Title

358: Boys with Hypospadias Exhibit Reduced Anogenital Distance, a Putative Sign of Endocrine Disruption

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patients. In this video we demonstrate a successful technique for laparoscopic partial adrenalectomy performed at the NCI.

METHODS: In this video we present two cases of left and right transperitoneal partial adrenalectomies. The first case is a 47 year old male with VHL, bilateral adrenal masses, undergoing left laparoscopic partial adrenalectomy. We demonstrate that with adequate preoperative blockade, this procedure can be safely performed without the need to ligate the left adrenal vein. The second case is a 35 year old symptomatic male with sporadic pheochromocytoma undergoing right laparoscopic partial adrenalectomy for a right adrenal mass. Anatomical details are illustrated. Intraoperative ultrasound is used to localize and demonstrate the margins of the tumor. Tumors may be enucleated by dissecting the plane between the pseudocapsule of the tumor and the normal adrenal parenchyma.

RESULTS: The techniques of left and right transperitoneal laparoscopic partial adrenalectomy are demonstrated in detail. There were no complications. Both specimen revealed pheochromocytoma with negative margins. At the National Cancer institute, we have performed both open and laparoscopic partial adrenalectomy in 63 patients with VHL and MEN II. In our series, the mean tumor size was 2.3 cm. Pathology confirmed pheochromocytoma in 60 of 63 patients. Only 6 of 63 patients required postoperative adrenal replacement therapy. Three of these were patients with solitary adrenal glands undergoing partial adrenalectomy. At a mean follow up of 41 months, only 3 patients required long term replacement therapy.

CONCLUSIONS: Laparoscopic partial adrenalectomy is a valuable surgical technique in patients at risk for the development of bilateral adrenal tumors. Partial adrenalectomy allows patients to avoid the morbidity of lifetime corticosteroid replacement therapy. We present our successful technique and eleven year results at the National Cancer Institute.

Source of Funding: National Cancer Institute, Urology Oncology Branch

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CYSTOSCOPIC TREATMENT OF URETERAL OBSTRUCTION FOLLOWING ROBOTIC-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY

Brian H Irwin and Joseph Wagner. West Hartford, CT and Hartford, CT.*

INTRODUCTION AND OBJECTIVE: Ureteral injury and obstruction at the time of radical prostatectomy are well described complications of both open and laparoscopic surgical techniques.

METHODS: We present a video presentation of a case of ureteral obtruction at the level of the vesico-urethral anastomosis following robotic-assisted radical prostatectomy. The video shows critical portions of the original sugery and the subsequent complication being treated cystoscopically with anastomotic suture incision, internal ureteral stenting, and foley catheter drainage.

RESULTS: The patient tolerated the procedure well with subsequent resolution of his hydronephrosis on follow-up ultrasound examination. Upon cystoscopic removal of the patient's ureteral stent, the anastomosis showed evidence of healthy granulation tissue as evidence of successful healing.

CONCLUSIONS: Cystoscopic incision of obstructing anastomotic sutures and ureteral stenting is a relatively minimally invasive and feasible treatment for ureteral obstruction following robotic-assisted laparoscopic radical prostatectomy.

Source of Funding: None

Pediatrics: Congenital Anomalies - Kidney & Ureter/Lower Urinary Tract & Genitalia (I)

Moderated Poster 11

Sunday, May 20, 2007 1:00 - 3:00 pm

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COMPARATIVE ANALYSIS OF TUBULARIZED INCISED PLATE VS. ONLAY ISLAND FLAP URETRHOPLASTIES FOR PENOSCROTAL HYPOSPADIAS

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INTRODUCTION AND OBJECTIVE: Despite being the dominant technique for repair of distal hypospadias, acceptance of Tubularized Incised Plate (TIP) approach for penoscrotal hypospadias (PSH) remains unclear. We reviewed our experience with PSH, comparing TIP to transverse island flap ONLAY urethroplasty.

METHODS: A retrospective review of consecutive patients with PSH was performed. 1657 boys underwent hypospadias repair at our institution from 1998 to 2006. 75 comprised our study population: at the surgeon's discretion, 35 children underwent TIP urethroplasty, 40 ONLAY. Preoperative penoscrotal transposition and degree of chordee, type of chordee repair, complication rate, available uroflowmetry in toilet trained-patients., and number of re-operations were compared between the 2 groups.

RESULTS: Mean age was 17m (9-91) for TIP and 17.8m (10-58) for ONLAY. Mean follow up was 30m (6-74) and 38.8m (16-80), respectively.

Variables	TIP n=35 (%)	ONLAY n=40 (%)	p
Preop penoscrotal transposition	14 (40)	16 (40)	NS
Preop severe chordee (> 45o)	7 (20)	18 (45)	0.02
Dorsal plication performed	19 (54.3)	27 (67.5)	NS
Mean catheter duration (days)	8.5 (7-10)	10.3 (7-14)	NS
Overall Complication Rate	21 (60)	18 (45)	NS
Fistula/Breakdown	18 (51.4)	10 (25)	0.01
Fistula location (proximal:distal)	13:5 (72:28)	2:10 (20:80)	0.02
Stricture	0 (0)	2 (5)	NS
Meatal stenosis	1 (2.8)	1 (2.5)	NS
Recurrent chordee	2 (5.7)	5 (12.5)	NS
Average flow rate (ml/sec)	3.1 to 13.2	3.0 to 16.0	NS
Flattened uroflow curve	16/24 (66.6)	7/21 (33.3)	<0.01
PVR >30% expected bladder capacity	2/24 (8.3)	0/21 (0)	NS
# pts with >2 re-operations	2 (5.7)	7 (17.5)	NS

CONCLUSIONS: The overall complication rate was similar for penoscrotal TIP and ONLAY urethroplasties. The TIP-fistula rate was higher vs. ONLAYS, though catheter duration was the same in both groups. While post-void residuals were not elevated, more flattened TIP-flow curves may suggest that TIP-urethroplasty is narrower and thus, behaves as a relatively distal "resistance" prompting more proximal fistula formation. Thus, the TIP-fistula rate may benefit from more delayed catheter removal or deeper plate incision. Nevertheless, both techniques appear to be equivalent approaches to correct PSH. Longer follow-up may reveal more divergent outcomes for these 2 approaches.

Source of Funding: None

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BOYS WITH HYPOSPADIAS EXHIBIT REDUCED ANOGENITAL DISTANCE, A PUTATIVE SIGN OF ENDOCRINE DISRUPTION

Michael H Hsieh, Benjamin N Breyer, Michael L Eisenberg, Laurence S Baskin. San Francisco, CA.*

INTRODUCTION AND OBJECTIVE: Endocrine disruptors (ED) are postulated to cause hypospadias and cryptorchidism in multiple species, including humans. Animal studies of proposed ED have noted an association between genital defects and reduced anogenital distance (AGD). Human studies have attempted to correlate reduced AGD to exposure to putative ED, but have not examined AGD in boys with hypospadias or cryptorchidism. We sought to examine the relationship between hypospadias, cryptorchidism, and AGD in humans.

METHODS: Data was prospectively collected on 109 boys undergoing operations for urologic conditions at the University of California San Francisco and the Children's Hospital of Oakland. Boys with evidence of Tanner stage 2 development or higher, imperforate anus, or known syndromes were excluded. Data included AGD, anoscrotal distance (ASD), age, height, weight, body-mass index, race, and urologic diagnoses including hypospadias and cryptorchidism. All measurements were performed after patients were intubated. Pearson product moment correlation coefficients were calculated to determine correlation between AGD or ASD and demographic or other morphometric data. Analysis of variance was performed to compare parameters, including AGD and ASD, among boys with hypospadias, cryptorchidism, or normal genitals. Statistically significant differences between groups were then further analyzed using unpaired t-tests.

RESULTS: 30, 32, and 47 boys had hypospadias, undescended testes, or normal genitals. There were no differences ($p>0.05$) among the groups in any parameters except for AGD and ASD. Within each group,

AGD and ASD correlated well with each other (r>0.71) but not with other parameters. The AGD and ASD of boys with hypospadias was shorter than that of boys with normal genitals or cryptorchidism (Table). Boys with cryptorchidism did not have decreased AGD or ASD compared to boys with normal genitals.

CONCLUSIONS: Boys with hypospadias have reduced anogenital distance compared to boys with normal genitals or cryptorchidism. Given the strong circumstantial evidence provided by animal and human studies, hypospadias and decreased anogenital distance may indeed be partly due to endocrine disruption.

	Normal boys	Hypospadiac boys	Cryptorchid boys
Mean AGD	93	72	90
Mean ASD	45	33	44
p value of T-test comparing AGD vs. normal boys	n/a	0.000007	0.56
p value of T-test comparing ASD vs. normal boys	n/a	0.0002	0.83
p value of T-test comparing AGD vs. cryptorchid boys	0.56	0.003	n/a
p value of T-test comparing ASD vs. cryptorchid boys	0.83	0.0003	n/a

Source of Funding: None

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GENE EXPRESSION PROFILING OF URETHRAL DEVELOPMENT IN THE HYPOSPADIAC RAT

Satoshi Kurokawa, Yoshiyuki Kojima, Kentaro Mizuno, Yutaro Hayashi, Kenjiro Kohri. Nagoya, Japan.*

INTRODUCTION AND OBJECTIVE: We have developed a rat model of hypospadias by exposure to flutamide in utero. This rat model showed proximal hypospadias in 100 % of offspring following maternal exposure to flutamide especially around gestational day 17 Whereas male pups without exposure to flutamide on gestational day 17 showed a wide-range external genitalia development from normal urethral meatus to middle hypospadias, but did not show proximal hypospadias. Gestational day 17 may be the critical period to close urethral folds to form the penile urethra and to fuse the genital swellings forming the scrotum. This study investigated the molecular mechanisms in the development of male urethra at the critical period for the production of hypospadias.

METHODS: Timed pregnant SD rats were administered 7.5 mg of flutamide or 1.5 ml of control vehicle by intraperitoneal injection from gestational days 15 to 17. Dams were sacrificed on gestational day 17, and the sex of removed fetuses was determined by examination of the gonads. Genital tubercles (GT) were harvested, and RNA was extracted. Gene expression was analyzed using oligonucleotid microarray containing 20,500 genes.

RESULTS: Of the 20,500 genes, 10 annotated genes in flutamide-treated GT were expressed at levels more than twice those in control-treated GT. We identified three myosin-related genes (Myh6, Myl2, Mybph) included among those 10 genes. There were also 23 annotated genes in flutamide-treated GT that were expressed qt levels less than half those in control-treated GT.

CONCLUSIONS: This study demonstrated for the first time the association of myosin-related genes with the production of hypospadias. Myosin is generally found not only in muscle cells but also in nonmuscle cells and mediates cytoplasmic movements. Those highly expressed genes including myosin-related genes in flutamide-treated GT could be candidates for disruption of the closure of urethral folds and the fusion of genital swellings to accurately form the external genitalia, while those showing low expression could be essential to achieve urethral formation.

Source of Funding: None

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A CONTEMPORARY ANALYSIS OF TWO-STAGE HYPOSPADIAS REPAIR

Pamela I Ellsworth and Anthony Caldamone. Providence, RI.*

INTRODUCTION AND OBJECTIVE: The tubularized incised plate (TIP) hypospadias repair has revolutionalized distal hypospadias repair. Its use has been extended to proximal hypospadias cases with a suitable urethral plate. However, often such cases are associated with moderate to severe chordee requiring grafting and/or a poorly developed urethral plate. We sought to identify the complication rate and cosmetic outcome of contemporary 2-stage hypospadias repair in this setting.

METHODS: Medical charts were reviewed of 20 males who underwent a planned 2-stage hypospadias repair in the past 7 years who had at least one post-operative visit after the initial catheter removal.

RESULTS: The preoperative meatal position was coronal in 1, proximal shaft in 5, penoscrotal in 11, scrotal in 1 and perineal in 2 patients. The urethral plate was poorly developed in all patients and all had moderate (7) or severe (13) chordee. 5 of the 20 patients had undescended testes, bilateral in 2 and unilateral in 3. Preoperative testosterone was used in 17 of 20 patients (85%). Age at first stage was 0.5 to 5 years and 1 to 6 years for the second stage. The urethral plate was divided in 17 (85%) and excised in 3 patients (15%). Chordee was treated with dermal grafting in 14 patients, alloderm grafting in 5 and 1 patient underwent plication. Four patients who underwent dermal grafting also had simultaneous plications performed. Tubularization of the Byar's flaps with a second layer of coverage was performed in all patients during the second stage. No patient had residual chordee. Eleven complications occurred in 8 patients and included, meatal regression in 2, megaurethra in 4, and urethrocutaneous fistula in 5. No patient required more than 1 additional surgical procedure for correction of the complication. At the time of last follow-up cosmesis and when evaluable urine stream, was noted to be excellent in 13 (65%) and good in 7 (35%).

CONCLUSIONS: Although the TIP provides excellent cosmetic and functional results for distal hypospadias repair its use in proximal hypospadias remains limited to select cases. We provide a more contemporary experience with those cases with poorly developed urethral plates and significant chordee in whom a two stage repair is often needed. The two-stage hypospadias repair provides excellent cosmesis and function in the majority; however, the risk of an additional procedure was noted to be 40%.

Source of Funding: None

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TRAINING RESIDENTS IN HYPOSPADIAS REPAIR: VARIATIONS OF INVOLVEMENT

Sean M DeLair, Stanley A Yap, Stacy T Tanaka, Eric A Kurzrock. Sacramento, CA.*

INTRODUCTION AND OBJECTIVE: Hypospadias repair is a complex and seminal procedure which has defined the subspecialty of pediatric urology. We sought to determine the degree of training necessary to achieve competence in hypospadias repair as well as both attending and resident opinions regarding the need for fellowship training.

METHODS: An electronic survey was sent to 518 urology residents and recent graduates and to 168 practicing pediatric urologists. Non-responders were resent the survey two additional times. The survey consisted of basic questions on level of training or years in practice. Both residents and practicing pediatric urologists were asked about the level of resident participation for each step of the hypospadias procedure and opinions on the necessity of fellowship training. Data was analyzed for statistical differences with Wilcoxon rank-sum, multiple and logistic regression tests.

RESULTS: Surveys were completed by 89 pediatric urologists and 208 urology residents or recent graduates (response rate of 53% and 40%, respectively). Approximately 70% of both residents and attendings report that less than 50% of the overall hypospadias procedure is performed by the resident. There was agreement between residents and attendings on the perceived amount of resident participation for all steps of the procedure except glanular mobilization. Additionally, 71% of residents and 86% of attendings feel that a pediatric fellowship is necessary to perform hypospadias surgery.

CONCLUSIONS: The majority of residents and attendings report limited resident participation in hypospadias surgery. Residents and attendings strongly agree on the perceived participation of residents during hypospadias repair. Our data do not corroborate the ACGME data regarding the role of urology residents in hypospadias repair and draw into question the self-reported number of cases performed by each resident as a primary surgeon versus assistant surgeon. In addition, the majority of residents and pediatric urologists feel as though specialized training is required to perform hypospadias surgery.

Source of Funding: None