PODIUM SESSION 1: PEDIATRIC UROLOGY
Friday, September 7, 8:15–9:00 am

1
Long-term urological follow-up of multicystic dysplastic kidneys: Is it still necessary in 2007?

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Background: To determine if the current indications for the long-term urological follow-up of children with multicystic dysplastic kidneys (MCDK) are supported by the literature. Observation of MCDK began in the 1980s. In 1993, the Multicystic Kidney Registry published that observation of MCDK was safe, and that prophylactic nephrectomy was not indicated. However, it has not been clarified if observation is necessary either. The author believes that after 20 years of observation, the answer to this question can now be answered.
Methods: The membership of the Pediatric Urologists of Canada was surveyed to determine if long-term urological follow-up was being performed, and if so, for what indications. A literature search using PubMed, EMBASE and a Conference Papers Index was performed to determine if the indications listed were supported by the current literature.
Results: A response rate of 72% was achieved for the survey, with 82% of responders (23/28) following children with MCDK long-term. The main indications listed for long-term follow-up were the increased risk of Wilms' tumor (54%), the increased risk of hypertension (32%), observation of the contralateral kidney (43%) and to observe involution of the MCDK (36%). The literature search did not support the need for long-term urological follow-up for any of these indications, provided unilateral MCDK was an isolated genito-urinary abnormality. There are were only 5 documented cases of Wilms' tumor in the United States between 1983–1998, and none since. No case series of MCDKs have observed a Wilms' tumor, suggesting the risk of developing Wilms' tumor with MCDK is nil. Hypertension, although rare, could be monitored for by a primary care physician. When unilateral MCDK is an isolated genitourinary abnormality and compensatory hypertrophy is confirmed, the risk of developing urinary tract infection, chronic renal failure or end stage renal disease is very low. With current radiological techniques, observation of involution is not required for confirmation of diagnosis. Additionally, not all MCDKs involute.
Conclusion: Twenty years of observation has shown that long-term urological follow-up of children with "simple" MCDK is no longer indicated once the diagnosis has been confirmed with a follow-up renal ultrasound at 12–24 months. Blood pressure monitoring by a primary care physician is recommended.

2
Single and multiple layer small intestine submucosa in the repair of severe chordee and complicated hypospadias

Matthew H. Hayn, MD; Mark F. Bellinger, MD; Francis X. Schneck, MD
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Background: Small intestine submucosa (SIS) has been described for corporal body grafting in cases of severe chordee. We describe our experience with single and multiple layer SIS in the repair of proximal hypospadias and severe chordee.
Methods: Between 2000 and 2004, 15 boys with proximal hypospadias and/or severe ventral chordee (> 40°) underwent SIS grafting to correct the curvature. Both single layer (Surgisis, Cook Biotech) and a 4-layer (Stratasis, Cook Biotech) were used for corporal grafting. In each case the ventral defect in the corporal bodies was measured, and the SIS graft was measured approximately 20% larger than the defect. Reassessment was performed by artificial erection test at the time of the second-stage reconstruction or at follow-up visit in the clinic.
Results: First-stage corporal body grafting was performed on 15 patients between June 2000 and March 2004. Surgisis was used in 6 cases and Stratasis was used in 9 cases. Of the 15 boys, 12 underwent a planned second-stage repair with subsequent urethroplasty 6 to 25 months after the initial first-stage repair. Median age at first-stage repair of the 12 boys was 12 months. Native meatus location was penoscrotal in 5 boys, mid-scrotal in 6 boys, and perineal in 1 boy. A 15-month-old boy underwent single stage combined chordee correction with SIS for penoscrotal hypospadias repair. Two boys without hypospadias, ages 1 and 4.5 years, underwent chordee correction with SIS. There were no medical or surgical complications related to the use of SIS for chordee repair. Median age of the 12 boys at second-stage repair was 24 months. At the time of the second-stage hypospadias repair, the graft site did not show any significant scarring and no patients had recurrence of chordee. All chordee correction has remained durable with follow-up ranging from 2 to 75 months. Postoperative complications associated with second-stage repairs occurred in 6 patients, including urethrocutaneous fistula in 4 patients requiring repair, separation of glans closure in 1 patient requiring distal revision, and stricture of buccal urethroplasty in 1 patient requiring redo-hypospadias repair.
Conclusions: Although this study includes a small population of patients, our outcomes suggest that SIS is safe and effective for corporal body grafting in the correction of severe chordee, especially in the setting of a multistage hypospadias and chordee repair.

3
Is prestenting necessary for upper tract ureteroscopic access in prepubertal children?

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Background: The ability to access the upper tract is limited in some prepubertal children by the small caliber of the ureter and concerns regarding development of stricture with aggressive dilitation. We investigated if age, height, weight or BMI were associated with failure to access the upper tract and need for ureteral stenting prior to definitive ureteroscopy.
Methods: We retrospectively reviewed all ureteroscopic procedures for upper tract calculi at 1 institution from 2001–2005. A 6.9 Fr flexible ureteroscope was used in all cases. Demographic, intraoperative and postoperative data were analyzed using SAS 9.1 statistical software.
Results: Twenty-nine patients (48% male), mean age 9.3 years (range 3–14) who underwent ureteroscopy for proximal ureteral or renal calculi were identified. Eighteen patients (62%) were prestented due to acute renal colic (78%) or infection (22%). Of the 11 patients (38%) that were not prestented, successful ureteroscopic access to the upper tract was achieved in 7 patients (64%). 8/10 Fr coaxial ureteral dilators were utilized in 91%. The youngest child with successful access was 3 years old, 94 cm tall, weighed 14 kg, with a BMI of 15.8. There was no significant difference in mean age (10 ± 4.8 v. 9.5 ± 2.6 yr, $p = 0.8$), height (128 ± 31 v. 131 ± 21 cm, $p = 0.75$) weight (32 ± 21 v. 42 ± 26 kg, $p = 0.34$) or BMI (17.6 ± 4.2 v. 22.3 ± 6.1, $p = 0.12$) between the patients with successful upper tract access versus access failures. These physical findings were similar in the group that was prestented (age 8.8 yr, height 130.4 cm, weight 33.9 kg, BMI 18.5). Of the unstented group, 91% were stone free (86% after a single ureteroscopic procedure) with no long-term complications at a mean follow-up of 13.3 months.
Conclusions: In our series, age, height, weight and BMI were not associated with difficulty accessing a naïve upper tract. Ureteroscopy is a rea-

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sonable first line therapy for upper tract calculi in prepubertal children with placement of a ureteral stent for passive dilatation only in cases of primary access failure. This approach reduces the number of necessary procedures while maintaining a low complication rate.

4
Comparative analysis of ventral penile lengthening versus dorsal plication for severe ventral curvature: single center experience with 100 cases

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Background: Corporal disproportion (with a shorter ventral surface) is often the intrinsic cause of severe ventral curvature (sVC) (> 45°) once all other intraoperative manoeuvres have been exhausted. The 2 main approaches to correct the persisting sVC are dorsal plication (DP) of the corpora or ventral corporal lengthening by tunica albuginea patching. Controversy persists as neither technique has been proven to be superior to the other with respect to initial or long-term outcome. However, a direct comparison of outcome of these 2 procedures has not been previously reported.

Methods: A retrospective review of 100 consecutive patients who underwent repair of penoscrotal or more proximal defects from 1996 to 2004 was performed. Children were divided into 2 groups: 32 had a ventral penile lengthening (VPL) procedure and 68 dorsal plication (DP-Nesbitt). Meatal location, penoscrotal transposition, preoperative testosterone stimulation, sVC (> 45°) at the beginning of operation and after degloving, and recurrent VC were compared between the 2 groups. Recurrent VC was assessed by direct history (children's or parents' reports) and observation in follow-up examination as documented in patients charts.

Results: Mean age was 17 months (9–56) for VPL patients and 17.8 months (10–58) for DP boys. Mean follow-up was 65 months (29–120) and 62 months (30–116), respectively.

Table 1. Abstract 4

Variables	VPL *n* = 32 (%)	DP *n* = 68 (%)	*p*
Initial meatal position			
Scrotal/perineal	14 (43.8)	13 (19.1)	0.009
Penoscrotal	18 (56.2)	55 (80.9)	
Penoscrotal transposition	29 (90.6)	41 (60.3)	0.002
Testosterone stimulation	13 (40.6)	27 (39.7)	0.93
Preop sVC (> 45°)	31 (96.8)	44 (64.7)	< 0.001
Preop sVC (> 45°)	29 (94.0)	19 (27.9)	< 0.001
Recurrent VC	3 (9.4)	19 (27.9)	0.03

Conclusions: Although VPL-patients had higher proportion of scrotal/perineal defects and preoperative sVC, and despite showing less intraoperative improvement following degloving (v. the DP-patients), they developed significantly less postoperative recurrent VC. We therefore recommend VPL over DP for patients with sVC.

5
Evaluation of flap perfusion during complex hypospadias repair using near infrared fluorescence of intravenous indocyanine green

Dragan J. Golijanin, MD; Eric A. Singer, MD, MA; Ralph R. Madeb, MD; Ronald W. Wood, PhD; Vikram S. Dogra, MD; William C. Hulbert Jr., MD; Robert A. Mevorach, MD; Ronald Rabinowitz, MD
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Background: Assessment of the viability of local tissue flaps in complex hypospadias repairs is difficult and is dependent on a surgeon's experience. Intraoperative detection of insufficient skin flap perfusion is highly desirable as it can improve hypospadias repair success and decrease complications. This video represents the intraoperative use of intravenous (IV) indocyanine green (ICG) in complex hypospadias repair.

Methods: The intraoperative use of laser-induced near infrared fluorescence (NIRF) of IV ICG allows for objective quantification of skin perfusion and viability with precise details of vascularity. We used Cardio-Green (Acorn, Buffalo Grove, IL) for intravenous administration of ICG and the SPY 2000 imaging system (Novadaq Technologies Inc., Mississauga, Ontario, Canada).

Results: Three boys (ages 2, 4 and 9 yr) underwent repair of complex hypospadias, 2 after previous attempts at repair. Preoperative assessment and intraoperative planning outlined the shape of the flaps to be used. ICG fluorescence was performed at the beginning of the flap drawings to visualize the feeding vessels, at the end of the flap formation, and at the conclusion of the operation by intravenously injecting 200 mL of ICG (0.25 mg/kg). The images were taken to outline perfusion of the flaps. In 2 out of 3 cases, near infrared imaging helped tailor the flaps and prevent the use of nonperfused tissue for reconstruction. There were no areas of nonperfusion detected at the end of each operation. Patients tolerated the procedures well and there were no complications or side effects from ICG use. Median follow up is 3 months (2–4 mo). Cosmetic and functional results of 2 complete and 1 first stage hypospadias repair are excellent.

Conclusions: IV use of ICG allows a detailed near infrared analysis of flap perfusion. Our preliminary results are encouraging and may support the use of ICG in complex hypospadias repairs to improve surgical outcomes.

6
Fetal MRI demonstrates similar volume evolution but different shape in right and left kidneys during evolution

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Background: To assess the changes at MRI in shape and volume of the fetal kidneys during gestation and to establish a normative curve for kidney growth during gestation.

Methods: A total of 142 human singleton fetuses without urogenital abnormalities between 20 and 36 weeks of gestational age (GA) underwent a prenatal MRI. T_2-weighted images (Single Shot Turbo Spin Echo) were used to measure the following kidney variables: bipolar diameter, anteroposterior (AP) diameter and volume. All variables were correlated to GA and a comparison was performed between the values in left and right kidneys.

Results: Linear regression analysis showed a correlation of both bipolar and AP diameter, area and volume with GA in weeks ($p < 0.0001$). The bipolar diameter increases twice as fast as the AP diameter with increasing GA. The bipolar diameter also expressed the least variability around the regression line. No substantial volume differences between left and right kidney could be identified, however, a significantly larger area and greater bipolar diameter ($p < 0.01$) of the right kidney compared to the left kidney was found.

Conclusions: This study proves that fetal kidney volumes increase linearly with increasing GA. The proffered normative curve can be used to detect volumetric abnormalities in pathologic cases and assess growth normalization after therapy. At the same time, the similar volumes, but significantly different areas and bipolar diameters of left and right kidneys, clearly demonstrate the different morphology of left and right kidneys in fetuses.

PODIUM SESSION 2: BPH / NEUOROUROLOGY
Friday, September 7, 3:30–4:00 pm

7
Transvaginal biofeedback and electrical stimulation: effective treatment for refractory urinary urgency and frequency associated with pelvic floor muscle spasm

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Background: Urinary urgency and frequency (U&F) can be debilitating and affect quality of life. A subset of patients have identifiable pelvic floor muscle spasm. Previous work has suggested a relationship between pelvic floor resting tone and irritative bladder symptoms; therapy aimed at relaxing the pelvic floor should decrease these symptoms. We report our results with transvaginal biofeedback and electrical stimulation (TVBEstim) in women.
Methods: Eighty-six women referred with diagnoses of refractory voiding dysfunction had pelvic floor muscle spasm on exam. Sixty-seven patients were eligible (e.g., no neurologic disease) and TVBEstim was recommended. Fifty-two patients (average age 44.9 ± 17) underwent therapy. Overlapping referring diagnoses included U&F (43), interstitial cystitis (8) and UTI symptoms with sterile cultures (20). TVBEstim consisted of 6 sessions: education, exercises monitored by graphic representation of vaginal probe activity, and passive electrical stimulation. Data was collected prospectively pre treatment and 3 months post treatment, including the American Urological Association Symptom Score (AUA-SS) and Quality of Life Score (AUA-QOL), 10-point Visual Analogue Scales (VAS) of symptom severity and effect on daily life, and systematic interview data.
Results: At completion of the TVBEstim sessions, 52 patients reported a mean symptom improvement of 64.5% (SD 27, range 0–100); while 27 patients at 6 weeks post-treatment showed a durable improvement of 75.1% (SD 24, range 0–100).
Conclusions: Early results show TVBEstim is a promising treatment for refractory urgency and frequency in women identified to have pelvic floor muscle spasm.

Table 1. Abstract 7. Systematic interview data (*n* = 52)

	Pre-treatment			Post-treatment follow-up							
				6 wk				3 mo			
	Mean	SD	Range	Mean	SD	Range	*p* value	Mean	SD	Range	*p* value
Frequency (h to void)	1.8	1.1	0.25–4.0	3.0	1.0	1–6	< 0.001	3.0 *n* = 31	1. 1	0.5–4	< 0.001
Nocturia (per h)	2.2	1.6	0–7	1.2	1.5	0–10	< 0.001	1.2 *n* = 29	1.2	0–5	< 0.001
Urge Intensity (0–5)	3.6	1.3	0–5	2.6	0.9	0–4	< 0.001	NA	NA	NA	

Table 2. Abstract 7. AUA-SS and AUA-QOL (*n* = 21)

	Pre treatment		3 mo post treatment		
	Mean	SD	Mean	SD	*p* value
Total symptom score (0–35)	15.4	6.9	7.4	8.0	< 0.001
Bother score (0–6)	4.3	1.2	2.8	1.7	< 0.001

Table 3. Abstract 7. VAS: Symptom severity and effect on daily life (*n* = 23)

	Pre treatment		3 mo post treatment		
	Mean	SD	Mean	SD	*p* value
Symptom severity (0–10)	6.0	2.3	3.5	2.6	< 0.001
Effect on daily life (0–10)	6.3	2.0	3.7	2.8	< 0.001

8
Magnetic resonance microscopy of the murine urinary tract

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Background: Several transgenic mouse strains display slow onset outlet obstruction associated with enlargement of tissues arising from the urogenital sinus. Several of these strains display profound increase in prostate mass. Identifying the site of partial outlet obstruction in the tissue obtained at necropsy is extremely labor intensive using conventional histologic methods. Since magnetic resonance imaging can achieve levels of spatial resolution that approach or are comparable to light microscopy, we thought this modality might be an efficient way to identify areas of outlet obstruction within the tumour mass.
Methods: The N20 TRAMP FVB mouse is a rapid onset transgenic adenocarcinoma model that has a life expectancy of approximately 5 months. After documenting reduced uroflow in a mouse whose lower urinary tract was subsequently fixed by immersion in 10% NBF, MR imaging was performed at 9.4 tesla using a Bruker Omega PSG instrument. Samples in tubes were placed in either a 4-cm diameter bird cage coil or a 2.5-cm diameter Alderman-Grant resonator. The imaging gradients have an internal diameter of 56 mm and maximum magnetic field gradients of 500 mTesla/metre. Three-dimensional gradient-echo images were acquired with the following initial parameters: first sample – TR/TE = 50/5 msec, flip angle approximately 25°, field of view was 4.0 × 2.8 × 2.8 cm with 512 × 256 × 256 resolution (voxel dimensions = 78 × 109 × 109 μm, 2 signal averages; second sample – TR/TE = 275/5 msec, flip angle approximately 45°, field of view was 3.2 × 1.4 × 1.4 cm with 512 × 256 × 256 resolution (voxel dimensions = 62 × 55 × 55 μm), 2 signal averages. Imaging parameters are adjusted from initial values for optimal contrast.
Results: Extraordinary detail was obtained with this imaging modality. Segmentation of the bladder and urethral lumen provided evidence of patency that extended to an area near the opening of the seminal vesicles to the urethra.
Conclusions: Prostate and suburethral gland enlargement is observed in probasin-driven transgenic mouse model systems, and the present observations are consistent with an obstruction resulting from suburethral gland enlargement. MR microscopy permits examination of fine detail of the murine lower urinary tract that can assist in blocking tissues for subsequent higher-resolution imaging and conventional histology.

9
Outcomes with the Prolieve Thermodilation System for BPH

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Background: The Prolieve Thermodilation System is a minimally-invasive

therapy for moderate BPH that combines microwave ablation with urethral balloon dilation. Industry data reported a 30% improvement in AUA score in > 50% of patients by 2 weeks, durable to 12 months, with 70% of patients able to discontinue medical therapy following treatment and only 20% of patients requiring a catheter post procedure. Our previous short-term results were largely consistent with these findings. Here, we reexamine our long-term outcomes.

Methods: A retrospective chart review was conducted for those who underwent this procedure at our institution since its use began in August 2005. Pre-procedure and follow-up history, uroflow testing, AUA symptom score, and PVR were obtained. Uroflow data was not analyzed for volumes less than 100 mL. We limited data analysis to those with at least 6 months follow-up.

Results: Forty-one patients underwent the procedure, the majority of whom were being successfully medically managed for their BPH. The average follow-up period was 10.9 months (range 6–16 mo). Eighty point nine percent of patients were taken off of medical therapy, with 76.4% able to successfully stay off of medication. The average improvement in the AUA score was 2.3 points, with only 31% demonstrating at least 30% improvement. There was essentially no change in the average Q_{max} (range –11 to 10.3 mL/s).

The average PVR actually increased by 10 mL. The sub-group which fared the best were those who underwent Prolieve treatment in order to avoid starting on medical therapy for BPH with an average 4.5 mL/second increase in Q_{max}, 32 mL decrease in PVR and 4.3 point increase in AUA score, all improving at least 30% by AUA. While prostate volume did not significantly impact outcomes, those with urethral lengths of 3 cm or greater tended to do more poorly. Twelve percent of patients required a catheter post procedure. Seventeen percent of patients in this study subsequently went on to TURP for either retention or failure to improve following therapy. Twelve percent of patients were started on anticholinergic medications for new irritative voiding symptoms.

Conclusions: While our early outcomes with the Prolieve system were favourable, it has not proven to be effective long term. Of concern, a number of patients also developed new irritative voiding symptoms following treatment. The patients who did best were not previously on medical therapy and had urethral lengths less than 3 cm. During the study period the Prolieve catheter had been modified, implicating possible equipment failure in the outcomes seen here.

PODIUM SESSION 3: IMPOTENCE / INFERTILITY
Friday, September 7, 4:00–4:30 pm

10
Efficacy of sildenafil at 8 and 12 hours postdose in men with mild to moderate erectile dysfunction

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Background: Empiric observation suggests that the period of effectiveness of sildenafil may be longer than its half-life of 4 hours. We sought to better define the period of responsiveness to sildenafil in 2 double-blind, placebo-controlled (DBPC) trials.

Methods: Study 1 had a crossover design with 2 4-week DBPC phases, while study 2 included a single 4-week DBPC phase. In both studies, men with mild to moderate ED (6-question IIEF Erectile Function domain score of 11–25) were given sildenafil (100 mg) or placebo and asked to have sexual intercourse 8 hours postdosing (7–9h) during an initial 4-week phase. In the first study, men crossed over to the other medication and were asked to have sexual intercourse 12 hours postdosing (11–13h) in a second 4-week phase. The primary end point was the mean per-patient proportion of occasions (PPP) of "yes" responses to question 3 of the Sexual Encounter Profile (SEP Q3), "Did your erection last long enough for you to have successful intercourse?" Other end points were the mean PPP of occasions of erection hardness score (EHS) of 1 to 4 and percentage of men satisfied with treatment (Erectile Dysfunction Inventory of Treatment Satisfaction [EDITS] Index > 50).

Results: A total of 351 men were randomized to placebo (n = 177, mean age ± SD = 52.8 ± 9.2 yr) or sildenafil (n = 174, mean age ± SD = 52.5 ± 10.5 yr) in the first study, and 250 men were randomized to placebo (n = 124; mean age ± SD = 52.9 ± 9.0 yr) or sildenafil (n = 126; mean age ± SD = 52.3 ± 8.8 yr) in the second study. Sildenafil demonstrated significant efficacy over placebo at both 8 and 12 hours postdose.

Table 1. Abstract 10.

	Study 1		Study 2		
	Baseline; mean ± SD	8 h; mean (95% CI)*	12 h; mean (95% CI)*	Baseline; mean ±SD	8 h; mean (95% CI)*
SEPQ3 (PPP %)					
P	42 ± 38	50 (43–57)	52 (44–60)	45 ± 39	43 (36–51)
S	48 ± 39	76 (69–82)	79 (72–85)	39 ± 37	85 (80–89)
EHS 4 (PPP %)					
P	—	10 (7–15)	17 (12–23)	—	7 (4–11)
S	—	41 (34–48)	44 (37–51)	—	43 (36–50)
EDITS (% satisfied)					
P	—	37 (30–45)	54 (45–62)	—	29 (21–38)
S	—	84 (77–89)	77 (70–83)	—	86 (78–91)

SD = standard deviation; CI = confidence interval.
*p < 0.0001 for odds ratio for end of treatment score sildenafil (S) v. placebo (P).

Conclusions: These findings illustrate that the period of responsiveness after a single dose of sildenafil in men with mild to moderate ED may be much longer than the 4 hours currently thought by many clinicians and patients to be the effective time period of sildenafil.

11
Return of nocturnal erections and erectile function after bilateral nerve-sparing radical prostatectomy in men treated nightly with Viagra (sildenafil citrate): subanalysis of a randomized, double-blind, placebo-controlled trial

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Background: After bilateral nerve-sparing radical retropubic prostatectomy (BNSRRP), nocturnal and sexually mediated erections may help to preserve normal erectile function (EF). To investigate nocturnal penile tumescence and rigidity (NPTR) in a subset (n = 54 men) from a randomized double-blind trial (n = 76) of nightly Viagra (sildenafil citrate) after BNSRRP.

Methods: Inclusion required preoperative "normal" EF (defined as a combined score of ≥ 8 for International Index of Erectile Function questions 3 [penetration] and 4 [maintained erection after penetration]) and NPTR testing (≥ 10 continuous minutes of > 55% rigidity [R > 55%] at the base of the penis). Postoperative assessments were at weeks 4 (pretreatment), 16, 28, 40 (during 36 weeks of nightly prophylaxis: Viagra 50 mg [n = 17], 100 mg [n = 18] or placebo [n = 19]), and 48 (after 8 weeks of no erectile dysfunction therapy). "Responders" were delineated at week 48 by the defined normal EF and a "yes" response to "Over the past 4 weeks, have your erections been good enough for satisfactory sexual activity?" Base and tip rigidity and tumescence of the penis were measured using RigiScan monitoring. Main outcome measures were duration of R > 55% and areas under the curve for rigidity and tumescence.

Results: Postoperatively, rapid profound reduction in nocturnal EF was noted in all groups. There was a gradual dose-dependent improvement in base and tip rigidity in the Viagra groups but little improvement in the placebo group. Eight weeks after treatment termination (48 wk postoperatively), 24% (4/17) of 50-mg Viagra recipients, 33% (6/18) of 100-mg Viagra recipients, and 5% (1/19) of placebo recipients were responders. Tip R > 55% was the most discriminating NPTR measure between nonresponders and responders to Viagra, in whom it regained preoperative levels whereas base R > 55% did not. Tip R > 55% was most prolonged in responders to Viagra 100 mg.

Table 1. Abstract 11. Mean duration of Tip R > 55%, as a percentage of preoperative levels, in responders (R) and nonresponders (NR)

	4 wk	16 wk	28 wk	40 wk	48 wk
Viagra 100 mg or 50 mg (R), n = 10	16%	36%	62%	39%	145%
Viagra 100 mg or 50 mg (NR), n = 25	4%	16%	10%	28%	21%
Placebo (R), n = 1	3%	5%	26%	13%	0
Placebo (NR), n = 18	18%	5%	9%	15%	13%

Conclusions: Although further study is needed, the results of this trial showed that nightly Viagra for 9 months post-BNSRRP objectively improved nocturnal erections and pharmaceutically unassisted EF in a significant

proportion of men after BNSRRP, compared with the slow and incomplete recovery in placebo recipients.

12

Developing a prognostic tool for Peyronie's disease: validation of a percutaneous aspiration technique

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Background: One of the greatest challenges in the treatment of Peyronie's disease (PD) is the lack of prognostic tools to help guide patient management. Previous data from our laboratory demonstrated differential protein expression between cell cultures of normal tunica albuginea and PD plaque tissue using surface enhanced laser desorption/ionization time-of-flight mass spectrometry (SELDI). The aim of this project is to validate a percutaneous penile plaque aspiration technique by correlating SELDI spectral data between aspiration and surgical biopsy specimens and to determine if a less invasive office-based needle aspiration technique will provide an adequate amount of protein for analysis.

Methods: Aspiration specimens were obtained from patients undergoing reparative surgery for PD. Aspiration was accomplished by moving a 25 gauge needle with a negative pressure syringe in and out of the palpable plaque within the tunica albuginea layer. During the surgery, a biopsy specimen of PD plaque was obtained for comparison purposes. Protein extracts were prepared using tissue protein extract buffer with protease inhibitor and homogenization. Total protein was quantified by BCA protein assay. Approximately 2 μg of protein from each sample was incubated on CM10 (weak cation exchange) array and read by the SELDI-PCS 4000 system. Spectra were analyzed using Ciphergen Express 3.0 software.

Results: Between 2–10 μg of protein was obtained from each sample by using the percutaneous aspiration technique. Similar spectral patterns were demonstrated between the surgical tissue and aspiration samples. The spectral peaks at molecular weight of 2.4 kDa, 6.5 kDa and 6.7 kDa appeared in all samples. Peaks at 15.8 kDa and 66.6 kDa appeared in most samples.

Conclusions: Our aspiration technique is a valid means of procuring an adequate amount of protein for SELDI analysis. It is efficient, less invasive and provides similar proteomic information as the surgical biopsy specimen. This may serve as a means of detecting protein alterations in men with Peyronie's disease. Further work to identify the proteins representing these spectral peaks and to correlate the expression pattern of these proteins with disease severity is ongoing in our laboratory.

PODIUM SESSION 4: ENDOUROLOGY / LAPAROSCOPY
Saturday, September 8, 7:30–8:30 am

13
Cold scissor dissection simplified repair technique for partial nephrectomy

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Roswell Park Cancer Institute, Buffalo, NY

Background: Goals of laparoscopic partial nephrectomy (LPN) include complete resection of the renal mass, and minimizing warm ischemia time and blood loss. We advocate use of cold scissor dissection to minimize the risk of positive margins and present a technique for suture closure, which achieves hemostasis without need for bolsters.
Methods: Thirty-one consecutive patients underwent laparoscopic partial nephrectomy with hilar clamping. Cold scissor dissection was performed followed by suture repair using 0 Vicryl suture on a partially straightened CPX needle. The needles were placed under the surface of the tumour bed in an overlapping horizontal mattress fashion and secured with LapraTy suture clips. The hilar clamp was released and additional sutures were placed across the tumour bed when necessary. Gelatin matrix sealant and Surgicel gauze were placed over the resection bed only after comfirming complete hemostasis. The collecting system was not repaired separately even when entry into the collecting was clearly noted.
Results: The mean patient age was 60 years (30–92 yr). There were 18 left-sided and 13 right-sided tumours. Mean tumour size was 2.3 cm (0.6–5.4). Thirteen tumours were located on the posterior surface of the kidney. Mean total operative time was 219 minutes (142–333 min). Mean warm ischemia time was 23 minutes (0–40 min). Mean blood loss was 316 mL (30–1000). Renal carcinoma was identified in 22 (71%) patients. All margins were negative. Mean length of stay was 1.6 days (1–6 d). No patient in this series required intraoperative transfusion; however 1 patient experienced delayed bleed requiring 4 units of blood. No patient developed a urine leak.
Conclusion: Hilar clamping and cold scissor dissection provide a clear view of the dissection plane through normal renal parenchyma, avoiding positive margins. Our suturing technique simplifies the reconstruction, achieving hemostasis and preventing urine leaks without use of bolsters.

14
Construct validity of the biometric smoothness in the ProMIS system: impact evaluation in a urology training program

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Background: The use of simulation for the advancement of laparoscopic skill among urology residency programs continues to advance. One purported benefit of simulation is that it allows for objectification of technical skill, enabling the documentation of performance improvements as experience increases. The aim of this study was to demonstrate the construct validity of the instrument smoothness parameter in the ProMIS (Haptica Ltd., Dublin, Ireland) augmented reality simulator using 5 standardized laparoscopic suturing tasks.
Methods: Fourteen urology residents ranging from R5–R1 were assessed using the ProMIS system on 3 occasions using 5 standardized laparoscopic tasks, including peg transfer, intra and extra corporeal suturing, vessel cannulation and laparoscopic cutting. Smoothness of movement was measured by detecting the changes of instrument velocity over time (unitless) for each task. The values were recorded and subjected to statistical analysis using the Student's *t* test. Senior residents with standardized laparoscopic experience greater than 50 hours were compared to junior residents with less than 50 hours of cumulative experience.
Results: The senior resident cohort demonstrated superior laparoscopic smoothness of movement in all 5 standardized laparoscopic tasks, demonstrating strong statistical significance ($p < 0.05$). This was further reflected in an improvement in overall task completion among the senior resident cohort as compared to the junior resident cohort. The senior resident group also demonstrated greater consistency of movement in this parameter, as evidenced by the standard deviations across tasks. This resulted in a 38% reduction in unnecessary laparoscopic instrument manipulation.
Conclusions: These preliminary results of construct validity for the smoothness biometric parameter of the ProMIS simulator demonstrate its ability to distinguish between more experienced and novice urologic laparoscopists in an urology teaching program. This is a compelling feature of ProMIS that should facilitate its further incorporation into urology training programs worldwide. It further demonstrates that ProMIS can be used to assess, train and follow a variety of laparoscopic technical skills, and will enhance efficiency of laparoscopic movement, and possibly decreased operative time for patients.

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Laparoscopic partial nephrectomy: functional and oncologic outcomes with up to 6 years follow-up

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Background: We present functional and oncologic outcomes of laparoscopic partial nephrectomy from one institution with a follow-up of up to 6.5 years.
Methods: Ninety-four patients underwent laparoscopic partial nephrectomy between August 2000 and September 2006. Of these, 53 patients with at least 1 year follow-up were included in this study. Mean patient age was 62.5 years. In 4 (7.5%) of the cases indication for partial nephrectomy was imperative. Mean tumour size was 2.4 cm (range 0.6–4.3). In 46 (86.8%) of the cases, postoperative histopathological examination was positive for renal cell carcinoma. A 2-tailed paired *t* test or Wilcoxon signed rank test were carried out for pre- and postoperative continuous parameters' comparisons. A *p* value inferior to 0.05 was considered statistically significant.
Results: Median follow-up was 36 months (mean 35.9; range 12–79 mo). Calculated creatinine clearance (CCT) decreased from a mean of 87.0 mL/minute preoperatively to 74.5 mL/minute in the immediate postoperative period ($p < 0.001$). Three months following the surgery, CCT improved significantly to 80.8 mL/minute ($p < 0.003$). Postoperative nuclear scans showed functional kidney moiety in all but 1 case. A mean calculated postoperative split MAG-3 clearance was significantly lower on the operated side than on the contralateral side (74.0 mL/min v. 110.7 mL/min respectively; $p < 0.001$). However a mean postoperative peak concentration time was similar on the both sides (6.42 min v. 6.05 min; $p = 0.652$). The rate of positive surgical margins was 2.2% (1 patient). No cases of disease progression, local or port-site recurrence were observed. Two patients (3.8%) died 11 and 20 months after the surgery of unrelated causes. Overall survival was 96.2% and disease-free survival 100% at a median of 36 months of follow-up.
Conclusions: At a median follow-up of 3 years, laparoscopic partial nephrectomy demonstrates oncologic and functional results similar to that of open surgery.

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Percutaneous surgery for treatment-resistant biliary calculi

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Background: Patients that have failed open or endoscopic (ERCP) treatment of biliary stones have few remaining treatment options. Due to extensive experience with percutaneous treatment of renal calculi, these patients may also be referred to urologists following percutaneous biliary tract drainage. Here we report the results of all biliary calculi treated by endourologic methods at a single institution over the past 10 years.
Methods: We conducted a retrospective study of all patients that underwent percutaneous, endoscopic treatment of biliary calculi since January 1, 1997. Both hospital and clinic charts were systematically reviewed. We investigated both the endoscopic technique used as well as type and location of tract as predictors of success. Primary outcomes of interest were symptom and stone free rates, length of hospital stay and complications.
Results: Over the past 10 years, 17 patients underwent 19 percutaneous treatments of their biliary calculi. The primary indication for treatment was: cholangitis (5), retained stone (10), and biliary colic (2). Of these, 15 patients (88.2%) had failed prior endoscopic or open attempts at treatment of their stones, while the remaining 2 patients (11.8%) were unable to tolerate a general anesthetic. Patients had experienced a mean of 1.79 prior failed attempts at stone removal. Several treatment modalities were utilized including Ho:YAG laser (68.4%), electrohydrolic lithotripter (15.8%), ultrasound (10.5%), basket extraction (10.5%) and balloon dilatation of the ampulla (21.1%). Overall, treatment led to symptom relief in 84.2% of patients and 73.7% were stone-free. Biliary tract imaging was conducted an average of 20.9 days after treatment. Average length of hospital stay was 1.97 days. One patient experienced a perioperative AMI and another prolonged biliary drainage. Both had successful endoscopic treatment of their calculi. There were no cases of treatment-related sepsis and no other complications were observed.
Conclusions: Biliary calculi may be successfully treated using standard endourologic methods with high stone-free rates. This technique is generally well-tolerated even among high-risk patients.

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Intraoperative imaging of renal cortical tumors using near infrared fluorescence of intravenous indocyanine green

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Background: Near infrared fluorescence (NIRF) of indocyanine green (ICG) has proven useful in the detection and treatment of various malignancies including breast and brain tumours. The objective of this study was to determine if renal cortical tumours can be detected by laser-induced NIRF of intravenous (IV) ICG.
Methods: Ten patients undergoing radical (2) or partial (8) nephrectomy had NIRF intraoperative imaging of their renal tumours following intravenous injection of ICG. After kidney mobilization, approximately 10 mL (2.5mg/mL) of ICG was injected intravenously. Shortly after injection, NIRF was recorded using a LUNA NIRF system (Novadaq Technologies Inc., Mississauga, Canada).
Results: All tumour and non-tumorous lesions were clearly delineated by NIRF in the partial nephrectomy patients. Mean tumour size was 3.6 cm (range 1.5–6.5 cm). A total of 14 lesions were found in 10 patients (9 solid and 5 cystic). All tumours (clear cell [8], papillary renal cell [2], chromophobe renal cell carcinoma [1]) were seen as hypo- or non-fluorescent areas which were clearly demarcated from the surrounding normal parenchyma. Benign cysts were characterized by increased fluorescence compared to the normal parenchyma. Simple, thick walled cysts had similar characteristics to normal parenchyma. Tumors examined during radical nephrectomy were not well visualized because of the thick layer of perinephric fat preventing NIRF detection. NIRF microscopy confirmed ICG presence in normal parenchyma, and less fluorescence inside tumorous tissue. H&E histopathology confirmed differential ICG fluorescence in tumour versus normal renal tissue. All surgical margins were negative and averaged 4 mm (range 2–10 mm). Intravenous ICG administration resulted in no hypersensitivity reactions or changes in postoperative hepatic or renal function.
Conclusions: NIRF after IV ICG permits accurate intraoperative detection of renal cortical tumours during partial nephrectomy. This modality may permit urologists to diagnose additional lesions, decrease positive surgical margin rates, and minimize resection of normal parenchyma thus preserving renal function.

18
Robot-assisted radical cystectomy and lymph node dissection: Is there a learning curve?

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Background: A learning curve was sought for robot-assisted radical cystectomy for surgical treatment of invasive bladder cancer.
Methods: Between October 2005 and March 2007, 45 patients underwent robot-assisted radical cystectomy (RARC) and pelvic lymph node dissection. Diversion was performed open. Preoperative parameters (age, sex and BMI) were similar in both groups. Intra-operative parameters, immediate postoperative results and oncological efficacy were used to compare the first 10 (group 1) and the last 12 patients (group 2).
Results: Total overall operative time was lower in the group 2 (441 min v. 324 min).The incision to RARC and diversion times were lower, while the robot-assisted PLND times were not different in the 2 groups (45 min v. 43 min). Overall median estimated blood loss increased in group 2 (475 mL v. 597 mL). Median hospital stay was similar in both groups (7 d). One patient was converted in the first group due to inability to tolerate steep Trendelenberg position. Two patients (group 1) with pathological disease greater than T- had positive margins while no positive margins were reported in group 2.

Table 1. Abstract 18

Complication	Group 1	Group 2
Rectal injury	0	0
Vascular injury	0	1
Ureteral stricture	0	1
Small bowel obstruction	0	0
Urinary tract infection	1	0
Pulmonary	0	0
Sepsis	0	0
Dehiscence	0	0
Wound infection	0	0
DVT	0	1
Myocardial infarction	0	0
Mortality	0	0

Conclusion: RARC was safe and feasible during the initial part of a learning curve, but increasing experience was associated with shorter operative times.

19
Evaluation of an elevated creatinine phosphokinase following da Vinci robotic assisted radical prostatectomy. What does it mean, and when should we look for it?

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Background and Introduction: Rhabdomyolysis is muscle necrosis and the release of intracellular contents into circulation which can ultimately lead to acute renal failure. This is a rare but serious complication that is most often encountered after operations in patients who have undergone prolonged procedures in exaggerated positions. We encountered several patients with rhabdomyolysis after robotically assisted prostatectomy and therefore reviewed our experience with this. The purpose of this study was to determine if a change in patient positioning would lead to lower postoperative creatinine phosphokinase levels.

Materials and Methods: The charts and records of all patients who have undergone a robotically assisted radical prostatectomy between June 27, 2005 and December 30, 2006 were reviewed retrospectively with regards to rhabdomyolysis. There were a total of 20 patients who had their serum creatinine phosphokinase (CPK) measured (elevated > 3000 IU/L). Hospital records were reviewed for, age, body mass index (BMI), OR time, EBL, patient positioning, serum creatinine and CPK.

Results: A total of 20 patients were included in the study ranging from 43–66 years of age (mean 56.7 yr). OR time ranged from 5–9 hours (mean 6.6 h). EBL ranged from 50–1300 (mean 295). The mean preoperative serum creatinine was 1.06, mean immediate postoperative creatinine was 1.32 and mean creatinine upon discharge was 1.14. The initial 10 patients included in the review were positioned in stirrups, placed on a bean bag and placed in an exaggerated lithotomy position. The mean OR time was 6.725 hours (SD 1.2 h), mean BMI 30.1 (SD 4.75) and the mean post operative CPK was 2071 (SD 2779). At the end of the review, the final 10 patients were positioned with split legs, without a beanbag and then put into the exaggerated Trendelenberg position. The mean OR time for these patients was 6.3 hours (SD 0.8), mean BMI 26.9 (SD 2.99) and the mean post operative CPK was 800 (SD 637).

Discussion: Rhabdomyolysis is a rare but serious complication that can be encountered after urological procedures. We observed elevated CPK levels, peaking 16 hours after surgery in patients placed in exaggerated lithotomy positions undergoing robotically assisted radical prostatectomies. Although 9 patients had an elevated serum creatinine postoperatively, none required dialysis and no patient experienced permanent renal damage. This data suggests that re-positioning patients leads to lower postoperative creatinine phosphokinase levels.

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Trends in the treatment of localized prostate cancer in Rochester, New York

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Background: Surgical telerobotic systems allow surgeons to visualize the operative field with great accuracy and manipulate instruments in a more intuitive and ergonomic fashion compared to pure laparoscopy. Urologic robotic surgery was adopted in Rochester, NY in 2001. Since then, Rochester urologists have been increasingly embracing robotic technology and have emphasized robotic surgery in the residency training curriculum. We retrospectively analyzed changes in treatment of localized prostate cancer as the urologic community has transitioned from an open surgical environment to a robotic one.

Methods: We retrospectively reviewed OR case logs for all surgeons performing open and robotic prostatectomies in all Rochester, NY hospitals from 2003–2006. We assessed other modalities of treatment for localized prostate cancer and analyzed the influence robotic prostatectomy had on the other modalities. The only oncologic parameter used to assess proficiency was positive surgical margin status — and was done only for those surgeons that had greater than 50 open and robotic cases. Other parameters evaluated were surgical logs of the graduating chief residents with respect to their open and robotic case numbers.

Results: Twenty surgeons in Rochester, NY regularly (> 10 cases per year) perform radical prostatectomy in Rochester's 4 hospitals. Two of the 4 hospitals have robotic systems. In 2003–2004 there were approximately 30 open radical prosatatectomies performed each month and less than 10 performed via the robotic approach. In 2006, the situation was reversed with approximately 50 robotic cases performed each month and less than 10 open cases performed. The rate of brachytherapy fluctuated over time and increased in centres without a surgical robot. The number of open prostatectomies performed in those centres without a surgical robot dropped significantly with less than 10 cases performed per year. Those surgeons that had sufficient experience with both open and robotic prostatectomies were able to at least halve their positive margin rate with this new technology ($p < 0.05$). Also notable is the significant decrease in the number of open prostatecomies performed by our graduating chief residents between 2003 and 2006.

Conclusions: Since the adoption of robotic prostatectomy in Rochester, significant changes have been seen in surgical outcomes, individual and group practice patterns, and resident training. Training of residents has become more analytical and progressive rather than intuitive. Robotic systems will continue to be an important asset in the urologic armamentarium and will likely continue to influence practice patterns and training of urologists in our community.

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Robot-assisted radical cystectomy and pelvic lymph node dissection: comparison with open radical cystectomy

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Roswell Park Cancer Institute, Buffalo, NY

Background: Few series of robot-assisted radical cystectomy (RARC) have been reported. Robot-assisted radical cystectomy was compared to open radical cystectomy at Roswell Park Cancer Institute as part of a robot-assisted surgical quality assurance program.

Materials & Methods: Robot-assisted radical cystectomy and pelvic lymph node dissection was offered to all patients who were candidates for an open radical cystectomy since October 2005. Forty-five consecutive patients from March 2002 to September of 2005 who underwent open radical cystectomy were compared to 45 consecutive patients who underwent robot-assisted radical cystectomy and pelvic lymph node dissection. Demographics, operative times, hospital course, complications and pathologic outcomes were compared in the 2 groups.

Results: Age, body mass index and ASA scores were similar between groups. The overall operative times were similar (Open: 384 min; Robot: 364 min). The 2 groups differed ($p < 0.0001$) in estimated blood loss (Open: 1731 mL; Robot: 542 mL), intra-operative transfusions (Open: 1.8; Robot: 0.3), time of removal of naso-gastric tube (Open: 5 d; Robot: 2 d), and time to diet (Open: 6 d; Robot: 4 d). The 2 groups had similar complication rates (Open: 45%; Robot: 35%). Pathologic stages were similar in the 2 groups; however, only 14 open patients had a lymph node dissection (LN yield: Open: 7; Robot: 17). Margin positive rates were 12% open and 9% robotic.

Conclusion: The early experience with robot-assisted radical cystectomy compared to open radical cystectomy showed lower blood loss and similar pathological efficacy. Careful follow-up is required in order to establish long-term oncological efficacy.

PODIUM SESSION 5: ASSORTED TOPICS
Saturday, September 8, 9:40–10:25 am

22
Long-term durability of an in-office, nonsurgical transurethral radiofrequency treatment for female stress urinary incontinence: a retrospective analysis

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Introduction and Study Objective: A transurethral radiofrequency (RF) collagen denaturation system (Renessa, Novasys Medical Inc., Newark, Calif.) has been approved for nonsurgical treatment of women with stress urinary incontinence (SUI) due to urethral hypermobility. RF energy applied through a transurethral probe heats submucosal tissue to produce collagen denaturation resulting in reduced tissue compliance without necrosis, thus distinguishing this procedure from a surgical transvaginal or laparoscopic RF tissue ablation procedure (SURx, Cooper Surgical, Lake Forest, Calif.). This retrospective study aimed to determine the long-term durability of transurethral RF collagen denaturation in women with SUI.

Methods: In a prospective, randomized, controlled clinical trial, 110 women with SUI were blindly randomized to receive RF collagen denaturation applied to the bladder neck and proximal urethra; 63 comparable women underwent identical sham treatment. All women were treated as outpatients. Ninety-one active treatment group patients were evaluated at 1 year post-treatment. Further follow-up conducted at ≥ 3 years post-treatment included 21 women who had received active treatment. Patients completed the Incontinence Quality of Life questionnaire (I-QOL), a 3-day voiding diary, and a questionnaire about satisfaction with RF collagen denaturation and other SUI treatments.

Results: Outcome measures were ≥ 10-point I-QOL improvement from baseline; any improvement from baseline at 1 year, with ongoing improvement at ≥ 3 years; and decreased number of incontinence episodes at 1 year, with ongoing decrease from baseline at ≥ 3 years. Women who had not achieved success at 1 year and sought alternative treatments were evaluated for the impact of RF collagen denaturation on subsequent treatments. No long-term safety issues were identified. I-QOL scores improved in 16 women (mean improvement 17.6), similar to results at 12 months. Twelve women (55%) had ≥ 10-point I-QOL improvement at ≥ 3 years. The majority of women were satisfied with results after 3 years. Five women with recurrent SUI symptoms had undergone additional incontinence procedures before 3-year follow-up, without negative impact.

Conclusions: Nonsurgical, transurethral RF collagen denaturation is a safe and effective SUI treatment and has demonstrated durable improvements in QOL, incontinence frequency, and patient satisfaction at ≥ 3 years post-treatment. This treatment does not negatively impact subsequent incontinence procedures.

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Videourodynamics following in-office transurethral radiofrequency collagen denaturation treatment for stress urinary incontinence

Kevin J. Cline, MD
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Introduction and Objective: Following nonsurgical, transurethral radiofrequency (RF) collagen denaturation treatment (Novasys Medical Inc., Newark, Calif.) in women with stress urinary incontinence (SUI) due to bladder outlet hypermobility, videourodynamics were evaluated.

Methods: In a prospective, multicentre, single-arm clinical trial, 137 women with SUI were treated with RF collagen denaturation applied transurethrally to the bladder neck and proximal urethra. All women were treated as outpatients. Videourodynamics conducted at baseline and at 3 months in patients at 1 study centre included abdominal leak point pressure (ALPP), cystometrogram, voiding pressure study (VPS), and urinary flow rate. Patients also completed the Incontinence Quality of Life (I-QOL) questionnaire at both time points.

Results: Eight women were available for baseline and 3-month videourodynamics. At baseline, mean ALPP was 123 cm H_2O at 200 mL and 111 at 250 mL of filling. On videourodynamics during voiding, 6 (75.0%) women had marked decensus and all had beaking. At 3 months, 3 women (37.5%) had no leaks at 200 mL, well above the baseline ALPP, and 1 woman (12.5%) had an improvement of 82 cm H_20. At 250 mL, 2 (25%) women had no leaks, and 3 (37.5%) had mean improvement of 23 cm H_20, for an overall improvement rate of 62.5% based on urodynamics. On fluoroscopy, 2 women improved from marked decensus (below pubic arch) to decensus (above pubic arch). The bladder neck was flattened during filling but showed beaking in all 8 women during Valsalva manoeuvre. Six women (75%) had improved I-QOL scores and 4 women (50%) had ≥ 10-point improvement by 3 months. Mean overall improvement was 25 points.

Conclusions: As shown in the pivotal trial at 12 months, RF collagen denaturation resulted in measurable improvement in ALPP by 3 months post-treatment in most women. Videourodyamics may demonstrate a change in bladder outlet appearance during Valsalva movements; however, change in bladder outlet appearance does not correlate to change in ALPP. This supports the proposed mechanism of action for RF collagen denaturation, which is an increase in bladder outlet and proximal urethral resistance without a direct impact on hypermobility.

24
Decrease in mortality in a contemporary series of patients with Fournier's gangrene

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Background: Mortality rates for patients with Fournier's gangrene range from 30% to 50% in the most recent published series. The Fournier's Severity Index (FSI) utilizes clinical parameters to predict mortality, based upon these rates. Treatment of Fournier's has evolved to include aggressive surgical débridement, broad-spectrum antibiotics, and intensive medical monitoring. We report the largest series of Fournier's patients to date, and hypothesize that advances in care have reduced mortality, necessitating adjustment of the FSI score as a predictive tool.

Methods: We retrospectively reviewed all patients treated at our institution from 1993 to 2006 with a diagnosis of Fournier's gangrene. Patient demographics, symptoms, comorbidities, physical exam and laboratory findings, operative records, intensive care monitoring, and all electronic hospital records were analyzed. FSI scores were calculated using admission vital signs and laboratory data. Data were stratified according to the outcomes of death ($n = 11$) or survival ($n = 57$). Data were analyzed using multivariate conditional logistic regression. For comparisons of means, 2-tailed Wilcoxon tests were performed.

Results: A total of 68 patients (mean age 55.8 ± 15.2 yr) were analyzed. The overall mortality rate was 16% ($n = 11$), with a 10% ($n = 7$) initial hospitalization mortality rate. As an isolated parameter, elevated serum lactate on admission was predictive of mortality ($p < 0.0022$). Patients with an FSI score of 7 or greater had a mortality rate 4.5 times higher than those with an FSI score < 7 ([odds ratio] OR 4.5 [95% {confidence interval} CI 1.1–17.0]). When modelled as a continuous predictor, each 1-point rise in FSI predicted a 30% increased risk of mortality (OR 1.3 [95% CI 1.1–1.5]). No other clinical parameters, alone, or in combina-

tion were statistically significant predictors of mortality.
Conclusions: While Fournier's gangrene remains a deadly disease, mortality rates have decreased by nearly 50% over reported values. The FSI remains a simple and objective method of predicting outcome in this patient population. However, unlike previous studies reporting negative outcomes in patients with FSI scores of 9 or greater, our results suggest that a lower FSI threshold of 7 may be a more accurate predictor of mortality.

25
The median lobe in robot-assisted radical prostatectomy: evaluation and management

Lawrence Jenkins, BS[1]; Mark Nogueira, MD[2]; Terence N. Chapman, MD[2]; Gregory E. Wilding, PhD[2]; Wei Tan, MA[2]; Hyung H. Kim, MD[2]; James L. Mohler, MD[2]; Khurshid Guru, MD[2]
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Background: To determine if the presence of a median lobe can be predicted preoperatively and whether its presence affects postoperative urinary function and immediate pathologic outcomes after robot-assisted radical prostatectomy.
Methods: From August 2004 to March 2007, 345 consecutive patients underwent robot-assisted radical prostatectomy at our institution. Retrospective review found that 29 (8%) had a median lobe. We compared these 29 men to 29 consecutive patients without a median lobe for preoperative clinical parameters, intraoperative parameters and pathological and clinical outcomes.
Results: Preoperative parameters: the 2 groups were similar in age, race, preoperative Gleason score and urinary bother score. Patients without a median lobe had higher clinical stage ($p = 0.043$). Of 10 patients with a median lobe who had preoperative CT scans, 7 (70%) had a visible median lobe. Intraoperative parameters: the presence of a median lobe did not increase operative time required for bladder neck dissection or anastomosis (including reconstruction). Estimated blood loss was similar between the 2 groups. Sixteen (55%) patients with a median lobe required bladder neck reconstruction compared with 1 (3.5%) without a median lobe. Methylene blue or indigo carmine was used in 10 patients with a median lobe for identification of the ureteral orifices. Postoperative parameters: the 2 groups had similar Gleason score, but patients with median lobes had larger prostates, 60.2 mL versus 26 mL ($p = 0.003$), and higher pathologic stage. Although pathologic stage was worse in men with median lobes, surgical margin status was similar. Postoperative urinary bother score and time to social or perfect continence were similar between the 2 groups.
Conclusions: Preoperative parameters cannot predict the presence of a median lobe. The presence of a median lobe does not alter pathologic outcomes or urinary function after robot-assisted prostatectomy.

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Prediction of differential renal function as determined by contrasted and non-contrasted computed tomography

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Background: Radioisotope renography is currently the gold standard determination of differential renal function. We propose the use of helical computed tomography (CT) may be a more efficient way to gain functional renal information. Previous studies have shown a highly significant correlation between contrasted spiral CT determined GFR and Tc 99m-MAG3, as well as a positive correlation between differential renal volumes and 24-hour creatinine clearances. We propose a simple method of CT evaluation to determine differential renal parenchymal volumes, whereby percentage total renal volume can then be used as a surrogate for percentage renal function.
Methods: CT and diuretic enhanced Tc 99m-MAG3 studies were performed in 23 patients with chronic obstruction. CT imaging was contrast enhanced in 17 and non-enhanced in 6. Diagnoses included UPJ obstruction in 13, nephrolithiasis in 5, ureteral stricture in 3, extrinsic compression in 1, and flank pain in 1. Measurements of renal parenchymal volume by CT used a region-based thresholding method. The products of slice thickness and area measurements were summated to obtain the renal unit volume. Each renal unit volume was converted to percentage total renal volume and correlated to percentage renal function, as calculated by Tc 99m-MAG3. Pearson's correlation coefficient, associated p values and confidence intervals were determined.
Results: A very strong correlation was observed between percentage renal function and percentage total renal volume in both contrast enhanced ($r = 0.92$, $p < 0.0001$, 95% [confidence interval] CI 0.79–0.97) and non-enhanced CT groups ($r = 0.95$, $p < 0.0001$, 95% CI 0.63–0.99). The correlation remained strong among 9 patients with a single kidney function between 6%–30% ($r = 0.80$, $p = 0.0103$, 95% CI 0.28–0.96). A subgroup of 5 patients had Tc 99m-MAG3 renography performed both before and after endoscopic or laparoscopic intervention for UPJ obstruction. Timing of functional imaging did not significantly effect correlation between percentage renal function and percentage total renal volume ($r = 0.98$, $p = 0.0037$ for early renography v. $r = 0.98$, $p = 0.0043$ for delayed renography).
Conclusions: Both contrast enhanced and non-enhanced helical CT provide a simple measure of differential renal volume which strongly correlates to differential renal function, even with a functional range < 30%. We propose renal scans are not necessary to determine differential function if a CT has been performed, and recommend CT as a single radiological diagnostic study of both anatomic and functional assessment in patients with a suspected poorly functioning kidney.

PODIUM SESSION 6: PROSTATE CANCER
Sunday, September 9, 8:00–9:00 am

27
Diagnostic confirmation in high PSA, negative biopsy patients: a pilot study on the use of fused capromab pendetide (ProstaScint) scans

Michael J. Manyak, MD, FACS[1]; Henri P. Lanctin, MD[2]; John G. Wolodzko, PhD[1]; Samuel L. Kipper, MD[2]; Greg S. Parries, MD[2]; Roy R. Brown, MD[2]; Chris W. Boelter, MD[2]
[1]Cytogen Corporation, Princeton, NJ; [2]St. Cloud Hospital, St. Cloud, MN

Background: Investigators have shown that prostate-specific membrane antigen (PSMA), expressed in the gland in prostate cancer and upregulated in patients with high grade, androgen insensitive, and metastatic deposits, predicts recurrence when overexpressed in the gland. Capromab pendetide (CP) immunoscintigraphy, which recognizes PSMA, fused with CT was used to scan men with high PSA and previous negative biopsy before repeat biopsy.
Methods: Fifteen men (age 53–74 yr) with elevated PSA (mean 6.8 ng/mL, range 4.1–15.3 ng/mL), a mean prostate volume of 61 (range 29–130) grams, and at least 1 negative biopsy underwent fused CP/CT scans before repeat biopsy (mean 17 cores). Scans guided additional biopsies evaluated by blinded independent readers.
Results: Thirteen of 15 men had evaluable fused scans with 2 inevaluable due to CT artifact. Ten of 13 had negative biopsies and 3 had moderate grade prostate cancer, 2 with a solitary small focus and 1 with 3 small foci. Five of 13 had increased focal signal intensity including 2 of the 3 with prostate cancer. All transrectal sonograms were isoechoic. Correlation of scan and pathology occurred in 9 cases (69%), 3 focally-small positive scans had negative biopsies, and 1 negative scan had a solitary small focus of cancer. All 3 patients with positive scans and negative biopsy deferred repeat biopsy.
Conclusions: Fused capromab pendetide scans may provide additional diagnostic information for patients with elevated PSA and negative biopsies suspected of harboring prostate cancer. This preliminary data warrants further investigation of increased intraprostatic PSMA signal intensity.

28
Biochemical and local control of primary prostate cancer patients treated with cryoablation and tracked with the COLD registry

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Background: The use of cryoablation as an initial treatment for localized prostate cancer has increased. The objective of this study is to report the outcomes of modern cryoablation at a large number of centres, both academic and community, which have participated in the Cryo On-Line Data (COLD) Registry.
Methods: A secure on-line database was developed consisting of case report forms designed to collect relevant pre and post treatment information for patients undergoing prostate cryoablation. Data from 1608 patients who had undergone primary cryotherapy is in the registry but this analysis includes only the 690 each of whom had a minimum 24 months of follow-up. Patients were stratified according to risk groups as follows. For low risk patients all of the following were true: PSA < 10, Gleason < 7 and stage < T2b. If a patient had a PSA > 20, Gleason > 7, or stage T2c or greater they were considered high risk. All other patients were considered moderate risk. Biochemical failure was defined according to both the original ASTRO definition (3 rises) and the 2006 updated ASTRO definition of nadir+2. Biopsy was performed at the physician's discretion, but most commonly if a patient had a rising or suspicious PSA.
Results: The average age was 67.8 ± 7.8 years. Pre treatment PSA was 9.7 ± 10.2 ng/mL, the average Gleason was 6.5 ± 1.3. Only 19.0% of patients had low risk disease, 37.7% had moderate risk disease and 43.3% had high risk. Patients were followed for 48.3 ± 26.2 months. Five year actuarial biochemical survivals and the number of patients at risk at 5 years are reported in the table. Notably, 27 of the 157 patients (17.2%) who failed according to the 3 rises definition did not have their PSA ever rise above 0.5 ng/mL. A total of 304 underwent post treatment biopsy. Of these, 53 showed evidence of disease resulting in a positive biopsy rate for those who underwent biopsy of 17.4%. The positive biopsy rate of the entire population was 53/690 (4.9%).
Conclusions: Cryoablation, as a primary treatment for prostate cancer practised over a wide spectrum of users provides durable biochemical and local control through 5 years.

Table 1. Abstract 28. Five-year biochemical survival

	ASTRO (3 rises)	ASTRO (nadir+2)
All (*n* = 227)	72.4 ± 2.0	78.9 ± 1.8
Low (*n* = 42)	78.4 ± 5.3	93.3 ± 2.5
Moderate (*n* = 93)	72.5 ± 3.6	84.6 ± 3.1
High (*n* = 73)	67.1 ± 3.3	68.2 ± 3.4

29
Androgen replacement therapy after prostate cancer

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Background: Androgen replacement therapy (ART) for hypogonadal men is widely considered to be contraindicated in patients with a history of prostate cancer, even in those who have been effectively treated and have no evidence of recurrent disease. However, there is a clear dearth of literature, and especially recent studies, to support this view. We examined our experience with ART following prostate cancer treatment for safety and efficacy.
Methods: A retrospective chart review was conducted for all patients receiving ART following definitive treatment for prostate cancer at our institution. The data was analyzed for tumour stage, grade, treatment modality, type and duration of ART, indication for ART, evidence of clinical or biochemical recurrence, as well as pre- and post-therapy testosterone levels.
Results: Nine patients, with ages ranging from 57 to 80 years (mean 67) were identified. The Gleason score of those treated ranged from 6 to 9 with a mode of 7. The cancer stages ranged from cT1c to pT3a, with all being node/metastasis negative. Five were treated with surgery alone, 3 with combination external beam radiation and androgen deprivation therapy, and one with a combination of external beam, brachyseed, and androgen deprivation therapies. The interval between definitive treatment and initiation of ADT ranged from 4 to 76 months (mean 40), with a duration of treatment ranging from 1 to 52 months (mean 25). No patients demonstrated clear biochemical or clinical recurrence. Eight of the 9 patients still have undetectable PSA levels. One surgical patient has demonstrated a very slow rise in PSA from a nadir of 0.1 to 0.18 over approxi-

mately 2 years. Therapy was efficacious by clinical and laboratory parameters for all patients, save one who was non-compliant with treatment. The only adverse reaction was polycythemia in one patient which resolved with a decrease in dosage. Indications for ART included prolactinoma, testicular failure, hypogonadotrophic hypogonadism, and permanent hypogonadism in response to androgen deprivation therapy.
Conclusions: Though this study represents the results of a small number of patients, ART was efficacious, generally well tolerated, and most importantly associated with little to no risk of recurrence of prostate cancer over a significant period of follow-up. Our series included a majority of patients with high grade and/or stage disease who also did quite well. Clearly, further studies should be performed to evaluate ART in the context of treated prostate cancer, but our series suggests ART is significantly less hazardous than previously considered.

30
Ablatherm HIFU, the Toronto experience

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Background: Ablatherm HIFU is a very popular treatment for organ confined prostate cancer in western European jurisdictions. It is approved for use in Canada and is currently undergoing FDA trials in the USA.
Methods: Patients suffering from T1 or T2 adenocarcinoma of the prostate were treated by Ablatherm HIFU at our Toronto Clinic facility. Close post treatment follow-up utilizing Q 3 monthly PSA and Q 6 monthly Quality of Life, Erectile Dysfunction, Prostate Symptom Score, and Incontinence Surveys were administered.
Results: We report on the treatment results of 111 patients with follow up of 3–21 months, (mean 7.2). 85% of patients achieved PSA nadir of < 0.5 µg/L at 3 months. QOL status was excellent and IPSS and Incontinence scores returned to base line levels within 6 months. Maitenance of erectile function was variable and requires further evaluation. No significant complications were encountered.
Conclusions: Ablatherm HIFU is a safe treatment for stage T1 and T2 adenocarcinoma prostate. Short-term treatment outcomes using PSA and survey information are encouraging. Additional follow-up and larger numbers are needed to confirm long-term efficacy.

31
Prostate brachytherapy with Cesuim-131: effects on gland volume and postoperative symptoms

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Introduction: Prostate brachytherapy is an effective treatment modality for localized prostate cancer and many patients choose brachytherapy because of its minimally invasive nature, the quick return to full activity, and the low risk of urinary incontinence. However, most men who undergo prostate brachytherapy experience bothersome voiding symptoms. Recently a new isotope, Cesium-131, has been introduced for use in prostate brachytherapy. One of the proposed benefits of Cesium-131 is that due to its shorter half life (9.7 d), the duration of voiding symptoms may be decreased. The present study evaluates the duration of urinary and bowel symptoms in men undergoing prostate brachytherapy with Cesium-131. Urinary and bowel symptoms were measured using the Expanded Prostate Cancer Index Composite (EPIC), which is a comprehensive health-related quality of life questionnaire addressing urinary, bowel, sexual, and hormonal domains.
Methods: We reviewed all cases of prostate brachytherapy with Cesium-131 performed at our institution. All patients completed the EPIC questionnaire prior to their brachytherapy procedure and at their 1 and 3 month follow-up appointments. The 1 and 3 month EPIC scores for urinary and bowel symptoms were compared to baseline scores.
Results: A total of 27 patients have undergone prostate brachytherapy with Cesium-131. Table 1 summarizes the mean EPIC urinary and bowel scores preoperatively and at 1 and 3 months postoperatively. There was a statistically significant decrease in all scores at 1 month as compared to preoperative baseline ($p < 0.05$). However, there was no statistically significant difference between the preoperative scores and the 3 month postoperative scores.

Table 1. Abstract 31. EPIC urinary and bowel scores in men treated with Cesium-131 brachytherapy

	Pre-op	1 month post-op	3 months post-op
Urinary summary	87.1	54.4	85.3
Function	93.5	72.2	91.5
Bother	82.5	41.7	81.0
Incontinence	89.8	81.3	84.5
Irritative/obstructive	85.7	41.9	89.3
Bowel summary	92.7	68.1	94.5
Function	91.3	70.2	93.8
Bother	94.4	65.9	95.2

Conclusion: In patients undergoing prostate brachytherapy with Cesium-131, postoperative urinary and bowel symptoms are not significantly different after 3 months as compared to preoperative baseline. The shorter half life of Cesium-131 appears to decrease the duration of bothersome urinary and bowel symptoms.

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Randomized trial of active cellular immunotherapy with sipuleucel-T in androgen dependent prostate cancer (ADPC)

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Background: Sipuleucel-T is an investigational, active cellular immunotherapy product for prostate cancer. To explore the potential for benefit in ADPC, sipuleucel-T was studied in a randomized, double blind, multicentre, placebo-controlled study, P-11.
Methods: Following a 3-month run-in period with hormonal therapy, men with ADPC were randomized (2:1) to sipuleucel-T or placebo. Patients underwent a standard leukapheresis in weeks 0, 2, and 4, and were infused 2–3 days later with sipuleucel-T or placebo. Patients eligible for run-in had a rise in serum prostate specific antigen (PSA) as the only sign of disease recurrence after prostatectomy. PSA kinetics were evaluated by time to biochemical failure (BF), defined as any PSA ≥ 3 ng/mL (primary endpoint), as well as PSA doubling time (PSADT). Clinical endpoints included time to distant metastases (DF) and survival. The effect of a single booster infusion of sipuleucel-T on the immune system was also evaluated.
Results: One hundred and seventy-six patients were randomized (117 sipuleucel-T:59 placebo) and analyzed by intent to treat. Median time to BF was 18.0 months for sipuleucel-T and 15.4 months for placebo (hazard ratio [HR] 0.94 [95% confidence interval {CI} 0.64–1.38]; $p > 0.05$, log rank). The hazard ratio for BF was 0.80 in favour of sipuleucel-T ([95% CI 0.53–1.20], $p > 0.05$) when the analysis was restricted to patients with a confirmed BF. An analysis of PSADT calculated from 90 days following randomization to BF or the initiation of systemic therapy demonstrated that patients randomized to sipuleucel-T had a 35% increase in PSADT (125 v. 91 d; $p = 0.046$, F test). PSADT calculated after patient testosterone recovery to baseline levels demonstrated a 48% increase in PSADT for the sipuleucel-T arm (155 v. 105 d; $p = 0.038$). Only 16% of patients developed distant metastases. The hazard ratio for time to DF was 0.78 (95% CI 0.34–1.58, $p = 0.42$, log rank). Patients are still being followed for DF and survival. The most common treatment-associated adverse events were chills, fatigue, headache, and pyrexia, which were primarily grade 1–2.

Conclusions: Time to BF was not different between the 2 study arms. The difference in PSA kinetics may suggest biologic activity of sipuleucel-T in men with ADPC. Additional follow-up for clinical endpoints of DF and survival is of interest.

33
Subsequent prostate cancer detection in patients with prostatic intraepithelial neoplasia or atypical small acinar proliferation

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Background: To evaluate the predictors of prostate cancer in follow up of patients diagnosed on initial biopsy with high-grade prostatic intraepithelial neoplasia (HGPIN) or atypical small acinar proliferation (ASAP).
Methods: We studied 201 patients with HGPIN and 22 patients with ASAP on initial prostatic biopsy who had subsequent prostatic biopsies. The mean time of follow up was 17.3 (range from 1 to 62) months; the mean number of biopsy sessions was 2.5 (range from 2 to 6), and the median number of biopsy cores was 10 (range from 6 to 14).
Results: On subsequent biopsies, the rate of prostate cancer was 21.9% (44/201) in HGPIN patients. Of these, 32/201 (15.9%), 9/66 (13.6%) and 3/18 (16.6%) cancer was found on the first, second and third follow up biopsy sessions, respectively. In ASAP patients, the cancer detection rate was 13/22 (59.1%), all of whom were found on the first follow up biopsy. There was a statistically significant difference between the cancer rate detection rate in ASAP and HGPIN patients ($p < 0.001$). Multivariate analysis showed that the independent predictors of cancer were the number of cores in the initial biopsy, the number of cores in the follow up biopsy more than 10 and PSA density ≥ 0.15 (odds ratio; 0.77, 3.46 and 2.78 respectively $p < 0.04$). On the other hand, in ASAP patients none of these variables were found to be associated with cancer diagnosis.
Conclusions: ASAP is a strong predictive factor associated with cancer when compared to HGPIN. The factors predictive of cancer on follow-up biopsy of HGPIN are number of cores on initial biopsy, > 10 cores in re-biopsy and elevated PSA density. As the cancer detection rate on repeated biopsy of HGPIN patients is the same as that of patients without HGPIN, perhaps the standard reflex of repeat biopsy in all patients with HGPIN should be revisited.

34
Pathological features of prostate cancer with previous high grade prostatic intraepithelial neoplasia (HPIN) and/or atypical small acinar proliferation (ASAP)

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Background: Follow-up of patients with high grade prostatic intraepithelial neoplasia (HPIN) and/or atypical small acinar proliferation (ASAP) based on transrectal ultrasound guided biopsy (TRUS Bx) is an important clinical issue. We reviewed the pathological features associated with detection of prostate cancer (CaP) on subsequent biopsy.
Methods: A total of 610 men (mean 61 yr) underwent repeat 8–12 core TRUS Bx between 1/2003 and 12/2004. Of the whole cohort, group 1 (G1) consists of 343 men who underwent repeat TRUS Bx for rising prostate specific antigen (PSA) levels and/or abnormal digital rectal examination (DRE) but no previous HPIN/ASAP; while 128 had previous HPIN only (G2), 89 men with previous ASAP only (G3), and 50 men had HPIN + ASAP in previous biopsies (G4). In men with positive repeat biopsy, analysis of Gleason score was done to evaluate if the presence of previous HPIN and ASAP is associated with lower or higher grade CaP.
Results: CaP detection rate on repeat Bx was 29.5% (101/343) for group 1, 14.8% (19/128) for group 2, 42.7% (38/89) for group 3, and 30.0% (15/50) for group 4. The cancer detection probability was higher for the ASAP group than the other 3 groups ($p < 0.001$). Furthermore, patients with previous HPIN and/or ASAP when they were diagnosed with CaP, their tumours were of lower Gleason score (Table 3). Out of these patients, 31 underwent radical prostatectomy. On final pathology, only 3 out of the 22 patients with Gleason score < 7 on TRUS biopsy were upgraded to 7. While 5 out of 9 patients with Gleason score ≥ 7 were downgraded to 6, only 1 patient with Gleason score of 7 was upgraded to 8.

Table 1. Abstract 34. Gleason score outcome in positive patients with previous HPIN and/or ASAP

Positive repeat biopsy ($n = 72$)	Gleason score (%)		*p* value*
	< 7	≥ 7	
Previous HPIN ($n = 19$)	15 (79)	4 (21)	0.09
Previous ASAP ($n = 38$)	27 (71)	11 (29)	0.44
Previous HPIN + ASAP ($n = 15$)	11 (73)	4 (27)	0.15

*Probability of detecting Gleason score of ≥ 7.

Conclusions: Patients with ASAP appear to have a higher risk of CaP detection on repeat biopsy. In our study, patients with previous HPIN and/or ASAP were more likely to be associated with CaP of Gleason score 6 or less. Vigilant follow-up with earlier repeat biopsies especially for patients with previous ASAP would be warranted for earlier detection of CaP.

PODIUM SESSION 7: GENERAL ONCOLOGY
Sunday, September 9, 10:00–11:00 am

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Partial cystectomy for urothelial carcinoma: 10 year experience

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Background: Partial cystectomy is a bladder sparing procedure used in the treatment of select patients with muscle invasive urothelial carcinoma. We reviewed our experience with partial cystectomy to assess local control and survival rates as well as identify pathologic predictors for recurrence.

Methods: We conducted a 10 year (1995–2005) retrospective review of patients with a diagnosis of primary bladder tumour undergoing partial cystectomy with curative intent by a single surgeon (RH) at our institution. As protocol, patients with primary solitary muscle invasive bladder tumours underwent preoperative localized radiotherapy (2000 grey fractionated over 5 doses), administration of intravesical thiotepa at the time of partial cystectomy, and postoperative intravesical BCG therapy. Data collected included tumour size, location, multifocality, histology, grade, pathologic stage, presence of carcinoma in situ (CIS), adjuvant therapy, and disease status. Data were analyzed using SAS 9.1 statistical software.

Results: Data from 25 patients' records meeting review criteria were analyzed (72% male, mean age 66.0 ± 9.9 yr). Mean tumour size was 3.2 ± 1.7 cm with solitary tumours located at the lateral (44%), dome (32%), posterior (20%), and anterior (4%) aspects of the bladder, respectively. Sixteen percent of patients had a history of a solitary superficial urothelial carcinoma treated with intravesical BCG before partial cystectomy, but no patient had CIS or multifocal tumours at TURBT. Eighty-eight percent of patients underwent preoperative radiation therapy, 100% received intraoperative intravesical thiotepa and 96% were treated with postoperative intravesical BCG to prevent recurrence. At a mean follow-up of 42.2 ± 31.9 months, recurrence-free, disease-specific, and overall survival were 72%, 84%, and 76%, respectively. At a mean of 20.2 ± 15.8 months, 8% (n = 2) recurred superficially and were treated with TURBT and intravesical chemotherapy. Twenty percent recurred with locally advanced tumours (n = 4) or visceral metastasis (n = 1) and were treated with systemic chemotherapy and/or local resection (2 patients progressed to cystectomy). No individual pathologic variable was associated with tumour recurrence.

Conclusions: Partial cystectomy offers adequate control of localized muscle invasive urothelial carcinoma in carefully selected patients with solitary primary tumours. Lifelong follow-up with cystoscopy and abdominal imaging is recommended to detect recurrence.

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Laparoscopic nephrectomy and resection of retroperitoneal lymph nodes for renal carcinoma is safe and feasible

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Background: For patients undergoing open radical nephrectomy (Nx) for renal cell carcinoma (RCC), retroperitoneal lymph node dissection (LND) improves staging accuracy. However, the safety and feasibility of performing laparoscopic (LAP) LND at the time of Nx has not been established.

Methods: Between September 2004 and March 2007, LAPNx and LND were attempted in all patients presenting with suspected RCC and clinically bulky lymphadenopathy and no evidence of venous involvement. Starting February 2006, all patients undergoing LAPNx also received LND regardless of the clinical node status. The LND on the left included the para-aortic and preaortic nodes, and on the right included the paracaval and precaval nodes. In 7 cases the interaortal caval nodes were also dissected.

Results: A total of 102 patients underwent LAP radical Nx during the study period, and 49 patients also underwent LAPLND. For the LAPLND group, the mean age was 66 (37–88). Twenty-eight tumours were left-sided. The mean OR time was 219 minutes (148–347 min), the mean EBL was 242 mL (10–4500 mL), and the mean hospital stay was 2.1 days (1–14 d). The mean size of the primary tumour was 7 cm (1.5–23 cm). The histology was RCC in 46 (94%) and benign in 3 (6%). For the malignant tumours, T-categories included T1 (23), T2 (8), T3 (14) and T4 (1). The mean number of nodes examined on the left and right were 9 and 3, respectively. For patients with clinically bulky nodes, the mean size of the largest node was 5 cm (2–8 cm). Four patients (8%) were M1 and 45 (92%) were M0. Nuclear grade was assessed as high grade in 20 (50%) cases and low grade in 20 (50%). One patient with bulky adenopathy extending across the midline required open conversion and repair of an injury to the contralateral renal artery; this patient was the only patient that required transfusions. Other complications included prolonged ileus (1), pneumothorax (1), pleural effusion (1), port site hernia (1), malignant ascites (1) and chylous ascites (1). There was no statistically significant difference in these preoperative and postoperative characteristics when comparing patients with clinically negative nodes undergoing LAPLND with patients undergoing LAPNx alone; however, 4 (8%) patients with clinically negative nodes had N+ RCC while no patients undergoing LAPNx alone were identified to have N+ RCC (p = 0.008).

Conclusions: LAPNx and LND is safe and feasible even when bulky adenopathy is present, and affords patients advantages of minimally-invasive surgery. LAPLND improves staging of nodal disease.

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Pathological upstaging in clinically localized renal tumor: Is it a concern?

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Background: The treatment approach for renal cell carcinoma (RCC) depends mainly on the clinical stage of disease while the 5-year cancer specific survival is determined mainly by the pathologic staging. Clinical staging relies primarily on computerized tomographic (CT) scanning or magnetic resonance imaging (MRI). However, neither modality can identify microscopic tumour invasion beyond the renal capsule. In this study we assessed the outcome of pathologic T3 RCC that were upstaged from clinical T1 or T2 disease to those with both clinical and pathologic T1 or T2 disease.

Methods: A total of 709 patients who underwent radical or partial nephrectomy from 1994–2006 were considered in the study. All patients underwent preoperative CT or MRI for clinical staging. Only clinical T1–2 diseases were included in our study. Postoperative tumour size, pathologic stage together with survival data were determined.

Results: A total of 360 patients with clinical T1 (278) or T2 (82) underwent radical or partial nephrectomy in our institution were included in the study. Partial nephrectomy was done for 25% of the patients and 29.5% of the patients underwent laparoscopic surgery. Final pathological staging showed that 66 (18.3%) patients were upstaged to pT3a, 39 of those were cT1 (14%, 39/278) and 27 were cT2 disease (33%, 27/82). Mean tumour size ± SD was 5.1 ± 3.3 cm for pT1–2 lesions and 7.3 ± 3.7 cm for pT3 lesions (p < 0.0001).The 5-year recurrence-free rate was 92.7% and 66.8% for pT1–2 and pT3 patients, respectively (p < 0.0001).

Conclusions: Pathologic upstaging of renal cell carcinoma is a common finding in patients diagnosed with clinically localized renal tumours and it has significant impact on progression-free and survival outcome. Vigilant clinical staging through CT/MRI imaging is warranted. In addition, the possibility of pathologic upstaging and its effect on the clinical outcome should be considered when counselling patients especially when considering active surveillance of those patients.

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Utility of urinary cytology in the workup of asymptomatic microscopic hematuria

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Background: Patients with asymptomatic microscopic hematuria represent a large number of new referrals. Current recommendations include upper tract imaging, cystoscopy, and cytological evaluation of voided urine. While cytology has been validated for use in patients with a history of urothelial malignancy, its use in patients with asymptomatic microscopic hematuria is controversial; this stems from its low sensitivity and high relative cost. We evaluated the utility of urine cytology in a cohort of consecutive patients, specifically assessing the performance characteristics while analyzing the cost to benefit ratio.

Methods: One hundred and eighteen consecutive patients with asymptomatic microscopic hematuria were referred to a urology clinic (university based) from August 2005 to December 2006. All patients underwent investigation with cystoscopy, upper tract imaging (either by abdominal ultrasound, intravenous pyelogram, or enhanced CT with delayed images), and urine cytology evaluated by an experienced staff cytopathologist. Results of urine cytology were classified as positive (evidence of malignant cells), atypical (degenerated, nondiagnostic), or negative.

Results: One hundred and eighteen patients completed the hematuria evaluation. Of the 118 patients, none had a positive cytology, 21 (18%) had an atypical (or non-diagnostic) cytology, and 97 (82%) had a negative urinary cytology. Of the 118 patients, 8 (7%) were found to have a transitional cell carcinoma (TCC) of the bladder, while no patient was found to have a lesion of the upper urinary tract. Four of seven lesions were pTa, while 4/7 tumours were pT1. Of the 21 patients with an atypical urinary cytology, 4 (19%) were found to have bladder tumours, while the other 4 patients with tumours had negative cytology. If we define an atypical cytology as positive, the sensitivity, specificity, positive and negative predictive values of cytology were 50%, 85%, 19%, and 96%, respectively. If we define an atypical cytology as negative, the sensitivity, specificity, positive and negative predictive values of cytology were 0%, 100%, 0%, and 93%, respectively. The cost of performing an individual urinary cytology was estimated at $175.

Conclusions: While this study demonstrated a role in evaluating patients with microscopic hematuria in general (7 patients with TCC), there were no overtly positive cytology results, and thus this aspect added no diagnostic benefit while being associated with a significant cost. The high specificity further supports the use of cytology as an adjunct to surveillance protocols in patients with a history of urothelial cancer. However, urinary cytology may be omitted from the workup of patients with asymptomatic microscopic hematuria.

39
Cystectomy: time and treatment factors affecting tumour progression

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Background: Intravesical BCG is first line therapy for many patients with high-risk non-invasive bladder cancer and has been shown to significantly decrease subsequent progression. Given the morbidity of a cystectomy, the decision to proceed as primary curative therapy for high-risk disease (T1G3), or to proceed after a failure after 1 course of intravesical therapy, is difficult. Whether repeated attempts at bladder preservation result in an increased risk of pathologic upstaging and decreased survival remains debatable. The purpose of this study was to determine factors predictive of clinical-to-pathological upstaging, particularly repeated courses of intravesical therapy for bladder preservation.

Methods: A retrospective chart review of all patients in a single centre who received intravesical therapy for bladder cancer and who subsequently underwent cystectomy between 1990 and 2006 was performed. For the purpose of statistical analysis, clinical and/or pathological states of T2, N0 and less disease were grouped into "low TN stage," and T3, N1 or higher were grouped into "high TN stage."

Results: The chart review identified 44 patients who met inclusion criteria, although 6 had insufficient records for analysis. Upstaging following cystectomy was seen in 42% of the cystectomies performed. No association was found between upstaging and age, length of time from first TURBT to cystectomy, number of cycles of intravesical therapy or number of TURBTs. No statistical significance was found between time to recurrence after cystectomy and age, length of time from first TURBT, number of intravesical therapy cycles, or number of TURBTs.

Conclusions: Despite an apparent aggressive bladder preservation approach to high-risk non-invasive bladder cancer, we have demonstrated only a 42% upstaging rate at the time of cystectomy, in line with results in the literature. Length of time between first TURBT to cystectomy, number of cycles of intravesical therapy and number of TURBTs do not appear statistically significant in affecting pathological upstaging or time to recurrence following cystectomy.

40
Clinical grading and staging of prostate cancer is relatively inaccurate, but still provides important value for intraoperative planning

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Background: Preoperative clinical staging before radical prostatectomy is important for intraoperative planning. Preoperative clinical staging, however, often does not correlate with postoperative pathological staging information. We sought to evaluate clinical and pathologic variables and pathologic outcomes in patients undergoing robot-assisted radical prostatectomy (RARP).

Methods: All patients undergoing RARP by a single surgeon from July 2003 until March 2007 were evaluated. Patients were divided into 2 groups based on clinical stage, group 1 included patients with clinical stage T1c and group 2 patients with clinically palpable disease. These groups were compared with respect to preoperative, intraoperative, pathologic, and postoperative parameters.

Results: A total of 883 patients who underwent RARP had clinical staging information available (see Table). There were 652 patients who had no clinically palpable disease, whereas another 231 had abnormal digital rectal examination. When comparing pathologic and clinical Gleason scores, there were 37.7% of patients whose prostatectomy Gleason score was different than the biopsy Gleason score: 0.9% were downgraded by 2 points and 7.7% by 1 point, 26.4% were upgraded by 1 point, 2.2% by 2 points, 0.1% by 3 points, and 0.3% by 4 points. These percentages in grade change were equivalent in both groups. Overall, clinical and pathologic Gleason scores were higher in group 2 than in group 1 ($p < 0.01$). Group 2 had substantially fewer patients with pT2 disease, and almost twice as many patients with pT3 disease. The positive margin rate was slightly higher in group 1 than in group 2. However, bilateral sparing of the neurovascular bundles was performed in the patients in group 2 less than half as often as in group 1. The PSA recurrence rate was over 2 times higher in group 2 than group 1.

Conclusions: Clinical staging is helpful in identifying patients at higher risk of having extraprostatic disease, allowing modification of surgical technique to limit positive surgical margins. Given the lack of intraoperative tactile feedback with laparoscopic or robot-assisted procedures, DRE under anesthesia before surgical draping is recommended to allow a more thorough assessment of abnormalities in the gland.

Table 1. Abstract 40.

	Negative rectal examination (Clinical stage T1c) (*n* = 652)	Positive rectal examination (Clinical stage T2 or T3) (*n* = 231)
Clinical stage (patients)	T1c (652)	T2 (230), T3 (1)
Age (yr)	59.8 (40–76)	60.9 (42–78)*
Body mass index (kg/m^2)	28.7 (18–54)	28.2 (20–40)
Preoperative PSA	6.6 (0.1–39)	6.2 (0.1–38.1)
Total operative time (min)	192 (91–486)	189 (102–415)
Estimated blood loss (mL)	189 (20–1400)	190 (25–1100)
Prostate weight (g)	56.7 (21–165)	52.7 (25–141)*
Clinical Gleason score	6.3 (4–9)	6.4 (5–8)*
Pathologic Gleason score	6.5 (4–9)	6.7 (5–10)*
Pathologic stage		
pT0	3 (0.5%)	1 (0.4%)
pT2	541 (82.8%)	160 (69.0%)
pT2a	119 (18.2%)	32 (13.8%)
pT2b	32 (4.9%)	14 (6.0%)
pT2c	390 (59.7%)	114 (49.1%)
pT3	106 (16.2%)	69 (29.7%)
pT3a	92 (14.1%)	50 (21.6%)
pT3b	14 (2.1%)	19 (8.2%)
pT4	2 (0.3%)	1 (0.4%)
Bundle sparing		
Non-sparing/partial	17.9%	24.8%
Unilateral sparing	26.3%	53.5%
Bilateral sparing	55.8%	21.7%
Positive margins	85 (13.0%)	25 (10.8%)
PSA recurrence rate	16/387 (4.1%)	13/122 (10.7%)

*$p < 0.05$ compared to group 1.

41
Robotic cystectomy: a potential option for cancer care

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Introduction: We report our initial experience with robotic radical cystectomy (RC) describing stepwise the surgical procedure and evaluating perioperative and pathologic outcomes.
Methods: Twenty-six patients underwent RC with various urinary diversions. The stepwise operative procedure is described in detail and shown in the video. Operative variables, hospital recovery, pathologic outcomes, and complications were evaluated for all patients.
Results: The data from 22 male and 4 female patients with a mean age of 65 years (38–86 yr) was examined. Average BMI was 27.6 (20–38). Over 90% of patients presented with hematuria and the most common pathologic entity warranting cystectomy was TCC (TCC in 22 patients; urachal anomalies/carcinoma in 3; and 1 patient with neurogenic bladder). Of the 22 patients with TCC, pathology demonstrated 14 patients having Tis or ≤ pT2, 6 patients with pT3, and 2 patients with T4 disease. The average OR time, including urinary diversion, was 5.5 hours (4–8.5 h). Mean estimated blood loss was 214 mL (100–500 mL). The majority of patients received ileal conduits ($n = 20$), while 4 patients had neobladders, and 2 had Indiana pouches. In most cases the urinary diversion was performed extracorporeally. In no case was there inadvertent entry into the bladder during surgery. Our positive surgical margin rate was 14% and lymph nodes were positive in 27% of patients. Lymph node count increased with every 10 cases. There were no transfusions and the average hospital stay was 10 days (4–25 d). The most common postoperative complication was UTI (4); other complications included ARF (1), anastomotic leak (1), prolonged ileus (2) and DVT (1).
Conclusions: Our initial experience with RC appears to be favourable with acceptable operative, pathologic, and short-term clinical outcomes. As our experience increases, we expect further refinement to our surgical technique and reduction in operating room times. Larger experiences are required to adequately evaluate and validate this procedure as an appropriate surgical and oncologic option for the bladder cancer patient.

42
In vitro proliferative effects of green tea: potential dietary intervention therapy for bladder cancer

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Background: Green tea consumption has increased considerably in the United States over the past several years. The inhibitory effects of green tea and its associated components on the growth of various cancers, including bladder cancer (BlCa), have been reported. However, their therapeutic use in the prevention/treatment of BlCa has not been fully evaluated in either experimental or clinical studies. Consequently, due to their promising anticancer properties, we investigated the antiproliferative effects of green tea extract (GTE) and 2 major GTE catechin components, ECG and EGCG, on proliferation of normal and malignant human bladder urothelial cells in vitro.
Methods: Cell proliferation was measured in UROtsa (normal; $n = 4$), SW780 (tumorigenic; low-grade; $n = 3$), and TCCSUP (tumorigenic; high-grade; $n = 3$) human bladder urothelial cells by XTT assay after treatment with 0–200 µg/mL GTE, ECG, or EGCG for 72 hours.
Results: We observed that GTE significantly inhibited the growth of UROtsa ($EC_{50} = 13.4$ µg/mL, $p < 0.001$) and TCCSUP ($EC_{50} = 20.7$ µg/mL, $p < 0.001$) cells in a dose-dependent manner, while growth inhibition of SW780 ($EC_{50} = 5.0$ µg/mL, $p < 0.001$) cells remained stable within the physiologic dose range of GTE (10–40 µg/mL). ECG also inhibited both UROtsa ($EC_{50} = 11.7$ µg/mL, $p < 0.001$) and TCCSUP ($EC_{50} = 18.0$ µg/mL, $p < 0.001$) cells within the physiologic range, however, the effect was absent at higher doses. EGCG significantly inhibited the growth of TCCSUP ($EC_{50} = 12.2$ µg/mL, $p < 0.001$) cells at all concentrations, while it did not have a significant anti-proliferative effect on UROtsa or SW780 cells.
Conclusions: Our results demonstrate that GTE, along with ECG and EGCG catechins, can modulate growth of both normal and tumorigenic human bladder urothelial cells in vitro. We believe that nutrient supplementation with catechin compounds via dietary consumption may be a viable preventative and therapeutic modality for the treatment of human BlCa. Current studies with additional catechin/GT compounds are ongoing that will determine whether or not: 1) similar growth effects are seen in other low/high-grade BlCa cell lines or primary cell cultures, and 2) GTE, ECG, and EGCG regulate expression of various growth factors.

MODERATED POSTER SESSION 1
Friday, September 7, 1:30–2:30 pm

P1
Protective effects of NSAIDS on prostate cancer progression: a population-based study

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Background: Pre-clinical investigations have demonstrated a benefit of nonsteroidal anti-inflammatory drugs (NSAIDs) by inhibiting oncogenesis and epidemiologic studies have confirmed a possible role of NSAIDs as a chemopreventative agent. However, evidence for a significant effect of this class of drugs on prostate cancer progression is lacking. We determine the effect of NSAID use on indicators of prostate cancer progression in men treated with radical prostatectomy, including the effect on pathologic findings and survival.

Methods: Cross-sectional and case-cohort designs were used to assess the effect of NSAIDs on indicators of prostate cancer progression, including grade of disease and disease-specific survival. The study population consisted of 2009 men treated by radical prostatectomy between 1990 and 1998 and sampled from regional cancer centres in Ontario. It was comprised of 1619 randomly selected patients (subcohort) and 453 prostate cancer mortality cases. Ordinal multivariate logistic regression was used to assess Gleason score at diagnosis. Cox proportional hazards regression modeling was used to compare disease-specific mortality across NSAID usage.

Results: Patients who used NSAIDs prior to diagnosis were more likely to have a Gleason score of 2 to 6 relative to 8 to 10 (adjusted odds ratio [OR]: 0.74), though this association was not statistically significant (95% confidence interval [CI]: 0.47–1.17). This trend was more pronounced among a middle tertile age group of 65 to 70 years (OR: 0.43, 95% CI: 0.18–1.02). Case-cohort survival analysis did not reveal a protective benefit to having used NSAIDs prior to diagnosis (hazard ratio [HR]: 1.01, 95% CI: 0.77–1.31). When inclusion was limited to those that had survived to at least 5 years follow-up, a slight trend toward a reduced risk of prostate cancer death among NSAID users was noted (HR: 0.83, 95% 0.51–1.31).

Conclusions: No statistically significant association of NSAID use and disease-specific survival was shown in this population-based study, although there was a trend to a protective benefit on Gleason score for men treated curatively with radical prostatectomy. Further investigation into the protective effect of NSAIDS on prostate cancer progression, particularly on pathologic variables, is warranted.

P2
Drainage characteristics of the horseshoe kidney: What is typical?

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University of Pittsburgh Medical Center, Pittsburgh, PA

Background: The horseshoe kidney is a common congenital renal malformation, present in approximately 1 in 400. Clearly, a significant feature frequently found in the horseshoe kidney is dilation and poor emptying of the renal pelvis. Yet little has been published specifically describing typical drainage characteristics of this anomaly, particularly in adults.

Methods: A retrospective review of 2201 nuclear renograms was performed in order to identify those with a horseshoe anomaly. Data was collected regarding presenting symptom, drainage characteristics, and differential function.

Results: A total of 49 studies were identified (31 MAG3, 17 DMSA and 1 glucoheptinate renograms) representing 19 patients (63% male), thus 38 evaluable renal units. The mean and median patient age was 31 years. The most common presenting symptoms were incidental discovery in 5 (26%), hematuria in 4 (21%), and nephrolithiasis in 3 (16%). The median $t^{1}/_{2}$ was 11 minutes. Eleven units (29%) had a $t^{1}/_{2}$ > 20 minutes, and 4 units (11%) showed no clearance at all. A right dominant moiety was present in 53% of patients. Relative function difference (the difference in function between the dominant and non-dominant side) was 24% and the median was 12%. The number of patients with a relative function difference > 10% was 11 (58%).

Conclusions: Horseshoe kidney is associated with fairly high rates of poor renal drainage and decreased differential function. These data can help physicians guide management and counsel patients regarding typical function of the horseshoe kidney.

P3 — Withdrawn

P4
Intermittent torsion of the spermatic cord has high risk of acute testicular infarction

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Objectives: Despite prompt surgical intervention, acute torsion of the spermatic cord (ATSC) results in testicular infarction in 40%–60% of cases. Intermittent torsion of the spermatic cord (ITSC), defined as torsion and subsequent spontaneous detorsion, may be antecedent to a future episode of ATSC and thus is a premonitory event. We compared the outcomes of boys with ITSC treated electively by testicular fixation with boys with a history of recurrent scrotal pain who required emergent operation for ATSC.

Methods: A retrospective chart review revealed 17 boys with recurrent scrotal pain who required emergency operation for ATSC (emergency group), and 30 boys with recurrent scrotal pain who were operated on electively for ITSC (elective group). The clinical presentation, number of recurrent painful episodes (RPE), lead time to operation, prior alternate diagnoses, intraoperative findings, and clinical outcome were recorded. A single-tailed *t* test between 2 unpaired groups with equal variances was performed to determine statistical significance between the 2 groups.

Results: There were a mean number of RPE of 2 in the elective group and 3 in the emergency group ($p < 0.025$). In the elective group, all boys were cured of pain after bilateral testicular fixation with no subsequent episodes of pain or acute torsion, with 100% testicular preservation at a mean of 4 months follow-up. In the emergency group, 47% of the symptomatic testes were lost secondary to gross infarction at operation, and 33% of the preserved testes were atrophied at a mean of 8 months follow-up. Intraoperatively, an ipsilateral bell-clapper deformity (BCD) was found in all of the boys in both groups. A contralateral BCD was noted in 90% and 88% in the elective and emergency groups, respectively. Ninety-four percent of the emergency group and 23% of the elective group were diagnosed on previous occasions with testicular pain thought to be secondary to processes other than torsion.

Conclusions: When diagnosed accurately, ITSC can be treated by elective testicular fixation with an excellent outcome. A misdiagnosis may create a cohort of boys with ITSC at risk for acute torsion and potential testicular loss. ITSC should be foremost on the minds of health care providers involved in the care of boys with recurrent scrotal pain. Urologists should be proactive in recommending elective scrotal exploration when ITSC is a likely clinical diagnosis, with the addition of contralateral scrotal exploration if an ipsilateral bell-clapper deformity is found.

P5
Significance of initial meatal position in proximal hypospadias: a multivariable analysis of factors associated with complications after transverse island flap (TVIF) repair in 137 patients

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Background: Historically, proximal hypospadias has been considered a single defect without precise regard for initial meatal position. It has been reported that division of the urethral plate (i.e., onlay v. tube urethroplasty) and severe ventral curvature (sVC) are associated with higher complication rate. We sought to determine the risk factors for complications after TVIF repair in children with proximal hypospadias in order to establish the most important determinants of outcome.

Methods: We retrospectively reviewed the charts of 137 boys who underwent TVIF repair and sVC correction from 1998 to 2005. Of these, 108 (78.8%) had preoperative proximal penile/penoscrotal and 29 (21.2%) scrotal/perineal hypospadias. Associated anomalies (AA) included > 1 of: uni/bilateral cryptorchidism (17/7), bifid scrotum (83), and ambiguous genitalia (22). Preoperative testosterone (pT) was used in 51/137 patients. Univariate and multivariable analyses of the data were performed.

Results: Mean age at surgery was 19.4 months (9–40); mean follow up was 61 months (10–104). Of 137 boys, 91 (66.4%) underwent onlay and 46 (33.6%) tube (i.e., urethral plate divided) repairs. sVC (> 45°) was found in 85 (62%) cases. Children with scrotal/perineal defects received pT more often than those with proximal penile/penoscrotal cases (72.4% v. 27.2%, $p < 0.01$). Complications occurred in 64/137 (46.7%) patients: fistula (26), dehiscence/breakdown (9), stricture (3), meatal stenosis (2), diverticulum (1) and recurrent VC (23). Although onlay was associated with more recurrent VC, and tube TVIF repair with more fistulas, the overall complication rate was similar for both techniques. Thus, when assessed by univariate analysis, pT and tube urethroplasty had no impact on outcome while proximal meatal position ($p = 0.02$), sVC ($p = 0.05$) and AA ($p = 0.04$) were associated with a higher overall complication rate. However, by multivariable analysis, only the preoperative meatal location was found to be associated with complication after TVIF repair ($p = 0.038$).

Conclusions: In a multivariable analysis, the complication rate after TVIF repair for proximal hypospadias was significantly associated with meatal location only. When adjusted for the initial position of the meatus, variables previously felt to be clinically relevant — the type of urethroplasty, the decision to use pT or not, or sVC — were not found to be statistically associated with overall complications. Thus, initial meatal position may be a marker of an underlying penile anatomy predisposed to more complex healing and complications.

P6

Third trimester ultrasound of fetal pyelectasis: predictor for postnatal surgery

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Background: The ability to predict the surgically relevant fetal renal pyelectasis is limited. We sought to determine if the intrauterine timing of prenatal pyelectasis can predict the need for postnatal surgery.

Methods: We retrospectively reviewed all patients with ultrasound measurements of the fetal renal pelvis during the second and third trimesters and postnatally. Pyelectasis was defined as > 7 mm for renal pelvis anterior–posterior diameter in the second trimester and > 10 mm in the third trimester.

Results: A total of 59 patients of 2397 candidates met criteria for inclusion. Kidneys were analyzed independently, for a total of 116 kidneys. Second trimester pyelectasis was associated with grade of postnatal hydronephrosis but not the need for surgery. Third trimester pyelectasis was associated with both postnatal hydronephrosis and surgery. The positive and negative predictive values for postnatal surgery were 18%, and 95% in the second trimester and 27% and 100% in the third trimester.

Conclusions: Third trimester ultrasound for fetal pyelectasis was better able to predict surgically relevant hydronephrosis than second trimester ultrasound.

P7

Trospium chloride extended release 60 mg once daily is effective for the improvement of symptoms and quality of life in subjects with overactive bladder syndrome

Scott MacDiarmid, MD[1]; David Staskin, MD[2]; Roger Dmochowski, MD[3]; Norman Zinner, MD[4]; Peter Sand, MD[5]
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Background: A once-daily (q.d.), extended-release formulation of trospium chloride (trospium 60 mg q.d.) has been developed for the treatment of overactive bladder syndrome (OAB). OAB comprises urinary urgency, with or without urgency urinary incontinence (UUI), usually with urinary frequency and nocturia. OAB with UUI is referred to as "OAB wet" and is associated with particularly detrimental effects on the social, psychological, and sexual aspects of subjects' quality of life. Two phase III studies have examined the efficacy and safety of trospium q.d. in the treatment of subjects with OAB with predominant UUI. Here we present pooled dry rate data from these studies.

Methods: Subjects aged ≥ 18 years with OAB of ≥ 6 months' duration with a mean of ≥ 1 UUI episode/day and symptoms of urgency (≥ 1 severe urgency severity rating associated with a toilet void/3 d) and frequency (mean ≥ 10 voids/d) were eligible for enrollment in these multicentre, parallel-group, double-blind, placebo-controlled trials. Three-day bladder diary data were used to enroll subjects who were randomized (1:1) to receive trospium 60 mg q.d. or placebo q.d. for 12 weeks. The dry rate (subjects experiencing no UUI episodes during treatment), in addition to the primary efficacy variables (change from baseline in the mean number of toilet voids/d and the mean number of UUI episodes/d), were derived from 3-day bladder diary data at weeks 1, 4, and 12.

Results: In total, 1165 subjects were randomized in these studies (placebo, $n = 587$; trospium [q.d.], $n = 578$). Trospium (q.d.) was statistically significantly superior to placebo ($p < 0.001$) for dry rates from week 1 through to week 12 (Table 1). In addition, trospium q.d. demonstrated statistically significant superiority over placebo in both primary efficacy variables from week 1 ($p < 0.01$).

Table 1. Abstract P7. Subjects experiencing no UUI episodes/day (intent-to-treat population; last observation carried forward data)

Dry rate	Placebo ($n = 576$)	Trospium q.d. (n = 559)	p value*
Baseline	0	0	NA
Week 1, *n* (%)	49 (8.5)	86 (15.4)	< 0.001
Week 4, *n* (%)	99 (17.2)	160 (28.6)	< 0.001
Week 12, *n* (%)	130 (22.6)	196 (35.1)	< 0.001

NA = not applicable.
*Cochran-Mantel-Haenszel test, controlling for pooled center.

Conclusions: The percentage of subjects with OAB wet, whose UUI resolved was significantly higher in subjects administered trospium q.d. versus those given placebo. The efficacy in subjects with OAB wet, in combination with the significant improvements in both primary endpoints, reflects the utility of trospium q.d. for the treatment of OAB symptoms.

P7

Trospium chloride exyended release 60 mg once daily is effective for the improvment of symptoms and quality of life in subjects with overactive bladder syndrome

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[1]Alliance Urology Specialists, Greensboro, NC; [2]New York Presbyterian Hospital, Weill-Cornell Medical College, New York, NY; [3]Vanderbilt University School of Medicine, Nashville, TN; [4]Western Clinical Research, Torrance, CA; [5]Evanston Continence Center, Feinberg School of Medicine, Northwestern University, Chicago, IL

Background: An extended-release formulation of the quaternary amine, trospium chloride, has been developed for once-daily (q.d.) administration in the treatment of overactive bladder syndrome (OAB). A double-blind, Phase III study of this new formulation — trospium chloride 60 mg q.d. — showed that it provides significant improvements in the symptoms of OAB (frequency, urgency urinary incontinence [UUI], and urgency). As improvements in objective parameters are not always paralleled by improvements in subject-reported quality of life (QoL), the International Continence Society now recommends inclusion of both objective and subjective measures in the assessment of therapeutic interventions for OAB. Here we present health-related QoL data from this phase III study with trospium q.d.
Methods: Subjects aged ≥ 18 years with OAB of at least 6 months' duration were eligible for inclusion. Three-day bladder diary data were used to identify subjects with urinary urgency (≥ 1 severe urgency severity rating associated with a toilet void/3 days), urinary frequency (mean ≥ 10 voids/day), and an average of ≥ 1 UUI episode/day. Subjects were randomized (1:1) to receive trospium 60 mg q.d. or placebo for 12 weeks. QoL was assessed at baseline and week 12 using the King's Health Questionnaire (KHQ) and the OAB Questionnaire (OAB-q).
Results: In total, 564 subjects took part in the study, (trospium q.d., n = 280; placebo, n = 284). After 12 weeks' treatment, a statistically significant ($p < 0.05$) improvement was demonstrated for trospium q.d. versus placebo in 7 of the 9 KHQ domains: Incontinence Impact, Role Limitations, Physical Limitations, Social Limitations, Personal Relationships, Sleep/Energy, and Severity. Trospium q.d. also had a positive effect on QoL and Symptom Bother as measured by the OAB-q. Subjects treated with trospium q.d. reported statistically significantly greater improvements compared with the placebo group in the mean OAB-q Total score (24.1 v. 17.7 point improvement, respectively; $p = 0.001$) and in 3 of the 4 health-related QoL subdomains (Concern/Worry, Coping, and Sleep; $p < 0.05$). Trospium q.d. was also associated with significantly better outcomes for mean OAB-q Total Symptom Bother scores compared with placebo (30.4 v. 21.1 point improvement, respectively; $p < 0.001$).
Conclusions: We conclude that the once-daily formulation of trospium chloride — trospium 60 mg q.d. — significantly improves the QoL of subjects with OAB, as assessed using the KHQ and the OAB-q instruments. Taken together with the positive effects on the symptoms of OAB (frequency, UUI, and urgency), the results show that trospium q.d. provides improvements in both objective and subjective measures of therapeutic efficacy in OAB.

P8

Therapy related senescence response in prostate cancer cells

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Introduction and Objective: Cell senescence is a physiological process that leads to irreversible growth arrest in normal and tumour cells. Tumour cell senescence can be strongly augmented by chemotherapy and radiation therapy. However, some senescent cells maintain secretory function and can secrete growth-stimulatory factors that promote the growth of surrounding cells. Our goal was to determine the effect of radiation therapy and androgen withdrawal on cell proliferation and the senescence responses in prostate cancer cells of variable metastatic potential.
Methods: Senescence-associated β-galactosidase activity (SA-β-gal) is the most widely used surrogate marker of senescence. Human prostate cancer cell line LNCaP and its highly metastatic variant LNCaP-LN3 were subjected to varying doses of ionizing radiation or androgen deprivation by using charcoal-stripped serum. Cell proliferation was determined by analyzing the growth curves and the senescence response was determined by SA-β-gal staining.
Results: The metastatic LNCaP-LN3 cells were more resistant to both radiation and androgen deprivation than the non-metastatic LNCaP. Both cell lines induced SA-β-gal after irradiation or hormone deprivation. SA-β-gal staining of LN3 cells that survived irradiation was stronger in non-dividing cells than in proliferating colonies. Despite being more resistant to treatment, LNCaP-LN3 showed higher intensity of treatment-induced SA-β-gal staining than LNCaP.
Conclusion: The metastatic cell line (LN3) shows higher resistance to radiation and androgen ablation. The stronger induction of SA-β-gal in LNCaP-LN3 may indicate differential regulation of β-galactosidase activity and/or higher secretion of paracrine growth-promoting factors by these senescent cells.

P9

Protein oxidation as a novel biomarker of bladder decompensation: cellular and subcellular protein oxidation during the transition from compensated to decompensated bladder function

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Background: Benign prostatic hyperplasia is one of the major causes of partial bladder outlet obstruction in men. Unless early medical or surgical treatments are employed, this can lead to long-term bladder dysfunction, decompensation, and ultimately cause permanent emptying failure. Cyclic ischemia and reperfusion occurs in the partially obstructed rabbit bladder causing free radical damage partially mediated by the generation of reactive oxygen species (ROS). Cellular damage caused by ROS can be measured by determination of protein carbonyl group content. This study seeks to determine if partial bladder outlet obstruction (PBOO) results in the generation of carbonyl groups, and if so, what subcellular components of the partially obstructed bladder are primarily affected.
Methods: Thirty-two rabbits were divided into 4 groups of 8. Each group underwent surgical partial bladder outlet obstruction for a duration of 1, 2, 4, and 8 weeks respectively. Two rabbits from each group served as controls. Bladder tissue from each group was homogenized and separated into subcellular fractions via differential centrifugation. Carbonyl content within the subcellular fractions, including the nuclear (P1), mitochondrial (P2), and microsomal (P3) pellets, was then quantified by dot blot analysis.
Results: Total bladder oxidation increases with duration of obstruction across all subcellular fractions. The largest increase in total oxidation is seen between weeks 4 and 8. Protein oxidation density in the nuclear (P1) and microsomal (P3) fractions both showed increases at 2 weeks obstruction, decreases at 4 weeks, and then large increases at 8 weeks. The increase in protein oxidation density between weeks 4 and 8 was most pronounced in the microsomal (P3) fraction, which contains proteins of post-synaptic nerve membranes.
Conclusions: Protein oxidation occurs to a significant degree in the partially obstructed rabbit bladder. Overall bladder protein oxidation increases with the duration of obstruction and increases at a greater rate during the transition to decompensation. Furthermore, based on protein density, the subcellular fraction that exhibits the most oxidation is the microsomal pellet containing proteins of the bladder's post-synaptic nerve membranes. This study suggests oxidative damage, as the result of cyclic ischemia and reperfusion during the compensated stage of partial bladder outlet obstruction, contributes to biochemical changes that lead to bladder decompensation.

P10

Prostate derived Ets factor expression in prostate cancer

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Background: Prostate derived Ets factor (PDEF) belongs to the Ets family of transcription factors that play a role in both normal and neoplastic growth. PDEF expression is increased in breast tumours. We evaluated PDEF expression in prostate cancer as a potential biomarker.
Methods: Patients (n = 216) with localized prostate cancer treated with

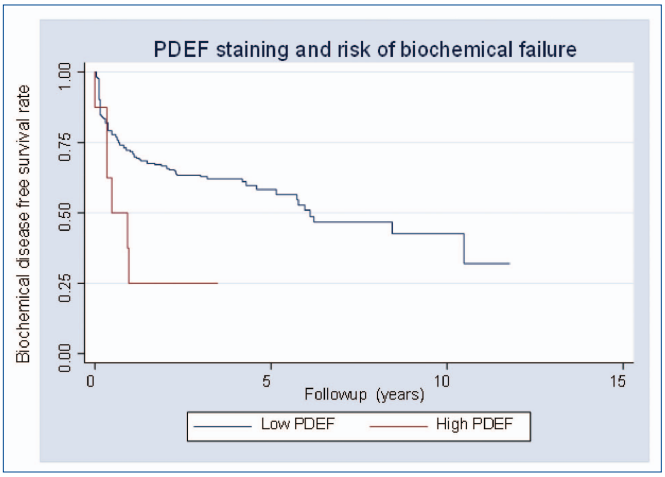
radical prostatectomy were included in the study. A tissue microarray containing cancer, PIN, and benign tissue was constructed using formalin fixed, paraffin embedded surgical specimens and immunohistochemically stained using a polyclonal antibody against PDEF. PDEF expression was scored for staining intensity (+1, +2, +3) and percentage of staining cells. Product of the 2 indicators (staining score) was used for data analysis and correlated with clinical information. Biochemical failure was defined as a PSA > 0.02.

Results: The mean preoperative PSA was 8.25 (SD 6.4). Gleason sum was < 7 in 96 (44%), 7 in 91 (42%) and > 7 in 29 (13%). Pathologic stages were T2 in 142 (66%), T3 in 72 (33%) and T4 in 2 (1%) patients. In 77 (64%) cases, PDEF expression in the adenocarcinomas was higher than in the matching benign tissues; however, in 43 (36%) cases, PDEF expression in the adjacent benign tissues was higher than in the adenocarcinomas (64% v. 36%; $p = 0.002$; Table 1). A similar relationship was observed when comparing adenocarcinomas and PIN; however, not when comparing PIN and benign tissue. Adenocarcinoma staining score (range 0–300) cutoff of 180 identified a group of patients with high PDEF expression who have an increased risk for biochemical failure (Fig. 1; $p = 0.0472$). In a multivariate analysis, staining score with a cutoff of 180 was a predictor of biochemical failure that was independent of preoperative PSA, gleason sum, pathologic stage and PDEF expression in the adjacent benign prostate.

Conclusions: PDEF expression is higher in prostate adenocarcinomas than in PIN or benign prostate tissue. High PDEF expression in prostate adenocarcinoma is an independent predictor of biochemical failure.

Table 1. Abstract P10. Comparison of PDEF expression in matching cancer, benign tissue and PIN

Staining score, x	Staining score, y	No. of matched samples	No. of samples with more PDEF in x	No. of samples with more PDEF in y	*p* value
Cancer	Benign	120	77 (64%)	43 (36%)	0.002
Cancer	PIN	55	39 (71%)	16 (29%)	0.002
PIN	Benign	49	20 (41%)	29 (59%)	0.199



P11

Metabolomic analysis of potential urinary biomarkers in a rodent model of partial urinary tract obstruction

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Background: Sensitive metabolomic analysis permits the evaluation of metabolite alterations that result from system perturbations at the cellular level. Identifying urinary metabolite alterations could have important implications in developing biomarkers and understanding the renal pathophysiology in urinary tract obstruction (UTO). The aim of this study was to use nuclear magnetic resonance (NMR) spectroscopy to compare the urinary metabololites of control and partial UTO in a rodent model. We hypothesized that alterations in the metabolism of renal cells would be demonstrated by distinct NMR spectra of urine specimens between obstructed and non-obstructed rats.

Methods: Six male 120 g Sprague-Dawley rats underwent surgery to induce partial ureteral obstruction by burying the left ureter in the psoas muscle, while 6 control sham-operated rats had exposure of the left ureter only. Urine samples were collected in metabolic cages during a 3 week period. Urine samples were subjected to ^{1}H NMR spectroscopy using a Bruker Avance DRX 500 spectrometer. MATLAB software were used to analyze specific metabolite changes. Principal component analysis (PCA), a standard method of interpreting metabolomic data, was used for cluster analysis.

Results: ^{1}H NMR spectroscopy revealed distinct clustering of the NMR spectra of control and obstructed urine samples. The separation of the spectra was primarily related to the metabolites trimethylamine *N*-oxide (TMAO) and citrate. The following urinary metabolites were increased in obstructed compared to control: TMAO, dimethylglycine (DMG), creatinine, taurine, hippurate, and acetate. Citrate and oxoglutarate were decreased in obstructed compared to control.

Conclusions: Metabolomic analysis of urine in a model of partial UTO has revealed alterations in several urinary osmolytes (TMAO, DMG, taurine) and compenents of the citric acid cycle (citrate, oxoglutarate). This improves our understanding of renal injury in UTO and indicates potential urinary biomarkers. This work was funded by the IWK Health Centre and the Northeastern Section of the AUA.

P12

The von Hippel-Lindau tumor suppressor is a regulator of P53 in renal carcinoma cell genotoxic response

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Background: Inactivation of the von Hippel-Lindau (VHL) tumour suppressor gene is linked to the development of tumours including renal cell carcinoma (RCC). Hypoxia-inducible factor-α (HIFα) is a well-known substrate of the VHL tumour suppressor protein (pVHL) and its overactivation is implicated in RCC tumorigenesis. However, there is evidence that the dysregulation of HIF is not sufficient to cause loss-of-VHL induced RCC development. Our objective is to identify HIF-independent tumour suppressor functions of pVHL and to investigate their potential roles in RCC pathogenesis.

Methods: HEK293, H1299 and RCC cell lines, 786-O and RCC4, and their sublines with restored pVHL expression, were used in our study. Western blotting was performed for evaluating protein expression and kinase activation. Northern blotting was applied for measuring mRNA expression and stability. P53 activation was detected by EMSA and luciferase reporter gene assay. Apoptosis was assessed via FACS.

Results: pVHL stablized p53 mRNA and increased p53 mRNA half-life. Compared to pVHL-positive cells, pVHL-deficient cells demonstrated decreased p53 mRNA and protein expression levels, which were not regulated by hypoxia. pVHL-deficient RCC cells also showed decreased p53 serine15 phosphorylation and diminished expression of p53 downstream pro-apoptotic gene expression, all of which lead to a much weaker p53 activation and elevated resistance to Doxorubicin-induced apoptosis. These findings suggest pVHL regulates p53 signal pathway by promoting p53 mRNA stability and serine15 phosphorylation — a process that culminates in enhanced p53 transactivity and Doxorubicin-induced RCC genotoxicity.

Conclusions: We found pVHL sensitizes RCC cells to Doxorubicin-induced genotoxic stress by stabilizing and transactivating p53. Our findings suggest that loss of p53 activity could play a critical role in the development of VHL-deficient tumours.

P13

Silencing of the Nox4 NADP(H) oxidase enhances cisplatin chemosensitivity of renal cell carcinoma

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Background: Loss of VHL occurs in greater than 60% of clear cell kidney cancer (RCC). VHL is a ubiquitin ligase for hypoxia inducible factor-α (HIF-α), and absence of VHL results in HIF-α accumulation and activation of HIF-dependent transcription of an array of genes including VEGF and TGF-α. We recently reported that expression of Nox4 is critical for expression and activation of HIF2-α even in the absence of VHL and that Nox4 silencing abrogated the tumorigenic phenotype of VHL-deficient cells in a xenograft model. RCC is a notoriously chemo-resistant tumour, limiting therapeutic options for advanced disease. Reactive oxygen species (ROS) have been shown to confer chemo-resistance by a poorly understood cellular mechanism. To determine if Nox4 generation of ROS contributes to the chemo-resistance of RCC, we examined the impact of Nox4 silencing on the 50% lethal dose (LD50) of cisplatin in vitro.

Methods: Small inhibitory RNA for Nox4 (siRNA) and a non-specific siRNA (scramble) were cloned into pSilencer 4.1-CMV puro (Ambion) and transfected into the VHL-deficient human RCC cell line 786–0. Single cell clones were screened for reduced production of ROS using a 2′,7′-dichlorofluorescin diacetate (DFA) florescent assay. Non-specific (scramble) siRNA served as a negative control. 10^5 cells per well were plated in DMEM with 10% FBS on 96-well plates. After 24 hours, cisplatin was added to 8 replicate wells in serial concentrations ranging from 0 to 100 μg/mL, and plates were incubated at 37°C for 24 hours. Cell viability was determined spectrophotometrically using an MTT [3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide] assay and concentration curves were generated for calculation of LD50.

Results: 786–0-scramble cells demonstrated the expected relative chemoresistance with an in vitro LD50 of 19.6 μg/mL. Following stable Nox4 knockdown, the LD50 for cisplatin decreased to 9.9 μg/mL. Standard deviation of the mean at all concentrations was less than 0.05 μg/mL for both cell populations. The shift in LD50 was confirmed on 3 independent assays.

Conclusions: Nox4 generation of ROS contributes to the relative chemoresistance of RCC. Thus, in addition to direct anti-tumour activity by inhibition of HIF2-α transactivation, Nox4-targeted agents have the potential to enhance the cytotoxicity of conventional chemotherapeutic agents if used in combination.

P14

Green tea protects bladder cells from hydrogen peroxide-induced inflammation: potential of herbal agents to treat inflammatory bladder diseases

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Background: Inflammation is indicated in multiple bladder diseases/conditions. Herbal supplements may be a beneficial and under utilized resource to modulate inflammation in the lower urinary tract. Previous studies have identified the potential anti-oxidant and anti-inflammatory effects of green tea and its catechin components. Limited studies have evaluated these properties of green tea on bladder urothelium and its potential for therapeutic use in inflammatory conditions of the bladder. We investigated the effects of green tea extract (GTE) and 2 major GTE catechin components, ECG and EGCG, on the viability of normal and malignant human bladder urothelial cells in vitro.

Methods: Cell viability and function were determined in UROtsa (normal, $n = 6$), SW780 (tumorigenic; low-grade, $n = 6$), and TCCSUP (tumorigenic; high-grade, $n = 6$) human bladder urothelial cells. Cells were treated with 1 mmol/L hydrogen peroxide (H_2O_2) alone or in the presence of 0–40 μg/mL GTE, EGCG, or ECG 40 μg/mL for 1 hour. After 23 hours, cell viability was determined through trypan blue exclusion and the XTT assay. Nitric oxide (NO) availability was analyzed to determine cell function and iNOS activity using the modified Greiss assay and DAF-FM diacetate fluorescence.

Results: EGCG conferred significant cellular protection in all cell lines after H_2O_2 induced injury with a 40.5% (TCCSUP), 70.8% (SW780), and 83.8% (UROtsa) decrease in cellular death compared to treatment with H_2O_2 alone. The improved cell viability of EGCG treated UROtsa cells appeared to be dose-dependent while TCCSUP and SW780 cells were most protected at the lowest concentrations of EGCG. ECG improved cell viability in all cell lines as well with a 45.8% (TCCSUP), 64% (SW780), and 92.6% (UROtsa) decrease in cellular death compared to treatment with H_2O_2 alone. Only UROtsa cells were affected in a dose-dependent manner. GTE demonstrated a potentially limited protective effect in UROtsa cells but did not confer a protective effect in either SW780 or TCCSUP cell lines.

Conclusions: Our results demonstrate that under in vitro conditions 2 catechin components of green tea, ECG and EGCG, can confer cellular protection after injury with H_2O_2. GTE, perhaps secondary to interactions of its other various components, does not seem to improve cell viability after injury and may even cause further cell damage at high doses. Herbal supplementation with catechin compounds may be a viable therapeutic modality for treatment of various inflammation or injury induced bladder conditions such as interstitial cystitis.

P15

Is the elderly patient at increased risk for advanced disease when undergoing robot-assisted radical prostatectomy?

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Background: As the elderly population increases, an increasing number of older men will be diagnosed with prostate cancer, seeking surgical cure. Pathologic parameters of prostate cancer differ among men of advanced age. This study investigates the impact of age on the pathologic parameters and outcomes of robot-assisted radical prostatectomy (RARP).

Methods: All patients who underwent RARP by a single surgeon (JVJ) from July 2003 to March 2007 were evaluated. Patients were divided into age ranges of < 50 years (group 1), 50 to 59 years (group 2), 60 to 69 years (group 3), and ≥ 70 years (group 4). They were compared with respect to preoperative, intra-operative, and postoperative parameters. Positive surgical margins were determined by cancer at the inked margin. PSA recurrence was defined as a PSA of ≥ 0.1 ng/dL in patients with at least 6 months follow-up. Complications were classified as surgical (bladder neck contracture, urinary retention, urinary tract infection, pelvic hematoma or abscess, anastomotic leak, lymphocele) or medical (deep venous thrombosis, pulmonary embolism, myocardial infarction, *C. difficile* colitis, or atrial fibrillation).

Results: A total of 889 patients underwent RARP. There were no significant differences in body mass index, total operative time, or estimated blood loss between the groups. Preoperative PSA was higher in the older age groups (mean 5.1 ng/dL in group 1, 6.4 ng/dL in group 2, 6.4 ng/dL in group 3, and 7.9 ng/dL in group 4). Specimen weight was significantly higher in the older patients (mean 47 g in group 1, 52 g in group 2, 58 g in group 3, and 65 g in group 3), as was pathologic Gleason score (mean 6.2 in group 1, 6.5 in group 2, 6.6 in group 3, and 6.7 in group 4). Pathologic stage showed a trend toward increasing T3 disease with older age (14% in group 1, 17% in group 2, 21% in group 3, and 34% in group 4). There were no significant differences in positive margins between the groups. There was a trend toward increasing PSA recurrence, primarily in the ≥ 70 year age group (4.5 to 6.5% in groups 1 to 3, 19.4% in group 4). There were no differences in complications or transfusions.

Conclusions: Older patients undergoing RARP did not experience an increase in complication rate. Advanced age, however, was associated with larger prostate glands, higher pathologic Gleason score, and a shift in pathologic stage from organ confined disease to extracapsular extension.

MODERATED POSTER SESSION 2
Saturday, September 8, 10:45–11:45 am

P16
Evaluating the "learning curve" for robot-assisted radical prostatectomy in a high volume institution

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Background: The term "learning curve" is frequently mentioned when evaluating new surgical technology, such as laparoscopic or robot-assisted radical prostatectomy (RARP). The significance and duration of this learning curve is unclear with significant variability in the numbers reported in the literature. The purpose of this study was to evaluate surgical case experience on the outcomes of RARP.

Methods: All patients undergoing RARP by a single surgeon from July 2003 until March 2007 were evaluated. Patients were divided into quartiles based on consecutive case number. These groups were compared with respect to preoperative, intraoperative, and postoperative parameters. Total operating time is measured from time of skin incision until completion of skin closure. PSA recurrence is defined as a PSA of ≥ 0.1 ng/dL with at least 6 months follow-up available. Complications were classified as surgical (bladder neck contracture, urinary retention, urinary tract infection, pelvic hematoma or abscess, anastomotic leak, lymphocele) or medical (deep venous thrombosis, pulmonary embolism, myocardial infarction, *C. difficile* colitis, or atrial fibrillation).

Results: A total of 889 patients underwent RARP. Groups 1, 2, and 3 had 222 patients each, and group 4 had 223. The ages of all patients were equivalent. Body mass index was higher in group 3 compared with group 1 ($p = 0.03$). Preoperative PSA was higher in groups 1 and 2 compared with groups 3 and 4. Total operative time showed a steady decline from group 1 (mean 238 min) to group 2 (mean 186 min) to group 3 (mean 166 min), but then leveled off in group 4 (mean 174 min). However, estimated blood loss was equivalent between all groups. Prostate weight was higher in groups 3 and 4 than groups 1 and 2. Pathologic stage was similar for all groups, as were the rates of PSA recurrence and blood transfusion. The positive margin rate decreased from group 1 (19.8%) to group 2 (14.9%) to group 3 (6.3%), then increased slightly in group 4 (9.5%). Complication rates also decreased with surgical experience, although later cohorts had shorter follow-up than the earlier cohorts.

Conclusions: Surgical experience and case volume lead to increased proficiency, and improved outcomes. Decreased operative time, margin and complication rates may be adequate surrogate markers of proficiency. However, defining a number to equate proficiency, as is often done, will remain elusive, as it reflects the variability in starting points, and the varying degree of difficulty of cases encountered by individual surgeons.

P17
Expression of frizzled-8 in the bladder urothelium of interstitial cystitis patients

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Background: Protein extracts from the urine of interstitial cystitis patients has antiproliferative activity when applied to normal urothelial cells in culture. This activity has been linked to a peptide (antiproliferative factor, APF) contained in the sixth transmembrane domain of the 7 transmembrane receptor frizzled-8 (FZD8). We have investigated expression of FZD8 protein and RNA in interstitial cystitis patients to determine its potential contribution to IC symptoms and etiology.

Methods: Bladder biopsies and cytology were obtained from IC patients during cystoscopy/hydrodistension procedures. Two biopsies were processed for histology and immunohisotchemistry and 2 were snap frozen and stored in liquid nitrogen for protein and RNA extractions. To date 20 IC patients have been sampled. RNA was extracted from exfoliated cells and biopsy specimens using Invitrogen Purelink reagents and spin-columns. RT-PCR was performed using random primers for reverse transcription and gene specific primers for FZD8. Biopsy specimens were homogenized in RIPA buffer with protease inhibitors for protein analysis. Western blots were probed with an antibody (Imgenex) to the extreme carboxy terminal region of the putative full length FZD8 protein. Immunohistochemistry was performed with an antibody to the fourth extracellular domain of FZD8. Normal pancreas was used as a positive control for full length FZD8 expression.

Results: Using RT-PCR, FZD8 transcripts have been detected in RNA extracted from 7 of 7 bladder biopsy specimens from IC patients and in 1 non-IC control biopsy specimen. We have also obtained FZD8 cDNA products by RT-PCR from voided urine and bladder irrigations specimens from IC and control specimens. FZD8 RNA is expressed in both normal and IC urothelium. FZD8 protein expression was found in normal control biopsy specimens, bladder cancer biopsy specimens and in IC biopsy specimens by Western blotting. Specimens from all sources have bands reactive with the antibody at the putative full length FZD8 protein molecular weight of approximately 74 kd. In addition, we detected higher molecular weight bands on the blots that appear to indicate persistent oligomerization of the FZD8 protein either as homo- or hetero-dimers. One IC biopsy yielded a unique oligomer band. Bladder biopsy specimens from IC patients show strong FZD8 immunoreactivity with the FZD8 antibody to the fourth extracellular domain.

Conclusions: These preliminary results indicate that FZD8 is expressed in both normal and disease states in bladder urothelium. There may be IC specific FZD8 isoforms and protein interactions.

P18
PSA levels in relation to NSAID and acetaminophen consumption: results from the 2001–2002 National Health and Nutrition Examination Survey

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Background: The precise relationship of oral nonsteroidal anti-inflammatory drug (NSAID) use and serum PSA is unknown. To further characterize this association we evaluated serum PSA levels with regards to NSAID (including ASA) and acetaminophen consumption in a large cross-sectional study of men in the United States.

Methods: PSA levels were determined in 1320 men over the age of 40 in the 2001–2002 National Health and Nutrition Examination Survey (NHANES). In order to account for the complex survey design, linear regressions were performed on log-transformed PSA levels to evaluate the relationships between PSA and NSAID and acetaminophen use after adjusting for the effects of age, race, education level, smoking status, body mass index (BMI), coexisting inflammatory conditions, and heart disease.

Results: NSAID and acetaminophen consumption displayed a negative association with PSA levels, i.e., individuals who reported using NSAIDs (19.8%) or acetaminophen (1.3%) regularly had lower PSA levels than individuals who did not take these drugs. PSA levels among NSAID users were 0.9 times the levels among no drug takers ($p = 0.038$), whereas PSA levels among acetaminophen users were 0.76 times the levels in no drug takers ($p = 0.14$). However, individuals who stated they took both NSAIDs and acetaminophen (0.99%) on a regular basis had high-

er PSA levels (1.8 times greater) than individuals who stated they did not take either one of these drugs regularly.
Conclusions: Analysis of the NHANES data revealed a statistically significant ($p < 0.05$) negative association between regular NSAID consumption and serum PSA levels. These results may have particular significance given the relationship of prostate inflammation and serum PSA levels and the putative association of chronic inflammation with prostate carcinogenesis. The unexpected findings of regular acetaminophen usage also correlating with lower serum PSA levels and that the concomitant use of both NSAIDs and acetaminophen was associated with increased PSA levels, though not significantly so, may be due to the low numbers of subjects in those categories. Further longitudinal studies are needed to elucidate the impact of oral NSAID use on prostatic inflammation, serum PSA, and prostate cancer risk.

P19
Patterns of care for clinically localized prostate cancer at the VA medical centers
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Background: The Veterans Affairs Healthcare Network is the largest health care provider in the United States. We seek to establish how the treatment for localized prostate cancer is provided at the VA, and to investigate the changes in the pattern of treatment that have occurred over time.
Methods: De-identified patient care information was gathered from the Central VA Tumor Board for all patients with clinically localized prostate cancer treated at the VA between 1995 and 2003 on a total of 57 671 patients. Clinical staging was standardized to reflect the current AJCC cancer staging system. Using this, we looked at which treatment modalities were employed over time.
Results: There was a steady increase in the number patients identified with prostate cancer from 4129 in 1995 to 8963 in 2003. Over this period of time, 19% to 21.5% were treated with surgery alone, 19.1% to 22.6% with radiation alone, and 13.8% to 16.2% with androgen deprivation (ADT) alone. Two percent to 0.7% were treated with combination surgery and radiation, 2% to 1.4% with combination surgery and ADT, and 0.5% to 0.3% with a combination of all 3 modalities. Three point four percent to 14.8% of patients were treated with combination of radiation and ADT. Thirty-nine point two percent to 24.3% had no documented treatment in the VA system. One to 1.2% were treated with other modalities such as chemotherapy, immune therapy or other therapeutic combinations.
Conclusions: The number of patients seen and treated at the VA more than doubled over the study period, given this magnitude of change, greater screening and detection of clinically localized prostate cancer had likely occurred. Approximately 20% of patients were treated with surgery or radiation alone, both with small increases in use over the study period. Hormonal therapy use increased more significantly. There is no distinction in the database between brachyseed and external beam radiation and as a result there can be no further evaluation along these lines. Combination therapies other than radiation/ADT were uncommonly employed, as were other unspecified treatment modalities. The radiation/ADT combination enjoyed the greatest increase in usage in this study. Over time, a greater percentage of patients had documented treatment at the VA, though it is unclear if this was due to a lesser employment of watchful waiting, more patients being treated at the VA versus outside health care systems, better documentation, or a combination of these factors.

P20
Raman spectroscopy to predict prostate cancer death after radical retropubic prostatectomy
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Background: Raman spectroscopy is an imaging technique that utilizes molecular-specific, inelastic scattering of light to interrogate biological tissue. Our objective was to determine if it could add clinically useful information to prostate cancer diagnosis and identify those that progress to metastatic disease.
Methods: We identified 6 patients who underwent radical prostatectomy for Gleason 3+3 adenocarcinoma of the prostate. Three of the patients died of metastatic prostate cancer; 3 matched patients were cured of their disease. Twenty Raman spectral images were captured for each patient.
Results: No significant differences between the groups were identified from known histopathologic variables. Principal component analysis revealed significant spectroscopic differences at PC1 and PC2 ($p < 0.001$).
Conclusions: Raman spectra can be obtained from paraffin-embedded prostate tissue. The spectra of patients that subsequently died of metastatic disease differ from those that have not developed metastatic disease. At this time, we are unable to determine the biochemical constituents that allowed for this differentiation, though work is continuing in this area. Further study will be needed to expand the patient population and to improve tissue targeting.

P21
Early experience with percutaneous renal cryotherapy
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Introduction: Percutaneous renal cryoablation is a minimally invasive therapeutic option for small renal tumours located posteriorly or posterolaterally within the kidney. Herein we report our experience with our first 14 patients.
Methods: Fourteen patients with radiographically documented enhancing renal masses suggestive of RCC, 4 of whom had a solitary kidney, were evaluated for treatment with percutaneous cryoablation. Between April 2005 and February 2007, 7 male and 6 female patients, aged 40 to 83 years, underwent percutaneous cryotherapy. Due to the proximity of the duodenum to the lesion, cryoablation could not be safely attempted in 1 of the original 14 patients. Tumor sizes ranged from 0.9 to 3 cm. All procedures were performed using CT guidance. Eleven procedures were performed using conscious sedation; 2 required general anesthesia secondary to severe COPD. Each treatment consisted of 2 freeze–thaw cycles. Early in our series patients were admitted for 23-hour observation, however, the later patients were discharged the same day after a short period of observation. Radiological imaging studies (CT or MRI) were used at 1, 3 and 6 months, and every 6 months afterward, to assess for residual or recurrent tumour. Patients that had any degree of internal enhancement of the lesion on imaging with IV contrast were retreated with cryotherapy.
Results: In all patients, the procedure was well tolerated. No patient had more than minimal blood loss. Two small perinephric hematomas were noted on intraoperative post-cryotherapy CT. Neither of these led to clinically significant sequelae. No delayed bleeds were observed. Mean follow-up was 14.5 months (2–24 mo). During follow-up imaging, 2 patients were discovered to have residual enhancement within the mass and subsequently underwent repeat cryotherapy. The most common complication was excoriation of the skin of the back (3 cases). This was treated with wound care and topical antibiotics resulting in rapid resolution. One patient experienced irritation of the paraspinal muscles at the site of probe placement. There was no significant change in serum creatinine from preoperative values in any patient.
Conclusions: Percutaneous cryotherapy is a feasible treatment option in patients with small renal tumours in accessible locations. CT guidance facilitates accurate placement of the cryoprobes, while the small size of the cryoprobes minimizes bleeding at the entry site. This technique serves as a reasonable nephron-sparing alternative to preserve renal function with minimal morbidity in appropriate patients. Longer follow-up is necessary to determine the durability of oncologic outcomes.

P22
Outcome after robot-assisted radical prostatectomy is not predicted by surgical case order

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Background: Fatigue has been implicated in medical and surgical errors. However, daily surgical case volume has not been studied with respect to surgical outcomes. At our institution, we perform 3 consecutive robot-assisted radical prostatectomy (RARP) cases in 1 day. We evaluated whether case order has an influence on surgical outcomes after RARP.

Methods: All patients undergoing RARP by a single surgeon (JVJ) on days during which 3 consecutive RARP cases were performed were evaluated. Patients were divided into groups of first (group 1), second (group 2), or third case (group 3). The patients were then compared with respect to preoperative, intraoperative, and postoperative parameters. Operative time is measured from skin incision to skin closure. PSA recurrence is defined as a PSA ≥ 0.1 ng/dL with at least 6 months of follow-up. Complications were classified as surgical (bladder neck contracture, urinary retention or infection, or lymphocele) or medical (deep venous thrombosis, pulmonary embolism, myocardial infarction, or *C. difficile* colitis).

Table 1. Abstract P22. Characteristic for all patients studied

	Case # 1 (n = 127)	Case # 2 (n = 127)	Case # 3 (n = 127)
Median start time	07:32 (07:22–09:00)	11:08 (10:08–13:44)*	14:56 (12:58–17:42)*†
Age (yr)	59.5 (42–77)	60.5 (41–76)	58.9 (40–73)
Body Mass Index (Kg/m^2)	28.4 (20.1–38.5)	28.4 (18.4–46.0)	28.5 (20.5–41.7)
Pre-operative PSA (ng/dL)	5.7 (0.4–35)	6.0 (1.0–39)	6.3 (0.1–39)
Operative time (min)	160 (102–276)	159 (91–319)	155 (98–275)
Estimated blood loss (mL)	166 (25–700)	166 (25–600)	196 (25–1100)
Prostate weight (g)	56 (30–119)	56 (25–135)	58 (31–135)
Pathologic Gleason Score	6.4 (5–9)	6.5 (5–10)*	6.5 (5–9)*
Pathologic stage			
pT0	1 (0.8%)	2 (1.6%)	0
pT2	103 (81.1%)	101 (79.5%)	95 (74.8%)
pT2a	26 (20.5%)	15 (11.8%)	24 (18.9%)
pT2b	8 (6.3%)	7 (5.5%)	4 (3.1%)
pT2c	69 (54.3%)	79 (62.2%)	67 (52.8%)
pT3	22 (17.3%)	24 (18.9%)	31 (24.4%)
pT3a	20 (15.7%)	22 (17.3%)	21 (16.5%)
pT3b	2 (1.6%)	2 (1.6%)	10 (7.9%)
pT4	1 (0.8%)	0	1 (0.8%)
Bundle sparing			
Non-sparing/ partial	15.8%	22.2%	25.4%
Unilateral sparing	35.7%	34.9%	33.3%
Bilateral sparing	48.4%	42.9%	41.3%
Positive margins	15 (11.8%)	16 (12.6%)	5 (3.9%)
PSA recurrence rate	4/55 (7.2%)	3/72 (4.2%)	3/67 (4.5%)
Complications			
Total	8 (6.3%)	9 (7.1%)	8 (6.3%)
Surgical	4 (3.1%)	8 (6.3%)	6 (4.7%)
Medical	4 (3.1%)	1 (0.8%)	2 (1.6%)
Patients requiring transfusion	1 (0.8%)	3 (2.4%)	2 (1.6%)

*$p < 0.05$ compared to Case # 1.
†$p < 0.05$ compared to Case # 2.

Results: A total of 381 patients were evaluated, 127 in each group (see Table). The total operative time was equivalent for all groups. Estimated blood loss was highest in group 3, but was not statistically different from groups 1 and 2. Pathologic Gleason score was higher in groups 2 and 3 than in group 1, and this difference reached statistical significance. Pathologic stage showed a slight trend toward decreasing amounts of T2 disease and increasing T3 disease in cases performed later in the day. Positive margin rates were lowest in group 3, and PSA recurrence was fairly similar between the groups, but highest in group 1. Neurovascular bundle sparing status was consistent with clinical staging information available at the time of operation: groups 2 and 3 had more clinically palpable disease (20.3% in group 1, 27% in group 2, and 30% in group 3) and therefore fewer bilateral nerve sparing was performed in these groups. Complication rates were constant at 6%–7% for all groups.

Conclusions: With an experienced surgical team, multiple robot-assisted radical prostatectomy procedures may be performed in 1 day, without significant variation in surgical outcomes among the cases.

P23

Ajulemic acid (IP-751) inhibits release of calcitonin gene-related peptide from isolated rat bladder

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Introduction: It is known that ajulemic acid (IP-751), a non-selective cannibinoid receptor agonist, possesses anti-inflammatory and analgesic properties. Previous reports from our laboratory showed that intravesical administration of liposomal ajulemic acid (AJA) protects against acetic acid induced bladder hyperactivity. In the present study, we determined the effect of AJA on baseline and chemically evoked release of the sensory neuropeptide, calcitonin gene-related peptide (CGRP) in an isolated rat bladder preparation.

Methods: Whole rat bladders removed from the animals were incubated in tissue baths containing physiologic salt solution (PSS). Following washing, bladders were incubated for 1 hour in either AJA (75 nmol/L) or vehicle. Subsequent incubations were performed in PSS to determine baseline CGRP release. Following equilibration, bladders were incubated in capsaicin (30 nM) and adenosine triphosphate (10 µmol/L) to evoke CGRP release in presence and absence of AJA. Pharmacological specificity of AJA was assessed by incubating the bladders with CB_1 and CB_2 antagonists (AM 251 and AM 630, respectively, 500 nmol/L) before incubation with AJA. CGRP release was determined by EIA (Peninsula laboratories).

Results: Mean baseline release of CGRP ± SEM was 605 ± 62 pg/g of bladder weight. AJA alone had no effect on the baseline CGRP release (608 ± 59 pg/g, $p = 0.97$). Addition of ATP/capsaicin significantly increased the CGRP release by 44% over baseline (870 ± 59 pg/g, $p < 0.05$). AJA application significantly decreased evoked CGRP release by 29% versus control (870 ± 59 pg/g v. 615 ± 80 pg/g, $p < 0.05$). The individual CB receptor antagonists, AM 251 and AM 630, had no effect on baseline CGRP release (666 ± 26 pg/g, $p = 0.417$ and 663 ± 79 pg/g, $p = 0.57$), but both reversed the effect of AJA, resulting in an increase in evoked CGRP release of 40% and 38% over baseline (930 ± 73 pg/g, $p < 0.02$ and 912 ± 74 pg/g, $p < 0.01$).

Conclusions: Ajulemic acid application inhibits the evoked release of CGRP from afferent nerve terminals in an isolated rat bladder model. This finding explains the underlying mechanism behind the therapeutic effect of intravesical AJA encapsulated in liposomes for the treatment of interstitial cystitis or sensory urgency. In addition, this finding suggests that AJA may be a promising treatment in patients with painful bladder syndrome/interstitial cystitis.

P24

Effect of Wnt signaling on the invasive characteristics of prostate cancer cells

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Introduction: Metastatic prostate cancer (PCa) often recurs in a hormone-refractory form (HRPCa) following some type of androgen ablation therapy. Recent evidence suggests that activation of the Wnt signaling pathway may play an important role in the process through which PCa cells acquire the hormone-refractory phenotype. We measured the effects of Wnt signal activation and androgens on the in vitro invasive properties of androgen-sensitive and androgen-independent human PCa cells (derivatives of LNCaP).

Methods: LNCaP cells are androgen-sensitive and do not form tumours in castrated male nude mice.The T6-*myc* derivative of LNCaP (T6-*myc*-LNCaP), in which Wnt signaling is activated, are androgen-refractory and are able to form tumours in absence of andogens. These 2 cell lines were compared in an in vitro invasion assay that assesses the ability of cells to invade and migrate through a Matrigel-coated membrane. Using fetal bovine serum as a chemo-attractant, we quantified cell invasion through the membrane after 24 hours.

Results: The Wnt-activated, T6-*myc*-LNCaP cells were nearly twice as likely to invade through Matigel-coated membrane than the parental LNCaP cells ($p < 0.04$). When the invasiveness of these cell lines was tested in the presence of exogenous androgens (R1881, 0.5 nmol/L), the invasiveness of the LNCaP cells increased by over 3-foldswhereas the invasiveness of T6-*myc*-LNCaP cells was decreased by 43% ($p < 0.002$).

Conclusion: Our results demonstrate that PCa cells with activated Wnt signaling are significantly more invasive than control cells. Although androgens increased the invasiveness of androgen-sensitive PCa cells, it suppressed the invasiveness of androgen-refractory PCa cells. The role of Wnt signaling pathway in the development of invasive phenotype and its potential as a therapeutic target HRPCa warrants further study.

P25

Flexible ureteroscopy for proximal stones in pediatric patients: how complete access simplifies the surgical approach

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Background: The use of ureteroscopy as a primary means of treating renal and proximal ureteral calculi has increased compared with SWL or PCNL at our institution. One study has suggested that rigid ureteroscopy is superior to flexible ureteroscopy for proximal ureteral stones. We reviewed our experience with flexible ureteroscopy for proximal stones to determine if the versatility of flexible ureteroscopy would outweigh the benefits of better visualization in rigid ureteroscopy.

Methods: We retrospectively reviewed all ureteroscopic procedures for upper tract calculi at our institution from 2001–2005. A 6.9 Fr flexible ureteroscope was used in all cases.

Results: Twenty-seven prepubertal patients (55% female) with a mean age 9.8 ± 3.9 years (range 1.2–13.8 yr) with upper tract calculi were managed with flexible ureteroscopy. Calculi ($n = 33$; mean diameter 12.2 ± 11.1 mm) were located in the proximal ureter/UPJ (46%), renal pelvis (9%), upper and mid poles (18%), and lower pole (15%). Twelve percent of children had staghorn calculi. Sixty-four percent of children were prestented and 72% had a postoperative stent placed. Ureteral orifice dilation was performed with an 8/10 Fr coaxial dilator in 86% and a 9.5/11 Fr ureteral access sheath was employed in 27%. Eighty-six percent of children were stone free with a mean of 1.3 ± 0.7 ureteroscopic procedures per patient. Patients with residual stone burden ($n = 7$) progressed to staged ureteroscopic procedures ($n = 4$), PCNL ($n = 2$) and SWL ($n = 1$) to achieve stone-free status. Of the children that failed primary ureteroscopic therapy, stone burden included large staghorn calculi ($n = 3$), pelvic stones > 1.5 cm ($n = 3$), and lower pole stones > 1 cm ($n = 1$). Ureteral perforation was noted intraoperatively in 1 child treated with placement of a ureteral stent. No long-term complications were noted at a mean follow up of 12.1 ± 13.5 months.

Conclusions: Flexible ureteroscopy is a safe and effective option for the treatment of large upper tract calculi in prepubertal children. This technique is particularly applicable for calyceal stone burden inaccessible to the rigid ureteroscope, although staghorn calculi or calculi > 1.5 cm may require multiple procedures to clear.

P26

Acute intermittent symptomatic hydronephrosis — diagnostic and etiologic considerations

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Background: The diagnosis of ureteropelvic junction obstruction (UPJO) associated with intermittent abdominal pain is often delayed due to the non-specific nature of symptoms. We reviewed the diagnostic evaluation, natural history, and anatomic causes of UPJO in children with intermittent symptoms to assess management implications in this population.

Methods: We conducted a 15-year (January 1990 to December 2005) retrospective review of medical records of patients undergoing dismembered pyeloplasty for UPJO. Presenting symptoms, diagnostic evaluation, intraoperative findings, and postoperative outcomes were analyzed using SAS 9.1 statistical software.

Results: Thirty-six percent ($n = 104$) of 286 patients undergoing pyeloplasty for UPJO by 2 surgeons (MB, FS) presented with intermittent abdominal symptoms over a 15-year period. Mean age at time of pyeloplasty was 10.2 ± 4.5 years and mean duration of symptoms before diagnosis was 15.7 ± 15.3 months. Presenting symptoms included nausea and vomiting (46%), generalized abdominal pain (34%), flank pain (55%), and urinary tract infections (14%). Diagnostic workup included the following: renal ultrasound (81%), CT scan (44%), IVP (44%), VCUG (40%), and functional scan (32%). Based on clinical presentation and radiographic imaging, children were divided into 2 subsets; those with persistent hydronephrosis and intermittent pain (71%) versus those with hydronephrosis only during symptomatic events (29%). The anatomic etiology of obstruction determined intraoperatively was similar in both groups: intrinsic cause (stenosis) (64% v. 57%), accessory crossing vessel (23% v. 36%), or extrinsic cause (13% v. 7%) (all p values = NS). At a mean of follow up of 1.6 ± 1.9 years, 92% of children are pain free with resolution or improvement of hydronephrosis in 94%.

Conclusions: Hydronephrosis was present during both acute episodes of renal colic and pain free periods in > 70% of our patients presenting with acute intermittent symptoms. Our intraoperative and imaging findings support our theory that despite their sporadic nature, acute symptomatic episodes are due to a transient increased obstruction of a chronically hydronephrotic kidney. Early screening with renal ultrasound which demonstrates hydronephrosis (even during pain free periods) in children with history of intermittent symptoms should initiate urologic evaluation. Worsening hydronephrosis confirmed by repeat imaging during a symptomatic episode is an indication for surgical intervention.

P27

The role of stimulatory ligand expression on prostate cancer cells and evasion of immune effector cell killing

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Background: Escape from immune surveillance is one outcome of neoplastic progression and facilitates proliferation, invasion and metastases of solid tumours, including prostate cancer. It has been previously demonstrated that tumour hypoxia is one mechanism underlying tumour escape. Herein, we determine the mechanisms of prostate cancer evasion of circulating immune cells.

Methods: To determine the effect of cancer cell exposure of a hypoxic

environment (1% O_2) on immune cell recognition and killing, 2 human prostate cancer cell lines PC3 and DU145 were used for cytotoxicity experiments using fresh human peripheral blood lymphocytes (PBL) in a standard chromium release assay. The effect of tumour hypoxia on the expression of immunostimulatory ligands on cancer cells, including MIC A/B, was assessed by flow cytometry and ELISA. The role of matrix metalloproteinase (MMP) on MIC expression was determined using pharmacologic inhibitors. The effect of cellular hypoxia on cytokine expression by the cancer cells was measued by ELISA of supernatant.
Results: Results of the cytotoxicity assays reveal that culturing cell lines in a low oxygen environment will significantly effect immunosurveillance by decreasing the natural killer (NK) cell activity of circulating PBLs. Exposure of cell lines to a hypoxic environment for as little as 8 hours significantly decreases the expression of the stimulatory ligand MIC A/B by shedding of the ligand from the cell surface. The MMP inhibitors appear to mediate this shedding. Hypoxia also modulates the tumour environment by increasing immunomodulating cytokines such as TGF-β.
Conclusions: These findings indicate hypoxia leads to cellular adaptive responses of prostate cancer cells, which interfere with immune effector cell killing. These hypoxia related effects are likely multiple, including modulation of cell surface ligands and immunosuppressive cytokine expression, but demonstrate possible therapeutic targets for immunotherapy protocols for prostate cancer.

P28

Evaluation of renal cell carcinoma vaccines targeting carbonic anhydrase IX using heat shock protein 110

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Background: Carbonic anhydrase IX (CA9) is a renal cell carcinoma (RCC)-specific tumour protein. We evaluate strategies using heat shock proteins (Hsps) to target CA9 and activate an antitumour immune response in a murine RCC model.
Methods: The chaperoning ability of Hsp110 can be used to form a complex with CA9 in vitro, which can be administered as a highly concentrated tumour vaccine in the murine RENCA model. Three different vaccines were evaluated: 1) recombinant Hsp110 noncovalently complexed to full-length CA9 (Hsp110+CA9) 2) recombinant Hsp110 noncovalently complexed to a CA9 peptide (Hsp110+CA9 peptide) 3) DNA plasmid vaccine consisting of a heat shock protein (Grp170) fused to the N-terminus of CA (DNA vaccine). Immune responses were monitored by ELISPOT and ELISA.
Results Obtained: In a mouse tumour prevention model, Hsp110+CA9 prevented the growth of RENCA tumours engineered to express CA9, and produced robust cellular and humoural immune responses. In a tumour treatment model, RENCA cells were injected intradermally to establish palpable tumours before vaccination. Hsp110+CA9 significantly decreased tumour growth compared with control vaccinations. Hsp110+CA9 peptide produced a significant antitumour response; however the cellular immune response was modest and no antibody response was seen. The DNA vaccine did not produce an antitumour response and produced no CTLs or antibodies.
Conclusion: Recombinant Hsp110 noncolvently complexed to CA9 was the most effective Hsp-based vaccine tested. This vaccine strategy should be further evaluated for testing in a clinical trial.

P29

Dietary habits and prostate cancer detection: a case-control study

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Background: Many studies demonstrated that different macronutrients, elements, supplements, and body mass index may affect prostate cancer detection. The aim of this study was to evaluate the influence of dietary habits on prostate cancer detection.
Methods: The study was performed on 917 patients who planned to have TRUS guided prostatic biopsy based on elevated PSA, rising PSA or abnormal digital rectal examination; before biopsy all patients answered a self administered questionnaire including: marital status, ethnic background, family history of prostate cancer, smoking, dietary profile, the difference in body weight between biopsy time and age of 30 years, medical history of general diseases and local GU diseases. In combination with pathology data we performed univariate and multivariate analyses for the predictors of cancer and also its aggressiveness.
Results: Prostate cancer was found in 42% (386/917). The mean age was 64.5 ± 8.3; the mean PSA for prostate cancer and benign cases respectively was 13.4 ± 28.2 ng/mL and 7.3 ± 4.9 ng/mL. Multivariate analysis revealed that age, PSA density and fish diet are the independent predictors of cancer (odds ratio [OR] 1.06, 4.14 and 0.75, respectively; $p < 0.03$). Aggressive tumours were defined by Gleason score (> 7), PSA level and the number of positive cancer cores. Age and green vegetable diet were the independent predictors for high Gleason score (OR 1.23 and 0.015, respectively; $p < 0.04$). PSA was correlated with the number of cancer positive cores (IRR 1.01; $p < 0.001$, using Poisson regression test) and positive linear regression between age and PSA level (coefficient 0.021; $p = 0.001$).
Conclusions: Fish containing diet appears to be protective against prostate cancer, while age and PSA density are risk factors. Green vegetables appear protective against aggressive cancer. These observations add to the growing body of evidence suggesting a relationship between diet and prostate cancer risk and prognosis.

P30

Biochemical survival after salvage cryoablation for recurrent prostate cancer following definitive radiation therapy: results from the COLD registry

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Background: Following failed radiation therapy for prostate cancer there are limited curative options for those patients with a local recurrence. Salvage cryoablation has historically been associated with a high incidence of complications. The objective of this study is to report contemporary outcomes of salvage cryoablation at several institutions, both academic and community, which have participated in the Cryo Online Data (COLD) Registry.
Methods: A secure online database was developed consisting of case report forms designed to collect relevant pre- and posttreatment information for patients undergoing cryoablation following pathologically confirmed failed definitive radiation therapy for localized prostate cancer. Patients were stratified according to their pre cryoablation (post radiation therapy) PSA score (< 10 v. ≥ 10 ng/mL). Kaplan–Meier (KM) analysis was performed with biochemical failure defined according to the 2006 ASTRO definition of biochemical failure of nadir+2. Incontinence was defined any leak of urine at 12 months as determined by physician interview and was also stratified according to pad use.
Results: Twelve physicians participated and 277 patients were entered. The average age was 70.0 ± 7.1 years. Pre treatment PSA was 7.6 ± 8.2 ng/mL and the median Gleason sum was 7. Of the 277 patients 215 (77.6%) had a PSA < 10 ng/mL. Patients were followed for 21.6 ± 24.9 months with 47 having at least 5-year follow-up. KM analysis demonstrated 5-year actuarial biochemical disease free rates of 61.6% ± 6.3% and 26.6% ± 9.8% for patients with a pre cryoablation PSA < 10.0 and ≥ 10 ng/mL, respectively ($p < 0.01$). The rectal fistula rate was 1.2%, and incontinence was 6.4% with 3.8% requiring pad use 12 months after therapy.
Conclusions: Salvage cryoablation offers a potentially curative option following failed radiation therapy and is associated with a morbidity profile favourable in comparison to salvage prostatectomy. Biochemical sur-

vival is significantly higher for patients with a pre cryoablation PSA < 10 ng/mL. In contrast to high historical rates, data from patients in the COLD registry indicate that the occurrence of rectal fistulas and incontinence is much less common than in the past. Efforts to continue to minimize these complications should continue.

P31

Focal and nerve sparing cryoablation: results from the COLD registry

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Background: Prostate cryoablation is associated with a high rate of post treatment erectile dysfunction. Focal cryoablation (FC) is a modification of the procedure in which only those regions known to harbor cancer are treated with aggressive freezing and uninvolved regions are spared (including a neurovascular bundle). During nerve warming cryoablation (NWC) the entire prostate is targeted for ablation and a warming probe is placed near one or both nerves to spare it from an ablative freeze injury. The objective of this study is to report the outcomes of both FC and NWC at a large number of centres, both academic and community, which have participated in the Cryo Online Data (COLD) Registry. To the authors' knowledge, this is the largest report of its kind to date.

Methods: Deidentified patient data were retrospectively collected on the secure online data registry. Biochemical failure defined according to the 2006 revised ASTRO definition (nadir+2). Patients underwent biopsy for rising or suspicious PSA. Incontinence was defined as any leak of urine 12 months post-treatment and further stratified according to pad use. Potency was defined as the ability to vaginally penetrate and complete intercourse 12 months after therapy and was stratified according to required assistance.

Results: Ten physicians participated and 240 patients were entered. Kaplan–Meier (KM) analysis demonstrated 3-year actuarial biochemical disease free survival of 83.6% ± 4.5% for FC patients and 2-year survival of 81.5% ± 6.9% for NWC patients. Of those patients biopsied 3/21 (14.6%) and 1/6 (16.7%) demonstrated residual or recurrent disease following FC and NWC, respectively. Return to intercourse data are presented in the table.

Table 1. Abstract P31. Potency outcomes

	Focal	Nerve Warming
Return to intercourse (at 12 mo)	36/51 (70.1%)	10/34 (29.4%)
Without any assistance	17/51 (33.3%)	4/34 (11.8%)
With oral pharmaceuticals only	16/51 (31.4%)	3/34 (8.9%)

Conclusions: Potency does not appear to be well preserved after NWC compared with FC. Although the follow-up of both procedures is short they both have encouraging biochemical control and biopsy results. Long-term follow-up is needed to determine the cancer control of focal cryoablation.

P32

Percutaneous impedance-based radio frequency ablation for renal tumors: early results from the University of Rochester Medical Center

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Background: Ablative techniques for the treatment of enhancing renal masses have become a useful tool in the urologist's armamentarium in recent years. We report our single institution experience using percutaneous radiofrequency ablation (RFA).

Methods: Since July 2005, our center has treated 27 selected patients with percutaneous RFA for enhancing renal masses using the impedance-based RF 3000 Radiofrequency Ablation System and LeVeen Needle Electrodes (Boston Scientific, Natick, Mass.) under non-contrast computerized tomography (CT) guidance. Patients with enhancing solid renal lesions amenable to percutaneous access were eligible for RFA. Centrally located lesions and cystic masses were excluded. Under general anesthesia, 18- or 16-gauge needle biopsies of the mass were performed immediately prior to treatment. Post-RFA follow-up consists of an initial postoperative check with laboratory studies 1-2 weeks after treatment followed by serial contrast imaging (CT or MRI) and blood work to evaluate renal function and monitor for disease recurrence.

Results: A total of 27 patients (17 men, 10 women) with a median age of 68 years (range 43–87) have been treated. The enhancing renal masses ranged in size from 1.0–4.5 cm (mean 2.25) with the following breakdown: 1.0–1.9 cm (n = 14), 2.0–2.9 cm (n = 6), 3.0–3.9 cm (n = 5), 4 cm (n = 2). Pretreatment needle biopsies were interpreted as: conventional clear cell 13 (48.1%), papillary 4 (14.8%), oncocytoma 3 (11.1%), and nondiagnostic 7 (25.9%). RFA was not able to be completed in 1 patient due to unfavorable anatomic relationships. Of the 26 successfully treated patients, all have been seen for their postoperative check and 22 have had follow-up imaging performed. For those with imaging, the mean post-RFA follow-up time is 7.3 months (range 1–17). No patient has required additional treatment to an ablated mass or experienced site-specific disease recurrence per imaging criteria. Pre- versus post-RFA renal function, as assessed by serum creatinine, is unchanged. Complications have been minor and include a superficial skin burn beneath a grounding pad (1 patient) and post-procedure bleeding that required the transfusion of a single unit of packed red blood cells (1 patient).

Conclusions: Our early data indicate that percutaneous RFA utilizing impedance monitoring is a safe treatment option for appropriately selected patients. Although early radiographic findings are encouraging, longer follow-up is necessary to determine this technique's oncologic efficacy.