRAINING MODEL

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PURPOSE

Increased utility of robotic pyeloplasty in children requires realistic simulation for efficient training and objective skills assessment. We describe a novel training model and its validation in surgeon volunteers and porcine kidneys.

MATERIAL AND METHODS

A total of 19 urological surgeons enrolled into the study. Subjects were categorized according to their robotic surgery experience; novice (0 cases), intermediate (100 cases). Baseline demographics and prior minimally invasive surgery experience were recorded. All participants were instructed with a video of the PIRS model prior to performing the exercise. A dilated ureter and renal pelvis were achieved by installation of saline via the distal ureter with clamping. Five mm robotic instruments were used for this model. Global Evaluative Assessment of Robotic Skills (GEARS) scores and exercise specific performance scores were recorded. A post-training survey was used to assess for face (simulator realism) and content (training usefulness) validity. Statistical analysis included comparison of all variables between the three groups (construct validity).

RESULTS

There were 10 novices, 6 intermediates and 3 experts. Participants rated the PIRS model as very realistic (median visual analog score 4/5) and rated the tasks difficulty at an appropriate level (3/5). Participants confirmed that the tasks were useful for training (5/5), where an experienced robotic surgeon could perform all tasks (5/5). Experts outperformed intermediates and novices in median GEARS scores (30.0 vs 21.7 vs 14.7, respectively, $p < 0.05$).

CONCLUSIONS

The PIRS training model is a reproducible and realistic model for pediatric robotic pyeloplasty (face, content and construct validity).

★ LAPAROSCOPIC PYELOPLASTY: IMPACT OF 3D VISION LAPAROSCOPY AND ARTICULATING SHEARS

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INTRODUCTION

To compare outcomes of laparoscopic pyeloplasty in a cohort of children with 3D vision laparoscopy and articulating shears to a cohort with standard 2D laparoscopy

PATIENT AND METHODS

A retrospective chart review of 33 consecutive patients with ureteropelvic junction obstruction who underwent laparoscopic pyeloplasty by a single surgeon from 2006 to 2013. The current 3D cohort (n=8) was compared to the previous 2D cohort (n=19), excluding cases from 2001-2005 to account for the learning curve. Descriptive data and operative time, dimension, presence of a crossing vessel, length of hospital stay, and complication rate were compared between the two groups. Articulating shears were used for pelvotomy and spatulation of the ureter. Statistical tests included linear regression models and chi square tests for trend

RESULTS

The median age and weight of the population was 7.5 yrs and 28.5kg. Operative time per case was decreased by an average of 48 minutes in the group undergoing 3D laparoscopic surgery compared to the group undergoing 2D laparoscopic surgery (p=0.02). When adjusted for the presence of a crossing vessel, operative time was still significantly shorter in the 3D group (p=0.03). There was no difference in median age, weight, or presence of crossing vessel between both groups. Complication rate and length of hospital stay were not significantly affected by the use of 3D laparoscopy. The majority (7 out of 8) of 3D cases were performed using the laparoscopic flexible scissors, which was significantly associated with operative time (p=0.02)

CONCLUSIONS

The use of 3D vision laparoscopy and articulating shears for pyeloplasty in children appears to significantly reduce the operative time compared to conventional 2D laparoscopy with rigid scissors. The use of 3D vision endoscopy with articulating instruments blurs the distinction between current robotic assisted and conventional laparoscopic technology, and provides an alternative hybrid deserving of further attention

★ PEDIATRIC LAPAROSCOPIC PYELOPLASTY: OUTCOME ANALYSIS OF INFANTS VERSUS OLDER CHILDREN

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PURPOSE

Laparoscopic pyeloplasty(LP) is less popular and considered less successful in infants compared to older children. The aim of this paper is to compare the results of LP in infants(group 1) with children over 1 year of age(group 2)

MATERIAL AND METHODS

The data of all children undergoing LP by a single surgeon between March 2009 and August 2014 was retrospectively analysed for patient details and follow-up. Both groups had Ultrasound and Diuretic renogram pre-operatively and for followup. A significant reduction of hydronephrosis (measured by anteroposterior diameter of the renal pelvis) on follow-up and/or improvement of drainage on diuretic renogram was considered to indicate successful pyeloplasty. The various parameters were compared between the two groups. Statistical analysis was done using software; student t test and chi-square test were applied.

RESULTS

The various parameters of both the groups are summarized in table 1. There was no difference in the success of LP or complications in both groups. Significant reduction in hydronephrosis and improvement in mean differential function on follow-up was noted in both groups. The operating time was longer in group 2 but the difference was not statistically significant; group 2 had more children with extrinsic obstruction. Group 1 had more children requiring bilateral LP, and significantly more kidneys demonstrating functional improvement (>10%) after surgery.

Parameter	group 1	group 2	p value (group 1 vs 2)
no of patients	167	94	
mean age mo	4.0+/-3.03	54.3+/-37.2	
mean wt kg	5.62+/-1.48	16.45+/-9.38	
bilateral operation	7 (4%)	1 (1%)	p= 0.04
extrinsic obstruction	7 (4%)	12 (13%)	p< 0.001
OT mean min	104	121	
complications	17(10%)	7(7.5%)	
kidneys with post-op function increase > 10%	51/98 (52%)	17/47 (36%)	p= 0.01
success	99%	100%	
median follow-up(mo)	18	12	

CONCLUSIONS

LP can be safely and successfully done in infants, with success comparable to older children, with greater chance of functional improvement of the affected kidney.

GLOBAL MINIMALLY INVASIVE PYELOPLASTY STUDY IN CHILDREN: RESULTS FROM THE PEDIATRIC UROLOGY EXPERT GROUP OF THE EAU YOUNG ACADEMIC UROLOGISTS WORKING PARTY

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PURPOSE

Minimally invasive pyeloplasty for UPJ obstruction in children has expanded globally over the past decade as an alternative to open surgery. Our goals were to identify the factors affecting complication rates of minimally invasive pyeloplasty in children and to compare the outcomes of laparoscopic and robotic pyeloplasty.

MATERIAL AND METHODS

We retrospectively evaluated the perioperative data involving 783 pediatric patients (< 18 years old) from 15 academic centers who underwent either laparoscopic or robotic pyeloplasty with an Anderson Hynes dismembered pyeloplasty technique. Redo cases and patients with anatomic renal abnormalities were excluded. Demographics and operative data including procedural factors were collected. Complications were classified according to the Satava and modified Clavien systems. Failure was defined as any of the following; obstructive parameters on diuretic renal scintigraphy, decline in renal function, progressive hydronephrosis, or symptom relapse. Univariate and multivariate analysis were applied to identify factors affecting the complication rates. All parameters were compared between laparoscopic and robotic approach.

RESULTS

A total of 575 children met the inclusion criteria. Laparoscopy, increased operative time, prolonged hospital stay, stenting technique and time required for stenting were factors influencing complication rates on univariate analysis. None of those factors remained significant on multivariate analysis. Mean follow-up was 12.8±9.8 months for robotic and 45.2±33.8 months for laparoscopic pyeloplasty ($p<0.01$). Hospital stay and time for stenting were shorter for robotic pyeloplasty ($p<0.05$). Success rates were similar between robotic and laparoscopic pyeloplasties (99.5% vs.97.3%). Postoperative complication was 7.7% for laparoscopic pyeloplasty and 3.2% for robotic pyeloplasty ($p<0.05$). All complications were of no greater severity than Satava grade III and Clavien grade IV.

CONCLUSIONS

Minimally invasive pyeloplasty is safe and effective in treating UPJ obstruction in children in many centers globally.

VALIDATED COST COMPARISON OF OPEN VERSUS ROBOTIC PEDIATRIC PYELOPLASTY IN AMERICAN CHILDREN'S HOSPITALS

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PURPOSE

Robotic pediatric pyeloplasty has advantages over open techniques, but most analyses have shown robotic approaches to be more expensive. Previous cost analyses have suffered from methodological shortcomings.

MATERIAL AND METHODS

We used PHIS (Pediatric Health Information System) database to query all pediatric pyeloplasties performed from 2004-2013 in 44 large, tertiary American children's hospitals. We validated this administrative database using a unique, local clinical database at Riley Hospital for Children in Indianapolis. We restricted comparisons between open and robotic cases to children over the age of 1 year, and to institutions that regularly employed robotic techniques. We performed regression analysis to compare open vs. robotic procedures in relation to: length of stay, rate of complications, and cost.

RESULTS

When PHIS data were compared to matched local patients, all but 5 were perfectly matched by medical record number, demographics, and date of procedure. Robotic cases had shorter length of stay (2.2 v. 1.6 days, p less than 0.001), similar surgical complications (open 4.5%, robotic 3.6%, $p = 0.50$), and robotic cases were more expensive by US\$3991 (p less than 0.001). OR and anesthesia charges accounted for the majority of the cost difference.

CONCLUSIONS

Robotic pyeloplasty is more expensive, but has same rate of complications and significantly shorter length of stay. Charges for OR and anesthesia time dominate the cost difference. Efforts to reduce these specific costs should be the focus of future cost-containment efforts.

RETROPERITONEAL LAPAROSCOPIC PYELOPLASTY IN CHILDREN: OUTCOME IN THE FIRST 4 YEARS AFTER COMPLETING A PEDIATRIC UROLOGY FELLOWSHIP

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PURPOSE

To report the outcomes of retroperitoneal laparoscopic pyeloplasty in Children performed by two academic Pediatric Urologists in the first 4 years of practice after completing a 2-year fellowship.

MATERIAL AND METHODS

A prospective study of all children with PUJ obstruction treated by laparoscopic pyeloplasty by two surgeons (TB and NB) between January 2011 and January 2015 was performed (n=67). The two surgeons had completed a 2-year Pediatric Urology fellowship. Dismembered pyeloplasty and anastomosis were performed using running monofilament 6-0 absorbable suture. All were drained by double-J stent.

RESULTS

All the children but 4 had a retroperitoneal laparoscopic pyeloplasty. Transperitoneal laparoscopic pyeloplasty was used for horseshoe kidney (n=2), ectopic kidney (n=1) or redo procedure (n=1) Mean age was 8 yr (0.9-16.5). Three patients had a solitary kidney. 25 patients (40%) had crossing vessels. Mean operative time was 210min (120-330). Conversion to open surgery was needed in four patients: fibro epithelial polyp, giant hydronephrosis, anaesthetic issue and peritoneal opening. Mean hospital stay was 1.6 days (1-5) and 60% were discharged the day after the procedure. Transient anastomotic leakage occurred in 2 patients and was successfully treated by conservative management. Redo pyeloplasty was needed in only one child. Mean follow-up was 1 yr (0.3-3.4).

CONCLUSIONS

Retroperitoneal laparoscopic pyeloplasty in children can now be successfully transferred to the new generation of specialty-trained Pediatric Urologists. Modern pediatric fellowship training allows performing such a difficult procedure with results comparable to those published by our mentor.

LAPAROSCOPIC TRANSPOSITION OF LOWER-POLE CROSSING VESSELS : A LONG TERM FOLLOW-UP OF 33 PATIENTS AT PUBERTY

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PURPOSE

Laparoscopic transposition of lower-pole crossing vessels (LPCV) has been described as an effective alternative to dismembered pyeloplasty in selected indications of hydronephrosis, with purely extrinsic vascular PUJ obstruction.

We report on the long term follow-up of children, treated with this technique during childhood, reviewed after they had reached puberty, focusing on the incidence of recurrent symptoms, residual renal dilatation, and systemic hypertension.

PATIENTS AND METHODS

Early 2015, we performed systematic clinical and radiological assessment of 33 adolescent patients (16 years [12-22]), who had undergone laparoscopic transposition of LPCV during childhood.

Assessment was based on :

- Clinical examination focusing on frequency of episodes of loin pain or UTIs
- Arterial blood pressure (ABP) measurements, compared to norms adjusted to height and age
- Renal ultrasonography (SFU grade) in 21/33 patients

RESULTS

The median follow-up after surgery was 69 months [13-113].

- Renal US showed residual SFU grade 2 pelvicalyceal dilatation in 2 asymptomatic patients (10%), SFU grade 1 extrarenal pelvis dilatation in 3, and was normal in the remaining.
- ABP was within normal range in all patients, adjusted for age and height.
- Three patients had occasional episodes of abdominal pain : two of them had normal US (including during pain episodes), one had persistent extrarenal dilated pelvis (31mm,vs>60mm preoperatively) with no calyceal dilatation. None of them showed obvious clinical characteristics linking the pain to a renal origin.
- One adolescent presented with febrile UTI at 18 years (8 years postoperatively) with normal renal US, and no hypertension.

CONCLUSIONS

In the long term follow-up, the vast majority of adolescents treated during childhood by laparoscopic transposition of LPCV for PUJ extrinsic obstruction remain asymptomatic, with normal arterial blood pressure, and normal renal ultrasound when they reach puberty.

A COMPARATIVE COST ANALYSIS OF ROBOTIC-ASSISTED SURGERY(RS) VERSUS LAPAROSCOPIC SURGERY (LS) AND OPEN SURGEY (OS) IN A PEDIATRIC HOSPITAL

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PURPOSE

The rising costs of health services oblige to cost-effective analyses for new technologies. The Robotic Surgery (robotic-assisted surgery (RS) offers well established advantages established in adults, while in children the cost-effectiveness is still controversial

MATERIAL AND METHODS

A working group of Children's Hospital sought to compare the costs of RS with laparoscopic (laparoscopic (LS) and open surgery (OS), analyzing also its impact on hospital organization. We performed a Break-even analysis (BEA) and cost-minimization analysis (CMA) from hospital system data and team expertise. BEA was calculated in not only a base-case scenario, but also changing the parameters between pre-defined ranges. A deterministic sensitivity analysis (DSA) was conducted to outline the variety of management scenarios as: number of surgeons, initial expenditures, consumables and supplies, manufacturer hypothetical sell proposal, maintenance annual fees. By the weighted case mix of 176 selected cases treated in the hospital in 2012, we calculated the Contribution Margin (CM) of RS, LS and OS procedures.

RESULTS

CM analysis shows a greater economic profit for OS and LS, hence considering RS the most expensive alternative. The BEA suggested that, in the base scenario, at least 349 annual interventions are needed; while it ranged from 103 to 458 procedures in different scenarios, and it is 272 considering urological cases only.

CONCLUSIONS

Robotic surgery implies increased hospital costs, due to initial investment and maintenance, and to procedure costs exceeding the tariffs for reimbursement. Solutions may be to define training and clinical programs through partnership with other hospitals, and to claim adequate NHS reimbursements

LAPAROSCOPIC EXTRAVESICAL URETERAL RE-IMPLANTATION: REFINEMENT OF THE TECHNIQUE

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INTRODUCTION

Our current technique of laparoscopic ureteral reimplantation has evolved with the addition of 3D vision endoscopy, bipolar cautery and a 3 port approach. We evaluated the benefit of the current 3D technique by comparing it to a previous cohort of 2D laparoscopy

PATIENTS AND METHODS

A retrospective review of 19 children who underwent laparoscopic extravesical ureteral reimplantation by a single surgeon from 2005 to 2013 was performed. The current 3D (11 patients) cohort was compared to the previous 2D (8 patients) cohort, excluding cases from 2002-2005 to account for the learning curve. Descriptive data, grade of VUR, dimension, technique of detrusor tunnel mucosal dissection, tunnel length, operative time, length of stay, and complications were retrieved. All statistical analysis was conducted per ureter (total of 28 ureters operated)

RESULTS

The median age of all patients was 5yrs, with the distribution of grades of VUR from 1 to 5 being 1-9-8-10-0, with 4 cases of common sheath reimplantation. The mean operative time for 2D (12 ureters) and 3D (16 ureters) was 217min and 130min. Operative time was reduced by an average of 86 minutes per ureter with the use of 3D laparoscopy vs. 2D ($p < 0.01$), and mucosal perforation rate was decreased from 67% to 19% ($p = 0.01$). There was no statistically significant difference between the 2 groups in the number of bilateral cases, median age or weight, mean detrusor tunnel length, nor grade of reflux. The 3D group was different in that the bipolar hook was used in 7 cases and 3 ports were used instead of 4. 3D laparoscopy did not significantly impact in-hospital stay

CONCLUSIONS

Operative times and mucosal perforation rates are significantly reduced with the use of 3D vision endoscopy and the bipolar hook for extravesical ureteral reimplantation. The 3D approach provides a novel alternative to which robotic assisted techniques should be more critically evaluated

ROBOTIC-ASSISTED PARTIAL NEPHRECTOMY IN DUPLICATED COLLECTING SYSTEM FOR CHILDREN BELOW THAN 15 KG.

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1) Limoges University Hospital, Pediatric Surgery, Limoges, FRANCE - 2) Tours university Hospital, Pediatric Surgery, Tours, FRANCE

PURPOSE

Laparoscopic transperitoneal approach for heminephrectomy (HN) has been reported as a safe technique with a low conversion rate for children. The aim of our study was to report the outcomes of robotic-assisted HN for duplex kidney in children below 15 kg.

MATERIAL AND METHODS

This prospective multicentric study evaluated the HN performed from 2007 to 2014. Demographic data, weight, surgical time, hospital stay, complications were collected. Mean follow-up was 26 months (5-58), based on clinical data, renal sonography and isotopic renogram.

RESULTS

Fifteen patients weighing less than 15 kg underwent PN. All of them had prenatal diagnosis of duplicated system. Mean age at surgery was 20.2 (7-39) months with a policy of early surgical intervention in cases of massively dilated upper renal tract. There was no conversion to open and mean total operative time was 201 min (130-245). All procedures started with a cystoscopic evaluation as this allows catheterization of the preserved ureter before transperitoneal approach with four laparoscopic ports. Mean hospital length of stay was 3.4 days (1-7) and 1,2 days for our 6 last patients. One patient had an omentum hernia that required a second operation. At initial follow-up ultrasound 1 patient (6%) demonstrated an asymptomatic fluid collection and was managed conservatively. No patients lost their remaining healthy moiety.

CONCLUSIONS

Compared to previously published literature evaluating open and laparoscopic heminephrectomy in small children, robotic system provides comparable outcomes in regards to feasibility and complication rate. The safety of the dissection seems to allow shorter hospital length of stay.

A NON-NARCOTIC BASED POSTOPERATIVE CLINICAL CARE PATHWAY IS A VIABLE POSTOPERATIVE TREATMENT ALGORITHM FOLLOWING PEDIATRIC ROBOTIC ASSISTED LAPAROSCOPIC PYELOPLASTY

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PURPOSE

To review our non-narcotic clinical care pathway (NNCP) for postoperative pain control following pediatric robotic assisted laparoscopic pyeloplasty.

MATERIAL AND METHODS

A retrospective review was performed of all patients who underwent robotic pyeloplasty at a single pediatric institution. Patient demographics, perioperative details, and outcomes were reviewed. Our non-narcotic clinical care pathway (NNCP) consists of alternating scheduled intravenous Toradol and intravenous Acetaminophen throughout the patients postoperative hospital stay. No standing narcotics are ordered and are given only as needed. Statistical analysis was performed using the Mann-Whitney and Chi Square test where appropriate.

RESULTS

A total of 129 patients (73 male, 56 female) were identified. 75 patients (63%) were placed on the NNCP. Median age was 83 months (range 3-255) in the NNCP group and 104 months (range 20-279) in the standard pain control (SPC) group ($p < .01$). The NNCP was effective in 46 patients (61%) while 29 patients (39%) were given at least 1 dose of narcotics. Forty-one patients (76%) in the SPC group received narcotics. Median hospital stay was 1 day (range 1-4) for the NNCP group and 2 days (range 1-7) for the SPC group ($p < .01$). The surgical success rate was 100% (75/75) for the NNCP group and 96% for SPC group (52/54), respectively ($p = 1.00$).

CONCLUSIONS

A non-narcotic based postoperative clinical care pathway following pediatric robotic assisted laparoscopic pyeloplasty is a viable and effective treatment option and is associated with a significantly shorter hospital stay. Patients treated with this pathway have adequate pain control without the adverse effects of narcotic medications.

OPEN VERSUS ROBOTIC-ASSISTED URETERAL REIMPLANTATION: COMPARING CLINICAL AND FINANCIAL OUTCOMES

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PURPOSE

This study compares clinical and financial outcomes between robotic-assisted laparoscopic ureteral reimplantation (RALUR) against open ureteral reimplantation (OUR) at our institution.

MATERIAL AND METHODS

A retrospective review was conducted on 56 extravesical RALUR and 25 Cohen's intravesical OUR patients from 2008-2014. Two RALUR technique improvements were made over the study period. All data were collected from electronic records. Two-tailed, unpaired t-tests were used to compare continuous variables and Fisher's exact tests were used to compare categorical variables.

RESULTS

78 renal units underwent RALUR and 34 underwent OUR. Reflux resolution rates were 81% for RALUR and 97% for OUR ($p < .05$). Analysis of technique-specific outcomes showed that the most recent RALUR technique resulted in a RALUR success rate (85%) not statistically different from that of OUR ($p = .145$). RALUR was associated with shorter hospitalizations, reduced catheterization time, reduced opioid analgesia, and reduced anticholinergic administration (all $p < .05$). There was no statistical difference in total cost between RALUR and OUR (\$6,618 vs. \$6,219, $n = 25$ each, $p = .83$).

CONCLUSIONS

Reflux resolution rates were higher in the OUR cohort (97%) than in the RALUR cohort (81%); however, optimizing the RALUR technique reduces the difference in VUR resolution rates. Perioperative morbidity was reduced in the robotic cohort. Financial data revealed no significant differences in total cost between the robotic and open approach. Reduced perioperative morbidity with the robotic procedure renders the robotic approach a viable option for management of VUR.

SURGEON PERFORMED ULTRASOUND FOR STENT POSITION IN LAPAROSCOPIC PYELOPLASTY

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INTRODUCTION

We currently place a JJ stent antegradely at laparoscopic pyeloplasty. Several methods are described for proving the distal end of the stent reaches the bladder, including fluoroscopy or placing methylene blue in the bladder, these both have significant disadvantages. We aimed to determine whether surgeon performed ultrasound scan can reliably confirm that a JJ-stent has reached the bladder.

METHODS

Prospective data collection from Dec 2013-Jan 2015. Portable ultrasound (Sonosite TM) was used to evaluate the stent position peri-operatively either at primary operation or at stent removal.

RESULTS

Thirteen patients, median age 10 (Range 5-15 years) were included. Eight scans were performed at insertion and 5 at retrieval. In 11 patients (85%) the end of the JJ stent was correctly identified in the bladder (confirmed at operative retrieval). In the other 2 patients the stent could not be confidently identified in the bladder and this was initially attributed to body habitus or technical difficulties, however in neither case was the stent to be found in the bladder and both required ureteroscopic removal.

CONCLUSIONS

We have found surgeon performed peri-operative ultrasound to be reliable in determining that the stent has reached the bladder when performing laparoscopic pyeloplasty in children. When the ultrasound did not clearly demonstrate the stent lying within the bladder this proved to be a true negative finding in both cases.

We recommend surgeon performed ultrasound as a reliable non-ionising modality to confirm good stent position at laparoscopic pyeloplasty. When there is uncertainty, then further investigation such as fluoroscopy is indicated.

VESICOSCOPIC CROSS-TRIGONAL URETERAL REIMPLANTATION FOR PRIMARY REFLUX

Venkata JAYANTHI and Megan SCHOBBER
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PURPOSE

Ureteral reimplantation is the gold standard for the surgical management of vesicoureteral reflux. We present our extensive experience with vesicoscopic Cohen repair.

MATERIAL AND METHODS

We retrospectively reviewed all patients who underwent vesicoscopic ureteral reimplantation at our institution. Only patients with primary reflux with standard indications for correction requiring a nontapered reimplant were considered to be appropriate candidates. Under CO₂ "pneumovesicum" a 5 mm camera port and two 3 mm working ports were placed directly into the bladder. In a manner analogous to open repair, the ureters were mobilized, submucosal tunnels were created and ureters were transposed to the contralateral side and secured. Postoperatively, the bladder was drained overnight. All patients underwent ultrasonography at 1 month and were offered cystography at 3 months postoperatively.

RESULTS

167 children (151 girls and 16 boys) underwent vesicoscopic ureteric reimplantation. Mean age at the time of reimplantation was 79 months (16 - 226). Thirteen of these children had failed injection therapy prior to reimplantation. There were 126 bilateral and 41 unilateral procedures. Mean operative time was 186 mins (99 min- 288 min). There were 4 open conversions. Resolution of reflux was noted in 91/96 (95%) of children tested. 4 of the failures were amongst the first 30 patients. Complications included bladder stones in one, extraperitoneal urine leak in the first patient and ureteral obstruction in 2.

CONCLUSIONS

Vesicoscopic ureteral reimplantation is a technically challenging procedure to learn. However, after the learning curve, success rates appear to be equivalent to open repair. Vesicoscopic ureteral reimplantation is a minimally invasive procedure for the definitive repair of primary reflux.

S29: VIDEO SESSION 2

Moderators: Gregory Dean (USA), Rita Gobet (Switzerland)

ESPU Meeting on Saturday 17, October 2015, 16:49 - 17:30

16:49 - 16:54

S29-1 (VP)

★ ROBOT-ASSISTED LAPAROSCOPIC BLADDER AUGMENTATION IN THE PEDIATRIC PATIENT

Patricia CHO, Ashley WIETSMA, Carlos ESTRADA and Richard YU
Boston Children's Hospital, Harvard Medical School, Urology, Boston, USA

INTRODUCTION

Bladder augmentation is a common surgical intervention for neuropathic bladder dysfunction, and has conventionally been an open procedure. Technological advancements have allowed minimally invasive approaches to be utilized. The feasibility and safety of robot-assisted laparoscopic bladder augmentation in pediatrics has been reported. We present a robotic ileocystoplasty to demonstrate the feasibility of an entirely intracorporeal approach in a pediatric patient.

METHODS

The patient was a 6 year old (18.5 kg) boy with a neurogenic bladder secondary to lumbar myelomeningocele. He did not have a ventriculoperitoneal shunt and had no previous intraabdominal surgery. Despite maximum anticholinergic therapy and clean intermittent catheterization (CIC) 5 times per day, urodynamic studies revealed a small capacity and poorly compliant bladder with a maximum detrusor storage pressure >40 cmH₂O. He was incontinent between catheterizations. A robotic augmentation cystoplasty was performed.

RESULTS

A three robotic arm setup was used with a fourth assistance laparoscopic port. Total surgical time was 496 minutes. There were no intraoperative complications and the patient was discharged on post-operative day 8. At one-month postoperatively, a cystogram revealed no urine leak, and the suprapubic tube was removed. The patient resumed CIC every 3 hours during the day and once overnight until postoperative urodynamic studies confirmed safe dynamics, after which the CIC interval could be lengthened.

CONCLUSIONS

Robotic bladder augmentation is safe and feasible in a select pediatric population. The entire procedure including preparation of the bowel segment can be completed intracorporeally even in smaller children. With further experience, operative times will approach those of open augmentation cystoplasty.

★ LAPAROSCOPIC LYMPHO-RENAL DISCONNECTION FOR IDIOPATHIC UNILATERAL SPONTANEOUS CHYLURIA

Juan BORTAGARAY, Nathalie WEBB, Colin BROOK and Christopher KIMBER
MONASH CHILDREN'S, PAEDIATRIC UROLOGY, Clayton, AUSTRALIA

INTRODUCTION

Chyluria is the passage of milky urine, due urinary excretion of fat and triglycerides. It is most frequently seen in adults due to abnormal chylo-urinary communications secondary to filarial infection, and is often bilateral. Unusual causes include trauma, tuberculosis, tumours or congenital lymphatic malformations. The authors present a video of a laparoscopic lympho-renal disconnection, for a case of unilateral idiopathic chyluria.

MATERIAL AND METHODS

A 15 year old male presented with 2 month history of acute-onset milky urine, most obvious in the morning. He also had weight loss (10 kg), nephrotic range proteinuria (5 g/day) and triglyceriduria (25.3 mmol/L). Tests for Wucheria bancrofti and tuberculosis were negative. There was no history of trauma. MR lymphangiography identified no obvious anomaly.

Cystoscopy found efflux of milky urine from the right ureteric orifice. Retrograde pyelography demonstrated urolymphatic fistulae from posterior upper and interpolar calyces.

Laparoscopically, complete lympho-renal disconnection was performed; ligating and dividing large lymphatics. After complete lymphatic stripping, synthetic, biodegradable cyanoacrylate glue (Glubran®; GEM Italy) was atomised over the renal surface and hilar vessels, to seal smaller vessels and achieve nephropexy.

RESULTS

Operative time was 150 minutes with minimal blood loss. Abdominal drain was left in situ for 24 hours. Urine clearance was immediate. Patient was discharged on post-operative day 2. At 6 week review, the patient had recovered lost weight, urine remained clear and urinary triglycerides were 0.1mmol/L.

CONCLUSIONS

The authors present a novel surgical technique for managing chylo-urinary fistulae, comprising complete laparoscopic lympho-renal disconnection and cyanoacrylate glue sealing.

★ LAPAROSCOPIC DISMEMBERED FLAP PYELOPLASTY IN CHILDREN

Radim KOČVARA, Josef SEDLACEK, Petr MACEK, Vojtech FIALA and Tomas HANUS

General Teaching Hospital and Charles University 1st Medical School in Prague, Department of Urology, Prague 2, CZECH REPUBLIC

PURPOSE

Laparoscopic dismembered flap pyeloplasty using vertical flap has been reported in a few paediatric cases only. The video shows feasibility of laparoscopic creation of a pelvic flap described by Kučera in order to bridge a longer ureteral stenosis or renal isthmus of the horse-shoe kidney.

MATERIAL AND METHODS

During 2003-2014, laparoscopic flap pyeloplasty was performed in 13 patients (in seven children 2-17 years old, and in six adults). It was indicated in intrarenal U-P junction with crossing vessels(3), in malrotated kidney(4), in horse-shoe kidney(3) and in redo surgery(3) in order to attain a tension free anastomosis. The video shows flap pyeloplasty in horse-shoe and in malrotated kidney. The upper part of the pelvis is stabilized with a traction suture. The ureter is ligated at the U-P junction and divided. Proximal part of the dilated pelvis is incised laterocaudally. The lower lip of the incised pelvis is flipped caudally creating a funnel thus prolongating the course of the pelvis. The ureter is spatulated and anastomosed to the lowest end of the pelvis with continuous 5-6/0 polyglactin suture. A double-J stent is inserted.

RESULTS

The mean operation time was 272 minutes (180 to 455); a calyceal stones was removed in one patient. One patient required replacement of a stent because of blood clots. Obstruction has been released in all patients.

CONCLUSIONS

Kučera flap pyeloplasty moves pyeloureteric anastomosis more distally preserving wide continuity with the pelvis and sufficient blood supply. It is indicated in anatomically selected group of patients. In our hands, this modification has replaced Culp/DeWeerd spiral or Scardino/Prince vertical flaps and can be performed by laparoscopy.

★ ADOLESCENT HINMAN'S SYNDROME : A ROBOTIC CHALLENGE

Dario Guido MINOLI¹, Bernardo ROCCO², Santiago VALLASCIANI¹, Alfredo BERRETTINI¹ and Gianantonio MANZONI¹
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PURPOSE

The advent of robotic surgery has radically changed the surgical and reconstructive strategy in pediatric urology. This video demonstrates the advantages of a robotic approach in an adolescent with Hinman Syndrome (non-neurogenic neurogenic bladder).

MATERIAL AND METHODS

A 13-year-old boy weighing 31Kg was admitted to our hospital with fever, acute urinary retention, renal failure and bilateral massive hydro-ureteronephrosis. In the past few months he had developed progressive voiding disturbance, urinary incontinence and severe constipation.

Immediate treatment consisted of continuous urinary drainage (initially trans-urethrally then with suprapubic cystostomy) and homeostasis. Further studies (US, VCUG, MRI, DMSA renal scan, cysto-urethroscopy) confirmed bilateral massive vesico-ureteric reflux, poor right renal function, a huge thick walled trabeculated bladder and a normal urethra. A final diagnosis of non-neurogenic neurogenic bladder was confirmed. Trans-urethral catheterisation (CIC) was refused and the creation of a catheterisable channel was mandatory.

A robotic assisted reconstructive treatment was achieved: a Mitrofanoff channel was created using the distal part of the right ureter (following extra-vesical reimplantation) along with a right-to-left trans-uretero-ureterostomy. A VQZ stoma completed the procedure.

RESULTS

He was discharged home after 2 days with an uneventful recovery. He is presently performing self-CIC with no difficulties and the bilateral hydro-ureteronephrosis has resolved.

CONCLUSIONS

A complex and demanding situation in a difficult adolescent was successfully managed with a minimally invasive approach. The robotic reconstruction was also fundamental in the persuasion and consent process of an extremely difficult psychological scenario

★ **DERMAL PATCH GRAFT CORRECTION OF SEVERE CHORDEE WITHOUT URETHRAL DIVISION IN BOYS WITHOUT HYPOSPADIAS**

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PURPOSE

Historically, the standard of care to correct severe ventral penile curvature in the rare instance of a normal urethra and orthotopic meatus is either via dorsal plication and/or division of the urethral plate in a staged fashion. This video is designed to show how the authors correct severe ventral penile chordee in the absence of hypospadias with a normal urethra via urethral mobilization and dermal patch graft thus avoiding urethral division.

MATERIAL AND METHODS

This video shows an 18 year old patient who presented with severe ventral chordee with an orthotopic meatus corrected initially via dorsal plication. The same degree of chordee recurred 6 months later. The video herein demonstrates our technique to correct severe ventral penile curvature in one stage by urethral mobilization and dermal patch graft orthoplasty without the need for urethral division successfully.

RESULTS

Three boys ages 10 -18 years old underwent successful correction of severe ventral chordee in the absence of hypospadias. Follow-up ranged from 11 months to 2 years (mean 1.5 years). All 3 boys have strong straight erections and a normal strong well directed urinary stream. No complications have been noted to date.

CONCLUSIONS

Extensive urethral mobilization with dermal patch graft can successfully correct severe ventral chordee without urethral division in a single operative setting in boys without hypospadias and normal urethras. Further experience and follow-up will determine if this technique stands the test of time.

VR: VIDEO ROOM

ESPU Meeting

VR-1 (VS)

ROBOTIC PROSTATECTOMY IN A CHILD OF 7 YEARS: A CASE REPORT

Anahi Maria Del Valle SALOMON VENEGAS, Victor ARANIBAR, Jimena ESNAOLA, Roberto VAGNI, Maria ORMAECHEA, Francisco DE BADIOLA and Juan MOLDES
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PURPOSE

The prostatic glándula is one of the common sites of rhabdomyosarcoma in pediatric patients. In surgical therapy, bladder preservation is a goal when there is bladder involvement. We report a case of prostatic rhabdomyosarcoma type embryo in a child of seven years old.

MATERIAL AND METHODS

We perform robotic prostatectomy, partial cystectomy and continent urinary ostoma (Mitrofanoff) The patient previously received 2 cycles of chemotherapy with vicristina, doxorubicin and actinomycin. For non response, we use a scheme with second-line drugs. He receives 4 cycles with etoposide and cisplatin. Then he underwent surgery. Intraoperative endoscopy showed bladder floor unscathed
We used transabdominal approach with 4 ports and other accessory manual port.

RESULTS

Dissection anterior bladder, prostate lateral dissection. Dissection of prerectal space. Proximal section of the bladder neck two centimeters away from the bladder trigone and distal at bulbar urethra level section. Bladder suture in two planes with neck closure, cystostomy catheter placement and preparation of urinary stoma with Mitrofanoff technique. Surgical time was 8 hours. There were no complications. Hospital stay 4 days.

CONCLUSIONS

Robotic transabdominal approach in therapy of prostatic rhabdomyosarcoma in pediatric patients in a safe and effective alternative. Avoid also the need for a second approach for distal via perineal dissection of compromised urethra.

SUCCESSFUL TREATMENT OF RECURRENT UPJ OBSTRUCTION WITH ROBOTIC-ASSISTED LAPAROSCOPIC NEPHROPEXY

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PURPOSE

Repeat pyeloplasty has a high success rate for treating recurrent UPJ obstruction after failure of primary pyeloplasty, but can sometimes be technically infeasible due to certain patients' anatomy. We present our technique of robotic assisted-laparoscopic (RAL) nephropexy in the pediatric population.

MATERIAL AND METHODS

In this case, our patient was a 19 year old girl who had undergone open right pyeloplasty as an infant and developed symptomatic recurrent right UPJ obstruction.

The patient was placed in the left lateral decubitus position, and a transperitoneal approach was performed. RPG showed abrupt narrowing at UPJ. Careful dissection of the UPJ demonstrated that the patient had an obstructing vessel (renal hilar vessel) running over the renal pelvis, as well as an intrarenal pelvis and numerous additional accessory vessels. As such, a dismembered pyeloplasty was not technically feasible. The kidney was then retracted laterally and in this position the crossing vessel was no longer causing obstruction. Nephropexy was performed using three 4-0 PDS sutures to secure the kidney to the lateral abdominal wall. At the conclusion of the procedure, the renal pelvis was free of pressure from the accessory vessels and the UPJ was also free.

RESULTS

The procedure was uneventful without intraoperative or perioperative complication. One month postoperative ultrasound showed grade 2 hydronephrosis postoperatively, improved from severe hydronephrosis on preoperative CT scan. The patient's pain resolved.

CONCLUSIONS

At the time of intervention for recurrent UPJ secondary to renal vasculature, RAL nephropexy should be considered as a viable and technically feasible treatment options among select patients.

ROBOTIC TRANSMESENTRIC RETEROCAVAL URETERAL RECONSTRUCTION

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PURPOSE

A 17 year old boy presented with incidental right hydronephrosis. Further work up demonstrated right retrocaval ureter. Robotic reconstruction of right ureter through transmesentric approach was performed.

MATERIAL AND METHODS

17 year old boy was diagnosed with incidental right hydronephrosis . MAG 3 scan showed good renal function bilaterally. CT scan with contrast was compatible with right retrocaval ureter. Retrograde pyelogram was performed that confirmed the diagnosis . Robotic transmesentric right ureteral reconstruction without mobilizing right colon, as is most commonly done, was performed. With this approach operative time is shorter and dissection easier.

RESULTS

The surgery was done uneventfully. Three month post-operative ultrasound showed minimal right hydronephrosis that was markedly improved.

CONCLUSIONS

Robotic transmesentric repair of retrocaval ureter is a feasible procedure with reduced operative time and dissection, compared to traditional approach that is done with right colon mobilization.

LAPAROSCOPIC SINGLE SITE NEPHRECTOMY IN INFANT WITH SYMPTOMATIC MULTICYSTIC DYSPLASTIC KIDNEY.

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PURPOSE

Multicystic dysplastic kidney (MCDK) is the most common renal cystic disease in children. Nephrectomy is reserve for some special indications such as recurrent urinary tract infection (UTI) and abdominal pain, etc. We present the experience of laparoendoscopic single site (LESS) nephrectomy in 2 month old infant with huge MCDK.

MATERIAL AND METHODS

A 2 month old girl with right MCDK detected by prenatal ultrasound was admitted due to recurrent UTI and abdominal distension. MRI showed multiple cysts on right kidney, the largest diameter was 7.5cm. Right ureter entered into right vagina. After a 1.5cm umbilical incision was made, we made homemade transumbilical port with Alexis wound retractor and surgical glove. First, we aspirated urine of largest cyst to reduce the size of right MCDK and dissected from the surrounding tissue with thermal ligation. The port was removed and then the MCDK was retrieved through the umbilical incision.

RESULTS

Total operative time was 93 min, blood loss was less than 10cc. There were no preoperative complications. The patient was discharged on 3-days postoperatively. The bulging in vaginal introitus was resolved immediately after operation. There was no recurrence of UTI during one year follow-up

CONCLUSIONS

Symptomatic MCDK should be considered to remove. LESS for huge MCDK is a safe and feasible operation with better cosmesis, compared with open or classic laparoscopic nephrectomy. LESS is a promising technique in infant with urogenital anomalies.

LAPAROSCOPIC URETEROCALICOSTOMY FOR URETEROPELVIC JUNCTION OBSTRUCTION IN A CHILD

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PURPOSE

Ureterocalicostomy has been indicated mainly in cases with failed pyeloplasty or with a completely intrarenal pelvis. While there were several case series in adults, laparoscopic ureterocalicostomy in pediatric cases has been rarely reported. This video demonstrates laparoscopic ureterocalicostomy in a 10-year-old girl.

MATERIAL AND METHODS

Ureteropelvic junction obstruction was identified in a 10-year-old girl. Since intrarenal pelvis and renal stone at ureteropelvic junction was identified, laparoscopic ureterocalicostomy was indicated via transperitoneal approach. Four ports were used, with 10-mm camera port placed at the umbilicus and 5-mm three working ports similar to laparoscopic pyeloplasty. After exposing renal hilum and the upper ureter completely by reflecting off the ascending colon, the renal stone was extracted without lithotripsy by making a small longitudinal incision at the ureteropelvic junction. Then, the ureter was transected and the renal pelvis was closed by 5-0 absorbable sutures at the level of renal hilum. To make the anastomotic site at the lower pole, a 2-cm incision was made by identifying thinning portion of the renal parenchyma at the lower calix using ultrasound. Bleeding from incised thin renal parenchyma was minimal without clamping renal vessels. A 5Fr double-J ureteral stent was placed in an antegrade manner followed by 3 anchor sutures using 5-0 absorbable sutures in the spatulated ureter. Ureteral-caliceal anastomosis was completed by running fashion using 5-0 absorbable suture. The operative time was 379 minutes. Blood loss was negligible and no transfusion was required.

RESULTS

Postoperative course was uneventful. The ureteral stent was removed at 8 weeks postoperatively. CT scan at 15 months postoperatively showed marked improvement of hydronephrosis and no recurrence of renal stone.

CONCLUSIONS

Laparoscopic ureterocalicostomy would be a feasible and safe option for selected patients with complicated ureteropelvic junction obstruction, even in the pediatric population.

LAPAROSCOPIC-ASSISTED URETEROURETEROSTOMY FOR ECTOPIC URETER IN CHILDREN

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PURPOSE

To describe a novel laparoscopic-assisted technique for ureteroureterostomy for the surgical Management of a completely duplicated collecting system with an ectopic ureter.

MATERIAL AND METHODS

This is the case of a 5-years-old girl who presented with lifelong continuous urinary incontinence. Ultrasound and renogram revealed a duplicated right collecting system with a functional superior moiety and dilated ureter. In cystoscopy, we observed that this upper-pole ureter leads in the vagina. We performed a 3 mm laparoscopy. We located and dissected both right ureters and we presented them by a small inguinal incision. We performed an open ureteroureterostomy and we placed a double J.

RESULTS

Double J was removed 1 month later. The patient tolerated the procedure well and ultrasound on follow-up revealed no residual hydronephrosis. She remains dry today.

CONCLUSIONS

This minimally invasive technique is a safe and feasible approach to repair a duplex collecting system with an ectopic ureter in the pediatric population. This technique combines the speed and ease of the open technique with the improved cosmetic and visualization of a laparoscopic approach.

SPLENOGONADAL FUSION IN AN 18-MONTH-OLD BOY

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PURPOSE

Splenogonadal fusion is a rare congenital connection of the primitive spleen and gonad. Approximately 190 cases have been described since being first publicized in 1883 by pathologist Eugen Bostroem. The fusion is attributed to the development of the spleen in close proximity to the urogenital ridge and tracking of the splenic tissue as the testis descends. It commonly presents as either cryptorchidism or a palpable mass. We present a case of splenogonadal fusion and its management.

PATIENTS AND METHODS

An 18-month-old male presented to our urology office with a non-palpable right testicle and a retractile left testicle. His treatment was recorded.

RESULTS

Laparoscopic examination (shown in our video) revealed a viable right testicle which was then brought into the right hemiscrotum and a retractile left testicle with adherent abnormal tissue appearing consistent with discontinuous splenogonadal fusion. Additional splenic tissue was found along the path of the testicular vessels. Options for further management were discussed with the family. A nuclear medicine liver-spleen scan (shown) demonstrated uptake in the area of the left gonad consistent with splenogonadal fusion. The patient's parents then elected for excision of the aberrant tissue adherent to the left testicle. Using an open inguinal approach, the splenic tissue was removed from the testicle and an orchiopexy was performed as is seen in our video. Pathology, shown, confirmed the diagnosis.

CONCLUSIONS

Removal of the splenic component in splenogonadal fusion may be accomplished with preservation of the testicle, as in our patient.

ABDOMINOPLASTY IN PRUNE BELLY SYNDROME (PBS)

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PURPOSE

Many patients with PBS require abdominoplasty alone or associated to correction of the urogenital abnormalities. This video presents a simplified technique to treat the abdominal flaccidity in PBS.

MATERIAL AND METHODS

With the patient in supine, a longitudinal xypho-pubic fusiform figure is drawn on the abdomen, calculated by approximation of the redundant abdominal wall to the midline. It represents the area of skin and subcutaneous to be removed. This is performed with preservation of the musculo-fascial layer and the circumcised umbilicus. A lateral elliptical single xypho-pubic line is drawn in the most lax side of the fascia, which is incised along this line. After urinary tract reconstruction and orchidopexy, closure is initiated by suturing the medial edge of the wider fascial flap laterally to the peritoneal side of the contralateral flap. Next, the now outer fascial flap is laid over the inner flap, and a button-hole is made to expose the umbilicus. The subcutaneous of the inner flap is undermined laterally to gain extra distance for the suture of the outer flap over the inner flap. The subcutaneous and the skin are sutured in the midline without tension, incorporating the umbilicus.

RESULTS

Between 1985 and 2015, 43 PBS patients underwent this procedure with improvement of abdominal size and tonus, without infection or dehiscence. Temporary umbilical necrosis was observed in 4 cases and keloid in 3 patients.

CONCLUSIONS

This abdominoplasty technique is simple and presents good functional and cosmetic results in PBS patients.

THE LAPAROSCOPIC NEUROBLASTOMA EXCISION

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PURPOSE

In this video, we want to present our experiences with laparoscopic neuroblastoma excision in two patients.

MATERIAL AND METHODS

Seven and 8 month-old-female and male infants were presented with left adrenal solid tumors (33x28x28 mm and 33x30x26 mm, retrospectively). Female patient's tumor was detected in her intrauterine life with ultrasonography. The size of tumor increased about 5 mm in her control ultrasonography.

The patient is placed a lateral decubitus position about 30-45° and three 5 mm trocar were used for the procedures. At the beginning, the left colon is mobilized and retroperitoneal space, between the spleen and kidney, bluntly dissected. Dissection of the retroperitoneal space reveals the left adrenal gland and tumor. Mobilization of the adrenal gland and tumor and control of the blood supply is accomplished using Ligasure (Covidien®). After the adrenal gland and the tumor is completely freed from surrounding tissues. The umbilical port is changed to the 10 mm port for insertion of retrieval endosurgical bag. The tumor is placed into the handmade bag and extracted from the abdominal cavity through the umbilical port.

RESULTS

Operation times are 30 and 45 minutes, retrospectively. Early postoperative periods were uneventful. The patients were discharged from the hospital 3th postoperative day. Pathological and biological evaluations showed that one of tumor unfavorable and other one favorable histology of neuroblastoma. Lymph nodes samplings were reactive. Chemotherapy programs still continue in Pediatric Oncology Department.

CONCLUSIONS

We considered that the laparoscopic approach for the selected neuroblastoma in pediatric patients to be feasible, safe and effective procedures.

BLADDER NECK RECONSTRUCTION FOR INCONTINENT EPISPADIAS: MITCHELL TECHNIQUE WITH DETRUSOR MUSCLE WRAP

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PURPOSE

Incontinent penopubic epispadias in male children needs bladder neck reconstruction for achievement of urinary control. Many techniques are in current use including the Mitchell with or without detrusor wrap technique.

MATERIAL AND METHODS

Five children with isolated epispadias, 3 boys and 2 girls were operated in the last 5 years by the same surgeon (H BADAWEY), median age at surgery was 4,5 y (3,5-5), 4 operated without a bladder wall wrap and only one patient with a bladder wrap. The video describes male patient 5 year old operated by total disassembly for correction of penopubic epispadias. Voiding cystogram, ultrasound abdomen and pelvis, Cystometry all showed normal bladder capacity for age with low sphincteric resistance. Midline suprapubic incision with intersymphyseal approach was used. Tubularization of the urethra over 10 Fr catheter leaving at the end 8fr catheter was performed by interrupted 5/0 vicryl sutures. Bladder wall flap 2cm x 6 cm demucosalized and wrapped around the reconstructed bladder neck and urethra. Urethral catheter was left for 5 days, ureteric catheters, suprapubic catheter for 2 weeks clamped and left inside to ensure no retention then removed.

RESULTS

four children attained complete continence for more than 4 hours diurnal and occasional nocturnal enuresis in 2 female children, one male child is dry for one hour only diurnal with nocturnal enuresis.

CONCLUSIONS

The technique is easy, feasible, and reproducible however, the results need longer follow up and larger number of children.

FEMINIZING GENITOPLASTY USING THE UROGENITAL SINUS MOBILIZATION TECHNIQUE WITH NO CLITOROPLASTY

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PURPOSE

congenital adrenal hyperplasia is the most common cause of DSD in children. Feminizing genitoplasty depends on the extent of virilization of the external genitalia, and the length of the urogenital sinus. Herein we present a case of urogenital sinus anomaly with no clitoromegaly.

MATERIAL AND METHODS

the video describes total urogenital sinus mobilization with no clitoroplasty because of absent clitoromegaly. Inverted U perineal flap is harvested, mobilization of the sinus until separate urethral orifice and vaginal orifice was reached, maturation of the flap to post wall of the vagina, maturation of the vestibule.

RESULTS

Perfect cosmetic appearance, good caliber vaginal orifice was maintained with no dilatation, normal urethral orifice and no urological complaints.

CONCLUSIONS

feminizing genitoplasty should be tailored to the degree of virilization of the genitalia, clitoroplasty is performed whenever clitoroplasty is present, urogenital sinus mobilization achieves excellent cosmetic outcome.

LAPAROSCOPIC EXCISION OF JUXTAGLOMERULAR CELL TUMOUR

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PURPOSE

We report a case of juxtaglomerular cell tumour of the kidney (reninoma) treated with laparoscopic nephron sparing surgery

MATERIAL AND METHODS

A 14-year old girl was incidentally found to have hypertension (180/114 mmHg) at the time of adenotonsillectomy. Pre-operative investigations revealed plasma renin level of 225.9 ng/dL (4.4-46), normal aldosterone, cortisol and urinary catecholamines. Abdominal ultrasound detected a 1.9x1.5 cm hypoechoic lesion in the right kidney lower pole; CT scan confirmed the presence of a 1.5 cm, well circumscribed, solid, hypoenhancing cortical lesion in the right lower pole. The blood pressure was controlled with ACE inhibitors and calcium channel blocker. At the time of surgery, a right J-J stent was placed. Laparoscopic nephron sparing surgery was accomplished by clamping the renal artery for 30 minutes (video); after excision the tumour bed was closed using barbed V-loc stures.

RESULTS

The procedure was completed laparoscopically in 150 minutes with no peri-operative complications. Patient was discharged home on day 4 post-op. Histology confirmed the diagnosis of juxtaglomerular cell tumour completely excised. The J-J stent was removed one month later. At follow-up the patient's blood pressure was normalized and medications were stopped. A DMSA scan performed 3 months later confirmed 36% residual function of the right kidney.

CONCLUSIONS

Laparoscopic nephron sparing surgery should be considered in children with juxtaglomerular tumour. This technique allows prompt recovery with preservation of significant renal function

LAPAROSCOPIC NEPHRON SPARING APPROACH FOR A RENAL MASS

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PURPOSE

In this video we aimed to present our laparoscopic partial nephrectomy experience on a right-sided kidney mass in a pediatric patient

MATERIAL AND METHODS

A 14-year-old girl complaining for right-sided flank pain was found to have a 6 cm mass on the right kidney. A transperitoneal laparoscopic partial nephrectomy was planned. The patient was placed in a 60 degrees lateral decubitus position. Total of 4 ports were placed, one 12 mm on umbilicus, one 12 mm and one 5 mm on right midclavicular line, and one more 5 mm on 2 cm below the xyphoid. Renal artery and vein was released from the surrounding tissues. The artery which was branching from the main renal artery and feeding the mass was locked by a 'Hem-o-Loc' clip. After the margins were scored by electrocautery, two endobulldog clamps were used to control renal artery and vein. Then the mass was removed from the parenchyma by the aid of a cold scissors. Collecting system and interlobular vascular structures were controlled by clips. Then the parenchymal defect was repaired with sutures in a continuous fashion. No bleeding was observed after removal of the bulldog clamps. The mass was taken out by an endobag and a drain was left in place.

RESULTS

Elapsed time was 113 minutes starting from the insertion of the first and ending by the removal of the last port. Warm ischemia time was 16 minutes and estimated blood loss was 150 mL. The drain was removed on the postoperative second day and then the patient was discharged home. The pathologic examination of the mass revealed a metanephric adenoma.

CONCLUSIONS

In selected pediatric oncologic cases, laparoscopic partial nephrectomy is an alternative surgical approach.

DIAGNOSTIC WORKUP AND LAPAROSCOPIC CORRECTION OF AN ECTOPIC URETER

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INTRODUCTION

Duplex renal collecting system is a common congenital anomaly in the pediatric population. If the child presents with life-long incontinence, especially after toilet training, one should suspect of ectopic insertion of the lower moiety of the duplex system. The most common spots of these ectopic insertions are the urethra distally to the external sphincter and vaginal cavity. Diagnostic workup should include a renal ultrasound, VUCG, and a cysto-vaginoscopy prior to the surgical procedure in order to identify the insertion of the ectopic ureter. This video will demonstrate the complete diagnostic workup prior to the procedure and a laparoscopic ipsilateral ureteroureterostomy.

PATIENT AND METHODS

A 10-year-old girl presented with lifelong continuous urinary incontinence. Workup revealed a duplicated collecting system with a functional superior moiety. Ultrasound suggested an ectopic ureteral insertion at the proximal portion of the vaginal cavity. An intraoperative vaginography and vaginoscopy detected the ureteral orifice and a successful catheterization showing the ectopic ureter was performed. After the final diagnostic workup a laparoscopic ipsilateral ureteroureterostomy was performed.

RESULTS

After locating the ectopic orifice, a double J stent was placed in the lower moiety ureter and an laparoscopic uretero-ureteroanastomosis was performed. The child reported no incontinence immediately after the procedure.

CONCLUSION

This video shows the appropriate diagnostic workup and the operative technique for a laparoscopic ureteroureterostomy. Efforts should be made to get appropriate localization of the ectopic meatus, to optimize the surgical correction of the duplex collecting system with an ectopic ureter.

RECURRENCE AFTER PARTIAL ADRENALECTOMY IN A CHILD WITH METACHRONIC BILATERAL PHEOCHROMOCYTOMA - LAPAROSCOPIC APPROACH

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PURPOSE

To present a case of laparoscopic resection of a recurrent tumor after partial adrenalectomy in a child with metachronic bilateral pheochromocytoma associated with von HippelLindau's disease.

MATERIAL AND METHODS

The patient, whose father had been diagnosed with von HippelLindau's disease and treated of an unilateral adrenal pheochromocytoma, presented at age 7 symptoms of night sweating and palpitation, and had the diagnosis of a 2.7cm right adrenal pheochromocytoma. He was then submitted to a successful total right laparoscopic adrenalectomy, with complete remission of the symptoms. At age 12, the symptoms recurred, and a left 2.6cm adrenal tumor was diagnosed. Prospective preoperative US showed that besides the tumor there was a non-affected postero-lateral segment of the gland that could be preserved. He was submitted to a transperitoneal laparoscopic procedure, that included section of the main adrenal vein and complete resection of the tumor, leaving the well vascularized remnant adrenal in situ. Cortisone replacement was initiated but interrupted after two weeks, since laboratory controls showed that the remnant adrenal was functioning, with physiologic corticosteroid levels. After 21 months of follow up, a 2.3cm recurrent left adrenal tumor was diagnosed. The patient underwent laparoscopic surgery with total resection of the residual left adrenal.

RESULTS

Pathological examination of the specimen showed a benign pheochromocytoma with free margins. The patient had a pancreatic fistula managed conservatively and was discharged from the hospital after 6 days. The child has a follow-up of 23 months without any symptoms, currently receiving cortisone replacement.

CONCLUSIONS

Laparoscopic resection of a recurrent adrenal tumor after partial adrenalectomy is a feasible technique in children with bilateral benign adrenal lesions.

PEDIATRIC ROBOT-ASSISTED LAPAROSCOPIC UPPER POLE PYELOPLASTY AFTER URETEROURETEROSTOMY

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INTRODUCTION

In the pediatric population, robotic-assisted laparoscopic pyeloplasty after previous failed open repair has demonstrated feasibility, safety, and clinical improvement. Pyeloplasty for ureteropelvic junction obstruction in complete duplex systems can be performed minimally invasively, but renal tissue preservation may be more challenging due to aberrant anatomy and after prior open surgery. We present a case of robotic-assisted laparoscopic upper pole pyeloplasty after failed open ureteroureterostomy.

METHODS

The patient is a 2 year old female (13.4kg) with a left duplex kidney associated with upper pole hydronephrosis for which an open left ureteroureterostomy was performed one year prior. Following this surgery, hydronephrosis persisted. Renal ultrasound and MR urogram demonstrated severe left upper pole pelviectasis secondary to vascular compression. The left upper pole accounted for 19% of renal function with 36% for the left lower pole and 45% for the right kidney. A robotic-assisted laparoscopic left upper pole pyeloplasty with cystoscopy and retrograde pyelogram was performed.

RESULTS

The previous ureteroureterostomy site was found to be widely patent, but the upper pole UPJ was extrinsically compressed by flanking renal arteries. A dismembered pyeloplasty with ureteral stent placement was accomplished. There were no intraoperative or postoperative complications. The patient was discharged on postoperative day 1 following removal of the urethral Foley catheter. The ureteral stent was removed 8 weeks postoperatively. Renal ultrasounds at 3 and 15 months postoperatively demonstrated very mild hydronephrosis.

CONCLUSIONS

Robotic-assisted laparoscopic pyeloplasty can be utilized safely and effectively even in young children for redo repair with aberrant renal anatomy.

POSTERIOR APPROACH TO THE PROCESSUS VAGINALIS IN ORCHIDOPEXY

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PURPOSE

The most critical step in an orchiopexy in achieving spermatic cord length is the separation of the processus vaginalis from the vas deferens and spermatic vessels. We report our experience with a posterior approach to the separation of the processus vaginalis. Our hypothesis was that the posterior approach to the processus vaginalis is comparable in surgical outcome measures to the more traditional anterior approach.

MATERIAL AND METHODS

Following internal review board approval, we retrospectively reviewed medical records of consecutive patients who underwent orchidopexy at Hasbro Children's Hospital between January 2006 and July 2012. Exclusion criteria included previous ipsilateral inguinal surgery and laparoscopic orchidopexy. Only patients with 6-month follow up were included in the study. Patients were divided into posterior and anterior surgical approach groups and operative outcomes were compared. The major endpoints at 6-month follow up included ipsilateral testicular atrophy, secondary reascension, and hernia recurrence. Additionally, a number of surgical variables were also considered, including gestational age, Tanner stage, presence of co-morbidities at the time of procedure, pre-operative and intra-operative testis location, and duration of procedure.

RESULTS

A total of 340 patients underwent orchidopexy who satisfied inclusion criteria within the time frame of our study. Of these patients, 191 and 149 underwent posterior and anterior approach orchidopexies, respectively. Follow up at 6 months revealed 1 case of testicular atrophy and 2 cases of secondary reascension in the posterior and anterior approach groups, respectively. Logistic regression analysis did not demonstrate significant difference in outcome superiority between the two groups ($P > 0.2061$).

CONCLUSIONS

In our study we have objectively determined that the posterior approach orchidopexy has the same surgical outcomes to the anterior approach, and thus is a viable surgical alternative. We believe the posterior approach to be more anatomical and easier to teach.

ROBOTIC ASSISTED REMOVAL OF SYMPTOMATIC URETERAL STUMP, ECTOPIC INTO SEMINAL DUCTS

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PURPOSE

Advanced technology allows safer and more complete surgical procedures. We describe a case where robotic-assisted laparoscopy avoided extensive surgery. Nephroureterectomy is generally uneventful, even if you leave the ureteral refluxing stump. Ureteral ectopia into the seminal ducts is extremely rare, but it may present in adolescents with recurrent febrile epididymitis

MATERIAL AND METHODS

A 14 years old boy, who underwent right nephroureterectomy at one year leaving its ureteral stump, presented with abdominal symptoms (fever, pain) and suspected appendicitis, but ultrasound showed fluid collection in the stump, and he recovered after antibiotic therapy. Recurrent epididymitis occurred during the following 3 years, thus decision was taken to remove the ureteral stump

RESULTS

Following cystoscopy confirming absent right ureteral meatus, robotic-assisted retrovesical exploration of the pelvis allowed to find the ureteral stump, to explore deeply to the seminal ducts, and to entirely remove the stump. We used a 30° robotic camera, with two trocars positioned as for radical prostatectomy, and a supplementary laparoscopicone. The procedure required 2.5 hours, the total hospital staying was 44 hours, without any postoperative pain, but little vesical symptoms due to endoscopy.

CONCLUSIONS

This is the first case described of ectopic stump removed by robotic-assisted surgery. The procedure allowed complete and safe removal of the stump, in an anatomic (retrovesical, anterectal) position, challenging to be reached by open surgery, and potentially requiring a transrectal approach. Robotic surgery permits not only minimally invasive surgery, but also to enter in anatomical areas difficult to reach.

VR-19 (VS)

ROBOTIC-ASSISTED LAPAROSCOPIC EXCISION OF MULTIFOCAL URETERAL AND RENAL PELVIS POLYPS

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PURPOSE

Fibroepithelial polyps are a rare cause of upper urinary tract obstruction in children. While endoscopic management is preferred in many cases, large or multi-focal polyps may preclude endoscopic management. Presented here is a case of a 9 year old with large, multifocal obstructive ureteral and renal pelvis polyps managed with robotic-assisted excision.

MATERIAL AND METHODS

After pre-operative evaluation confirmed the presence of obstructive polyps, a robotic-assisted approach was chosen. Standard robotic set-up for upper urinary tract surgery was planned, utilizing two robotic surgeon arms and a working port for the bedside assistant. A ureterotomy was made in the proximal ureter, exposing the ureteral polyps. Counter-incisions were made distally on the ureter in order to identify additional polyps and the anterior portion of the ureter was opened to expose all involved urothelium. Polyps were excised with electrocautery. Intra-corporeal ureterorenoscopy confirmed the excision of all significant polyp disease. The ureterotomy was closed in a water-tight, running anastomosis over a ureteral stent.

RESULTS

Final pathology confirmed the presence of fibroepithelial polyps of the urinary tract. The patient is currently without signs or symptoms of recurrent obstruction.

CONCLUSIONS

Robotic-assisted laparoscopy is a safe and feasible alternative to endoscopic treatment of fibroepithelial polyps. The robotic platform may be especially applicable for large or multifocal polyps of the ureter or renal pelvis.

USE OF THE VENOUS COUPLER FOR INTERNAL SPERMATIC TO INFERIOR EPIGASTRIC SHUNT WITH NUTCRACKER SYNDROME

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PURPOSE

The Nutcracker Syndrome (NCS) refers to symptomatic compression of the left renal vein (LRV). This can occur when the LRV traverses in the normal anatomic position- in the angle between the aorta and the superior mesenteric artery, or when the LRV is retroaortic - in an anomalous location as can be found in 1.8% of autopsies.

When symptoms such as hematuria, abdominal/pelvic pain or varicocele are sufficiently severe to warrant surgery, various types of surgical shunts have been utilized. Li et al (1) reported a microsurgical spermatic - inferior epigastric vein anastomosis in infertile men and Dong et al (2) performed this for adolescents with varicocele and NCS. Both of these authors utilized more difficult, hand sewn anastomoses. The venous coupler device is used extensively for microvascular surgery, but has not been reported for correction of NCS.

MATERIAL AND METHODS

A 13 year old boy with a symptomatic varicocele and solitary left testicle had chronic scrotal/abdominal pain. Doppler LRV sonography and CT scan confirmed a retroaortic LRV as the cause of his NCS, with gonadal and renal venous dilatation

RESULTS

Through a left inguinal incision, the internal spermatic vein was divided. The distal stump was ligated and the proximal end of the internal spermatic vein was anastomosed to the inferior epigastric vein in a simplified fashion using the venous coupler device and this is depicted. On postoperative imaging, the size of the pampiniform plexus and the LRV normalized and the symptoms completely resolved.

CONCLUSIONS

Adolescents with symptomatic primary or recurrent varicocele should be evaluated for the presence of NCS. When NCS is present, a venous shunt should be performed and the venous coupler greatly facilitates this procedure.

1) Li H, Zhang M, Jlang Y, Zhang Z, Na W Urology 83: (1) 94 -99, 2014

2) Dong W, Yao Y, Huang H, Han J, Zhao X, Huang J JPUrol 10, 424-429, 2014

VR-21 (VS)

LAPAROSCOPIC TRANSCUTANEOUS EXTRAPERITONEAL REPAIR OF HYDROCELE IN CHILDREN BY USING J SHAPED BENDED SPINAL NEEDLE

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PURPOSE

To introduce a unique technique, single port laparoscopic assisted extraperitoneal closure of patent processus vaginalis using J shaped bended spinal needle.

MATERIAL AND METHODS

Sixteen children underwent Laparoscopic Transcutaneous Extraperitoneal (LTE) repair of hydrocele by using J shaped bended spinal needle.

A 2.7-mm 30-degree laparoscope was inserted through an umbilical incision. The scope could view both inguinal ring. J shaped bended 18G spinal needle was inserted just 5mm lateral to the internal inguinal ring. The needle was introduced to the extraperitoneal space over the vas deferens and spermatic vessels, injecting of saline for the preperitoneal hydrodilatation. A 3-0 polyester suture was threaded through an 18G spinal needle. Same 3-0 polyester suture was threaded through a 20G spinal needle from the tip. Along the guidance of the suture and 18G needle, J shaped bended 20G spinal needle was reintroduced to extraperitoneal space. 20G spinal needle traveled through the upper margin of internal ring, 20G needle tip was pulled out of the initial 18G needle punctured opening. 3-0 polyester suture was pulled outside from the 20G needle tip and then 20G needle is also withdrawn. After all these procedure, internal inguinal ring was completely encircled and tied extracorporeally. The knot was buried in the subcutaneous area within the punctured needle hole.

RESULTS

All patients were discharged on the same day after surgery without any complication. During a mean follow-up period of 8 months (range 1-12mo), no recurrence has been observed except first 2 cases.

CONCLUSIONS

This LTE technique is simple, fast, safe and cosmetic procedure for pediatric hydrocele.

NEOPHALLOPLASTY BY CONGENITAL APHALIA USING TWO TRANSVERSE SKIN-FLAPS: AN ALTERNATIVE APPROACH

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PURPOSE

Penile agenesis is a rare congenital abnormality with an incidence of 1 in 30 million births. We want to demonstrate in this video a new technique of neophalloplasty based on two transverse skin flaps from lower abdominal wall.

MATERIAL AND METHODS

Patient was placed into a prone position, the urethral meatus was found inside the rectum, 2 cm from the anal border. An ASTRA approach was performed, the urethra isolated and repositioned as a perineal urethrostomy. We created the neophallus based on two flaps, each measured 7 x 3 cm. After incision, flaps were rotated 90 degrees and sutured one to each other to create the neophallus. We also created a Mitrofanoff channel to secure bladder emptying in case of urethrostomy stricture.

RESULTS

Patient had an uneventful clinical evolution, voids preferably through the urethrostomy and mother uses the Mitrofanoff once a day. Present follow-up is 18 months.

CONCLUSIONS

We acknowledge limited clinical experience with this technique. On the other hand, the same principle has been used to create catheterizable urinary channels with favorable results and longer follow-up. The use of transverse skin flaps might be an interesting alternative for neophalloplasty in aphalia.

LAPAROSCOPIC RETROPERITONEAL APPROACH FOR RETROCAVAL URETER IN CHILDREN

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PURPOSE

Retrocaval ureter (RCU) is a rare congenital anomaly and published data on pediatric laparoscopic management are poor. The aim of this study was to report our experience of retroperitoneal laparoscopic approach for management of RCU in children.

MATERIAL AND METHODS

A retrospective review of data from patients treated for RCU between 2002 and 2015 was performed. All patients were placed in a flank position and underwent a three-port (5-mm optical trocar and two 3-mm trocars) laparoscopic retroperitoneal ureteroureterostomy. Anastomosis was made by 6/0 absorbable sutures. A JJ stent was always inserted.

RESULTS

Five patients with a median age of 94 months (5-152) were operated on and followed up for a median time of 58 months (1-155). Median operating time was 200 minutes (160-270). No conversion and no transfusion occurred. Median hospital stay was 2 days (1-4). Ureteral stent was removed after 52 days (47-82). Complications included UTI (N=1). In all cases, hydronephrosis decreased postoperatively.

N	Age (months)	Symptoms	Preoperative imaging	Preoperative diagnosis	Postoperative diagnosis	Surgical techniques
1	137,3	UTI	US, MAG3 renography	PUJO	RCU	Resection of ureter - Ureteroureterostomy
2	5,2	Antenatal diagnosis	US, MAG3 renography, uroRMI	PUJO	RCU	Resection of PUJ and ureter - Pelvi-ureteric anastomosis
3	94,5	Hematuria and lithiasis	US, UroCT scan	RCU with suspended lithiasis	RCU	Resection of PUJ and ureter - Pelvi-ureteric anastomosis
4	151,6	Hematuria and flank pain	US, UroRMI	RCU	RCU	Resection of ureter - Ureteroureterostomy
5	16,8	Antenatal diagnosis	US, MAG3 renography	PUJO	RCU	Resection of PUJ and ureter - Pelvi-ureteric anastomosis

CONCLUSIONS

Retroperitoneal laparoscopic approach for RCU is safe and effective in children. Our video demonstrates different patients with specific surgical details to show how to manage these children. The global vision of the upper tract by laparoscopy leads to optimal management of these children even if the anomaly was not detected preoperatively.

ROBOTIC URETERO-URETEROSTOMY: A BETTER SOLUTION FOR UPPER POLE OBSTRUCTION

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PURPOSE

Robotic-assisted laparoscopy (RAL) has been rapidly adopted in pediatric urology due to favorable outcomes coupled with the benefits of improved visualization, facile instrumentation and short hospital stay. RAL has provided safe and effective approaches to lower tract reconstruction which may obviate the need for more risky upper pole approaches in cases of upper pole ureteral ectopia or obstruction. We present the basic steps for a robotic assisted laparoscopic upper to lower pole ureteroureterostomy.

MATERIAL AND METHODS

The patient is positioned in the dorsal lithotomy position for the entire procedure. Cystoscopy is performed for placement of a double J stent into the normal lower pole ureter. Peritoneal access is obtained and ports are placed in the same orientation as for an extravesical ureteral reimplantation. The upper and lower pole ureters are identified and separated, and the upper pole ureter is transected. The remaining distal ureter is excised. Using a hitch stitch to stabilize it, a longitudinal incision is made into the lower pole ureter and an end to side anastomosis is performed.

RESULTS

Robotic assisted laparoscopic ureteroureterostomy avoids manipulation of the bladder, avoids the risk of renal loss from upper pole partial nephrectomy, and enables visualization of the entire length of the ureter which is important for cases of long distal obstruction.

CONCLUSIONS

By virtue of a wide field of vision and facile instrumentation, RAL ureteroureterostomy provides a valuable alternative to the management of upper pole ectopic or obstructed ureters, and avoids potentially morbid or risky procedures involving the bladder or kidney.

ROBOT-ASSISTED LAPAROSCOPIC LOWER POLE PARTIAL NEPHRECTOMY IN THE PEDIATRIC POPULATION

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INTRODUCTION

In pediatric urology, partial nephrectomy is used primarily to remove a nonfunctioning renal moiety, more commonly the upper pole, in a duplicated system. The most common causes of decreased function are reflux, obstruction from an ureterocele, and ectopic ureters. Although our institution has previously reported our experience with older, larger children (median age 7.2 years, median weight 34.8 kg), there is limited data involving infants. As such, we present a video of a robot-assisted laparoscopic lower pole partial nephrectomy in an infant.

METHODS

Our patient was an 11 month old (10.7kg) male with a history of prenatal hydronephrosis, who was diagnosed postnatally with a duplicated right collecting system. Ultrasonography revealed severe hydroureteronephrosis of the right lower collecting system. Voiding cystourethrogram showed reflux into the right lower pole with concomitant evidence of ureteropelvic junction obstruction. A DMSA demonstrated a differential renal function with 68% in the left kidney and 32% in the right kidney, but no radiotracer uptake in the right lower pole. A robot-assisted laparoscopic lower pole partial nephrectomy was performed.

RESULTS

There were no intraoperative or postoperative complications. On postoperative day one, the urethral Foley catheter was removed, and the patient was discharged home. At one-month postoperatively, an ultrasound demonstrated no hydronephrosis or perinephric fluid collection.

CONCLUSIONS

Robotic partial nephrectomy is safe and feasible in pediatrics including both older children and infants. It is successful for both upper and lower pole partial nephrectomies.

TRANSURETHRAL INCISION OF ANTERIOR URETHRAL DIVERTICULUM (SYRINGOCELE)

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PURPOSE

Here we present a 3 year old boy with disturbed urine flow with anterior urethral diverticulum.

MATERIAL AND METHODS

A 3 year old boy presented with symptoms of straining during micturition, weak urine flow, intermittent haematuria and postvoid dribbling since birth. Physical examination and urinalysis were unremarkable and urine cultures were negative. Initial ultrasonography revealed an increased bladder wall thickness with a bladder volume of 166 cc and a postvoiding residual volume of 120 cc without any ureteral dilatation or hydronephrosis. Uroflowmetry revealed an obstructive voiding pattern; maximum flow: 1.4 ml/sec, average flow rate: 0.7 ml/sec, voided volume:20cc, residual volume:130cc. A micturition cystourethrogram revealed bladder trabeculation without vesicoureteral reflux. On urodynamic study, bladder volume was 210 cc, bladder compliance was reduced and most of the bladder content was remaining residual. The patient had undergone urethrocystoscopy which revealed a large urethral diverticulum (syringocele) located at the anterior urethra and the bladder demonstrated severe trabeculation. Posterior urethra was normal. Diverticulum was incised proximal to distally by monopolar cautery and complete unroofing was achieved.

RESULTS

Two months after the intervention, patient had undergone uroflowmetry, urodynamic study and urethrocystoscopy examinations. On uroflowmetry, maximum flow rate was 16.6 ml/sec and average flow rate was 4.7 ml/sec with a residual volume of 20cc. On repeated urodynamic study bladder capacity was measured 170 cc and residual volume was 35 cc with a staccato micturition. On second-look urethrocystoscopy, no residual tissue that necessitate incision was encountered.

CONCLUSIONS

Anterior urethral diverticulum must be considered while evaluating children with disturbed urine flow.

THE MULTI-INSTITUTIONAL BLADDER EXSTROPHY CONSORTIUM: TECHNICAL STANDARDIZATION OF COMPLETE PRIMARY REPAIR OF EXSTROPHY IN THE GIRL

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INTRODUCTION

To improve our experience and proficiency in the care of bladder exstrophy (BE), we formed the Multi-Institutional BE Consortium (MIBEC). In this video, we describe the standardization of complete primary repair of BE (CPRE) in the female as developed through this collaboration.

MATERIAL AND METHODS

Three institutions alternately served as hosts with commentary, critique and teaching by collaborating surgeons via direct observation or real-time video transmission. Employing the MIBEC method and protocol, CPRE with bilateral iliac osteotomy was performed between 1-3 months of age. Patients were prospectively followed for outcomes including complications.

RESULTS

From February 2013-February 2015, MIBEC surgeons performed CPRE in 13 consecutive girls at median age of 1.9 months (0.1-51.6 months) for 10 classic BE and 3 epispadias patients. There was no dehiscence. Hydronephrosis of mild grade was present in 3 girls and moderate in 5; 5 had unilateral or bilateral hydroureter. Pyelonephritis of ≥ 1 episode occurred in 5 girls, and 4 girls had varying degrees of urinary retention. Two were managed successfully with temporary clean intermittent catheterization (CIC), and 2 developed complete retention; 1 with a stenotic bladder outlet will require diversion to vesicostomy, and 1 with meatal stenosis resulting in bladder rupture continues CIC after repair. Changes in the sequence of perineal reconstruction and urethral maturing, relative to symphyseal approximation, have been made due to obstructive complications. A more gradual tapering of the bladder neck into the proximal urethra has also been incorporated.

CONCLUSIONS

CPRE in girls is an evolving process with each patient benefiting from the last. We have modified our technique through the MIBEC to improve outcomes and decrease complications.

VR-28 (VS)

GUBERNACULAR SPARING LAPAROSCOPIC ORCHIDOPEXY FOR INTRA-ABDOMINAL TESTICLE

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PURPOSE

Laparoscopic management of the intra-abdominal testis typically involves division of the gubernaculum and passage of the testicle into the scrotum through a new inguinal hiatus. However, this approach can compromise gubernacular blood supply and may predispose the patient to testicular atrophy.

MATERIAL AND METHODS

Video demonstrating techniques for performing two-stage laparoscopic orchidopexy with gubernacular preservation.

RESULTS

N/A

CONCLUSIONS

The laparoscopic two stage orchidopexy with gubernacular preservation is a safe, feasible, and effective technique

PEDIATRIC ROBOTIC-ASSISTED LAPAROSCOPIC URETEROCALICOSTOMY: TIPS AND TRICKS

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PURPOSE

Robotic-assisted laparoscopic ureterocalicostomy is a treatment option for patients with recurrent ureteropelvic junction (UPJ) obstruction after failed pyeloplasty. We present the role of flexible pyeloscopy and the harmonic scalpel in identification of the dependent lower pole renal calyx and in maintaining a hemostatic anastomosis, especially in those with a thick renal cortex.

MATERIAL AND METHODS

In this case, our patient was a 4 year-old female with a right UPJ obstruction who had failed prior pyeloplasties with increasing hydronephrosis and recurrent urinary tract infections.

The patient was placed in the left lateral decubitus position, and a transperitoneal approach was employed. The colon was reflected, and the right ureter and hydronephrotic kidney were identified. The ureter was spatulated before transection, to take advantage of two fixed points. A flexible cystoscope was inserted through the transected UPJ via the assistant port to identify the most dependent lower pole calyx, which was then amputated with harmonic shears to expose the calyx with bloodless edges. The proximal ureteral stent was placed into the lower pole through this opening. Interrupted sutures were placed from the calyceal epithelium to the spatulated ureter at 3, 6, 9, and 12 o'clock and then tied simultaneously to prevent tearing. A hemostatic agent was applied to the surgical site, and a drain was placed.

RESULTS

The procedure was uneventful without intraoperative or perioperative complications. The ureteral stent was removed at four weeks, and postoperative ultrasound showed improvement of her hydronephrosis.

CONCLUSIONS

Flexible pyeloscopy and the harmonic scalpel aid in identification of the dependent lower pole calyx and maintain a bloodless field, especially with a thick renal cortex, for anastomosis in robotic-assisted laparoscopic ureterocalicostomy.

SINGLE INCISION PRONE RETRO-PERITONEOSCOPIC PAEDIATRIC NEPHRECTOMY

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PURPOSE

The first paediatric laparoendoscopic single site (LESS) nephrectomy was reported in 2009. We have previously published our early experience (two patients) of single incision nephrectomy via the retroperitoneal prone route using an advanced access platform (GelPOINT Mini – Advanced Medical, CA, USA). Here, we review our single centre series to date and also present a detailed video demonstrating the technique.

MATERIAL AND METHODS

In the prone position, a single transverse incision was made at the midpoint on a line along the lateral border of erector spinae bounded by the lower border of the 12th rib and iliac crest. Posterior abdominal muscles were split and the deep lumbodorsal fascia incised. The Alexis retractor was positioned and the Gel-Seal cap with low-profile sleeves locked in place. Hilar vessels were divided by endoclip application or harmonic scalpel. The kidney was retrieved directly or via an endobag. The Alexis retractor was removed and wound closed with absorbable sutures.

RESULTS

Between July 2013 and March 2015, we have used this approach to perform ten nephrectomies in 9 patients (4 male and 5 female). Nephrectomies were performed for multicystic dysplastic kidneys (n=4), focal segmental glomerulosclerosis (n=2), obstructive nephropathy (n=3) and dysplasia (n=1). Median age at nephrectomy was 10.9 years (range 2.7 – 15.9 years). Median patient weight was 34.9 Kg (15.4 – 78Kg). Median kidney length was 7.5 cm (range 3.7 – 11.5 cm). No complications occurred and none converted to open procedure.

CONCLUSIONS

Single incision retroperitoneal nephrectomy is feasible, safe and provides excellent cosmesis.

ROBOTIC-ASSISTED PARTIAL CYSTO-PROSTATECTOMY FOR EMBRYONAL RHABDOMYOSARCOMA

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PURPOSE

Robotic surgery can open new horizons and strategies as a minimally-invasive approach for situations generally considered the exclusive preserve of open surgery

MATERIAL AND METHODS

A 2-year-old child was admitted to our hospital with acute renal failure, bilateral hydro-uretero-nephrosis and suprapubic mass. After initial treatment (bilateral nephrostomy, haemodialysis) further analysis confirmed an embryonal rhabdomyosarcoma originating from bladder base/prostate with regional infiltration.

According to EpSSG RSM 2005 protocol, chemo- and targeted radiotherapy resulted in good local regression but left a residual neoplastic mass involving the bladder base and prostate. A trans-vesical partial cysto-prostatectomy, without ureteric reimplantation was performed with DaVinci robot resulting in the complete removal of residual tumour tissue. Histology revealed absence of neoplastic cells including the resection margins.

Ureteral stents were removed after two months. The child underwent adjuvant chemotherapy and three monthly endoscopic and MRI follow-up evaluation

RESULTS

After 18 months, the child has autonomous micturition, complete bladder emptying and preserved continence. Mild left vesico-ureteric reflux is present without clinical symptoms. Endoscopy and imaging are negative for tumour recurrence

CONCLUSIONS

This case describes a laparoscopic robotically-assisted approach to bladder/prostate rhabdomyosarcoma in a child, previously unreported in the literature. Robotic surgery allowed precise and complete local excision of residual mass which would have been impossible by conventional open surgery, thereby avoiding the need for radical cystectomy and more complex and demanding substitutive procedures. Such progress underlines the need for such cases to be managed in highly specialised multi-disciplinary centres; further experience and follow-up are necessary to confirm the validity of this innovative approach

SELECTIVE ARTERIAL MAPPING USING NEAR INFRARED FLUORESCENCE IMAGING IN PEDIATRIC ROBOT ASSISTED LAPAROSCOPIC HEMINEPHRECTOMY

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PURPOSE

Selective arterial mapping (SAM) using near-infrared fluorescence (NIRF) imaging with administration of Indocyanine green (ICG) is used during robot partial nephrectomy to determine regional renal perfusion. We hypothesize that SAM may prevent vascular complications in pediatric robotic laparoscopic heminephrectomy (RALHN) by determining or confirming the area of excision. This purpose of this video is to demonstrate this novel technique.

MATERIAL AND METHODS

We have performed SAM in 5 RALHNs. In each, 0.5 to 1 ml of ICG was infused after soft bulldog occlusion of a candidate segmental renal artery. After 60 seconds, NIRF imaging was used to determine regional perfusion deficit. This video depicts one of the 5 cases.

RESULTS

SAM was completed successfully in all 5 children. There were no complications or adverse reactions associated with IV ICG. There were 3 males and 2 females. The mean age was 5.4 years (2.2 to 10 years). This video shows the case of a 4 y/o female who presented continuous urinary incontinence secondary to a duplex right kidney with an ectopic upper pole ureter.

CONCLUSIONS

In pediatric RALHN, SAM was feasible and safe, and provided real-time intraoperative confirmation of selective ischemia in the moiety to be excised, and safely guided arterial ligation in complex duplex renal anatomy. The patient from the video did well and her incontinence resolved after surgery.

PERCUTANEOUS NEPHROLITHOTOMY IN CHILDREN: A PRELIMINARY CASE REPORT

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PURPOSE

The incidence of stone disease has been increasing and the risk of recurrent stone formation is high in a pediatric population. The options for management for upper tract urolithiasis include shock wave lithotripsy (SWL), percutaneous nephrolithotomy (PNL), retrograde intrarenal surgery (RIRS), and open / laparoscopic stone surgery. Recently, endoscopic methods have been safely and effectively used in children with minor complications. As a low-risk procedure with a high retreatment rates (18–67 %), SWL often leads to persistent residual stones. The developing RIRS can minimize the risks associated with bleeding and visceral injury, but there are cases in which the pelvicalyceal anatomy is not ideal, and because of the anatomical delicacy of pediatric ureter, flexible ureteroscopy may not be an ideal option. Being a safe procedure in adults, PNL was first described in children by Woodside et al. in 1985, with total stone removal in one session, using standard adult instruments. Ever since then, there have been multiple studies by various authors in pediatric PNL.

MATERIAL AND METHODS

In this video, we describe the PNL procedure, emphasizing the essential points of PNL, in a 8 years child with a stone in renal pelvis of 2.4 cm with bilateral renal atrophy due to reflux nephropathy.

RESULTS

Percutaneous nephrolithotomy for pediatric renal stones >2 cm is associated with less hospital stay, less blood transfusion and less renal damage, compared with open surgery. Both techniques had comparable outcome and complications. Moreover, the operative time is not significantly longer with the use of pediatric nephroscopes. We did not notice any recurrence after our short follow-up (12 months).

CONCLUSIONS

Percutaneous nephrolithotomy for renal stones in pediatric patients is safe and feasible in selected cases after an extensive learning curve.

LAPAROSCOPIC RESECTION OF HIGH RISK ADRENAL NEUROBLASTOMA BY POSTERIOR APPROACH FOLLOWING CHEMOTHERAPY

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PURPOSE

laparoscopic adrenalectomy by posterior approach carries high recovery and shorter operative time. Children with metastatic high risk neuroblastoma arising from the suprarenal gland should undergo local surgical excision of the primary tumor before further intensification of chemotherapy and possible bone marrow transplantation. Herein, we report a video of left laparoscopic adrenalectomy showing the different steps of the procedure.

MATERIAL AND METHODS

3.8 y old boy with left metastatic suprarenal neuroblastoma, received chemotherapy according to high risk European protocol. Child positioned in prone position, first trocar at the tip of the last rib by open introduction, two 5mm trocars one in costovertebral angle and the other is lateral. Balloon development of the space, gerota fascia opened, the upper pole of kidney identified, mass dissected, suprarenal vein is clipped during dissection, extraction in bag.

RESULTS

oral feeding is begun after 6 hours, discharge from hospital in the second day postoperatively, rapid convalescence, rapid resumption of chemotherapy.

CONCLUSIONS

laparoscopic adrenalectomy using posterior approach gives direct access to the adrenal gland, no peritoneal violation, rapid intestinal movement recovery, short hospital stay and rapid recovery. All advantages that might facilitate the early start of adjuvant chemotherapy in children with neuroblastoma, however, oncological outcome should be proven by long term follow up, larger number of patients, and good selection of small tumor facilitates surgical extirpation.

EXCISIONAL TREATMENT OF RENAL HYDATID CYST MIMICKING RENAL TUMOUR WITH DIODE LASER TECHNIQUE: A CASE REPORT

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PURPOSE

Cystic echinococcosis, one of the most important helminthic infections, is a serious life-threatening health problem in developing countries. Hydatid cyst of kidney is a rare condition in children and can be treated with medical therapy or surgical treatment for resistant cases. Here we present a case of renal hydatid cyst who was treated with laparoscopic excision with diode laser.

MATERIAL AND METHODS

A 15 year old female patient was admitted with abdominal pain. Abdominal ultrasonography revealed a 32*23*19 mm solid mass with cystic component at lower pole of right kidney. An indirect hemagglutination (IHA) test for echinococcosis granulosis was performed which was positive at a 1:320 titre. Other laboratory tests were within normal limits. The patient received albendazole therapy for 3 months. Control magnetic resonance imaging showed a solitary lesion with exophytic extensions which was containing large septations. No contrast enhancement could be detected after gadolinium injection. As no regression could be detected radiologically surgical treatment was planned. Laparoscopic renal lower pole mass cyst excision with diode laser was performed and the patient was hospitalized for one day without any blood transfusion. Histopathological examination was consistent with hydatid cyst of kidney.

RESULTS

Our patient was treated with laparoscopic cyst excision successfully. At the postoperative second month the ultrasonography of kidneys were normal.

CONCLUSIONS

The diagnosis of hydatid cyst of kidney is generally put incidentally and can be misdiagnosed as primary kidney tumours. For patients from endemic areas, hydatid cyst should always be included in the differential diagnosis. Laparoscopic excision of renal hydatid cysts with diode laser is a feasible and safe technique for resistant cases.

THE "RETURN MANOEUVRE" IN PAEDIATRIC ROBOTIC ASSISTED LAPAROSCOPIC PYELOPLASTY: EASY FOR THE SURGEON, BETTER FOR THE PATIENT

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PURPOSE

Literature reports double J stent placements in paediatric robotic assisted laparoscopic pyeloplasty (PRALP). Their main drawback is the need for either endoscopic removal under general anaesthetic or removal using an uncomfortable externalized string. We used a novel approach to drain the pelvic cavity.

MATERIAL AND METHODS

Once the posterior wall of the anastomosis was performed, a 14G cathlon was inserted under vision through the ipsilateral flank wall. A 4.7F Urosoft multipurpose® stent (Bard®), cut after the first loop, was pushed in the abdominal cavity through the cathlon. Using the needle holder, the inserter was pushed in a calyx and through the parenchyma. The loop was placed in the renal pelvis and the inserter was pushed back out through the cathlon. The stent was stitched to the skin. Anastomosis was ended. The stent was clamped two days after surgery and removed two weeks later in outpatient clinic without sedation.

We present our series of patients who underwent the return technique. Data are given in median (range).

RESULTS

Six patients underwent this technique. Age was 5years (8months-11years). All but one had their stent clamped at day 2. One patient required intermittent clamping during 2 weeks due to intermittent pain. Stent removal was performed in outpatient clinic at 16 days postoperative for 5 patients and 28 days for one. None presented complication linked to the stent.

CONCLUSIONS

The "return manoeuvre" is an easy and feasible technique of drainage insertion during PRALP. It avoids the drawbacks of double J stenting.

LAPAROSCOPIC EXPLORATION FOR NEPHRECTOMY ENDED WITH DIAGNOSIS OF MULTIPLE ANOMALIES: INCOMPLETE URETERAL TRIPLICATION AND INTRAABDOMINAL TESTIS ASSOCIATED WITH AN ATYPICAL POLYORCHIDISM

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PURPOSE

Nephrectomy is not a simple surgical procedure. One must be ready for all possible abnormalities and variations. TriPLICATION of the ureter is one of the rarest anomalies in the urinary tract and association with polyorchidism was not reported yet. In this video, we present a patient having ureteral triPLICATION and intraabdominal testis (IAT) associated with polyorchidism.

MATERIAL AND METHODS

A left side laparoscopic nephrectomy was planned in 11 month-old boy having recurrent urinary tract infection and nonfunctioning left kidney. He also had nonpalpable left testis.

RESULTS

Cystoscopy revealed a single left ureteric orifice at bladder neck. Laparoscopic exploration showed incomplete ureteral triPLICATION. A stay suture was placed to laterally located ureter; the second and then a third ureter were found. The patient was an infant and all the neighboring structures were close to the pathology in a narrow space. A special care was taken during dissection of the medially located ureter which is close to the main vascular structures. Following the nephroureterectomy, kidney and ureter were removed from a mini inguinal incision. IAT was also brought out and inguinal exploration showed another testis located in inguinal region (polyorchidism). Inguinal one was nubbin testis. The nubbin testis had vas deferens, while normal looking IAT had only epididymis and no vas. Vas deferens of nubbin was anastomosed to epididymis of the IAT and orchiopexy was performed.

CONCLUSIONS

Some surgically challenging anomalies may not be determined preoperatively in a nonfunctioning kidney. Laparoscopy provides a better exposure and identifies associated anomalies in such cases.

KELLY PROCEDURE FOR MALE PRIMARY EPISPADIAS

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PURPOSE

Primary epispadias is a rare congenital malformation involving the urogenital system. In patients with epispadias, bladder closure enhances bladder growth and continence.

MATERIAL AND METHODS

This video aims to demonstrate the Kelly procedure for primary epispadias in a male child.

A lower midline incision is employed extending down to the sub-coronal region, degloving the penis, exposing the full length of its attachment. The urinary bladder is mobilised and the inter-pubic ligament is divided in the midline. The prostate and bladder neck is separated from the symphysis and the pelvic floor muscles are delineated and divided. The fat in the ischio-rectal fossa is visualised and swept inferiorly to give access to Alcock's canal. The pudendal neurovascular bundle is identified and preserved. Mobilisation of the corpora cavernosa along with periosteum begins at the anterior pubic surface and extends posteriorly. These steps bring the bladder neck to the midline and allow tension free bladder neck reconstruction and recreation of the natural angulation of urethra.

The urethral plate, penile shaft is dissected and corpora cavernosa are separated. The bladder neck repair is performed. The urethral plate is tubularised and brought ventrally. The separated corpora are reapposed avoiding torsion. The skin is reoriented to provide cover to the penis.

RESULTS

The Kelly procedure improves cosmesis and continence by reconstructing a tension free bladder neck repair and lengthening the penis.

CONCLUSIONS

This video demonstrates the Kelly procedure for primary epispadias in a male child.

MICROPERC

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PURPOSE

Micro percutaneous nephrolithotomy (Microperc) is one of the minimally invasive procedures for the treatment of urinary stone disease. In this video we aimed to demonstrate how we do micro percutaneous nephrolithotomy in children

MATERIAL AND METHODS

A 7-year old girl complaining of abdominal pain was found to have three kidney stones, largest one 7 mm in diameter in the left renal pelvis by KUB and CT scan. A micro percutaneous nephrolithotomy was planned for her.

RESULTS

Under general anesthesia the patient was placed in supine position. A 5-Fr ureteral catheter was placed into the left kidney over a glide wire via a 9.5 Fr ureteroscope. Then the patient's position was changed to prone. Access to the left kidney was made through the middle zone under direct visualization by a 0 degrees optic through an "all-seeing needle" under scopic guidance. Three kidney stones, largest one 7 mm in diameter were observed in renal pelvis. Then the stones were fragmented by using holmium:YAG laser. Following totally fragmentation of the stones, a 4.7 Fr/16 cm ureteral double-J stent was placed into the left kidney. After confirmation of the stone-free status on postoperative day 1 with a KUB, urethral catheter and double-j stent was removed and the patient was discharged on the same day. Anesthesia time was 65 minutes, scopy 3 minutes and hospital stay was 1 day.

CONCLUSIONS

Micro percutaneous nephrolithotomy technique, that shown step by step in this video, is an effective and safe procedure for the minimally invasive treatment of selected kidney stones in children.

INNOVATION IN ROBOTICS AND PEDIATRIC UROLOGY: ROBOTIC URETEROURETEROSTOMY

Julia FINKELSTEIN, Mark SILVA, Sarah LAMBERT and Pasquale CASALE
Columbia University College of Physicians & Surgeons, Urology, New York, USA

PURPOSE

Robotic technology has increasingly been utilized for complicated reconstructive surgeries in pediatric urology, such as ureteroureterostomy (UU). There are only 9 publications, encompassing 45 patients, regarding pediatric minimally invasive UU. We sought to evaluate and report on our pediatric experience with robot-assisted laparoscopic UU.

MATERIAL AND METHODS

With approval from the Institutional Review Board, a retrospective chart reviewed was performed of all pediatric patients who underwent a robot-assisted laparoscopic UU by 2 pediatric urologists at our institution over a two-year period, from March 2013 to March 2015. An externalized ureteral catheter was kept overnight and was generally removed with the indwelling urinary catheter on post-operative day #1. Intraoperative as well as postoperative complications including hematuria, fever, and urinary tract infections (UTIs) were recorded. Follow up renal ultrasound was done at 3 months.

RESULTS

Overall, 12 patients (4 male, 8 female) underwent robotic UU at a mean age of 19.4 months (range 9-48 months) during the study time period. The majority of patients (81.8%) initially presented with antenatal hydronephrosis and all were found to have ureteral ectopia. Mean weight of the cohort at the time of surgery was 11.8 kg (range 9-14.2 kg). One child had bilateral surgery. Mean operative time was 167 minutes (range 100-345 minutes) and mean estimated blood loss was 1.5 cc (range 0-3). There were no intraoperative complications and no case required open conversion. Mean length of hospital stay was 1 day. One patient developed a febrile UTI postoperatively. All patients experienced improvement in symptoms and/or became dry. Overall success rate was 100%.

CONCLUSIONS

Our institutional results demonstrate that robot-assisted laparoscopic ureteroureterostomy is a safe and effective technique to manage duplicated, ectopic ureters in children.

NEONATAL CLOSURE OF BLADDER EXSTROPHY

Pankaj MISHRA, Simon RAJENDRAN and Imran MUSHTAQ
GREAT ORMOND STREET HOSPITAL, PAEDIATRIC UROLOGY, London, UNITED KINGDOM

PURPOSE

Bladder exstrophy is a rare congenital malformation involving the lower abdominal wall, the pelvic structures and the urogenital system. The primary aim in management is to close the open bladder in order to facilitate its growth and function.

MATERIAL AND METHODS

This video aims to demonstrate the bladder closure for classic bladder exstrophy.

The ureteric orifices are identified and stented. Large mucosal polyps are excised and mucosa repaired. A midline incision is made starting above the umbilical cord, encircling it and extending on each side on the mucosal edge of the bladder up to the level of the verumontanum. The edge of bladder is partially mobilised and bladder closure is started from dome with interrupted inverting sutures. A stent is placed across the bladder neck and secured before the closure of the bladder.

The abdominal muscles are mobilised off the skin and apposed with interrupted horizontal mattress sutures starting from the upper part of the wound. In the lower part of the wound the sutures are applied and put on cross-over traction to stretch the pelvic ligaments, and tied in turn while maintain the traction to approximate the pelvis. The skin and subcutaneous tissue are approximated.

Epidural analgesia and enteral nutrition is the key to postoperative pain management and healing.

RESULTS

Neonatal bladder closure restores the near normal anatomy, facilitates growth and function of the bladder and allows for early bonding of the baby.

CONCLUSIONS

This video demonstrates neonatal closure of bladder exstrophy.

PRE-TRANSPLANT ROBOTIC ASSISTED LAPAROSCOPIC SIMPLE NEPHRECTOMY WITH CREATION OF CATHETERIZABLE URETERAL STOMA

Paul KOKOROWSKI and Roger DE FILIPPO

Children's Hospital Los Angeles, Keck School of Medicine of the University of Southern California, Urology, Los Angeles, USA

PURPOSE

Pre-transplant creation of a catheterizable urinary stoma is commonly recommended for boys with poor bladder emptying secondary to posterior urethral valves. We describe a minimally invasive use of the native ureter as a catheterizable channel in a boy with chronic renal disease and neurogenic bladder secondary to posterior urethral valves.

MATERIAL AND METHODS

The patient is a 7-year-old boy with a history of stage IV chronic kidney disease secondary to posterior urethral valves and bilateral high-grade vesicoureteral reflux, which resolved on the left side and persisted into a small dysplastic right kidney. He was on intermittent catheterization with good capacity and compliance, but poor emptying. His GFR was estimated at 15-29 ml/min with minimal function from the right kidney. Pre-transplant nephrectomy with catheterizable vesicostomy was recommended and discussed with the family.

RESULTS

We placed a 12mm umbilical camera port, two 8mm robotic arm ports and one 5mm assistant port. A right nephrectomy was performed and the ureter transected proximally. The robot was repositioned for the ureteral reimplantation with vesicostomy creation. A submucosal tunnel was made along the right bladder wall. The detrusor muscle was re-approximated as an anti-reflux valve and the proximal ureter brought out through the right lower quadrant. Continence of the vesicostomy was tested and a drain positioned. Post-operative course was uneventful and the patient is completely continent.

CONCLUSIONS

Robotic assisted laparoscopic simple nephrectomy with creation of a continent native ureter stoma is a feasible minimally invasive method for creating a catheterizable vesicostomy in carefully selected patients.

ALL INTRACORPOREAL ROBOT ASSISTED LAPAROSCOPIC AUGMENTATION ILEOCYSTOPLASTY FOR A 11-YEAR-OLD-BOY PATIENT: INITIAL EXPERIENCE IN TURKEY

Yusuf KIBAR, Serdar YALCIN and Burak KOPRU
Gulhane Military Medical Academy/Ankara/Turkey, Urology, Ankara, TURKEY

PURPOSE

Augmentation cystoplasty can be performed by open surgery, laparoscopic and robot-assisted laparoscopy. In this video, we wanted to share our robotics augmentation ileosistoplasty experience in 11-year-old male patient with a diagnosis of neurogenic bladder.

MATERIAL AND METHODS

Patients and methods: 11-year-old male patient treated with clean intermittent catheterization and anti-cholinergic therapy for neurogenic bladder. Bladder capacity was detected 180cc, the irregularities in the bladder contour and left grade 1 VUR was detected in control video urodynamics. So we decided to implement robotic augmentation ileocystoplasty to the patients.

RESULTS

The transperitoneal approach is used for the procedure. The abdomen was insufflated using CO₂ and trocars placed under direct vision. (1 of camera port (12 mm), 3 of da Vinci ports (8 mm) was placed and 1 of 5 mm and 1 of 10 mm assistant ports were placed.) A 30 cm segment of ileum with mesentery was incised with about 30 cm proximal from the ileocecal valve and this segment was suspended. Intestinal anastomosis was performed with 4-0 vicril and 4-0 monocril sutures and created an u-shaped ileal pouch. The bladder was released from the surrounding tissue. About 8 cm, longitudinal incision was made to the bladder. A single-J catheters were placed to the left ureter and bladder for the left ureteral catheter and cystostomy. The bowel prepared for bladder augmentation and it was sutured with 4.0 PDS with water tight anastomosis. Operation was terminated by placing the drainage catheter.

CONCLUSIONS

Robotic augmentation ileocystoplasty is preferred minimally invasive surgical approach by a lower morbidity than open surgery, less blood loss and the because of the short duration of hospital stay.

VIDEO-URODYNAMIC EVALUATION IN CHILDREN: STANDARDIZED EVALUATION IN SITTING AND LYING POSITION

Anne-Francoise SPINOIT, Veerle DECALF, Inge RAGOLLE, Achilles PLOUMIDIS, Luitzen-Albert GROEN, Erik VAN LAECKE and Piet HOEBEKE
UNIVERSITY HOSPITAL GHENT, Urology, Ghent, BELGIUM

PURPOSE

Video-Urodynamic studies (VUDS) in children are gold standard in diagnosis of neurogenic bladder dysfunction (NBD). It allows identifying those children at risk for urinary tract deterioration if no intervention is done. Other children presenting with therapy resistant lower urinary tract disorders (LUTD) can benefit from VUDS. According to the International Children's Continence Society (ICCS), in these children VUDS is recommended for characterization of their non-neurogenic bladder dysfunction (NNBD), and/or to rule out NBD. A standardized procedure to perform VUDS in children in a sitting and lying position is here presented.

MATERIAL AND METHODS

Data necessary to obtain urodynamic evaluation of bladder sphincter function are gathered by concomitant measurement of bladder, urethral and abdominal pressure. A 7F transurethral double-microtip catheter (Gaeltec, Isle of Skye, Scotland) is used for measuring the bladder and sphincter pressures and a water-filled 8F catheter connected to a pressure transducer is inserted into the rectum for rectal pressure measurement. All pressures are measured using a transducer and recorded on computer. The bladder is filled through the trans-urethral tube using diluted contrast medium with sterile water. Two filling cycles are done, one in sitting and one in lying position. Cystometry is combined with fluoroscopy, providing simultaneous voiding cysto-urethrography. Detrusor activity, bladder sensation, capacity and compliance are measured during filling cystometry. Filling rate is 10% of estimated bladder capacity (EBC) for age per minute. In those with severe instability the filling rate was reduced to 5% of the EBC for age. Voiding cystometry comprises recording of pressures in the bladder sphincter and abdomen with simultaneous urinary flow measurement when possible.

RESULTS

VUDS are performed in NNBD and NBD children to allow further therapeutic decision.

CONCLUSIONS

A good and reproducible VUDS performed with a transurethral catheter is mandatory to allow correct therapeutic decision in NNBD and NBD children. A standardised approach is presented in this video.

ESPU Nurses meeting

ESPUN S1: OPENING COURSE

Moderators: Shelly King (USA) & Jo Searles (UK)

ESPU-Nurses Meeting on Wednesday 14, October 2015, 16:05 - 17:30

16:05 - 16:35

Patient's story - Kevin a young adult born with Bladder Exstrophy

16:35 - 16:45

ESPUN S1-1 (O)

LIVING WITH AN AUGMENTED BLADDER: THE EXPERIENCES OF YOUNG PEOPLE FOLLOWING THEIR SURGERY

Sarah DOYLE¹, Bernie CARTER², Lucy BRAY³ and Caroline SANDERS⁴

1) Alder Hey NHS Foundation Trust, Department of Surgery, Liverpool, UNITED KINGDOM - 2) University of Central Lancashire & Alder Hey Children's NHS Foundation Trust, School of Health & Children's Nursing Research Unit, Preston, UNITED KINGDOM - 3) Edge Hill University & Alder Hey NHS Foundation Trust, Evidence-based Practice Research Centre & Children's Nursing Research Unit, Ormskirk, UNITED KINGDOM - 4) Alder Hey NHS Foundation Trust, Department of Surgery & Children's Nursing Research Unit, Liverpool, UNITED KINGDOM

PURPOSE

The personal experiences of young people (YP) following bladder augmentation (BA) is under researched. The aim of this study was to explore YP's life following BA. This presentation will share early concepts, which explore the experiences of life with a BA.

MATERIAL AND METHODS

A qualitative study was undertaken from 2012-2014 using interpretative phenomenological analysis (IPA). Recruitment was from one paediatric and one adult hospital, written informed consent was obtained. Face-to-face interviews were organised at a date, time & venue negotiated between the YP and researcher. Interviews were audio recorded and transcribed verbatim. Analysis was undertaken using IPA, initially case by case then by cross case analysis to identify themes.

RESULTS

Eight YP (aged 14-25 years; mean 19 years) who had a BA performed 3-14 years previously were interviewed. The findings show that prior to BA surgery, living with the unpredictable nature of their bladder was challenging and limited their engagement in social activities. Involvement in the BA surgical decision-making varied and was influenced by their age, understanding and motivation. Following surgery for some YP noticeable restrictions persisted such as regular catheterisation. Despite this YP believed that surgery had offered a sense of freedom that was previously not achievable. This is evidenced in how they talked about independence and their flexibility in their bladder management.

CONCLUSIONS

While small, this study emphasises the impact having a BA has on these YP in many aspects of their life. Surgery enhanced their wellbeing and provides them with the opportunity to normalise their lives.

16:45 - 17:30

Workshop - Patient's associations, Partners In Care?

Nathalie Fort (France) & Rosemary Grant (USA)

ESPUN S2: LUT DYSFUNCTION

Moderators: Ellen Janhsen (Germany) & Nathalie Fort (France)

ESPU-Nurses Meeting on Thursday 15, October 2015, 08:20 - 09:00

08:20 - 08:30

ESPUN S2-1 (0)

IS PARASACRAL NEUROMODULATION USING TENS A COST-EFFECTIVE FIRST-LINE TREATMENT FOR BLADDER OVERACTIVITY IN CHILDREN?

Rebecca HUTCHINSON¹, Massimo GARRIBOLI¹, Joanna CLOTHIER² and Anne WRIGHT³

1) Evelina London Children's Hospital - Guy's and St Thomas NHS Foundation Trust, Paediatric Urology, London, UNITED KINGDOM - 2) Evelina London Children's Hospital - Guy's and St Thomas NHS Foundation Trust, Paediatric Nephrology and Children's Bladder clinic, London, UNITED KINGDOM - 3) Evelina London Children's Hospital - Guy's and St Thomas NHS Foundation Trust, Paediatric and Children's Bladder clinic, London, UNITED KINGDOM

PURPOSE

Emerging evidence suggests that parasacral neuromodulation using TENS (TENS) maybe as successful as anticholinergics (AC) as first-line specific treatment of bladder overactivity after baseline urotherapy. We aimed to ascertain whether TENS could represent a clinical and cost-effective alternative

MATERIAL AND METHODS

We carried out a retrospective analysis of new referrals in 2014. We reviewed those who have received AC for 6 month period as first line therapy and proposed that in future these patients would commence on 3 months of TENS as first line management. We ascertained the individual associated costs of TENS (including disposable components such as batteries and electrodes) and AC treatment using hospital financial data. We reviewed our response rates to TENS therapy and used published data for AC.

RESULTS

Of 490 new referrals received in 2014, 90 patients started AC. Fifteen (33%) received Tolterodine tartrate MR 4mg daily, 15 (33%) Tolterodine tartrate 1-2mg bd, 9 (20%) Oxybutynin 2.5mg tds and 6 (13%) Solifenacin 5mg daily. The median cost/patient for six months of therapy was £74.00 while the cost/patient of TENS therapy for 3 months is £33.12. The response rate for AC is 60% (published data) and 54% (based on our patient group). In the analysed cohort of patients, changing first line management to TENS therapy could lead to a £3679.2 saving (45% cost saving).

CONCLUSIONS

Treatment with neuromodulation TENS provides a slightly lower (54% versus 60%) but quicker (3 months versus 6) response rate and represents a 45% cost savings compared with six months treatment with an anticholinergic. To confirm cost-effectiveness of both pathways a prospective randomized controlled trial (neuromodulation vs anticholinergic) should be considered.

URIKA, CONTINUOUS ULTRASOUND MONITORING OF URINARY BLADDER FILLING IN CHILDREN WITH DYSFUNCTIONAL VOIDING: A PILOT STUDY

Paul VAN LEUTEREN¹, Ellen DE BRUIJN-KEMPE¹, Laurence HERMSEN-HEILEMA¹, Bennie TEN HAKEN² and Pieter DIK¹
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PURPOSE

In the Netherlands, the prevalence of daytime incontinence affects 6-9% of the children older than four year old. Dysfunctional voiding (DV) refers to children who do not develop or even lose the ability to consciously recognize a full bladder. An ultrasonic bladder monitor which is able to sense the bladder filling and is capable of alarming the user before voiding, may be useful for training these children. A new, wearable and wireless ultrasonic bladder device: the URIKA Bladder Monitor is developed. In this study, the aim is to evaluate the feasibility and validity of the URIKA Bladder Monitor in the detection of bladder filling.

MATERIAL AND METHODS

The URIKA Bladder Monitor consists of an electronic case for generation and reception of ultrasound pulses. The case is connected to the transducer assembly, containing a single-element 3.81 MHz transducer. The transducer assembly is fixed to the lower abdomen by a belt with coupling gel. This pilot study includes 15 children (age 6-12 years) with DV. The patient is subjected to an URIKA monitoring session of 1.5-2 hours, during which 2D ultrasound images are made repeatedly as reference.

RESULTS

The study is on-going, but the first results show that the URIKA Bladder Monitor is able to detect the anterior and posterior wall of the bladder. The calculated distance between both bladder walls is comparable to the measured distance with 2D ultrasound.

CONCLUSIONS

Currently, the URIKA Bladder Monitor is able to detect the anterior and posterior wall of the bladder. In the future, the alarm functionality will be investigated.

A BIG BLADDER A BIG PROBLEM. RESULTS OF BIOFEEDBACK THERAPY.

Katarzyna KRZEMINSKA¹, Michal MATERNIK², Magdalena DROZYNSKA-DUKLAS², Piotr CZARNIAK², Agata LAKOMY², Andrzej GOLEBIEWSKI³ and Aleksandra ZUROWSKA²

1) *Medical University of Gdansk, Department of Physical Therapy, Gdansk, POLAND* - 2) *Medical University of Gdansk, Department Paediatric & Adolescent Nephrology & Hypertension, Gdansk, POLAND* - 3) *Medical University of Gdansk, Department of Surgery and Urology for Children and Adolescents, Gdansk, POLAND*

PURPOSE

Children with big bladders may develop dysfunctional voiding (DV) following a long standing compensatory increase in sphincter activity. Patients with DV may not respond to standard urotherapy. This prospective study presents the results of animated biofeedback training of a cohort of 9 children with EMG documented DV and a bladder capacity (BC) >600ml.

MATERIAL AND METHODS

9 children, aged 8-17, with BC > 600ml and DV registered during an urodynamic assessment with incontinence symptoms unresponsive to prior urotherapy were included in the study. The frequency of bladder dysfunction symptoms were evaluated at baseline and following 2 months of treatment by bladder diary and questionnaire according to ICCS definitions. Primary outcome was defined as the resolution of bladder symptoms after 2 months of therapy and the resolution of sphincter contraction on electromyography tracing at the same time point.

RESULTS

The bladder capacity ranged from 600 to 1100ml. Prior to treatment residual urine was observed in 9/9, 8/9 had recurrent UTI, 8/9 declared wetting during the day and 2/9 during the night. 3/9 had a history of VUR. All of the children demonstrated DV; additionally 3/9 had signs of an underactive bladder. Following 8 weeks of training 8/8 reported improvement for daytime incontinence, 2/2 for nighttime incontinence, 7/9 had still residual urine - decreased. DV was still present on EMG recordings in all subjects.

CONCLUSIONS

2 month animated biofeedback training is a highly effective treatment for clinical resolution of incontinence symptoms in children with big bladders and dysfunctional voiding but is too short to reverse the long standing compensatory increased sphincter activity during voiding.

EXPERIENCES OF VESICOSTOMY BUTTONS IN CHILDREN

Monika DOROSZKIEWICZ¹, Malin LEIDZÉN² and Gundela HOLMDAHL³

1) *The Queen Silvia Children's Hospital, Urotherapy, Göteborg, SWEDEN* - 2) *The Queen Silvia Childrens Hospital, Göteborg, SWEDEN* - 3) *The Queen Silvia Chuldrens Hospital, Urology unit, Göteborg, SWEDEN*

PURPOSE

To present our experiences using vesicostomy buttons on children with severe bladder dysfunction

MATERIAL AND METHODS

Sixteenen children, 5 girls and 11 boys, age 22 months-17.3 years have had a vesicostomy button inserted at our institution during the period of June 2012 to March 2015. All of them have had a suprapubic line for a period of about one month before the button. We use a protocol for follow up: including registration of indications, size of the button, date and need of sedation for button change and complications.

RESULTS

Indication included bladder dysfunction due to neurogenic bladder, posterior urethra valves with polyuria, bladder exstrophy and bladder dysfunction associated with VUR. Until now, the average duration of use was 11.9 months (1m-27m). We used Fr14 for 15/16 children. The latest patient had an Fr12 because it is easier to insert and hopefully irritates the abdominal wall less. The length of the button 2.5cm to 4 cm. All buttons were changed at the hospital by the urotherapist, 4 needed anestethia the first time and many of the children are sedated with nitrous oxide or midazolam. We changed the button with about 3 months (2-4m) intervals. Four patients removed the button because of changed clinical situations; one got a Mitrofanoff stoma, 2 patients had a succesful bladder rehabilitation, one patient with polyuria had no need of the button after TX. One boy with spinal tumour died. Minor complicationsoccured including local infection (n=39, granulomas (n=5), UTI (n=3), muddy urine (n=29), obstruction of the button (n=1). No one had problems of leakage.

CONCLUSIONS

Minor complications occurs. Vesicostomy buttons are useful för bladder drainage and are well accepted by children and their parents. It is a good alternative to a suprapubic line, when CIC through urethra is impossible and there is not yet clear indication of Mitrofanoff.

ESPUN S3: NEUROPATHIC BLADDER

Moderators: Louiza Dale (UK) & Hanny Cobussen (Netherlands)

ESPU-Nurses Meeting on Thursday 15, October 2015, 09:00 - 09:35

09:00 - 09:10

ESPUN S3-1 (O)

CAN 4-HOUR VOIDING OBSERVATION DETECT NEUROGENIC BLADDER DYSFUNCTION IN NEONATES WITH ANORECTAL MALFORMATION?

Helena BORG, Charlotte ARWIDSSON, Gundela HOLMDAHL and Ulla SILLÉN
Queen Silvia Children's hospital, Department of Pediatric surgery, Gothenburg, SWEDEN

PURPOSE

Neurogenic bladder dysfunction (NBD) is present in about 25% of patients with anorectal malformation (ARM). The aim was to determine if non-invasive investigation of bladder function with 4-hour voiding observation (FVO) can replace cystometry in diagnosing NBD.

MATERIAL AND METHODS

FVO was performed in 34 patients pre- and post anorectal surgery (median age 4 and 14 months respectively), including registration of voiding pattern, number of voiding (≤ 8), leakage, bladder capacity ($\geq 50\%$ of expected) and mean residual (ultrasound, ≤ 10 ml). For diagnosis of NBD, cystometry was performed. Bladder function was also followed longitudinally with a structured questionnaire and flow-residual measurements.

RESULTS

All patients with cystometric diagnosed NBD (n=9) or non-neurogenic neurogenic dysfunction (n=1) presented abnormal voiding variables. Mild abnormalities were registered in 3 girls with tethered cord: Voiding frequency (10-13) and residual (mean 10-14 ml) were increased and bladder capacity $< 50\%$. A pathologic voiding pattern was seen in 5 boys with spinal cord malformation: Urinary leakage, small voided volumes, frequent voiding (13-22) and incomplete emptying. High bladder capacity and large residual were recognized in the remaining two patients.

The majority of patients, without known NBD or severe functional disturbance (n=24), had normal voiding pattern. A moderate increase in residual was seen in 5 patients and with high bladder capacity in two. These 5 patients had periods with bladder dysfunction during follow-up.

CONCLUSIONS

4-hour voiding observation can detect NBD in patients with ARM, especially severe dysfunction, and can therefore be used for screening of NBD. However, it cannot replace cystometry in follow-up of patients with NBD.

IMPROVING UNDERSTANDING OF NEURAL TUBE DEFECTS (NTD) - PRESENTATION OF AN INTERNET- BASED MEDICAL EDUCATION PROGRAM

Ingo KRAUSE¹, Magaretha NILSSON² and Iris RÜBBEN³

1) Wellspect HealthCare Dentsply IH GmbH, Elz, GERMANY - 2) Wellspect HealthCare Dentsply IH AB, 21 Mölndal, SWEDEN - 3) University Clinic Essen, Urology Department, Essen, GERMANY

PURPOSE

Myelomeningocele (MMC), a neural tube defect (NTD), is one of the most common nonlethal malformations of the central nervous system with significant lifelong disabilities. With high-resolution ultrasound an accurate diagnosis of MMC can be made prenatally, which plays a crucial role in parent counseling and pregnancy management. The management of infants born with MMC depends on understanding how their bladder stores and empties urine. Newborns and children with MMC are dependent on their parents and health-care professionals to manage bladder management interventions during early years. The ability of parents to effectively integrate medical recommendations in daily life is fundamental for intervention success and upper urinary tract protection.

MATERIAL AND METHODS

In medical education, internet-based education for parents and health care providers is still a novelty why a program was developed describing different clinical characteristics of the whole NTD-spectrum.

RESULTS

The program explains details about neurogenic bladder dysfunction, embryogenetic development and special neurological features of the disease by using didactical figures and images. In addition to the educational tool, the program also includes a computer-based MMC information database and instructions on how to use it in different settings.

CONCLUSIONS

Once implemented in clinical practice, the long term aim of the program is to increase background knowledge for all parents and health care givers in order to optimize therapy-compliance in each individual patient.

PROSPECTIVE EVALUATION OF PERISTEEN® ENEMA WITH THE VALIDATED NEUROGENIC BOWEL DYSFUNCTION SCORE SHEET IN THE PEDIATRIC POPULATION

Maryellen KELLY¹, Crystal DORGALLI², Gordon MCLORIE² and Antoine KHOURY²

1) University of California Irvine/CHOC Children's Hospital, Paediatric Urology, Orange, USA - 2) CHOC Children's Hospital, Urology, Orange, USA

PURPOSE

Poor neurogenic bowel (NBo) control leads to emotional, physical, and psychological distress. Adequate assessment of bowel programs' in decreasing symptoms of NBo is vital for accurate treatment. Our objective was to determine the ability of Peristeen®enema to reduce symptoms of NBo in patients using the only validated NBo dysfunction scoring system for the pediatric population.

MATERIAL AND METHODS

Patients 6-18 years with NBo whose current bowel program was unsuccessful were given the Neurogenic Bowel Dysfunction (NGBD) score sheet before initiating Peristeen®, and again at 2 weeks (n=24), 2 months (n=9) and 6 months (n=12) after initiation. All patients were started on Peristeen®with tap water calculated to 20ml/kg per daily irrigation. Mean and paired t-tests were completed comparing NGBD scores.

RESULTS

Mean NGBD score at initiation was 20.30 (SD+/-5.66). At 2-weeks the mean score was 12.78 (SD+/- 4.49), with a mean decrease of 7.52 points (SD+/- 5.77, 95%CI 5.02-10.02), $t(23)=6.255, p<0.008$. Paired t-test comparing the NGBD score at initiation to 2-month follow-up revealed $t(8)=2.83, p=0.022$ with a mean decrease of 7.67 points (SD+/- 3.89). At six-months the mean NGBD score was 8.81 (SD+/- 2.40) with a paired t-test of $t(11)=5.28, p<0.008$.

CONCLUSIONS

Use of Peristeen®enema shows a significant reduction in NGBD scores. A steady decrease in the NGBD score was found in those who used the device. The Peristeen®enema system should be considered when conservative bowel management techniques are unsuccessful in children with NBo.

ESPUN S4: CLINICAL PRACTICE

Moderators: Louiza Dale (UK) & Hanny Cobussen (Netherlands)

ESPU-Nurses Meeting on Thursday 15, October 2015, 09:35 - 10:25

09:35 - 09:45

ESPUN S4-1 (0)

WHICH IS THE BEST TENS PROGRAMME TO USE FOR IDIOPATHIC BLADDER OVERACTIVITY IN CHILDREN

Claire FOSTER¹, Joan MCKENZIE¹, Keisha HEPBURN¹, Rebecca HUTCHINSON¹, Massimo GARRIBOLI¹, Joanna CLOTHIER² and Anne WRIGHT³

1) Evelina London, Guy's and St Thomas' NHS Foundation Trust, Paediatric Urology, London, UNITED KINGDOM - 2) Evelina London, Guy's and St Thomas' NHS Foundation Trust, Paediatric Nephrology and Bladder Disorders, London, UNITED KINGDOM - 3) Evelina London, Guy's and St Thomas' NHS Foundation Trust, Paediatric Bladder Disorders, London, UNITED KINGDOM

PURPOSE

Neuromodulation is recognised treatment for idiopathic bladder overactivity (OAB) in children. However, there is no strong evidence about the best frequency to use with both high and low frequencies demonstrating effect. High frequencies (over 20 Hz) are reportedly associated with worsening of symptoms due to excitement of the neuromotor system (Lordelo et al. The Journal of Urology 2009;182 (6):2900-4).

The purpose of the study was to compare two different frequency programmes to determine which was the most effective.

MATERIAL AND METHODS

A retrospective, non-randomized trial was performed in children referred to our tertiary referral centre with idiopathic OAB. Patients were treated with a TENS machine applied to the parasacrum for 40-60 mins/day for 12 weeks. The patients were divided into 2 groups: group 1 used a frequency of 10Hz and group 2 a frequency of 80Hz (pulse width 200µs,, mA maximum tolerated per session.) Data regarding days completed, time used, complications/problems and symptoms were recorded and assessed against ICCS criteria.

RESULTS

A total of 204 patients were recruited; 138 (68%) patients in group 1 and 66 (32%) in group 2. The overall response rate was 54%.

Results are shown in the table.

	Group 1= 66 (10Hz)	Group 2=138 (80Hz)	p value
Full response	16 (24%)	36 (26%)	p= 0.864
Partial response	22 (33%)	36 (26%)	p=0.4374
No response	21 (31%)	61 (44%)	p=0.2
Complications	17 (26%)	34 (25%)	p=0.8643

CONCLUSIONS

TENS is successful in the treatment of idiopathic OAB but there is no significant difference in response rate and complications between two frequencies (10 Hz, 80Hz). Further studies are needed in order to identify the optimal frequency and placebo effect.

PARENTAL INVOLVEMENT IN PEDIATRIC PATIENTS SAFETY MONITORING

Karen KWAK¹, Jacqueline KNOLL¹, Joris FUIJKSCHOT², Wouter FEITZ³, Barbara KORTMANN³ and Robert DE GIER³
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PURPOSE

In 2014 our Children's Hospital introduced the Pediatric Risk Evaluation Stratification System (PRESS), a highly innovative signaling system that aims to improve pediatric patient's safety by early detection of risk-factors for complications. PRESS incorporates parental input in a simple risk-scoring system.

MATERIAL AND METHODS

PRESS calculates an individual risk level (standard/medium/high) for adverse clinical events; the result is displayed in the patient's EMR in simple green/yellow/red icons; innovative aspect of PRESS is that not only standard input from care-takers (eg vital signs) is used, but also regular input from parents, the so-called "Worried Sign" (WS). Serious adverse clinical events or complications are often preceded by parental pre-sentiments ("WS") but these are difficult to quantify and therefore difficult to use in a monitoring system. A validated scoring system is used to discriminate true WS from "normal" parental worrisome in the hospital situation, to overcome this problem.

RESULTS

Incorporating parental input in the PRESS system results in earlier detection of possible serious adverse clinical course / complications. Combined with protocols for better surveillance and preventive measures for children with medium or high risk-levels, the system has proven to be a valuable instrument to reduce incidence and seriousness of adverse clinical course in pediatric patients.

CONCLUSIONS

PRESS can reduce the likelihood and severity of adverse clinical course by incorporating parental input in the safety-monitoring system.

IT'S MY BODY INCLUDE ME!

Yvie MORLEY¹ and Cheryl JENNINGS²

1) *Royal Manchester children's Hospital, Therapeutic and Specialised play, Manchester, UNITED KINGDOM* - 2) *Royal Manchester children's Hospital, Paediatric Urology, Manchester, UNITED KINGDOM*

PURPOSE

Within the Royal Manchester Children's Hospital dysfunctional voiding service we believe each individual child should be involved in their bladder assessment with support from a parent or carer. Therefore we have designed a unique tool that has been written specifically to engage and encourage the compliance of children aged 6 years and above.

MATERIAL AND METHODS

The work book has been designed to engage the child and encourage their participation in their own bladder assessment.

It is brightly coloured with simple information and diagrams about how the urinary system works, there are sheets with advice on how, when, and how often to sit on the toilet. Also included fluids that are good and bad for the bladder, fibre intake and diary sheets that are completed over a 2 week period. The work book also contains a reward chart that is filled in each day on completion of all the other daily tasks. There is also a section with fun activities for the child to complete.

RESULTS

There were 25 children included in a pilot study to monitor the effectiveness of the work books. we will present these results at ESPU.

CONCLUSIONS

The completed work books have improved the information that is brought back to clinic, compliance with the programme and ultimately continence. The diaries have highlighted the importance of engaging with each individual child and encouraging them to be part of their own assessment. we are now in collaboration with the international company Wellspect and with their kind support the work books are in the process of being published.

THE INTRODUCTION OF A CLINICAL NURSE SPECIALIST (CNS) TO SUPPORT YOUNG ONSET UROLOGY (YOU) PATIENTS

Winifred NUGENT¹, Arash TAGHIZADEH², Jonathon OLSBURGH³ and Claire TAYLOR⁴

1) Guys and St Thomas NHS Hospital Trust, Evelina London Paediatric Urology, London, UNITED KINGDOM - 2) Guys and St Thomas Hospital and Evelina London., Paediatric Urologist, London, UNITED KINGDOM - 3) Guys and St Thomas Hospital Trust, Urology and Renal, London, UNITED KINGDOM - 4) Guys and St Thomas Hospital Trust, Urology, London, UNITED KINGDOM

PURPOSE

There is growing recognition that young people with long-term urological conditions need specific support which can be provided by a Clinical Nurse Specialist (CNS). The Young Onset Urology (YOU) service is for adults who have had complex urological problems. It receives patients who are making transition from paediatric services as well as direct referrals. We describe our experience to raise awareness of this patient group.

MATERIAL AND METHODS

We have analysed the role of the CNS in our YOU clinic focussing on achievements and contribution to the development of the service. A patient survey was also performed to investigate user needs and feedback.

RESULTS

- Patient satisfaction survey revealed 90% of patients found the service good /very good; results were used to benchmark and inform development
- Agreed patient pathways and follow up protocols
- Introduction of monthly Functional Urology MDT meetings
- Development of patient database tracking demographics, clinic attendance and clinical information
- Improvement in preparation of paediatric patients resulting in 93% of young people reporting feeling prepared for transition
- Provision of patient advocacy/key worker support in multidisciplinary clinics
- Establishment of CNS led review clinics in paediatrics and adult services
- CNS led non-video and CNS/Consultant led videourodynamics providing holistic and individualised patient care

CONCLUSIONS

A CNS service can improve the experience of YOU patients by streamlining the pathway, providing clinical expertise and successfully preparing young people for transition with high levels of patient satisfaction. A repeat patient survey will aid analysis of patient experience and need, in order to influence ongoing service development

THE INFLUENCE OF THE USE MEDICAL CLOWNS TO THE REDUCTION OF PREOPERATIVE ANXIETY, POSTOPERATIVE PAIN AND MEDICAL COSTS IN CHILDREN UNDERGOING OUTPATIENT PENILE SURGERY: A RANDOMIZED CONTROLLED TRIAL.

Michal DARMON, Genady LEV, Stanislav KOCHEROV, Yudit GABAY and Boris CHERTIN
Shaare Zedek Medical Center, Pediatric Urology, Jerusalem, ISRAEL

PURPOSE

We aimed to investigate prospectively the potential benefits of the participation of the medical clowns in the outpatient pediatric penile surgery.

MATERIAL AND METHODS

We have randomly divided 80 children ageing from 2 to 16 years into two groups (40 each) who underwent meatotomy utilizing an identical clinical setup. In the first group the medical clown was an integral part of the medical team and in the second group the treatment was given without participation of the medical clown. We have recorded the following parameters: the level of preoperative anxiety utilizing Modified Yale Preoperative Anxiety Scale Instrument, the level of the postoperative pain utilizing FLACC Wong pain scores, need in pain rescue during first 24 hours after surgery and the time needed to return to normal activities.

RESULTS

The patients from the first group demonstrated lower anxiety index upon ($p=0.0319$) and after surgery ($p=0.0042$), required less induction time for anesthesia ($p<0.001$), spent overall less time in the operating room ($p<0.0001$) and required less time to recover from the surgery and to be discharged ($p=0.0172$). The majority of health professionals agreed with the presence of clowns in the operating theater (96.43%), considering them useful for the children (96.4%), for the parents (89.3%), and for themselves (78.3%). The majority of the parents 78(97.5%) favored continuing this type of intervention and 2(2.5%) thought that clowns are disturbing agents.

CONCLUSIONS

Use of the medical clown allows reducing children preoperative anxiety and shortage the overall time in the hospital therefore potentially may reduce an overall medical cost.

ESPUN S5: BASIC RESEARCH

Moderators: Brigitta Karanikas (Sweden) & Anna Giambonini (Switzerland)

ESPU-Nurses Meeting on Thursday 15, October 2015, 10:45 - 11:15

10:45 - 10:55

ESPUN S5-1 (O)

NURSING CARE IN UROLITHIASIS. LITERATURE REVIEW

Maria Teresa ALONSO TORRES, Anna PALOMINO MARTÍNEZ, Laura GARCIA PORRAS, María MUÑOZ PÉREZ, Esther FRANQUET BARNILS, Anna BULLICH LLOSA, Sandra GONZALEZ CAÑAS and Sofia BOSCH COLLETTE
Fundación Puigvert, Nursing, Barcelona, SPAIN

PURPOSE

Urinary calculi are a problem in uropediatric clinical practice since their management is difficult and expensive, both in the way they are studied and treated. The main symptoms are: severe pain, nausea and/or vomiting, hematuria and/or fever, possibly secondary to a urinary tract infection or renal obstruction. The types of calculi are diverse and multifactor. The aim of this study is to review the published literature on nursing care in pediatric urolithiasis.

MATERIAL AND METHODS

A literature search was performed in databases PubMed, Medline, Scielo, The Chocrane, Science Direct and Academic Google from November 2014 to March 2015. Articles in English and Spanish exclusively referring to: Nursing care in pediatric urolithiasis, urolithiasis, ESWL, LEOCs in pediatrics were included and reviewed; articles on kidney calculi in adults were excluded.

RESULTS

Articles related to nursing care of pediatric urolithiasis are scarce and many refer to the genetic origin of the calculus. Others refer to sociodemographic variables, including race and dietary habits as relevant factors in the development of urolithiasis in children

CONCLUSIONS

The role of the nurse in pediatric urolithiasis is essential to carry out interventions to improve the health of these patients, based on the therapeutic education regarding dietary habits, treatment patterns, pain monitoring and emotional factors.

PEDIATRIC PATIENT SHOWING BLEEDING AFTER RENAL PERCUTANEOUS NEPHROLITHOTOMY

Sandra GONZALEZ CAÑAS, Anna BULLICH LLOSA, María MUÑOZ PÉREZ, Sofia BOSCH COLLETTE, Laura GARCIA PORRAS, Esther FRANQUET BARNILS, Anna PALOMINO MARTÍNEZ and Maria Teresa ALONSO TORRES
Fundación Puigvert, Nursing, Barcelona, SPAIN

PURPOSE

Renal bleeding is one of the most serious postoperative complications after a percutaneous nephrolithotomy (PNL). Selective embolization is one of the treatments of choice to stop the bleeding. The role of the nurse in the early detection of signs and symptoms of this complication is vital for the preservation of renal function. This study describes the role of the nurse in the early detection of renal hemorrhage after PNL.

MATERIAL AND METHODS

A case study, 14 years old male with a history of repeated cystine calculi, receiving PNL performed in the left kidney, after which he presented clinical symptoms of hematuria and hemodynamic instability. An angiography was performed and it evidenced intrarenal pseudoaneurysm that was treated with selective embolization. An Individualized Care Plan was applied

RESULTS

During late post-operative period characteristic signs and symptoms of complications post PNL (moderate pain, hematuria, nausea and vomiting) with hemodynamic stability was detected. 24 hours later the patient manifested sudden hemodynamic instability (hypotension, diaphoresis, skin pallor and decreased hemoglobin).

CONCLUSIONS

The application of an individualized care plan and supervision and control of the signs and symptoms of renal bleeding in the pediatric patient allows early detection of complications post PNL and promotes the satisfactory progress of the case.

CONSTIPATION PROPHYLAXIS IN CHILDREN UNDERGOING ORTHOPEDIC SURGERY: A QUASI-EXPERIMENTAL STUDY

Laila MANTEGAZZI¹, Brigitte SELINER¹ and Lorenz IMHOF²

1) Children's University Hospital Zurich, Zurich, SWITZERLAND - 2) Zurich University of Applied Sciences, Institute of Nursing, Winterthur, SWITZERLAND

INTRODUCTION

Orthopedic patients are prone to constipation due to immobility, opiate administration, dehydration, and the lack of privacy. Given that constipation can have physical and psychological consequences, prevention in orthopedic pediatric patients is paramount. Therefore a standardized nursing assessment and intervention for constipation prophylaxis, including ensuring privacy, fluid intake, mobility and bathroom training, as well as administering stool softener and suggesting a proper diet, were developed with the support of an Advanced Practice Nurse. Additionally nursing trainings about constipation were performed.

This study evaluated the effectiveness of the implementation of the newly developed nursing constipation prophylaxis

METHODS

A quasi-experimental study with an historical control group was performed. The control group consisted of 112 consecutive records of orthopedic patients (47.3% boys, range 4-17 years) who had been hospitalized in the surgical ward before the intervention was implemented. The intervention group included 59 patients (35.6% boys, range 1-18 years) admitted in the seven months following the training and the introduction of the constipation prophylaxis program.

RESULTS

The implementation of the constipation prophylaxis program resulted in an absolute risk reduction (27%) of developing constipation. In the intervention group, 50.8% patients developed constipation, compared to 77.7% in the historical group. Fisher's Exact Test showed a significant difference between the two samples ($p = .001$), giving a number needed to treat of 3.7.

CONCLUSIONS

This study demonstrated the effectiveness of the program with the support of an Advanced Practice Nurse. Therefore it is necessary to implement a constipation prophylaxis program on a pediatric orthopedic unit.

ESPUN S6: POSTERS

Moderators: Brigitta Karanikas (Sweden) & Anna Giambonini (Switzerland)

ESPU-Nurses Meeting on Thursday 15, October 2015, 11:15 - 11:35

11:15 - 11:20

ESPUN S6-1 (PP)

ADVANTAGES OF TRANSUTANEOUS ELECTRICAL NERVE STIMULATION OF THE TIBIAL NERVE IN PATIENTS PRESENTING VESICAL EXSTROPHY

Adrien BARRIER and Remi BESSON

Hopital Jeanne de Flandre, Chirurgie pédiatrique, Lille, FRANCE

PURPOSE

Transcutaneous electrical nerve stimulation (TENS) of the tibial nerve is used to treat urinary symptoms among adult patients. Vesical exstrophy is a rare pathology, commonly complicated of urinary leakage. TENS could be useful for children as well.

MATERIAL AND METHODS

Sixteen patients (12 boys, 4 girls) who underwent surgery for vesical exstrophy (14 patients) or epispadias (2 patients) and presenting urinary leakage were treated by TENS on their tibial nerve between July 2014 and February 2014. Symptoms were evaluated by a questionnaire and a Pad test before and after treatment. The follow up lasted for a month and the patients were examined by kinesiologists and pediatric urologist.

RESULTS

TENS treatment lowered the amount of urinary leakage in 11 patients (2 girls, 9 boys): 9 cases of vesical exstrophy and 2 cases of epispadias. They needed less urinary protection, especially during night time. Even though the objective benefit might have been low, most patients were satisfied with this treatment. Placebo effect possibly played an important role for the patients and their parents. Two patients didn't get benefits from the treatment. Two patients stopped the treatment: one switched to self catheterization, the other one stopped the treatment because it was too demanding.

CONCLUSIONS

In this preliminary study, the benefit on urinary symptoms was noted among patients with low rates of urinary leakage. It is an advantage for the socialization of these children. TENS for patients presenting vesical exstrophy appears to be efficient on urinary leakage. It is non invasive, cheap and reassuring for the patient's parents.

REDUCING THE OPERATING ROOM RISKS: THE EXPERIENCE ON BLADDER EXSTROPHY-EPISPADIAS SURGERY

Valentina CILLO¹, Federica RICCI¹, Sofia CESTRA¹, Laura SERAFINI¹, Fabio FERRARI¹, Simona GEROCARNI NAPPO¹ and Paolo CAIONE²

1) *Bambino Gesù Children's Hospital, Emergency Medicine and Critical Care, Rome, ITALY* - 2) *Bambino Gesù Children's Hospital, Paediatric Urology, Rome, ITALY*

PURPOSE

Our Pediatric Hospital is accredited by Joint Commission International (JCI) since 2006.

We report our experience on adopting the new JCI procedures during reconstructive surgery for the Exstrophy-Epispadias Complex (EEC) repair, to increase safety.

MATERIAL AND METHODS

The "sign in-time out - sign out" procedure was adopted in the Urology Operating Room during surgery for EEC repair (study group) during 2014 year. The method included nurses-surgeons pre-operative briefing, sign-in before starting the surgical procedure, time-out at anesthesia induction, sign-out at patient wake-up. Adverse events, sentinel events and near-miss events were recorded, comparing with the patients who received surgery for EEC repair, during the previous 12 months (control group). The EEC primary repair required a 2-stage technique in male patients.

RESULTS

A total of 13 patients underwent surgical repair, 6 bladder closure and 7 epispadias (study group). Eleven patients, 4 exstrophic bladder closure and 7 epispadias repair were the control group. Both groups of patients received the same reconstructive surgical technique.

No adverse events were recorded in the study group whereas 2 adverse events were observed in the control group (red cell transfusion not ready at surgery starting, delay of X-ray check of CVC). The difference was significant.

CONCLUSIONS

Both the two stages of the EEC repair are considered as major surgery that required specific preparation and attention of the Nurses/Anesthesiologist/Urologist team in the operating room. Adopting the JCI procedures allowed a significant reduction of the adverse events, increasing the safety of the surgery.

ASSESSMENT OF GENITAL ORGAN PERCEPTION BY PARENTS IN MATERNITY WARD.

Arthur LAURIOT DIT PREVOST¹, Ouardia MAMOURI², Estelle AUBRY¹, Dyuti SHARMA¹, René-Hilaire PRISO¹, Dominique THOMAS², Maryse MACIEJEWSKY³, Thameur RAKZA² and Remi BESSON⁴

1) Hôpital Jeanne de Flandre, Université de Lille, CHRU de Lille, Urologie pédiatrique, Lille, FRANCE - 2) Hôpital Jeanne de Flandre, Université de Lille, CHRU de Lille, Maternité Jeanne de Flandre, Lille, FRANCE - 3) Hôpital Jeanne de Flandre, Université de Lille, CHRU de Lille, Endocrinologie pédiatrique, Lille, FRANCE - 4) Hopital Jeanne de Flandre, Urologie pédiatrique, Lille, FRANCE

PURPOSE

Many parents refer to their paediatrician because of genital organ (GO) malformation suspicion in their child. Consultation seldom leads to such a diagnosis. A questionnaire was built comparing parental vs. paediatrician GO assessment in maternity ward in order to highlight worrying aspects for the parents.

MATERIAL AND METHODS

The questionnaire was submitted to both paediatricians and parents, between November 2013 and January 2014. Data regarding sex, term, anatomical characteristics (testis/penis, clitoris/labiae: aspect, size), socio-economical status of the parents and genital medical history of both parents and siblings were collected.

RESULTS

Questionnaires were available from 29/1350 patients (2.15%), 14 of which were correctly filled in. There were 8 girls and 6 boys. Parental examination found 6 anomalies (2 testes, one penis and 3 labiae) while only one anomaly was noted by the parents in the group of 15 incomplete questionnaires. None of these 6 abnormalities were confirmed by paediatricians. During the same period, a questionnaire regarding breast-feeding was submitted, collecting 360/1350 answers (26.67%).

CONCLUSIONS

The most important finding was the very low rate of answers. Morphological aspect of GO seems to be an embarrassing topic for parents, thus leading to wrong assessment of normal GO anatomy and variability. It is suggested that the low answer rate might be due to embarrassment, questionnaire complexity, and insufficient medical information when the questionnaire was submitted to the parents. We advise that medical examination of GO be performed with the parents in order to alleviate all possible doubts regarding GO abnormalities.

USE OF SMARTPHONE TECHNOLOGY TO BETTER UNDERSTAND POST-OPERATIVE HEALING PHASES IN HYPOSPADIAS PATIENTS

Megan SAUNDERS, Paul BOWLIN and Walid FARHAT
The Hospital for Sick Children, Urology, Toronto, CANADA

PURPOSE

Hypospadias surgery is a common procedure routinely performed in a day care setting. Consequently, the majority of the recovery process is observed solely by the patient's caregiver(s). Post-operative caregiver concerns are common and knowledge about the stages of healing is limited. We sought to utilize smartphone technology to follow and document the post-operative course of these patients.

MATERIAL AND METHODS

Caregiver(s) of patients undergoing hypospadias surgery by a single surgeon (WF) were identified, contacted, and signed photography consent. Age of the patient, severity of hypospadias, and surgical details were documented. Caregivers were instructed to take photos on post-operative days 1-7, 10, 14, 21, 35, and 42, and email them to the urology team. Caregivers were encouraged to communicate their concerns, if any, through email.

RESULTS

Between October 2014 and February 2015, 25 of 28 patients who underwent hypospadias repair consented to participate. To date, there are 11 full sets of pictures through post-operative day 42. Though the hypospadias severity varied, the healing phases were similar. In the first few days (days 1-7), there was swelling, bruising, erythema, and minor bleeding, which later (days 14-21) transitioned into generalized penile/scrotal bruising, and fibrinous tissue at the suture lines. At days 35-42, the outcome was better delineated, however minor swelling remained.

CONCLUSIONS

Though the stages of wound healing are known, the use of smartphone technology aided the inter-professional team and caregivers to visually better understand the post-operative course of hypospadias procedures. The photos assembled may be used in the future as an educational tool for caregivers and providers.

ESPUN S7: LOW TRACT URINARY

Moderators: Brigitta Karanikas (Sweden) & Laila Mantegazzi (Switzerland)

ESPU-Nurses Meeting on Thursday 15, October 2015, 11:35 - 12:00

11:35 - 11:40

ESPUN S7-1 (PP)

PERCUTANEOUS TIBIAL NEUROSTIMULATION : EFFECTIVENESS AND TOLERANCE IN OVERACTIVE BLADDER IN CHILDREN. LITTERATURE REVIEW.

Ania BENNOUR¹, Remi BESSON², Rene-Hilaire PRISO², Anne TEMMEN³ and Annie LAHOUCHE⁴

1) CHRU Lille Hopital Jeanne de Flandre, Néphrologie pédiatrique, Lille, FRANCE - 2) CHRU Lille Hopital Jeanne de Flandre, Pediatric urology, Lille, FRANCE - 3) CHRU Lille Hopital Jeanne de Flandre, Physiology, Lille, FRANCE - 4) CHRU Lille Hopital Jeanne de Flandre, Pediatric nephrology, Lille, FRANCE

PURPOSE

Dysfunctional voiding is a prevalent pediatric urologic problem. Overactive bladder (OAB) is the most common voiding dysfunction in children.

RESULTS

The peak incidence of OAB is between the ages of 5 and 7 years. 20 % of 7 years old children have urgentureries, 20 % of 4-6 years old children are incontinent during the day occasionnally.

Daytime involuntary wettings become a social problem for children and their family, decrease quality of life, increase social isolation.

High pressures during bladder filling are associated with high incidence of vesico-ureteral reflux among children with OAB. The incidence of recurrent (upper and lower), urinary tract infections is high in children with OAB. Both mecanisms further the development of chronic renal failure. 20 % of children have a refractory OAB to conventional management. Bladder neurostimulation has gained acceptance in adults, also in children with electric stimulation posterior tibial nerve stimulation (PTNS).

Good results (efficiency, tolerance, acceptance), with percutaneous stimulation for bladder instability in children were reported byHoebecke and al, De Gennaro and al, Capitannuci and al.

As a long term treatment, some suggest to follow the benefic effects of PTNS, by a chronic stimulation.

Prospectiv studies are necessary to establish a common management for OAB in children between the different centers in France (stimulation frequency, time of session, frequency of sessions).

CONCLUSIONS

PTNS may represent an attractive non invasive treatment modality for non neurogenic bladder dysfunction in children, resistant to conventional urotherapy.

OUR EXPERIENCE OF A NURSE LED DYSFUNCTIONAL VOIDING SERVICE: AN INNOVATIVE APPROACH TO ENGAGE WITH CHILDREN IN A CLINIC SETTING

Cheryl JENNINGS¹, Anju GOYAL¹ and Yvie MORLEY²

1) Royal Manchester Children's Hospital, Paediatric Urology, Manchester, UNITED KINGDOM - 2) Royal Manchester Children's Hospital, Therapeutic Specialised Play, Manchester, UNITED KINGDOM

PURPOSE

To demonstrate since introducing the bladder workbook patients have become more focused on their bladder training.

MATERIAL AND METHODS

The Manchester Children's Hospital has a well-established nurse led lower urinary dysfunction service. Children with overactive bladder symptoms, voiding postponement and dysfunctional voiding are all assessed in clinic. Children attend for an initial assessment where a detailed history is taken, flow studies and bladder scans are performed. The child is followed up in clinic two weeks following initial assessment and then every four weeks.

Previously to the bladder workbook difficulty was found in engaging patients to complete a 24hr bladder assessment for two weeks.

Since September 2013 each child has been provided with a bladder diary workbook which is a unique tool devised by Clinical Nurse Specialist and Play Specialist.

RESULTS

All patients are completing workbooks therefore a relevant pathway is assigned to each patient thus reducing the timescale to discharge.

CONCLUSIONS

The bladder diary has enabled the child to engage and participate in the bladder training. The child becomes more aware of his/her body with the implementation of voiding strategies and the importance of documentation throughout.

The Nurse Specialist works in collaboration with children and families with the aid of a very effective tool.

Compliance from both child and family has been shown via application of techniques discussed within the programme, also completion of a detailed diary within the workbook.

EFFECTIVE PREPARATION USING A CARE PATHWAY (CP) IN CHILDREN REQUIRING URETHRAL CLEAN INTERMITTENT CATHETERISATION (CIC)

Keisha HEPBURN, Joan MCKENZIE, Claire FOSTER, Cathy GILL, Anne WRIGHT and Joanna CLOTHIER
Evelina London Children's Hospital, Paediatric Nephro-urology, London, UNITED KINGDOM

PURPOSE

Clean Intermittent Catheterisation (CIC) can cause fear and apprehension in children, families and some health care professionals. We have developed a Care Pathway (CP) to address this issue which includes discussion/agreement in the multidisciplinary team meeting, consultant provision of explanation plus written information for parents and child, preparation sessions with nurse and play specialist, final attendance for an intensive day of CIC training. We aim to present CIC training outcomes following this CP.

MATERIAL AND METHODS

We retrospectively reviewed data regarding all patients referred for CIC training over a two year period (2013-2014). Outcome measures were success of CIC and complications.

RESULTS

76 patients (35 boys, 41 girls) were referred for CIC training, median age 7 years (3months-17 years). Reasons for CIC included neuropathic bladder, incomplete emptying in non-neuropathic bladders, dysfunctional voiding and/or recurrent urinary tract infections. At 1 month follow-up CIC was successfully performed by 67 patients (88%). Among those who didn't succeed 2/9 were unable to tolerate the procedure, 2/9 had some anatomical anomaly, 4/9 had learning disability/neurobehavioural difficulties and in 1 case parent felt unable to perform the procedure. Four out of nine who didn't succeed were under 5 years age. No complications were recorded.

CONCLUSIONS

Use of the proposed CIC CP has been demonstrated to be highly successful for children and families. However, age, neurodevelopmental/behavioural conditions and parental approach to CIC can contribute significantly to the success despite effective preparation.

ICCS meeting

ICCS S1: LUT DYSFUNCTION

Moderators: Ann Raes (Belgium) & Luis Guerra (Canada)

ICCS Meeting on Thursday 15, October 2015, 14:00 - 15:00

14:00 - 14:06

ICCS S1-1 (LO)

CAN A QUANTITATIVE MEANS BE USED TO PREDICT FLOW PATTERNS: AGREEMENT BETWEEN VISUAL INSPECTION VS. FLOW INDEX DERIVED FLOW PATTERNS.

Jacob FRANCO¹, Sang W HAN², Eun CHOI² and Israel FRANCO³

1) Stonybrook Medical College, Chappaqua, USA - 2) Severance Children's Hospital, Pediatric Urology, Seoul, KOREA (REPUBLIC OF) - 3) New York Medical College, Section of Pediatric Urology, Chappaqua, USA

PURPOSE

We recently derived a flow index (FI), which is based on an idealized normal voider. This normalized FI was found to correlate well with 3 basic flow curves; bell, plateau and tower. Each pattern has well-defined cutoffs, which predicted the flow curve. Our hypothesis is that FI derived flow patterns (FP) should have reasonable precision when we compared to visual inspection FP.

MATERIAL AND METHODS

Patients known to have LUTS and or DV had uroflow parameters recorded along with FP, and PVR (by ultrasound). FI was produced for each patient based off Normal voider estimated (NVE) Q_{max} and Q_{avg} . The FI was defined as Actual $Q/NVE Q$. Using cutoffs defined in our previous publication for Bell, Plateau and Tower patterns we calculated Kappa (κ) to determine the precision of our FI predictions. We evaluated Q_{avg} and Q_{max} FI to predict patterns for both sexes.

RESULTS

There were 145 male and 245 female flows available for analysis. We found that there was moderate agreement using Q_{max} FI for both sexes $\kappa=0.41$. Using Q_{avg} to predict FP we found there was fair agreement for males ($\kappa=0.38$) and slight agreement for females ($\kappa=0.18$).

CONCLUSIONS

We found that Q_{max} FI is capable of providing moderate agreement between trained observers interpretations of uroflow curves and a quantitative method to define flow patterns. A well-defined quantitative method that is capable of providing true interobserver reproducibility and creates a consistent and reproducible means to judge studies appears to be close at hand with this method.

EVALUATION OF BLADDER VOLUME IN PATIENTS WITH BLADDER DISFUNCTION - CORELATION BETWEEN BLADDER DIARY AND UROFLOWMETRY.

Michał MATERNIK, Ilona CHUDZIK and Aleksandra ZUROWSKA
Medical University of Gdansk, Pediatric Nephrology, Gdansk, POLAND

PURPOSE

Bladder volume evaluation is a crucial point during investigation of bladder dysfunctions in children. It is usually done by using bladder diary and evaluating MVV as a functional bladder capacity.

The aim of the study was to compare compatibility of MVV as a predictor of functional bladder capacity and bladder volume evaluated during triplicate urine flow measurements with ultrasound evaluation of PVR as an alternative method for evaluation of bladder capacity in different various well defined bladder disturbances.

MATERIAL AND METHODS

52 treatment naïve patients with bladder dysfunctions were diagnosed in our secondary center. Patient history, bladder diary consisting of 14 days recording of bladder symptoms and 48h frequency/volume chart, and triplicate urine flow measurement (Andromeda device) with post void residual evaluation with ultrasound was done. Type of bladder dysfunction was evaluated in accordance with ICCS terminology. Normal bladder capacity was defined as 65-150% of EBC for age.

RESULTS

After complex evaluation 26/52 patients were diagnosed with OAB, 11/52 with MNE, 13/52 with dysfunctional voiding and 2/52 with enuresis risoria. Decreased bladder capacity was found in both evaluating methods in 22/52 cases. Incompatibility in bladder volume evaluation defined as normal/abnormal bladder volume between frequency/volume chart and urine flow measurement was found in 10/52 cases, 6/26(23%) OAB, 2/11(18%) MNE, 2/13,(15%) DV and 0/2 (0%) enuresis risoria.

CONCLUSIONS

1. High concordance (80%) was found between both methods.
 2. Bladder diary is objective method of bladder capacity evaluation as well as triplicate urine flow measurements and may be used interchangeably diagnosing different types of bladder dysfunctions.
-

DEVELOPMENT OF AN ANDROID-APP FOR THE ASSESSMENT AND TREATMENT OF INCONTINENCE IN CHILDREN

Catharina WAGNER¹, Lukas NAUMANN², Justine NIEMCZYK¹, Uwe TRONNIER² and Alexander VON GONTARD¹
1) Saarland University Hospital, Department of Child and Adolescent Psychiatry, Homburg/saar, GERMANY - 2) University of Applied Sciences, Zweibrücken, GERMANY

PURPOSE

The use of smartphone applications (Apps) is wide spread and so-called "mobile health Apps" have become more and more important. Smartphones are an attractive modality for children to playfully learn about and manage their own incontinence. An Android-App to assess diagnostically relevant data and to start a treatment in children with incontinence was developed to increase compliance and self-management.

MATERIAL AND METHODS

The app contains diagnostic tools which are used in the clinical setting, e.g. parental information about the different subtypes of incontinence and a 48-h-bladder diary. For the treatment, charts for the registration of wet and dry nights, urge symptoms, as well as for timed voiding and for fluid intake (including reminders) are provided. The App is divided into two sections, one for children and one for parents, which can be used by both on the same device. If desired, the data can easily be sent to the therapist by e-mail, once a day or once a week.

RESULTS

An evaluation of the App in a randomized-controlled-design compared to a pencil and paper version in the control group for both assessment and therapy of incontinence, is in the planning process. The structure of the App and the study design will be presented.

CONCLUSIONS

Mobile Health Apps enable patients to actively take on responsibility for their own health. The incontinence App could be a useful tool to gain information, motivate children and facilitate patient-provider-communication.

ENURESIS AND OAB IN CHILDREN. HOW ARE THEY RELATED?

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PURPOSE

To evaluate the prevalence and predictive factors of enuresis in children with overactive bladder (OAB) as well as to study the influence of enuresis in the daytime symptom resolution after parasacral TENS.

MATERIAL AND METHODS

A prospective study was conducted on 223 children diagnosed with OAB. Inclusion criteria: Presence of urgency and/or daytime incontinence, age 5 to 16 years, no anatomical or neurogenic abnormalities of the urinary tract. Patients were divided into two groups: with and without enuresis, and were compared for sex, age, race, urinary tract infection (UTI), presence of urgency, urge incontinence, number of daytime incontinence, frequency, holding maneuver and constipation.

RESULTS

The patients' ages ranged from 5 to 16 years with a mean of 8.6 ± 2.9 years, Enuresis was found in 152 (68%) patients, more frequent in girls (N=135, 60.5%). Enuresis was ≥ 3 times per week in 115 (79.3%). The presence of enuresis was associated only to symptoms of urgency ($p=0.001$), daytime incontinence ($p<0.001$), holding maneuvers ($p = 0.007$) and frequency ($p=0.013$). No significance was found for gender, age, race, UTI, presence of dysfunctional voiding, nocturia, encopresis, constipation, voiding diary information. Enuresis was seen in 95(67,3%) children ≤ 9 years old and in 53(70,6%) children > 9 years old.

CONCLUSIONS

In children with OAB, enuresis is associated with holding maneuvers. Unlikely monosymptomatic enuresis, enuresis associated to OAB is more prevalent in girls and tend do not to resolve with time if not treated.

OVERACTIVE BLADDER IN CHILDREN: ASSOCIATED SYMPTOMS AND FINAL DIAGNOSIS

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PURPOSE

The ICCS defines OAB by the subjective symptom of urgency; DO is only implied. While no other symptom is required, OAB can also be associated with urinary frequency, decreased functional bladder capacity, and incontinence. We sought to determine how often these associated findings occur in OAB.

MATERIAL AND METHODS

The charts of 548 children (231M,318F; mean age 9.0, range 3-20) who presented sequentially with urgency (OAB) were reviewed along with their final urodynamically-defined diagnosis which included dysfunctional voiding (DV), idiopathic detrusor overactivity disorder (IDOD; ie, OAB with a short EMG lag time and quiet pelvic floor EMG during voiding), detrusor underutilization disorder (DUD, similar to willful retention), and primary bladder neck dysfunction (PBND).

RESULTS

Daytime incontinence was reported in 398 (72.6%) and frequency in 258 (47.1%). Mean %EBC was 80.9. (Table1). Females were more likely to report daytime incontinence (76.7% vs. 67.5%, $p=0.02$) and frequency was found more often in males (63.7% vs. 38.1%, $p<0.001$). %EBC was less in males (70.0 vs. 88.8, $p<0.001$). Table2 illustrates the final diagnoses in patients presenting with urgency.

Table1. %EBC

Additional Symptom(s)	%EBC	P-value*
Urgency alone(n=53)	117.2	
With frequency(n=97)	82.7	<0.001
With daytime incontinence(n=237)	81.9	0.002
With frequency and daytime incontinence(n=161)	65.9	<0.001

*=As compared to urgency alone

Table2. LUT condition diagnosis

Diagnosis	No. Patients(%)
DV	80(14.6)
IDOD	339(61.7)
DUD	16(2.9)
PBND	29(5.3)
None (OAB?)	85(15.5)

CONCLUSIONS

%EBC for age is usually normal or mildly increased in OAB when urgency is the only symptom but decreases dramatically with each additional LUTS. OAB is more common in girls who also have a lower incidence of frequency, more incontinence. and >%EBC. While the majority of children with OAB are diagnosed with IDOD, almost 15% will be diagnosed with DV and another 5% with PBND.

CAN CHILDREN WITH OVERACTIVE BLADDER (OAB) AND DYSFUNCTIONAL VOIDING (DV) TRANSITION BETWEEN EACH OTHER? (IE, ARE THEY ONE DISEASE?)

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PURPOSE

In 1998, the first ICCS terminology document suggested that "urge syndrome", later replaced by the term "OAB", and "DV" can transition into one another. It was our goal to determine if this phenomenon actually occurs. To create an objective study, objective "qualifiers" to support the diagnosis of each of the 2 conditions were introduced.

MATERIAL AND METHODS

For the diagnosis of DV we included the qualifier of an active EMG during voiding on 2 occasions. For OAB, we used the qualifiers of a short lag time and quiet EMG during voiding, ie, IDOD.

RESULTS

Mean follow up of 77 children with DV and 77 with OAB was 17.5 months and included 475 uroflow/EMGs. Mean age for DV was 6.5 years and OAB 7.2 years. Of the 77 OAB children, none transitioned into DV, although 2 demonstrated transient mild DV on a single study. Of the 77 with DV, 25 of 31(81%) treated with biofeedback alone and only 8 of 39 (21%) treated with biofeedback and anticholinergics had a short lag time on at least one occasion during follow-up.

CONCLUSIONS

The 33 of 77 children with DV who demonstrated a short lag time during follow-up did so, not because of a conversion to OAB but rather once the EMG quieted in response to biofeedback, its masking effect on the already existing secondary DO lifted, making apparent the DO that was still present particularly in those who had not been on anticholinergics. In conclusion, in our experience children with DV and OAB do not appear to transition from one condition to the other and thus these findings call into question the previously held notion that conversion between these two conditions does occur in children. More symptomatic DV requires anticholinergics in addition to biofeedback.

ARE INTERFERENTIAL ELECTRICAL STIMULATION AND DIAPHRAGMATIC BREATHING EXERCISES BENEFICIAL IN CHILDREN WITH BOWEL BLADDER DYSFUNCTION ?

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PURPOSE

Evaluation of the bowel function in children with LUTS is necessary as more than 50% of these children fulfill the diagnostic criteria for functional defecation disorders. Treatment of constipation significantly reduces LUTS. Interferential electrical stimulation has been used to treat chronic treatment-resistant constipation and soiling in children. The aim of the study was to evaluate the effects of interferential electrical stimulation and diaphragmatic breathing exercises in children with bowel bladder dysfunction.

MATERIAL AND METHODS

Seventeen children with dysfunctional voiding who were chronically constipated were included in the prospective clinical study. All the children were checked for their medical history regarding bowel habits and LUTS. Physical examination including abdominal and anorectal digital examination were performed. Children kept a voiding and defecation diary, and underwent urinalyses and urine culture, the ultrasound examination of bladder and kidneys and uroflowmetry with pelvic floor EMG. In order to evaluate the colonic transit pattern, colonic scintigraphy was performed. In addition to education and bi behavioural modifications, children were assigned diaphragmatic breathing exercises and interferential electrical stimulation for 2 weeks. Clinical manifestations, uroflowmetry curve type and postvoided residual urine (RU) were analysed before and after the therapy.

RESULTS

One month after the therapy, defecation increased in 14/17 patients and fecal incontinence decreased in 2/3 patients. LUTS disappeared in 10/17 patients. Bell-shaped uroflow curve was observed in 10/17 children while RU was reduced in 6/9 children.

CONCLUSIONS

Interferential electrical stimulation and diaphragmatic breathing exercises are beneficial in chronically constipated dysfunctional voiders. Further trials are needed to define the long-term effects of this program.

PELVIC-FLOOR THERAPY IN CHILDREN AND ADOLESCENT WITH GIGGLE INCONTINENCE

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PURPOSE

To evaluate efficacy of pelvic-floor therapy (PFT) in children and adolescent with Giggle Incontinence (GI)

MATERIAL AND METHODS

In the last 3 years, 15 (5 male and 10 female) patients with GI were observed. Before to start PFT, all patients underwent bladder diary, flowmetry with EMG of the pelvic floor and ultrasound postvoiding residual urine evaluation (PVR). PFT consisted in, at least, 3 sessions (1 session/month) of cognitive and behavioural therapy and physiotherapy of pelvic floor muscles by means of exercises to develop ability to isolate, contract and relax perineal muscles. Patients were instructed to perform daily exercises at home between sessions. Bowel management was added in children with associated constipation. Results on GI were assessed at the end of PFT. Student t test and Chi square test were applied for statistical comparison.

RESULTS

Three patients had been previously treated with anticholinergics without results. Non invasive urodynamic evaluation showed voiding postponement in 2 males and dysfunctional voiding in 5 females; in none, types of urinary incontinence different from GI were found. Average age at PFT was 10.6 years in males and 12.1 years in females ($p=0.45$). Mean number of PFT sessions was 6 in males and 4.2 in females ($p=0.01$). Ten (1 male and 8 females, $p=0.003$) patients showed improvement of GI after PFT

CONCLUSIONS

PFT is useful to treat GI in children and adolescent. Since PFT seems to be more effective in girls than in boys, it should be considered before pharmacotherapy especially in female patients

DIFFERENCE IN PATIENT AND PARENTAL RECOGNITION FOR LOWER URINARY TRACT SYMPTOMS THROUGH CROSS-CULTURAL VALIDATED ADAPTATION OF DYSFUNCTIONAL VOIDING SYMPTOM SCORE (DVSS) TO JAPANESE LANGUAGE.

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PURPOSE

In using questionnaires for children with daytime incontinence (DI) or nocturnal enuresis (NE), it is unclear whether children and parents respond to a question in the same manner. We performed cross-cultural validated adaptation of Dysfunctional Voiding Symptom Score (DVSS, Farhat W et al. J Urol. 2000; 164: 1011-5) to a non-English language, and evaluated patient and parental recognition.

MATERIAL AND METHODS

(1) Validation process. We translated DVSS into two non-English versions; pDVSS for parents and cDVSS for children. Pre-testing was done with 5 to 15-year-old patients by a specialist in cognitive linguistics. When a child needed help by parents to understand a question, it was defined as 'misidentification'. (2) Trial with children and parents. After we completed the validated translation by amending the issues raised above, cDVSS or pDVSS were answered by children or parents, respectively.

RESULTS

(1) Pre-testing was done for 32 patients. In children, a similar pattern of misidentification was observed for representation of time or frequency. (2) There were 37 patients without DI or NE (control, Group 1), 35 with NE without DI (Group 2), 29 with both DI and NE (Group 3). Group 3 showed significantly higher scores of DVSS than Group 1, without discrepancy between cDVSS and pDVSS (Table, *compared to group 1). However, total scores and scores in questions about bowel symptoms were significantly higher in cDVSS than in pDVSS (Table, #compared to pDVSS).

	Group 1 (control)	Group 2 (NE without DI)	Group 3 (NE with DI)
cDVSS	3.9±3.1	3.1±2.6 [#]	8.3±3.5 [*]
pDVSS	3.4±3.0	2.3±2.7	7.4±3.9 [*]

CONCLUSIONS

Caution should be taken for using the terms related with time or frequency since temporal sense is not fully developed in children. DVSS is useful for differentiating DI patients and control, but parents of NE without DI may under-estimate bladder and bowel symptoms.

COMPLICATIONS OF SUPRAPUBIC LINE INSERTION FOR VIDEO-CYSTOMETROGRAMS

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PURPOSE

Insertion of suprapubic lines (SPL) for video-cystometrogram (VCMG) is an invasive procedure with the potential for serious complications. We are not aware of a published benchmark for complications. We review our results.

MATERIAL AND METHODS

A retrospective case not review was performed of patients undergoing VCMG between October 2008 and July 2014. Two 5 Fr supra pubic lines were inserted under general anaesthesia as a day case procedure four days prior to urodynamics.

RESULTS

65 patients were identified. Median age at SPL insertion was 7.1 years (range 10 months to 18 years). VCMG were successfully completed in all. Significant complications were experienced by 2 children (3.1%): severe urinary extravasation requiring the insertion of a urethral catheter in one, and difficulty voiding requiring admission on another. More minor complications were experienced by 12 children (18.5%): 4 (6.2%) had mild self-limiting extravasation, 4 had increased urinary frequency or urgency, 3 (4.6%) had difficulty voiding, and 1 (1.5%) had significant pain and incontinence. No patient required a return to theatre or developed urinary infection.

CONCLUSIONS

Despite the potential for hazard, SPL insertion for VCMG can be performed with an acceptable complication rate. This study provides new and useful information for counselling parents and patients, and contributes to setting standard against which practice can be measured.

INCIDENCE OF TOWER AND OTHER UROFLOW PATTERNS IN SHORT LAG TIME PROVEN IDIOPATHIC DETRUSOR OVERACTIVITY (IDO)

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PURPOSE

In children with LUTS, uroflow patterns and EMG lag time are often used to support diagnoses. For instance, a tower uroflow pattern (left shifted explosive curve) is thought to be indicative of idiopathic detrusor overactivity (IDO) especially when associated with urgency. An EMG lag time of 0 seconds or less on uroflow/EMG has been shown to be diagnostic of DO in children with LUTS. We sought to determine the spectrum of uroflow patterns, including tower pattern, at presentation in children diagnosed with IDO by a very short EMG lag time and a quiet EMG during voiding.

MATERIAL AND METHODS

Only children diagnosed with IDO on the basis of a very short EMG lag time (ie, 0 seconds or less) and a quiet EMG during voiding, on at least 2 studies, were included. Presenting LUTS and ICCS-described uroflow patterns were reviewed

RESULTS

82 consecutive children (46M,36F; mean age 7.4 years, range 4-16) diagnosed with IDO were identified. Initial uroflow patterns are shown in table 1. Only 9 patients (11%) had an initial tower flow pattern. Patients with tower flow were more likely to have frequency, urgency, and daytime incontinence compared with children with other flow patterns (67% vs. 49%, respectively, $p > 0.05$).

Table 1 Uroflow patterns at initial flow/EMG.

	Uroflow Pattern				
No. Patients	Normal	Plateau	Tower	Staccato	Interrupted
82	46(56%)	17(21%)	9(11%)	8(10%)	2(2%)

CONCLUSIONS

Most children with IDO as evidenced by a very short EMG lag time and a quiet EMG during voiding do not exhibit a tower uroflow pattern. Although not statistically significant, those with a tower pattern appeared to be the most symptomatic. While a normal uroflow pattern was most common with IDO, 33% had flow curves often thought reflective of other LUT conditions, supporting a cautionary note when relying on specific flow patterns alone to diagnose an underlying condition.

ICCS S2: LUT DYSFUNCTION (CONT.)

Moderators: Israel Franco (USA) & Anka Nieuwhof-Leppink (Netherlands)

ICCS Meeting on Thursday 15, October 2015, 16:10 - 16:40

16:10 - 16:16

ICCS S2-1 (LO)

YOUNG RATS EXHIBIT AN AGE AND SEX DEPENDENT BLADDER RESPONSE TO ALPHA ANTAGONISTS BUT NOT BETA AGONISTS

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PURPOSE

The use of alpha-1 antagonists for dysfunctional voiding and beta-3 agonists for overactive bladder in children will likely increase over time. We studied the response of the rat bladder and external urethral sphincter (EUS) after birth to determine if there was an age during which these compounds become effective, since previous studies showed a delayed onset of alpha receptor activity until 6 weeks of life.

MATERIAL AND METHODS

Sprague-Dawley rats underwent cystometry and EUS electromyography under urethane anesthesia at ages 3 weeks (weaning), 6 weeks (puberty), and 9 weeks (young adult). 6 females and 6 males were studied at each time point. Maximum intravesical pressure during voiding, pressure threshold, bladder capacity, EUS storage and emptying function were measured. The non-selective alpha agonist phenylephrine (0.3 mg/kg), alpha antagonist phentolamine (1-3 mg/kg), beta agonist isoprenaline (3 mg/kg), and beta antagonist propranolol (3 mg/kg) were injected intravenously.

RESULTS

The alpha antagonist phentolamine lowered intravesical pressure in 6 and 9 week old males and 6 week old females, but did not lower the pressure threshold. The beta agonist isoprenaline lowered intravesical pressure in males and females of all ages, also without affecting the pressure threshold. The pressure threshold in males and females of all ages was increased by the beta antagonist propranolol, which also decreased bladder capacity in females. Neither the alpha antagonist nor the beta agonist improved bladder capacity or EUS storage and emptying function.

CONCLUSIONS

Alpha antagonists are more effective at lowering intravesical pressure in post-pubertal male rats than in female rats. Beta agonists reliably lower intravesical pressure in male and female rats of all ages. We propose that alpha antagonists be used in older males, and beta-3 agonists be used in females and younger males, if the beta-3 agonists are shown to be safe in children.

SOLIFENACIN IN CHILDREN AND ADOLESCENTS WITH OVERACTIVE BLADDER: RESULTS OF A PHASE 3 CLINICAL TRIAL

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PURPOSE

To evaluate efficacy, safety and pharmacokinetics of solifenacin succinate oral suspension in children (5–11 yrs) and adolescents (12–17 yrs) with overactive bladder.

MATERIAL AND METHODS

Following 2-week, single-blind placebo run-in, subjects with >4 daytime incontinence episodes in a 7-day diary were randomized to 12 weeks' once-daily solifenacin/placebo+standard urotherapy. Solifenacin starting doses, based on subject's weight at screening, aimed to deliver steady-state plasma drug exposure equivalent to the 5 mg tablet dose in adults (PED5). Titration was in steps of 3-weeks duration to attain optimal individual doses at Week 9 (final doses equivalent to PED2.5 to PED10). Primary efficacy variable: change from baseline to end of treatment in Mean Volume Voided (MVV)/micturition. Key secondary endpoints: mean number of incontinence episodes and micturitions/24 hrs. Efficacy was assessed using a 7-day diary.

RESULTS

148 children and 41 adolescents were randomized. Children on solifenacin had a greater increase in MVV/micturition vs those on placebo (Table; P=0.046). There were no statistically significant differences between solifenacin and placebo in incontinence or micturition frequency in children, or for primary or key secondary endpoints in adolescents (not powered). Exploratory analyses demonstrated statistically significant reductions in micturition frequency vs placebo when adjusted for change in fluid intake. Most common drug-related TEAEs are shown (Table). Solifenacin did not increase PVR volume. Increase from baseline in mean corrected QT interval with solifenacin was 4.2 ms; below the threshold of clinical concern (5 ms).

Change from Baseline to End of Treatment in Mean Volume Voided/Micturition (mL) in Children and Adolescents (FAS)				
	Placebo+standard urotherapy		Solifenacin+standard urotherapy	
	Children (n=70)	Adolescents (n=19)	Children (n=73)	Adolescents (n=21)
Baseline Mean (SE)	94.1 (4.6)	169.1 (14.6)	96.9 (4.8)	159.6 (13.4)
End of Treatment Mean (SE)	108.5 (5.4)	185.7 (13.7)	123.1 (6.2)	177.2 (13.4)
Change from Baseline Adjusted Mean (SE)	13.4 (4.8)	6.9 (14.6)	25.5 (4.8)	2.3 (14.0)
Difference (Solifenacin-Placebo) Adjusted Mean (SE)			12.1 (6.0)	-4.7 (15.7)
95% CI			(0.2, 24.0)	(-36.7, 27.4)
P-value			0.046	
Incidence of Most Common Drug-Related TEAEs in Children and Adolescents (SAF) [†]				
	Placebo+standard urotherapy		Solifenacin+standard urotherapy	
	Children (n=73)	Adolescents (n=19)	Children (n=73)	Adolescents (n=22)
Constipation	2.7%	0%	5.5%	0%
ECG QT prolonged [‡]	2.7%	5.3%	5.5%	4.5%
Dry mouth	1.4%	5.3%	2.7%	0%

CI=confidence interval, ECG=electrocardiogram, FAS=full analysis set, SAF=safety analysis set, SE=standard error, TEAE=treatment-emergent adverse event
[†]TEAEs listed represent those with the highest incidence in both age cohorts combined
[‡]AEs were driven by patients who met the discontinuation criterion in the study

CONCLUSIONS

Solifenacin in a once-daily liquid formulation improved MVV/micturition in children with OAB and appeared safe and well tolerated.

SOLIFENACIN IN CHILDREN AND ADOLESCENTS WITH OVERACTIVE BLADDER: RESULTS OF AN OPEN-LABEL, LONG-TERM CLINICAL TRIAL

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PURPOSE

To evaluate the safety and efficacy of long-term treatment with solifenacin succinate oral suspension in children (5–11 yrs old) and adolescents (12–17 yrs old) with overactive bladder.

MATERIAL AND METHODS

119 children and 29 adolescents entered this 40-week extension study 2-3 days after the last dose of study medication in the preceding 12-week, placebo-controlled study (52 weeks total). Solifenacin starting doses, based on subject's weight at screening, aimed to deliver steady-state plasma drug exposure equivalent to that delivered by a 5 mg dose in adults (PED5). Titration was in steps of 3-weeks duration to attain optimal individual doses at Week 9 (final doses equivalent to PED2.5, PED5, PED7.5 or PED10). Safety assessments were adverse events (AEs), ECG, vital signs and post-void residual (PVR) volume. Efficacy variables (assessed using a 7-day diary) included change from baseline to end of treatment in mean number of incontinence episodes/24 hrs and micturitions/24 hrs.

RESULTS

The most common drug-related treatment-emergent AEs are shown in the table; none were serious. Solifenacin did not increase PVR volume and there were no apparent effects on vital signs or laboratory variables. Reductions in micturition frequency and number of incontinence episodes/24 hrs that were evident after 3 weeks of treatment in the double-blind study increased over the course of the open-label study up to 52 weeks.

	Children (5–11 yrs) n=118			Adolescents (12–17 yrs) n=29		
	Incidence of most common drug-related TEAEs (SAF), n (%) [†]					
Constipation	14 (11.9)			1 (3.4)		
Nausea	0			2 (6.9)		
Electrocardiogram QT prolonged	10 (8.5)			4 (13.8)		
Dry mouth	5 (4.2)			1 (3.4)		
Duration of Solifenacin Treatment	n	Mean (SD)	Mean Change From Baseline (95% CI)*	n	Mean (SD)	Mean Change From Baseline (95% CI)*
	Mean number of incontinence episodes/24 hrs (FAS)					
Baseline	117	2.7 (2.3)		29	2.7 (2.3)	
40 weeks [‡]	97	1.1 (1.2)	-1.6 (-1.8, -1.3)	23	1.1 (1.8)	-1.6 (-2.3, -0.8)
52 weeks [‡]	44	1.0 (1.2)	-1.9 (-2.2, -1.7)	11	0.6 (1.0)	-2.0 (-2.8, -1.2)
	Mean number of micturitions/24 hrs (FAS)					
Baseline	117	8.2 (2.6)		29	8.0 (3.6)	
40 weeks [‡]	97	6.8 (1.6)	-1.5 (-1.8, -1.2)	23	6.4 (1.6)	-1.2 (-1.9, -0.4)
52 weeks [‡]	44	6.6 (1.6)	-1.8 (-2.2, -1.4)	11	5.7 (1.1)	-1.8 (-2.6, -1.0)

*Adjusted estimates are from a repeated measures ANCOVA model

[†]TEAEs listed represent those with the highest incidence in both age cohorts combined

[‡]Total exposure to solifenacin is 40 weeks or 52 weeks depending on treatment allocation in the 12-week double-blind study

CI=confidence interval, ECG=electrocardiogram, FAS=full analysis set, SAF=safety analysis set, SE=standard error, TEAE=treatment-emergent adverse event

CONCLUSIONS

Solifenacin in a once-daily liquid formulation was well-tolerated in children and adolescents for up to 52 weeks of exposure. Efficacy was maintained or increased relative to the preceding 12-week study.

CHILDREN'S EXPERIENCES OF VOIDING SCHOOL INTERVENTION

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PURPOSE

This qualitative focus-group study describes children's experiences of voiding school intervention.

MATERIAL AND METHODS

Children, aged 6-12, participated in the voiding school at the nurse-led outpatient clinic. The intervention included two one-day group visits two months apart. The educational content was based on the International Children's Continence Society's standards for urotherapy. The education was delivered with child-oriented teaching methods such as play and group discussion with other children. At the end of the second visit, 19 children (mean age 9 years, range 7-12; 12 girls and 7 boys) were interviewed in five focus groups. Data were analyzed with inductive content analysis.

RESULTS

The participating children experienced incontinence as a substantial burden in their daily life. They felt shame and had also experienced bullying because of it. Although the voiding school raised mixed feelings in the children, they experienced it very positively. The children perceived it as more child-oriented than usual outpatient visit with their parents, in where adults communicated mostly with each other. In the voiding school, videos and learning-by-doing helped children to understand the basis of the advice they were given. With the help of this education they were able to learn and remember new habits that gave them control over the incontinence. Peer support helped them to talk about this embarrassing subject. Sharing experiences with peers and improvements in their incontinence supported the children's self-esteem and encouraged them to do new things, such as staying overnight with friends.

CONCLUSIONS

Voiding school as a child-oriented intervention provides the means for children themselves to have control over their incontinence.

PREDICTORS OF PARASACRAL TRANSCUTANEOUS NEUROSTIMULATION (TENS) FAILURE IN CHILDREN WITH OVERACTIVE BLADDER

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PURPOSE

Parasacral TENS has been an effective method for treating children with overactive bladder (OAB). However, we still do not know the clinical characteristics that may be associated with a worse outcome. Therefore, the aim of this study is to evaluate the predictors of the outcomes of parasacral TENS in the treatment of OAB in children.

MATERIAL AND METHODS

This is a prospective study of children with symptoms of isolated OAB who were treated consecutively with parasacral TENS. OAB was defined as the presence of urgency. Isolated OAB was defined as the presence of these symptoms but no sign of dysfunctional voiding. The symptoms were considered completely resolved when the parents/patients reported 100% improvement in the visual analogic scale (VAS). Parasacral TENS were performed 3 times a week, 10 HZ, sessions of 20 min. Predictors evaluated: gender, frequency, enuresis, intensity of urgency, daytime incontinence and its intensity, nocturia and hold maneuvers.

RESULTS

Out of 84 patients (age ranged from 4 to 17 years), 48 (57%) had the symptoms resolved. Before treatment 54 (64%) children were female, 71 (84%) had urgeincontinence, 48 (57%) frequency, 33 nocturia, 60 (71%) holding maneuvers, 56 (57%) enuresis, 29 (51%) constipation (57 patients were evaluated with Rome III) and 59 (70%) has a history of UTI. Only enuresis was associated with the outcome. Out of 56 patients with enuresis 26 (46%) had the symptom resolved. Out of 28 patients without enuresis, OAB resolved in 22 (79%).

CONCLUSIONS

Enuresis was the only symptoms associated with outcome after parasacral TENS.

ACCURACY OF FLOW INDEXES BETWEEN DIFFERENT VOIDS IN THE SAME PATIENT.

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PURPOSE

Attempts to normalize flows using nomograms or volume corrected flows have been made but with little success. We recently derived a quadratic formula to estimate Q which is then used to generate a Flow index (FI) based on an idealized normal voider. We set out to prove its reliability from one void to the next and amongst various bladder volume and PVR scenarios.

MATERIAL AND METHODS

A data set consisting of 1268 children who underwent 2 voids was used to test our sex specific formulas to derive FI Q_{max} and Q_{avg} . Matched pairs of voids based on flow patterns, bladder volume, PVR were tested in various permutations. Q_{max} , Q_{avg} FI for each void were compared and tested for accuracy using Root mean square error (\sqrt{MSE}) and Median Absolute % error (medA%E). Non-parametric testing was done on the different groups to confirm no difference from the first to the second void.

RESULTS

We found that the most accurate means of evaluating one flow from another was to use FI based off the Total bladder volume and Idealized voider equation. Q_{avg} and Q_{max} were less accurate regardless of the type of permutations set up with medA%E approaching 40% in disparate volume voids and dissimilar voiding patterns. Similar voiding patterns with similar volumes and PVR were most accurate medA%E =14%, 15% and \sqrt{MSE} =0.23 and 0.27 females and males respectively.

CONCLUSIONS

Even though non-parametric tests can show that there are no statistical differences between different ways to calculate flow index and different groups of voiders. The best measure of how accurate a test is and how reproducible is to use accuracy measures as we have done. We have shown that an idealized normal voider FI is reproducible from one flow to the next and is a useful tool to follow children over time.

A NORMAL VOIDER DERIVED FLOW INDEX CAN BE A MEASURE OF VOIDING EFFICIENCY

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PURPOSE

We recently derived a Flow index (FI) based on an idealized normal voider. Efficiency is the measure of the ability to empty the bladder fully and promptly as defined by the physics of voiding. Our hypothesis is that FI can be a proxy for voiding efficiency and that elevated PVR and high volumes affect efficiency.

MATERIAL AND METHODS

A data set consisting of 1268 presumed normal voiding children who underwent 2 voids was used to calculate our sex specific quadratic formula for Q. FI (Actual Q/est Q) for each void were compared and tested for accuracy. Non-parametric testing was done on the different groups to confirm no difference from the first to the second void.

RESULTS

We found that in both sexes that an elevated PVR and a bladder volume in excess of 110% of expected capacity both impart negative effects on bladder emptying by lowering the FI from its median of 0.97 in normal voiders to 0.53 and 0.72 respectively in females and 0.91, 0.64, and 0.7 in males. Root mean sq error for females was 0.284, 0.12 and 0.26 and males 0.27, 0.16, and 0.12 respectively.

CONCLUSIONS

Our findings show that FI can be a proxy for voiding efficiency since bladder emptying is directly proportional to the volume in the bladder at the time of micturition. Therefore our FI takes into account the effects of PVR and overdistended bladder aside from our previous findings that abnormal flow patterns also lower the FI giving us a proxy for efficiency of voiding.

REFERRAL PATTERN FOR WETTING CHILDREN TO A PAEDIATRIC UROLOGY CENTER: WHO SHOULD SEE WHAT?

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PURPOSE

Management of day and or night time incontinence forms a significant proportion of a urology service. Clinics can be time consuming and patients are often seen for prolonged periods. This can cause a burden upon available services. Our aim was to review the referral pattern within our network and develop a more efficient referral pathway.

MATERIAL AND METHODS

A retrospective review of all referrals to a paediatric urology clinic was performed over a 3year period. Referrals for continence related issues were identified and stratified according to symptoms and management prior to referral. A consensus was gained within our consultant cohort of suitable referrals. This was carried out in accordance with national guidelines.

RESULTS

300 of 940 referrals between 2012-2014 were continence related. A third were considered to be 'inappropriate' referrals, including primary nocturnal enuresis (PNE), wetting with associated behavioural or developmental issues, concurrent bowel disease. Patients with PNE and daytime wetting (45%) could have been initially assessed by a continence nurse specialist (CNS) to carry out relevant investigations (e.g. non-invasive urodynamics). 22% of referrals were considered to be 'appropriate', including intractable PNE, continuous daytime wetting and wetting associated with congenital anomalies and recurrent infections.

CONCLUSIONS

With further education and a network pathway, a third of referrals for continence issues could be managed locally before involvement of the paediatric urologist. An experienced CNS within the department can streamline the service and frees up the consultant to manage the complex cases. Implementation of the pathway can improve efficiency and reduce departmental costs.

ICCS S3: NOCTURNAL ENURESIS

Moderators: Johan vande Walle (Belgium) & Jens Christian Djurhuus (Denmark)

ICCS Meeting on Friday 16, October 2015, 08:00 - 09:00

08:00 - 08:06

ICCS S3-1 (LO)

EFFECTIVE TREATMENT OF NOCTURNAL ENURESIS RESULTS IN AMELIORATION OF NEUROCOGNITIVE DYSFUNCTION AND DISRUPTED SLEEP.

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PURPOSE

The high comorbidity between nocturnal enuresis, sleep disorders and psychological problems is suggestive of a common pathway in the central nervous system. This study aims to evaluate the effect of a simple therapeutic intervention for nocturnal enuresis on the major comorbidities: disrupted sleep and neuropsychological dysfunction.

MATERIAL AND METHODS

In this open-label, prospective phase IV study, children with monosymptomatic nocturnal enuresis associated with nocturnal polyuria, underwent standardized video-polysomnographic testing and multi-informant neuropsychological testing at baseline and 6 months after the start of desmopressin treatment. The primary endpoints were the change in sleep and neuropsychological functioning. Neuropsychological functioning was measured on five domains: quality of life, attention, executive function, internalizing problems and externalizing problems. The secondary endpoint was the change in the first undisturbed sleep period or the time to the first void.

RESULTS

Thirty-nine patients were screened and 35 patients were included in the study and completed the first examination. Thirty children (23 boys and 7 girls) between 6 and 16 years (mean 10.43, SD 3.08) completed the study. Response rate to desmopressin was 82%. The study demonstrated a significant decrease in periodic limb movements during sleep ($F(1,26) = 122.50, p < 0.001$ [95% CI, -6.26 to -3.27]) and a prolonged first undisturbed sleep period. Additionally neuropsychological functioning was improved on several domains: quality of life, executive functioning, internalizing problems and externalizing problems.

CONCLUSIONS

This study demonstrates that effective treatment of nocturnal polyuria in children with monosymptomatic nocturnal enuresis has a beneficial effect on sleep disruption and neuropsychological dysfunction.

PSYCHOLOGICAL FOLLOW-UP OF THE PARENTS ALONG THE TREATMENT OF CHILDREN WITH PRIMARY MONOSYMPTOMATIC ENURESIS IMPROVES RESULTS

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PURPOSE

Parents may see enuresis as a failure in the education process, resulting in punishment and generating anguish and guilt. Herein, we evaluate the results of psychological follow-up of parents in the treatment of enuretic children.

MATERIAL AND METHODS

Sixty-six children aged 6 to 15 yo with monosymptomatic enuresis were randomized into two groups. Children in both groups were evaluated with voiding and dry nights diaries and answered the Impact Scale, and were treated with urotherapy and psychological follow-up. In the Experimental Group (EG) parents received psychological follow-up every 2 weeks for six months while in Control Group (CG) parents were not followed. All parents answered a questionnaire to evaluate violence against their children (Conflict Tactics Scales Parent-Child - CTSPC) and the Tolerance Scale.

RESULTS

Mean age, gender and the CTSPC questionnaire results, prior to treatment, were similar in both groups. In the evaluation of the parents, CTSPC showed less violence after treatment in GE ($p=0.0069$). Tolerance Scale showed that parents of all enuretic children were intolerant and that, after treatment, the intolerance diminished more in GE ($p=0.0003$). In children, Impact scale showed that they suffer a great impact from being enuretics and that after follow-up those in GE had a smaller impact ($p=0.0085$) compared to controls. After treatment, the percentage of dry nights improved better in GE (52[30-91]) than in GC (10[3-22.5]) $p=0.0001$.

CONCLUSIONS

Children whose parents received psychological follow-up during treatment improved percentage of dry nights and had less impact of enuresis after treatment while their parents could deal better with the problem and were more tolerant after receiving psychological support during their children's treatment.

REBOXETINE IN THERAPY-RESISTANT ENURESIS

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PURPOSE

The aim of this study was to determine whether there is a role for the noradrenergic antidepressant reboxetine, as monotherapy or combined with desmopressin, in the treatment of therapy-resistant enuresis, and whether there are side effects involved. We also sought prognostic factors in anamnestic data and in the voiding chart.

MATERIAL AND METHODS

This was a randomized placebo-controlled study with a double-blind cross-over design. After baseline documentation of enuresis during 14 days and the completion of a voiding chart including measurements of nocturnal urine production, all children underwent treatment during three four-weeks periods: one with reboxetine 4mg and placebo, one with reboxetine 4mg and desmopressin 240 ug, and one with double placebo treatment. The reduction of wet nights between baseline and the last two weeks of each treatment period were compared.

RESULTS

Eighteen children were included. When the reduction of wet nights with treatment with reboxetine in monotherapy and in combination therapy with desmopressin respectively was compared to that of placebo treatment, using the nonparametric Wilcoxon signed ranks test, a highly significant ($p=0.004$ resp 0.002) difference was found.

With reboxetine in monotherapy six children experienced negative side effects, as compared to three with combination therapy, and two with placebo. All of these side effects were reversible, and most were mild. One patient chose to cease treatment because of side effects (headache)

No prognostic factors was found in either the anmnestic data or in the voiding chart.

CONCLUSIONS

Reboxetine seems to be an alternative in the treatment of enuretic children who have not responded to standard treatment.

ISOLATED REDUCED NOCTURNAL BLADDER RESERVOIR FUNCTION - A NEW TYPE OF NOCTURNAL ENURESIS

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PURPOSE

Bladder reservoir function in children with monosymptomatic nocturnal enuresis (MNE) is assessed by maximal voided volumes (MVV) registered on frequency-volume charts during daytime. Although a degree of association is evident, MVV does not necessarily reflect the nocturnal bladder reservoir function in MNE. We aimed to evaluate the nocturnal bladder reservoir function during the night in children with a normal MVV.

MATERIAL AND METHODS

Data from 239 children aged 5-15 treated for MNE in a tertiary referral centre was collected for a nested cohort study. Data from 99 children was excluded due to reduced MVV according to ICCS standardization and 34 were lost to follow-up. The remaining 106 were divided into two groups, based on whether they experienced wet nights with nocturnal urine production (NUP) below MVV.

RESULTS

82 % of the children with MNE and a normal bladder capacity experienced wet nights with NUP below their MVV. The mean proportion of wet nights with NUP below MVV was 49 % and below MVV expected for age (MVV_{Age}) the proportion was 23 %. Desmopressin response was negatively correlated with proportion of wet nights with NUP below MVV. The children with an occurrence of wet nights with NUP below MVV above 40 % had 11 % response rate for desmopressin treatment. Furthermore these children shared higher maximal NUP on dry nights than minimal NUP on wet nights.

CONCLUSIONS

Most children with MNE and normal MVV during daytime experience wet nights with urine volumes well below their MVV and MVV_{Age} , the latter could be viewed as isolated reduced nocturnal bladder reservoir function. This indicates bladder reservoir function abnormalities during sleep that is not assessed by day recordings. Physicians treating children with MNE should consider anticholinergic and combination treatment.

URINARY NERVE GROWTH FACTOR CAN BE A BIOMARKER FOR PREDICTING THERAPEUTIC SUCCESS IN MONOSYMPTOMATIC NOCTURNAL ENURESIS

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PURPOSE

Primary monosymptomatic nocturnal enuresis (MNE) is caused by a complex set of conditions, involving a mismatch between nocturnal diuresis and bladder capacity as well as a disturbance of arousal before micturition, but there have not been sufficient investigations regarding the relationship between MNE and bladder function. Urinary nerve growth factor (NGF) is considered a potential biomarker for overactive bladder syndrome in both children and adults. In this study we measured urinary NGF in children with MNE and evaluated the relationship between MNE and urinary NGF as a predicting factor of therapeutic success.

MATERIAL AND METHODS

Urine samples were collected from 31 children (24 boys and 7 girls, mean age: 9.3 years) with MNE before treatment and 11 children (6 boys and 5 girls, mean age: 10.0 years) without MNE as a control group. Urinary NGF levels were measured by using ELISA assay. NGF levels were normalized to the concentration of urinary creatinine. After 3 months of desmopressin or alarm treatment, treatment outcomes were assessed. The disparity of urinary NGF/Cr was evaluated between the MNE and in a control groups, and the relationship between urinary NGF/Cr and treatment outcome was evaluated.

RESULTS

Urinary NGF/Cr was significantly higher in the MNE group, compared with the control group (0.67 ± 0.69 vs. 0.11 ± 0.09 , $p=0.0003$). After treatment, success (defined as more than 90% reduction in wet nights per month) was achieved in 37% of patients in the MNE group. Urinary NGF/Cr was significantly lower in the treatment-success group, compared with the non-success group (0.18 ± 0.15 vs. 0.93 ± 0.86 , $p=0.0009$).

CONCLUSIONS

Urinary NGF/Cr was significantly higher in children with MNE than in controls and was lower in the treatment-success group than in the non-success group. Urinary NGF/Cr may become a potential biomarker for MNE and a predictor of treatment outcome for patients with MNE.

A PROSPECTIVE RANDOMIZED TRIAL OF BUZZER AND VOICE ALARMS FOR NOCTURNAL ENURESIS

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PURPOSE

Enuresis alarms successfully treat nocturnal enuresis, but alarms can be stressful. In a sleep lab study (Smith, et al. Pediatrics 2006;118:1623-1632), 6-12 year olds woke from stage 4 sleep more often to a voice smoke detector than a tone smoke detector. Voice recordable bedwetting alarms are available. We randomized children to buzzer or voice alarm to see which alarm was more effective.

MATERIAL AND METHODS

If the child chose to use a bedwetting alarm, the family was given a chance to enroll in the bedwetting alarm study approved by the Institutional Review Board. 197 children were divided into groups according to sex and age. Within each group, the children were randomized to receive the voice alarm or the buzzer. Success = 28 consecutive dry nights with no alarms. Improvement = less than 1 wet night per week. Failure = at least 1 wet night per week at the end of 4 months.

RESULTS

Type of Alarm	Boys 6-11 years	Boys 12-17 years	Girls 6-11 years	Girls 12-17 years
Buzzer Success	18	4	12	3
Improved	2	1	2	1
Failure	20	8	11	2
LTF	4	2	1	5
Voice Success	22	5	4	7
Improved	1	0	4	1
Failure	12	9	14	5
LTF	7	3	5	2

LTF: lost to follow up

In this study 50% of those completing the study were dry or improved at the end of 4 months using either type of alarm.

CONCLUSIONS

In a prospective randomized study, the initial success rate (28 consecutive dry nights) was not different between children using the voice recordable alarm and children using the buzzer alarm for nocturnal enuresis.

NOCTURNAL ENURESIS WITH ADHD: EXPERIENCE OF TREATMENT WITH ATOMOXETINE

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PURPOSE

Recent studies showed that incontinence and ADHD co-exist and interact each other. However, the treatment for the patients with nocturnal enuresis (NE) and ADHD has not been established.

We performed the treatment of NE with mild ADHD using atomoxetine.

MATERIAL AND METHODS

We treated 265 new patients with NE at Juntendo University Nerima Hospital & Musashi-murayama Hospital (Tokyo, Japan) since May 2013 to October 2014, with ages of 6 – 14 (198 cases with MNE and 67 cases with NMNE). With the routine interviews and physical examinations at the patients' first visits, we had excluded the possibility of comorbid ADHD and its related disorders. Patients with MNE were treated with or desmopressin and/or alarm and those with NMNE were treated with anti-cholinergics and/or alarm. At 12-weeks after the treatments, 52 with MNE and 13 with NMNE were classified as PR or NR. These 65 patients were re-assessed whether they had "subclinical" ADHD, and 24 patients (15 with MNE and 9 with NMNE) met the diagnostic criteria of DSM-IV-TR. They were treated with atomoxetine (ATX) (1.8mg/kg/day) in addition to ongoing therapy for enuresis.

RESULTS

After 8-weeks ATX therapy, the average wet nights per months were significantly decreased: 17.1 to 2.7 in MNE ($P=0.0007$) and 23.2 to 11.4 in NMNE ($p=0.0117$). Overall, ATX treatment was beneficial in 20 of 24 cases (FR:3, R:9, PR:8, NR:4).

CONCLUSIONS

We need pay more attentions for the possible comorbid ADHD in refractory cases with NE, and recommend ATX therapy for those patients.

URINE: USING HIGH DOSE ANTICHOLINERGICS FOR REFRACTORY PATIENTS IN COMBINATION WITH DESMOPRESSIN FOR NOCTURNAL ENURESIS

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PURPOSE

Desmopressin (DDAVP) is the most common pharmacologic therapy for nocturnal enuresis. Combination therapy, DDAVP plus fixed dose anticholinergic therapy improves symptoms in some patients who fail DDAVP monotherapy. We sought to evaluate treatment response of high dose anticholinergic therapy plus DDAVP in prior DDAVP monotherapy failures and factors predicting response.

MATERIAL AND METHODS

An IRB approved retrospective review was performed of all children treated from November 2013 through December 2014 with DDAVP monotherapy and combination therapy (DDAVP plus oxybutynin) with at least one visit after treatment initiation/change to evaluate response and who satisfied study inclusion/exclusion criteria. Factors evaluated included BMI, age, sex, ADHD, OAB, constipation, treatment for constipation, family history of nocturnal enuresis, psychotropic medication use and postvoid residual.

RESULTS

63 children (39 males, 24 females, age 7-18 years) met study criteria and received DDAVP 0.2 to 0.6 mg. Of the 27 DDAVP monotherapy nonresponders, 25 tried combination therapy and attended at least 1 follow-up visit. Of the 63 patients, 36 (57%) responded to DDAVP monotherapy. Twenty five of the 27 nonresponders received combination therapy, 68% responding to low dose combination therapy (DDAVP + oxybutynin 5mg). Of the 8 low dose combination therapy nonresponders, 6 (75%) responded to high dose combination therapy (DDAVP + oxybutynin 7.5-10mg).

CONCLUSIONS

We demonstrate that titrating the dose of oxybutynin (5-10mg) in DDAVP nonresponders allowed for overall 92% of patients to be dry at night. Failure of prior alarm therapy was more common in all nonresponders, whereas coexistent ADHD, dysfunctional voiding and OAB were more common in monotherapy nonresponders. Males were more likely to require high-dose combination therapy than females.

CONTENT VALIDITY OF NEW PNE QOL IMPACT QUESTIONNAIRE FOR BEDWETTING CHILDREN.

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PURPOSE

There are few questionnaires assessing the impact of bedwetting in children and these are either too long or rather negatively phrased. This study aimed to develop an electronic questionnaire directed at the child, positively phrased, short and sensitive to treatment.

MATERIAL AND METHODS

A literature review of areas of relevance for bedwetting children was conducted. The content validity of the items was explored through qualitative semi-structured interviews with Danish children, age 5-15, seeking treatment for bedwetting and/or other bladder problems. A draft e-questionnaire was thereafter developed and tested for completeness, understandability and adequate response options with bedwetting children in treatment in UK.

RESULTS

Nine one-to-one interviews were conducted with Danish children. The questions were considered relevant and comprehensive, however one question 'I sleep well' was replaced with 'I enjoy sleepovers at my friends or at camp' as the majority of children considered this a major burden and a more relevant topic.

The e-questionnaire was tested in one UK focus group of 10 patients. The initial division in age groups was removed as all patient groups could agree to the very simple questionnaire and design. The e-design was reported to be more easily understandable after the facial expressions of the smiley faces were adjusted.

CONCLUSIONS

The PNE impact questionnaire has high content validity and will be tested in a real life study for reliability and sensitivity in an online patient tool from April 2015.

DDAVP THERAPY AND ALARM THERAPY FOR NOCTURNAL POLYURIA

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PURPOSE

We investigated treatment outcomes of DDAVP therapy and alarm therapy performed in patients with nocturnal polyuria who visited our department.

MATERIAL AND METHODS

Of patients with monosymptomatic nocturnal enuresis who visited our department, 24 nocturnal polyuria patients with normal diurnal bladder capacity and above 130% of the bladder capacity expected from their ages were included in this study. DDAVP therapy was performed in 50 subjects between 7 to 14 years old (mean age: 9.9 years old). Of these, 13 subjects (26%) had nocturnal polyuria. Alarm therapy was performed in 50 subjects between 7 to 14 years old (mean age: 10.0 years old). Of these, 11 subjects (22%) had nocturnal polyuria. Control were defined as children without nocturnal polyuria whose bladder capacity was within the normal.

RESULTS

Treatment outcomes of DDAVP therapy performed in subjects with nocturnal polyuria (13 subjects) were as follows: at 3 months after the start of treatment, partial response: 3 (23%); response: 3 (23%); and at 6 months after the start of treatment, partial response: 3 (23%); response: 3 (23%). Treatment outcomes of control subjects were as follows: at 3 months, partial response: 14 (38%); response: 7 (19%); and at 6 months, partial response: 16 (43%); response: 7 (19%). Treatment outcomes of alarm therapy performed in subjects with nocturnal polyuria were as follows: at 3 months, partial response: 4 (36%); response: 0 (0%); and at 6 months, partial response: 6 (55%); response: 0 (0%). Treatment outcomes of control subjects were as follows: at 3 months, partial response: 18 (46%); response: 0 (0%); and at 6 months, partial response: 18 (46%); response: 4 (10%).

CONCLUSIONS

There are definitely not a large number of patients who meet the criteria for nocturnal polyuria according to the ICCS Guidelines. No significant difference was observed in treatment outcomes between DDAVP therapy and alarm therapy performed in patients who met the criteria for nocturnal polyuria.

EFFICACY OF ADDING ANTICHOLINERGICS ACCORDING TO THE BLADDER CAPACITY IN MONOSYMPTOMATIC ENURETIC PATIENTS WITHOUT RESPONSE TO DESMOPRESSIN

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PURPOSE

We analyzed and compared the outcome of desmopressin monotherapy and the additional effect of anticholinergics between those with or without small bladder capacity in monosymptomatic enuresis patients.

MATERIAL AND METHODS

We retrospectively reviewed medical records of 150 patients with monosymptomatic enuresis, who visited our clinic. According to their bladder capacity, patients were divided into small bladder capacity (SBC) group or normal group. Small bladder capacity was defined when the patient's maximal voided volume in voiding diary was less than 65% of age-matched estimated bladder capacity. We stratified response to medication as complete, partial, or no response and analyzed the difference of therapeutic effect in each group.

RESULTS

After excluding 25 patients treated without medication, a total of 125 patients (average age of 7.9 years) were included in this study. The average follow-up duration was 11.4 (1-60) months. The proportion of male was higher in group without SBC than in group with SBC (80.8% vs. 59.6%, $p=0.009$). Patients of both groups responded (complete or partial response) similarly by the initial treatment with desmopressin (50.7% vs. 46.2%, $p=0.617$). In patients without response to desmopressin, we added anticholinergic agents. The response rate was higher in both groups (80.5% and 71.4%, $p=0.727$) after adding anticholinergics.

CONCLUSIONS

Anticholinergic agent was useful even in the treatment in monosymptomatic enuresis patients without respond to demopressin, regardless of bladder capacity. We speculate that administration of anticholinergics could be useful for desmopressin non-responders, even when the functional bladder capacity estimated from voiding diary is normal.

AN ENURESIS CLINIC DATABASE APPLICATION

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PURPOSE

In our weekly nurse provided enuresis clinic of 10 years stranding in a rural part of the country, we follow the NICE and ICCS guidelines. We experienced difficulties to consistently calculate and record the values of the measurements of the initial assessment (Maximum Voided Volume, Maximum Nocturnal Voided Volume, Recommended amount of fluid intake per day), measures of progress (Reduction as a percentage in wet nights from the baseline, Percentage of dry nights (Dry-index) since last visit, Degree of response (None/Partial/Complete) at 16 weeks as well as other outcome measures (Initial Success, Continued Success, Complete Success, Relapse, Drop out, attendance rates).

MATERIAL AND METHODS

Our solution was a Microsoft Access database named Electronic Enuresis File (EEF) located at a server which is securely accessible through the internet which has an administrative module (for appointments, patient details, latest update of enuresis documents etc), a clinical module which replaces most of the clinical paper work and records and makes the above mentioned calculations user friendly. It also provides visual aids (graphs) of progress, and an analytic module for continuous auditing of the effectiveness (clinical outcome) of the clinic.

RESULTS

Over 500 children have been served with this clinical database. Recently an enuresis clinic identical to ours has been set up in a neighbouring health area and is working very well.

CONCLUSIONS

We see a future in this "Web based App" to support and standardise the running of bedwetting clinics in our country. We would be keen to give a demonstration of this model of service delivery as a poster (or oral presentation) and receive feedback from other specialists in the field.

REFERENCE VALUES FOR FREQUENCY VOLUME CHART PARAMETERS IN ADOLESCENT AND ADULT ENURESIS PATIENTS.

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PURPOSE

Reference values of Frequency Volume Chart (FVC) parameters are available for children until the age of 11, but are lacking for adolescent and adult enuresis patients. We aimed to describe reference values for this group.

MATERIAL AND METHODS

Retrospective, descriptive cohort study, in 907 patients between 2003 and 2013, aged 11 years and older, suffering from enuresis of at least one wet night per fortnight.

The main FVC and uroflowmetry parameters of interest were: maximum voided volume, 24h urine production and nocturnal urine volume including first morning void. Nocturnal polyuria (NP) was defined based on both International Childrens' Continenence Society (ICCS) and International Continenence Society (ICS) definitions. Data of all patients were collected from the medical files.

RESULTS

Small bladder capacity for age was present in 41% of men and 30% of women. Prevalence of NP differs tremendously when assessed by the ICS or the ICCS definition: following ICS guidelines, NP was present in 96% of our male and 93% of our female population. Following ICCS guidelines, NP was present in 27% of men and 41% of women.

CONCLUSIONS

Both small bladder capacity and nocturnal polyuria were found frequently in our adolescent and adult enuresis patients, which is in line with the current thought on causal factors.

NP prevalence is very different when assessed by using ICCS or ICS definitions, respectively. To make outcome research results comparable, coordinating activities to conform these definitions could be worthwhile.

AN INCREASE IN URINE VOLUME IS ASSOCIATED WITH AN INCREASE IN URINARY SODIUM AND CALCIUM BUT A FALL IN SUPERSATURATION OF CALCIUM OXALATE.

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PURPOSE

To investigate the relationship between urine sodium, calcium, and supersaturation of calcium oxalate (SS CaOx) in children as urine volume changed on consecutive days.

MATERIAL AND METHODS

We evaluated two 24-hour urinary metabolic stone profiles performed on consecutive days in 304 children. The urinary metabolic stone profiles were performed by Litholink Corporation. Since children vary in size, total urinary sodium and calcium were converted to mg/kg/day. The difference from the first day to the second day was plotted against the change in urine volume in ml/kg/day from day 1 to day 2. A subset of children with the greatest change in urine volume but similar urine creatinines was evaluated separately.

RESULTS

On average each 10ml/kg/day rise in urine volume was associated with a rise in urine sodium of 0.8mg/kg/day

Each 10ml/kg/day rise in urine volume was associated with a rise in urine calcium of approximately 0.7mg/kg/day.

Each 10ml/kg/day rise in urine volume was associated with a fall in supersaturation of calcium oxalate (SS CaOx) of 17.5%

Could the change in volume and calcium be secondary to an increase in dietary and thus urinary sodium? To address this concern, we evaluated 27 children whose volume varied by more than 40% between 2 consecutive days but whose urine creatinines were similar.

This significant change in volume is unlikely to be due to increased dietary sodium. In 19 children the higher urine volume was associated with a higher urine sodium and calcium but an improvement in SS CaOx.

CONCLUSIONS

Increasing urine volume is associated with higher urine sodium and calcium but lower urine SS CaOx. When children acutely change urine volume, there may be an increase in urine sodium and calcium that does not reflect dietary indiscretions but rather intravascular expansion. Despite a rise in sodium and calcium, an increase in urine volume usually leads to improved SSCaOx.

ICCS S4: LOWER URINARY TRACT

Moderators: Stephen Yang (Taiwan) & Anthony Khoury (USA)

ICCS Meeting on Friday 16, October 2015, 10:15 - 11:15

10:15 - 10:21

ICCS S4-1 (LO)

RELATIONSHIP BETWEEN BRAIN ACTIVITIES VOIDING PATTERN IN HEALTHY PRETERM NEWBORN

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PURPOSE

To investigate the relationship between voiding pattern and brain activity by using Video- electroencephalogram (EEG) in healthy preterm newborn.

MATERIAL AND METHODS

Forty-seven healthy preterm neonates (16 female) whose conceptual age (CA) was 34.10 ± 1.81 weeks: group I (31 weeks \leq CA < 33 weeks; n=13), group II (33 weeks \leq CA < 35 weeks; n=14) and group III (35 weeks \leq CA < 37 weeks; n=20). Video-EEG data from eight cortical regions were recorded from 8a.m. to 12a.m.. Meanwhile, the 4h free voiding parameters including voiding frequency (VF), voiding volume (VV), post-voiding residual volume (PRV) and status at voiding (awake/sleep) were recorded.

RESULTS

There was no significant difference in VF and VV/BW between the three groups ($P > 0.05$). VF in sleeping preterm neonates of group III was significantly less than that of the other two groups ($P < 0.05$). PRV/BW of group I was significantly larger than that of group II and group III. The electrode pair Fp1-T3 and Fp2-T4 amplitude showed significant difference between group I and group II, the electrode pair C3-O1 and C4-O2 amplitude showed significant difference in group III during quite sleep voiding(QSV), 5 second before and after voiding ($P < 0.05$). Comparing the amplitude in the three groups during QSV, 5 second before and after voiding, the electrode pair Fp1-T3, C3-O1 and T3-O1 respectively showed significant difference during 5 second before voiding, QSV and 5 second after voiding ($P < 0.05$). The EEG frequency showed no significant difference in the three groups during QSV, 5 second before and after voiding ($P > 0.05$).

CONCLUSIONS

Even in the early preterm neonate, the brain maybe has played a role in control of voiding function in QSV. With the age increasing, the central region and occipital area of the brain, especially the left cerebral regions in preterm neonates played an important part in voiding control.

IS THERE A DIFFERENCE BETWEEN DIFFERENT QMAX FLOW INDEXES (FI, ACTUAL Q/EST. Q)

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PURPOSE

There have been attempts to normalize uroflowmetry to volume by using a flow index. A recent report in the adult literature indicates that Total bladder volume^{0.5} (\sqrt{TBV}) is a good predictor of abnormal voiding. Our our own studies using our own quadratic derived estimated Q indicates that this is a good way to evaluate patients objectively. We set out to determine if there are differences between the different FI's described and which is most accurate.

MATERIAL AND METHODS

A data set consisting of 1268 children who underwent 2 voids was used to test our sex specific formulas to derive FI Q_{max} . FI based off the voided volume^{0.5} (\sqrt{VV}) and \sqrt{TBV} as well as Q_{max} with our formula using VV instead of TBV. FI for each void were compared and tested for accuracy. Non-parametric testing was done on the different groups to confirm no difference from the first to the second void.

RESULTS

We found that for both sexes that FI using our derived formulas were more accurate and approached unity (0.96, 0.93 females and males) while $FI = \sqrt{VV} = 1.7, 1.6$ and $FI \sqrt{TBV} = 1.7, 1.6$. We saw little difference when we used our normalized FI with VV except in cases of elevated PVR where it can then influence the FI and reduce accuracy. \sqrt{MSE} were 0.28, 0.29, 0.35, 0.36 and 0.28, 0.28, 0.52, 0.53 respectively for males and females for bell normalized FI TBV and VV, \sqrt{VV} , \sqrt{TBV} .

CONCLUSIONS

The old standard of using \sqrt{VV} as a measure of the expected Q_{max} leaves a wide margin for error. This concept needs to be discarded and replaced with a more accurate predictor of expected flow, a FI based on an idealized normal voider derived quadratic formula which estimates Q_{max} and accounts for residual urine and the slowing of the stream at high volumes seems to be the most accurate method.

CHARACTERISTICS OF PAEDIATRIC PATIENTS WITH IDIOPATHIC DETRUSOR UNDERACTIVITY

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PURPOSE

Idiopathic detrusor underactivity (DU) is an uncommon diagnosis in paediatric patients. Our aim is to describe the characteristics of this group.

MATERIAL AND METHODS

A retrospective, single centre, review of children diagnosed with DU was performed and data regarding demographic, symptoms, diagnostic tests and management recorded. Values displayed as median (range).

RESULTS

From January 2010 to March 2015 we identified 24 patients, aged 9.7 years (5.2-14.8), 16 female (67%). Three (13%) presented in urinary retention, 19(83%) were referred with urinary incontinence and 2 difficulty voiding. Symptoms included: recurrent UTI (n=16,67%), abdominal pushing (n=15,63%), constipation (n=15,63%), infrequent voiding (n=9,38%) and urgency (n=7,29%). Uroflow assessment was successfully completed in 20(83%) patients: fractionated and staccato flows were diagnosed in 3(15%) and 6(30%), respectively. Nine (45%) had large and one (5%) small capacity bladder (BC); overall BC was 135%(35-247%) of expected BC. In 19(95%) cases post-void residual was present, which corresponded to 19% of BC (0-97%). All had ultrasound scan, 21% had abnormal upper tract findings; renal scarring (DMSA) was present in 7/11 patients. Four children had renal impairment. Video-urodynamics findings were: atonic bladders in 2/24(8%) unsustained bladder contractions in 21/24(88%). MaxpDet was 42cmH20(15-68), 1 girl had sustained but reduced strength (MaxpDet 29cmH20). Sixteen(67%) had bladder sensation, in 5(21%) vesico-ureteric reflux, 5(21%) detrusor overactivity and 7(29%) were unable to void. Fifteen (63%) patients were treated with CIC, while timed double-voiding and constipation management was recommended to 9(37%).

CONCLUSIONS

Idiopathic DU should be considered in children presenting with urinary incontinence and/or voiding difficulties with a normal-large capacity, incompletely emptying bladder.

CAN NON-INVASIVE URODYNAMICS REPLACE VIDEO-URODYNAMICS IN BOYS WITH PUV?

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PURPOSE

Non-invasive urodynamics (NIU) is used as a first line test to assess bladder function prior to Videourodynamics (VUD) in boys with posterior urethral valve (PUV). Aim of the study was to compare NIU and VUD performed at 5 years of age to determine whether an invasive assessment is necessary at this time-point.

MATERIAL AND METHODS

We retrospectively reviewed the results of NIU and VUD performed at about 5 years of age in boys with PUV born between 2005 and 2009. Bladder capacity (BC), post void residual (PVR), detrusor over activity (DOA) and bladder compliance were compared. Patients with PVR less than 10% of BC at NIU were considered normal.

RESULTS

Seventy-one patients were identified. Thirty-five boys had both NIU and VUD and were included in the analysis. Median age at NIU and VUD was 58 months (range 38-71) and 61 months (range 44-92), respectively ($p=0.06$). Mean BC at NIU was 204.8 ml (range 87-356) and at VUD was 223.8 ml (range 59-520) Pearson $r=0.459$ ($p=0.006$). Mean PVR at NIU was 56.48 ml (range 0-319) and at VUD was 45.77 ml (range 0-350) Pearson $r=0.517$ ($p=0.03$). Fourteen patients (36%); had a PVR less than 10% at NIU: in these boys VUD showed DOA greater than 15 cmH₂O in 8/14 (58%), median 42.5 cmH₂O (15-88); vesico-ureteric reflux was identified in 3/14 (22%) and median bladder compliance was 11.5 ml/cmH₂O (range 1-76).

CONCLUSIONS

There is good concordance of NIU and VUD for BC and PVR, but by themselves NIU may miss important data such as presence of DOA, VUR and diminished compliance.

DUAL THERAPY FOR REFRACTORY OVERACTIVE BLADDER IN CHILDREN: A PROSPECTIVE OPEN-LABEL STUDY.

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PURPOSE

To optimize pharmacotherapy in children who failed anticholinergic monotherapy by simultaneous administration of one anticholinergic and mirabegron, a Beta3-adrenergic agonist.

MATERIAL AND METHODS

Patients without symptoms improvement under intensive behavioural and medical therapies and/or significant S/E on antimuscarinic dose escalation were recruited. A prospective off-label study using add-on adjusted-dose regimens of Mirabegron (25 to 50mg) was conducted with paediatric patients presenting refractory OAB. Efficacy and tolerability were assessed by: voiding diaries, post-void residuals, urine cultures, EKG, vital signs and UDS if judged necessary. Families were also questioned for continence, S/E, compliance, and patient perception of bladder condition (PPBC) questionnaire.

RESULTS

Twenty-six patients (5 girls, 21 boys) with OAB were recruited. Mean age at initiation of the second medication was 10.6 ± 3.3 years and patients were on the add-on Mirabegron for a mean of 7.6 ± 4.3 months (minimum 3 months). Mean bladder capacity improved from 170 ± 77 mL to 237 ± 99 mL. So far, continence improved in all patients but 3, with 6 being completely dry. Post-void residual was increased to 50ml for one patient and no UTI was reported. Mean PPBC improved from 4.4 to 2.2. Four patients reported new mild or moderate S/E: rhinitis, abdominal cramps, constipation and nausea. Three patients withdrew from the protocol because of lack of efficacy and/or S/E. EKG and vitals signs remained normal.

CONCLUSIONS

Mirabegron, the first Beta3-agonist used for the treatment of OAB, can effectively improve symptoms in children with refractory overactive bladder. The dual therapy (antimuscarinic-Mirabegron) was well tolerated and adjusted-dose regimen appeared safe in this first pediatric study.

COMPLIANCE TO ANTIMUSCARINICS IN CHILDREN WITH OVERACTIVE BLADDER

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1) *CHU de Québec-Université Laval, Surgery, Québec, CANADA* - 2) *CHU de Québec-Université Laval, Pediatrics, Québec, CANADA*

PURPOSE

Overactive bladder (OAB) is a common disorder characterized by urinary urgency symptoms ± urinary incontinence. Symptoms are treated with long-term antimuscarinic medication. Persistence and compliance rates in adults are low but too little data exists for the paediatric population. Non-compliance can lead to unnecessary escalation of therapy. The objective of this study was to report on the compliance in children treated for OAB with antimuscarinics.

MATERIAL AND METHODS

Patients presenting OAB (0-18 years old) were recruited at their control visit with a pediatric urologist. After obtaining consent, we contacted their drugstore enquiring about prescription renewals since beginning of treatment. The medication possession rate (MPR), (No. days dispensed/No. days between two refills) was calculated and grouped by 3-month periods. A good compliance was established as a MPR ≥80% every 3-month period and compared to the compliance reported on a questionnaire.

RESULTS

Seventy-one patients were recruited (mean age: 9.7±2.8 years). They have used the antimuscarinic medication for a mean of 20±17 months (2565 prescription periods). If we group the periods by 3, 6 or 12 months, a MPR ≥80% was found in 50.7%, 63.4% and 74.6% of patients respectively. No difference in compliance was found between different antimuscarinic medications. Patients/parents over-estimated their rate of compliance by 5-10% when compared to the MPR pharmacy reality.

CONCLUSIONS

Medication compliance is also an important problem in the pediatric population suffering from overactive bladder but seemed significantly better in our cohort. It has to be addressed and considered in the follow-up of pediatric patients.

PERSISTENCE AND PATTERNS OF ANTICHOLINERGIC THERAPY IN PEDIATRIC

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PURPOSE

Overactive bladder symptoms (OAB) are complex and generally require long-term therapy. Despite the impact of these symptoms on patients' well-being, persistence rates of antimuscarinics have been shown to be low in adults, but have never been studied in children. Better understanding of treatment patterns of children on antimuscarinics could help improve the quality of drug management and outcomes. Our objective was to evaluate treatment patterns of patients <18years of age on antimuscarinic therapy over a 4-year period.

MATERIAL AND METHODS

Pediatric patients receiving a first antimuscarinic prescription between April 2007 and March 2008 were identified using IMS Brogan's Public and Private Drug Plans Database and were analyzed retrospectively. Patients were followed for 4 years to assess: prescribed drugs, lines of treatment and the average duration on each treatment.

RESULTS

Data were available for 374 patients. The most prescribed drugs as first line were Oxybutynin (326) and Tolterodine (33). Patients refilled their index prescriptions for an average of 429 days. Solifenacin had the highest mean duration (765 days) followed by Oxybutynin and Tolterodine. During the 4-year follow-up, 324 patients (86,6%) only had one line of therapy. At the end of follow-up, 44 patients (11,8%) still persisted on therapy.

CONCLUSIONS

Discontinuation rate of antimuscarinic therapy in children (88% at 4 years) seems comparable to reported rates in adult OAB (65-89% at 12 months). However, children seem to persist on medication for a longer duration before adherence start declining. The low rate of persistence highlights the importance of identifying alternatives to antimuscarinics.

TROSPIUM: A USEFUL ALTERNATIVE ANTICHOLINERGIC IN CHILDREN WITH EMOTIONAL BEHAVIOURAL DISORDERS

Anne WRIGHT and Jo CLOTHIER
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PURPOSE

Anticholinergic (AC) medications used to treat OAB in children have well-known central nervous system (CNS) adverse effects (AE) and there have been recent concerns regarding long-term CNS effects. Trospium does not cross the blood-brain barrier and is a useful alternative.

MATERIAL AND METHODS

Descriptive, retrospective chart review of children treated for overactive bladder (OAB) with Trospium in our institution.

RESULTS

Thirteen children (median age 7years/4-16, 7M/6F) diagnosed with OAB were commenced on trospium 20mg twice daily to aid symptom control. 8 of the patients had failed treatment with tolterodine/oxybutynin due to CNS adverse effects including irritability, anxiety and anger issues and of these 4 had no history of emotional, behavioural disorder (EBD). Five patients with EBD were commenced on trospium as initial treatment. Only one patient experienced CNS side effects (no history and similar AE on modified release oxybutynin). Of 9 patients with diagnosed EBD, none experienced exacerbation of EBD symptoms and in one behavioural symptoms improved. With regards to OAB symptoms 4 patients had no response (<50% effect), 7 had partial response (50-99%) and 2 had complete response (100%). 9 patients had no AE, 3 had gastrointestinal AE and 1 had dry mouth.

CONCLUSIONS

Trospium is a useful alternative for children with OAB and a history of EBD, or CNS adverse effects on first line anticholinergic medications.

LONG TERM OUTCOME OF RENAL AND VOIDING FUNCTION OF PATIENTS WITH POSTERIOR URETHRAL VALVE WHO UNDERWENT SURGICAL INTERVENTION.

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2) Dong-A University Medical Center, Seoul, KOREA (REPUBLIC OF)

PURPOSE

We investigated differences in long-term renal and voiding function according to the surgery performed during the prenatal and neonatal period.

MATERIAL AND METHODS

We retrospectively analyzed 28 patients treated for posterior urethral valves. We classified patients according to whether fetal intervention was performed and the primary surgical treatment, namely, primary valve excision or vesicostomy. Renal function was assessed by determining the serum creatinine concentration. Decreased bladder capacity was defined as maximum bladder capacity lower than 65% of the age-related calculated bladder capacity.

RESULTS

The mean gestational age at birth was 34.2 (28–40) weeks and the median follow-up period was 50 (4–214) months. In total, 12 out of 28 patients (42%) underwent fetal intervention. Patients who underwent fetal intervention had significantly higher serum creatinine concentrations than patients who did not (2.04 ± 1.51 mg/L vs. 1.17 ± 0.76 mg/L, $p = 0.046$). Patients who underwent vesicostomy had higher preoperative serum creatinine concentrations than patients who underwent endoscopic resection (2.08 ± 1.34 mg/L vs. 0.86 ± 0.71 mg/L, $p = 0.014$); however, postoperative serum creatinine concentrations, which were measured at the final follow-up, did not significantly differ between these two groups of patients (0.9 ± 1.4 mg/L vs. 0.3 ± 0.1 mg/L, $p = 0.252$). Five patients (50%) in the fetal intervention group, three patients (21%) in the non-treatment group, four patients (33%) in the vesicostomy group, and three patients (27%) in the primary endoscopic valve excision group had decreased bladder capacity. All patients were able to void freely, with the exception of one patient (4%) who underwent dialysis and one patient (4%) who required self-catheterization.

CONCLUSIONS

Neither fetal intervention nor vesicostomy decreased renal function and bladder capacity in long-term follow-up.

ICCS S5: NEUROPATHIC BLADDER

Moderators: Mario de Genarro (Italy) & Eliane Fonseca (Brazil)

ICCS Meeting on Friday 16, October 2015, 13:20 - 14:15

13:20 - 13:26

ICCS S5-1 (LO)

A MOUSE MODEL OF OCHOA SYNDROME WITH DYSFUNCTIONAL URINATION

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PURPOSE

Genetic basis of urinary incontinence is poorly defined. Ochoa syndrome is a rare autosomal recessive disorder with severe dysfunctional urination including megacystis, incontinence and urinary tract infection. Two candidate genes, Hpse2 and Lrig2, have been reported but the causative role is yet to be established.

MATERIAL AND METHODS

We have generated Hpse2 and Lrig2 mouse mutants. Potential urinary tract defects were evaluated at gross, histological, molecular and physiological levels. For example, immunohistochemical analyses of phospho-histone H3, smooth muscle actin and uroplakin were used to evaluate cell proliferation and differentiation defects. Voiding behavior was examined by voided stain on paper and cystometrograms assays.

RESULTS

Deletion of Hpse2 but not Lrig2 causes megacystis and abnormal voiding behavior. While Hpse2 is largely dispensable for development, the mutants have decreased levels of cell proliferation. Excessive amount of fibrotic bladder tissue was observed, which correlates well with the elevated Tgf β signaling. Hpse2 mutants leak constantly and have a significantly higher resting intravesical pressure and maximum intravesical pressure. Comprehensive blood chemistry and urinalysis demonstrate renal dysfunction of Hpse2 mutants.

CONCLUSIONS

We have established the first mouse genetic model, Hpse2 mutation, of Ochoa syndrome with dysfunction urination. Hpse2 but not Lrig2 is most likely a causative gene of Ochoa syndrome. Future characterization of Hpse2 gene functions would shed new insight onto the pathogenesis of dysfunctional urination including UI.

URODYNAMIC DIFFERENCES OF JARCHO-LEVIN SYNDROME FROM ISOLATED SPINA BIFIDA APERTA

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PURPOSE

Jarcho-Levin Syndrome (JLS) is a congenital developmental defect associated with costovertebral malformations, spina bifida and multisystemic anomalies and overall accepted as a severe form of spina bifida. The aim of this study was to delineate the urological properties in this rare clinical entity.

MATERIAL AND METHODS

The data of spina bifida patients were reviewed retrospectively. Those patients who had the diagnosis of JLS with radiological evaluation and randomly selected isolated spina bifida aperta (SBA) patients were included. The urodynamic results were evaluated. Numeric values were evaluated with one way ANOVA test and nominal values were assessed with chi-square test.

RESULTS

The data of 780 patients in our center were evaluated. There were 35 JLS patients, 23 girls and 12 boys and 50 isolated SBA patients. The mean age of JLS patients were $67,6 \pm 5,8$ months and SBA patients $15,7 \pm 25,6$ months, respectively. There were no difference in terms of leak point pressures, postvoid residual urine, bladder capacity, compliance and gender. However, detrusor activity was reduced in 16% of SBA patients and 25% of JLS patients ($p=0,016$) and detrusor sphincter dyssynergia (DSD) was observed in all JLS patients whereas 84% of SBA patients ($p=0,01$).

CONCLUSIONS

JLS is an anomaly mostly seen in girls. This disease has clinical significance due to more detrusor underactivity and DSD which may denote a more severe neurourological condition. This presented JLS case series is the largest series in the literature. Recognition of urological problems in these patients may enable proper clinical evaluation.

URODYNAMIC DIFFERENCES BETWEEN HIGH PRESSURE VERSUS LOW PRESSURE DETRUSOR OVERACTIVITY IN PATIENTS WITH SPINA BIFIDA

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PURPOSE

The aim of the study is to delineate the differences between high pressure and low pressure detrusor overactivity in patients with spina bifida.

MATERIAL AND METHODS

Patients for whom urodynamic study was done with the diagnosis of spina bifida were studied. No patients had anticholinergic treatment during the studies. Age of the patients, gender, bladder capacity, leak point pressures (LPP), postvoiding residual urine and compliance were questioned. Patients were divided into two groups; Group 1, patients with detrusor overactivity with LPP over 60 cmH₂O and Group 2, pressures below 60 cmH₂O. Numeric values were analysed with independent samples t test and nominal values with chi-square test.

RESULTS

A total of 519 urodynamic studies were evaluated. For 275 patients, urodynamic study was done for spina bifida. Only patients who had detrusor overactivity were selected. There were 61 patients in Group 1 and 17 patients in Group 2. Mean age of the patients in Group 1 was 6.65±6.24 months vs. 6.52±3.55 months in Group 2. Gender difference was insignificant. Bladder capacities in Group 1 was 31±16.4 ml vs. 41.4±25 ml in Group 2 (p=0,046). LPP in Group 1 was 118.3±35 cmH₂O vs. 48.2±12.3 cmH₂O in Group 2 (p=0,002). Mean residual urine was 9±12.3 ml in Group 1 whereas 19.5±25.1 ml in Group 2 (p=0,016). Bladder compliance was more reduced in Group 2 (p=0,0001).

CONCLUSIONS

Bladder capacities of those patients with high LPP are more reduced due to increased contractility. They also have less residual urine secondary to high pressures. Increased frequency of low compliance in low pressure patients may be due to decreased detrusor contractility as a sign of a more severe condition. Delineation of these urodynamic differences may help for a better understanding of neuropathic bladder dysfunction in patients with spina bifida.

PREOPERATIVE AND POSTOPERATIVE URODYNAMIC DIFFERENCES OF CHILDREN WITH SPINA BIFIDA APERTA

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PURPOSE

Neurological injury starts from antenatal period in spina bifida. After postnatal repair, patients are followed up neurourologically. The aim of this retrospective study was to compare the preoperative and postoperative urodynamic results to predict the outcome in these patients.

MATERIAL AND METHODS

The urodynamic reports of patients with the diagnosis of spina bifida aperta (SBA) were evaluated. Only the reports before the closure of the defect were included in the study. The postoperative patients were randomly selected and their urodynamic results were noted. Age, sex, postvoid residual urine, leak point pressures, capacity, compliance, detrusor and sphincter activities were noted. One way ANOVA test for comparison of numeric values and chi-square test for nominal values were used.

RESULTS

Among a total of 780 patients, 24 newborns with SBA and 50 postoperative cases were selected, randomly. Preoperative evaluation was done at a mean age of $2,4 \pm 3,4$ days. The measured bladder capacity was significantly assessed as low in newborn SBA patients ($p=0,015$). The bladder compliance was found to be significantly lower in postoperative group ($15,7 \pm 25,6$ months of age) ($p=0,05$). Detrusor overactivity is marked in preoperative group ($p=0,036$) but sphincter dyssynergia was equally common in both groups. There was no significant difference in terms of postvoid residual urine and leak point pressures in both groups.

CONCLUSIONS

Neuropathic bladder dysfunction is a congenital injury in SBA patients. Preoperatively the patients are born more prone to detrusor overactivity and decreased capacity. This overactivity and bladder compliance decreases with age. The delineation of the course of the disease may give the opportunity for proper neurourological follow up.

THE RELATIONSHIP BETWEEN SPINA BIFIDA OCCULTA AND THE TREATMENT OF PRIMARY NOCTURNAL ENURESIS

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PURPOSE

To investigate the relationship between the spina bifida occulta (SBO) and the response to treatment of PNE.

MATERIAL AND METHODS

The diagnosis and treatment records of 163 children with PNE and arousal dysfunction were reviewed. Children with UTI and other organic urological diseases were excluded. Bladder diary was routinely recorded before the start of PNE treatment. The functional bladder capacity (FBC) data was collected from bladder diary. The children with SBO were confirmed by X ray. All patients were divided into two groups: SBO groups and non-SBO groups. They were given the same treatment programs. The frequency of enuretic episodes per week was recorded. The follow-up was carried out once a month for at least half a year. Chi-square test was used for data analysis, and $P < 0.05$ was considered to be statistical significant.

RESULTS

SBO was detected in 122 children (74.8%)(9.8 ± 2.3 years). There was no significance between the two groups in age, the frequency of enuretic episodes and the FBC ($P > 0.05$) before treatment. There was a significant difference between the two groups in the increment of FBC after treatment ($P < 0.05$). In the SBO group, 20.5% patients showed a complete response, 20.5% showed a response, 27.9% showed a partial response and 31.1% showed no response, and the corresponding incidence of non-SBO groups is 48.8%, 24.4%, 22.0% and 4.8%, respectively. There was a significant difference between the two groups in terms of outcome ($P < 0.001$), with a complete response more likely in children without SBO ($P < 0.001$).

CONCLUSIONS

The response of treatment is better in PNE children without SBO than with SBO.

PROSPECTIVE EVALUATION OF PERISTEEN® ENEMA SYSTEM WITH THE VALIDATED NEUROGENIC BOWEL DYSFUNCTION SCORE SHEET IN THE PEDIATRIC POPULATION

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INTRODUCTION

Poor neurogenic bowel (NBo) control leads to emotional, physical, and psychological distress. Adequate assessment of bowel programs' in decreasing symptoms of NBo is vital for accurate treatment. Our objective was to determine the ability of Peristeen® enema to reduce symptoms of NBo in patients using the only validated NBo dysfunction scoring system for the pediatric population.

MATERIAL AND METHODS

Patients 6-18 years with NBo whose current bowel program was unsuccessful were given the Neurogenic Bowel Dysfunction (NGBD) score sheet before initiating Peristeen®, and again at 2 weeks (n=24), 2 months (n=9) and 6 months (n=12) after initiation. All patients were started on Peristeen® with tap water calculated to 20ml/kg per daily irrigation. Mean and paired t-tests were completed comparing NGBD scores.

RESULTS

The mean NGBD score at initiation was 20.30 (SD+/-5.66). At 2-week after use the mean score was 12.78 (SD+/-4.49), with a mean decrease of 7.52 points (SD+/- 5.77, 95%CI 5.02-10.02), $t(23)=6.255, p<0.008$. Paired t-test comparing the NGBD score at initiation to at the 2-month follow-up revealed $t(8)=2.83, p=0.022$ with a mean decrease of 7.67 points (SD+/- 3.89). At six-months the mean NGBD score was 8.81 (SD+/- 2.40) with a paired t-test of $t(11)=5.28, p<0.008$.

CONCLUSIONS

Use of the Peristeen® enema shows a significant reduction in NGBD scores. A steady decrease in the NGBD score was found in those who used the device for 6 months. The Peristeen® enema system should be considered when conservative bowel management techniques are unsuccessful in children with NBo.

EFICACY OF INTRADETRUSOR INJECTION OF ONABOTULINUMTOXIN A IN PEDIATRIC POPULATION

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PURPOSE

The aim of the study is to evaluate the efficacy of onabotulinumtoxinA for the treatment of neurogenic and idiopathic overactive bladder resistant to medical treatment in pediatric population.

MATERIAL AND METHODS

We retrospectively reviewed the clinical records of 20 pediatric patients diagnosed of neurogenic and idiopathic overactive bladder by urodynamic test resistant to antimuscarinics and treated with intradetrusor injection of onabotulinumtoxinA (100-300UI). Demographics, response duration, subjective and urodynamic efficacy were assessed at two and twelve months after surgery.

RESULTS

20 patients were reviewed, with a median age of 11 years (6-18 years). 67% had neurogenic overactive bladder and 33% idiopathic. 53% performed clean intermittent catheterization (CIC) before treatment. All patients referred clinical improvement of symptoms after the first onabotulinumtoxinA injection, 46.7% were completely dry. In patients with idiopathic overactive bladder 80% were dry and 20% had urine leakage. In neurogenic patients 40% were dry and 60% persisted with incontinence. 6 patients required a second injection and one patient a third one. The median time for a second or third injection was of 419 days (203-784). The urodynamic test revealed an upgrade on the bladder capacity of a median of 52 cc and a median reduction of the peak detrusor pressure of 27,9 cm de H₂O, median bladder compliance was upgraded in 9,4 ml/cm H₂O. Only one patient had acute urinary retention that required CIC for a month.

CONCLUSIONS

Treatment of neurogenic and idiopathic overactive bladder with onabotulinumtoxin A was effective and safe improving children's quality of life ameliorating urodynamic parameters

PREOPERATIVE AND POSTOPERATIVE URODYNAMIC OUTCOME OF TETHERED CORD SYNDROME IN CHILDREN

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PURPOSE

Tethered cord syndrome (TCS) should be treated in children to avoid motor dysfunction in lower extremities and neurourological disabilities. The aim of this study was to evaluate the urodynamic outcome of children with TCS before and after cord release operation.

MATERIAL AND METHODS

Urodynamic reports of all patients with neuropathic bladder dysfunction with TCS were evaluated, retrospectively. Urodynamic studies were done before and 3 months after tethered cord release in these patients. Patients who had both preoperative and postoperative test results were enrolled. Age, gender, postvoid residual urine, leak point/voiding pressures, bladder capacities, detrusor and sphincter activities were noted. Numeric data were evaluated using Wilcoxon signed ranks test and nominal values with chi square test.

RESULTS

Among a total of 511 urodynamic studies for neuropathic bladder dysfunction, 200 of them that were done for tethered cord syndrome were evaluated. There were 141 studies for preoperative patients and 59 for postoperative cases. Only 22 patients met the inclusion criteria for whom preoperative and postoperative studies were completed in our institution. There were 16 females and 6 males with a mean age of $17,8 \pm 28$ months. Postvoid residual urine increased from $10,5 \pm 30,4$ ml preoperatively to $15,2 \pm 33,4$ ml postoperatively ($p=0,058$). Bladder capacities increased from $62,6 \pm 77,5$ ml preoperatively to $86,50 \pm 81,3$ ml postoperatively ($p=0,024$). Detrusor activity improved in 8 of 22 patients (36%) and remained unchanged in the rest. All other comparisons were found to be statistically insignificant.

CONCLUSIONS

When done with correct timing tethered cord release may improve bladder function. Although the interpretation of detrusor activity may not change, it significantly increases bladder capacity and postvoid residual urine which indicates the relaxation of detrusor in general. Urodynamic studies should be used for indication and follow-up of these children.

URINARY INCONTINENCE AND LOWER URINARY TRACT SYMPTOMS IN CHILDREN WITH CEREBRAL PALSY: A SYSTEMATIC REVIEW

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PURPOSE

The purpose of this review is to investigate studies concerning the influence of cerebral palsy (CP) on the development of bladder control. Prevalence of urinary incontinence in children with CP can underline the need for specific treatment.

MATERIAL AND METHODS

A systematic literature search was conducted in Pubmed, Web of Science and CINAHL using different keyword combinations. Once identified, trial quality was assessed, data were extracted and results were expressed. The systematic review was composed following the PRISMA statement guidelines (Liberati et al. BMJ 2009).

RESULTS

Prevalence of incontinence is more common in children with GMFCS-classification III-V and a low IQ. Motor and mental disability are therefore important factors influencing bladder control. Spasticity is more frequently associated with urinary incontinence. Concerning localization of motor disability, children with quadriplegic CP show a higher incidence of urinary incontinence.

CONCLUSIONS

Urinary incontinence is significantly more common in children with CP in comparison with healthy children. This incidence indicates the need for individually designed treatment.

TRANSDERMAL OXYBUTYNIN NEOXY® TAPE 73.5 MG SURPASSES ORAL OXYBUTYNIN HYDROCHLORIDE FOR CHILDREN WITH NEUROGENIC DETRUSOR OVERACTIVITY.

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PURPOSE

It is important to pursue the ideal conservative treatment for neurogenic bladder dysfunction. Transdermal oxybutynin NEOXY® Tape 73.5 mg (NEOXY), which is applied daily and equivalent to oral oxybutynin hydrochloride (OXY) 6 mg, became available in Japan from 2013. NEOXY has the advantage of providing an effective blood concentration of OXY without constipation and dry mouth. We evaluated the efficacy and safety of NEOXY with or without overnight urinary drainage (OUD) in children with neurogenic detrusor overactivity.

MATERIAL AND METHODS

Anticholinergic drugs were changed to NEOXY in 14 children with neurogenic detrusor overactivity who required more than OXY 6 mg and additional intravesical OXY: median age 8.43 ± 3.55 (range, 4–15) years; 6 boys and 8 girls with spina bifida ($n = 11$), cerebral palsy ($n = 2$), and unknown ($n = 1$). OUD was instituted in 6 patients, while 1 patient received a vesicostomy. Five patients had reflux and renal scars. The reasons for changing anticholinergic drugs were: severe constipation ($n = 14$), intractable urinary tract infection (UTI) ($n = 6$), incontinence ($n = 5$), taking medication haphazardly (3), and dilation of the upper urinary tract ($n = 2$). A video urodynamic study (VUDS) was performed before and after changing anticholinergic drugs.

RESULTS

After a 10.3 ± 3.3 month follow-up, UTI, incontinence, and hydronephrosis were improved. No patient experienced a deterioration of constipation. Three patients ceased NEOXY therapy due to severe eruption within 1 month. At 3–8 months later, a VUDS showed that bladder capacity was unchanged (180 ± 33.2 to 200.8 ± 37.3 mL, $p = 0.28$) and bladder compliance was significantly improved (5.01 ± 0.84 to 6.14 ± 0.59 mL/cmH₂O, $p < 0.05$).

CONCLUSIONS

Transdermal oxybutynin NEOXY® Tape 73.5 mg is effective for the control of high intravesical pressure with minimal drawbacks for children with neurogenic detrusor overactivity.

ICCS S6: BBD - BLADDER AND BOWEL DYSFUNCTION

Moderators: Michal Maternik (Poland) & Charlotte Siggaard (Denmark)

ICCS Meeting on Friday 16, October 2015, 15:30 - 16:30

15:30 - 15:36
ICCS S6-1 (LO)

CENTRAL NERVOUS SYSTEM PROCESSING OF EMOTIONS IN CHILDREN WITH FECAL INCONTINENCE

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PURPOSE

Fecal incontinence (FI) and constipation are common disorders in childhood. The aim of the study was to analyse neurophysiologically the central processing of emotions in children with FI and constipation in comparison to healthy controls.

MATERIAL AND METHODS

30 children with FI and constipation (70% male, mean age=8.6 years) and 15 controls (66.7% male, mean age=9.2 years) were examined by a physical exam, sonography, the Child Behavior Checklist (CBCL), a psychiatric interview and intelligence test. Acoustic evoked potentials were recorded according to standardized methodology. For event-related potentials, 80 neutral, 40 positive, 40 negative pictures from the International Affective Picture System (IAPS) and 40 stool pictures were presented.

RESULTS

Compared to controls, children with FI and constipation had significantly more intense responses to negative pictures over the parietal and central regions at the time interval 650-850 ms. Children with FI and psychological comorbidity, as well as children with FI and urinary incontinence did not differ from children with FI only.

CONCLUSIONS

Children with FI and constipation have increased responses only in the processing of negative emotions. Additional psychological comorbidity or urinary incontinence does not affect the processing of emotions in children with FI and constipation.

NON INVASIVE EVALUATION OF CHILDREN WITH BOWEL BLADDER DYSFUNCTION

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PURPOSE

Children with Lower Urinary Tract Symptoms (LUTS) are widely represented in a school age population (15-20%). More than 50% of children with LUTS are affected with Functional Constipation (Bowel Bladder Dysfunction, BBD). The aim was to investigate with non invasive integrated urodynamic studies (according to ICCS), the voiding parameters in children with BBD, following non invasive urodynamic method and Rome III criteria.

MATERIAL AND METHODS

This study included 25 patients with BBD (16 male and 9 female, mean age: 8.28 years). All these patients received a non-invasive integrated study, compilation of frequency/volume chart and gastroenterologic approach with Bristol stool form scale (BSC), completed from uroflowmetry with ultrasound study of bladder with maximum cystometric capacity (MCC), post-void residual urine volume (PVR) and rectal diameter (DR). We also described the presence of eventual dilated ureters. The uroflowmetry with US evaluation was performed two times for each patient.

RESULTS

17/25 (68%) patients had constipation (BSC score <3), among them:
- 10 (59%) had a bladder volume above normal for age,
- 4 (23.5%) had encopresis,
- 13 (76.5%) had DR >3 cm and MCC was 112% higher than expected (p=0.03),
- 2 (11.75%) had DR = 2,5-3 cm.

9/25 patients (36%) had detrusor-sphincter dyssynergia; among them 7 (77.7%) had a PVR >10%.
12/25 had a low BSC score (≤ 2); among them, 8 (66.6%) had abnormal voiding frequency (<4/24h, p=0.024).
10/25 patients (40%) had recurrent urinary tract infections and 40% of them had dilatation of the upper urinary tract (p=0,017).

CONCLUSIONS

We obtain a significant correlation between patients with DR >3 cm and patients with abnormal MCC. Low voiding frequency and constipation are strongly correlated (p=0.024). This non invasive urodynamic integrated approach is inexpensive, sensitive, well accepted and could better explain in future the etiology and physiopathology of BBD.

BLADDER AND BOWEL TRAINING - A PROSPECTIVE EVALUATION OF AN UROTHERAPEUTIC TRAINING PROGRAM

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PURPOSE

A manualized bladder and bowel training program was developed for children with therapy-resistant incontinence. The effectiveness was evaluated in a prospective design, including a follow-up assessment. The program comprises information about anatomy, pathophysiology, nutrition, drinking, stress and emotion regulation and was performed in groups (2-6 children in 7-9 weekly sessions) or individually (3 sessions).

MATERIAL AND METHODS

Preliminary data of 33 children with therapy-resistance (mean age 8.8 years; 23 boys) are presented. 14 children received group and 19 individual therapy. Incontinence frequency, treatment success (complete response: 100% reduction of symptoms; partial response: 50-99% reduction), as well as psychological symptoms (Child Behavior Checklist (CBCL)) were assessed before and after the treatment, as well as 6 months later.

RESULTS

Frequencies of daytime urinary incontinence (DUI) were significantly reduced from 4.4 wetting episodes/week (before training) to 3.7 (after training) to 1.8 (6 months after training). Frequencies of fecal incontinence (FI) did not decrease significantly (2.3 soiling episodes/week to 2.1 to 2.4). 50% of children with DUI and 23.1% of children with FI had a complete response at follow-up. Reduction of soiling and complete response in FI were higher in the group than in the individual training. Total, internalizing and externalizing psychological symptoms also decreased significantly.

CONCLUSIONS

This training program is an effective treatment for children with therapy-resistant incontinence, especially DUI. Symptoms still improved 6 months after training. Additionally, the training program is helpful to reduce psychological symptoms.

PREDICTING STOMAL COMPLICATIONS IN PEDIATRIC MALONE ANTEGRADE CONTINENCE ENEMA (MACE) PATIENTS

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PURPOSE

When conservative treatments for chronic constipation fail, the Malone antegrade continence enema (MACE) is an effective alternative surgical option. This study aims to identify surgical risk factors for complications of the MACE procedure in children.

MATERIAL AND METHODS

We retrospectively reviewed patient charts from 97 pediatric MACE patients at four hospitals. Data collected included: age, weight status (obese vs non-obese), open vs. laparoscopic surgery, stomal location, use of a permanent stomal button. Complications including stomal stenosis, leakage, and infection were analyzed. Two groups were compared. One group had a permanent Mic-key button placed across the repair. The other group did not. 72 of 74 surgeries without button use utilized traditional imbrication sutures. None of the 23 surgeries involving button use did.

RESULTS

Twenty two patients (23.7%) developed stomal stenosis and twenty seven patients (27.8%) experienced stomal leakage. The placement of a stomal button resulted in: 24.8% greater chance of complication ($p=.026$); 31.9% greater rate of stomal leakage ($p=.003$); 16% greater rate of stomal site infection ($p=.011$) and a 25.4% lower rate of stomal stenosis ($p=.012$). In patients without button placement, 32.35% of patients with umbilical stomas experienced stomal leakage, versus 9.09% of patients with RLQ stomas ($p=.019$).

CONCLUSIONS

The use of a permanent stomal button across a MACE repair decreases the risk of stomal stenosis but significantly increases the risk of fecal leakage and infection. The use of imbrication sutures may reduce these risks. While an umbilical stoma is more cosmetically appealing, it is associated with an increased risk of stool leakage.

INCONTINENCE IN PERSONS WITH DOWN SYNDROME

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PURPOSE

Down Syndrome (DS), characterized by typical facial features and a physical growth delay, is caused by the presence of partial or complete triplication (trisomy) of chromosome 21. It is the most common genetic cause for intellectual disability, which is in the mild and moderate range. The aim of this study was to assess the rates of incontinence and associated psychological problems in persons with DS.

MATERIAL AND METHODS

122 children (4-18 years) and 160 adults (18-51 years) with DS were recruited through a German parent support group (59.6% male, mean age 19.2 years). The Parental Questionnaire: Enuresis/Urinary Incontinence, the Incontinence Questionnaire-Pediatric Lower Urinary Tract Symptoms (ICIQ-CLUTS), as well as the Developmental Behavior Checklist for parents (DBC-P) or for adults (DBC-A) were filled out by parents or care-givers.

RESULTS

17.2% of the sample had nocturnal enuresis (NE), 15.9% had daytime urinary incontinence (DUI) and 14.2% had fecal incontinence (FI). Incontinence was present in 64.0% of young children (4-12 years), 10.3% of teens (13-17y), 12.8% of young adults (18-30y) and in 22.4% of older adults (>30y). 13.6% of children and 8.4% of adults had a DBC score in the clinical range. 19.5% of children and 27.8% of adults with incontinence had behavioral problems. There was a significant association between NE/DUI and clinical DBC score in adults.

CONCLUSIONS

Incontinence in DS is mainly present in young children, but adults are affected, as well. Behavioral comorbidity is associated with incontinence only in adults with DS. Screening and treatment of incontinence in children with DS is recommended.

INCONTINENCE IN PERSONS WITH ANGELMAN SYNDROME

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PURPOSE

Angelman Syndrome (AS) is a congenital syndrome caused by a microdeletion or uniparental disomy on chromosome 15q11-13 with a prevalence of 1:10-20,000. AS is characterized by impairments in intellectual, neurological and motor functioning, as well as psychological problems. Individuals with AS often have severe intellectual disability, ataxia, seizures, dysmorphic facies, an inability to speak and a happy, sociable disposition with inappropriate laughter. The aim of the study was to investigate the rate of incontinence and associated psychological problems in AS.

MATERIAL AND METHODS

90 children (4-18 years) and 54 adults (18-31 years) with AS were recruited through a parent support group (55.6% male, mean age 15.1 years). The Parental Questionnaire: Enuresis/Urinary Incontinence, the Incontinence Questionnaire-Pediatric Lower Urinary Tract Symptoms (ICIQ-CLUTS), as well as the Developmental Behavior Checklist for parents (DBC-P) or for adults (DBC-A) were filled out by parents or care-givers.

RESULTS

85.6% of individuals with AS were affected by at least one subtype of incontinence. 81% had nocturnal enuresis (NE), 61.4% daytime urinary incontinence (DUI) and 53.9% fecal incontinence (FI). The rate of incontinence declined in adults (74.0% vs. 95.3% in children). 50.6% of the children and 34.1% of adults had a clinically relevant DBC score. Incontinence was not associated with psychological symptoms.

CONCLUSIONS

Children with AS have high rates of incontinence, which decrease with age. Many adults are still affected by NE, DUI or even FI. Screening, assessment and treatment of incontinence in children with AS is recommended.

INCONTINENCE IN PERSONS WITH MOWAT-WILSON SYNDROME

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PURPOSE

Mowat-Wilson Syndrome (MWS) is a congenital syndrome caused by deletion or mutation of the ZEB2 gene on chromosome 2q22. MWS is characterized by a distinctive facial appearance, severe intellectual disability and other anomalies, i.e. seizures or congenital heart defects. Most individuals have a sociable demeanor, but one third show psychological problems. The aim of the study was to investigate incontinence and psychological problems in MWS.

MATERIAL AND METHODS

35 children (mean 10.5 years) and 8 adults (mean 24.8 years) with MWS were recruited through a worldwide MWS support group. The Parental Questionnaire: Enuresis/Urinary Incontinence, as well as the Developmental Behavior Checklist (DBC) were completed by parents or care-givers.

RESULTS

97.5% of persons with MWS were affected by at least one subtype of incontinence. 72.5% had nocturnal enuresis (NE), 74.4% daytime urinary incontinence (DUI) and 82.1% fecal incontinence (FI). Incontinence was still high in adults (100% vs. 97% in children). 38.2% of the children and 37.5% of adults reached a clinically relevant DBC score. The majority was affected by physical disabilities: seizures (86%), congenital heart defects (44.2%), Hirschsprung disease (39.5%) and anomalies of the urogenital tract (39.5%).

CONCLUSIONS

Incontinence rates in children and adults with MWS are high. All had physical disabilities including anomalies of the urogenital tract, so that both functional and organic incontinence could be present. About 40% of persons with MWS were affected by psychological problems. Due to the high prevalence rates, a screening for organic and functional incontinence and psychological problems in persons with MWS is recommended.

INCONTINENCE IN BOYS WITH FRAGILE-X-SYNDROME

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PURPOSE

Fragile-X-Syndrome (FXS) is caused by a mutation on the X-chromosome (Xq27.3). Male persons with a full mutation have typical dysmorphic signs, moderate intellectual disability and psychological problems (ADHD, autism, anxiety). 20-40% are affected by incontinence. The aim of the study was to clinically assess and diagnose subtypes of incontinence and psychological problems in children with FXS in their home environments.

MATERIAL AND METHODS

In 22 boys with FXS (mean age 11.0 years) and 22 healthy controls (mean age 11.1 years), sonography (rectum, bladder), uroflowmetry, 48-h-bladder diary, physical examination, IQ test, parental psychiatric interview and questionnaires regarding incontinence and psychological symptoms (CBCL) were performed in a home setting.

RESULTS

Boys with FXS had higher rates of incontinence than controls: nocturnal enuresis (NE) 45.5% vs. 4.5%, daytime urinary incontinence (DUI) 36.4% vs. 0%, fecal incontinence (FI) 31.8% vs. 0%. The most common subtypes in FXS boys were primary non-monosymptomatic NE (n=8), urge incontinence (n=3) and non-retentive FI (n=7). 90.9% boys with FXS had a psychological comorbidity, e.g. ADHD, anxiety, obsessive-compulsive and tic disorders. Incontinence and behavioral symptoms were not associated.

CONCLUSIONS

Boys with FXS have a higher risk for physical disabilities, psychological disorders and incontinence than healthy boys. Constipation does not seem to be a major problem in FXS. As effective treatment is available for children with ID, we recommend offering assessment and therapy to all children with FXS and incontinence or psychological symptoms.

THE GASTROCOLIC REFLEX IN HEALTHY CHILDREN DURING TOILET TRAINING: AN OBSERVATIONAL STUDY

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INTRODUCTION

Peristaltic movements in the colon will lead to filling of the rectum and a defecation urge. This gastro-colic reflex can be suppressed by contracting the pelvic floor muscles, but retaining stool could lead to stool problems. During toilet training, children are more responsive to develop functional constipation.

Our aim was to investigate whether and when the gastro colic reflex occurs in healthy toddlers during toilet training.

MATERIAL AND METHODS

Forty children, aged 18 to 27 months, were enrolled during the toilet training process. Prior to the observation, parents filled in a questionnaire on stool problems, toilet training behaviors and an observational list of meals and bowel movements.

Children were observed to evaluate the stool frequency and characteristics, such as color and consistency.

RESULTS

We found that 51% of all toddlers make stool within the first 40 minutes after a meal. 25% defecates more than 90 minutes after a meal and 18% 30 to 40 minutes after the meal. Parents report an average frequency of defecation of 1,4 times per day. 59% of the toddlers defecate after having breakfast and 54% after lunch.

Stool consistency type 4 and 6 occurred the most. 35% of the parents reported characteristics of stool problems. Children not eating regularly high fibre food all showed characteristics of bowel problems.

10% of the children hid while defecating. 13% of the children performed several movements to withhold their stool, like sitting down and squatting, running around and the potty dance.

CONCLUSIONS

More research on this natural response of the bowel is strongly advised to investigate the clinical relevancy of the gastro-colic reflex when toilet training children and to provide practical guidelines for parents and health care workers to prevent constipation problems during toilet training.

ELIMINATION SIGNALS DURING MICTURITION OBSERVED IN HEALTHY CHILDREN NOT WEARING DIAPERS

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PURPOSE

Voiding in infants was assumed to be an automatic process which cannot be accelerated by toilet training. However, recently supra-spinal control was detected. To our knowledge, this is the first study that aims to list signals infants give while voiding.

MATERIAL AND METHODS

This pilot study observed 13 healthy children aged 18 months to 4 years in all-day child care centers, for elimination signals before, during and after two micturations when not wearing diapers. Two observers independently monitored behavior. Inter rater reliability of each elimination signal was determined by calculating Cohen's Kappa in SPSS 22.

RESULTS

The study resulted in a checklist of 6 elimination signals detectable promptly before and 3 during voiding in infants not wearing a diaper. The class of elimination signals before voiding consists of: a sitting voiding position, verbal indication of the need to void, stimulation of the perineal area, sudden interest in the potty, searching physical contact with a parent, the need to be alone. Similar elimination signals can be observed during voiding: change in voiding position, interruption of activity, a short change in facial expression. Inter-rater agreement varied from good (>0.6) to perfect.

CONCLUSIONS

The findings of this study provide insights in the elimination behavior during micturition of infants not wearing diapers. More research is required to determine the efficacy and clinical relevance of implementing these signals in toilet training. The aim is to formulate practical guidelines for people working in kindergartens and parents, to facilitate the process of toilet training.
