Moderated Poster Session IV: Pediatrics, Trauma & Infertility
Friday, October 28, 2011, 10:15 am – 12:00 pm

P60
Biofeedback Pelvic Muscle Retraining for the Treatment of Incontinence and UTI in Children with Dysfunctional Elimination Syndrome

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Background: Dysfunctional elimination syndrome is a behavioral condition in children associated with urine holding and constipation. It may cause urinary incontinence and infection which can greatly decrease a child's or family's quality of life. This study assesses whether or not pelvic muscle retraining using biofeedback improves urinary incontinence and UTI in children with dysfunctional elimination syndrome.

Methods: Retrospective review of all children ages 4 to 18 years old who presented to the Children's Hospital of Eastern Ontario (CHEO) with dysfunctional elimination syndrome and underwent biofeedback pelvic muscle retraining between 2005 and 2010. Primary outcomes were urinary incontinence and UTI. Biofeedback was performed by the urodynamics nurse.

Results: There was a total of 35 patients, 15 males, median age 9 yrs (IQ 1st 7; 3rd 10.5). Mean follow up 7.7 (4.3) months. Number of patients with urinary incontinence decreased after biofeedback from 54% (19/35) to 34% (12/35) ($p<0.0001$). The mean number of urinary accidents per week decreased from 7.1(SD8.2) to 3.9 (SD6.4) ($p<0.002$). Mean dysfunctional voiding symptom score improved from 9.5 (SD4.3) to 5.7 (SD4.1) pre and post biofeedback ($p<0.0001$). UTI and post-void residuals were not significantly different, 13 to 8 ($p=0.21$) and 69 (SD79) cc to 58 (SD70) cc ($p=0.35$) respectively. Number of patients with constipation decreased from 11 to 4 ($p=0.08$), but this was not significant.

Conclusions: In this retrospective analysis, biofeedback pelvic floor retraining improved incontinence in children with dysfunctional elimination syndrome. It did not, however, improved the occurrence of constipation, UTI, or decreased post-void residuals.

P61
Is Urodynamic Testing a Useful Tool in the Management of Infants with Cutaneous Stigmata of Spinal Dysraphism

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Background: Patients with spinal dysraphism and tethered spinal cord may present with a range of clinical symptoms including dysfunction of the lower limbs, bladder and bowel. Lumbar cutaneous stigmata in infants associated with spinal dysraphism and tethered cord often trigger evaluation including urodynamic testing. As these infants are usually asymptomatic, the indication for tethered cord release is heavily based on urodynamic testing, but the benefit of urodynamic testing in this population remains uncertain. We examined whether urodynamic testing is useful in this population by evaluating the association between abnormal urodynamics and tethered cord release.

Methods: Retrospective review of all infants with cutaneous stigmata of spinal dysraphism referred to the Children's Hospital of Eastern Ontario Urology clinic for urodynamic testing between the years 2000-2010. Baseline characteristics including urological, neurological, orthopedic, and gastrointestinal function were recorded. Urodynamic studies and neurosurgical interventions were reviewed. Patients were excluded if data was incomplete, no urodynamic testing occurred, or if they had non-spinal cord related neurological disease. Univariate analysis was performed assessing the predictive value of urodynamic testing and imaging studies for neurosurgical intervention.

Results: 153 patients were referred for urodynamic testing of which 123 met inclusion criteria for analysis. 91% (112/123) of the population consisted of non-toilet trained infants (median age 11 months 1st and 3rd IQ: 6.5, 15.5), with 46% male and 54% female. 19% (23/123) of patients had abnormal urodynamics, 85% had abnormal spinal MRI's, and 96% had abnormal spinal ultrasounds. 33% (40/121) of patients underwent surgery for tethered cord release. Univariate analysis revealed a significant association between abnormal urodynamics and neurosurgical intervention ($p = 0.003$). Abnormal spine MRI was also significantly associated with operative intervention ($p = 0.03$). Ultrasound of the spine ($p = 1.0$) was not associated with surgical intervention for tethered cord release.

Conclusion: Abnormal urodynamic studies in infants with cutaneous stigmata of spinal dysraphism are significantly associated with neurosurgical intervention for tethered cord release. Urodynamics are an important diagnostic modality aiding the neurosurgeon in the determination of the need for surgical intervention in this population. MRI spine seems to be the most useful imaging study in this context, and the role of spinal ultrasound should be questioned.

P62
Can Inhibin B Be Utilized as a Marker of Seminiferous Tubule Impairment in Children with Cryptorchidism?

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Background: Seminiferous tubule dysfunction resulting in infertility is a common complication of cryptorchidism. A direct hormonal bioassay of seminiferous tubule function would be useful in diagnosis and management of children with conditions that involve the testis. Inhibin B may be the best available endocrine parameter of spermatogenesis in men. Our objective was to examine the association between serum inhibin B levels and age, laterality and testicular position in children with cryptorchidism undergoing orchiopexy.

Methods: 200 children undergoing elective orchiopexy for cryptorchid testis/es were prospectively enrolled for analysis. Serum Inhibin B, FSH, LH, and testosterone levels were obtained at the time of orchiopexy. Inhibin B levels were quantitated by a double-antibody enzyme-linked immunosorbent assay from Serotec Ltd. (Oxford, UK). Results were stratified by age, unilateral or bilateral cryptorchidism, and testicular position

Results: Within the 13-36 (n=48) and 37-144 (n=42) month age groups, mean inhibin B levels were significantly higher in cryptorchid patients (155.1±10.3pg/ml vs. 101.4±9.3pg/ml; 113.6±9.2 vs. 54.2±4.2pg/ml; $p<0.001$). In cryptorchid children, there was a non-significant trend toward decreasing inhibin levels with increasing age. Within the 37-144 month age group, bilateral cryptorchidism was associated with a significant increase in inhibin B levels compared to normal testes ($p<0.001$; Fig. 1). We also observed a trend toward increased Inhibin B levels with higher testicle position (Fig. 2). No significant correlation between FSH and inhibin B was observed in the overall cohort of cryptorchid patients.

Conclusions: Cryptorchid children between 13-144 months of age and children with bilateral cryptorchidism had significantly higher levels of inhibin B. Long term follow-up will be required to determine whether

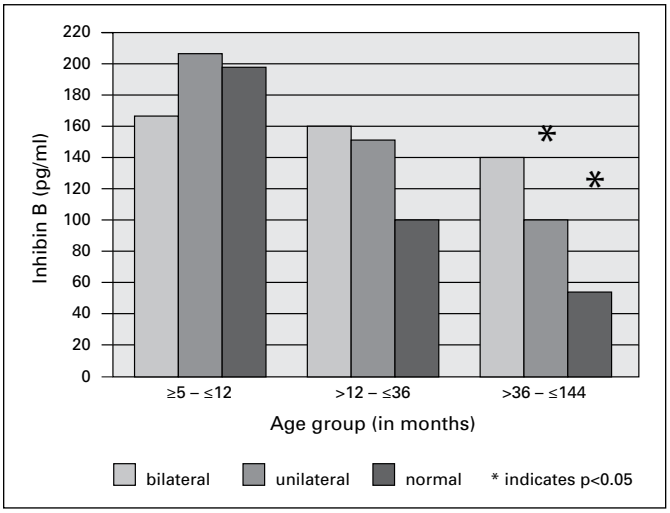

Fig. 1. P62. The effect of bilateral cryptorchidism on Inhibin B levels.

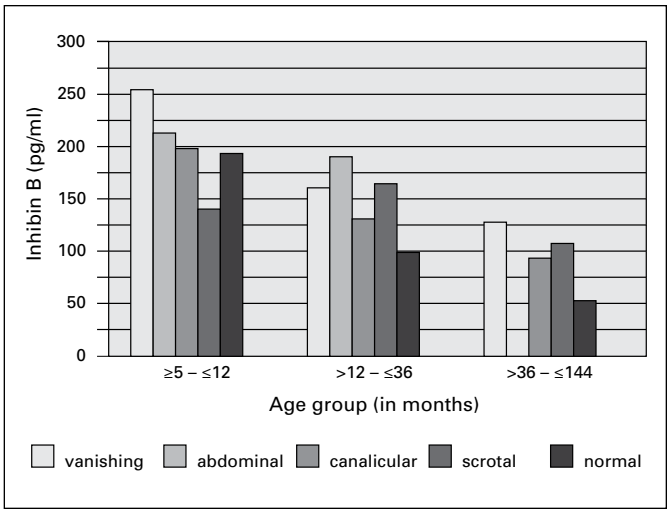

Fig. 2. P62. The effect of testicular position on Inhibin B levels.

inhibin B is diagnostic or predictive of seminiferous tubule dysfunction in children with cryptorchidism.

P63

Laparoscopic Pyeloplasty for Ureteropelvic Junction Obstruction in Infants

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Background: Laparoscopic and open pyeloplasty have demonstrated comparable efficacy for the treatment of ureteropelvic junction (UPJ) obstruction in pediatric patients. The role of laparoscopic pyeloplasty in infants is less well defined. We present our experience utilizing laparoscopic pyeloplasty in children younger than 1 year of age.

Methods: We retrospectively reviewed all infants undergoing transperitoneal laparoscopic pyeloplasty for the treatment of symptomatic and/or radiographic UPJ obstruction from May 2005 to January 2011 (n=26). Patients underwent follow up with renal ultrasound at regular intervals. Treatment failure was defined as inability to complete the intended procedure, persistent radiographic evidence of obstruction, and/or need for definitive adjunctive procedures.

Results: Mean patient age was 6.1 ± 2.7 months and follow up was available in all but four patients with a mean duration of 13.7 ± 10.4 months. Mean operative time was 241 ± 44 minutes. All cases were completed laparoscopically without complications. There were two minor postoperative complications reported, including ileus and superficial wound infection. Two patients had persistent symptomatic and/or radiographic evidence of obstruction; one required re-operative open pyeloplasty, and the other is being managed expectantly. The overall success rate was 90.5%.

Conclusions: Laparoscopic pyeloplasty in infants remains a technically challenging procedure limited to select centers. Our early experience reveals success rates comparable to other treatment modalities with minimal morbidity.

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Mast Cell Number Correlates with Fibrosis in Cryptorchid Testes

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Background: An undescended testis occurs in approximately 3% of boys. Testicular fibrosis is a marker for testicular damage and is associated with a decrease in germ cell number and increases with age at the time of orchidopexy. It is unclear what processes lead to tubular fibrosis in these testes. Mast Cell Numbers are higher in testis biopsies of infertile men and mast cells have been shown to activate fibroblasts and promote collagen synthesis. Their presence in cryptorchid testes is unknown.

Hypothesis: Mast Cell numbers will correlate with fibrosis and germ cell number in cryptorchid testes biopsies.

Methods: Testicular biopsies from cryptorchid testis were collected over two years. Biopsies from 78 patients were retrospectively sectioned, stained, and reviewed for the amount of fibrosis as well as mast cell number. MCNs were quantified by tryptase staining and avg. MCN per HPF was determined. Fibrosis was graded on a scale of 0-3 as has been previously described. Statistical analysis was performed with a one-way analysis of variance and a pair wise comparison done with a Tukey's test when significant.

Results: Larger MCNs were significantly associated with lower fibrotic indices at the time of orchidopexy. Average MCNs per HPF were 2.43, 0.94, 0.45, and 0.63 for fibrosis indexes of 0, 1, 2, and 3, respectively. MCNs were significantly higher in biopsies with a fibrotic index of 0 than all other groups ($p<0.05$).

Conclusion: An increase in mast cell numbers precedes the pathologic fibrosis seen in cryptorchid testis and may be linked to fibroblast activity and fibrosis in cryptorchidism.

P65

Prenatal Vesico-allantoic Communication – Patent Urachus, Covered Exstrophy or Omphalocele? – A Case Series

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Background: We report on three cases of prenatally detected communication between the fetal urinary bladder and a cystic structure within the umbilical cord.

Methods: Review of prenatal ultrasound performed between 2004 and 2010 revealed three cases (two female fetuses) of communication between the fetal bladder and a cystic dilatation of the umbilical cord. All presented with similar images showing an intracorporeal bladder component,

a cystic dilatation in the cord, and an obvious communication, resulting in an hourglass shaped finding. Patients were followed with serial ultrasound. All showed a decrease in size in the cystic component until the cyst alongside the umbilical cord disappeared. Ultrasound did not detect other abnormalities in any case. Given the unknown nature of the pathology, the expectant mothers were referred to our institution for labor and delivery.

Results: All patients were born at term without complications. All were found to have a protuberant mass in the area of the umbilicus, mucosal-lined, and consistent with prolapsed bladder. The mass varied in size (3-6cm). There appeared to be a narrowing at the neck of the defect where the mass disappeared into the umbilicus. The umbilicus appeared normally positioned and there were no bony abnormalities of the hips or pelvis. Spontaneous urethral voiding occurred within 24 hours in all infants. Concomitantly, all had minimal drainage though the abnormal umbilical structure consistent with urine, and this was confirmed by voiding cystourethrogram. None had evidence of urethral obstruction. Repair of the abnormality was performed electively. Umbilicoplasty was performed as part of the skin closure. Postoperative cystography revealed low-grade reflux in two infants, but no other abnormal findings. Bladder capacity, contour and emptying were normal. Urinary continence has been achieved in the two oldest children. Pathology analysis uniformly demonstrated normal to moderately inflamed transitional urothelium with a defined lamina propia and detrusor fibers consistent with normal urinary bladder as opposed to urachal pathology.

Conclusions: Our series is the first to document the pathology of the resected specimen as bladder tissue without urachal remnants. Using terms such as patent urachus in similar cases may in fact be a misnomer. Until the embryology of this disorder is better characterized, it would be best described as a congenital umbilical bladder prolapse. Isolated prenatal finding of an hourglass communication between the bladder and the umbilical cord should be considered predictive of umbilical bladder prolapse, which, based on our case series, carries a good prognosis.

P66

Outcomes of the Augmented Non-Transected Anastomotic Urethroplasty for the Treatment of Bulbar Urethral Strictures

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Background: The augmented anastomotic urethroplasty (AAU) combines primary urethral anastomosis (after full thickness stricture excision) and an onlay graft or flap. A variant of the AAU involves complete stricture excision without transecting the urethra. Our objective was to compare the outcomes of augmented non-transected anastomotic urethroplasty (ANTA) to dorsal onlay buccal grafting (DOBG).

Methods: This was a retrospective cohort study. Medical records of all patients who received either a single stage ANTA or a single stage DOBG for bulbar urethral stricture disease between 2005-2010 where reviewed. A minimum of 6 months postoperative followup was required. A cross sectional questionnaire was used to assess long-term outcomes. Data is presented as median (interquartile range).

Results: A total of 44 men (n=23 DOBG, n=21 ANTA) with a mean followup of 2.3 (1.2-3.8) years were identified. There were no significant differences between ANTA patients and DOBG patients in terms of age, previous treatment, etiology, location of the stricture within the bulbar urethra, or postoperative followup. ANTA were more likely to be used for an obliterative type stricture (found in 50% versus 18% of those who underwent a DOBG, p=0.075). The median change in postoperative Qmax was 1 (-4 to +4) mL/sec, and did not change significantly during followup in the ANTA (p=0.792) and DOBG (p=1.00) groups. There was no significant difference between groups in the use of bilateral buccal grafts (p=0.416); median buccal length harvested was significantly less in the ANTA group (4.5 [4.0-5.00] cm) versus the DOBG group (5.0 [5.0-8.0] cm, p=0.048). Response rate to the cross sectional survey was 59%. A total of 5 patients reported postoperative complications related to harvest of the buccal graft; there were no significant differences between ANTA and DOBG groups. Overall success rate was 93% and not statistically different between groups (log rank test, p=0.548), with one ANTA patient and two DOBG patients requiring a post-urethroplasty dilation.

Conclusions: The ANTA has results similar to DOBG in this population. Significantly less buccal graft is required when using the ANTA technique compared to traditional DOBG. ANTA can be used for obliterative type strictures that would have otherwise required a transected AAU.

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Pharmacokinetics Of Testosterone Replacement In Hypogonadal Men Treated With Subcutaneous Testosterone Implants

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Background: Hypogonadism is increasingly diagnosed. Treatment modalities include daily testosterone gels, weekly intramuscular injection and subcutaneous pellets. Few data exist to determine the optimal number of subcutaneous pellets to place and the frequency of re-implantation. We reviewed our multi-institutional data on post-implantation hormone levels to derive pharmacokinetic data to aid in determining the optimal number of pellets and frequency for implantation.

Methods: A retrospective review of 296 patients from Baylor College of Medicine and New York University with hypogonadism treated with subcutaneous testosterone implants between 2008 and 2010 was performed. Serum total testosterone (TT) levels were assessed before and after testosterone pellet implantation. TT was analyzed as a function of time from implantation, number of pellets implanted, and patient BMI (Fig. 1). Men were grouped by BMI into Underweight/Normal (U/N,30) groups, and by number of pellets implanted (6-9 or 10+ pellets). A formula for testosterone decay using linear regression of the log of TT level and time from implantation was determined and used to extrapolate serum TT levels at day 1 and the time for TT levels to reach 300 ng/dL. Decay curves were calculated for all BMI and pellet categories.

Results: Mean±SD subject age was 62±28 years. Baseline TT was 239.7±122 ng/dL, FT was 6.29±8.77 pg/mL and E was 26.7±22 pg/mL. 439 serum measurements were assessed. Distribution of BMI in the population examined was 24%, 36% and 39% for U/N,OW,OB patients, respectively. The correlation coefficient for Log TT vs. time from implantation was 0.7. Extrapolated TT peaks (446, 799 vs. 937, 1286 ng/L for OB and U/N groups with 6-9 and 10-12 pellets, respectively) were sig-

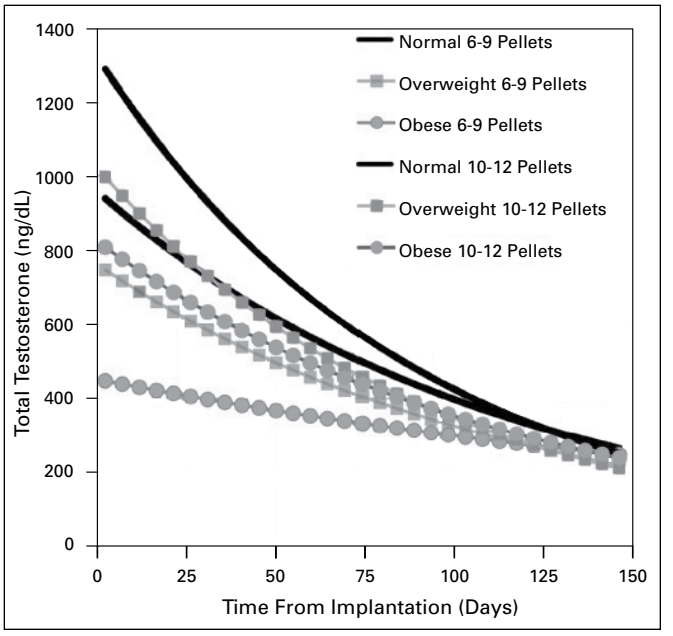

Fig. 1. P67. Total testosterone by day from implantation by BMI.

nificantly lower and TT decay slower in OB vs. U/N men in both pellet groups.
Conclusions: Men with a normal/underweight BMI achieve therapeutic TT levels with 6-9 pellets whereas obese and overweight men require 10-12 pellets. At 120 days, roughly equal TT levels are observed in all BMI and pellet groups, and re-implantation is strongly recommended by 120 days.
Keywords: Testosterone replacement, subcutaneous testosterone implant, hypogonadism.

P68
The Relationship between Vitamin D and Testosterone Values in Men Referred for Infertility
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Background: Calcitriol (1α, 25-dihydroxycholecalciferol) is the hormonally active form of Vitamin D and is involved with the calcium metabolism pathway via binding to the Vitamin D receptor. Vitamin D and calcium are thought to play a role in male infertility. Vitamin D receptors have been identified in human testis tissue as well as in the epididymis, spermatagonia, and Sertoli cells in rodents. Vitamin D deficient animal models have shown decreased fecundity, reversible with calcium supplementation. The relationship between human semen quality and Vitamin D deficiency has not yet been evaluated. However, Vitamin D has recently been associated with decreased testosterone levels in men presenting for coronary angiography. In this pilot study, we examined the relationship between Vitamin D levels, testosterone, and semen analyses in a group of men presenting for infertility.
Methods: After institutional review board approval was obtained, we retrospectively analyzed 90 men who were referred to an infertility clinic between September 2009 and February 2010 for whom testosterone, FSH, LH, Vitamin D, and semen analyses had been obtained. Spearman correlations were calculated to determine the association between Vitamin D, testosterone levels, and various semen parameters.
Results: Overall, there was no correlation between Vitamin D and testosterone ($r=0.22$, $p=0.22$). However, examining only those men with testosterone values below our laboratory's minimum normal value of 300 (40 subjects), a statistically significant correlation of 0.312 ($p=0.04$) was found. No correlations were observed between Vitamin D, and semen parameters.
Conclusions: In this population of men, referred specifically for infertility, Vitamin D correlates with testosterone only in those men with a total testosterone value of <300. Furthermore, even in this subpopulation, we did not observe a correlation between vitamin D and semen parameters. These preliminary results suggest that Vitamin D is not strongly associated with markers of infertility in men. A prospective trial is on-going at our institution comparing infertility patients to vasectomy controls in order to further elucidate this relationship.

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