Podium Session 1: Endourology, BPH, Robotics
June 29, 2019; 1500–1600

POD-1.1

WATER II: Aquablation therapy for benign prostatic hyperplasia (80–150 cc) 12-month safety and efficacy results

Naeem Bhojani[1], Dean S. Elterman[2], Ryan F. Paterson[3], Alan I. So[3], S. Larry Goldenberg[3], Ronald P. Kaufman Jr.[4], James E. Lingeman[5], Steven Kaplan[6], Mitchell Humphreys[7], Kevin Zorn[1], Claus Roehrborn[8]; submitted on behalf of the WATER II investigators

[1]Urology, Université de Montréal, Montréal, QC, Canada; [2]Urology, University of Toronto, Toronto, ON, Canada; [3]Urology, University of British Columbia, Vancouver, BC, Canada; [4]Urology, Albany Medical College, Albany, NY, United States; [5]Urology, Indiana University, Indianapolis, IN, United States; [6]Urology, Icahn School of Medicine at Mount Sinai, New York, NY, United States; [7]Urology, Mayo Clinic Arizona, Scottsdale, AZ, United States; [8]Urology, UT Southwestern Medical Center, Dallas, TX, United States

Introduction: In a large, blinded, multicentre, randomized trial (WATER), Aquablation (AquaBeamSystem, PROCEPT BioRobotics, Inc., U.S.), an ultrasound-guided, robotically executed waterjet ablative procedure, demonstrated improved urinary symptom scores that were comparable to those found after transurethral resection of the prostate (TURP) in men suffering from benign prostatic hyperplasia (BPH) with gland sized from 30–80 cc. In a previous study, subset analysis revealed that patients with larger gland sizes demonstrated better outcomes with Aquablation compared to TURP. These observations identified the need to assess the safety and efficacy of performing Aquablation in men with larger prostate glands (80–150 cc) (WATER II). Herein, we report the 12-month outcomes.

Methods: A total of 101 men with moderate-to-severe BPH symptoms and prostate volumes of 80–150 cc underwent a robotic-assisted Aquablation procedure in a prospective, multicentre, international clinical trial. Baseline demographics and standardized postoperative management parameters were carefully recorded in a central independently monitored database. Functional and safety outcomes were assessed at 12 months postoperatively.

Results: Mean prostate volume was 107 cc (range 80–150). Mean operative time was 37 minutes and mean Aquablation resection time was eight minutes. The average length of hospital stay following the procedure was 1.6 days. Mean International Prostate Symptom Score (IPSS) improved from 23.2 at baseline to 6.2 at 12 months ($p<0.0001$). Mean IPSS quality of life improved from 4.6 at baseline to 1.3 at 12-month followup ($p<0.0001$). Significant improvements were seen in peak flow rate (Qmax) (12-month improvement of 12.5 cc/sec) and post-void residual (PVR) (drop of 171 cc in those with PVR>100 at baseline). Antegrade ejaculation was maintained in 81% of sexually active men. No patient underwent a repeat procedure for BPH symptoms. There was a 2% de novo incontinence rate at 12 months and 10 patients did require a transfusion postoperatively, while five required take back fulgurations. At 12 months, prostate-specific antigen (PSA) decreased from 7.1±5.9 ng/mL at baseline to 4.4±4.3 ng/mL.

Conclusions: The Aquablation procedure is demonstrated to be safe and effective in treating men with large prostates (80–150 cc) after one year of followup, with an acceptable complication rate and without a significant increase in procedure or resection time compared to smaller-sized glands.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/272

POD-1.2

Demonstration of an effective ultra-low-dose computed tomography protocol with lower radiation dose than abdominal x-ray

Kymora Scotland[1], Jean Buckley[2], Savvas Nicolaou[2], Charles Zwirewich[2], Patrick McLaughlin[2], Ben H. Chew[1]

[1]Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; [2]Radiology, University of British Columbia, Vancouver, BC, Canada

Introduction: Computed tomography of the kidneys, ureters, and bladder (CT-KUB) is the gold standard to identify renal calculi. However, its use is concerning for radiation exposure, particularly in recurrent stone-formers. At this institution, KUB x-rays are routinely performed immediately prior to shockwave lithotripsy (SWL). Recent advances have made sub-milliSievert (mSv) ultra-low-dose CT (ULDCT) acquisition feasible, but their diagnostic performance in comparison with KUB x-ray (KUB) has not been reported. In this prospective study, we compare the radiation dose and diagnostic performance of ULDCT to KUB in patients prior to SWL. We hypothesized that ULDCT will detect more symptomatic calculi than KUB at less radiation exposure prior to SWL.

Methods: Patients were enrolled prospectively to receive a KUB and ULDCT prior to SWL. If no stones were identified, they received a standard low-dose abdominal CT. Radiation exposure parameters were recorded and both examinations were read in random order by two blinded radiologists to determine image quality and diagnostic accuracy.

Results: A total of 102 patients with a mean age of 55.7±13.8 years were enrolled. ULDCT detected stones with 95% sensitivity and 98% specificity with effective radiation dose 48% lower (0.28±0.08 mSv) compared to KUB (0.54±0.11 mSv; $p<0.001$). Negative and positive predictive values were 95% and 98% for ULDCT (83%, 92% for KUB). Measurement of stone size was equivalent using ULDCT (6.47±3.34 mm) compared to KUB (6.98±3.41 mm; $p=0.455$); however, in 12 cases (14.5%), ULDCT localized stones undetected on KUB. ULDCT reduced the requirement for repeat conventional dose CT-KUB.

Conclusions: ULDCT delivers 48% less radiation than a KUB radiograph and is superior at detecting the number and size of stones. In 14.5% of cases, ULDCT identified and localized ureteric stones prior to SWL that were not seen on KUB. ULDCT can be safely and effectively used in recurrent stone-formers with smaller radiation dose than low-dose CT.

POD-1.3

Predicting ureteric stone expulsion with patient-reported outcomes: A prospective, observational study

Ryan McLarty[1], Mark Assmus[1], Tim Wollin[1], Shubha De[1]

[1]Division of Urology, University of Alberta, Edmonton, AB, Canada

Introduction: Many outcome-based studies have used patient-reported accounts to establish stone passage rates, however, little data exists regarding the accuracy of such assessments. We sought to prospectively quantify the accuracy of patient-reported variables on true ureteric stone expulsion rates.

Methods: New patients presenting to the University of Alberta stone clinic were prospectively surveyed between April 2016 and November 2017. Current patient symptoms and an assessment of whether or not they believed they had passed their stone were assessed. Exclusion criteria included non-ureteric stones, sepsis, and prior ureteric stent or intervention for the current stone episode. The primary outcome was radiographic stone passage as confirmed by ultrasound and kidneys-ureters-bladder (KUB) computed

tomography (CT) scan or ureteroscopy. Radiographic stone passage was compared to patient survey responses to calculate sensitivity and specificity.
Results: A total of 136 patients met inclusion criteria with an average followup of 16.9±8.0 days from diagnosis; 69.5% were male, 50% were distal stones, average stone size was 6.8±3.2 mm, and 43.3% of patients had imaging-confirmed stone passage at first visit. Fifty-eight percent of patients who reported cessation of pain had passed their stone. Furthermore, only 77.7% of patients who believed they had passed their stone had actually passed it. Cessation of pain at the time of assessment demonstrated a sensitivity of 79.7% (95% confidence interval [CI] 67.1–89.0) and a specificity of 55.8% (95%CI 44.0–67.1%) for true ureteric stone expulsion. Patient-reported stone passage had a sensitivity of 59.3% (95% CI 45.7–71.9) and a specificity of 87.0% (95% CI 77.4–93.5) for true ureteric stone expulsion.
Conclusions: This is the largest prospective cohort study to assess patient-reported outcomes on ureteric stone expulsion. Cessation of pain displayed a high sensitivity for predicting ureteric stone expulsion, while patient-reported stone passage had a high specificity. Both assessments may incorrectly assess ureteric stone expulsion, which raises concern for their validity as a clinical endpoint.

POD-1.4

"Stone-free," now what? A retrospective review of patients following stone-free status

Betty Wang[1], Mark Assmus[2], Nick Dean[2], Shubha De[2], Trevor D. Schuler[2], Tim Wollin[2]
[1]Faculty of Medicine & Dentistry, University of Alberta, Edmonton, AB, Canada; [2]Department of Surgery, Division of Urology, University of Alberta, Edmonton, AB, Canada
The Data Integration and Management Repository (DIMR)
Introduction: There remains a paucity of clinically relevant long-term stone event rate data for varying stone burdens. Previous literature quotes 30–50% recurrence rates at 8–10 years for all first-time stone-formers irrespective of stone burden.[1-3] We sought contemporary, long-term event rates for a subset of "low stone burden" patients presenting with single symptomatic urinary tract calculi who achieved stone-free status.
Methods: To date, 119 adults with a solitary symptomatic urinary tract stone on computed tomography (CT) seen by one of four urologists in Edmonton, Alberta, from April to September 2009, who later achieved stone-free status, have been added to a REDCap database. Province-wide data was extracted with Data Integration and Management Repository (DIMR) for demographics, stone burden, and eight-year outcomes (emergency room [ER] renal colic, urology visit, stone surgeries). T-test, Fisher's exact two-tailed test, and Kaplan-Meier time to event curves were used (significance $p<0.05$).
Results: A total of 119 patients with solitary symptomatic urinary tract calculi achieved stone-free state. Mean age was 55 years (18–94) with 41% female. Thirteen percent (15/119) had spontaneous passage, while the remainder required surgery. Once stone-free (asymptomatic and imaging-confirmed), 29% (34/119) had a subsequent stone event within eight years, with 20% (24/119) requiring surgery. Nineteen percent (23/119) re-presented to the ER with renal colic. Four patients required >2 surgeries and only two patients experienced a septic stone event at eight years. The eight-year stone event rate for this "low stone burden" population differed between first-time stone-formers and recurrent (FTSF 21% vs. RS 44%, $p<0.05$).
Conclusions: Eight-year followup of patients achieving stone-free status after a solitary symptomatic urinary tract calculi revealed an overall symptomatic recurrence rate of 29%. Overall, achieving stone-free status led to a low rate of subsequent ER visits, urology consultations, and need for surgery, especially for first-time stone-formers.
References
1. Uribarri J, Oh MS, Carroll HJ. The first kidney stone. *Ann Intern Med* 1989;111:1006-9. https://doi.org/10.7326/0003-4819-111-12-1006
2. Ljunghall S, Danielson BG. A prospective study of renal stone recurrences. *Br J Urol* 1984;56:122–4. https://doi.org/10.1111/j.1464-410X.1984.tb05346.x
3. Ljunghall S. Incidence of upper urinary tract stones. *Miner Electrolyte Metab* 1987;13:220-7.

POD-1.5

Surgical performance as a predictor of functional and oncological outcomes in robotic prostatectomy

Mitchell G. Goldenberg[1], Alaina Garbens[1], Hossein Sadaat[1], Antonio Finelli[1], Rajiv K. Singal[1], Jason Lee[1], Teodor P. Grantcharov[2]
[1]Division of Urology, Department of Surgery, University of Toronto, Toronto, ON, Canada; [2]Division of General Surgery, Department of Surgery, University of Toronto, Toronto, ON, Canada
Royal College of Physicians and Surgeons and Canada (RCPSC), Canadian Urologic Oncology Group (CUOG)
Introduction: Objective assessments of surgical technical performance have been identified as a novel measure of surgical quality across multiple procedures.[1] This study aimed to investigate the ability of such assessments to predict clinically significant patient outcomes following robotic-assisted radical prostatectomy (RARP) in a multicentre, prospective cohort.
Methods: Surgical video from patients undergoing RARP at three institutions was collected over a nine-month period. Blinded surgical analysts completed assessments of surgeon technical skill using the Global Evaluative Assessment of Robotic Skills (GEARS),[2] and the Prostatectomy Assessment Competency Evaluation (PACE).[3] Postoperative urinary continence at three months, sexual function at 12 months, and positive surgical margins were selected as primary outcomes. Binary logistic regression was used to control for patient factors and a sensitivity analysis was carried out to account for surgeon and hospital fixed effects. Cross-validation was carried out to further test the predictive models.
Results: Thirty-one surgeons, including staff and trainees, and 92 patients were eligible for the final analysis. On multivariable analysis, GEARS score was an independent predictor of continence ($p<0.05$) and PACE score was predictive of continence ($p<0.01$), potency ($p<0.05$), and positive surgical margin ($p<0.05$). Adjusting for surgeon experience and hospital volume, only PACE remained a significant predictor of continence ($p<0.01$) and positive surgical margin ($p=0.02$). Cross-validation reduced the area under the curve for the continence model from 0.742 to 0.740, and the positive surgical margin model from 0.725 to 0.521.
Conclusions: Surgical technical skill is a predictor of oncological and functional outcomes following RARP. These findings have implications for training, credentialing, and quality improvement in the field of urologic oncology.
References
1. Fecso AB, Szasz P, Kerezov G, et al. The effect of technical performance on patient outcomes in surgery: A systematic review. *Ann Surg* 2017;265:492-501. https://doi.org/10.1097/SLA.0000000000001959
2. Goh AC, Goldfarb DW, Sander JC, et al Global evaluative assessment of robotic skills: Validation of a clinical assessment tool to measure robotic surgical skills. *J Urol* 2012;187:247-52. https://doi.org/10.1016/j.juro.2011.09.032
3. Hussein AA, Ghani KR, Peabody J, et al. Development and validation of an objective scoring tool for robot-assisted radical prostatectomy: Prostatectomy assessment and competency evaluation. *J Urol* 2017;197:1237-44. https://doi.org/10.1016/j.juro.2016.11.100

POD-1.6

A population-based comparison of healthcare utilization and retreatment after electrode and laser transurethral prostatectomies

Blayne K. Welk[1,2], Jennifer Reid[2], Michael Ordon[2,3], Hassan Razvi[1], Jeffrey B. Campbell[1]
[1]Surgery, Western University, London, ON, Canada; [2]Institute for Clinical Evaluative Sciences, London, ON, Canada; [3]Surgery, University of Toronto, Toronto, ON, Canada
Funded by the St Joseph's Hospital Foundation
Introduction: To our knowledge, the real-world implementation of laser-based transurethral resection of prostate (TURP) has not been studied. Our

objective was to compare the healthcare utilization and repeat TURP rate among older men undergoing either an electrode or laser-based TURP.
Methods: We used administrative data from the province of Ontario, Canada to identify all men >66 years who underwent their first TURP between 2003 and 2016. Our index event (TURP) was defined using a combination of billing and procedure codes. Our primary exposure was type of TURP (laser or electrode). Our primary outcome was need for repeat TURP. Secondary outcomes included blood transfusion, length of stay, and return to the emergency room (ER). Our primary analysis was an adjusted marginal Cox model approach, which accounted for clustering of patients within treating physicians; a marginal logistic regression was used for some secondary outcomes (adjusted hazard ratios [aHR]/odds ratios [aOR] and 95% confidence intervals [CI]).
Results: We identified 52 748 men: 6838 (13%) underwent laser TURP and 45 910 (87%) underwent electrode TURP. Median age was similar, and laser TURP became more common with time. Compared to the laser TURP group, more patients in the electrode group had more prior gross hematuria or urinary retention, and fewer had used anticoagulants or 5-alpha reductase inhibitors. The need for repeat TURP was significantly higher among men who had a laser TURP (aHR 1.57; CI 1.38–1.78; absolute risk difference +2.3%); laser TURP was also associated with a slightly higher risk of return to ER within 30 days of TURP (aOR 1.11; CI 1.01–1.22). Laser TURP had a significantly lower risk of blood transfusion (aOR 0.24, CI 0.16–0.37) and the majority of cases were done as a <24-hour stay (73% vs. 7% for electrode TURP).
Conclusions: We confirmed the expected benefits of laser TURP (shorter hospital stay and decreased blood loss), however, there was a significantly higher rate of repeat TURP.

Poster Session 1: Urinary Incontinence, Lower Urinary Tract Reconstruction, Renal Transplantation
June 30, 2019; 0730–0900

MP-1.1
Is there an association between urinary incontinence and mortality in community-dwelling elderly individuals? A retrospective cohort study

Rano Matta[1], Amanda Hird[1], Refik Saskin[2], Sidney B. Radomski[1,3], Lesley Carr[1,4], Ronald T. Kodama[1,4], Robert K. Nam[1,4], Sender Herschorn[1,4]
[1]Division of Urology, University of Toronto, Toronto, ON, Canada; [2]IC/ES, Toronto, ON, Canada; [3]Division of Urology, University Health Network, Toronto, ON, Canada; [4]Division of Urology, Sunnybrook Health Sciences Centre, Toronto, ON, Canada
Functional Urology Research Group, University of Toronto

Introduction: Urinary incontinence (UI) is a prevalent condition in community-dwelling older adults. Frailty, as a state of vulnerability, an important measure in this population, is associated with multiple adverse health outcomes. Previous studies have demonstrated an association between UI and increased mortality, independent of demographic and health status. However, they have not accounted for the effect of frailty. We explored whether there was an association between UI and mortality, and if so, whether adjustment for frailty diminishes the association.

Methods: We conducted a retrospective cohort study using a nationally representative sample of community-dwelling individuals ≥50 years surveyed in the 2003–2004 and 2005–2006 cohorts of the United States National Health and Nutrition Examination Survey (NHANES). The primary outcome was overall survival reported on December 31, 2015. We used design-adjusted Cox proportional hazards regression models to estimate the hazard of mortality associated with UI. We adjusted our models for demographics and a validated 45-item frailty index, which incorporates an accumulation of deficits in the domains of health and independence.

Results: We identified a sample of 2282 survey participants eligible for analysis. Within this sample, 22% of individuals reported having UI at least a few times a week. UI was independently associated with an increase in the frailty index by 6.1% (95% confidence interval [CI] 4.3–7.9%; p<0.0001). In survival analysis, adjusted for age, gender, race, household income, and body mass index, and excluding the frailty index, individuals with UI experienced a higher risk of death (hazard ratio [HR] 1.40; 95% CI 1.11–1.76; p=0.005). When adjusted for the frailty index, the association between UI and mortality was diminished (HR 1.09; 95% CI 0.87–1.36; p<0.44).

Conclusions: The reported association between UI and mortality can be understood based on higher frailty in incontinent individuals. UI itself is not independently associated with mortality.

MP-1.2
AdVance/AdVance XP transobturator male slings: Single-centre experience for treatment of post-prostatectomy incontinence

Cameron Lam[1], Timothy O. Davies[1]
[1]Department of Surgery, Division of Urology, McMaster University, Hamilton, ON, Canada

Introduction: Male stress urinary incontinence (SUI) is a common occurrence after radical prostatectomy. Although the insertion of an artificial urinary sphincter has been the standard of care, over the last 10 years, the transobturator male urethral sling has emerged as a minimally invasive option for management of SUI.

Methods: A retrospective review between June 2010 and June 2018 identified 76 patients who underwent insertion of a transobturator male urethral sling at Hamilton Health Sciences by a single surgeon. Exclusion criteria included patients who had previous surgical management of SUI, neurological disorders affecting voiding, and patients who displayed predominant urge incontinence on urodynamic studies (UDS). All patients were assessed with UDS preoperatively. Incontinence was assessed by number of pad usage per day (PPD) prior to sling procedure, at 1–3 months postoperatively, and at the last documented followup. Severity of SUI was defined as mild (1–2 PPD), moderate (3–5 PPD), and severe (≥6 PPD). Outcomes were defined as cured (≤1 PPD), improved (≥50% PPD reduction), and failed (<50% PPD reduction). A Cox proportional hazard regression model was used to identify possible prognostic variables for failure defined a priori, including age, prior radiation, sling type, body mass index (BMI), time from original procedure to sling insertion, and PPD.

Results: Between June 2010 and June 2018, a total of 23 AdVance and 53 AdVance XP slings were implanted.Average age of the patients was 67.8±6.0 years with a BMI of 28.7±3.6. Median (range) followup time was 8.6 (1.3–81.1) and 13.7 (1.3– 42.9) months for the AdVance and AdVance XP, respectively. Cure rate was 95.7% and 92.5% at last followup for the patients implanted with the AdVance and AdVance XP sling. Univariate analysis showed no difference between the AdVance and AdVance XP in treatment failure rate and the only significant variable predictive of failure was age (hazard ratio [HR] 1.511; p=0.028); multivariate analysis significance toward age (HR 1.211; p=0.041) and a trend toward preoperative pad useage (HR 2.742; p=0.057) as a predictor of failure to cure.

Conclusions: The AdVance and AdVance XP are both effective and safe treatment options for male post-prostatectomy mild to severe SUI and there appears to be no superiority of one over the other. Cure rates were similar at 95.7% and 92.4% for the AdVance and AdVance XP sling at our centre, slightly higher than reported in the literature. Increasing age was a significant prognostic factor in predicting patients who would go on to both 'failed' and 'improved' outcomes, but likely represents a relationship with overall health and mobility rather than age alone. Preoperative pad usage also showed a trend towards predicting patients who may not go on to complete cure. Prior radiation, BMI, or preoperative urgency were not predictive of failure.

MP-1.3
Surgeon experience does not influence success or complications of trans-obturator male slings

Logan W. Zemp[1], Steven Tong[1], Nathan Hoy[1], Keith F. Rourke[1]
[1]Division of Urology, University of Alberta, Edmonton, AB, Canada

Introduction: The effect of surgeon experience on trans-obturator male slings is unclear. Our objective was to assess the effect of surgeon experience on non-adjustable trans-obturator sling failure and 90-day complications in men undergoing treatment for post-prostatectomy incontinence (PPI).

Methods: A retrospective, single-surgeon review of Advance/Advance XP trans-obturator male sling procedures for PPI was performed over a 10-year period (2007–2017). The treating surgeon had prior experience with urethral surgery. Patients with known risk factors for sling failure were excluded from the study, including those with severe incontinence (>5 pads), radiation therapy, untreated detrusor overactivity, or neurogenic detrusor dysfunction. Clinical factors examined were patient age, Charlson comorbidity index (CCI), diabetes, obesity (body mass index ≥35), type of prostatectomy and number of preoperative pads. The outcome measures were sling failure (defined as 1 or less pads postoperatively if preoperative pads were ≥2 or 0 pads if preoperative pad use was 1) and 90-day complications (Clavien grade). Surgeon experience was coded as the total number of slings performed by the surgeon before each surgery and also by quartiles

for descriptive purposes. Cox regression analysis was used to evaluate the association between surgeon experience and sling failure and binary logistic regression to examine the effect on 90-day complications.
Results: Of 158 patients, continence was achieved in 82.3% (n=130) with a mean followup of 42.9 months. Mean pad usage preoperatively was 2.8 pads per day with a mean change of 2.1±1.3 pads (p<0.0001). Patient-reported satisfaction was 86.7% (n=137) and complications (any Clavien grade) occurred in 12.0% (n=19) of patients. On univariate Cox regression analysis, surgeon experience was not associated with sling failure (p=0.55), while increasing age (p=0.01), CCI (p=0.02), and preoperative pad use (p<0.0001) were. (p=0.49). Likewise, on multivariate analysis, surgeon experience was not associated with sling failure (hazard ratio [HR] 1.0; 95% confidence interval [CI] 0.9–1.1; p=0.92), while increasing preoperative pad use was (H.R. 1.3; 95% CI 1.1–1.6; p=0.01). Additionally, surgeon experience did not influence the occurrence of 90-day complications after male slings (p=0.33).
Conclusions: There does not appear to be a significant surgical learning curve for placement of non-adjustable trans-obturator male slings, at least in surgeons with prior experience in urethral surgery.

MP-1.4

Association between stress incontinence surgery and pelvic malignancy: A population-based cohort study

Humberto Vigil[1], Christopher Wallis[1], Joseph R. LaBossiere[2], Sender Herschorn[1], Lesley Carr[1]
[1]Division of Urology, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada; [2]Division of Urology, University of Alberta, Edmonton, AB, Canada
Introduction: Stress incontinence surgery was revolutionized by the mid-urethral sling. However, concerns with respect to the implantation of pelvic mesh continue to exist. One such concern is a potential link between pelvic mesh and malignancy. We sought to evaluate the association between stress incontinence surgery (including transvaginal mesh) and carcinogenesis in a large, population-based cohort.
Methods: Using administrative data, we performed a retrospective cohort of all adult women who underwent stress incontinence surgery from 1994–2016 in Ontario, Canada. The primary outcome of interest was the diagnosis of pelvic cancer. The standardized incidence rate (SIR) was calculated to evaluate for a potential increased risk of malignancy. Subgroup analyses were performed for individual malignancies and urethral sling patients.
Results: A total of 120 999 women underwent a procedure for stress incontinence in the form of urethropexy, combined abdominal/vaginal sling, bulking agent, or urethral sling in Ontario during the study period. Urethral sling accounted for 63% of procedures. Median followup was 9.3 years (interquartile range [IQR] 5.4–14.4). Over a total of 1 221 668 person-years of observation, 935 pelvic cancers were observed. Based on an age-stratified sample of the general population, the expected number of cases was 1146 (SIR for any pelvic cancer 0.816, 95% confidence interval [CI] 0.764–0.870). Similarly, among patients who underwent a urethral sling, the SIR was 0.831 (95% CI 0.758–0.909).
Conclusions: Stress incontinence surgery including the transvaginal implantation of mesh was not associated with an increased risk of pelvic malignancy in a large population-based cohort.

MP-1.5

Impact of detrusor overactivity on the efficacy of selective bladder denervation for the treatment of female refractory overactive bladder

Raphaëlle Brière[1], Patrick Richard[2], Matthieu Gratton[3], Stefan De Wachter[4], Le Mai Tu[2]
[1]Université Laval, Québec City, QC, Canada; [2]Urology, Université de Sherbrooke, Sherbrooke, QC, Canada; [3]Urology, Université Laval, Québec City, QC, Canada; [4]Urology, University of Antwerp, Antwerp, Belgium
Partial funding from Amphora Medical Inc.
Introduction: Sub-trigonal afferent nerve signaling has been thought to cause overactive bladder (OAB) symptoms.[1] A recent publication reported the superior efficiency of selective bladder denervation (SBD) using a 60-second, temperature-controlled radiofrequency (RF) protocol (RF60) compared to a 10-second, voltage-controlled RF protocol (RF10).[2] We evaluated the clinical outcomes of SBD according to the presence or absence of baseline detrusor overactivity (DO).
Methods: This was a prospective observational institutional study of 46 females with refractory OAB who underwent SBD from May 2015 to April 2017. The first 23 patients received RF10 whereas the last 23 received RF60. Patients were categorized according to treatment protocol and DO status (DO- vs. DO+) on baseline urodynamics. Clinical outcomes assessed at 12 weeks and 12 months were the 24-hour pad weight test (PWT), three-day voiding diary variables, and subjective improvement assessed via OAB-q, Treatment Benefit Scale, and subjective improvement rate.
Results: In the RF10, only the DO- group reported significant reduction in several outcomes at 12 weeks (voids/24-hour, urgency/three days and Patient Perception of Intensity of Urgency Scale [PPIUS] grade 3/24 hours), and at 12 months (voids/24 hours, nocturia, urgency and urgency urinary incontinence (UUI) per three days). In the RF60, both DO- and DO+ groups reported significant improvement at 12 weeks in the 24-hour PWT, UUI/three days, urgency/three days, and PPIUS grades 0–2, 3, and 4/24 hours, and at 12 months in urgency/three days and PPIUS grade 3/24 hours. When directly comparing DO- and DO+ outcomes, only the reduction of UUI/three days in the RF60 DO- group at 12 weeks was significantly different (-9.0 vs. -6.5; p=0.045; Table 1). Regardless of the protocol, both groups were subjectively improved at each followup, except for the RF10 DO+ group at 12 weeks (Table 2).
Conclusions: Regardless of baseline DO status, SBD for females with refractory OAB using the RF60 appears to provide more efficient results, both objectively and subjectively, than the RF10.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/45
References
1. Birder L, Andersson KE. Urothelial signaling. *Physiol Rev* 2013;93:653-80. https://doi.org/10.1152/physrev.00030.2012
2. Tu LM, De Wachter S, Robert M, et al. Initial clinical experience with selective bladder denervation for refractory overactive bladder. *Neurourol Urodyn* 2019;38:644-52. https://doi.org/10.1002/nau.23881

MP-1.6

A randomized controlled trial of transcutaneous tibial nerve stimulation to treat overactive bladder and neurogenic bladder patients

Blayne K. Welk[1], Mary McKibbon[2]
[1]Surgery, Western University, London, ON, Canada; [2]St. Joseph's Hospital, London, ON, Canada
This study was funded by a CUA Astellas Grant and a SUFU Neuromodulation Grant
Introduction: Percutaneous tibial nerve stimulation (using a needle) is an established treatment for overactive bladder (OAB), but it is limited by high cost and provider burden. Transcutaneous tibial nerve stimulation (TTNS) uses patch electrodes to deliver stimulation; previous study of this has been limited by lack of blinding or a placebo group.
Methods: We conducted a randomized, double-blind, sham-controlled study. Patients were recruited into one of two groups: 1) adult women with OAB; and 2) adults with neurogenic bladder symptoms. The intervention was unilateral stimulation of the posterior tibial nerve, 30 minutes three times per week for 12 weeks at home. The sham group applied the electrodes away from the tibial nerve. The primary outcome was the patient perception of bladder condition (PPBC). Intention-to-treat analysis and ANCOVA models (with adjustment for baseline values) were used and marginal means (MM) are reported; p<0.05 was considered significant.
Results: Twenty patients with OAB and 28 patients with neurogenic bladder were recruited; 1/20 and 2/28 patients did not complete the study. Most neurologic patients had multiple sclerosis (79%). Baseline characteristics in both groups were similar. There was a poor correlation between the patient's actual and perceived assignment to sham/active treatment, suggesting adequate blinding. At completion, there was no

significant difference in the PPBC between active or sham groups in the OAB group (MM 4.4 vs. MM 4.6; p=0.60) or neurogenic bladder cohort (MM 4.0 vs. MM 4.2; p=0.63). Similarly, there were no significant differences in secondary patient-reported outcomes: the MM of the OAB-sf score for the OAB cohort was 47.5 (active) vs. 48.8 (placebo), (p=0.83) and the MM of the NBSS score for the neurogenic bladder groups was 32.9 (active) vs. 35.5 (placebo) (p=0.35). There were no differences in 24-hour pad weights.

Conclusions: TTNS does not appear to be efficacious among people with OAB or neurogenic bladder dysfunction.

MP-1.7

The relationship between overactive bladder and obstructive sleep apnea in a Canadian community-based population

Samer Shamout[1], Sarah Bouhadoun[1], Abubakr Mossa[1], Peter Chan[2], Lysanne Campeau[1]

[1]Urology, McGill University, Montréal, QC, Canada; [2]Urology, McGill University Health Centre, Montréal, QC, Canada

Introduction: Obstructive sleep apnea syndrome (OSAS) is associated with hypoxia, cardiovascular complications, and metabolic syndrome, all of which have been linked to overactive bladder syndrome (OAB) and erectile dysfunction (ED). We aimed to identify the prevalence of OAB symptoms among patients with OSAS and to describe the relationship between OSAS, OAB, and ED in a community-based population of Canadian men.

Methods: This is a cross-sectional study of 988 male participants of the Men's Health Day organized by McGill University (Montréal, Canada) (2013–2015). Participants underwent clinical evaluation, urine analysis, and blood sampling, and completed validated questionnaires of sexual health inventory (Sexual Health Inventory for Men [SHIM] and ADAM) and lower urinary tract symptoms (OAB-V8 and International Prostate Symptoms Score [IPSS]). Berlin questionnaire was used to classify participants into high and low risk of OSAS. Patients with persistent symptoms in any two of three domains were considered at high risk for OSAS.

Results: A total of 988 men with a mean age of 55 (±12.8) years showed a prevalence of 22.8% for OSAS, 36% for OAB, 50% for ED (mild to severe), and 60% for androgen deficiency. The high-risk OSAS group demonstrated significantly higher body mass index, blood pressure, triglycerides, and OAB-V8 score, while their testosterone level was significantly lower than the low-risk group. The incidence of diabetes mellitus, hypogonadism, and severe lower urinary tract symptoms (IPSS) were also higher among the high-risk group. The OAB-V8 score positively correlated with age (r=0.234), IPSS score (r=0.721), and Berlin score (r=0.111). SHIM score inversely correlated with OAB score (r=-0.263), IPSS (r=-0.259), and age (r=-0.418).

Conclusions: Higher risk of OSAS appears to be associated with metabolic syndrome, OAB, and lower testosterone level. Severity of ED correlated with severity of symptoms of OAB syndrome but showed no association with OSAS.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/47

MP-1.8

Novel cooling device for kidney transplant surgery

Ali Dergham[1], Luke Witherspoon[2], Thomas A. Skinner[2]

[1]School of Medicine, Faculty of Health Sciences, Queen's University, Kingston, ON, Canada; [2]Division of Urology, Department of Surgery, The Ottawa Hospital and University of Ottawa, Ottawa, ON, Canada

Introduction: In renal transplantation, warm ischemia time (WIT) describes the period of ischemia beginning with removal of the organ from ice and concluding at reperfusion. Metabolic activity in cooled kidneys is minimal at 5 ºC and resumes above 15 ºC, a temperature reached after only 15 minutes of WIT.[1-4] We set out to develop a novel, inexpensive device to maintain allograft temperatures ≤5 ºC, thereby limiting ischemic damage during transplantation.

Methods: 3/16″ aluminum tubing was organized in a serpentine pattern to create a malleable, form-fitting cooling jacket. Coolant comprised 4 ºC saline solution flowing at 240 mL/min. Adult porcine kidneys (n=4) (175 g, 13x7x3 cm LxWxH) were used to test the device. Kidneys were placed at 24 ºC; surface and core temperatures were monitored using implanted thermocouples. Device usability was tested by anastomosing porcine kidney vessels to GORE-TEX® vascular grafts with the cooling jacket in place in a simulated ex-vivo operative field.

Results: Our cooling jacket costs less than $3.00 to produce and is moldable to any size kidney. The device resulted in mean surface and core temperatures at 60 minutes of (mean ± standard deviation [SD]) 5.8±0.6 ºC and 5.4±0.5 ºC, respectively, significantly less than those of the control, 16.6±1.4 ºC and 16.6±1.2 ºC (p<0.00001 in both), respectively (Fig. 1). Moreover, our device mitigated surface temperature increases (2.4±1.3 ºC vs. 12.9±0.9 ºC) and core temperature increases (2.8±1.7 ºC vs. 14.1±1.5 ºC) at 60 minutes (p<0.00001). Ex-vivo anastomosic testing was not inhibited or delayed by our device during testing by expert transplant surgeons (Fig. 2).

Conclusions: WIT is associated with many adverse outcomes. We developed a novel inexpensive, and easy-to-use aluminum cooling jacket that mitigated temperature increase, and maintained renal temperatures below metabolically active levels, without impeding anastomoses.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/52

References

1. Russell JC, Chambers MM. Comparative temperature dependence of (Na+ + K+)-ATPase. *Physiol Chem Phys* 1976;8:237-51.
2. Szostek M, Kosieradzki M, Chmura A, et al. Does "second warm ischemia time" play a role in kidney allograft function? *Transplant Proc* 1999;31:1037-8. https://doi.org/10.1016/S0041-1345(98)01892-2
3. Ward JP. Determination of the optimum temperature for regional renal hypothermia during temporary renal ischemia. *Br J Urol* 1975;47:17-24. https://doi.org/10.1111/j.1464-410X.1975.tb03913.x
4. Kuipers TG, Hellegering J, El Moumni M, et al. Kidney temperature course during living organ procurement and transplantation. *Transpl Int* 2017;30:162-9. https://doi.org/10.1111/tri.12892

MP-1.9

Safety of ureterolysis in the management of retroperitoneal fibrosis

James Ross[1], Neal E. Rowe[1]

[1]Department of Surgery, Division of Urology, University of Ottawa, Ottawa, ON, Canada

Introduction: Retroperitoneal fibrosis (RPF) is rare and can progress to extrinsic ureteric obstruction. Surgical management with ureterolysis is typically reserved for patients failing medical treatment; however, current literature on complications is limited to small, single-centred series. In this study, we aim to use a large, multicentred database to assess the short-term surgical outcomes of ureterolysis for patients with RPF.

Methods: Using the American College of Surgeons National Quality Improvement Program (NSQIP) database, a retrospective review was conducted on patients who underwent ureterolysis for RPF between January 1, 2006 and December 31, 2016. Only patients who underwent ureterolysis as a principle operative procedure by a urologist were included. Complications within 30 days of surgery were captured in the data set and organized based on the Clavien-Dindo classification system. The frequency of secondary urological procedures at the time of initial ureterolysis (ureteroureterostomy, ureteroneocystostomy, and ureteroneocystostomy with psoas hitch/bladder flap) was identified.

Results: One hundred patients (51 male, 49 female) were included in the cohort, with a mean age of 57 years (interquartile range [IQR] 43, 66). Of these patients, four underwent a secondary urological procedure at the time of ureoterolysis: one ureteroureterostomy, two ureteoneocystostomy, and one ureteroneocystostomy with psoas hitch/bladder flap. The overall complication rate was 12%, of which almost all were Clavien grade I or II (wound or urinary infection). Only one patient required a return to the operating room (Grade III) and there were no high-grade complications (Grade IV or V).

Conclusions: This is the largest study of perioperative complications from ureterolysis in the setting of RPF. The overall complication rate was low

and most complications were low-grade. As such, ureterolysis likely represents a safe treatment option for ureteric obstruction secondary to RPF.

MP-1.10

Urethral stricture is frequently a morbid condition: Identifying patients at increased risk for complications due to urethral stricture

Christopher King[1], Keith F. Rourke[1]
[1]Division of Urology, University of Alberta, Edmonton, AB, Canada

Introduction: While urethral stricture can diminish a patient's quality of life, some patients will also experience complications directly related to urethral stricture. The objective of this study is to determine the frequency of complications related to urethral stricture and identify clinical factors associated with them.

Methods: A total of 1851 patients with urethral stricture presenting to a single urologist from 2005–2016 were retrospectively reviewed. Clinical variables examined were complications directly related to urethral stricture at the time of presentation, presenting signs/symptoms, type of complications, patient age, stricture length, location, and etiology. Complications considered significant were acute urinary retention or difficult catheterization requiring emergent urological intervention or renal failure, urosepsis, or urethral abscess directly related to urethral stricture. Patients without complete data were excluded from the study. The occurrence of complications was compared in relation to patient age, symptoms, stricture length, location, and etiology using binary logistic regression.

Results: Of 1023 patients meeting inclusion criteria, mean patient age was 48.0 years and mean stricture length was 5.0cm (1–18). Stricture etiology was most commonly idiopathic (46.3%), iatrogenic (15.0%), or due to lichen sclerosus (14.9%). The most common stricture location was bulbar (65.6%), followed by penile (18.6%), multisegment (10.6%), and posterior (5.4%). Less than half (40.6%, 415) of patients had at least one complication directly related to urethral stricture, including acute urinary retention (32.6%), difficult catheterization (16.0%), urethral abscess/urosepsis (5.0%), and renal failure (3.1%); 7.0% of patients experienced complications deemed to be life-threatening. On multivariate analysis, stricture length (in cm) (odds ratio [OR1.1; 95% confidence interval [CI] 1.1–1.2; p=0.01), lack of reported lower urinary tract symptoms (LUTS) (OR 3.8; 95% CI 1.9–7.3; p<0.0001), posterior stenosis (OR 3.0; 95% CI 1.3–6.8; p=0.01), and traumatic strictures (OR 1.6; 95% CI 1.1–2.4; p=0.02) were associated with complications related to urethral stricture. On multivariate analysis, stricture etiology, particularly trauma (OR 2.2; 95% CI 1.1–4.6; p=0.03) and hypospadias (OR 2.5; 95% CI 1.1–6.5; p=0.05) were associated with an increased risk of life-threatening complications.

Conclusions: Urethral stricture is frequently a morbid condition. Patients with longer strictures, posterior stenoses, absence of preceding LUTS, and traumatic strictures are at highest risk for complications related to urethral stricture. Patients with these high-risk characteristics should perhaps be strongly encouraged to pursue definitive treatment.

MP-1.11

Reconstruction of proximal bulbar strictures caused by transurethral procedures for benign prostatic hyperplasia

Callum Lavoie[1], Keith F. Rourke[1], R. Christopher Doiron[1]
[1]Division of Urology, University of Alberta, Edmonton, AB, Canada

Introduction: Proximal bulbar urethral strictures are a well-known complication of transurethral treatments for benign prostatic hyperplasia (BPH). Urethroplasty outcomes in this specific population are important given the close proximity of these strictures to the membranous urethra in patients with a compromised bladder neck. Our objective is to examine outcomes of urethroplasty for proximal bulbar strictures caused by transurethral procedures for BPH.

Methods: A retrospective review of patients undergoing urethroplasty for proximal bulbar urethral strictures caused by transurethral procedures from January 2004 to March 2018 was performed. Patient age, demographics, stricture length, etiology, prior treatment, surgical technique, 90-day complications, and semi-quantitative assessment of erectile function and incontinence were recorded. The primary outcome was success defined as urethral patency >16 Fr on routine followup cystoscopy. Secondary outcome measures included 90-day complications, de novo erectile dysfunction, incontinence, and persistence of lower urinary tract symptoms (LUTS).

Results: Thirty-six patients underwent urethroplasty caused by either transurethral resection of the prostate (69.4%) or Greenlight photovaporization of the prostate (30.6%). Mean stricture length was 2.7 cm and mean patient age was 71.9 years. Most (94.4%) patients had failed prior endoscopic treatment a mean of 3.3 times. Overall success rate was 91.7% at a mean followup of 53.2 months. A total of 5.6% of patients experienced de novo erectile dysfunction and 0% had an adverse change in continence; 21.2% of stricture-free patients complained of persisting LUTS without evidence of lower urinary tract obstruction after urethroplasty.

Conclusions: Urethroplasty for proximal bulbar urethral strictures after transurethral resection for BPH yields satisfying patency rates with minimal impact on erectile function and continence. However, patients endorse persistent LUTS without evidence of lower urinary tract obstruction likely owing to underlying detrusor dysfunction.

MP-1.12

Use of subcutaneous low-suction drains for the prevention of wound-related complications in obese renal transplant recipients

Thomas A. Skinner[1,2], Nikhile Mookerji[1], Luke Witherspoon[1,2], Annie-Claude Blouin[3], Nicholas Paterson[1,2], Brian D. Blew[1,2], John E. Mahoney[1,2], Jeffrey Warren[1,2]
[1]Faculty of Medicine, University of Ottawa, Ottawa, ON, Canada; [2]Department of Surgery, Division of Urology, The Ottawa Hospital, Ottawa, ON, Canada; [3]Department of Surgery, Division of Urology, Université Laval, Québec City, QC, Canada

Introduction: Postoperative wound complications in the kidney transplant population are common and include infection, hematoma, lymphocele, dehiscence, and hernia. These complications are especially prevalent in patients with elevated body mass index (BMI) and contribute to longer hospital stays, higher readmission rates, and return trips to the emergency department.[1-6] Any intervention that may reduce the risk of wound complications is worth exploring and some surgeons at our centre have begun using extra-fascial, low-suction (Jackson-Pratt) drains in patients with elevated BMI as a prophylactic strategy. We set out to determine whether the placement of these drains at the time of kidney transplantation is protective against wound-related complications in the postoperative period.

Methods: A retrospective chart review of all patients who underwent renal transplantation at The Ottawa Hospital between January 1, 2016 and January 20, 2018 was conducted. Patient demographics, type and severity of complications, and drain use were recorded. Univariate and multiple logistic regression analyses were performed to determine the relationship between drain use and wound complications.

Results: A total of 295 patients were identified in the study, with an average age of 55 years (Table 1). Ninety-seven (33%) patients were obese or morbidly obese (BMI>30). Drains were used in 24 (39%) non-obese patients and 38 (61%) obese or morbidly obese patients. Wound complications were found in 33 (51%) obese patients, 13 (39%) of whom had drains. Univariate analysis identified drain use as a protective factor for wound complications (odds ratio [OR] 0.41; 95% confidence interval [CI] 0.236, 0.708). Multiple regression analysis indicated no significant effect of drain use on wound complication rate, however, BMI and delayed graft function were independent risk factors for the development of wound complications (OR 1.09 and 2.99, respectively; p<0.05) (Fig. 1).

Conclusions: Through a robust retrospective chart review, we failed to demonstrate a convincing benefit to using superficial incisional drains in overweight and obese renal transplant recipients.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/48

References

1. Shabanzadeh DM, Sørensen LT. Laparoscopic surgery compared with open surgery decreases surgical site infection in obese patients: A systematic review and meta-analysis. *Ann Surg* 2012;256:934-45. https://doi.org/10.1097/SLA.0b013e318269a46b

2. Cannon RM, Jones CM, Hughes MG, et al. The impact of recipient obesity on outcomes after renal transplantation. *Ann Surg* 2013;257:978-84. https://doi.org/10.1097/SLA.0b013e318275a6cb
3. Chang SH, Coates PTH, McDonald SP. Effects of body mass index at transplant on outcomes of kidney transplantation. *Transplantation* 2007;84:981-7. https://doi.org/10.1097/01.tp.0000285290.77406.7b
4. Lynch RJ, Ranney DN, Shijie C, et al. Obesity, surgical site infection, and outcome following renal transplantation. *Ann Surgery* 2009;250:1014-20. https://doi.org/10.1097/SLA.0b013e3181b4ee9a
5. Molnar MZ, Kovesdy CP, Mucsi I, et al. Higher recipient body mass index is associated with post-transplant delayed kidney graft function. *Kidney Int* 2011;80:218-24. https://doi.org/10.1038/ki.2011.114
6. Yarlagadda SG, Coca SG, Formica Jr RN, et al. Association between delayed graft function and allograft and patient survival: A systematic review and meta-analysis. *Nephrol Dial Transplant* 2008;24:1039-47. https://doi.org/10.1093/ndt/gfn667

MP-1.13

A randomized controlled trial of a modified cystoscopy technique to decrease patient's pain and anxiety

Khalil Hetou[1], Ailsa Gan[1], Jonathan I. Izawa[1], Joseph Chin[1], Nicholas E. Power[1]
[1]Urology, University of Western Ontario, London, ON, Canada

Introduction: Pain, anxiety, and embarrassment are documented feelings in patients undergoing ambulatory cystoscopy. Peak-end theory suggests that perception of any experience depends on the peak and end of that experience regardless of its duration. We explored using peak-end theory in improving pain perception in patients undergoing diagnostic cystoscopy. We hypothesized that if we created a less unpleasant ending of the cystoscopy procedure, this will improve patients' pain and anxiety perception after cystoscopy.

Methods: We conducted a randomized clinical trial for patients undergoing an ambulatory flexible diagnostic cystoscopy for the first time. Males to females, as well as arm-allocation ratios, were 1:1. Control arm received a standard cystoscopy. In the intervention arm, the cystoscope was left in the bladder for an additional two minutes without further manipulation before scope removal. Pain and anxiety scores after cystoscopy were assessed using Visual Analogue Scale (VAS).

Results: We present the results of 54 patients out of 61 patients recruited so far after exclusion of seven patients. Baseline characteristics were balanced between the two arms. Mean VAS scores were lower in the intervention arm but not statistically significant (17.2 mm vs. 12.0; p=0.30). VAS scores were also lower in the intervention arm in the female subgroup (8.1 vs. 9.6; p=0.73) and in the male subgroup (16.1 vs. 23.2; p=0.36). Post-cystoscopy anxiety scores were lower in the intervention arm (1.1 vs. 2.3; p= 0.024). Anxiety scores were significantly lower only in the male subgroup (0.96 vs. 3.4; p=0.013). In the female subgroup, intervention arm showed lower scores but this was not statistically significant (0.92 vs. 1.0; p=0.90).

Conclusions: Our study represents the first assessment of peak-end theory in the office-based urological setting. Making the end-phase of an unpleasant procedure less unpleasant showed a potential improvement in post-cystoscopy pain and anxiety perception, especially in males.

MP-1.14

Ureteral strictures in kidney transplant recipients: Trends and severity

Michelle Minkovich[1], Tierza Johnson[1], Wendi Qu[1], Olusegun Famure[1], Yanhong Li[1], S. Joseph Kim[1,2], Jason Lee[1,3]
[1]UHN Transplant Program, University Health Network, Toronto, ON, Canada; [2]Division of Nephrology, Department of Medicine, University of Toronto, Toronto, ON, Canada; [3]Division of Urology, Department of Medicine, University of Toronto, Toronto, ON, Canada

Introduction: Ureteral complication post-kidney transplant can be a significant morbidity, often requiring invasive re-operations to repair leaks and strictures and potentially impacting graft function.[1,2] This puts patients at risk for outcomes such as graft rejection and increases healthcare burden.[3] We investigated the incidence, trends in severity and treatment of ureteral strictures among kidney transplant recipients (KTR) in a large transplant centre.

Methods: We conducted a single-centre, retrospective cohort study of KTR transplanted from January 1, 2005 to March 31, 2017 with a one-year followup period (n=1782). Non-kidney and simultaneous multiorgan transplants were excluded. Trends in severity of, and treatments for, ureteral strictures were examined. We used logistic regression models to conduct a risk factor analysis of ureteral strictures.

Results: The incidence of ureteral strictures in the first year post-transplant was 2.63 per 100 person-years (95% confidence interval [CI] 1.96, 5.53). Extended criteria donor (ECD) KTR had a significantly higher incidence than non-ECD KTR (p=0.0081). The mean number of days to resolution was 32±6.9 days for simple events (strictures that resolved with one intervention), and 133±22.7 days for complex events (required more than one intervention). Percutaneous nephrostomy was the most common initial treatment. In recent years, open surgery has become more frequent as an intervention. Lastly, some identified risk factors included recipient history of peripheral vascular disease (odds ratio [OR] 2.40; 95% CI 1.05, 5.49; p= 0.038) and longer duration until stent removal in days (OR 1.002; 95% CI 1.001, 1.003; p=0.032).

Conclusions: Factors associated with ureteral strictures include recipient history of peripheral vascular disease and longer duration until stent removal. Targeting patients at risk may help reduce the incidence of complex events and the need to resort to open surgery as a treatment. Future steps include studying relationships between ureteral strictures and clinical outcomes.

References

1. Krajewski W, Dembowski J, Kołodziej A, et al. Urological complications after renal transplantation: A single-centre experience. *Cent Eur J Urol* 2016;69:306-11.
2. Berli JU, Montgomery JR, Segev DL, et al. Surgical management of early and late ureteral complications after renal transplantation: Techniques and outcomes. *Clin Transplant* 2014;29:26-33. https://doi.org/10.1111/ctr.12478
3. Kumar S, Jeon JH, Hakim A, et al. Long-term graft and patient survival after balloon dilation of ureteric stenosis after renal transplant: A 23-year retrospective, matched-cohort study. *Radiology* 2016;281:301-10. https://doi.org/10.1148/radiol.2016151629

MP-1.15

The succinate receptor GPR91 mediates detrusor relaxation

Abubakr Mossa[1], Monica Velasquez-Flores[1], Philippe Cammisotto[1], Lysanne Campeau[1,2]
[1]Lady David Institute, Jewish General Hospital, Montréal, QC, Canada; [2]Division of Urology, Department of Surgery, McGill University, Montréal, QC, Canada

Introduction: The succinate receptor GPR91 is expressed by the bladder urothelium and detrusor layers. The acute and immediate effects of its activation on bladder function have yet to be described. Using a mouse model with specific deletion of the GPR91 receptor, we aimed to unravel the acute effect of succinate activation of its receptor GPR91 on bladder contraction/relaxation.

Methods: Conscious cystometry was carried out on SD rats, C57Bl6 and GPR91(-/-) mice. Contractile properties of bladder strips were assessed by organ bath. Morphology and characterization of bladders were obtained by Masson's trichrome and immunoblotting. Cell cultures were used to measure nitric oxide secretion (colorimetric assay), ATP, and cGMP levels (commercial kits).

Results: GPR91(-/-) and C57Bl6 mice displayed similar body weight. Bladder mass was higher and urothelium and lamina propria was thicker in GPR91(-/-) mice. Conscious cystometry revealed that GPR91(-/-) mice had a lower bladder capacity, lower micturition volume, and lower intercontraction interval. When intravesical instillation of succinate (10 mM) was performed, bladder capacity increased in C57Bl6 mice only. In organ bath, bladder strips from C57Bl6 and GPR91(-/-) mice presented similar contractions elicited by potassium chloride, carbachol, and electrical

field stimulation, while succinate relaxed carbachol-stimulated strips in C57Bl6 mice only. Nitric oxide and cGMP did not contribute to succinate activity, while a decrease in released ATP was demonstrated in urothelial cell culture from C57Bl6 and KO mice in response to succinate.
Conclusions: These results demonstrate that succinate is essential for bladder physiology and that it contributes to the relaxation-contraction state of the detrusor through GPR91, through a decrease in urothelial ATP secretion.

MP-1.16

Is urinary urgency a source of diverted attention leading to gait changes in older people with overactive bladder?

William Gibson[1], Kathleen F. Hunter[2], Adrian S. Wagg[1]
[1]Division of Geriatric Medicine, Faculty of Medicine and Dentistry, University of Alberta, Edmonton, AB, Canada; [2]Faculty of Nursing, University of Alberta, Edmonton, AB, Canada
This study was funded by the 2016 CUA-Astellas Research Grant Program
Introduction: There is a strong but unexplained association between lower urinary tract symptoms, overactive bladder (OAB), and falls in older men[1] and women.[2] Incontinent, middle-aged women's strong desire to void induces changes in gait.[3] Diverted attention, the simultaneous execution of two cognitively demanding tasks, leads to a decline in performance of both tasks.[4] Diverted attention causes changes in gait in older adults.[5] We hypothesized that urinary urgency acts as a source of diverted attention in older adults with OAB, and that this induces gait changes, which predispose to falls.
Methods: Participants were recruited from a specialist continence clinic and through local newsletters. Inclusion criteria were: age ≥65 years, a clinical diagnosis of OAB, daytime frequency of eight and at least weekly urgency incontinence. Exclusion criteria were: cognitive impairment, defined as a Montréal Cognitive Assessment score[6] of 25/30 or lower, neurological disease, or inability to walk 30 meters unaided. Participants underwent 3D motion gait analysis while walking for 30 minutes under three conditions: undistracted and with an empty bladder; distracted by performing the n-back test, a validated source of diverted attention;[7] and when experiencing self-reported, ICS-defined urinary urgency, induced by drinking non-caffeinated fluids. Gait parameters (velocity, cadence, and stride length) were recorded. These were then compared under each of the three conditions using a repeated-measures ANOVA with Bonferroni correction. Statistical significance was set at $p<0.05$.
Results: Twenty-seven participants were recruited. The mean age was 75.3 years (standard deviation 5.8); 22 (81%) were female. Gait parameters are summarized in Fig. 1.
Conclusions: Urgency induced changes in gait, which were similar to those induced by distraction. These changes, specifically reduced gait speed and shortened stride length, have been associated with increased falls risk in older adults. These results suggest that urgency may act as a source of diverted attention in older adults with OAB.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/277
The authors gratefully acknowledge the Canadian Urological Association.
References
1. Noguchi N, Chan L, Cumming RG, et al. A systematic review of the association between lower urinary tract symptoms and falls, injuries, and fractures in community-dwelling older men. *Aging Male* 2016;19:168-74. https://doi.org/10.3109/13685538.2016.1169399
2. Brown JS, Vittinghoff E, Wyman JF, et al. Urinary incontinence: Does it increase risk for falls and fractures? Study of Osteoporotic Fractures Research Group. *J Am Geriatr Soc* 2000;48:721-5. https://doi.org/10.1111/j.1532-5415.2000.tb04744.x
3. Booth J, Paul L, Rafferty D, et al. The association between overactive bladder and falls in older women: A proposed explanation. *Neurourol Urodyn* 2013;32:805-6.
4. Pashler H. Dual-task interference in simple tasks: Data and theory. *Psychol Bull* 1994;116:220-44. https://doi.org/10.1037//0033-2909.116.2.220
5. Al-Yahya E, Dawes H, Smith L, et al. Cognitive motor interference while walking: A systematic review and meta-analysis. *Neurosci Biobehav Rev* 2011;35:715-28. https://doi.org/10.1016/j.neubiorev.2010.08.008
6. Nasreddine ZS, Phillips NA, Bedirian V, et al. The Montréal Cognitive Assessment, MoCA: A brief screening tool for mild cognitive impairment. *J Am Geriatr Soc* 2005;53:695-9 https://doi.org/10.1111/j.1532-5415.2005.53221.x
7. Owen AM, McMillan KM, Laird AR, et al. N-back working memory paradigm: A meta-analysis of normative functional neuroimaging studies. *Hum Brain Mapp* 2005;25:46-59. https://doi.org/10.1002/hbm.20131

MP-1.17

Impact of surgeon's experience in long-term outcome of sacral neuromodulation

Dean S. Elterman[1], Seyed Hossein Saadat[1], Valentine Shabataev[1]
[1]Urology, University Health Network, Toronto, ON, Canada
Introduction: Management of overactive bladder symptoms, urinary retention (non-mechanical), and chronic pelvic/bladder pain can be refractory and require many treatment modalities. Sacral neuromodulation (SNM) has shown to be very effective for these refractory symptoms.[1-5] Although this treatment modality has been available for decades, to our knowledge, there is no data on impact of surgeon experience on long-term outcomes.
Methods: Failure of SNM was reviewed in patients who had received the implant during the first year in practice of a single surgeon and compared to failure rates in those who received the implant after ≥18 months of the surgeons' experience. The outcomes were categorized into: 1) initial results; 2) early results; and 3) long-term results. The study period was confined between December 2013 and December 2015 to allow for three years' followup. Failure was defined as <50% improvement despite conservative management or revision of implant due to inefficacy or bothersome symptoms.
Results: A total 25 patients had received SNM implants during the first year of the surgeon's experience, while 31 implantations were done between 18 and 24 months' experience. The demographic data and storage symptoms, urinary retention, and pelvic pain were similar in the two groups ($p>0.05$). Mean implantation time during the first and second years were 55 minutes (25–142) and 36 minutes (24–60), respectively, with 34% of surgeries in the first year lasting >60 minutes. Initial failure rates were higher during the first year (12% vs. 6.25%); however, this was not statistically significant ($p=0.44$; Fig. 1). Although log-rank (Mantel-Cox) test did not show significant outcome difference during 36 months of followup, long-term outcomes (after 540 days of followup) were significantly better in patients who had received the implants during the second year of surgeon's experience ($p=0.04$) (Fig. 2).
Conclusions: Surgeons' experience plays a significant role in the long-term outcome of SNM implantation.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/276
References
1. van Kerrebroeck PEV, van Voskuilen AC, Heesakkers JPFA, et al. Results of sacral neuromodulation therapy for urinary voiding dysfunction: Outcomes of a prospective, worldwide clinical study. *J Urol* 2007;178:2029-34. https://doi.org/10.1016/j.juro.2007.07.032
2. Sokal P, Zieliński P, Harat M. Sacral roots stimulation in chronic pelvic pain. *Neurol Neurochir Pol* 2015;49:307-12. https://doi.org/10.1016/j.pjnns.2015.07.003
3. Leong RK, Marcelissen TA, Nieman FH, et al. Satisfaction and patient experience with sacral neuromodulation: Results of a single-centre sample survey. *J Urol* 2011;185:588-92. https://doi.org/10.1016/j.juro.2010.09.090
4. Banakhar MA, Al-Shaiji T, Hassouna M. Sacral neuromodulation and refractory overactive bladder: An emerging tool for an old problem. *Ther Adv Urol* 2012;4:179-85. https://doi.org/10.1177/1756287212445179
5. Ismail S, Chartier-Kastler E, Perrouin-Verbe M-A, et al. Long-term functional outcomes of S3 sacral neuromodulation for the treatment of idiopathic overactive bladder. *Neuromodulation Technol Neural Interface* 2017;20:825-9. https://doi.org/10.1111/ner.12696

UP-1.1

Outcomes of urethroplasty for radiation-induced urethral stenoses

Runhan Ren[1], Logan W. Zemp[1], Keith F. Rourke[1]
[1]Urology, University of Alberta, Edmonton, AB, Canada

Introduction: Bulbomembranous urethral stenosis is a challenging and under-reported complication of radiotherapy, particularly for prostate cancer. Our objective is to report outcomes of urethroplasty for these patients.

Methods: A retrospective review of 81 patients undergoing urethroplasty for refractory radiation-induced bulbomembranous stenoses from January 2004 to March 2018 was done at the University of Alberta. Primary outcome was urethral patency greater than 16 Fr on routine followup cystoscopy. Secondary outcomes were 90-day complications, de novo erectile dysfunction, and incontinence assessed at six months.

Results: Forty and 41 patients had posterior urethral stenosis due to brachytherapy and external beam radiation, respectively. Mean stenosis length was 2.8 cm, mean time from radiation to urethroplasty was 6.8 years, and mean number of prior failed endoscopic procedures was 3.6. A total of 34.6% (28) of patients had an indwelling suprapubic catheter preoperatively and 53.1% (43) had preoperative erectile dysfunction; 71.6% (58) underwent anastomotic urethroplasty, with the remainder undergoing substitution urethroplasty (23). Overall, there was an 87.7% (71) urethral patency rate, with a mean followup of 51.3 (6–173) months. Ninety-day postoperative complication (Clavien ≥2) occurred in 17.3% of patients; 17.3% and 22.2% reported adverse changes in erectile function and incontinence, respectively. On Cox regression analysis, substitution compared to anastomotic urethroplasty had a higher rate of recurrent stenosis (14.3% vs. 4.3%; p=0.003), with no difference in secondary outcomes. Patients with prior prostate surgery (p=0.002) and infrapubectomy (p=0.03) were more likely to experience adverse changes in continence.

Conclusions: Urethroplasty for radiation-induced bulbomembranous stenosis yields satisfying patency rates but with some risk of de novo incontinence and erectile dysfunction. Anastomotic urethroplasty appears more successful and should be used when possible.

UP-1.2

The evolution of urethral stricture and urethroplasty over 15 years: A single-centre, single-surgeon 1319 urethroplasty analysis

R. Christopher Doiron[1], Keith F. Rourke[1]
[1]Division of Urology, Department of Surgery, University of Alberta, Edmonton, AB, Canada

Introduction: The management of urethral strictures has evolved dramatically over the last 15 years. We aimed to analyze trends in patient presentation and reconstructive practice in all patients undergoing urethroplasty at a single centre over 15 years.

Methods: Patients undergoing urethroplasty by single surgeon (KFR) from August 2003 to May 2018 were included in the analysis. Patient demographics, clinical presentation, and surgical procedure and outcomes data were collected in a prospectively maintained database. A retrospective analysis categorized patients into three, five-year cohorts based on date of surgery, and trends over time were analyzed.

Results: A total of 1319 urethroplasties were completed over the study period. During the first five years (T1), 299 urethroplasties were performed, while 431 and 589 were performed in T2 and T3, respectively. Mean overall patient age was 46.8 years and this increased significantly over time (p<0.001). Most patients presented with an idiopathic cause of their stricture (n=516, 39%) and this did not change over time. Trauma was the second most common etiology overall (n=262, 20%), but decreased significantly over time (p<0.001). Radiation-induced strictures significantly increased over time (n=9, 3% ([T1], n=22, 5% [T2], n=51, 9% ([T3]; p=0.001), as did iatrogenic strictures. Mean stricture length was 4.4 cm and this decreased over time (4.7 cm [T1], 4.8 cm [T2], 4.0 cm [T3]; p<0.001). Most patients presented with a previously failed endoscopic treatment alone (n=861, 65%), while 249 patients (19%) had additionally undergone a prior open reconstruction. Overall, patients had a mean of 3.2 prior endoscopic procedures; this decreased over time (3.4 [T1]), 3.9 [T2], and 2.5 [T3]; p<0.001). Overall, single-stage urethroplasty with buccal mucosa was the most common technique performed (n=656, 50%) and increased in prevalence over time (p=0.009), while both flap and staged techniques decreased over time (p=0.008, p=0.004, respectively). The remaining techniques did not vary over time. Finally, the overall success rate was 90% (n=1106). This appeared to improve significantly with time (n=248, 87% [T1], n=359, 90% [T2], n=499, 93% [T3]; p=0.001).

Conclusions: The surgical treatment of urethral stricture has evolved over the last 15 years with an increase in patient age, increase in radiation and iatrogenic strictures, decrease in stricture length, and a reduction in the number of endoscopic procedures performed prior to referral. Increased use of single-stage urethroplasty using buccal mucosa was observed, which may have contributed to an increase in urethroplasty success over the same time period.

UP-1.3

Necessity for routine crossmatch for blood transfusion at the time of renal transplantation: A quality improvement project

Douglas C. Cheung[1], Luke F. Reynolds[1], Melin Peng[1], Michael Ordon[1]
[1]Urology, University of Toronto, Toronto, ON, Canada

Introduction: Routine crossmatch of packed red blood cells (pRBCs) is completed preoperatively at many transplantation centres in Canada. However, rates of blood transfusion vary and the timing of transfusion during the hospital stay is unclear. Furthermore, judicious and medically appropriate resource adjudication remains a concern. Our objective was to determine the incidence of perioperative pRBC transfusion and predictors of transfusion in patients undergoing renal transplantation.

Methods: A retrospective review of all patients undergoing renal transplantation at our institution from January 2013 to May 2016 was performed. Demographic, biochemical, and clinical parameters, including the incidence of perioperative transfusion, were determined. Perioperative transfusion, defined as an intraoperative transfusion or transfusion within two days of surgery, was the primary outcome. Multivariable logistic regression was performed to assess for predictors of perioperative transfusion.

Results: We identified 428 patients during the study period (average age 55 years, 60% male, 72% deceased donor, and 43% blood thinner use). Twenty (4.7%) patients required an intraoperative transfusion with a mean of 3.1 pRBCs per transfusion. Forty (9.3%) patients required transfusion perioperatively with a mean of 2.8 pRBCs per transfusion, with the most common reason for transfusion being a gradual Hb decline over two days (51%). On multivariable regression analysis, lower preoperative Hb (per g/L unit increase odds ratio [OR] 0.92; 0.88–0.95; p<0.01) and female gender (OR 2.76; 1.20–6.73; p=0.02) were associated with perioperative transfusion.

Conclusions: In our retrospective review, intraoperative and perioperative transfusion rates were low, suggesting routine cross-match may not be necessary. Given that only 9.3% of patients required perioperative transfusion within two days, 90.7% of cross-matched blood went unused in our cohort. Preoperative Hb and female gender were associated with increased transfusion.

UP-1.5

Effect of cryogen-cooled monopolar radiofrequency treatment for stress urinary incontinence in women: A subanalysis based on body mass index

Bruce B. Allan[1], Kathryn Husarek[2]
[1]Allan Centre, Calgary, AB, Canada; [2]Medical Affairs, Viveve, Englewood, CO, United States

Introduction: Stress urinary incontinence (SUI) is the most common type of urinary incontinence. Millions of women are affected, with prevalence increasing with body mass index (BMI). While a variety of treatment options exist, treatment efficacy varies depending on severity of incontinence and the impact on quality of life. This gap in treatment options for SUI presents an opportunity to meet an unmet need in healthcare for women. This abstract represents a subanalysis of the data based on BMI from a clinical feasibility study aimed to investigate the safety and efficacy of a non-surgical cryogen-cooled monopolar radiofrequency (CMRF) treatment for SUI.

Methods: Thirty-five subjects were enrolled and treated. Subjects were randomized into two groups: group 1 received one treatment and group

2 received two treatments six weeks apart. Followup visits occurred at 10 days and at one, four, six, and 12 months post-treatment. Subjects were asked to perform a one-hour pad weight test (PWT) and complete a voiding diary and validated SUI questionnaires. This study received Health Canada ITA clearance and approval from the Health Research Ethics Board of Alberta. BMI ranges were provided by the Center for Disease Control (CDC); normal was defined as 18.5–24.9, overweight as 25.0–29.9, and obese as over 30.

Results: Results from 12-month data indicate improvements in SUI symptoms for subjects, as determined by the one-hour PWT and SUI questionnaires. The percentage of women with a >50% reduction in pad weight was 62%, 50%, and 25% for normal weight, overweight, and obese women, respectively. Women in the normal BMI range observed the greatest percent reduction from baseline, over 71%.

Conclusions: The outcome measures indicate an improvement in SUI symptoms for all BMI ranges based on the one-hour PWT and several SUI subjective patient-reported outcomes. The benefit of the CMRF vaginal treatment for SUI suggests its potential use as a non-surgical approach to treat SUI.

UP-1.6

Reconstruction by tissue engineering and subcutaneous implantation into mice of an endothelialized human-derived 3D vaginal mucosa

Weronika Jakubowska[1], Christophe Caneparo[1], Stéphane Chabaud[1], Geneviève Bernard[1], Stéphane J. Bolduc[1]

[1]Surgery, CHU de Québec-Université Laval Research Centre, Québec City, QC, Canada.

Merck Sharpe & Dohme Corp.-Université Laval Foundation

Introduction: Reconstruction of autologous vagina mucosa (VM) by tissue engineering (TE) would open the door to new surgical options for vaginal reconstruction for patients suffering from congenital anomalies, trauma, or post-radiotherapy consequences. A major challenge in TE is the rapid revascularization of reconstructed tissues. Graft survival, and therefore success rate, highly depends on it. In this study, we aim to reconstruct a microvascular network (MVN) within a tissue-engineered VM, free of exogenous material, using the self-assembly technique.

Methods: Vaginal stromal and epithelial cells were isolated from healthy donors' biopsies. The stromal cells were co-seeded with human umbilical cord vein endothelial cells (HUVEC) and cultured for four weeks until the formation of a tissue-like scaffold, and mechanical properties of the constructs were measured. Then, epithelial cells were seeded on top of the scaffold and cultured for an additional week before being raised at the air/liquid interface for a final three-week maturation period. Differentiation of the vaginal epithelium was assessed by immunofluorescences (IF) and periodic acid Schiff staining. The presence of a MVN was verified by IF. After quality-check, VM were subcutaneously implanted on the back of nude mice as open pockets containing an agarose stent. Mice were sacrificed after three weeks and VM harvested and analyzed using the same techniques as before implantation.

Results: VM showed markers of adequate maturation and a dense MVN was present. The VM survived to the implantation period and signs of reperfusion of the graft MVN to the host were present, as evidenced by mice red blood cells in the human MVN. Some contraction of the implanted VM has been noted.

Conclusions: Our VM is a promising alternative to techniques currently used. HUVEC will be replaced by vaginal-specific human microvascular endothelial cells and contraction should be limited by the use of a silicon stent instead of biodegradable agarose.

UP-1.7

Management of neurogenic lower urinary tract dysfunction and impact on disability in spinal cord injury patients in Canada

Samer Shamout[1], Nawar Touma[1], Lysanne Campeau[1]

[1]Urology, McGill University, Montréal, QC, Canada

Acknowledgement: The Rick Hansen SCI Registry (RHSCIR)

Introduction: Management of neurogenic lower urinary tract dysfunction (NLUTD) following spinal cord injury (SCI) is a crucial component of the rehabilitation program with an immediate impact on quality of life. Therefore, we aimed to identify the impact of NLUTD and related management strategy on disability and quality of life in the SCI population from a Canadian societal perspective.

Methods: This is a retrospective, multicentre study analyzing the database registry of 198 adult patients with traumatic SCI who received urological care at Rick Hansen Institute participating facilities in Montréal, Canada from April 2010 to July 2017. Participants underwent clinical evaluation, including demographic and injury profile based on the American Spinal Injury Association Impairment Scale (ASIA). Patients provided urine analysis and completed validated questionnaires of General Self-Efficacy Scale (GSE) and pain inventory. Functional state of patients was evaluated by using the Spinal Cord Independence Measure (SCIM). Patients also described their bladder management method over the long-term.

Results: A total of 155 men and 43 women with a mean age of 53 (±18.5) years were included in the study. The etiology of lesion was traumatic falls in 98 (50%) patients and transport-related injury in 43 (22%) patients. The mean period following injury at assessment was 3 (±8.3) years. Most of these SCIs were incomplete motor by the ASIA classification; 64 (40%) fit the classification for AIS D, 43 (27%) for AIS A, 29 (18%) for AIS C, 25 (15%) for AIS B, and one (0.6%) for AIS E. The prevalence of urinary tract infection (UTI) was 42%. The method of bladder management at followup was normal voiding in 73 (49%) cases, intermittent self-catheterization (ISC) in 52 (35%), catheterization by attendant in four (3%), indwelling urethral catheterization in 12 (8%), and suprapubic catheterization in seven (5%) cases. Patients with UTI had significantly less total SCIM score and subscales scores ($p<0.001$). Analysis of bladder management method in relation to quality of life parameters revealed ISC and normal voiding groups had significantly higher SCIM and GSE scores compared to other groups (Table 1).

Conclusions: The most common bladder management methods were normal voiding and ISC. Bladder management strategy and urinary tract infection had substantial impact on long-term ability of SCI patients to perform basic activities independently. The use of ISC can provide optimal management and is associated with better long-term quality of life and lower disability in selected SCI patients.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/64

Poster Session 2: Bladder Cancer
June 30, 2019; 0730–0900

MP-2.1
Effect of blood transfusions on oncological outcomes in patients undergoing radical cystectomy

Chun Huang[1], *Melissa Assel*[2], *Nima Almassi*[1], *Shawn R. Dason*[1], *Victor A. McPherson*[1], *Lucas Dean*[1], *Daniel Sjoberg*[2], *Andrew Vickers*[2], *Bernard Bochner*[1], *Eugene Cha*[1]

[1]Urology Service, Memorial Sloan Kettering Cancer Center, New York, NY, United States; [2]Department of Biostatistics, Memorial Sloan Kettering Cancer Center, New York, NY, United States

Introduction: It has been suggested that blood transfusion (PRBC-T) negatively affects oncological outcomes after radical cystectomy (RC). We assessed the association between perioperative PRBC-T and oncological outcomes in patients (pts) undergoing RC, taking into account the effects of neoadjuvant chemotherapy (NAC).

Methods: We identified 2454 pts who underwent RC at Memorial Sloan Kettering Cancer Center (MSKCC) between 2000 and 2015 for clinically localized bladder cancer. Pts who received non-standard preoperative chemotherapy were excluded. PRBC-T was categorized as preoperative, intraoperative, and postoperative. Recurrence-free (RFS) and cancer-specific survival (CSS) were analyzed using multivariable Cox models adjusting for age, grade, stage, lymph node (LN) status, histology, and receipt of NAC. We performed sensitivity analyses to determine the effect of risk adjustment.

Results: There were differences depending on transfusion status: pts who received PRBC-T (1457, 64%) were older, had higher stage disease (all p<0.0001), and higher rates of LN involvement (p=0.0004) (Table 1). We saw a statistically significant association between PRBC-T and CSS (hazard ratio [HR] 1.30; 95% confidence interval [CI] 1.07, 1.58; p=0.007) though not RFS (HR 1.18; 95% CI 0.99, 1.41; p=0.052). The results were highly sensitive to risk adjustment. A 2.2% change in risk of cancer-specific mortality caused the difference between groups to become non-significant. The timing of PRBC-T did not affect RFS (p=0.9) or CSS (p=0.8). Pts receiving NAC were more likely to receive PRBC-T (75% vs. 59%; p<0.0001), but NAC did not significantly modify the relationship between PRBC-T and either RFS (p=0.8) or CSS (p=0.5).

Conclusions: Given the differences between the transfused and non-transfused cohorts, and sensitivity of our findings to small differences in risk-adjustment, we did not find conclusive evidence that PRBC-T portends poorer oncological outcomes. We suspect that unmeasured differences were not adequately controlled for by multivariable analyses. We found no evidence that the timing of PRBC-T influenced oncological outcomes.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/66

MP-2.2
Role of routine biopsy after radiation-based therapy for muscle-invasive bladder cancer

Ronald Kool[1], *Adnan El-Achkar*[1], *Gautier Marcq*[1], *Fadi Brimo*[2], *Marie Vanhuyse*[3], *Armen G. Aprikian*[1], *Simon Tanguay*[1], *Fabio Cury*[4], *Luis Souhami*[4], *Wassim Kassouf*[1]

[1]Urology, McGill University Health Centre, Montréal, QC, Canada; [2]Pathology, McGill University Health Centre, Montréal, QC, Canada; [3]Medical Oncology, McGill University Health Centre, Montréal, QC, Canada; [4]Radiation Oncology, McGill University Health Centre, Montréal, QC, Canada

Introduction: Radiation-based therapy (RT) has emerged as a suitable organ-sparing treatment for muscle-invasive bladder cancer (MIBC) patients who refuse radical cystectomy or are medically unfit to undergo surgery.[1-3] According to most guidelines, a biopsy after RT is recommended to rule out persistent or residual disease after treatment.[4-6] Our objective was to analyze the performance of biopsy to assess response post-RT.

Methods: This was a retrospective study on patients treated with curative-intent RT for MIBC at our institution between 2001 and 2017. Results from cross-sectional imaging, cystoscopy, urine cytology, and biopsy were collected, and descriptive analysis was performed.

Results: After exclusion criteria, a total of 167 patients were analyzed. Median age was 75 years (interquartile range [IQR] 67–81). Stage repartition was 150 (90%) cT2, 12 (7%) cT3, and five (3%) cT4. Neoadjuvant chemotherapy was given in 30 (18%) patients. Isolated RT was administered in four (5%) patients and 154 (92%) received trimodal therapy. First post-treatment cystoscopy and/or cytology were suspicious in 26 (15.5%) cases and eight (42%) out of 19 biopsies in this setting were benign. On the other hand, when cystoscopy and cytology were both normal, a control biopsy taken in 56 (40%) patients was able to detect residual NMIBC in six (10.7%) and MIBC in three (5.3%).

Conclusions: We demonstrated that when residual disease is suspected, pathology can be benign in up to 42% of biopsies, while up to 16% of patients will have residual disease despite normal cystoscopy and cytology. A systematic routine biopsy after RT is highly recommended to assess response in all patients who are surgical candidates regardless of cystoscopy and urine cytology findings. Larger multi-institutional studies are needed to validate these findings.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/67

References

1. El-Achkar A, Souhami L, Kassouf W. Bladder preservation therapy: Review of literature and future directions of trimodal therapy. *Curr Urol Rep* 2018;19:108. https://doi.org/10.1007/s11934-018-0859-z
2. Rose TL, Deal AM, Ladoire S, et al. Patterns of bladder preservation therapy utilization for muscle-invasive bladder cancer. *Bladder Cancer* 2016;2:405-13. https://doi.org/10.3233/BLC-160072
3. Ploussard G, Daneshmand S, Efstathiou JA, et al. Critical analysis of bladder sparing with trimodal therapy in muscle-invasive bladder cancer: A systematic review. *Eur Urol* 2014;66:120-37. https://doi.org/10.1016/j.eururo.2014.02.038
4. Alfred Witjes J, Lebret T, Comperat EM, et al. Updated 2016 EAU guidelines on muscle-invasive and metastatic bladder cancer. *Eur Urol* 2017;71:462-75. https://doi.org/10.1016/j.eururo.2016.06.020
5. Chang SS, Bochner BH, Chou R, et al. Treatment of non-metastatic muscle-invasive bladder cancer: AUA/ASCO/ASTRO/SUO guideline. *J Urol* 2017;198:552-9. https://doi.org/10.1016/j.juro.2017.04.086
6. Flaig TW, Spiess PE, Agarwal N, et al. NCCN guidelines insights: Bladder cancer, Version 5.2018. *JNCCN* 2018;16:1041-53. https://doi.org/10.6004/jnccn.2018.0072

MP-2.3

Predicting complications following radical cystectomy with the National Surgical Quality Improvement Program universal surgical risk calculator

Miles Mannas[1,2], Taeweon Lee[1], Tracey Hong[3], Andrea Bisaillon[3], Alan I. So[1,2], Martin E. Gleave[1,2], Kelly Mayson[4], Peter C. Black[1,2]

[1]Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; [2]Vancouver Prostate Centre, Vancouver, BC, Canada; [3]Quality and Patient Safety Coordinator, Vancouver General Hospital, Vancouver, BC, Canada; [4]Anesthesia and Perioperative Care, Vancouver General Hospital, Vancouver, BC, Canada

Introduction: There has been debate regarding the utility of universal surgical risk calculators, such as that developed by the National Surgical Quality Improvement Program (NSQIP), to aid in point-of-care prediction of complications in individual patients preoperatively.[1] At our tertiary care hospital, we retrospectively evaluated the predictive value of the NSQIP universal surgical risk calculators (USRC) in a prospective cohort of patients who underwent radical cystectomy (RC).

Methods: A prospective cohort of patients undergoing RC was retrospectively reviewed between October 2014 and August 2017. All patients who underwent RC for benign disease, had inadequate followup, or underwent additional surgical procedures deemed a significant deviation from USRC codes 51590, 51595, and 51596 were excluded (n=29). A total of 223 patients were included who underwent open or robotic RC (n=17). Accuracy of the USRC was assessed by ROC AUC and Brier scores for NSQIP-defined complications. We also compared its prediction of any and serious complications according to NSQIP definitions to observed complications according to the Clavien-Dindo classification (any [grades 1–5] and serious [grade 3–5]).

Results: The USRC was found to have positive predictive ability for several NSQIP complications. Determined by AUC C-stat and Brier scores, prediction was good for cardiac complications (0.80 and 0.021); fair for pneumonia (0.75 and 0.017); and poor for urinary tract infection (0.64 and 0.078), 30-day mortality (0.62 and 0.013), any complication (0.60 and 0.19), and serious complication (0.60 and 0.17). There was significant discordance between the rate of NSQIP predicted vs.Clavien-Dindo observed any and serious complications: 28.8% vs 67.3%, and 25.3% vs 11.7%, respectively. AUC ROC and Brier scores indicated failure of any and serious NSQIP-defined complication to predict for both any and serious Clavien-Dindo-defined complications.

Conclusions: This is the first description of the USRC indicating it may have predictive power for some NSQIP-defined surgical complications after RC.

Reference

1. Winoker J, Paulucci, D, Anastos H, et al. Predicting complications following robot-assisted partial nephrectomy with the ACS NSQIP® universal surgical risk calculator. *J Urol* 2017;198:803-9. https://doi.org/10.1016/j.juro.2017.04.021

MP-2.4

Reducing surgical site infections in patients undergoing radical cystectomy using wound protection

James Ross[1], Christopher Knee[2], Kristen McAlpine[1], Rodney H. Breau[1,2], Neal E. Rowe[1], Ilias Cagiannos[1], Christopher Morash[1], Lara Williams[3], Ranjeeta Mallick[2], Carl van Walraven[2,4,5], Luke T. Lavallee[1,2,4]

[1]Department of Surgery, Division of Urology, University of Ottawa, Ottawa, ON, Canada; [2]The Ottawa Hospital Research Institute, The Ottawa Hospital, Ottawa, ON, Canada; [3]Department of Surgery, Division of General Surgery, University of Ottawa, Ottawa, ON, Canada; [4]School of Epidemiology and Public Health, University of Ottawa, Ottawa, ON, Canada; [5]Institute for Clinical Evaluative Sciences, University of Ottawa, Ottawa, ON, Canada

Introduction: Our institution implemented a surgical site infection (SSI) reduction strategy for patients undergoing radical cystectomy (RC). The intervention included the use of a barrier wound protector (Alexis retractor), sterile closing tray, wound cleansing, and antibiotic-impregnated dressings. The objective of this study was to evaluate the efficacy of the SSI reduction strategy and characterize risk factors for SSI.

Methods: A historical cohort of all patients who underwent RC by four urologic oncologists at The Ottawa Hospital (TOH) from January 2016 to October 2018 was reviewed. Patient, tumour, and operative characteristics were collected. Inpatient and outpatient SSIs were identified until 30 days postoperative from the medical record. The SSI reduction strategy was implemented for all patients having RC after February 28, 2018. Adjusted associations between patient, tumour, operative characteristics, and the SSI reduction intervention with the risk of SSI was determined.

Results: A total of 117 patients underwent RC during the study period, including 26 after institutional implementation of the SSI reduction strategy. The mean age was 70 years, 88 (75%) were male, and 51 (44%) received neobladders. Higher body mass index, history of smoking, intraoperative transfusion, and diabetes were independently associated with increased risk of SSI ($p<0.05$). Overall SSI risk was 24%. The risk of SSI was 28% prior to the intervention and 12% after. The SSI reduction strategy reduced the risk of SSI by 60% (relative risk 0.42; 95% confidence interval 0.14–1.28; $p=0.12$)

Conclusions: The risk of SSI after radical cystectomy is high. The implementation of our SSI reduction strategy reduced the risk of SSI, warranting further evaluation in other centres to improve patient care.

MP-2.5

Expression status and prognostic significance of tissue and serum micro RNAs in urothelial carcinoma of urinary bladder

Uttam Mete[1], Anuradha Chakraborti[2], Nandita Kakkar[3]

[1]Urology, PGIMER, Chandigarh, Chandigarh, India; [2]Experimental Medicine, PGIMER, Chandigarh, Chandigarh, India; [3]Pathology, PGIMER, Chandigarh, Chandigarh, India

Introduction: Clinical and pathological factors, including tumour grade and tumour stage, are not specific enough to predict progression and recurrence of bladder tumour. Patient followup is both expensive and unpleasant (frequent invasive cystoscopies). Therefore, there is a need for additional clinical tools, including microRNAs. The current study was conducted to evaluate whether tissue and serum microRNAs can be used as prognosticating biomarkers.

Methods: Blood and tissue samples were collected from 50 patients and 10 healthy controls. miR-125, miR-31, miR-145, and miR-200 were assayed in both serum and tissue samples. Circulating miRNAs were isolated from the serum using miRNA assay serum/plasma kit, Qaigen. Polyadenylation and cDNA synthesis was performed using miRNA first-strand cDNA synthesis kit, Agilent. Further, qRTPCR was performed for the above-mentioned miRNAs.

Results: Eight patients had recurrent and 42 had first-time presentation. T2 high-grade, Ta low-grade, and Ta high-grade lesions were present in 8, 20, and one patient(s), respectively. Twenty-one patients had T1 lesion, including 13 high-grade and eight low-grade. Expression of serum miR-125 was found to be highly up-regulated in most patients, while all other miRNAs were down-regulated. Moreover, the amount of down-regulation was higher in cases of miR-31. Tissue miRNA expression in 14 patients miR-31 was up-regulated; out of these, five had T1 high-grade lesion and another four had muscle-invasive disease. Only one had Ta low-grade lesion. miR-125 was very high among 36 patients and almost all of these patients had low-grade pathology. miR-145 and mir-200 were up-regulated in almost all patients.

Conclusions: Tissue mir-31 is usually up-regulated in high-grade or high-stage lesions. Up-regulation of tissue miR-145 and miR-200 was noticed in almost all patients. Therefore, we believe combined histopathology and serum and tissue microRNA status can be a better prognostic factor than histopathology alone.

MP-2.6

Predictors of 90-day mortality in a contemporary cohort of patients undergoing radical cystectomy for bladder cancer: Results from the National Cancer database

Sandra Kim[1], Andrea Kokorovic[1], Vidit Sharma[2], Stephen Boorjian[2], Ricardo A. Rendon[1], David Bell[1], Ross Mason[1]
[1]Urology, Dalhousie University, Halifax, NS, Canada; [2]Urology, Mayo Clinic, Rochester, MN, United States

Introduction: Radical cystectomy (RC) represents the gold standard definitive treatment for localized muscle-invasive bladder cancer (MIBC), as well as high-risk non-muscle-invasive disease. However, RC is associated with a significant risk of both morbidity and mortality. Herein, we sought to identify 30- and 90-day mortality rates after RC and to identify preoperative risk factors associated with 90-day mortality in patients undergoing RC for bladder cancer using the National Cancer Database (NCDB).

Methods: We identified all patients who underwent RC for non-metastatic urothelial carcinoma of the bladder within the NCDB between 2006 and 2013. Mortality rates at 30 and 90 days postoperatively were determined, and factors associated with 90-day mortality were investigated with logistic regression models.

Results: We identified 37 366 patients who underwent RC for urothelial carcinoma between 2006 and 2013. All-cause mortality was 2.5% (936 patients) within 30 days and 6.8% (2554 patients) within 90 days of RC. Mortality rates have remained stable over time (Fig. 1). In multivariable analysis, increased age, higher clinical T and N stage, increased Charlson-Deyo comorbidity classification, African-American race, decreased hospital volume, non-academic centres, and lower patient income were all factors significantly associated with a higher 90-day mortality after RC. Other analyzed variables, such as sex and insurance type, were not found to be statistically significant risk factors for 90-day mortality.

Conclusions: Older, lower-income patients with higher-stage disease, higher comorbidity index, African-American race, who undergo their RC at lower hospital volume, non-academic centres are at an increased risk of short-term mortality after RC. These preoperative clinical variables should be evaluated and discussed with patients diagnosed with non-metastatic bladder cancer who are potential candidates for RC.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/71

MP-2.7

Clinical characteristics and outcomes for young patients with advanced urothelial carcinoma

Cyrus Chehroudi[1], Jean-Michel Lavoie[2], Peter C. Black[1], Bernhard Eigl[2]
[1]Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; [2]Medical Oncology, British Columbia Cancer Agency, Vancouver, BC, Canada

Introduction: The outcomes of patients with advanced urothelial carcinoma (UC) remain poor. While UC is predominantly a disease of the elderly, there is a cohort of relatively young patients whose natural history is incompletely studied. We present a multicentre series of young patients diagnosed with metastatic UC.

Methods: We identified patients from the BC Cancer Registry who had a diagnosis of metastatic UC at age ≤55 and received first-line cisplatin-gemcitabine (Cis-Gem) from 2000–2017. Individual patient records were reviewed for baseline characteristics, treatment, and outcomes. Kaplan-Meier analysis was conducted with log-rank tests for statistical significance.

Results: A total of 94 cases were identified, of which the majority were male (78%) and smoking-related (68%). Median Eastern Cooperative Oncology Group (ECOG) score was 1 and 40% had visceral metastases at diagnosis. Forty-two patients (45%) had previous cystectomy and 17% received perioperative Cis-Gem. Nearly half of patients were unable to complete first-line Cis-Gem due to progression (26%) and adverse events (18%). Median overall and progression-free survival were 9.7 and 7.1 months, respectively, for all patients. Thirty-three patients received subsequent systemic therapies, mostly taxanes (n=19) or another platinum doublet (n=9). Four patients went on to clinical trial and five received immunotherapy. Univariate factors associated with poor survival include anemia (median 15 vs. 8.8 months; p=0.02), visceral metastases (median 12.9 vs. 8.7 months; p=0.01), and having received only one line of systemic therapy (17.5 vs. 8.5 months; p<0.0001). There was a trend towards worse survival in patients diagnosed with de novo metastatic disease (median 11.7 vs. 10.5 months; p=0.06) and ECOG ≥2 (median 10.8 vs. 6.3 months; p=0.19).

Conclusions: Metastatic UC in young patients is an aggressive entity with poor survival that appears worse than expected for the general population. Known risk factors for mortality were validated in this cohort. Further studies are warranted to directly analyze the impact of age on outcomes.

MP-2.8

Required one-year effectiveness for novel therapies in Bacillus Calmette-Guérin-unresponsive non-muscle-invasive bladder cancer: A decision analysis

Marian S. Wettstein[1], David Naimark[2], Michael A. Jewett[1], Lothar Lilge[3], Girish S. Kulkarni[1]
[1]Division of Urology, Department of Surgery, Princess Margaret Cancer Centre, University Health Network, University of Toronto, Toronto, ON, Canada; [2]Division of Nephrology, Department of Medicine, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada; [3]Department of Medical Biophysics, Princess Margaret Cancer Centre, University Health Network, University of Toronto, Toronto, ON, Canada

Introduction: Non-muscle-invasive bladder cancer (NMIBC) unresponsive to intravesical Bacillus Calmette-Guérin (BCG) immunotherapy is a clinical dilemma. Early radical cystectomy (ERC) provides superior oncological control but leads to a decreased postoperative quality of life (QoL) and comes at the mortality and morbidity of the procedure. On the other hand, novel therapies (NT) that aim to preserve the bladder and the associated QoL are inferior regarding cancer control. The aim of the current investigation was to find by a decision-analytic approach the required one-year effectiveness for NT at which the quality-adjusted life expectancy (QALE) is comparable to ERC.

Methods: We developed a seven-state Markov microsimulation model (cycle length: three months; discount rate: 3%) as illustrated in Fig. 1 and simulated the two strategies "NT" and "ERC" with a cohort of 10 000 patients. Each sampled individual was modeled by distinct age, sex, and tumour characteristics (T stage, grade, concomitant carcinoma in situ). We defined the required one-year effectiveness for NT as the threshold value where the two strategies yield an equal amount of QALE. Transition probabilities and utilities were obtained through literature review and expert consensus. Before analysis, the model was validated and calibrated to a cohort that underwent ERC and was followed for over 15 years.

Results: After calibration, our model produced a 10-year BC-specific survival of 80%, which we considered as valid in relation to contemporary series. The reference treatment strategy "ERC" yielded on average 10.1 quality-adjusted life years (Monte-Carlo standard error 0.06). We then varied the one-year effectiveness parameter in small increments across a range from 0–100% and found a comparable amount of QALE in the interval between 65% and 70%.

Conclusions: Our study could demonstrate that potential NT for BCG-unresponsive NMIBC can compete with ERC at one-year effectiveness between 65% and 70%. As soon as NT reach clinical maturity, their clinical utility has to be evaluated from a cost-effectiveness perspective.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/73

MP-2.9

Preventing postoperative ileus in radical cystectomy patients: A cost-utility analysis of alvimopan

Douglas C. Cheung[1], Karen Chung[2], Jennifer Tang[1], Antonio Finelli[1]
[1]Urology, University of Toronto, Toronto, ON, Canada; [2]Plastic Surgery, University of Toronto, Toronto, ON, Canada

Introduction: Routine perioperative opioid analgesia contributes to the development of post-operative ileus (POI) in patients undergoing radical cystectomy. POI leads to poor oral intake, prolonged length of stay, and higher risk of complications. Alvimopan, a peripheral mu-opioid receptor antagonist, counteracts this effect independently of analgesia, but is

expensive since it is dosed prophylactically, regardless of whether patients would develop POI.
Methods: A cost-utility analysis using a Markov cohort model was completed to compare alvimopan vs. routine care from the inpatient stay to 90 days post-discharge (Fig. 1 Simplified Health States). Primary outcomes of interest were predicted POI rate, total costs, and quality-adjusted life years (QALYs) gained. Secondary outcomes included nasogastric (NG) insertion, complications, emergency room (ER) presentations, and hospital readmissions. The model was populated using systematic literature review.
Results: Standardized to the annual cystectomy rate of 200 cases in Ontario, prophylactic alvimopan prevents 15.9 cases of POI, 14.9 NG insertions, 19.6 ER presentations, and 9.7 re-admissions. Alvimopan provides cost-savings at $783.61 and 0.00170 QALYs per patient and maintained these results across the inpatient stay and followup period. Of 1000 scenarios, 95.2% were either dominant or cost-effective at $50 000/QALY. Our results were most sensitive to the cost of alvimopan, efficacy of alvimopan in reducing POI, and the baseline POI rate.
Conclusions: Alvimopan dominated current care: it was cost-saving ($783.61/patient), improved outcomes (events avoided), and improved quality of life (0.00170 QALYs/patient). However, the largest limitation may remain the policy application; although widely used in the United States (up to 70% adoption rate) with proven safety/efficacy data, alvimopan has not yet gained approval in Canada.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/74

MP-2.10
Curative therapy for muscle-invasive bladder cancer: A 21-year population-based analysis
Benjamin Shiff[1], Ryan Sun[1], Oksana Harasemiw[2], Navdeep Tangri[2], Jeffery W. Saranchuk[1], Rahul Bansal[1], Darrel E. Drachenberg[1], Jay Nayak[1]
[1]Urology, University of Manitoba, Winnipeg, MB, Canada; [2]Chronic Disease Innovation Centre, Winnipeg, MB, Canada
Introduction: Approximately 25% of bladder cancers are muscle-invasive at diagnosis, requiring further treatment beyond transurethral resection. Definitive treatment entails either radical cystectomy or radiation therapy, each with or without neoadjuvant or adjuvant chemotherapy. Thus far, neither treatment modality has proven conclusively superior with proper patient selection. In this study, we aimed to compare the survival outcomes between surgery and radiation for bladder cancer in the context of a large, province-wide cohort database.
Methods: We performed a retrospective cohort study by analyzing patient-level of data from linked administrative datasets of all patients within the province of Manitoba who underwent radical cystectomy or radiotherapy for invasive bladder cancer from 1995–2015. The survival outcomes were compared between those who had cystectomy and with those treated with radiation.
Results: A total of 5554 patients who were diagnosed with bladder cancer were identified. Of these, 1039 patients underwent treatment for invasive disease, either with radical cystectomy (n=454) or radiation therapy (n=577). Those who underwent surgery were younger (68.1 vs. 76.8 years; p<0.0001) and had lower Charlson comorbidity index (6.3±3.6 vs. 6.8±3.4; p=0.03). With a median followup time of 1.90 (0.8–5.2) years, radical cystectomy was associated with significantly improved overall survival compared with radiation therapy (hazard ratio [HR] 2.65; 95% confidence interval [CI] 2.27–3.01). The five-year estimated overall survival was 51.77% following radical cystectomy compared with 17.63% with radiation therapy (p<0.001).
Conclusions: In this preliminary analysis, radical cystectomy was associated with superior survival compared with radiation therapy for invasive bladder cancer. Further evaluation is required to determine the causes of these differences.

MP-2.11
Impact of glycemic control on the recurrence and progression of non-muscle-invasive bladder cancer in patients with diabetes mellitus
Myung Soo Kim[1], Sumin Son[1], Tae Hee Kim[1], Eun Seong Jong[1], Young Ho Seo[1], Seong Hyeon Yu[1], Se Heon Jeong[1], Ho Seok Chung[1], Ho Song Yu[1], Eu Chang Hwang[1], Sun-Ouck Kim[1], Kyung Jin Oh[1], Seung Il Jung[1], Taek Won Kang[1], Dongdeuk Kwon[1], Kwangsung Park[1]
[1]Department of Urology, Chonnam National University Medical School, Gwangju, Korea
Introduction: We sought to investigate the relationship between glycemic control and non-muscle-invasive bladder cancer (NMIBC).
Methods: From January 2004 to May 2015, 617 patients with NMIBC were analyzed (group 1: patients without diabetes mellitus [DM], n=499; group 2: DM with preoperative Hb A1c <7, n=58; group 3: DM with preoperative Hb A1c ≥7, n=60). A 1:2 propensity-score matching was performed using variables related to tumour progression, such as age, sex, body mass index (BMI), tumour multiplicity, size, grade, and pathological stage.
Results: There was no significant difference in tumour characteristics between group 1 and group 2. The tumour recurrence of group 2 was higher than of group 1 but not statistically significant, and tumour progression was similar (33.0% vs. 44.8%, p=0.074; 11.4% vs. 12.0%, p=0.888). Group 3 had significantly higher tumour multiplicity, pathological stage than group 1 (multiplicity >3, 42.4% vs. 58.3%, p=0.02; pathological stage >T1, 30.9% vs. 43.3%, p=0.039). The tumour recurrence and progression of group 3 were higher than group 1 (33% vs. 48.3%, p=0.019; 11.4% vs. 31.6%, p<0.001). After propensity score matching between group 1 and group 3, there was no significant difference in the characteristics of tumour (multiplicity >3, 59.2% vs. 58.3%, p=0.02; pathological stage >T1, 45.8% vs. 43.3%, p=0.717) and recurrence rate (41.7% vs. 48.3%, p=0.428). However, the tumour progression of group 3 was significantly higher than that of group 1 (15.8% vs. 31.6%, p=0.02). Kaplan-Meier analysis showed significant differences in progression-free survivals between group 1 and group 3 (p=0.023).
Conclusions: Poor glycemic control was related to the shorter progression-free survival of patients with NMIBC.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/76

MP-2.12
Characterization and distribution of soft tissue and nodal recurrences after radical cystectomy
Chun Huang[1], Andreas Meier[2], Yamashita Rikiya[2], Emily Vertosick[3], Nicole Benfante[3], Daniel Sjoberg[3], Eugene Cha[1], Guido Dalbagni[1], Hebert Alberto Vargas[2], Bernard Bochner[1], Timothy Donahue[1]
[1]Urology Service, Memorial Sloan Kettering Cancer Center, New York, NY, United States; [2]Department of Radiology, Memorial Sloan Kettering Cancer Center, New York, NY, United States; [3]Department of Biostatistics, Memorial Sloan Kettering Cancer Center, New York, NY, United States
Introduction: Disease recurrence after radical cystectomy (RC) is associated with poor survival. Pelvic recurrences (PR) within the field of dissection are particularly concerning. The nature and spatial relation of soft tissue (ST) and lymph node (LN) PRs are not well-described. We characterize the risk factors for LN and ST recurrence after RC and mapped their 3D spatial locations.
Methods: From 2000–2014, 2257 bladder cancer patients underwent RC at Memorial Sloan Kettering Cancer Center (MSKCC). We radiographically identified all first PR, defined as a mass initially presenting in the pelvis and or retroperitoneum (RP) below the inferior mesenteric artery (IMA) with or without distant metastasis. Using competing risk regression, we tested for association between first PR and pathological stage, lymph node (LN) status, margins, histology, and preoperative chemotherapy (PC) against the risk of initial extrapelvic recurrence and death from other causes prior to recurrence. Tomographic imaging provided location, size, and nature of PR, with results collated on a vascular and pelvis map. 3D volume-averaging visualized recurrence risk and disease burden.
Results: A total of 298 patients were found to have a first PR. Higher pathological stage, positive LN, positive ST margin, and variant histol-

ogy were associated with a higher risk of PR (p<0.0001 for all). PC was associated with higher risk of PR (p<0.0001), with the highest risk in those who underwent chemotherapy with consolidation surgery (subhazard ratio 3.01; 95% confidence interval 2.10, 4.31). The most frequent sites of LN recurrences (Fig. 1) were the RP below the IMA (23%) and left common iliac artery (13%). ST recurrences were found near the bifurcation of left (30%) and right (26%) common iliac arteries (Fig. 2).
Conclusions: Pelvic and lower RP recurrences after RC are found near vessel bifurcations, and posterior to certain vessels. First PR is associated with high-risk pathological features at RC and receipt of PC. This study can help identify sites vulnerable to in-field recurrence and may guide intraoperative or adjuvant therapy.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/77

MP-2.13
Cost of managing metastatic bladder cancer with the introduction of immunotherapies from a Canadian healthcare perspective
Côme Tholomier[1], Sara Nazha[1], Wassim Kassouf[1], Alice Dragomir[1]
[1]Department of Surgery, Division of Urology, McGill University Health Centre, Montréal, QC, Canada
Introduction: The development of immunotherapies (IOs) for the treatment of bladder cancer in first- and second-line, namely pembrolizumab and atezolizumab, increased the economic burden of this disease. We aimed to use an economic model to compare the additional cost when IOs are included in the treatment algorithm of metastatic bladder cancer.
Methods: The model evaluated overall survival (OS), progression-free survival, and costs associated with each drug; adverse event (AE) treatment; monitoring; and post-progression (third-line treatment, best supportive care [BSC]). Efficacy, safety, and treatment duration were estimated from regimens' pivotal clinical trials. The model included first-line gemcitabine-cisplatin (Gem-Cis), gemcitabine-carboplatin (Gem-Carb), or IOs in Cis-ineligible patients and high PD-L1 expression, and second-line IOs, Gem-Carb, paclitaxel or docetaxel. Cost of BSC and AEs was retrieved from published Canadian studies. Sensitivity analyses were conducted to take into consideration potential rebates to IOs in hospital.
Results: The cost of treating patients with Gem-Cis first-line was estimated to be $16 339, with 53% of cost related to the management of AEs. When treating patients in the second-line setting, the incremental survival of pembrolizumab and atezolizumab compared to paclitaxel/docetaxel were 3.3 and 4.1 months, respectively. Treatment with second-line therapy costs $64 207, $54 857, $14 119, and $14 154 for pembrolizumab, atezolizumab, paclitaxel, and docetaxel, respectively. Cost of managing AEs represented <1% for IOs and 10% for paclitaxel/docetaxel. In Cis-ineligible patients, the use of IOs in first-line increased the cost by $47 818 (total $72 596) vs. Gem-Carb, while improving OS by 6.6 months.
Conclusions: In a Canadian setting, inclusion of IOs for treatment of metastatic bladder cancer in first- or second-line will increase treatment cost by approximately $50 000 for an incremental survival of 3–6 months.

MP-2.14
Prospective implementation of enhanced recovery after surgery to radical cystectomy at the University of Alberta Hospital
Graeme Follett[1], Niels-E.B. Jacobsen[1], Nupur Agarwal[1], Heather Y. Ting[2], Adrian Fairey[1]
[1]Division of Urology, Department of Surgery, University of Alberta, Edmonton, AB, Canada; [2]Department of Anesthesia and Pain Medicine, University of Alberta, Edmonton, AB, Canada
Introduction: Enhanced recovery after surgery (ERAS) pathways have been introduced in surgical oncology to facilitate postoperative recovery. Patients undergoing radical cystectomy and urinary diversion for bladder cancer may be ideal candidates for an ERAS pathway, as the potential for surgical stress and postoperative serious adverse events (SAE) is high. We determined whether implementation of a cystectomy enhanced recovery pathway (CERP) improved clinical outcomes at the University of Alberta Hospital (UAH).
Methods: The study was a non-randomized, quasi-experimental design. Data was collected between December 2015 and May 2018. Eligible subjects were those with biopsy-proven bladder cancer (cTanyN1-3M0) undergoing curative-intent open radical cystectomy and urinary diversion by one of two fellowship-trained urologic oncologists at the UAH. The CERP was implemented in August 2017. The CERP had 26 components, including same-day admission, carbohydrate fluid loading, targeted intraoperative fluid resuscitation, regional postoperative analgesia, early mobilization, and chewing gum use. The primary endpoint was length of hospital stay (LOS). Secondary endpoints were 30-day mortality rate, SAE, and readmission to hospital. Statistical tests were two-sided ($p \leq 0.05$).
Results: Data were evaluated for 48 subjects managed with CERP and 51 subjects not managed with CERP. Baseline demographic, clinical, and pathological characteristics did not differ between groups (all comparisons, p>0.05). Median LOS was nine days (range 7–12 days) in the CERP group vs. 13 days (range 9–16) in the non-CERP group (p<0.05). SAE occurred in three subjects (6%) in the CERP group vs. six subjects (12%) in the non-CERP group (p<0.05). Thirty-day mortality (0% vs. 0%) and hospital readmission (19% vs. 16%) did not differ between groups.
Conclusions: The UAH CERP was associated with decreased LOS and SAE with no increase in perioperative mortality or readmission to hospital. CERPs provide an opportunity to improve bladder cancer quality of care.

UP-2.1
Human-derived 3D bladder cancer models reconstructed by tissue engineering: On the road to precision medicine
Cassandra Ringuette-Goulet PhD[1], Stéphane Chabaud PhD[1], Geneviève Bernard MSc[1], Frédéric Pouliot[1], Stéphane J. Bolduc[1]
[1]Surgery, CHU de Québec-Université Laval Research Centre, Québec City, QC, Canada
CUOG
Introduction: Bladder cancer (BCa) is one of the most common cancers. If the majority of BCa are non-invasive (85%), they have a high rate of recurrence. The role of the tumour microenvironment (TME) has been demonstrated for the initiation, progression, and metastasis steps. A major concern in cancer research is the translation of the results from bench to patients. The 2D culture systems and in vivo animal models poorly replicate the dynamic nature of the human TME, with a translation rate of about 7%. New models mimicking TME and maintaining heterogeneity of cells are needed and we propose human-derived 3D BCa models reconstructed by tissue engineering using not only BCa cell line spheroids, but also patient BCa biopsies.
Methods: Epithelial and mesenchymal cells from healthy bladder biopsies were extracted and banked. Bladder mesenchymal cells were cultured for four weeks in the presence of ascorbate to produce a tissue-like scaffold. Epithelial cells were then seeded on top of the construct and after 10 days of maturation (just after formation of the basal lamina), RT4 or T24 BCa cell line spheroids were implanted. The constructs were then kept in culture for three additional weeks. Alternatively, spheroids were replaced by patient's BCa biopsies (tansurethral resection of bladder tumour [TURBT]).
Results: As expected, invasive BCa cells (from spheroids or biopsies) invaded the stromal compartment but non-invasive cell lines or biopsy specimen (low-grade) remained superficial on the reconstructed tissue. BCa biopsies could be maintained at least 90 days in culture and presented heterogeneity of cell morphology.
Conclusions: Our human-derived 3D models of BCa are now ready for further TME investigations. Addition of immune cells from patients, as has been done with skin and vagina models at LOEX, will be the next step. Furthermore, the spheroid-derived model could serve as a tool to discover new drug targets and the patient-derived biopsy model to test the effects of known drugs in the context of precision medicine.

UP-2.2

Robot-assisted radical cystectomy with extracorporeal urinary diversion does not increase ureteroenteric stricture rate: Outcomes from a randomized trial comparing open vs. robotic cystectomy

Chun Huang[1], Taehyoung Lee[1], Melissa Assel[2], Victor A. McPherson[1], Sherri Donat[1], Harry Herr[1], Jonathan Coleman[1], Vincent Laudone[1], Guido Dalbagni[1], Andrew Vickers[2], Bernard Bochner[1], Alvin Goh[1]

[1]Urology Service, Memorial Sloan Kettering Cancer Center, New York, NY, United States; [2]Department of Biostatistics, Memorial Sloan Kettering Cancer Center, New York, NY, United States

Introduction: The rate of benign ureteroenteric anastomotic stricture (UAS) after open radical cystectomy (ORC) ranges from 3–10%, with high-volume centres reporting rates close to 3–4%. There have been reports of higher stricture rates following robot-assisted radical cystectomy (RARC) and extracorporeal urinary diversion (ECUD). We performed an analysis of stricture rates in a randomized cohort of ORC and RARC with ECUD to evaluate UAS outcomes.

Methods: A total of 118 patients were randomized to undergo robotic and open cystectomy at a single, high-volume institution from March 2010 to April 2013. Urinary diversion in both arms was performed by an experienced open surgeon; 110 (93%) patients achieved one year of followup. A stricture was defined as a non-malignant obstruction on imaging, corroborated by clinical status, and requiring procedural intervention. Clinicopathologic variables, such as gender, American Society of Anesthesiologists classification, body mass index, surgical approach, diversion type, neoadjuvant chemotherapy, stage, histology, and post-operative complications, were obtained. Stricture rates were compared between groups by log-rank as a post-hoc analysis.

Results: Fifty-eight and 60 patients were randomized to undergo RARC and ORC, respectively. There were five strictures identified; all occurred in patients randomized to receive ORC. The overall stricture rate was 2.2% (per renal unit). Median time to stricture was 4.5 months and the risk of a stricture at one year in those who underwent ORC was 9% (95% confidence interval 4%, 20%; p=0.018). Three patients were managed endoscopically while two patients required open revision of the anastomosis. There was no evidence that a perioperative grade 3–5 complication was associated with the development of a stricture (p=1) and there was no difference in 24-month creatinine (p=0.4).

Conclusions: Robotic cystectomy with extracorporeal diversion can achieve excellent ureteral anastomotic outcomes when performed at a high-volume centre. Patients undergoing ORC were at higher risk of stricture compared to those undergoing the hybrid robotic procedure.

UP-2.3

Cost of muscle invasive bladder cancer treatment: Phase-specific costs of trimodal therapy compared with radical cystectomy

Diana E. Magee[1], Marian S. Wettstein[1], Amanda Hird[1], Peter Chung[2], Padraig Warde[2], Charles Catton[2], Alejandro Berlin[2], Srikala S. Sridhar[3], Alexandre Zlotta[1], Neil E. Fleshner[1], Girish S. Kulkarni[1]

[1]Division of Urology, University of Toronto, Toronto, ON, Canada; [2]Department of Radiation Oncology, University of Toronto, Toronto, ON, Canada; [3]Department of Medical Oncology, University of Toronto, Toronto, ON, Canada

Introduction: Radical cystectomy (RC) is the gold standard treatment for muscle-invasive bladder cancer (MIBC), but trimodal therapy (TMT) has been increasing in popularity for appropriately selected patients.[1] As the two therapeutic modalities are now well-accepted, we sought to evaluate the micro-level costs associated with RC and TMT in adults with MIBC.

Methods: All patients undergoing TMT or RC for primary treatment of urothelial MIBC at a single academic centre between 2008 and 2012 were included. Direct costs associated with each phase of a patient's clinical course were collected from the hospital's financial department and physician costs were calculated based on the provincial fee schedule. Costs of radiation treatments were derived from previously published literature.[2]

Results: A total of 111 patients were included. The median patient age was 68 (interquartile range [IQR] 61.5–76.5). Overall, 79 (71%) patients underwent RC and 32 (29%) were treated with TMT. The RC group had higher rates of cT3/T4 compared to those in the TMT group (59% vs.19%; p<0.001). The median cost in the treatment phase for RC was $21 911 (IQR 19 384–28 531) vs. $15 407 (IQR 14 738–16 231) for TMT (p<0.001). There was no significant difference between treatment groups with respect to costs of diagnosis or workup. However, the cost of followup care was higher for patients undergoing TMT compared to RC ($5519 vs $2876, p=0.04). In a subgroup analysis for patients with cT2 disease (n=57), median treatment costs for both RC and TMT remained largely unchanged and the difference in cost between the two modalities remained statistically significant (p<0.001).

Conclusions: In appropriately selected patients with MIBC where TMT is a reasonable treatment option, costs are not prohibitive and are lower than for RC. With increasing followup time after primary treatment, the cost difference between modalities may be mitigated by the need for bladder surveillance and salvage therapy in the TMT cohort.

References

1. Witjes JA, Comperat E, Cowan NC, et al. Updated 2016 EAU guidelines on muscle-invasive and metastatic bladder cancer. *Eur Urol* 2016;71:462-75. https://doi.org/10.1016/j.eururo.2016.06.020
2. Yong JHE, McGowan T, Redmond-Misner R, et al. Estimating the costs of intensity-modulated and 3-dimensional conformal radiotherapy in Ontario. *Curr Oncol* 2016;23:e228-38. https://doi.org/10.3747/co.23.2998

UP-2.4

Impact of neoadjuvant chemotherapy on bladder recurrences in patients managed with trimodal therapy (TMT) for muscle-invasive bladder cancer

Khaled Ajib[1], Michael Tjong[1], Guan Hee Tan[1], Gregory Nason[1], Annette Erlich[2], Manjula Maganti[1], Srikala Sridhar[1], Neil Fleshner[1], Alexandre Zlotta[2], Alejandro Berlin[1], Peter Chung[1], Girish S. Kulkarni[1]

[1]Urology, Princess Margaret Hospital, Toronto, ON, Canada; [2]Urology, Mount Sinai Hospital, Toronto, ON, Canada

Introduction: Bladder preservation with trimodal therapy has emerged as an alternative treatment in patients with muscle-invasive bladder cancer. We evaluated whether receipt of neoadjuvant chemotherapy (NAC) decreases local bladder recurrences.

Methods: We retrospectively analyzed our bladder preservation database and identified all patients with localized, pT2-T4 bladder cancer treated with curative intent between 2003 and 2017. Patients were treated with maximal transurethral resection of bladder tumour (TURBT), followed by chemotherapy/radiotherapy. Contemporary patients were also treated with NAC. Overall recurrence-free survival (RFS) and bladder RFS were analyzed using the Kaplan-Meier method and Cox proportional hazards modeling.

Results: Median age and followup periods were 72 years and 3.6 years, respectively. Fifty-four patients had NAC and concurrent chemoradiation (group 1) vs. 70 patients who had concurrent chemoradiation only (group2). Carcinoma in situ (CIS) was present in 31% of the patients in group 1 compared to 24% in group 2 (p=0.40). After treatment, 24 (44%) and 31 (44%) patients in groups 1 and 2, respectively, had bladder tumour recurrence. Overall RFS at three years was 46% and 50% in groups 1 and 2, respectively (p=0.70). Moreover, bRFS at three years was 55% and 69% in groups 1 and 2, respectively (p=0.27). However, the three-year cystectomy-free survival was similar across groups (74% in group 1, 70% in group 2; p=0.84). Multivariate analyses found that the presence of concomitant CIS (hazard ratio [HR] 2.13; 95% confidence interval [CI] 1.06–4.27; p=0.0036) was the primary factor associated with local bladder recurrence (three-year bRFS 76% without CIS vs. 29% with CIS). In a subgroup analysis of the patients with concomitant CIS (n=31), the three-year bRFS rate was similar between patients that did and did not receive NAC (31% vs. 27%; p=0.49).

Conclusions: Receipt of NAC does not obviate the risk of bladder recurrence after TMT. Patients with CIS should be monitored especially closely for local recurrence.

UP-2.6

Endocrine disruptors and bladder carcinoma: Is bladder cancer progression impacted by bisphenols?

Ève Pellerin[1,2], Stéphane Chabaud[1], Anthony Kerever[2], Andrew Z. Leong[2], Frédéric Pouliot[1], Martin Pelletier[2], Stéphane J. Bolduc[1]
[1]Surgery, CHU de Québec-Université Laval Research Centre, Québec City, QC, Canada; [2]Infectious and Immune Disease, CHU de Québec-Université Laval Research Centre, Québec City, QC, Canada
CRSNG/NSERC

Introduction: Bisphenols (BP) are endocrine disruptors used in the production of a broad range of commonly used products. BP-A is found in >90% of urine and blood samples, at concentrations susceptible to induce substantial effects. BP-A-free alternatives, such as BP-S, may also disrupt hormonal pathways. The exposure to BP is linked to cancer progression and metastasis, especially in hormono-sensitive cancers. Even if the bladder is not a hormono-sensitive tissue, the activation of androgen and estrogen receptors plays a role in the initiation and progression of bladder cancer (BCa). A hallmark of tumour progression is the alteration of the metabolic profile, known as the Warburg effect: a metabolic switch from mitochondrial respiration to glycolysis. Due to the chronic exposition of the bladder to BP and their metabolites in urine, we hypothesize that the metabolic switch induced by BP in BCa cells is linked to its progression.
Methods: Primary normal urothelial cell (UC), non-invasive (RT4) and invasive (T24) BCa cell lines were used for this study. Evaluation of bioenergetics in real-time of cell culture was established after 24, 48, or 72 hours BP-A or BP-S treatment at various concentrations (vehicle as a control) using an XF extracellular flux analyzer. Progression of cancer cell lines after 72 hours BP-A/S treatment was evaluated by measuring cell migration, proliferation, and MMP activities.
Results: After 24 hours of BP exposure, energy metabolism was dramatically reduced in BCa cells, followed by an increase in glycolysis at 72 hours, indicating a metabolic switch mimicking the Warburg effect. After only a 72-hour BP exposition, proliferation of UC was increased to levels of BCa cell lines. At the same time, RT4 cell migration was slightly enhanced. MMP activities remained roughly unaffected.
Conclusions: This increased proliferation of UC after BP exposure could mimic a hyperplasic phenotype leading to potential errors in DNA replication and mutation accumulation favouring tumour initiation.

UP-2.7

Urothelial carcinoma cells produce proteinases that can regulate proteinase-activated receptors (PARs) 1 and 2, which can induce migration and invasion in these cells

Stacy de Lima[1], Koichiro Mihara[1], Antoine DuFour[2], Morley D. Hollenberg[1], M. Eric Hyndman[3]
[1]Inflammation Research Network, Snyder Institute, Physiology and Pharmacology Department, University of Calgary, Calgary, AB, Canada; [2]McCaig Institute for Bone and Joint Health, Physiology and Pharmacology Department, University of Calgary, Calgary, AB, Canada; [3]Southern Alberta Institute of Urology (SAIU), Calgary, AB, Canada

Introduction: An unmet challenge for the management of urothelial carcinoma (UC) is distinguishing indolent from aggressive disease. We hypothesize that microenvironment proteases generated both by tumour and parenchymal cells play a critical role in determining disease aggressiveness by dictating cell invasion and metastasis through oncogenic signaling via proteinase-activated receptors (PAR) and explored this by evaluating PAR function and protease-secreting properties of UC cell lines.
Methods: UC-derived cell lines used included: T24 & HTB9. qPCR validated PAR1/2 expression. PAR1/2 function was tested in a calcium assay. Proteomic analysis identified cell-secreted protease and inhibitors in UC supernatants (SN) and activity was confirmed with enzyme family-selective chromogenic substrates. Two methods were used for assessment of UC-secreted proteases that cleave PAR1/2: 1) An N-luciferase tag fused to PAR1/2 in a non-UC cell line is released upon cleavage to determine paracrine activity;[1] 2) an N-terminal mCherry/RFP;C-terminal eYFP construct was transfected into UC cells to visualize receptor status and autocrine cleavage (intact receptor=yellow; cleaved receptor=green).[2,3] PAR1/2 effect on migration was assessed in a wound healing assay with and without PAR1/2 agonism, and in UC cells that had deleted PAR1/2 expression (using CRISPR), or overexpression (using lentiviral transfection). Invasion was tested with and without PAR1/2 agonism or expression using a transwell assay.
Results: UC cell lines express functional PAR1/2 and secrete proteases and protease inhibitors that affect signaling. Neither cell line cleave PAR1, nor 2 via a paracrine mechanism, but demonstrated robust autocrine cleavage of PAR1. Activating PAR1/2 and/or increasing expression-induced migration and invasion by both cell lines, deleting expression inhibited this behaviour.
Conclusions: Functional PAR1 and 2 are expressed by UC cells. Increasing expression levels and agonism of these receptors increases invasion and migration.

References

1. Mihara K, Ramachandran R, Saifeddine M, et al. Thrombin-mediated direct activation of proteinase-activated receptor-2: Another target for thrombin signaling. *Mol Pharm* 2016;89:606-14. https://doi.org/10.1124/mol.115.102723
2. Ramachandran R, Mihara K, Chung H, et al. Neutrophil elastase acts as a biased agonist for proteinase activated receptor 2 (PAR2). *J Biol Chem* 2011;286:24638-48. https://doi.org/10.1074/jbc.M110.201988
3. Mihara K, Ramachandran R, Renaux B, et al. Neutrophil elasease and proteinase-3 trigger G protein-biased signaling through proteinase-activated receptor-1 (PAR1). *J Biol Chem* 2013;288:32979-90. https://doi.org/10.1074/jbc.M113.483123

UP-2.8

The anti-tumour effect of PD-1 blockade is reduced when combined with TIGIT blockade in the MB49 murine bladder cancer model

Alain Bergeron[1,2], Fanny Gaignier[1,2], Yves Fradet[1,2]
[1]Axe Oncologie, Centre de Recherche du CHU de Québec-Université Laval, Québec City, QC, Canada; [2]Department of Surgery, Université Laval, Québec City, QC, Canada

Introduction: TIGIT is an emerging immune checkpoint (IC) with a promising potential for tumour immunotherapy. However, the role of TIGIT in the immunosuppression of the anti-tumour immune response in comparison to PD-1 is poorly characterized. Expression of TIGIT, PD-1, and CD3 mRNAs is highly correlated in human bladder tumours, suggesting that T-cells infiltrating bladder tumours frequently co-express these ICs. The objective of this study was to assess the anti-tumour effect of the inhibition of PD-1, TIGIT, or both in MB49 murine bladder tumours.
Methods: MB49 tumour cells were injected subcutaneously in C57BL/6 mice. Tumour growth was measured twice a week until tumour volume reached 2 cm^3 and mice sacrificed. Tumours were dissociated and analyzed by multicolour flow cytometry. Expression of PD-1, TIGIT, and their ligands were characterized on immune cells. In vivo blockade was realized by 4 i.p. injections of antagonistic anti-PD-1 and anti-TIGIT antibodies two days apart, starting three days after tumour cell implantation. Tumour growth was followed as described above.
Results: Most T-lymphocytes expressed TIGIT, as 69% of CD8+ and 48% of CD4+ T-cells were TIGIT+PD-1+. No CD8+ but 18% of CD4+ cells were TIGIT+PD-1-. Regarding the expression of their ligands, 56% of CD11b+ and 39% of CD103+ dendritic cells were PD-L1+CD155+. In vivo inhibition of TIGIT slightly reduced tumour growth, whereas PD-1 blockade resulted in the cure of 40% of mice. Dual TIGIT and PD-1 inhibition induced a reduction in tumour growth that was less important than the one observed with PD-1 blockade alone, as no mice were cured by the combined treatment.
Conclusions: TIGIT and PD-1, as well as their ligands, are frequently co-expressed on immune cells infiltrating MB49 tumours. TIGIT blockade improved the survival of mice but much less than PD-1 blockade. When combined, TIGIT inhibition reduced the anti-tumour effect of PD-1 inhibition. Further analysis is needed to understand the interaction between PD-1 and TIGIT pathways.

UP-2.9

Venous thromboembolism and transfusion following major abdominopelvic surgery

Kristen McAlpine[1], Rodney H. Breau[1,2], Christopher Knee[2], Marc Carrier[2,3], Philippe Violette[4], Carl van Walraven[2,3], Dan I. McIsaac[2,5], Ranjeeta Mallick[2], Ilias Cagiannos[1,2], Christopher Morash[1,2], Luke T. Lavallée[1,2]

[1]Division of Urology, The Ottawa Hospital, Ottawa, ON, Canada; [2]Ottawa Hospital Research Institute, Ottawa, ON, Canada; [3]Department of Medicine, The Ottawa Hospital, Ottawa, ON, Canada; [4]Departments of Health Research Methods Evidence and Impact and Surgery, McMaster University, Hamilton, ON, Canada; [5]Departments of Anesthesiology & Pain Medicine, The Ottawa Hospital, Ottawa, ON, Canada

Funding: University of Ottawa Department of Surgery Research Program Award

Introduction: Thromboprophylaxis aims to reduce venous thromboembolism (VTE) but has the potential to increase bleeding. We sought to evaluate the risk of VTE and transfusion following major abdominopelvic procedures and to quantify the independent risk of procedure on VTE.

Methods: The American College of Surgeons' National Surgical Quality Improvement Program was queried for patients who received an abdominopelvic surgery from 2005–2016. Patient factors, operative factors, and outcomes were collected. A modified Caprini score was calculated for each patient. Multivariable analyses were used to determine the association between individual procedures and VTE. Area under the curve (AUC) analyses were performed to assess whether the addition of surgical procedure to Caprini score improved the ability of the model to predict VTE. The primary outcome was risk of VTE within 30 days of surgery. Secondary outcomes were the risk of transfusion within 30 days and the association between operative time and VTE.

Results: There were 896 441 patients who received an abdominopelvic procedure during the study period. The overall risk of VTE was 1.9% (n=16 665). Urological procedures with the highest risk of VTE were radical cystectomy (4.3%) and open nephrectomy (2.4%). The overall risk of transfusion was 9.5% (n=84 889). Urological procedures with the highest risk of transfusion were radical cystectomy (37.7%) and open nephrectomy (27.2%). On multivariable analyses, individual procedures were independently associated with VTE despite adjusting for the Caprini score. AUC analyses indicated risk-prediction of the baseline model (Caprini score AUC 0.59) improved when surgical procedures were added (AUC 0.68).

Conclusions: Patients undergoing abdominopelvic surgery are at high risk of VTE and transfusion. Improved risk-stratification may be possible by including more procedural information in scoring systems or by creating scoring systems that incorporate procedures' baseline VTE risk.

Poster Session 3: Endourology
June 30, 2019; 0730–0900

MP-3.1
Comparison of early vs. delayed ureteroscopy following obstructive pyelonephritis treated with urinary diversion

Steven Lagace[1], *Jonathan Cloutier*[1], *Ioana Fugaru*[1], *David Simonyan*[2], *Nathalie Laflamme*[2]
[1]Department of Urology, CHUQ-Université Laval, Québec City, QC, Canada; [2]Centre de Recherche (PRCE), CHUQ-Université Laval, Québec City, QC, Canada

Introduction: Urolithiasis is a common disease affecting approximately 8.8% of Americans.[1] Obstructive urolithiasis and sepsis call for emergent decompression and antibiotic therapy.[2,3] After treatment, definitive management can be achieved with ureteroscopy (URS) or percutaneous nephrolithotomy.[2] There are no guidelines identifying the best moment to perform elective URS after urosepsis. Thus, our objective was to compare the outcomes, especially post-URS sepsis, of patients who underwent early vs. delayed URS for obstructive pyelonephritis following decompression.

Methods: In this retrospective, non-inferiority, single-centre study, data were collected from patients who underwent elective URS following decompression for obstructive pyelonephritis between 2012 and 2017. Patients with the following criteria were excluded: obstruction unrelated to urolithiasis, other procedures performed during URS, and unclear diagnosis. Early URS was defined as URS performed within 14 days after decompression while the patient was still on antibiotics.

Results: A total of 164 patients were included in the study. Of those patients, 61 of them had early URS, while 103 had delayed URS. There were 10 cases of post-URS sepsis, including one in the early URS group and the other nine in the delayed URS group. The adjusted odds ratio after multivariate analysis was 7.3 (p=0.0661) for post-URS sepsis when comparing delayed URS to early URS. The complication-free survival at 30 days was 98.4% for early URS and 91.3% for delayed URS (p=0.0665).

Conclusions: Our study clearly shows the non-inferiority of early URS for post-URS sepsis when compared to delayed URS. Furthermore, our data show a tendency that early URS might be better than delayed URS regarding post-URS sepsis, although it is not statistically significant. Further studies will be needed to evaluate the superiority of early URS. However, our results showed that it is safe to perform early URS for treatment of urolithiasis following emergent decompression for obstructive pyelonephritis.

References
1. Scales CD Jr, Smith AC, Hanley JM, et al. Prevalence of kidney stones in the United States. *Eur Urol* 2012;62:160-5. https://doi.org/10.1016/j.eururo.2012.03.052
2. Sammon JD, Ghani KR, Karakiewicz, et al. Temporal trends, practice patterns, and treatment outcomes for infected upper urinary tract stones in the United States. *Eur Urol* 2013;64:85-92. https://doi.org/10.1016/j.eururo.2012.09.035
3. Borofsky MS, Walter D, Shah O, et al. Surgical decompression is associated with decreased mortality in patients with sepsis and ureteral calculi. *J Urol* 2013;189:946-51. https://doi.org/10.1016/j.juro.2012.09.088

MP-3.2
What is the relationship of stress to patients' stone-related quality of life?

Colin Lundeen[1], *Jonathan Lim*[1], *Kymora Scotland*[1], *Reza Safaee Ardekani*[1], *Kristina Penniston*[2], *Necole Streeper*[3], *Thomas Chi*[4], *Jaime Landman*[5], *Davis Viprakasit*[6], *Ben H. Chew*[1]
[1]Department of Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; [2]Department of Urology, University of Wisconsin - Madison, Madison, WI, United States; [3]Penn State Health, Hershey, PA, United States; [4]Department of Urology, University of California San Francisco, San Francisco, CA, United States; [5]Department of Urology, University of California Irvine, Irvine, CA, United States; [6]Department of Urology, University of North Carolina, Chapel Hill, NC, United States

Introduction: Patients with kidney stones have lower health-related quality of life (HRQOL) not only when they have a stone, but also between stone events and even when their stone(s) are asymptomatic. Higher stress has been reported as a potential factor in HRQOL, yet there have been few investigations into the effect of stress on stone-related quality of life (QOL). The Wisconsin Stone Quality Of Life questionnaire (WISQOL) is a recently developed tool to assess patients' HRQOL. In this study, we evaluated the relationship of stress to stone-related QOL and determined the extent to which the stress affects HRQOL in patients with a history of kidney stones.

Methods: Patients enrolled in the WISQOL Research Consortium who contemporaneously completed both the WISQOL and the PSS-10, a validated general stress questionnaire, were included. Patients were stratified into those with stones at the time of the questionnaires (further subdivided into those with and without symptoms) and those without stones. Statistical comparisons were made between groups and correlations between responses on the two instruments.

Results: Patients (n=704) from six centres were included. There was no overall correlation (R=-0.05; Pearson correlation coefficient) between the questionnaires. Moreover, while the WISQOL identified patients who currently had a stone, the PSS-10 did not (p<0.0001). These factors suggest that stress is not a significant driver of stone-related QOL. However, stress was higher in patients with symptomatic stones.

Conclusions: General stress does not appear to drive overall stone-related QOL, including in patients with a current kidney stone. However, patients with current symptoms related to stones did have higher stress, suggesting that stone symptoms affect stress. The lack of correlation between QOL and stress indicates that patients with stone disease have factors other than stress that affect QOL. The WISQOL is a highly sensitive tool capable of measuring patients' stone-related QOL.

MP-3.3
Augmenting the predictive criteria for successful medical expulsive therapy

Naveen Kachroo[1], *Rajat Jain*[2], *Luay Alshara*[1], *Sherif Armanyous*[1], *Sara Maskal*[1], *Manoj Monga*[1], *Sri Sivalingam*[1]
[1]Department of Urology, Cleveland Clinic, Cleveland, OH, United States; [2]Department of Urology, University of Rochester, Rochester, NY, United States

Introduction: A number of clinical and radiological predictors of either stone impaction or ureteral stone passage have been proposed. We aimed to identify the key predictors of successful stone passage during medical expulsive therapy (MET) using readily available computed tomography (CT)-based tools/measurements.

Methods: Patients presenting to the emergency room from February 2017 to February 2018 with an acute unilateral ureteral stone confirmed on non-contrast CT and managed by MET were prospectively followed for stone passage. Patients with renal impairment, sepsis, or requiring emergent intervention were excluded. Patients were followed at one month to confirm stone passage (stone collection/repeat imaging) or failure of passage. CT variables analyzed: stone factors (location, size, volume, Hounsfield unit density [HUD]), ureteral HUD above and below the stone, maximal ureteral wall thickness (UWT) at the stone site, contralateral UWT and ureteral diameter above and below the stone. Binary logistic regression analysis was performed to identify predictors of stone passage.
Results: Forty-nine patients met study inclusion criteria, of whom 32 (65.3%) passed the stone without further intervention. The HUD above/below stone, ureteral diameter, or any stone factor did not have a significant predictive value. Only maximal UWT at the stone site was significantly associated with stone passage, with the odds of stone passage decreasing by 97.5% for each 1 mm increase in UWT above 2 mm at the stone impaction site (odds ratio 0.0149; p=0.02) (Table 1). Youden's criterion identified 2.3 mm as the optimal UWT cutoff point, below which will accurately predict stone passage with an 87.5% sensitivity and 82.4% specificity.
Conclusions: Maximal UWT at the stone site was the most significant predictor of successful MET in acute unilateral ureteral stones, with an optimal cutoff point of 2.3 mm. Further prospective studies are needed to accurately predict spontaneous stone passage.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/91

MP-3.4

Bariatric surgery in patients with a history of nephrolithiasis: 24-hour urine profiles and radiographic changes after Roux-en-Y gastric bypass vs. sleeve gastrectomy

Richard Di Lena[1], Michael Uy[1], Jen Hoogenes[1], Badr Al-Harbi[1], Scott Gmora[2], Bobby Shayegan[1], Edward D. Matsumoto[1]
[1]Department of Surgery, Division of Urology, McMaster University, Hamilton, ON, Canada; [2]Department of Surgery, Division of General Surgery, McMaster University, Hamilton, ON, Canada
Introduction: Roux-en-Y gastric bypass (RNYGB) and sleeve gastrectomy (SG) are the most common bariatric surgeries, yet it is not clear which is superior.[1] Considering the propensity for the development of lithogenic urinary profiles and nephrolithiasis, post-bariatric surgery is important.[2] To our knowledge, no studies have evaluated these changes in post-bariatric surgery patients with a history of nephrolithiasis. We evaluated the differences in 24-hour urine (24HU) values and radiographic imaging post-RNYGB and SG in patients with a history of nephrolithiasis.
Methods: We reviewed the records of 92 patients with a history of nephrolithiasis and who underwent either RNYGB or GS at our centre. Computed tomography of the kidney-ureter- bladder (CT KUB) imaging and 24HU profiles were performed preoperatively and at one-year followup. The Wilcoxon rank sum test compared pre- and postoperative values, while multivariate regression analysis determined predictors of stones.
Results: Fifty-five patients underwent RNYGB and 37 had SG. No baseline differences were found between groups. For 24HU profiles (Table 1), both groups had similar findings, although the RNYGB group had a significant increase in oxalate and a decrease in citrate, while the SG group had a significant decrease in oxalate and stable citrate. A history of stone procedures (odds ratio [OR] 4.4; 95% confidence interval [CI] 1.2–16.5; p=0.03) and RNYGB (OR 4.2; 95% CI 1.2–14.9; p=0.03) were predictors of postoperative hyperoxaluria. Radiographically, 20.4% of the RNYGB group and 24.3% of the SG developed new stones. Postoperative stone procedure rate for each group was 9.3% and 8.1%, respectively.
Conclusions: Patients with a history of nephrolithiasis who underwent RNYGB had exacerbated lithogenic 24HU profiles, while those in SG patients improved. There were no differences in stone event rate, although this may be due to limited followup. The postoperative stone formation rate is higher than previously reported in similar studies. These findings support close urinary monitoring in patients with a history of nephrolithiasis who undergo RNYGB.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/92
References
1. Peterli R, Wölnerhanssen BK, Peters T, et al. Effect of laparoscopic sleeve gastrectomy vs. laparoscopic Roux-en-Y gastric bypass on weight loss in patients with morbid obesity. *JAMA* 2018;319:255-65. https://doi.org/10.1001/jama.2017.20897
2. Valezi AC, Fuganti PE, Junior JM, et al. Urinary evaluation after RYGBP: A lithogenic profile with early postoperative increase in the incidence of urolithiasis. *Obes Surg* 2013;23:1575-80. https://doi.org/10.1007/s11695-013-0916-0

MP-3.5

Tubeless ambulatory percutaneous nephrolithotomy: Initial 15-year experience from a single institution

Kash Visram[1], Michael A. Di Lena[1], Michael Kim[1], Andrea Kokorovic, Darren T. Beiko[1]
[1]Department of Urology, Queen's University, Kingston, ON, Canada
Introduction: Percutaneous nephrolithotomy (PCNL) is the gold standard treatment for large renal calculi, and is typically regarded as an inpatient procedure. Tubeless ambulatory PCNL (aPCNL) has been shown to be a safe and effective procedure when adhering to strict discharge criteria in carefully selected patients. We report the outcomes over our initial 15-year experience with aPCNL to better define the safety and efficacy of this approach.
Methods: A retrospective chart review was conducted of all consecutive unilateral and bilateral ambulatory PCNL cases done at Kingston Health Sciences Centre from January 1, 2004 to December 31, 2018. Preoperative, intraoperative, and postoperative data were collected, including gender, age, body mass index (BMI), American Society of Anesthesiologists (ASA) score, stone type, number, size, and location based on imaging. Safety of aPCNL was determined by assessing postoperative complications, emergency department (ED) visits, and hospital readmissions. Efficacy of aPCNL was determined by assessing radiographic stone-free rate.
Results: The mean patient age was 55.7 years, 54% were male and 46% were female. The average BMI was 34.3 kg/m^2, and 46% of patients were ASA 3. The average stone size was 16.1 mm, and 59% of patients had multiple stones. At the time of abstract submission, we did not have complete followup data available on all patients. The preliminary stone-free rate was 88%, with 17% and 5% of patients requiring ED visits and hospital readmission, respectively.
Conclusions: aPCNL is a safe and effective treatment and patient selection and strict discharge criteria are still imperative for success. However, our data shows that despite performing aPCNL in more comorbid patients with more complex stones, a high stone-free rate and low hospital readmission rate can be achieved.

MP-3.6

Incidence of hydronephrosis and stricture with the use of ureteral access sheaths in the treatment of nephrolithiasis

Luke F. Reynolds[1], Daniela Ghiculete[1], Abdulaziz M. Althunayan[2], Jason Lee[3], Michael Ordon[1], Kenneth T. Pace[1]
[1]Division of Urology, St. Michael's Hospital, Toronto, ON, Canada; [2]Division of Urology, King Khalid University, Riyadh, Saudi Arabia; [3]Division of Urology, Toronto General Hospital, Toronto, ON, Canada
Introduction: The ureteral access sheath (UAS) is an effective adjunct for ureteroscopic management of stone disease. While there are many benefits, there is a risk of ureteric injury with UAS use.[1] A clear causative link between UAS use and ureteral stricture disease has not been demonstrated, but is possible.[2] Our objective was to assess the incidence of hydronephrosis and ureteric strictures following ureteroscopy (URS) for urolithiaisis with and without the use of a UAS.
Methods: Consecutive patients undergoing URS for urolithiasis with and without ureteral access sheaths were compared. A control group of patients undergoing semi-rigid and flexible URS without a UAS was used to compare outcomes of patients undergoing flexible URS with either a 9.5/11 Fr or 12/14 Fr UAS for ureteric and renal stones. The primary

outcome was the development of ureteric stricture (confirmed with renal scan and diagnostic URS). Secondary outcomes were the persistence or development of hydronephrosis at three months postoperatively and long-term hydronephrosis (>6 months post-URS).
Results: A total of 236 patients were included in this retrospective series. No patients in the UAS group developed a stricture with a mean followup of 21.7 months, while one patient in the no-UAS group developed a stricture at the site of an impacted ureteric stone. Postoperative hydronephrosis was the same or worse three months after URS in four patients in each group (3.3% of patients in the UAS group vs. 3.5% in the no-UAS group; p=NS). All other cases of hydronephrosis at three months and at long-term followup were caused by non-obstructing, unresolved hydronephrosis or residual stone fragments.
Conclusions: In our series of patients who underwent URS with a UAS, no patients developed a ureteric stricture. The UAS provides surgeons with the ability to perform URS safely without added risk of postoperative hydronephrosis or strictures.
References
1. Traxer O, Thomas A. Prospective evaluation and classification of ureteral wall injuries resulting from insertion of a ureteral access sheath during retrograde infra-renal surgery. *J Urol* 2013;189:580-4. https://doi.org/10.1016/j.juro.2012.08.197
2. De Coninck V, Keller EX, Rodríguez-Monsalve M, et al. Systematic review of ureteral access sheaths: Facts and myths. *BJU Int* 2018;122:959-69. https://doi.org/10.1111/bju.14389

MP-3.7
The effect of a bacterial urinary infection isolate and antibiotics in a calcium urolithiasis model

Jennifer Bjazevic[1], Kait F. Al[2], Jaswanth Gorla[2], Hassan Razvi[1], Jeremy P. Burton[1,2]
[1]Surgery, Western University, London, ON, Canada; [2]Microbiology & Immunology, Western University, London, ON, Canada
Urology Care Foundation Research Scholar Award
Introduction: Urinary tract infections and antibiotic exposure with ciprofloxacin and sulfonamides have shown an increased association with calcium-based (non-struvite) stone disease in large epidemiological studies.[1,2] In an attempt to elucidate the potential mechanism of action behind this phenomena, we examined the effect of a non-urease-producing bacterium and antibiotics on the formation of calcium oxalate (CaOx) stones in a *Drosophila melanogaster* (DM) fly model.
Methods: DM flies were exposed to a non-urease-producing strain of *Escherichia coli* (UTI89) and 0.1% sodium oxalate (n=30 per group). Treatment with sub-minimum inhibitory concentrations of ciprofloxacin (0.2 µg/mL) or trimethoprim-sulfamethoxazole (TMP-SMX, 30/10 µg/mL) occurred on days 5–7. UTI89 inoculation was confirmed post-UTI89 exposure by culturing pulverized flies on lysogeny broth agar plates. Survival curve analysis and measured pixel intensity of stones within dissected Malpighian tubules under birefringent microscopy was used to assess stone burden (MATLAB, 2018).
Results: UTI89 inoculation was confirmed with a minimum concentration of $3x10^3$ colony forming units/fly. DM treated with oxalate food had a trend towards decreased survival over days 15–35; however, DM survival was unaffected by UTI89 exposure. Preliminary results suggest that at day 7, exposure to UTI89 increased CaOx crystal production in Malpighian tubules (p=0.001), and treatment with both ciprofloxacin (p=0.012) and TMP-SMX (p=0.001) attenuated this effect (Fig. 1).
Conclusions: Using the DM calcium urolithiasis model, our findings suggest that CaOx stone formation may be impacted by both exposure to both a non-urease-producing *E. coli* and treatment with the antibiotics ciprofloxacin and TMP-SMX. Further research is required to confirm these results and determine the potential mechanisms by which urinary pathogens and antibiotics may affect calcium-based stone formation.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/95
References
1. Holmgren K, Dalielson BG, Felsltrom B, et al. The relation between urinary tract infections and stone composition in renal stone formers. *Scand J Urol Nephrol* 1989;23:131-6. https://doi.org/10.3109/00365598909180827
2. Tasian GE, Jemielita T, Goldfarb DS, et al. Oral antibiotic exposure and kidney stone disease. *J Am Soc Nephrol* 2018;29:1731-40. https://doi.org/10.1681/ASN.2017111213

MP-3.8
Impact of a bacterial urinary infection isolate on calcium oxalate crystal adherence to renal epithelial cells: Potential novel role for osteopontin and zinc

Jennifer Bjazevic[1], Kait F. Al[2], Jaswanth Gorla[2], Hassan Razvi[1], Jeremy P. Burton[1,2]
[1]Surgery, Western University, London, ON, Canada; [2]Microbiology & Immunology, Western University, London, ON, Canada
Urology Care Foundation Research Scholar Award
Introduction: Urinary pathogens have been implicated in the development of calcium stone disease; however, the mechanisms by which this may occur have yet to be elucidated.[1] Both osteopontin (OPN) and zinc (Zn) are known to be involved in calcium oxalate (CaOx) urolithiasis and have also been shown to play a role in bacterial pathogenesis.[2-4] We examined the impact of a non-urease-producing bacterium isolated from a urinary tract infection, OPN, and Zn, on the adherence of CaOx crystals to renal epithelial cells in an in vitro model.
Methods: A crystal adherence assay was performed using HEK293 and MDCK renal epithelial cells grown to 90% confluence. Cells were exposed to a non-urease-producing strain of *Escherichia coli* (UTI89) for 20 minutes at 37 °C (103 CFU), washed, and then incubated with CaOx crystals (0.5 mg/mL) in artificial urine with or without the addition of OPN (0.1 µg/mL) or zinc chloride (500 µg/mL), for an additional 20 minutes. Unattached crystals were washed free and the adherence of CaOx crystals was determined with birefringence microscopy and quantified by pixel intensity with MATLAB (2018).
Results: Microscopy demonstrated live HEK/MDCK cells in all groups and bacterial rods visible in cells treated with UTI89. In MDCK cells, significantly increased crystal adherence was observed following UTI89 exposure ($p<0.001$). Treatment with OPN and Zn were noted to have opposite effects; crystal adherence following UTI89 exposure appeared decreased with OPN and increased with Zn treatment ($p<0.001$). Examination of HEK293 cells showed similar trends; however, these results did not reach significance (Fig. 1).
Conclusions: Our results suggest that non-urease-producing *E. coli* may impact CaOx crystal adherence, and both Zn and OPN may play a novel role in this process. Further investigation is required to delineate the potential mechanisms by which urinary pathogens may alter crystal adherence and the precise role that both Zn and OPN may play in this process.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/96
References
1. Holmgren K, Dalielson BG, Felsltrom B, et al. The relation between urinary tract infections and stone composition in renal stone formers. *Scand J Urol Nephrol* 1989;23:131-6. https://doi.org/10.3109/00365598909180827
2. Rittling S, Zetterberg C, Yagiz K, et al. Protective role of osteopontin in endodontic infection. *Immunology* 2009;129:105-14. https://doi.org/10.1111/j.1365-2567.2009.03159.x
3. Chi T, Kim MS, Lang S, et al. A drosophila model identifies a critical role for zinc in mineralization for kidney stone disease *PLoS One* 2015;10:e0124150.
4. Sabri M, Houle S, Dozois CM. Roles of the extra-intestinal pathogenic *Escherichia coli* ZnuACB and ZupT zinc transporters during urinary tract infection. *Infect Immun* 2009;77:1155-64. https://doi.org/10.1128/IAI.01082-08

MP-3.9

Radiation exposure in prone vs. modified supine position during percutaneous nephrolithotomy: Results with an anthropomorphic model

Marie-Pier St-Laurent[1], Maéva Rosec[2], Jean-Baptiste Terrasa[2], Lucca Villa[2], Olivier Traxer[2], Jonathan Cloutier[1,2]
[1]Department of Urology, University Hospital of Québec – Université Laval, Québec City, QC, Canada; [2]Department of Urology, Tenon University Hospital, APHP, Paris, France

Introduction: Radiation exposure during urological procedures is still of concern in the urology community. It has been reported that percutaneous nephrolithotomy (PCNL) in supine position has less irradiation, as the puncture is mostly done under ultrasound guidance.[1] However, it can also be done under fluoroscopy guidance. Unfortunately, data on radiation exposure during PCNL is lacking since they are often drawn form generalization and extrapolation,[2] or are not evaluating new procedures or different positions. The aim of our study was to compare the radiation dose depending on the position of the surgeon.

Methods: A portable C-arm was used in standard mode (32 impulsions/seconde; 98 kV, 3.8 mA). Specific dosimeters were placed for lens, extremity, and torso. Anthropomorphic models and hand phantom models were used to reproduce the position of surgeon and patient (with same bone density than real human) during PCNL in prone and modified supine position. Fluoroscopy time (FT) was six minutes to obtain higher exploitable signal and the results are given for a FT of three minutes (more realistic). Ten percent of the FT is done with an angulation of 15 degrees and the rest in anteroposterior position.

Results: The equivalent doses (ED) are given in uSV (uncertainty k=2). During the modified supine position: neck, lens, right index finger, left thumb, and index finger received ED of 99 (20%), 62 (18%), 437 (10%), 112 (12%), and 204 (10%), respectively. In a prone position, the phantom received ED on the neck, lens, right thumb and index finger, and left thumb and index finger of 85 (20%), 92 (12%), 401 (10%), 585 (10%), 295 (10%), and 567 (10%), respectively. In both positions, the right hand seems more exposed than the left hand.

Conclusions: The effective dose is 1.5- and 1.3-fold higher for lens and extremities, respectively, in a prone position PCNL compared to a modified supine position. Both positions are still well below the recommended limit for professional exposure.[3]

References

1. Breda A, Territo A, Scoffone C, et al. The evaluation of radiologic methods for access guidance in percutaneous nephrolithotomy: A systematic review of the literature. *Scand J Urol* 2018;52:81-6. https://doi.org/10.1080/21681805.2017.1394910
2. Hellawell GO, Mutch SJ, Thevendran G, et al. Radiation exposure and the urologist: What are the risks? *J Urol* 2005;174:948-52; discussion 952. https://doi.org/10.1097/01.ju.0000170232.58930.8f
3. Governor General in Council, Radiation Protection Regulations, in (SOR/2000-203), Minister of Natural Resources, Editor. 2000: Official Gazette, Statutory Instruments, 2000;134:1171-83.

MP-3.10

Success rate of repeat flexible ureteroscopy following previous failed access from ureteral spasm

Dylan Hoare[1], Tim Wollin[1], Shubha De[1], Michael G. Hobart[1]
[1]Division of Urology, Department of Surgery, University of Alberta, Edmonton, AB, Canada

Introduction: Approximately 8% of patients that undergo therapeutic or diagnostic ureteroscopy will have the procedure aborted due to failed access. These patients are usually stented to allow for passive dilation of the ureter. There is currently no evidence-based duration for indwelling ureteric stents after which interval ureteroscopy should be attempted. The primary objective of this study was to assess the average time to salvage/staged ureteroscopy and the associated rate of successful renal access.

Methods: This retrospective descriptive study evaluated all patients undergoing interval ureteroscopy following a failed procedure by urologic surgeons participating in the stone treatment group at the University of Alberta affiliated hospitals. Patients were identified from January 2016 to March 2018 with billing codes signifying "diagnostic ureteroscopy." These patients were then individually queried and those with failed access were included in our patient cohort. Patients declining interval ureteroscopy or those with known strictures were excluded. The outcome measures were mean/median time to salvage ureteroscopy (days) and the rate of successful renal access of the repeat procedure.

Results: A total of 119 patients were identified as having a failed ureteroscopy during our study period. Average and median age were 55.85 and 56.99 years, respectively. Median stent duration to second procedure was 17 days (mean 20.46, range 10–84). Twenty-two (18.49%) patients had their repeat ureteroscopy between 10 and 13 days. No patients underwent repeat ureteroscopy in less than 10 days. The overall success rate of renal access during a second ureteroscopy after stenting was 99.16% (118/119).

Conclusions: Ureteric stenting following failed ureteroscopy leads to exceedingly high rates of successful access at interval procedure (99.16%). Of the patients that underwent an accelerated second procedure (between 10 and 13 days of stenting), all had successful access at their interval procedure.

MP-3.11

Perioperative opiate use for transurethral surgery patients with catheter-related bladder discomfort

Samir Sami[1], Haider Abed[2], Alina Abbasi[2], Hassan Razvi[1]
[1]Urology, London Health Sciences Centre, London, ON, Canada; [2]Medicine, Western University, London, ON, Canada

Introduction: Catheter-related bladder discomfort (CRBD) is common in the postoperative period following transurethral surgery. CRBD can cause significant pain and often requires multimodal analgesia. Over-prescription of narcotics is prevalent during this period and has been implicated in potential long-term misuse after low-risk surgery. We sought to improve understanding of CRBD management at our centre by identifying analgesic use incidence and assessing potential contributory perioperative factors.

Methods: We retrospectively reviewed all patients undergoing a transurethral resection of prostate (TURP) or bladder tumour (TURBT) at our center from 2016–2018. Descriptive statistics were used to evaluate general trends, and assessment of potential factors that could be predictive of opioid-specific analgesia requirement, including preoperative analgesic use, catheter size, previous indwelling catheter, anesthetic type, trial of void (ToV) success, and use of anticholinergics postoperatively, was done by multivariate logistical and linear regression.

Results: A total of 310 patients with a mean age of 71.7 years, including 174 and 126 patients who underwent TURP and TURBT, respectively, were analyzed. Of these, 173 patients did not use any preoperative analgesia regularly, 86 patients used non-steroidal anti-inflammatories, and 23 used opiates. In the early postoperative period, 75% of patients required analgesics, including 61% who required mild opioids, 22% who required an additional strong opioid, and 40% who required anticholinergic use for CRBD. Among TURP patients, spinal anesthetic showed an association with mild opiate use ($p<0.05$), while lack of anticholinergic use and day 1 ToV failure showed an association with strong opiate use ($p<0.05$).

Conclusions: Opioid analgesics are commonly used for CRBD following transurethral surgery. Adjunctive non-opiate treatment modalities need to be further explored in order to better control CRBD and minimize opiate use.

MP-3.12

Pulmonary complications following percutaneous nephrolithotomy in the tubed vs. tubeless eras

Monica Farcas[1], Thomas Canil[1], Daniela Ghiculete[1], R. John D. Honey[1]
[1]Urology, St. Michael's Hospital, Toronto, ON, Canada

Introduction: Pulmonary complications, although rare,[1] can be a significant cause of morbidity to patients undergoing percutaneous nephrolithotomy (PCNL).[2] The routine use of nephrostomy tubes following PCNL (tubed approach) may pose an increased risk of clinically significant pulmonary injury by potentiating a transpleural tract. Our objective in this study was to assess whether the cessation of routine nephrostomy tube insertion following PCNL (tubeless approach) has reduced the incidence of pulmonary injuries.

Methods: We performed a retrospective chart review of all consecutive PCNLs performed at our centre from 2007–2010 ('tubed era') and 2012–2014 ('tubeless era'). For each case, we documented the exit strategy (tubed vs. tubeless), presence of pulmonary complications and intervention undertaken, as well as access site location. Our primary outcome was the rate of pulmonary complications between the tubed vs. tubeless approach to PCNL.
Results: A total of 544 PCNLs were performed over this span of time. All 160 cases during the tubed era were confirmed to have a nephrostomy tube left at the end of the case, while of the 384 PCNLs performed during the tubeless era, 357 (93%) were left with only a stent. During the tubed era, seven patients (4.4%) developed pulmonary complications. Of these, two patients were treated conservatively, with the remaining five patients requiring external drainage. During the tubeless era, four patients (1.1%) developed pulmonary complications from PCNL access, with three requiring percutaneous intervention. The tubed era had a lower rate of supra-11 punctures during this period (4.4%) compared to the tubeless era (6.6%). The overall pulmonary complication rate during the study periods was 2.1%.
Conclusions: There appears to be a trend towards increased risk of pulmonary complications following PCNL with a tubed vs. tubeless approach despite access site location. Overall, the risk of pulmonary injury following PCNL remained low in our study cohort.
References
1. Tyson MD, Humphreys MR. Postoperative complications after percutaneous nephrolithotomy: A contemporary analysis by insurance status in the United States. *J Endourol* 2014;28:291-7. https://doi.org/10.1089/end.2013.0624
2. Palnizky G, Halachmi S, Barak M. Pulmonary complications following percutaneous nephrolithotomy: A prospective study. *Curr Urol* 2014;7: 113-6. https://doi.org/10.1159/000356260

MP-3.13
Percutaneous nephrolithotomy (PCNL) training in Québec: Patterns among residents and comparison of pre- and post-simulation training scores
Ahmad Almarzouq[1], Jason Hu[1], Julien Letendre[2], Naeem Bhojani[2], Jundi Mazen[1], Mohamed El-Sherbiny[1], Nader Fahmy[1]
[1]Urology Division, Department of Surgery, McGill University, Montréal, QC, Canada; [2]Urology Division, Deptartment of Surgery, Université de Montréal, Montréal, QC, Canada
Introduction: Percutaneous nephrolithotomy (PCNL) is one of the cornerstone procedures in urology and gaining access to the pelvi-calyceal system is a critical step. The evidence shows improvement of outcomes and lower complications after the 15th case and plateaus after the 60th case. This number may not be attainable with a reduction in working hours and the introduction of competency by design training model. The primary objective of this study was to establish trends of PCNL performances among urology residents in Québec. The secondary objective was to assess the impact of simulation training on PCNL access in a simulated (OSCE) setting.
Methods: We conducted a retrospective review of the results from an OSCE that included all senior urology residents from all Québec programs. Bullseye and triangulation access by PGY3–5 were tested on the PERC Mentor™. Following the findings of the station, a session was given to the residents in one program, where access using both techniques was taught on the simulator. In the second OSCE, one of the groups was used as a control to compare the impact of one session of teaching both techniques on the success of gaining access on the PERC Mentor™.
Results: A total of 33 residents were included. Fifty-one percent of the residents had no prior experience with PCNL. Table 1 breaks down the self-declared experience with PCNL prior to OSCE 1, stratified by residency year and program. The majority of residents had no prior case experience with either technique. Simulation training significantly improved performances of previously non-exposed residents (Table 2).
Conclusions: There is a clear deficiency in PCNL access among a significant portion of senior urology residents in Québec. Simulation training improved non-exposed residents significantly. Residents scored higher in both bullseye and triangulation techniques after one session using the simulator. There is a role for simulation to complement clinical training in centres with low PCNL volume.

MP-3.14
Bilateral percutaneous nephrolithotomy on the same procedure: A retrospective analysis of its safety and efficiency
Joanie Pelletier[1], Ioana Fugaru[1], Frédéric Soucy[1], Bruno Laroche[1], Jonathan Cloutier[1]
[1]Urology, CHU de Québec, Québec City, QC, Canada
Introduction: Percutaneous nephrolithotomy (PCNL) has become the gold standard for more complex nephrolithiasis.[1] When patients present with bilateral kidney stones, there is no consensus as to whether to proceed to a synchronous bilateral PCNL (sBPCNL) or do a staged surgery.[1-3] To assess the safety and efficacy of sBPCNL, we performed a review of the perioperative outcomes of our sBPCNL. The second endpoint was to evaluate the validity of the nephrolithometry nomogram (CROES) with sBPCNL.
Methods: Using hospital coding data, we identified 802 patients who underwent a PCNL between January 2006 and June 2016. Thirty of them underwent a sBPCNL. The Charlson comorbidity index (CCI) was used to compare comorbidities. The stone characteristics and prediction of stone-free rate (SFR) were analyzed using the CROES nephrolithometry scoring system.[4] The SFR was analyzed with an X-ray or a computed tomography. Treatment success was defined as residual fragments of 4 mm or less. Postoperative outcomes were evaluated with the modified Clavien Dindo score.[5] Bivariate analyses were used to identify variables affecting SFR.
Results: The median CCI was 3 (0–9) for the sBPCNL. The total mean stone burden was 416.9 mm^2 (65.9–1479). The mean operating time was 168 minutes (121–183). Fifteen (57.7%) patients had no postoperative complications (Clavien 0). There was no Clavien score higher than 2. The SFR for the first side operated was achieved in 20 patients (68%) compared to 17 patients (61.5%) for the second side. Overall, the first side operated had a better SFR than the second side in about 10% (p=0.37). CROES scores predicted a SFR of 80% for both renal units compared to 45% according to postoperative imaging.
Conclusions: From our data, sBPCNL manipulation is feasible and safe. It can be offered to selected patients with medium-sized bilateral renal stones in high-volume centres by experienced surgeons. The CROES nephrolithometry scoring system seems to be a valid tool to predict the SFR but for renal unit separately.
References
1. Kadlec AO, Greco KA, Fridirici ZC, et al. Comparison of complication rates for unilateral and bilateral percutaneous nephrolithotomy (PCNL) using a modified Clavien grading system. *BJU Int* 2013;11:E243-8. https://doi.org/10.1111/j.1464-410X.2012.11589.x
2. Desai M, Grover R, Manohar T, et al. Simultaneous bilateral percutaneous nephrolithotomy: A single-centre experience. *J Endourol* 2007;21:508-14. https://doi.org/10.1089/end.2006.0401
3. Williams SK, Hoeing DM. Synchronous bilateral percutaneous nephrostolithotomy. *J Endourol* 2009;10:1707-12. https://doi.org/10.1089/end.2009.1538
4. Smith A, Averch TD, Shahrour K, et al. A nephrolithometric nomogram to predict treatment success of percutaneous nephrolithotomy. *J Urol* 2013;190:149-56. https://doi.org/10.1016/j.juro.2013.01.047
5. Tefekli A, Karadag MA, Tepeler K, et al. Classification of percutaneous nephrolithotomy complications using the modified Clavien grading system: Looking for a standard. *Eur Urol* 2008;53:184-90. https://doi.org/10.1016/j.eururo.2007.06.049

MP-3.15

A comparison of potential clinical and metabolic determinants favouring calcium oxalate monohydrate vs. dihydrate stone formation

Noah Stern[1], Jennifer Bjazevic[1], Linda Nott[1], Hassan Razvi[1]
[1]Department of Surgery, Division of Urology, Schulich School of Medicine & Dentistry, Western University, London, ON, Canada

Introduction: The majority of urinary stones are predominantly calcium oxalate (CaOx) in composition and can be found in two main chemical forms: calcium oxalate monohydrate (COM) and dihydrate (COD). COM stones are known to be more difficult to fragment, especially with shock wave lithotripsy, which can have important implications for the success rates of stone treatment and patient counselling regarding surgical options. Our study examined a large contemporary cohort to determine potential clinical and biochemical characteristics that may favour the formation of COM or COD stones.

Methods: A retrospective analysis of a prospectively maintained metabolic stone clinical database from September 2001 to February 2017 was performed. Patients with predominantly (>50%) COM or COD stones were identified and those with incorrectly collected 24-hour urine collections were excluded. Analysis of patient demographic data, serum and urine biochemistry was performed.

Results: A total of 298 patients (85.9%) with primarily COM and 49 patients (14.1%) with principally COD stones were identified. COM patients were older (54±13 vs. 48±17 years; p=0.012). There was no correlation between gender, body mass index, medical comorbidities, family history of stone disease, or prior history of stone treatment and stone composition. Low urine volume was significantly associated with COD stones (p=0.006). However, there was no correlation with stone type and other 24-hour urine findings, including urinary pH, sodium, calcium, oxalate, urate, phosphate, and urea; or serum biochemistry, including serum calcium, parathyroid hormone, urate, and vitamin D levels.

Conclusions: Prior small studies have demonstrated conflicting results between CaOx stone type and 24-hour urine results. Our study on a large contemporary series fails to show an association between the usually assessed clinical and biochemical characteristics favouring the formation of COM over COD stones. Further research is required to better elucidate the mechanisms behind CaOx stone formation.

MP-3.16

Extracorporeal shockwave lithotripsy in the management of distal ureteral calculi

Justin Chan[1], Kymora B. Scotland[1], Gholamreza Safaee Ardekani[1], Ryan F. Paterson[1], Ben H. Chew[1]
[1]Department of Urologic Sciences, University of British Columbia, Vancouver, BC, Canada

Introduction: Current American Urological Association guidelines recommend ureteroscopy as primary management of distal ureteral stones and shockwave lithotripsy (SWL) as a secondary option. Use of SWL in the management of nephrolithiasis in North America has decreased. We hypothesized that SWL continues to be an effective option in the management of distal ureteral calculi and studied data from our centre in patients who received SWL for distal ureteral stones.

Methods: A retrospective review was performed of 104 patients treated initially with SWL for distal ureteral calculi between 2011 and 2017 at this institution. The success rate of SWL was assessed via radiological imaging and if subsequent procedures were required to render patients stone-free.

Results: Operative note and chart review identified 104 patients who presented with distal ureteral stones and were treated with SWL as the initial form of management. Average patient age was 52.2±15.3 years, average body mass index BMI was 27.4±5.7, and average total axial stone surface area was 25.96±14.32 mm^2. Of these patients, 78.8% (n=82) were stone-free following one SWL and required no subsequent procedures; 87.5% (n=91) were stone-free following a second SWL. After the initial SWL, residual stones were identified in 21.2% of patients (n=22). Of these residual stone patients, 40.9% (n=9) required a repeat SWL, 40.9% (n=9) required a ureteroscopy, and 18.2% (n=4) required a salvage ureteroscopy following a failed second SWL to achieve a stone-free status.

Conclusions: One SWL procedure offers a stone-free rate of 78.8%, and after two SWLs, an 87.5% stone-free rate. Only 12.5% of patients undergoing SWL at our centre required ureteroscopy to achieve a stone-free status. SWL is an effective modality in the treatment of distal ureteral stones. Further studies investigating quality of life may show SWL is an even better choice for distal ureteral stones.

UP-3.1

Targeting a stone staging system: Categorizing long-term urinary stone event rates

Mark Assmus[1], Nick Dean[1], Betty Wang[2], Shubha De[1], Trevor D. Schuler[1], Tim Wollin[1]
[1]Department of Surgery, Division of Urology, University of Alberta, Edmontn, AB, Canada; [2]Faculty of Medicine and Dentistry, University of Alberta, Edmonton, AB, Canada

The Data Integration and Management Repository (DIMR)

Introduction: Although urinary tract calculi remain one of the most prevalent disease processes, there is a paucity of contemporary, long-term stone event rate (SER) data to counsel patients with varying stone burdens. Attempts to incorporate stone burden have focused on surgical success (STONE score, Guy's stone score) or have clinical barriers (ROKS nomogram).[1-3] We sought to establish local SERs for a spectrum of baseline stone burdens.

Methods: We reviewed all computed tomography (CT)-detected urinary tract stones in adult patients referred to four urologists from April to September 2009. In collaboration with Data Integration and Management Repository (DIMR), demographics, and stone burden on CT, as well as eight-year followup SERs were added to a REDCap database. SERs were defined as emergency department visit, urology visit, or surgery. Both t-test and Fisher's exact two-tailed test were used, while time to SER curves were constructed by Kaplan-Meier method and analyzed by log-rank test (significance $p<0.05$).

Results: To date, 318 adults at a mean age of 54 years (18–94) were added to our database. Overall, 75% successfully treated their symptomatic stone with surgery, while 16% spontaneously passed their stone. Thirty-nine percent achieved stone-free status and were labelled "low-burden," S0. Sixty-one percent (195/318) of patients had additional stone(s) on CT, other than their treated stone(s), and were labelled S1. Overall, 32% presented to the emergency room over eight years and 29% required additional surgery. Using univariate and multiple regression analysis, we identified two significant variables along with CT stone burden (low vs. high) in order to divide patients into three stages, each with distinct eight-year SERs across all outcomes (e.g., eight-year ER renal colic rate by stage: I – 15%, IIA – 30%, IIB – 44%, III – 51%; $p<0.05$).

Conclusions: We are completing our database and province-wide data extraction to establish a preliminary staging system that characterizes long-term, clinically significant SERs for both first-time and recurrent stone-formers.

References

1. Rule AD, Lieske JC, Li X, et al. The ROKS nomogram for predicting a second symptomatic stone episode. *J Am Soc Nephrol* 2014;25:2878-86. https://doi.org/10.1681/ASN.2013091011
2. Molina WR, Kim FJ, Spendlove J, et al. The S.T.O.N.E. score: A new assessment tool to predict stone free rates in ureteroscopy from preoperative radiological features. *Int Braz J Urol* 2014; 40:23-9. https://doi.org/10.1590/S1677-5538.IBJU.2014.01.04
3. Thomas K, Smith NC, Hegarty N, et al. The Guy's stone score — grading the complexity of percutaneous nephrolithotomy procedures. *Urol* 2011;78:277-81.

UP-3.2

Outcomes of surgical vs. medical management in emergency departments for acute ureteral colic

Grant Innes[1], Kevin Carlson[1], James Andruchow[1], Alec Mitchell[1], Andrew McRae[1], Eric Grafstein[2], Frank Scheuermeyer[2], Michael Law[2], Joel Teichman[2], Bryce A. Weber[1]

[1]University of Calgary, Calgary, AB, Canada; [2]University of British Columbia, Vancouver, BC, Canada

Introduction: Ureteric colic is a common condition that causes severe pain and generates substantial health system utilization.[1-5] Management includes analgesia and a trial of spontaneous passage, which succeeds in most cases,[5-9] but causes severe morbidity.[10-14] Stone removal rapidly improves patient outcomes by relieving obstruction and pain,[15-17] but to date, there has not been a study comparing early intervention with spontaneous passage.[18]

Methods: We looked at two health regions, Calgary Health Region and Vancouver Coastal Health region. Using regional administrative databases, we identified all emergency department (ED) patients with a diagnosis of renal colic. Eligible patients required computed tomography (CT) to confirm a stone 2.0–9.9 mm in size. Two cohorts were studied: an early intervention group, which had surgical intervention within three days from ED presentation, and a trial of spontaneous passage group, which did not receive surgical intervention for at least five days.

Results: We studied 3081 ED patients. Of these, 1168 (37.9%) underwent early surgical intervention and 1913 (62.0%) had a trial of spontaneous passage. Patients that underwent spontaneous passage saw adverse outcomes increase in a linear fashion, with increasing stone width and proximal location. In early intervention patients, outcomes are relatively constant regardless of stone size, but worse with proximal location.

Conclusions: This study provides strong evidence for specific stone parameters to guide early intervention in patients presenting with ureteral colic. This data suggests that patients having low-risk stones (width <5 mm) undergo a trial of spontaneous passage, that patients having high-risk stones (width >7.0 mm or proximal-middle >5 mm) be offered early surgical intervention, and that those with medium-risk stones (distal >5.0 mm) be managed on a case-by-case basis. These recommendations are more aggressive than current American guidelines, which recommend a trial of spontaneous passage at <10 mm.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/106

References

1. Scales CD, Smith AC, Hanley JM, et al. Prevalence of kidney stones in the United States. *Eur Urol* 2012;62:160-5. https://doi.org/10.1016/j.eururo.2012.03.052
2. Bensalah K, Tuncel A, Gupta A, et al. Determinants of quality of life for patients with kidney stones. *J Urol* 2008;179:2238-43; discussion 2243. https://doi.org/10.1016/j.juro.2008.01.116
3. Saigal CS, Joyce G, Timilsina AR. Direct and indirect costs of nephrolithiasis in an employed population: Opportunity for disease management? *Kidney Int* 2005;68:1808-14. https://doi.org/10.1111/j.1523-1755.2005.00599.x
4. Bryant M, Angell J, Tu H, et al. Health-related quality of life for stone formers. *J Urol* 2012;188:436-40. https://doi.org/10.1016/j.juro.2012.04.015
5. Teichman JM. Acute renal colic from ureteral calculus. *N Engl J Med* 2004;350:684-93. https://doi.org/10.1056/NEJMcp030813
6. Ordon M, Andonian S, Blew B, et al. Canadian Urological Association guideline: Management of ureteral calculi. *Can Urol Assoc J* 2015;9:E837-51. https://doi.org/10.5489/cuaj.3483
7. Preminger GM, Tiselius HG, Assimos DG, et al. 2007 guideline for the management of ureteral calculi. *J Urol* 2007;178:2418-34. https://doi.org/10.1016/j.juro.2007.09.107
8. Coll DM, Varanelli MJ, Smith RC. Relationship of spontaneous passage of ureteral calculi to stone size and location as revealed by unenhanced helical CT. *Am J Roentgenol* 2002;178:101-3. https://doi.org/10.2214/ajr.178.1.1780101
9. oursey C, Casalino D, Remer E, et al. ACR appropriateness criteria: Acute onset flank pain suspicion of stone disease. *Ultrasound Q* 2012;28:227-33. https://doi.org/10.1097/RUQ.0b013e3182625974
10. Brown J. Diagnostic and treatment patterns for renal colic in US emergency departments. *Int Urol Nephrol* 2006;38:87-92. https://doi.org/10.1007/s11255-005-3622-6
11. Sfoungaristos S, Kavouras A, Kanatas P, et al. Early hospital admission and treatment onset may positively affect spontaneous passage of ureteral stones in patients with renal colic. *Urology* 2014;84:16-21. https://doi.org/10.1016/j.urology.2014.01.005
12. Lindqvist K, Hellström M, Holmberg G, et al. Immediate versus deferred radiological investigation after acute renal colic: A prospective randomized study. *Scand J Urol Nephrol* 2006;40:119-24. https://doi.org/10.1080/00365590600688203
13. Schoenfeld EM, Pekow PS, Shieh MS, et al. The diagnosis and management of patients with renal colic across a sample of us hospitals: High CT utilization despite low rates of admission and inpatient urologic intervention. *PLoS One* 2017;12:1-15. https://doi.org/10.1371/journal.pone.0169160
14. Turk C, Petrik A, Sarica K, et al. EAU guidelines on interventional treatment for urolithiasis. *Eur Urol* 2015;69:475-82. https://doi.org/10.1016/j.eururo.2015.07.041
15. Picozzi SCM, Ricci C, Gaeta M, et al. Urgent ureteroscopy as first-line treatment for ureteral stones: A meta-analysis of 681 patients. *Urol Res* 2012;40:581-6. https://doi.org/10.1007/s00240-012-0469-z
16. Youn JH, Kim SS, Yu JH, et al. Efficacy and safety of emergency ureteroscopic management of ureteral calculi. *Korean J Urol* 2012;53:632-5. https://doi.org/10.4111/kju.2012.53.9.632
17. Sarica K, Tanriverdi O, Aydin M, et al. Emergency ureteroscopic removal of ureteral calculi after first colic attack: Is there any advantage? *Urology* 2011;78:516-20. https://doi.org/10.1016/j.urology.2011.01.070
18. Canadian Agency for Drugs and Technologies in Health. Treatment strategies for patients with renal colic: A review of the comparative clinical and cost-effectiveness. *CADTH Rapid Response Serv* 2014;November:1-6.

UP-3.3

Role of attenuation histogram analysis in the prediction of extracorporeal shockwave lithotripsy efficacy for renal and ureteric calculi

Benjamin Shiff[1], Mark Nassar[2], Premal Patel[3], Signy Holmes[2], Taylor Kohn[4], Brian Peters[1], Mohammad Mohaghegh[5], Iain Kirkpatrick[2]

[1]Urology, University of Manitoba, Winnipeg, MB, Canada; [2]Radiology, University of Manitoba, Winnipeg, MB, Canada; [3]Urology, University of Miami, Miami, FL, United States; [4]Surgery, Johns Hopkins University, Baltimore, MD, United States; [5]Surgery, University of Manitoba, Winnipeg, MB, Canada

Introduction: Extracorporeal shockwave lithotripsy (ESWL) is a frequent first-line treatment of renal and ureteric calculi. However, the efficacy of this treatment modality is variable. Recently, novel computed tomography (CT) parameters describing stone heterogeneity have been shown to correlate with treatment outcome.[1,2] Stone heterogeneity studies have been limited to analysis of standard deviation of stone density and its derivatives. More detailed heterogeneity evaluation using density histogram analysis may provide more accurate prediction of ESWL success.

Methods: A historical cohort of 57 patients who had undergone ESWL at our institution between January and June 2017 was identified. Stones <5 mm or >20 mm in diameter were excluded. Pre-procedure CT scans were reviewed for stone parameters and post-procedure x-rays were used to determine ESWL success, defined as absence of residual stone fragments >4 mm after up to three treatments within a three-month period. Stone parameters were compared between the success and failure groups.

Results: Of 57 ESWL patients, 36 (63.2%), had treatment success and 21 (36.8%) had treatment failure. Successful stones were of higher mean axial density (1133.8 vs. 933.5 HU; p=0.006) and of smaller volume (0.32 vs. 0.43 cm^3; p=0.13) than the unsuccessful ones, though the latter difference was not significant. In ordinal regression, controlling for stone volume, laterality, location, and number of ESWL attempts, percent of Hounsfield unit per stone was not predictive of ESWL success (p>0.05).

Only location "ureter below brim" was associated with increased success in all models (odds ratio 1.50; 95% confidence interval 1.07–2.10). No other variable was predictive.
Conclusions: Stones in the unsuccessful group were of higher mean axial density and trended towards higher volumetric density and larger volume. However, stone density distribution was not found to be predictive of ESWL success. Among the variables examined, only stone location was associated with ESWL success.
References

1. Yoshida S, Hayashi T, Ikeda J, et al. Role of volume and attenuation value histogram of urinary stone on non-contrast helical computed tomography as predictor of fragility by extracorporeal shock wave lithotripsy. *Urology* 2006;68:33-7. https://doi.org/10.1016/j.urology.2006.01.052
2. Yamashita S, Kohjimoto Y, Iguchi T, et al. Variation coefficient of stone density: A novel predictor of the outcome of extracorporeal shockwave lithotripsy. *J Endourol* 2017;31:384-90. https://doi.org/10.1089/end.2016.0719

UP-3.4

Patient search engine trends of common topics in nephrolithiasis: Evaluation of a novel method for assessment of patient interest in endourology topics

Luke Witherspoon[1], Brendan B. Wallace[1], Thomas A. Skinner[1], James D. Watterson[1]
[1]Department of Surgery - Division of Urology, University of Ottawa, Ottawa, ON, Canada
Introduction: Kidney stone management is a vital component of any urological practice, with patient education surrounding the prevention and treatment being an essential aspect. It can be challenging to assess specifics of what patients are interested in learning about and finding areas that patient education is deficient. In this study, we used Google Trend data to assess common kidney stone terms and assess how patients are investigating these topics online.
Methods: We used Google Trends to assess common kidney stone search topics, as they were searched between 2014 and 2018 in Canada. Google Trends is a free online service allowing analysis at a population level of all search queries of a term or topic. Interest in a subject is condensed into a search volume index (SVI). SVI trends can be reported based on either time or geographic region. SVIs are normalized values with the most popular time or geographic area being given a score of 100 out of 100, with all other variables related to this value.
Results: Of the search queries assessed, the top three geographic regions (mean SVI ± standard deviation [(SD]) that were searching these topics were Ontario (91.8±9.7), British Columbia (42.4±43.2), and Alberta (31.9±41.7). Interestingly, Ontario was the only province that showed interest in kidney stone surgery, kidney stone removal, or kidney stent. The most researched topics in the past five years have been kidney stone (66.1±13.1), kidney stone symptoms (34.2±17.3), and calcium oxalate (32.1±14.8). Peak interest in these areas was November 2018, September 2015, and February 2017, respectively.
Conclusions: This study shows some of the first evidence that analysis of online activity can help guide insight into the real-time interest of the general public into topics in urology. Furthermore, it can help direct educational materials both towards subjects that are not being assessed by the general public, as well as geographic regions that show interest in these topics.

UP-3.5

Ultra-mini percutaneous nephrolithotomy (PCNL) for stones too big for flexible ureterorenoscopy and too small for PCNL: An early experience at a teaching hospital

Keith Yuen[1], Adeel Anwar[1], Sachie Siriwardena[2], Jyoti Basu[1], Alistair Stewart[1], James Forster[1]
[1]Urology, Bradford Royal Infirmary, Bradford, United Kingdom; [2]Urology, University Hospital Coventry, Coventry, United Kingdom
Introduction: In the modern world, percutaneous nephrolithotomy (PCNL) procedures are a popular mode of renal stone treatment. In order to reduce the complication rates while maintaining high stone-free rates, several new miniaturized PCNL techniques have been introduced. Here, we are sharing our initial experience with ultra-mini percutaneous nephrolithotomy (UMP) for the stones too big for flexible ureterorenoscopy and too small for standard PCNL.
Method: We retrospectively evaluated all UMP carried out between 2016 and 2018 at our centre. Patient demographics, stone burden, operative techniques, perioperative complications, and stone clearance were analyzed.
Results: Thirty-nine calculi were treated in 24 UMP procedures by three endourologists using sheath sizes 11 Fr or 14 Fr with a median of one puncture per case. Mean index stone size was 11.5 mm (range 8 -25). Seventeen (71%) were "totally tubeless," i.e., did not necessitate ureteric stent, catheter, or percutaneous nephrostomy. No blood transfusion was required for the cohort, and 22 (92%) experienced no perioperative complications. The median length of stay was 1.2 days. One case was abandoned due to the loss of access during UMP. Five patients were readmitted within 30 days due to pain and infection. Twenty-two (92%) had complete stone clearance or insignificant residual stone at the time of planned postoperative surveillance.
Conclusions: Our study demonstrates that UMP is a safe treatment option for renal stones up to 25 mm. It is particularly suited to patients who want to avoid a two-stage ureterorenoscopy and associated stent symptoms, and prefer a shorter hospital stay than traditional PCNL.
References

1. Haghighi R, Zeraati H, Ghorban Zade M. Ultra-mini-percutaneous nephrolithotomy (PCNL) vs. standard PCNL: A randomized clinical trial. *Arab J Urol* 2017;15:294-8. https://doi.org/10.1016/j.aju.2017.10.003
2. Desai J, Zeng G, Zhao Z, et al. A novel technique of ultra-mini PCNL: Introduction and an initial experience for treatment of upper urinary calculi less than 2 cm. *Biomed Res Int* 2013;2013:490793. https://doi.org/10.1155/2013/490793
3. Jones P, Elmussareh M, Aboumarzouk OM, et al. Role of minimally invasive (micro and ultra-mini) PCNL for adult urinary stone disease in the modern era: Evidence from a systematic review. *Curr Urol Rep* 2018;19:27. https://doi.org/10.1007/s11934-018-0764-5

Poster Session 4: Prostate Cancer I
June 30, 2019; 0730–0900

MP-4.1

Effect of a hospital funding reform in Ontario on patients diagnosed with localized prostate cancer: A population-based, retrospective cohort study

Marian S. Wettstein[1], Vicki Ling[2], J. Michael Paterson[2], Alvin H. Li[3], Adalsteinn Brown[4], Karen S. Palmer[5], Noah Ivers[5], Girish S. Kulkarni[1]
[1]Division of Urology, Department of Surgery, Princess Margaret Cancer Centre, University Health Network, University of Toronto, Toronto, ON, Canada; [2]ICES, Toronto, ON, Canada; [3]Ottawa Hospital Research Institute, Ottawa, ON, Canada; [4]Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada; [5]Women's College Research Institute, Women's College Hospital, University of Toronto, Toronto, ON, Canada

Introduction: In the fiscal year of 2015/2016, the government of Ontario, Canada, introduced a new funding model (quality-based procedures, QBP). According to this model, hospitals that offer radical prostatectomy for localized prostate cancer are reimbursed according "price x volume," with quality intended to be accounted for through adherence to best clinical practices outlined in QBP-specific handbooks. We investigated whether this policy change led to changes in the management of localized prostate cancer or to altered patient characteristics among those undergoing radical prostatectomy.

Methods: Linked health-administrative data were used to derive incident cases of localized prostate cancer (January 2011 to October 2016) and patients who underw ent radical prostatectomy for localized prostate cancer (January 2011 to November 2017). We then performed interrupted time series analysis (implemented by autoregressive integrated moving average models) to investigate if the policy change led to changes of initial management, tumour risk profiles per management strategy, monthly case volumes, monthly average length of stay, proportion of patients returning to the hospital or the emergency department, proportion of patients >65 years, monthly average Charlson comorbidity index, and the proportion of minimally invasive performed radical prostatectomies.

Results: We identified 33 128 patients with incident localized prostate cancer and 17 159 patients who received radical prostatectomy. Our analyses did not reveal any negative consequences of the policy change, neither for the management of localized prostate cancer, nor for characteristics of patients undergoing radical prostatectomy. Conversely, QBPs appear to be associated with more appropriate patient selection for radical prostatectomy.

Conclusions: In the province of Ontario, the introduction of QBPs seems to have a beneficial impact on the management of localized prostate cancer.

MP-4.2

Prospective comparison of open and robot-assisted radical prostatectomy for clinically localized prostate cancer in the Canadian healthcare system

Benjamin Beech[1], Jan K. Rudzinski[1], Ryan McLarty[1], Sunita Ghosh[2], Graeme Follett[1], Adrian Fairey[1]
[1]Department of Surgery, Division of Urology, University of Alberta, Edmonton, AB, Canada; [2]Department of Oncology, University of Alberta, Edmonton, AB, Canada

Introduction: High-quality data comparing open radical prostatectomy (ORP) and robot-assisted radical prostatectomy (RARP) are sparse. We compared pathological cancer control and perioperative outcomes in men with clinically localized prostate cancer (CLPC).

Methods: The study was a prospective, comparative analysis. Eligible subjects had newly diagnosed CLPC and had chosen radical prostatectomy as their primary treatment. Subjects were allocated to either ORP (two surgeons) or RARP (seven surgeons) based on surgeon practice. The outcomes were positive surgical margins (R1), estimated blood loss (EBL), blood transfusion, serious adverse event (SAE; ≥ Clavien 3a), 90-day mortality, 90-day return to the emergency room, and length of hospital stay (LOS). T-tests and Chi-square tests were used to analyze outcomes (two-sided $p<0.05$).

Results: Between September 2007 and May 2018, 3152 men were practice-allocated to ORP (n=331) or RARP (n=2821). Baseline characteristics did not differ between groups except that a lower proportion of men had National Comprehensive Cancer Network intermediate-risk disease in the ORP group (49% vs. 62%; $p<0.01$). R1 (24.2% vs. 24.8%; $p=0.81$), SAE (1.8% vs. 2.2%; $p=0.65$), 90-day mortality (0.3% vs. 0.1%; $p=0.35$), and 90-day return to the emergency room (20.0% vs. 23.5%; $p=0.14$) did not differ between the ORP and RARP groups. EBL (478 ml vs. 140 ml; $p<0.01$), blood transfusion (4.0% vs. 1.6%; $p<0.01$), and LOS (2.8 days vs. 2.4 days; $p<0.01$) were lower in the RARP group.

Conclusions: RARP was associated with lower EBL, blood transfusion, and LOS compared to ORP.

MP-4.3

Validation of the prognostic value of NF-κB p65 in prostate cancer using a large multi-institutional cohort of the Canadian Prostate Cancer Biomarker Network

Andrée-Anne Grosset[1], Veronique Ouellet[1], Christine Caron[1], Gabriela Fragoso[1], Veronique Barres[1], Nathalie Delvoye[1], Mathieu Latour[1], Armen G. Aprikian[2], Alain Bergeron[3], Simone Chevalier[2], Ladan Fazli[4], Neil E. Fleshner[5], Martin E. Gleave[4], Pierre Karakiewicz[1], Louis Lacombe[3], Jean-Baptiste Lattouf[1], Theodorus van der Kwast[5], Dominique Trudel[1], Anne-Marie Mes-Masson[1], Fred Saad[1]
[1]Axe Cancer/Institut du Cancer de Montréal, Centre de Recherche du Centre Hospitalier de l'Université de Montréal, Montréal, QC, Canada; [2]Surgery and Urology, Research Institute - McGill University Health Centre, Montréal, QC, Canada; [3]Axe Oncologie, Centre Hospitalier Universitaire de Québec et Universtié Laval, Québec City, QC, Canada; [4]Vancouver Prostate Centre, Vancouver, BC, Canada; [5]University Health Network, Toronto, ON, Canada
Canadian Prostate Cancer Biomarker Network (CPCBN), Terry Fox Research Institute

Introduction: The identification of patients with high-risk prostate cancer (PCa) is a major challenge for clinicians, and the improvement of current prognostic parameters is an unmet clinical need. We and others have identified the association between the nuclear localization of NF-κB p65 (p65) and biochemical recurrence (BCR) in PCa in small and/or single-centre cohorts of patients.

Methods: In this study, we accessed two different multicentre tissue microarrays (TMAs) representing cohorts of patients (Test-TMA and Validation-TMA series) of the Canadian Prostate Cancer Biomarker Network (CPCBN) to validate the association between nuclear p65 expression and PCa outcomes. Immunohistochemical staining of p65 was performed on the Test-TMA and the Validation-TMA series, which include PCa tissues from patients treated by first-line radical prostatectomy (n=250 and n=1262, respectively). Two independent observers evaluated the frequency of nuclear p65 expression on digital images in either benign adjacent glands or cancer cells. Kaplan-Meier curves coupled with a log-rank test and univariate and multivariate Cox regression models were used for statistical analyses of continuous values and dichotomized data (cutoff of 3%) of nuclear p65.

Results: Kaplan-Meier analyses showed that patients with a higher frequency of nuclear p65 had an increased risk of progression (biochemical relapse and bone metastasis development) and mortality ($p<0.05$). When combined with preoperative prostate-specific antigen (PSA), Gleason grade, margin status, and pTNM, nuclear p65 expression remained significant in Cox regression analyses. Indeed, patients with higher level of nuclear p65 presented an increase risk progression using three different endpoints: biochemical relapse (hazard ratio [HR] 1.33; p=0.005), development of bone metastases (HR 1.82; p=0.033), and PCa-specific mortality (HR 2.63; p=0.033).

Conclusions: We report the first study using the pan-Canadian multicentre cohorts of CPCBN and validate the association between increased frequency of nuclear p65 expression and risk of disease progression.

Reference

1. Ouellet V, Aprikian A, Bergeron A, et al. The Terry Fox Research Institute Canadian Prostate Cancer Biomarker Network: A descriptive analysis of a pan-Canadian, multicentre cohort for biomarker validation. *BMC Urol* 2018;18:78. https://doi.org/10.1186/s12894-018-0392-x

MP-4.4

Does time spent on active surveillance adversely affect the pathological and oncological outcomes in patients undergoing delayed radical prostatectomy?

Ardalan Ahmad[1], Patrick Richard[1], Narhari Timilshina[1], Maria Komisarenko[1], Girish S. Kulkarni[1], Robert Hamilton[1], Alexandre Zlotta[1], Neil E. Fleshner[1], Antonio Finelli[1]

[1]Division Urology, Department Surgery, University Health Network, University of Toronto, Toronto, ON, Canada

Introduction: The pathological and oncological outcomes of men undergoing radical prostatectomy (RP) following a period of active surveillance (AS) for favourable-risk prostate cancer (PCa) is not well-established. We aimed to asses pathological and oncological outcomes for men with favorable-risk PCa on AS progressing to RP for clinically significant PCa (Gleason group ≥2).

Methods: A prospectively maintained AS database at Princess Margaret Cancer Centre (PMCC) was queried to identify patients progressing to RP (n=294) between 1992 and 2015. Patients undergoing RP for clinically significant PCa were selected (ASRP, n=171). Clinical and pathological characteristics at the time of progression to RP (age, prostate-specific antigen [PSA], year of biopsy, Gleason score, and primary Gleason grade) were used to compare pathological and oncological outcomes to a matched cohort of patients treated with upfront RP at diagnosis (n=407).

Results: One hundred seventy-one patients underwent RP after a median of 31.0 months (interquartile range [IQR] 30.0–44.0) on AS. At RP, the rate of pT3, pN1, and positive surgical margin rate were comparable between ASRP and matched controls. The ASRP cohort had a smaller cancer volume and lower extraprostatic extension (EPE) and seminal vesicle invasion (SVI) rate. Median followup after RP was 4.9 (IQR 3.1–6.9) years. Biochemical recurrence (BCR) occurred in 24 (14%) and 78 (19%) of ASRP and matched controls, respectively (p=0.14). At five years, the BCR-free survival rate in the ASRP cohort and upfront RP cohort were 85.6% and 79.2%, respectively (p=0.112). The retrospective, single-centre nature of the study is a limitation.

Conclusions: Curative-intent RP after a period of AS renders excellent pathological and oncological outcomes at five years. Moreover, the delay of therapy after a period of AS does not appear to result in inferior oncological outcomes compared to patients with similar risk characteristics undergoing upfront RP.

MP-4.5

Expression of EGFR-ERBB2-ERBB3 demonstrates a potential to predict prostate cancer relapse or bone metastasis development

Sylvie Clairefond[1,2], Véronique Ouellet[1,2], Benjamin Péant[1,2], Véronique Barrès[1,2], Pierre Karakiewicz[1,4], Anne-Marie Mes-Masson[1,2,3], Fred Saad[1,2,4]

[1]Centre de Recherche du Centre Hospitalier de l'Université de Montréal, Montréal, QC, Canada; [2]Institut du Cancer de Montréal, Montréal, QC, Canada; [3]Département de Médecine, Université de Montréal, Montréal, QC, Canada; [4]Département de Chirurgie, Université de Montréal, Montréal, QC, Canada

Molecular Pathology Core Facility of the CRCHUM

Introduction: Prostate cancer (PCa) is the most frequently diagnosed cancer in men and the third leading cause of cancer-related mortality among men in Canada. PCa patient management varies widely, thus there is a need for reliable biomarkers to identify patients with poor prognosis and to accurately stratify PCa for optimal treatment. Members of the ERBB family are involved in epithelium cancers and represent potential biomarkers for PCa. Our objective was to evaluate these proteins, separate or combined, and correlate their expression with patient clinical data.

Methods: Immunofluorescence was performed on tissue microarrays (TMAs) composed of radical prostatectomy specimens (285 patients). The TMAs included two cores of benign tissue and two cores of tumour from each patient. Quantification of biomarker expression was semi-automated using the VisiomorphDP software. Correlation with patient clinical outcome was determined using SPSS V25 and R V1.1.383 software.

Results: Within benign glands, Kaplan-Meier analysis showed a significant association between high expression of EGFR or ERBB2 and an increased risk of developing a biochemical recurrence (BCR) (p=0.009 and p=0.022, respectively). Patients expressing high levels of both EGFR and ERBB2 had the worst prognosis (p=0.004). Basing on a multivariate Cox regression model, these proteins were strong predictive biomarkers of BCR. Within tumour cores, Kaplan-Meier analysis showed a significant association between low ERBB2 or ERBB3 expression and the development of bone metastasis (p=0.003 and p=0.036, respectively). By including EGFR, ERBB2, and ERBB3 in a decision tree model, four groups are obtained to discriminate between patients at low and high risk of bone metastasis development ($p<0.001$).

Conclusions: Our results show that two different combinations of these proteins are associated with poor patient outcome when using BCR or bone metastasis development as an endpoint. Currently, large-scale, multicentre validation studies are ongoing.

MP-4.6

Psychological morbidity associated with a new diagnosis of prostate cancer: Rates and predictors of depressive symptoms in the RADICAL PC study

Gagan Fervaha[1], Jason Izard[1], Dean A. Tripp[1], Selina Rajan[2], Sarah Karampatos[2], Bobby Shayegan[3], Edward D. Matsumoto[3], Tamim Niazi[4], Annabel Chen-Tournoux[5], Vincent Fradet[6], Yves Fradet[7], Guila Delouya[8], Daniel Taussky[8], Luke T. Lavallée[9], Christopher Johnson[9], Joseph L. Chin[10], Darin Gopaul[11], Margot Davis[12], Jehonathan H. Pinthus[3], Darryl P. Leong[2,3], D. Robert Siemens[1]

[1]Department of Urology, Queen's University, Kingston, ON, Canada; [2]Population Health Research Institute, Hamilton Health Sciences, Hamilton, ON, Canada; [3]McMaster University, Hamilton, ON, Canada; [4]Department of Oncology, McGill University, Montréal, QC, Canada; [5]Department of Medicine, McGill University, Montréal, QC, Canada; [6]Department of Surgery, CHU de Québec-Université Laval, Québec City, QC, Canada; [7]Université Laval, Québec City, QC, Canada; [8]Department of Radiation Oncology, Centre Hospitalier de l'Université de Montréal, Montréal, QC, Canada; [9]University of Ottawa, Ottawa, ON, Canada; [10] Division of Urology, Western University, London, ON, Canada; [11]Department of Radiation Oncology, Grand River Regional Cancer Centre, Kitchener, ON, Canada; [12]University of British Columbia, Vancouver, BC, Canada; RADICAL PC Investigators

Introduction: Across all cancer sites and stages, prostate cancer has one of the greatest median five-year survival rates. With this comes a focus on survivorship issues following diagnosis and treatment. In the current

study, we sought to evaluate the prevalence and predictors of depressive symptoms in a large, contemporary, prospectively collected sample of newly diagnosed men with prostate cancer.
Methods: Data from the current study were drawn from the RADICAL PC study, a parent prospective cohort study conducted across 13 sites in Canada. Men with a diagnosis of prostate cancer within 12 months were recruited. Depressive symptoms were evaluated using the nine-item version of the Patient Health Questionnaire. To evaluate predictors of depressive symptoms, a logistic regression model was constructed, including biological, psychological, and social predictor variables.
Results: Data from 1440 patients were available at the time of this analysis. Of these, 108 (7.5%) endorsed clinically significant burden of depressive symptoms. Having a pre-existing diagnosis of depression or anxiety disorder increased risk of depressive symptoms at the time of evaluation (odds ratio [OR] 4.12; p<0.001). Above and beyond this, greater comorbid conditions (OR 1.20; p=0.03), poorer functional status (OR 5.78; p<0.001), and smoking (OR 3.27; p=0.001) also predicted depressive symptoms. Higher education (OR 0.48; p=0.03) and being retired (OR 0.57; p=0.04) were protective against depression. Despite having univariate associations with depression, stage of disease and income did not have independent predictive value in our multivariate model.
Conclusions: Our multicentre study of newly diagnosed prostate cancer patients confirms the presence of clinically significant depressive symptoms in a contemporary and sizeable sample of men. Early in their cancer trajectory, men with prostate cancer are burdened by not only the extent of their illness but also by many other interacting variables, some modifiable and others not. Clinicians should be vigilant to screen for depression in those patients with poor social determinants of health and concomitant disability.

MP-4.7

Investigating the impact of a lower testosterone threshold on castration-resistant progression in patients on continuous androgen-deprivation therapy

Maylynn Ding[1], Taehyoung Lee[2], Richard D. Di Lena[3], Bobby Shayegan[3]
[1]Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada; [2]Surgery, Urology Service, Memorial Sloan Kettering Cancer Center, New York, NY, United States; [3]Surgery, Division of Urology, McMaster University, Hamilton, ON, Canada
Introduction: We aimed to determine if a lower testosterone level, below the previously accepted castration level of <50 ng/dL, has an impact on time to progression to castration-resistant prostate cancer (CRPC) in patients on continuous androgen-deprivation therapy (ADT).
Methods: This is a single-centre, retrospective review of prospectively collected data on 156 consecutive patients who initiated continuous ADT at a tertiary centre from 2006–2017. Serum prostate-specific antigen (PSA) and testosterone levels were routinely assessed every three months after initiation of ADT. Patients were stratified based on absolute testosterone levels measured at six and nine months following ADT initiation. Progression to CRPC was assessed using the Kaplan-Meier method and compared with the log-rank test.
Results: A total of 116 patients were included in the analysis. Median age at diagnosis was 68 years old (interquartile range [IQR] 61, 78) and median PSA prior to initiation of ADT was 18 ng/mL (IQR 8.7, 51.3). Median followup was 48 months (IQR 30.5, 62.5); 41.4% of all patients were CRPC-free at the date of last followup. In this study cohort, 71.6% of patients achieved a one-year mean testosterone level <20 ng/dL; 21.6% achieved 20–32 ng/dL; 3.4% achieved 32–50 ng/dL; and 3.4% achieved ≥50 ng/dL. Patients who achieved an absolute testosterone level of <20 ng/dL at six months had a significantly increased time to CRPC (log-rank p=0.025, median CRPC-free survival of 48 months [<20 ng/dL] vs. 24 months [≥20 ng/dL]) (Fig. 1). Likewise, patients with a nine-month absolute testosterone level <20 ng/dL had a significantly increased time to CRPC (log-rank p=0.039, median CRPC-free survival 48 months [<20 ng/dL] vs. 20 months [≥20 ng/dL]).
Conclusions: Our study results support stricter testosterone control of <20 ng/dL in patients undergoing continuous ADT for the management of advanced prostate cancer. A larger, multicentre, prospective study is needed to validate these findings.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/111

MP-4.8

Prostate Cancer Patient Empowerment Program (PC-PEP) addresses multidimensional needs of men undergoing radical prostatectomy

Robert Rutledge[1], Gabriela Ilie[1,2,3], Gregory Bailly[2], David Bell[2], Ross Mason[2], Ricardo A. Rendon[2], Melanie Keats[4], Scott Grandy[4], Joseph G. Lawen[2]
[1]Radiation Oncology, Dalhousie University, Halifax, NS, Canada; [2]Urology, Dalhousie University, Halifax, NS, Canada; [3]Community Health and Epidemiology, Dalhousie University, Halifax, NS, Canada; [4]School of Health and Human Performance, Dalhousie University, Halifax, NS, Canada
Introduction: A Maritime-wide study of over 400 prostate cancer survivors who completed a comprehensive online quality of life survey showed 70% of these men reported sexuality/intimacy and relationship issues, 50% were suffering moderate to severe urinary symptoms, and 15–20% report problems of insomnia, fatigue, emotional distress, relationship difficulties, and many other issues.[1] Of grave concern, 17% of our sample are categorized as suffering from clinical depression or troubling anxiety. Fewer than 20% have attended a prostate cancer support group. To address these many issues directly, we created a Patient Empowerment Program (PEP) to be delivered pre-surgery to educate and teach the men and partners life skills/habits aimed at improving their fitness levels and quality of life, and to decrease treatment-related side effects.
Methods: The PEP program was created based on a review of the prehabilitation literature, expert opinion, and the experience of the lead investigators. The 28-day program includes: 1) informational empowerment (e.g., how to navigate the medical system); 2) strength and aerobic personalized training by a physiologist; 3) pelvic floor training; 4) meditation (EEG and heart rate variability [HRV] biofeedback); 5) relationship/connection teaching; 6) co-participant support; and 7) daily multimedia reminders via text, emails, and video/webcasts.
Results: To date, in our first cohort of 30 men participating in the program, we have 100% compliance with the pre-intervention assessments, which include: 1) 20–30 minutes quality of life online multidimensional survey; 2) fitness testing (six-minute walk, sit to stand, flexibility, balance); and 3) assessment of stress levels through EEG and HRV monitoring.
Conclusions: A multidimensional patient empowerment program may improve quality of life and multiple other domains of health in men undergoing radical prostatectomy. Preliminary results (pre- vs.post-intervention outcomes, compliance rates, focus group evaluation) will be submitted prior to the late-breaking abstract deadline.
Reference
1. Ilie G, Bradfield JA, Bell D, et al. A longitudinal examination of the impact of treatment modality on relationship satisfaction and mental health quality of life outcomes in a Maritime sample of prostate cancer survivors (under review *PLOS Medicine,* 2019).

MP-4.9

A Canadian consensus forum on the management of patients with advanced prostate cancer

Fred Saad[1], Christina Canil[2], Antonio Finelli[3], Sebastien J. Hotte[4], Shawn Malone[2], Bobby Shayegan[5], Alan I. So[6], Lorne Aaron[7], Naveen S. Basappa[8], Henry J. Conter[9], Brita Danielson[8], Geoffrey Gotto[10], Robert J. Hamilton[3], Jason P. Izard[11], Anil Kapoor[5], Michael Kolinsky[8], Aly-Khan A. Lalani[4], Jean-Baptiste Lattouf[3], Christopher Morash[2], Scott C. Morgan[2], Tamim Niazi[12], Krista L. Noonan[13], Michael Ong[2], Ricardo A. Rendon[14], Sandeep Sehdev[2], Jeffrey M. Spodek[15], Huong Hew[16], Laura Park-Wyllie[16], Kim N. Chi[13]
[1]Centre Hospitalier de l'Université de Montréal, Montréal, QC, Canada; [2]The Ottawa Hospital, University of Ottawa, Ottawa, ON, Canada; [3]Princess Margaret Cancer Centre, University of Toronto, Toronto, ON, Canada; [4]Juravinski Cancer Centre, McMaster University, Hamilton, ON, Canada; [5]St. Joseph's Healthcare, McMaster University, Hamilton, ON,

Canada; [6]Prostate Centre at Vancouver General Hospital, University of British Columbia, Vancouver, BC, Canada; [7]Service d-Urologie and Centre de la Prostate, Longueuil, QC, Canada; [8]Cross Cancer Institute, University of Alberta, Edmonton, AB, Canada; [9]William Osler Health System, University of Western Ontario, Brampton, ON, Canada; [10]Southern Alberta Institute of Urology, University of Calgary, Calgary, AB, Canada; [11]Kingston Health Sciences Centre, Queen's University, Kingston, ON, Canada; [12]Jewish General Hospital, McGill University, Montréal, QC, Canada; [13]BC Cancer Agency, University of British Columbia, Vancouver, BC, Canada; [14]Queen Elizabeth II Health Sciences Centre, Dalhousie University, Halifax, NS, Canada; [15]Scarborough Health Network, Toronto, ON, Canada; [16]Medical Affairs, Janssen Inc, Toronto, ON, Canada

Introduction: The management of advanced prostate cancer (PCa) continues to evolve with the emergence of new diagnostic and therapeutic strategies. As a result, there are multiple areas in this landscape with a lack of high-level evidence to guide practice. Consensus initiatives are an approach to establishing practice guidance in areas where evidence is unclear.[1] We conducted a Canadian-based consensus forum to address key controversial areas in the management of advanced PCa.

Methods: A core scientific group of PCa physicians (n=8) identified controversial areas for discussion and developed an initial set of questions, which were then reviewed and finalized with a larger group of 29 multidisciplinary PCa specialists. The main areas of focus were: 1) non-metastatic castration-resistant prostate cancer (nmCRPC); 2) metastatic castration-sensitive prostate cancer (mCSPC); 3) metastatic castration-resistant prostate cancer (mCRPC); 4) oligometastatic prostate cancer; 5) genetic testing in prostate cancer; and 6) imaging in advanced prostate cancer. Questions were administered as a pre-meeting vote prior to the consensus discussion. Twenty-seven voting physicians participated in the interactive forum and all voting was anonymous. The pre-determined threshold for consensus was set at 74% (agreement from 20 of 27 participating physicians).

Results: Consensus participants included uro-oncologists (n=13), medical oncologists (n=10), and radiation oncologists (n=4). Of the 64 questions, consensus was reached in 32 questions (n=5 unanimously). Consensus was more predominant in the areas of mCSPC, nmCRPC, sequencing of therapies, and mCRPC (Table 1).

Conclusions: A Canadian consensus forum in PCa identified areas of agreement in 50% of questions discussed. Areas of variability may represent opportunities for further research, education, and sharing of best practices. These findings reinforce the value of multidisciplinary consensus initiatives to optimize patient care.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/119

Reference

1. Gillessen S, Attard G, Beer TM, et al. Management of patients with advanced prostate cancer: The report of the Advanced Prostate Cancer Consensus Conference (APCCC2017). *Eur Urol* 2018;73:178-211. https://doi.org/10.1016/j.eururo.2017.06.002

MP-4.10

A high percent-free prostate-specific antigen in the setting of biochemical recurrence after radical prostatectomy is associated with poorer outcomes: A validation study using prospectively collected biobank specimens

Dixon Woon[1], Hanan Goldberg[1], Jaime O. Herrera-Cáceres[1], Hina Shiakh[1], Emily A. Whelan[1], Thenappan Chandrasekar[1], Guan Hee Tan[1], Khaled Ajib[1], Greg Nason[1], Omar Alhunaidi[1], Girish S. Kulkarni[1], Antonio Finelli[1], Robert Hamilton[1], Alexandre Zlotta[1], Neil E. Fleshner[1]

[1]Surgical Oncology, University Health Network, Toronto, ON, Canada

Introduction: Our team previously conducted a retrospective study of 308 patients and found that percent of free prostate-specific antigen (%fPSA) of ≥15 in the setting of biochemical recurrence (BCR) confers a more aggressive disease, manifesting in faster development of castrate-resistant prostate cancer (CRPC), metastasis, and death. However, this retrospective study has its intrinsic limitations, in particular, the %fPSA tests were performed at random and at various time points after BCR. To validate our previous findings, we propose to use biobank specimens collected prospectively when patients were first diagnosed with BCR.

Methods: Biobank specimens of all patients with undetectable PSA after radical prostatectomy (RP) who then developed BCR (PSA ≥0.2) were included. Biobank samples were analyzed for %fPSA. Patients were stratified according to the %fPSA cutoff of 15% (group 1: <15%, group 2: ≥15%). Multivariable logistic regression analysis was performed to predict covariates associated with a higher %fPSA. Cox proportional hazard models were performed to evaluate androgen-deprivation therapy (ADT)-free, metastasis-free, CRPC-free, cancer-specific (CSS) survival, and overall survival (OS).

Results: A total of 154 men were included (Table 1). Patients in group 2 were more likely to receive ADT (42.9% vs. 24.8%; hazard ratio [HR] 2.3; 95% confidence interval [CI] 1.09–4.9; p=0.03), develop metastatic disease (21.4% vs. 7.9%; HR 8.16; 95% CI 1.59–41.77; p=0.04), and become castrate-resistant (14.3% vs. 4%; HR 495; 95% CI 1.18–206521; p=0.04). Time from surgery to the start of ADT was shorter in group 2 (38.2 months) vs. group 1 (45.1 months), (p=0.03). Time from surgery to metastasis was shorter in group 2 (28.4 months) vs. group 1 (63.4 months) (p=0.018).

Conclusions: Patients with %fPSA of ≥15 were started on ADT earlier, and they progressed to CRPC and metastatic stage earlier. %fPSA of ≥15 in the setting of BCR after RP is an indicator of more aggressive disease and it can potentially be used as a simple and inexpensive biomarker. Unlike in the diagnostic setting, a higher %fPSA ratio portends a worse clinical outcome.

MP-4.11

Prostate Cancer Canada electronic Library for Improved Function (eLIFT): The construction of the platform and initial analysis for patients' satisfaction

Khalil Hetou[1], Kristin Tangen-Steffins[2], Shiva Nair[1], Khurram Siddiqui[1], Nelson Leong [2], Hon Leong[1], Chan Garson[1], Jennifer Goulart[2], Joseph Chin[1]

[1]Urology, University of Western Ontario, London, ON, Canada; [2]Radiation Oncology, BC Cancer, Victoria Centre, Victoria, BC, Canada

Prostate Cancer Canada

Introduction: A Movember/Prostate Cancer Canada joint initiative developed an online platform (electronic Library for Improved Function, eLIFT) for patients planned to undergo prostate cancer (PCa) treatment. The platform includes video library tailored to treatment of choice. Herein, we describe this tool and assess its impact on patients' satisfaction, knowledge, and self-efficacy.

Methods: eLIFT included 22 videos in English and French. Content ranges from "Overview of radical prostatectomy (RP)" to "Risks and bowel habit changes of radiotherapy (RT)." Others are generic (e.g., pelvic floor muscle training). Two sites were involved: Patients at site A were to undergo RT, whereas patients at site B were to undergo RP. In both sites, the first group of patients recruited did not have access to eLIFT (standard of care [SOC] and a subsequent group of patients were recruited with access to eLIFT. Questionnaires were based on validated quality of life (QoL) survey instruments (Expanded Prostate Cancer Index Composite [EPIC] 16, EQ-5D-5L, BI-B)

Results: Forty-four patients were recruited to SOC and 23 to eLIFT intervention at site A. Forty-three patients were recruited to SOC and 20 to eLIFT at site B. At site A, 78% of patients in the eLIFT arm agreed strongly that information given at time of consultation was helpful in improving their knowledge of urinary and bowel side effects and management compared to 59% in the SOC arm; 7% in the eLIFT arm reported that they experienced a side effect that they did not expect compared to 32.4 % in the control arm. Sixty-four percent of patients in the eLIFT group strongly agree that eLIFT was generally helpful in improving their knowledge of urinary and bowel side effects, and 66% strongly agreed that eLIFT was generally helpful in improving management of urinary and bowel side effects. Over 74% of patients in the eLIFT arm strongly agreed the eLIFT was generally helpful in improving their knowledge of urinary and bowel side effects.

Conclusions: Survey analysis showed promising patient satisfaction and empowerment results with eLIFT. This appears to be a good medium for knowledge transfer and patient empowerment.

MP-4.12

Examining contemporary prostate-specific antigen usage practices in Nova Scotia using the Canadian Primary Care Sentinel Surveillance Network database

Sandra Kim[1], Christie Chan[2], Ricardo A. Rendon[1], David Bell[1], Rodrigo Romao[1], Gabriella Ilie[3], Mathew Grandy[2], Ross Mason[1]
[1]Urology, Dalhousie University, Halifax, NS, Canada; [2]Family Medicine, Dalhousie University, Halifax, NS, Canada; [3]Community Health and Epidemiology, Dalhousie University, Halifax, NS, Canada

Introduction: Prostate-specific antigen (PSA) testing for prostate cancer screening remains a controversial topic, specifically in the field of primary care. Herein, we examined contemporary PSA usage practices in Nova Scotia using the Canadian Primary Care Sentinel Surveillance Network (CPCSSN)-MaRNetFP database.

Methods: Information on PSA tests ordered by primary care physicians across the province between 2006 and 2017 was collected using the CPCSSN-MaRNetFP Nova Scotia database using cross-sectional data. The database includes records from 58 229 males. Descriptive analyses were used to examine number of PSA tests performed by patient age.

Results: Reviewed records from the Nova Scotia CPCSSN-MaRNetFP database indicate that 15 709 patients had at least one PSA tests ordered between 2006 and 2017 and that in total, 67 582 PSA tests were ordered by primary care physicians in that time period. Of these, 19 651 (29.1%) PSA tests were linked to patients who received a diagnosis of prostatic pathology (e.g., prostate cancer, benign prostatic hypertrophy, or prostatitis). The remaining 47 931 (70.9%) of PSA tests ordered were not linked to any diagnosis of prostatic pathology. Among the PSA tests performed without a diagnosis of prostatic disease, 6692 (13.9%) were ordered for men younger than 50 and 8701 (18.2%) were ordered for men older than 70.

Conclusions: The majority of PSA tests performed in Nova Scotia are on patients between the ages of 50 and 70, although a significant proportion of tests are performed outside of these guideline-based age ranges. Further analysis of this data will be aimed at identifying factors associated with appropriate and inappropriate PSA assessment use to optimize usage of valuable healthcare resources.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/122

MP-4.13

Tumour control outcomes of salvage cryotherapy for radio-recurrent prostate cancer at median 12 years' followup

Shiva M. Nair[1], Max Peters[2], Haider Abed[1], Jochem van der Voort van Zyp[2], Marieke van Son[2], Joseph Chin[1]
[1]Division of Urology, Department of Surgery, University of Western Ontario, London, ON, Canada; [2]Department of Radiotherapy, University Medical Centre Utrecht, Utrecht, Netherland

Introduction: Local prostate cancer recurrences after primary radiotherapy can occur. Salvage therapies can defer the use of subsequent non-curative systemic therapies, which have significant side effects. The aim of the study is to examine long-term oncological results of a large cohort of salvage cryotherapy patients.

Methods: Patients treated with salvage cryotherapy between March 1995 and September 2004 were included. Patients had histological confirmation of local recurrence. Metastatic screen with computed tomography (CT) and radionucleotide bone scan was negative. Pre-salvage clinical data was collected to predict oncological outcomes. Kaplan-Meier analysis was performed to assess overall survival (OS), prostate cancer-specific survival (PCSS), metastases-free survival (MFS), and castrate-resistant prostate cancer (CRPC). The Pheonix definition was used for biochemical recurrence (BCR). Cox regression was used to assess predictive factors for OS, PCSS, CRPC, and MFS.

Results: A total of 187 patients were treated with salvage cryotherapy. Median followup was 149 months (12 years). Median age before salvage was 71 years (interquartile range [IQR] 66–74), median prostate-specific antigen (PSA) pre-salvage 11 ng/ml (IQR 7.8–18.7). Twelve-year OS was 56% (confidence interval [CI] 49–64). Pre-salvage age and PSA nadir post-salvage predicted overall mortality. Twelve-year PCSS was 81% (CI 75–88). Pre-radiation Gleason score 8–10 and stage (T3a–T4), pre-salvage PSA, and PSA-nadir post-salvage cryotherapy predicted PCSS in multivariable analysis. Twelve-year freedom from CRPC was 80% (CI 73–87) and MFS was 78% (CI 71–85). Median time to BCR was 58 months (CI 44–79), with median time to ADT 101 months (CI 65–NA). Ninety-one patients (48.7%) were androgen-deprivation therapy (ADT)-free at end of followup.

Conclusions: Salvage cryotherapy for localized radio-recurrent prostate cancer can provide durable response, with PCSS and MFS of approximately 80% at 12 years. Salvage treatment can achieve ADT-free status in selected patients and delay the need for ADT in those who subsequently develop systemic disease.

MP-4.14

Exosomal AR-V7 as a prognostic biomarker in patients with castration-resistant prostate cancer

France-Hélène Joncas[2], Frédéric Pouliot[1,2], Fannie Morin[1], Mélanie Rouleau[2], Yves Fradet[1,2], Caroline Gilbert[3,4], Paul Toren[1,2]
[1]Department of Surgery, Université Laval, Québec City, QC, Canada; [2]Division of Oncology, CHU de Québec Research Centre, Québec City, QC, Canada; [3]Division of Infectious and Immune Diseases, CHU de Québec Research Centre, Québec City, QC, Canada; [4]Department of Microbiology and Immunology, Université Laval, Québec City, QC, Canada
This work was supported by a Canadian Urological Association Scholarship Foundation-Astellas grant.

Introduction: The development of phenotypic biomarkers to aid in the selection of treatment for patients with castration-resistant prostate cancer (CRPC) is an important priority. Plasma exosomes have excellent potential as real-time biomarkers to characterize the tumour since they are easily accessible in the blood, and contain DNA, RNA, and protein. In this study, we investigate plasma exosomes as biomarkers in patients with CRPC.

Methods: We investigated plasma extracellular vesicles (EVs) in patients with CRPC. EVs were isolated using both precipitation and ultracentrifugation methods; physical characterization was performed using dynamic light scattering, acetylcholinesterase activity, and iodixanol gradients. Exosomal mRNA was quantified using digital droplet polymerase chain reaction (PCR) for KLK3 and AR-V7 genes. Serum sex steroids were measured using liquid chromatography tandem mass spectroscopy.

Results: No significant differences in physical properties of EVs were observed in CRPC patients compared to controls with localized or hormone-sensitive prostate cancer. Velocity gradients identified that PSMA-positive exosomes occupied a specific fraction of isolated EVs. A total of 37 patients had mRNA analyzed from plasma exosomes. Detectable exosomal KLK3, the gene coding for prostate-specific antigen (PSA), corresponded with higher concomitant serum PSA measurements, as expected (mean 145.4 ng/mL vs 17.1 ng/mL; p=0.02). Further, detectable levels of the androgen receptor splice variant AR-V7 was associated with a shorter time to progression (mean 15.9 vs. 33.5; log-rank p=0.02). Further, detectable exosomal ARv7 was significantly associated with testosterone levels below the lower limit of quantification (<0.1 nM).

Conclusions: Our results highlight the utility of plasma exosomes as phenotypic biomarkers and confirm that exosomal AR-V7 status is significantly associated with patient prognosis in patients with advanced prostate cancer.

MP-4.15

Abiraterone vs. docetaxel for metastatic hormone-sensitive prostate cancer: A Markov microsimulation model

Amanda Hird[1], Douglas C. Cheung[2], Diana E. Magee[2], Rano Matta[1], Robert K. Nam[1], Girish S. Kulkarni[2]
[1]Urology, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada; [2]Urology, Toronto General Hospital, University of Toronto, Toronto, ON, Canada

Introduction: In the setting of metastatic castrate-sensitive prostate cancer (mCSPC), androgen-deprivation therapy (ADT) has traditionally been the standard of care; however, the introduction of early docetaxel chemotherapy (DC) and anti-androgen agents (abiraterone with prednisone [AA]) have resulted in significant improvements in overall survival (OS).[1-3] While these two alternative regimens have shown to be efficacious, they have

not been compared head-to-head and it remains unclear which regimen should be offered as the initial treatment regimen. Our aim was to determine whether ADT with AA or ADT with DC resulted in improved quality adjusted life months (QALMs) among men with de novo mCSPC.
Methods: A Markov microsimulation model was constructed employing two-dimensional Monte Carlo simulation. A lifetime horizon was used. Our primary outcome was QALMs. Secondary outcomes included rates of second- and third-line therapy, OS, and adverse events. A systematic literature review was used to generate probabilities and utilities to populate the model. The base case was a 65-year-old patient with de novo mCSPC.
Results: A total of 100 000 microsimulations were generated. AA resulted in a longer QALM of 36.8 months compared to 36.0 months with DC. Mean crude OS was 55.9 months with AA and 54.2 months with DC. A total of 44.9% and 45.6% of patients received second-line therapy and 8.6% and 8.2% of patients received third-line therapy in the AA and DC groups, respectively. Grade 3/4 adverse events were experienced in 56.4% of patients receiving initial AA and 26.4% of patients receiving initial DC.
Conclusions: This study suggests that AA results in a higher QALM and crude OS compared to DC. Until robust randomized trials can be completed, the results of this study may help to guide treatment. However, the ultimate choice should be based on patient and tumour factors.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/125

References
1. Sweeney CJ, Chen YH, Carducci M, et al. Chemohormonal therapy in metastatic hormone-sensitive prostate cancer. *N Engl J Med* 2015;373:737-46. https://doi.org/10.1056/NEJMoa1503747
2. Fizazi K, Tran N, Fein L, et al. Abiraterone plus prednisone in metastatic castration-sensitive prostate cancer. *N Engl J Med* 2017;377:352-60. https://doi.org/10.1056/NEJMoa1704174
3. James ND, Sydes MR, Clarke NW, et al. Addition of docetaxel, zoledronic acid, or both to first-line long-term hormone therapy in prostate cancer (STAMPEDE): Survival results from an adaptive, multiarm, multistage, platform randomized controlled trial. *Lancet* 2016;387:1163-77. https://doi.org/10.1016/S0140-6736(15)01037-5

UP-4.1
Surgical castration in the management of metastatic prostate cancer: Current trends in androgen-deprivation therapy
Patrick Anderson[1,2], Christopher Langley[2], Neal E. Rowe[1,2]
[1]Department of Surgery, Division of Urology, The Ottawa Hospital, Ottawa, ON, Canada; [2]University of Ottawa, Ottawa, ON, Canada
Introduction: The majority of cases of metastatic prostate cancer (mPCa) in North America are treated with medical androgen-deprivation therapy (ADT), rather than the gold standard treatment of surgical castration (SC). A previous cost analysis by the same authors has identified the potential for significant cost-savings through increased use of SC in the treatment of mPCa. Here, we aim to identify current practice patterns and attitudes of urologists regarding the treatment of mPCa.
Methods: An electronic survey was developed with the aim of assessing current practice patterns and attitudes in the treatment of mPCa. Information collected included practice demographics and current practices in the treatment of mPCa. This survey was distributed via email to approximately 700 urologists across Canada. Responses were tabulated and quantitative and qualitative analyses were performed.
Results: Survey responses were obtained from urologists in all 10 Canadian provinces and included urologists practicing in both academic and community settings. Half (50%) of respondents indicated they only sometimes offer SC, while 37% of respondents stated that they do not routinely offer SC as a treatment for metastatic prostate cancer; 81% of respondents estimated that currently <5% of their patients have been treated with SC. Factors preventing wider adoption of SC included perceived negative attitudes of patients towards SC, invasiveness of surgery, and lack of operating room availability. Most (72%) of respondents felt that SC is an underused treatment and 66% agreed that urologists should more actively offer SC. Seventy-five percent of respondents stated they would like to see more data on the cost-effectiveness of SC.
Conclusions: SC is likely an underused treatment modality with potential for significant cost-savings in the treatment of mPCa in Canada and abroad. Further study of patient attitudes toward SC is warranted.

UP-4.3
Mental health and urinary outcomes in prostate cancer survivors from the Maritimes
Gabriela Ilie[1,2,3], Gregory Bailly[1], David Bell[1], Ross Mason[1], Ricardo A. Rendon[1], Tetteh Ago[2], Gavin M. Langille[1], David Bowes[2], Derek Wilke[2], Patil Nikhilesh[2], Robert Thompson[2], Larry Pan[2], Joseph G. Lawen[1], Peter Massaro[1], Dave Padmore[1], Daniel F.G. Costa[1], John E. Grantmyre[1], Robert Rutledge[2]
[1]Urology, Dalhousie University, Halifax, NS, Canada; [2]Radiation Oncology, Dalhousie University, Halifax, NS, Canada; [3]Community Health and Epidemiology, Dalhousie University, Halifax, NS, Canada
Dalhousie Research Medical Foundation - Soillse Research Fund
Introduction: We aimed to examine the burden of mental health and urinary problems in a population-based cohort of adult men with localized prostate cancer residing in one of three Maritimes provinces in Canada and to evaluate their associations with active (e.g., surgery, radiation, hormones, and combined forms) and non-active (active surveillance) treatment modalities.
Methods: A total of 298 men, who were 47 years of age or older (M 68.53; standard deviation [SD] 7.16) with a history of clinically localized prostate cancer completed an online 20-minute survey from 2017–2018, assessing quality of life patient-reported outcomes. The primary outcome was mental health (assessed using Kessler Psychological Distress Scale-K10) and the secondary outcome was urinary function (assessed with the International Prostate Symptom Score [IPSS] questionnaire).
Results: A total of 14.1% of men scored positive for mental health issues at the time the survey was completed. In this sample, 16.8% of participants were currently on active surveillance and 83.2% reported having been treated with one or more forms of active treatment. Half of the sample (54.7%) reported mild urinary problems, 38.6% reported moderate, and 6.7% reported severe urinary problems. Odds ratios were 3.65 (95% confidence interval [CI] 1.79, 7.47) times higher for screening positive for mental health problems among survivors with moderate to severe urinary problems compared with those with mild urinary problems. Odds ratios for screening positive for mental health issues when moderate to severe urinary problems were present, compared to mild urinary problems, were 3.52 times higher and statistically significant (95% CI 1.55, 7.99) in the active treatment group of prostate cancer survivors.
Conclusions: Survivors with a history of localized prostate cancer who received active forms of prostate cancer treatment had a statistically significant burden of mental health issues. This data points to important opportunities for prevention and intervention.

UP-4.4
Expanding the use of ex-vivo tumour-derived 3D model to study treatment response in prostate cancer
Kayla Simeone[1,2], Sylvie Clairefond[4,5], Benjamin Peant[1,2], Euridice Carmona[2], Jennifer Kendall-Dupont[2], Thomas Gervais[2,3], Anne-Marie Mes-Masson[1,2], Fred Saad[1,2]
[1]Medicine, Université de Montréal, Montréal, QC, Canada; [2]Oncology, CRHCUM/ICM, Montréal, QC, Canada; [3]Engineering, Polytechnique de Montréal, Montréal, QC, Canada
Introduction: PARP inhibitors (PARPi) are currently in clinical trials to improve the treatment of castrate-resistant prostate cancer (CRPC) patients. However, only 20% of CRPC patients respond to PARPi, thus our group is developing and adapting our novel ex-vivo tumour-derived model to study the underlying DNA repair mechanisms to better understand patient sensitivity to PARPi.
Methods: Micro-dissected tissues (MDTs) of ~400 µm in diameter are derived from prostate cancer cell line xenografts (LNCaP, 22RV1, C4-2B, DU145, and PC3), cultured and exposed to olaparib (0, 1, 10 and 100 nM for 72 hours) in microfluidic devices (containing a total of 32 MDTs). They are further analyzed immediately after the exposure time using a technique based on formalin fixed paraffin embedding of MDTs named MDT-micro array (MDTMA) to monitor MDT viability (cleaved caspase-3),

proliferation (Ki-67), epithelial composition (CK 8/18), and senescence (p21, p16) by immunohistochemistry (IHC) and immunofluorescence (IF) techniques. MDTs were also exposed to gamma irradiation (5 or 10 Gy) to identify homologous recombination (HR) repair efficiency by following the cells ability to form y-H2AX and RAD51 foci using IF.
Results: Our 2D sensitivity profile characterization suggests a correlation between the status of hormone dependency and sensitivity to PARPi, as well as to their efficiency in repairing double strand DNA breaks. Basing our 3D analyses on our 2D characterization, we have identified a treatment regimen, consisting of a 72-hour exposure to olaparib, to monitor various cell fates induced by the cytostatic drug, such as cell death, cell proliferation, and senescence. In addition, we have optimized the IF staining of our irradiated MDTs showing that we can reproduce the 2D HR response to gamma irradiation in a 3D setting.
Conclusions: This additional information will help dictate which patients would most likely benefit from this targeted treatment and would give insight on how to properly stratify patients according to molecular properties in a clinical decision-making timeframe.

UP-4.5

IKKε inhibition by BX795 induces cell cycle arrest and genomic instability to promote the senescence in castrate-resistant prostate cancer cell lines

Sophie Gilbert[1], Benjamin Péant[1], Hubert Fleury[1], Nicolas Malaquin[1], Kim Leclerc-Desaulniers[1], Anne-Marie Mes-Masson[1,2], Fred Saad[1,3]
[1]Institut du Cancer de Montréal, Centre de Recherche du CHUM, Montréal, QC, Canada; [2]Département de Médecine, Université de Montréal, Montréal, QC, Canada; [3]Département de Chirurgie, Université de Montréal, Montréal, QC, Canada
Introduction: Prostate cancer (PCa) is the third most common cause of cancer-related death in Canadian men. Advanced prostate cancer often evolves from a hormone-sensitive (HS) to a lethal castration-resistant (CR) state. Our lab has previously demonstrated that CR cells exhibit a constitutive over-expression of IKKε. In this context, this kinase activates the transcription factor C/EBP-β to induce IL-6 expression. Recent studies have shown that C/EBP-β participates in the development of senescence in response to androgen-deprivation therapy (ADT), called androgen-deprivation induced-senescence (ADIS). We hypothesize that IKKε expression has a role in PCa progression by preventing ADIS in PCa cells.
Methods: BX795 is used as an inhibitor of the IKKe/TBK1 complex. We tested this inhibitor on CR cells (PC-3, DU-145, and C4-2b) and HS cells (LNCaP and 22Rv1). DU145 cell lines are subcutaneously injected in our mouse model, and when the tumour reaches 400 mm^3, BX795 is administered intra-peritoneal.
Results: Proliferation of CR cells dramatically decreased after BX795 treatment compared to HS cells. This was confirmed by the EdU incorporation assay. The number of SA-b-Gal+ cells (senescence marker) increased in CR cells with an increase of p15 and DNA damage (gH2AX foci). After six days of treatment, CR cells increased G2/M phase of cell cycle. We also observed a pool of cells with 8N DNA content. These multinuclei cells were observed in DAPI staining with micronuclei. Overall, BX795 injection in a mouse model results in a decrease in tumour volume while having no effect on mouse behaviour and body weight.
Conclusions: Our study suggests that BX795 treatment promotes a cell cycle disrupt in CR cells only. This cell cycle arrest is accompanied by DNA damage and promotes a senescence phenotype. These results suggest a possible involvement of IKKε in the development of a CR state and justify further studies addressing the potential of IKKε as a therapeutic target.

UP-4.6

Qualitative correlations of positron-emission tomography-detected intra-prostatic lesions with sextant transrectal ultrasound biopsy and post-prostatectomy histopathology results

Khalil Hetou[1], Glenn Baumann[2,4], Jonathan Thiessen[3], Madeleine Moussa[5], Irina Rachinsky[5], Zahra Kassam[5], Stephen E. Pautler[1,2], Shiva Nair[1], Ting Yim Lee[2,3], John F. Vallian[6], Aaron Ward[2,4], Joseph Chin[1,2]
[1]Urology, University of Western Ontario, London, ON, Canada; [2]Oncology, University of Western Ontario, London, ON, Canada; [3]Medical Imaging, University of Western Ontario, London, ON, Canada; [4]Medical Physics, University of Western Ontario, London, ON, Canada; [5]Pathology, University of Western Ontario, London, ON, Canada; [6]Chemistry and Chemical Biology, McMaster University, Hamilton, ON, Canada
Canadian Institutes of Health Research (CIHR), Ontario Institute for Cancer Research, Smarter Imaging Program – Prostate (OICR)
Introduction: As part of a Prostate Cancer Image-Guided Interventions Study, we investigated positron-emission tomography (PET) imaging with two different tracers in the preoperative setting, for possible correlation with clinical parameters, using transrectal ultrasound (TRUS)-guided biopsy (Bx) as the reference.
Methods: A sextant template was created to compare Bx and PET findings with final pathological whole-mount specimens. The sum of maximum standardized uptake (SUVmax) values from all positive foci was calculated for each case to assess for correlation with extra-prostatic extension (EPE).
Results: F-18 Cohort: 138 prostate sites from 23 men were identified. Site-specific sensitivity and specificity of PET for any disease were 44.8% and 72.7%, respectively. For clinically significant disease (CS) (GS of 3+4 and higher) sensitivity increased to 55.2% but had a specificity of 62%. GS-stratified analysis showed no significant difference in PET-positive lesions among GS subgroups (p=0.18). Bx had a sensitivity of 20% but a specificity of 96.6% for CS disease. Mean total SUVmax in men with pT2 was similar to that in men with pT3 (9.0 vs. 8.8) (p=0.61). DCFPyL cohort: 120 prostate sites were identified from 20 men. Site-specific sensitivity and specificity of PET for any disease were 28.4% and 74.3%, respectively. Bx had a sensitivity of 60.3% and specificity of 66.7% for any disease. Sensitivity and specificity of PET for CS disease increased to 32% and 76%, respectively. Bx had a sensitivity of 32% and a specificity of 80% for CS disease. GS-stratified analysis showed no significant difference in PET-positive lesions among GS subgroups (p=0.73). Mean total SUVmax in men with pT2 (n=12) was 5.72 (standard dveiation [SD] 1.4) vs. 14.89 (SD 3.73) in men with pT3 (p=0.016).
Conclusions: On qualitative, sextant-wise assessment, preoperative Bx and PET had modest correlation with RP specimens. Higher PSMA PET SUVmax among men with EPE suggests possible utility for treatment planning. Quantitative (voxelwise) correlative studies are underway.

UP-4.7

Modulation of microbiota and ectopic prostate tumour growth by polyunstaturated fatty acids

Gabriel Lachance[1,2], Nikunj Gevariya[1], Thibaut Varin[2], Karine Robitaille[1], Alain Bergeron[1], Yves Fradet[1], André Marette[2], Vincent Fradet[1]
[1]Oncology Axis, Centre de Recherche du CHU de Québec-Université Laval, Québec City, QC, Canada; [2]Médecine, Centre de Recherche de l'IUCPQ-Université Laval, Québec City, QC, Canada
Introduction: Several studies highlighted a contributing effect of nutrient overload for increasing aggressiveness of several cancers, including prostate cancer (PCa). In the gut, elevated lipid ingestion promotes the replication of commensal microbes and contributes to chronic inflammation. Since omega-3 (Ω3) fatty acids (FA) have documented anti-inflammatory properties and potential anti-cancer effects, we tested the contribution of ingested pure polyunsaturated Ω3 and controls Ω6 and Ω9 FA for TRAMP-C2 PCa tumour growth in immunocompetent mice.
Methods: C57BL/6 mice were fed with a low-fat diet and daily supplemented by oral gavage with purified monoglycerides of FAs, i.e.Ω3-eicosapentaenoic acid (EPA), Ω3-docosahexaenoic acid (DHA), Ω6-arachidonic acid (AA), or Ω9-rich high-oleic sunflower oil (HOSO) until animal sacrifice (n=12 mice/group). After two weeks, TRAMP-C2 mouse PCa cells were implanted subcutaneously on each mouse flank

and tumour growth measured every day until sacrifice. Fecal samples were harvested at different time points and microbiota analyzed via 16srRNA high throughput sequencing. Blood and tumours were collected at endpoint and cytokines profiled using BioPlex Pro™ 23-plex.
Results: We observed reduced late-stage tumour growth in animals given EPA. Level of cytokines for both EPA and DHA were generally similar to HOSO, while AA displayed a profile associated with pro-inflammatory cytokines. 16srRNA profiling revealed an Ω3-driven reduction of *ruminococcaceae* that correlated with reduced IL-17 in plasma. The Ω3 treatment also correlated with altered levels of a panel of bacteria previously associated with IL-17.
Conclusions: Here we report the anti-cancer effect of pure EPA molecules. We also outline an approach that study changes in gut microbes as a proxy for interactions between dietary lifestyle altered immunity and prostate tumour growth.

UP-4.8

Investigating a novel recombinant antibody to attenuate prostate cancer progression by targeting cell surface GRP78

Ali Al-Hashimi[1], Kevin Won [1], Elizabeth Pham [2], Natalie Mariano[2], Julie Bailis[2], Richard Austin[1], Bobby Shayegan[1]
[1]Department of Surgery and Medicine, McMaster University, Hamilton, ON, Canada; [2]Department of Research, Amgen, South San Francisco, CA, United States
Introduction: Tissue factor (TF), a procoagulant protein, drives prostate cancer (PCa) tumour progression via activation of GRP78 on the cell surface (cs). In PCa, GRP78 is an endoplasmic reticulum-resident chaperone that localizes to the cell surface, where it functions as a signaling molecule with antigenic properties. PCa patients produce autoantibodies (AutoAbs) against the N-terminus of GRP78 that act as a potent driver of tumour growth via upregulation of TF activity and prosurvival pathways. Here, we describe a recombinant anti-GRP78 antibody (AEP8587) that competes with the binding of AutoAbs to csGRP78, decreases TF activation, and may act as a novel therapeutic antibody with anti-tumour activity.
Methods: Changes in TF activity or survival were evaluated in vitro in the PCa cell line DU145 following treatment with anti-GRP78 AutoAbs or co-treatment with either enoxaparin, a low molecular weight heparin (LMWH), or AEP8587. Protein expression of TF and UPR markers was determined using western blotting and qRT-PCR. TF activity was determined using a real-time continuous assay. AutoAbs were purified from PCa patients (St. Joseph's Healthcare Hamilton).
Results: Pre-prostatectomy PCa patients display high levels of anti-GRP78 AutoAbs (~60 µg/ml), compared to healthy controls (~5 µg/ml). Here, we show that anti-GRP78 AutoAb increases TF activation in vitro and leads to increased tumour progression in a DU145 xenograft model. In contrast, we show a co-treatment of anti-GRP78 AutoAb with either enoxaparin or AEP8587 completely abolishes the AutoAb-mediated increase in TF activity in vitro. Enoxaparin or AEP8587 co-treatment reversed the AutoAb effect on increased UPR markers.
Conclusions: We have identified anti-GRP78 AutoAb as a driver of PCa progression. Our results indicate that a recombinant antibody, AEP8587, can bind to csGRP78 and prevent the binding of anti-GRP78 AutoAbs. This represents a potential novel means to manage PCa progression.

UP-4.9

Strategy for improving therapeutic response and delaying resistance in prostate cancer through the inhibition of lipogenesis

Amine Lounis[1], Benjamin B. Peant[1], Fred Saad[1]
[1]Institut de Cancer de Montréal, CRCHUM, Montréal, QC, Canada
Introduction: Prostate cancer (PCa) is the most common cancer in men and the second leading cause of cancer-related deaths in men. Progression of PCa leads to a transition from androgen-dependent state to castration-resistant state (CRPC). Enzalutamide is a new-generation anti-androgen that blocks several steps in the AR-signaling pathway. However, similar to other PCa therapies, patients eventually develop a resistance to enzalutamide treatment, and the exact mechanisms responsible for this resistance remain unclear. Many studies showed that the inhibition of enzymes implicated in de novo lipogenesis (FAS, ACC, and SCD1) reduced tumour growth and enhanced cell death of PCa cells. Expressions of enzymes involved in de novo lipogenesis are initially decreased in patients treated with androgen-deprivation therapy (ADT) but re-emerge at higher levels in CRPC.
Methods: We used two PCa cell lines: LNCaP as a hormone-sensitive cell line, and C4-2B as a castrate-resistant cell line. Cells were treated with enzalutamide (20 uM), SCD1 inhibitor (10 uM), or a combination of the two treatments (combo) for 72 hours. We analyzed the effect of each treatment on cell proliferation and viability. We also evaluated the effect on endoplasmic reticulum (ER) stress and reactive oxygen species production (ROS). Finally, we used xenograft mice to confirm our in vitro observed results.
Results: We showed that the combination of both treatments induces a higher decrease in cell proliferation and an increase in death cells (apoptosis) compared to monotherapies. We also showed an increase in ER stress and ROS production in cells treated with the combination of therapies. Finally, we showed that xenograft mice treated with the combo had a lower tumour growth and a higher level of apoptotic cells.
Conclusions: Our study showed that the combination of enzalutamide with an inhibitor of SCD1 could be an interesting strategy for improving cell response and in preventing therapy resistance.

UP-4.10

Disease-specific costs of non-metastatic and metastatic castration-resistant prostate cancer in Québec

Ivan Yanev[1], Armen G. Aprikian[1], Emma Nablsi[1], Zachary Vaillancourt[1], Jonathan Primiani[1], Karen Bremner[2], Steven Carcone[2], Nicholas Mitsakakis[2], Welson Rayan[2], Murray Krahn[2], Alice Dragomir[1]
[1]Urology, McGill University, Montréal, QC, Canada; [2]Toronto Health Economics and Technology Assessment (THETA) Collaborative, Toronto General Hospital Research Institute, University Health Network, Toronto, ON, Canada
Introduction: Prostate cancer (PCa) accounts for 10% of all cancers diagnosed in Canada and 21% (21 300 new cases) of cancers among males. Androgen-deprivation therapy (ADT) is a very effective strategy for managing PCa. However, nearly all men will develop castration-resistant disease and the majority of men who die from PCa will experience a progression to metastatic disease.
Methods: We aimed to estimate the disease-specific costs of PCa patients during the health states of non-metastatic castration-resistant prostate cancer (nmCRPC) and metastatic castration-resistant prostate cancer (mCRPC). This cohort analysis contains 211 PCa patients from the McGill University Health Centre (MUHC) that were selected retrospectively through the period from 2000 to the end of 2015. The patients were followed from diagnosis of PCa until death or until the end of 2016. An algorithm of detecting nmCRPC and mCRPC was based on increases of prostate-specific antigen (PSA) levels after castration and the detection of metastasis. Consecutively, the mean time per health state was identified. Resource prices were obtained from the Régie de l'assurance maladie du Québec (RAMQ) list of medications when available; when unavailable, prices were obtained from the MUHC internal price lists. This cost analysis was performed from a healthcare system perspective.
Results: Mean duration of nmCRPC was 26.07 months, while duration of mCRPC was 20.79 months, with 62 and 68 patients per health state, respectively. The average disease-specific resource use per patient for 30 days was $786 for nmCRPC and $2210 for mCRPC, with the cost driver being chemotherapy or prescription drugs different than ADT. The total average cost for nmCRPC health state was $20 457 compared to $45 956 for mCRPC.
Conclusions: The disease-specific resource utilization costs for mCRPC are significantly higher than the costs for nmCRPC. The overall cost of these phases of PCa should be even higher, as the present study captured only costs associated with medical health records.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/136

Poster Session 5: Training & Evaluation
June 30, 2019; 0730–0900

MP-5.1
Deficits in urological knowledge and skills among family medicine residents in Canada

Sahar Saleem[1], Trustin S. Domes[2], Keith F. Rourke[1]
[1]Division of Urology, University of Alberta, Edmonton, AB, Canada; [2]Division of Urology, University of Saskatchewan, Saskatoon, SK, Canada

Introduction: The last 10 years have seen a decline in formal undergraduate urological education throughout Canada. Given the large volume of urological presentations in family practice, trainees need to acquire the requisite urological knowledge and skills to serve their patients. The objective of this study is to determine the perceived level of urological knowledge and skills among Canadian family medicine residents.

Methods: A 15-item anonymous online survey was distributed via email to all Canadian Family Medicine Program Directors from September to December 2018 and distributed to their current residents. The survey obtained data on demographics, training, undergraduate urology experience, self-reported experience/proficiency in interpreting urological investigations, performing common urological procedures, and managing common urological conditions. Descriptive statistics were used to summarize data.

Results: The questionnaire was completed by 142 family medicine residents with representation from the prairie provinces (27.5%), Ontario (33.4%), and Quebec (40.1%). A total of 39.4% of respondents completed a urology rotation during medical school and 29.1% felt that their medical training adequately prepared them for the urological aspects of family medicine. For urological clinical skill proficiency, the majority felt proficient performing a digital rectal exam (58.5%), while the minority felt proficient with a male genitourinary examination (40.1%), uncomplicated male (34.5%) and female (45.8%) urethral catheterization, and difficult catheterization (9.1%). For managing common urological conditions, the majority felt comfortable anaging urinary tract infections (97.2%), kidney stones (74.6%), female incontinence (62.7%), benign prostatic hyperplasia (62.7%), retention (57.0%), and hematuria (55.6%), while the minority felt comfortable managing erectile dysfunction (41.5%), scrotal swelling (34.7%), and scrotal pain (25.7%).

Conclusions: There are significant deficiencies in urological knowledge and skills among family medicine residents in Canada, possibly as a consequence of inadequate educational experiences during medical training.

MP-5.2
Survey of Canadian urology programs: Which elements of the CaRMS application are the most important?

David-Dan Nguyen[1], Jason Lee[2], Roger Valdivieso[3], Julie Franc-Guimond[3], Naeem Bhojani[3]
[1]Faculty of Medicine, McGill University, Montréal, QC, Canada; [2]Division of Urology, University of Toronto, Toronto, ON, Canada; [3]Division of Urology, Université de Montréal Hospital Centre, Montréal, QC, Canada

Introduction: Determining which aspects of the application are most important when applying to residency programs can be challenging for students. Due to the lack of current and reliable information on the criteria for Canadian urology residency programs (CanURP), we set out to survey each program about which criteria of the application are the most important to further provide transparency and to offer the programs an idea of how their criteria compare.

Methods: An electronic survey was sent to all 13 CanURP (program directors and selection committees). It asked respondents to rate each aspect of the application on a five-point Likert scale. Following a 100% response rate from program directors, the same survey was sent to each selection committee member. A numeric mean score was calculated for each individual aspect surveyed to create an overall rank list of the components. Independent samples t-test (two groups) was used to compare the scores of program directors vs. program committee members and francophone programs vs. anglophone programs.

Results: A total of 43 urologists involved in the application process answered — all program directors and at least two members per selection committee. The three most important aspects overall were rotation performance at their institution (4.95±0.21), quality of reference letters from a urologist (4.60±0.62), and interview performance (4.49±0.63). Table 1 provides the mean score, standard deviation, and rank of each individual aspect surveyed. There were no statistically significant differences between program directors and committee members for mean score of any aspect surveyed. Compared to anglophone programs, francophone programs gave a statistically more significant importance to French proficiency ($p<0.001$) and preclinical academic performance ($p=0.0272$), while giving less importance to English proficiency ($p<0.001$).

Conclusions: CanURP are similar in their ranking of clinical ability as the most important selection criteria. Previous research experience, especially outside of the field of urology, and future career ambitions matter less when considering future residents.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/138

MP-5.3
The current status of undergraduate urology education in Canada

Samya Vellani[2], Trustin S. Domes[1]
[1]Division of Urology, University of Saskatchewan, Saskatoon, SK, Canada
Canadian Undergraduate Urology Curriculum Committee

Introduction: Given how common urological presentations are in general practice, there is concern that education gaps may exist in the undergraduate curricula in Canadian medical schools. To determine the current status of undergraduate urology education in Canada, a pan-Canadian survey was conducted.

Methods: In the fall of 2018, a structured electronic survey was administered to the undergraduate urology education directors of all 17 Canadian medical schools. The survey assessed multiple factors, including: hours of instruction, when and if urological topics are covered, use of standardized patients (SPs) to teach male rectal and genital examinations, amount of urological exposure during clerkship, adequacy of content, and the preparedness of graduating students.

Results: The survey response rate was 100%. There is considerable variation in the duration (mean total duration: 22.5±17.2 hours [5–75]) of instruction and when urological topics are taught in the curriculum. Schools cover the majority of core content areas, however, erectile dysfunction (29.4%), urotrauma (35.3%), and pediatric urology topics (41.2%) are underrepresented. Most schools (64.7%) use SPs to teach male rectal and genital examinations. One school has a mandatory urology clerkship rotation (one week) and the other 16 schools offer a selective (median two weeks), with 24.3% (5–50%) of students completing this experience. Most education directors (64.7%) believe the curricular time devoted to urology is inadequate; 29.4% feel that their graduates are unprepared to diagnose and treat common urological problems and 76.5% strongly agree/agree that a national curriculum would be useful at their school.

Conclusions: There is significant heterogeneity in the duration of instruction and timing of urological topics in Canadian medical schools. There is a

perceived need for more urological instruction by most education directors, who welcome a national curriculum as a strategy to address this need.

MP-5.4

Perceptions on Competence by Design (CBD) in urology

Zhan Tao (Peter) Wang[1,2], Ernest Chan[1], Adam Forster[3], Alp Sener[1], Sumit Dave[1,2,4], Jennifer Vergel De Dios[5], Saad Chahine[6,7,8]

[1]Department of Surgery, Division of Urology, Schulich School of Medicine & Dentistry, London, ON, Canada; [2]Department of Surgery, Division of Pediatric Surgery, Schulich School of Medicine & Dentistry, London, ON, Canada; [3]Schulich School of Medicine & Dentistry, London, ON, Canada; [4]Department of Pediatrics, Schulich School of Medicine & Dentistry, London, ON, Canada; [5]Department of Anesthesia & Perioperative Medicine, Schulich School of Medicine & Dentistry, London, ON, Canada; [6]Department of Medicine, Schulich School of Medicine & Dentistry, London, ON, Canada; [7]Centre for Education Research & Innovation, Schulich School of Medicine & Dentistry, London, ON, Canada; [8]Faculty of Education, Western University, London, ON, Canada

Introduction: The Royal College of Physicians and Surgeons of Canada has begun implementing Competence by Design (CBD). However, it is unclear how much urology trainees and faculty know about CBD, their attitudes towards this change in medical pedagogy, and their willingness to embrace and participate in this new model of medical training.

Methods: This cross-sectional study was conducted through an online survey, which was administered to all trainees and faculty at Canadian urology programs prior to the implementation of CBD. The final survey consisted of eight demographic questions, 17 five-point Likert items, one visual analog scale (VAS) question, 11 multiple-choice questions, and two open-ended questions.

Results: A total of 74 participants (38 faculty and 36 trainees) across 12 universities responded with a completion rate of 82.4%. This corresponded to an overall response rate of 20.5%. Overall, there was a lack of resounding enthusiasm towards this shift to CBD in urology. Although both trainees and faculty had overall positive perceptions of CBD on assessment, teaching and readiness (Table 1), most agreed that this transition will be costly and associated with increased requirements for time, funding, and administrative support (Table 2). Furthermore, there were significant concerns regarding the lack of valid assessment tools and evidence for the validity of entrustable professional activities.

Conclusions: While this survey has demonstrated an appreciation for the benefits of CBD, challenges are equally anticipated. CBD in urology will be a fertile research area with several important educational questions regarding the model's effectiveness and consequences, providing collaborative opportunities among all Canadian programs.

MP-5.6

Publication outcomes of abstracts presented at the Canadian Urological Association annual meeting

Haider Abed[1], Alina Abbasi[1], Katherine Li[1], Samir Sami[2], Nicholas E. Power[2]

[1]Medicine, Western University, London, ON, Canada; [2]Urology, London Health Sciences Centre, London, ON, Canada

Introduction: The Canadian Urological Association (CUA) serves an integral role in the dissemination and discussion of current trends in the advancement of urology. It allows physicians and researchers to showcase current work and receive appropriate feedback. We aim to review publication rates and factors associated with publication of abstracts from the 65th (2010) and 70th (2015) annual meeting of the CUA.

Methods: All abstracts presented at the meeting were evaluated and systematically searched for matching manuscripts indexed in PubMed or Google Scholar. Descriptive analysis was used to identify trends and logistic regression models to determine factors associated with manuscript publication, such as subspecialty, location of origin, basic/clinical, type of research (retrospective, prospective, etc), and presentation type.

Results: A total of 556 abstracts were evaluated, with an overall publication rate of 41.7%; 2010 and 2015 had rates of 36.1% and 46.1%, respectively. The majority of abstracts had a primary focus on oncology (49.6%), followed by endourology at 14.1%, and pediatric urology at 10%. Most abstracts were Canadian-based, with 39.2% and 22.8% from Ontario and Québec, respectively. Research type was primarily retrospective (51.1%) and prospective (24.6%), with less than 5% based on randomized control trials. Abstracts were presented as unmoderated posters, moderated posters, and podium presentations at rates of 48.4%, 40.5%, and 11.2%, respectively. Published abstracts averaged an impact factor of the journals of 3.68 and average time to publication was 18 months. Analysis of factors predicting abstract publication showed significance for type of presentation (p=0.046), with subsection analysis indicating an odds ratio of 3.4 (p=0.033) for podium presentation compared to unmoderated poster, and 1.88 (p=0.038) compared to moderated poster.

Conclusions: Around 40% of abstracts were published, with podium presentations being a strong predictor of publication success.

MP-5.7

Developing ergonomic habits in robotic-assisted surgery: Association between cognitive workload, technical performance, and armrest use

Jethro C.C. Kwong[1], Jason Lee[2]

[1]Faculty of Medicine, University of Toronto, Toronto, ON, Canada; [2]Division of Urology, Department of Surgery, University of Toronto, Toronto, ON, Canada

Introduction: Developing proper ergonomic habits in robotic-assisted surgery (RAS) can be challenging for novices, as they are often preoccupied with learning the novel surgical platform and with task completion. We sought to explore the relationship between cognitive workload, technical performance, and armrest use in RAS.

Methods: Participants were recruited to perform two basic tasks on the da Vinci robot: ring transfer (RT) and suturing (ST). Task completion time and armrest use data was collected and technical performance was video-recorded. Cognitive workload was assessed with the NASA Task Load Index (NASA-TLX). Technical performance was evaluated by three expert raters using the Global Evaluative Assessment of Robotic Skills (GEARS) tool. Correlation analyses were conducted to determine associations between performance metrics and cognitive workload.

Results: A total of 12 participants were included in the study (Table 1). Armrest use did not improve with console experience for RT (ρ=0.167; p=0.60) or ST (ρ=0.092; p=0.78). For RT, console experience correlated with reduced cognitive workload (ρ=-0.596; p=0.04), however, no correlations were seen between NASA-TLX vs. armrest use (R=-0.124; p=0.70) and armrest use vs. GEARS (R=0.324; p=0.30). For ST, higher cognitive workload correlated with longer completion times (R=0.581; p=0.05), reduced armrest use (R=-0.662; p=0.02), and lower GEARS scores (R=-0.584; p=0.05). Armrest use decreased with higher mental demand (p=0.02), physical demand (p=0.03), and self-rated performance (p<0.01) on NASA-TLX. Although higher armrest use was not associated with better overall GEARS scores (R=0.575; p=0.051), it correlated with higher bimanual dexterity ratings (R=0.758; p<0.01).

Conclusions: Higher cognitive workloads can lead to poor armrest use. This suggests that ergonomic habits may improve with familiarity and comfort with a given task. However, armrest use did not impact technical performance in our cohort.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/144

MP-5.8

Changes in surgical experience during urological training prior to the introduction of Competence by Design (CBD): A comparison between 1986, 1997, 2003, and 2017

Nick Dean[1], Adam Kinnaird[1], Nathan Hoy[1], Max Levine[1], Niels-E.B. Jacobsen[1], Michael P. Chetner[1]

[1]Division of Urology, University of Alberta, Edmonton, AB, Canada

Introduction: In 2018, the Royal College of Physicians and Surgeons of Canada mandated a switch in medical residency education to a Competence by Design (CBD) structure that will affect urology training. The CBD model requires meeting all entrustrable professional activities

(EPAs) associated with common urological procedures. The primary objective of our study was to identify the shift in chief residency caseload at the University of Alberta and evaluate procedure volumes at our institution in the context of incoming EPAs.
Methods: A retrospective review of six-month case logs from a single senior resident from July to December 1986 (MPC), three senior residents from July to September, October to December 1997 (GG, TM, AP), one chief resident from July to December 2003 (NJ), and two chief residents from April to September 2017 (NH, ML) were retrospectively reviewed. The case logs were averaged in the setting of greater than one resident per year. EPAs associated with a number volumes of procedures required were extracted from the Royal College website.
Results: The number of cases over a six-month period declined from 1986 to 2003 to 215 cases in 2017. Transurethral surgery decreased from 181 cases in 1986 to 50 cases in 2017. Total urologic oncology cases increased over the 40-year period from 25 cases in 1986 (6% of total cases) to 88 cases in 2017 (41% of total cases). CBD requires competence in three lap nephrectomies and 2017 residents took part in an average of 46 nephrectomy operations, with 11 being laparoscopic. Urethroplasty surgery was not performed in 1986, but was performed an average of 17 times by the 2017 resident cohort.
Conclusions: The focus of chief resident experience has appropriately shifted with the change in clinical practice towards uro-oncology, endourology, and reconstruction. Overall, the 2017 cohort met or largely exceeded case volumes attached to incoming EPAs in CBD, however, resident-assisting does not necessarily equate to resident competence to perform that same procedure.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/145
References

1. Royal College Physicians and Surgeons of Canada. Urology EPAs (2018). Available at: http://www.royalcollege.ca. Accessed April 5, 2019.
2. Chetner M, Gray G, McCallum T, et al. Changes in the profile of resident's surgical experience during urological training: A comparison of experience between 1986, 1997, and 2003. CUA 2004
3. Hueber PA, Zorn KC. Canadian trend in surgical management of benign prostatic hyperplasia and laser therapy from 2007–2008 to 2011–2012. *Can Urol Assoc J* 2013;7: E582-6. https://doi.org/10.5489/cuaj.203

MP-5.9
Does the learning healthcare system work: A systematic review

Raees Cassim[1], Viviane Grandpierre[1], Beth Potter[2], Pranesh Chakraborty[3,4], Melise Keays[1]
[1]Division of Urology, Department of Surgery, Children's Hospital of Eastern Ontario, Ottawa, ON, Canada; [2]School of Epidemiology and Public Health, University of Ottawa, Ottawa, ON, Canada; [3]Newborn Screening Ontario, Children's Hospital of Eastern Ontario, Ottawa, ON, Canada; [4]Department of Pediatrics, Children's Hospital of Eastern Ontario, Ottawa, ON, Canada

Introduction: The Institute of Medicine describes a learning healthcare system (LHS) as the alignment of science and informatics with the goal of improving care and generating new knowledge. With the increased uptake of electronic medical records (EMR) at healthcare centres, we hypothesized that LHS have been developed and are improving healthcare and research outcomes. Our objective was to determine if existing LHCS are effective in increasing research efficiency, provider efficiency/satisfaction, cost-effectiveness, and quality improvement.
Methods: We searched MEDLINE, Cochrane CENTRAL Trials Registry, CINAHIL, and EMBASE for articles related to LHS. We included articles describing systems that automatically collected/analyzed data. Articles had to describe effects on quality improvement, research efficiency, provider efficiency/satisfaction, or cost-effectiveness. We screened abstracts using the liberal accelerated method (i.e., two reviewers to exclude, one reviewer to move to full text). After double reviewer screening of full text, we extracted data from each article, including outcome measures, EMR used, disease area, and publishing institution.
Results: We screened 1258 abstracts, 257 of which moved to full text screen. Eighteen articles met our inclusion criteria. Of the included articles, 12 reported on quality improvement, six on research efficiency, five on provider efficiency/satisfaction, and one on cost-effectiveness. The majority of the articles described improvements on the aforementioned outcomes, with no articles describing any detrimental effect. Only three articles specified the EMR used (EPIC, GE Centricity). Most LHS focused on a specific disease area, with oncology being the most common. Most of the articles were published in the U.S. with some published in Europe and Asia.
Conclusions: Current publications suggest successful implementation of several LHS in the world. These systems have been described as effective at improving outcomes in specific disease areas.

MP-5.10
Objective structured clinical examinations performance among Québec urology residents: A retrospective study from 2008–2018

Laurianne Rita Garabed[1], Ahmad Almarzouq[1], Sero Andonian[1], Mohamed El-Sherbiny[2], Nader Fahmy[1]
[1]Division of Urology, Department of Surgery, McGill University Health Centre, McGill University, Montréal, QC, Canada; [2]Division of Urology, Department of Pediatric Surgery, McGill University Health Centre, McGill University, Montréal, QC, Canada

Introduction: Objective structured clinical examinations (OSCEs) have been established as an efficient and standardized evaluation tool in medical education. In Québec, biannual OSCEs are organized across urology residency programs in post-graduate year (PGY) residents year 3–5. OSCEs may include standardized oral questions, visual recognition examinations (VREs), simulated patient stations, and telephone consultations. The aim of this study is to evaluate trends in OSCE performance of Québec urology residents and identify strengths and weaknesses across urological subspecialties and years of training.
Methods: Individual OSCE station scores from PGY 3–5 residents across the four urology residency programs in Québec were retrospectively reviewed from May 2008 to February 2018. Scores were grouped according to PGY level and station subspecialty/type (oncology, endourology, andrology, pediatrics, functional, reconstructive, VRE). Mean scores and standard deviations were subsequently analyzed.
Results: In total, data from 17 OSCE sessions were included in the study. Mean scores were consistently higher in PGY-5 than PGY-4 residents, and in PGY-4 than PGY-3 residents, across all subspecialties and VREs. Scores were lower in VRE than in oral question stations (47.1% vs 68.3%). Among oral question stations, residents scored lower in functional urology, notably in urodynamic studies, than in other subspecialties (61.8% vs. 68.3%). Endourology and reconstructive urology stations were less frequently included than stations from other subspecialties.
Conclusions: This study identified a relatively weaker performance in VREs compared to other forms of examination. Additionally, residents had relatively weaker scores in functional urology than in other subspecialties. Furthermore, this study confirms that OSCE scores improve with PGY level across all subspecialties and station types. These results can give potential direction for effort investment in residency teaching.

MP-5.11
Analgesic prescribing habits and patterns of Canadian urology residents

Ali Dergham[1], Gregory Hosier[2], Melanie Jaeger[3], J. Curtis Nickel[2], D. Robert Siemens[2], Thomas McGregor[2]
[1]School of Medicine, Faculty of Health Sciences, Queen's University, Kingston, ON, Canada; [2]Department of Urology, Queen's University, Kingston, ON, Canada; [3]Department of Anesthesiology and Perioperative Medicine, Queen's University, Kingston, ON, Canada

Introduction: Prior studies have identified significant knowledge gaps in acute and chronic pain management among graduating urology residents as of five years ago.[1] Since then, there has been increasing awareness of the impact of excessive opioid prescribing on long-term narcotic use and development of adverse narcotic-related events. However, it is unclear

whether the attitudes and experience of graduating urology residents have changed. We set out to evaluate the attitudes and experience of graduating urology residents in prescribing opioid/non-opioid analgesia for acute (AP), chronic non-cancer (CnC), and chronic cancer (CC) pain.
Methods: Thirty-five graduating urology residents were surveyed at a review course in 2018. The survey consisted of open-ended and close-ended five-point Likert scale questions. Descriptive statistics, Mann-Whitney U-test, and Student's t-test were performed.
Results: Thirty-two responses were collected. The vast majority agreed that formal training in managing AP/CnC/CC is valuable (91%/78%/81%). Most found their training in CnC/CC management to be inadequate and are unaware of any prescribing guidelines; 66% never counsel patients on how to dispose of excess opioids. In general, 88% are comfortable prescribing opioids, whereas most are very uncomfortable prescribing cannabis or antidepressants (100%/78%). Residents reported the Acute Pain Service as the highest rated resource for information, and dedicated textbooks the least.
Conclusions: This survey demonstrated that experience in pain management remains variable among urology residents. Knowledge gaps remain, particularly in the management of CnC and CC pain.
Reference
1. Pace J, Jaeger M, Nickel JC, et al. Pain management in urology training: A national survey of senior residents. *Can Urol Assoc J* 2013;7:456-61 https://doi.org/10.5489/cuaj.1562

MP-5.12
Assessment of a novel 3D-printed urinary catheter insertion model for undergraduate medical students
Charlie Gillis[1], Nicole Bishop[2], Adam Dubrowski[2,3], David Harvey[4]
[1]School of Medicine, Memorial University, St. John's, NL, Canada; [2]MUNMed3D, Memorial University, St. John's, NL, Canada; [3]Emergency Medicine, Memorial University, St. John's, NL, Canada; [4]Surgery, Memorial University, St. John's, NL, Canada
Introduction: Urinary catheter insertion is a mandatory procedure taught during medical school. It is imperative that learners are provided the opportunity to practice the procedure, as improper catheterization technique can result in urethral trauma and contribute to urinary tract infections.[1,2] Simulation training offers the advantage of avoiding patient harm while allowing learners to feel comfortable to learn from their mistakes, resulting in increased user confidence[3,4] and shortening the learning curve for basic procedures. 3D-printed simulation models are anatomically accurate, low-cost, reusable, and effective for teaching basic procedural skills.[5] This study aims to assess the self-rated effectiveness of the 3D model in increasing student confidence and preparedness.
Methods: First- and second-year undergraduate medical students (n=40) participated in procedural skills training sessions using the 3D-printed model (Fig. 1). The students were provided with didactic teaching from a urologist, a hands-on demonstration, and then allowed to practice the procedure using the 3D model. Students were subsequently asked to complete a survey to evaluate their experience and the 3D model as an educational tool.
Results: All respondents who completed the survey indicated that they would use and recommend the use of the 3D-printed model to augment their ongoing training and education. The students rated the model an average of 4.06±0.74 out of 5 for increasing preparedness in completing the procedure on a real patient, and an average of 4.39±0.80 out of 5 for increasing confidence in this procedure.
Conclusions: Preclerkship undergraduate medical students found the 3D-printed male catheter insertion model to be a useful learning tool with accurate anatomical representations and technical qualities. The 3D-printed model can be beneficial for increasing learner confidence and preparedness when completing a catheter insertion, allowing for the opportunity to practice on a low-cost, accessible simulator.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/149
References
1. Thomas AZ, Giri SK, Meagher D, et al Avoidable iatrogenic complications of urethral catheterization and inadequate intern training in a tertiary care teaching hospital. *BJU Int* 2009;104:1109-12. https://doi.org/10.1111/j.1464-410X.2009.08494.x
2. Cohen A, Nottingham C, Packiam V, et al. Attitudes and knowledge of urethral catheters: A targeted educational intervention. *BJU Int* 2016;118:654-9. https://doi.org/10.1111/bju.13506
3. Zhong X, Wang P, Feng J, et al. Novel transparent urinary tract simulator improves teaching of urological operation skills at a single institution. *Urol Int* 2015;95:38-43. https://doi.org/10.1159/000375129
4. Rodríguez-Díez MC, Díez N, Merino I, et al. Simulators help improve student confidence to acquire skills in urology. *Actas Urol Esp Engl Ed* 2014;38:367-72.
5. Grober ED, Hamstra SJ, Wanzel KR, et al. The educational impact of bench model fidelity on the acquisition of technical skill: The use of clinically relevant outcome measures. *Ann Surg* 2004;240:374-81. https://doi.org/10.1097/01.sla.0000133346.07434.30

UP-5.1
Analysis of forces in laparoscopy: The deconstruction of an intracorporeal suturing task
Kai-Ho Fok[1], Sophia Duong[1], Brian Carrillo[2], Justin T. Gerstle[2], Georges Azzie[2], Monica Farcas[1]
[1]Urology, University of Toronto, Toronto, ON, Canada; [2]General and Thoracic Surgery, The Hospital for Sick Children, Toronto, ON, Canada
Introduction: An intracorporeal suturing task simulator has been developed that can measure forces in real time during the performance of the task.[1] These forces have been described and have been shown to be greater in larger-size simulators.[2] We analyze the forces on deconstructed task segments to allow for targeted assessment and teaching.
Methods: Participants performed a defined intracorporal suturing task on a laparoscopic simulator. Expertise level was assigned based on case number. Real-time force and torque data were collected in three 3 degrees of freedom using a custom-designed, force-sensing platform.[1] The task was deconstructed into four segments: pull-through, double-throw knot, first single-throw knot, and second single-throw knot. Force analysis parameters (FAPs) were calculated for each of the segments. FAPs included maximum, mean, and number of extreme force events. Outcomes were analyzed using one-way ANOVAs and paired sample t-tests ($p<0.05$).
Results: One-hundred two participants were recorded (20 experts, 52 intermediates, 30 novices). The largest differences were seen in the "double-throw knot segment." In this segment, significant differences were identified in mean forces exerted in the "side-to-side" direction. Experts exerted a mean force to the right, whereas novices exerted a mean force to the left. Congruently, differences were also seen in this segment between novices, intermediates, and experts in the torque applied in the "side-to-side axis." Similar differences were not found in other segments. In the "first single throw segment," the novices had a significantly larger number of extreme force events in the "up-and-down" direction.
Conclusions: An ability to perform real-time assessment of forces during an intracorporeal suturing task is demonstrated. Deconstruction of the task into segments gains further insights that distinguish expertise level. Further investigation on specific maneuvers may better characterize expertise and allow for more effective teaching/evaluation.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/152
References
1. Gavrilovic B, Fahy AS, Carrillo B, et al. Development of an open-source laparoscopic simulator capable of motion and force assessment: High tech at low cost. *J Laparoendosc Adv Surg Tech A* 2018;28:1253-60. https://doi.org/10.1089/lap.2018.0126
2. Fahy AS, Jamal L, Gavrilovic B, et al. The impact of simulator size on forces generated in the performance of a defined intracorporeal suturing task: A pilot study. *J Laparoendosc Adv Surg Tech A* 2018 Jul 13. [Epub ahead of print]. https://doi.org/10.1089/lap.2018.0255

UP-5.2

The burden of urological disease in Zomba, Malawi: A needs assessment in a sub-Saharan tertiary care centre

Tristan Juvet[1], James Hayes[2], Sarah R. Ferrara[1], Duncan Goche[3], Robert D. MacMillan[4], Rajiv K. Singal[5]
[1]Urology, University of Toronto, Toronto, ON, Canada; [2]Urology, University of Ottawa, Ottawa, ON, Canada; [3]Surgery, Zomba Central Hospital, Zomba, Malawi; [4]Urology, Kelowna General Hospital, Kelowna, BC, Canada; [5]Urology, Michael Garron Hospital, Toronto, ON, Canada

Introduction: A large part of the developing world continues to lack access to surgical care and this situation is accentuated in sub-Saharan Africa. Urology remains one of the least represented surgical subspecialties in global health. In order to begin understanding the burden of urological illness in sub-Saharan Africa, we sought to characterize all patients presenting to a tertiary hospital in Malawi with a urological diagnosis or related complaint in the past year.

Methods: Retrospective review of the surgical clinic record book and surgical theater record books at Zomba Central Hospital (ZCH) was performed for a one-year time span from March 2017 to March 2018. Patients presenting with urological diagnoses or undergoing a urological procedure under local or general anesthetic in the operating theater were identified and recorded.

Results: A total of 440 clinical patients were reviewed (Table 1). The most common clinic presentations were for urinary retention (153 patients, 34.7%), lower urinary tract symptoms (68 patients, 15.5%), and hydrocele (45 patients, 10.2%). A total of 182 surgical cases were reviewed (Table 2). The most common diagnoses for surgical patients were urethral stricture disease (40 patients, 22%), followed by bladder masses (31 patients, 17%) and benign prostatic hyperplasia (BPH) (27 patients, 14.8%). When combined, stricture-related procedures, including visual internal urethretomy and urethral dilatation, were the most frequent (26 and 14 cases, 14.2% and 7.7%, respectively). BPH-related procedures, including simple prostatectomy and transurethral resection of the prostate, were the second most common (12 and 15 cases, 6.7% and 8.2%, respectively).

Conclusions: Urethral stricture disease, BPH, and urinary retention represent the clinical diagnoses with the highest burden of visits at ZCH. Despite these numbers, very few definitive procedures are performed on an annual basis. Further focus on urological training in sub-Saharan Africa should focus on these conditions and their management.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/153

UP-5.3

SMARTv: Surgical Mentoring by Annotated Real-Time Video

Anne-Sophie Blais[1], Shaun Trecarten[1], Ivan Reel[1], Greg Patterson[1], Armando J. Lorenzo[1], Fadi Zu'bi[1], Darius J. Bagli[1]
[1]Urology, Hospital for Sick Children, Toronto, ON, Canada

Introduction: As surgical modalities expand and operative caseloads are reduced, new teaching strategies are needed to enhance intraoperative learning. We developed a novel intraoperative training strategy of Surgical Mentoring by Annotated Real- Time Video: SMARTv. Using an iPad and Apple Pencil, SMARTv allows a mentor to annotate live video of the surgical field, which is streamed to a trainee video monitor. Without scrubbing in, mentors can highlight teaching points directly on the iPad surgical field image and bookmark key moments, which can be archived for later debriefing and longitudinal assessment of improvement. To validate the effectiveness of SMARTv, we conducted a pilot study using open surgery of the perceived impact of SMARTv on the intraoperative educational experience of trainees and on the mentoring experiences of educators.

Methods: Following completion of SMARTv-guided open surgery, the trainees and their mentor completed a Likert scale (1-strongly disagree, 5-strongly agree) assessment questionnaire based on Kirkpatrick's model of effectiveness evaluation.

Results: To date, five (one mentor, four trainees) surveys were completed. SMARTv was used to guide trainees through hypospadias repairs and urethrocutaneous fistula repairs. All respondents agreed that the tool was easy to use (mean score 4.5/5) and improved instruction clarity and the quality (4.4) and quantity (4.2) of feedback. Four respondents agreed that the tool improved trainee autonomy (4.2). No one rated the tool as distracting (2.2). Many SMARTv-guided surgeries are scheduled for the upcoming months; more data will be obtained.

Conclusions: SMARTv is an innovative tool that provides close intraoperative guidance while maintaining trainee autonomy. We speculate this approach will extract greater learning from each case, require fewer cases to achieve competence in surgical training, and find a key role in the design of competency-based training. These goals await future long-term studies.

Podium Session 2: Mixed Non-oncology
June 30, 2019; 1150–1250

POD-2.1

Opioid prescription to patients after low-acuity urological surgery is a risk factor for long-term opioid use

Jeffrey Campbell[1], Andrew McClure[2], Collin Clarke[3], Kelly Vogt[4], Blayne Welk[1]

[1]Department of Surgery, Division of Urology, Western University, London, ON, Canada; [2]Institute for Clinical Evaluative Sciences, London, ON, Canada; [3]Department of Anesthesia, Western University, London, ON, Canada; [4]Department of Surgery, Western University, London, ON, Canada

Introduction: The opioid abuse epidemic is changing the way the medical community uses narcotics. Our objective was to determine if postoperative opioid prescriptions after low-acuity urological surgeries leads to long-term opioid use.

Methods: We conducted a retrospective cohort study using administrative data from the province of Ontario, Canada. We identified all adult men who underwent their first vasectomy, transurethral prostatectomy, urethrotomy, circumcision, spermatocelectomy, or hydrocelectomy from 2013–2016. We excluded men with prior opioid use, confounding concurrent procedures, a prolonged hospital stay, or cancer. Our primary exposure was whether patients filled a prescription for an opioid within five days of their urological surgery. The primary outcome was evidence of at least two narcotic prescriptions filled 9–15 months after their urological surgery. To ensure exposed and unexposed men were similar, 25 medical comorbidities and 16 markers for healthcare utilization potentially related to chronic pain were measured.

Results: We identified 91 083 men, most of whom underwent vasectomy (78%). A total of 32 174 (35%) filled a prescription for an opioid after their procedure. The post-procedure opioid users and non-users did not differ in the majority of the medical comorbidities or markers of healthcare utilization. The most common opioid prescribed was codeine (70%) and urologists were the primary prescribers (81%). Overall, 1447 (1.6%) of men had evidence of long-term narcotic use; men who had filled a postoperative opioid prescription had both a significantly higher risk of long-term narcotic use (adjusted odds ratio [aOR] 1.4; 95% confidence interval [CI] 1.3–1.6) and the secondary outcome of overdose (OR 3.0; 95% CI 1.5–5.9).

Conclusions: Physicians prescribing opioids after low-pain-intensity surgery is a significant risk factor for potential narcotic dependence; efforts should be made to reduce postoperative narcotic use, especially for procedures that should have minimal postoperative pain.

POD-2.2

Efficacy and safety of mirabegron vs. placebo add-on therapy in men with overactive bladder symptoms receiving tamsulosin for underlying benign prostatic hyperplasia (PLUS)

Sender Herschorn[1], Steven Kaplan[2], Kevin McVary[3], David Staskin[4], Christopher Chapple[5], Steve Foley[6], Javier Cambronero Santos[7], Rita M. Kristy[8], Nurul Choudhury[9], John Hairston[8], Carol Schermer[8]

[1]Department of Surgery/Urology, University of Toronto, Sunnybrook Health Sciences Centre, Toronto, ON, Canada; [2]Department of Urology, Icahn School of Medicine at Mount Sinai, New York City, NY, United States; [3]Department of Urology, Stritch School of Medicine, Loyola University Medical Center, Maywood, IL, United States; [4]Department of Urology, St Elizabeth's Medical Center, Brighton, MA, United States; [5]Department of Urology, Royal Hallamshire Hospital, Sheffield, United Kingdom; [6]Department of Urology, Royal Berkshire Hospital, Reading, United Kingdom; [7]Department of Urology, Infanta Leonor Hospital, Madrid, Spain; [8]Astellas Pharma Global Development Inc., Northbrook, IL, United States; [9]Astellas Pharma Europe Ltd., Chertsey, United Kingdom

Introduction: The objective was to study the efficacy and safety of mirabegron (MIRA) vs. placebo (PL) for treating overactive bladder (OAB) symptoms in men concurrently receiving tamsulosin (TAM) for lower urinary tract symptoms (LUTS) due to underlying benign prostatic hyperplasia (BPH).

Methods: This 12-week, phase IV, randomized, double-blind, multicentre (North America/Europe) study enrolled men (≥40 years) receiving TAM for ≥2 months. After a four-week TAM run-in period, patients were randomized to either MIRA 25 mg or PL. At four weeks, all patients were titrated to MIRA 50 mg or PL equivalent for eight more weeks. The primary endpoint was change from baseline (BL) to week 12/end of treatment (EoT) in mean number of micturitions/24 hours. Changes in mean volume voided (MVV)/micturition, urgency episodes/day, total urgency and frequency score (TUFS), and International Prostate Symptom Score (IPSS) total score were analyzed. Safety assessments were treatment-emergent adverse events (TEAEs) and changes in post-void residual (PVR) volume and maximum urinary flow (Q_{max}).

Results: Of 676 men, mean age was 64.9 years (380 [56.2%] were ≥65 years). The adjusted mean change from BL to EoT in micturitions/24 hours for TAM+MIRA was statistically superior to TAM+PL (Table 1). Statistically superior results were also obtained for TAM+MIRA in MVV/micturition, urgency episodes/day, and TUFS (no significant difference in IPSS total score). TEAE rates were higher with TAM+PL, although drug-related TEAE rates were higher with TAM+MIRA. Serious TEAE rates were similar in both groups. One (0.3%) TAM+PL and six (1.7%) TAM+MIRA patients experienced urinary retention. Changes in mean PVR volume and Q_{max} were not clinically meaningful.

Conclusions: Among men receiving TAM for LUTS due to BPH, the addition of MIRA was superior to PL in mean number of micturitions/24 hours in patients with OAB symptoms, the primary endpoint. Similar findings were observed for MVV/micturition, urgency episodes/day, and TUFS. There were no unexpected safety concerns.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/273

POD-2.3

Randomized, blinded, placebo-controlled trial of continuous antibiotic prophylaxis for febrile urinary tract infection prevention in infants with prenatal hydronephrosis: The Alpha study

Luis H. Braga[1,5], Melissa McGrath[1], Steven Arora[2], Martha Fulford[3], Armando J. Lorenzo[4], Lucy Giglia[2], Farough Farrokhyar[5]

[1]Surgery, McMaster University, Hamilton, ON, Canada; [2]Pediatrics, McMaster University, Hamilton, ON, Canada; [3]Infectious Diseases, Medicine, McMaster University, Hamilton, ON, Canada; [4]Urology, The Hospital for Sick Children, Toronto, ON, Canada; [5]Epidemiology and Biostatistics, McMaster University, Hamilton, ON, Canada

Introduction: Continuous antibiotic prophylaxis (CAP) to prevent febrile urinary tract infection (fUTI) in infants with prenatal hydronephrosis (PHN) remains controversial, contributing to a lack of consensus guidelines and diverse practice patterns. We aimed to determine whether CAP vs. placebo reduces fUTIs in prenatal HN patients within the first 18 months of life.

Methods: Infants 0–7 months old with PHN were recruited. Inclusion criteria included Society for Fetal Urology (SFU) grade III/IV with/without dilated ureter (>7 mm) or urinary tract dilation (UTD) P2/P3, and voiding cystoure-

throgram (VCUG) to rule out Vesicoureteral reflux (VUR). Patients received equivalent volumes of trimethoprim (TMP) or placebo (syrup)with a 1:1 allocation ratio, using a computer-generated randomization sequence in random block sizes of four, six, and eight. Trial participants were blinded, except the pharmacist. The primary outcome was catheter specimen fUTIs adjudicated by a three-physician panel. The secondary outcome was bacterial resistance patterns. Intention-to-treat (ITT) analysis to estimate fUTI-free rate was done using Kaplan-Meier curves. A subgroup analysis between ureteropelvic junction obstruction (UPJO)-like vs. non-refluxing primary megaureter (NRPM) was conducted. Followup included monthly phone calls and quarterly ultrasound for 12 months. Compliance was assessed through a medication logbook.

Results: We screened 1435 infants; 1137 did not meet inclusion criteria, 48 refused, and 150 were randomized (75 to placebo/75 to TMP) Four patients withdrew, leaving 146 for analysis. Baseline characteristics were equally distributed between groups (Table 1). Overall fUTI rate was 6% (9/146), with eight events in the placebo group vs. one (TMP-resistant bacteria) in the intervention group (11% vs.1.4%; p=0.03). Eight fUTIs occurred in uncircumcised males and one in a female. NRPM infants had a significantly higher fUTI rate vs. UPJO-like (14% vs.3; p=0.02). Median time to fUTI was three months (Figs. 1A, 1B). Multidrug resistance was higher in placebo vs. intervention patients (42% vs. 22%; p=non-significant). Overall number needed to treat (NNT) was 10 and NNT for NRPM was four.

Conclusions: Patients with SFUIII/IV-PHN receiving placebo were 10 times more likely to develop a fUTI than those on TMP. CAP should be offered to uncircumcised males and those with dilated ureters due to their higher risk of fUTI.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/28

POD-2.4

Are renal bladder ultrasounds necessary for routine followups of vesicoureteral reflux patients after continuous antibiotic prophylaxis discontinuation?

Smruthi Ramesh[1], Melissa McGrath[1], Kornelia Palczek[1], Catherine Lovatt[2], Luis H. Braga[1,2]

[1]Surgery, McMaster Children's Hospital, Hamilton, ON, Canada; [2]Surgery, McMaster University, Hamilton, ON, Canada

Introduction: Patients with vesicoureteral reflux (VUR) are routinely seen at followup visits with serial ultrasounds (US) after stopping continuous antibiotic prophylaxis (CAP). Since there is little evidence to support this practice, we sought to examine the impact of US findings on the clinical management of VUR patients at followup visits.

Methods: A prospectively collected VUR database from 2009–2018 was reviewed. We identified 218 patients who have stopped CAP. Variables collected included age at CAP discontinuation, followup time, gender, circumcision status, Society for Fetal Urology (SFU) grades (low [I–II] vs. high [III–IV]), and febrile urinary tract infection (fUTI). Change in management was defined as surgical intervention to treat symptomatic VUR or CAP.

Results: The median age at CAP discontinuation and median followup time were 20 months (interquartile range [IQR] 13–32) and 42 months (IQR 28–61), respectively. Of 218 VUR patients, 105 (48%) were male and 38 (36%) circumcised. There were 135 (62%) patients with unremarkable serial US findings and 83 (38%) with hydronephrosis (HN). Patients with normal vs. abnormal US findings experienced similar rates of change in management (11% vs. 8%; p=0.7). In patients with normal US findings, those with fUTI were more likely to experience a change in management than those without (52% vs. 0%; p<0.01). Of patients with abnormal US findings, 58/83 (70%) had low-grade HN. In this group, change in management was more likely to occur in patients with fUTI vs. those without (50% vs. 2%; p<0.01). Classification of low vs. high HN did not have a significant effect on change in management (9% vs. 8%; p=1.0).

Conclusions: In 2/3 of VUR patients, US findings were unremarkable and did not impact clinical management. The driving factor for change in management was fUTI post-CAP discontinuation. Thus, asymptomatic VUR patients may not require routine followups with renal US after stopping CAP.

POD-2.5

Comprehensive prospective assessment of patient-reported outcomes after urethroplasty

Jordan Bekkema[1], Keith F. Rourke[1]

[1]Division of Urology, University of Alberta, Edmonton, AB, Canada

Introduction: While urethroplasty is the most effective treatment for urethral stricture, the majority of outcomes are reported from a surgeon perspective. Our objective is to comprehensively describe patient-reported outcomes after urethroplasty.

Methods: A total of 357 patients from 2011–2018 were enrolled in a prospective, single-centre study comprehensively assessing patient-reported outcomes after urethroplasty, including patient satisfaction, urinary function, quality of life, erectile function, ejaculatory function, penile appearance/curvature, genitourinary pain, and post-void dribbling. Patient satisfaction was determined using a five-point Likert scale. Voiding function was assessed with the International Prostate Symptom Score (IPSS). Erectile function was assessment with the International Index of Erectile Function 5 (IIEF-5) with erectile dysfunction defined as a ≥5-point change. Ejaculatory function was scored using a hybrid of the brief Sexual Function Inventory. The remaining measures were assessed using literature-derived Likert scales. Descriptive statistics were used to summarize findings, while both parametric (paired t-test, Chi-square) and non-parametric (Wilcoxon) tests were used to compare pre- and postoperative findings.

Results: Of the 357 patients enrolled, mean age was 49.7 years with a mean stricture length of 4.4 cm. Stricture location was most commonly bulbar (59.7%), followed by penile (19.9%) and posterior (13.7%). The most common stricture etiology was idiopathic (40.3%), iatrogenic (14.0%), trauma (13.2%), or lichen sclerosus (12.3%). Patients underwent a variety of urethroplasty techniques, including buccal mucosa graft onlay (42.6%), anastomotic (30.0%), or staged (11.2%). Most (92.0%) patients were stricture-free on followup cystoscopy; 80.0% of patients reported being satisfied with surgery, while 7.3% of patients were unsatisfied. Voiding function was globally improved after urethroplasty, including urinary quality of life (4.7 vs. 1.6; p<0.0001), IPSS (19.3 vs. 6.0; p<0.0001), post-void dribbling (2.7 vs. 2.5; p=0.04), and sitting to void (2.4 vs. 1.9; p<0.0001). Additionally, genitourinary pain scores improved postoperatively (2.2 vs. 1.6; p<0.0001). Overall, erectile function remained unchanged (17.7 vs. 17.2; p=0.46) but 12.0% of patients reported new-onset erectile dysfunction. The incidence of ejaculatory function remained unchanged (p=0.13) but 7.1% of patients reported worsening of ejaculatory function postoperatively. The majority of patients reported minimal change in penile length or curvature but 6.7% and 3.1% of patients complained of bothersome loss of penile length or curvature, respectively.

Conclusions: Urethroplasty globally improves voiding function and genitourinary pain associated with urethral stricture. While sexual function is preserved for the majority of patients, a small proportion of patients describe new-onset erectile dysfunction, as well as penile shortening or curvature, and should be counselled accordingly.

POD-2.6

Implementing and evaluating the efficacy of an acute care urology model of care in a large community hospital

Abirami Kirubarajan[1,2], Roger J. Buckley[3], Shawn Khan[1], Rebecca Richard[4], Veselina Stefanova[5], Nicole Golda[3]

[1]MD Program, Faculty of Medicine, University of Toronto, Toronto, ON, Canada; [2]Institute of Health Policy Management and Evaluation, University of Toronto, Toronto, ON, Canada; [3]Urology, North York General Hospital, Toronto, ON, Canada; [4]Division of Urology, University of Toronto, Toronto, ON, Canada; [5]Bachelor of Sciences Program, Western University, London, ON, Canada

Introduction: An acute care urology (ACU) model was implemented at a large Canadian community hospital to determine the impacts on safe and timely care of patients with renal colic.

Methods: The model includes a dedicated ACU surgeon, a clinic for emergency department (ED) referrals, and additional daytime operating room (OR) blocks for urgent cases. We conducted a chart review of 579 patients presenting to the ED with renal colic. Data was collected before (pre-intervention, September to November 2015) and after (post-

intervention, September to November 2016) implementation of the ACU model. Secondary methods of evaluation included surveying patients and 20 ED physicians to capture subjective feedback.

Results: Of the 579 patients presenting with renal colic,194 were diagnosed with an obstructing kidney stone and were discharged from ED and referred to urology for outpatient care. The ED-to-clinic time was significantly lower for those in the ACU model ($p<0.001$). The mean time to clinic was 15.8 days (standard deviation [SD]15.5, range 1–93) pre-intervention vs. 4.2 days (SD 2.3, range 1–12) post-intervention. Furthermore, the ACU clinic resulted in significantly more patients being referred for outpatient care ($p=0.0004$). There was also higher likelihood that patients would successfully obtain an appointment post-referral ($p=0.0055$). Decreasing trends were shown in mean ED wait time and time from surgical assessment to procedure. The number of after-hours and weekend surgeries decreased significantly after dedicated ACU daytime OR blocks were added in September 2015; 15.4% (19/123) of cases were performed on weekends or after-hours from April to June 2016, in contrast to 51% (51/100) from April to June 2014 ($p<0.0001$). All surveyed patients rated the care as either "excellent" or "very good," and physicians believe the ACU model has improved patient care.

Conclusions: The ACU model has shown benefit in ensuring timely followup for ED patients, reducing use of after-hour OR time, and improving patient and physician satisfaction.

Podium Session 3: Prostate Cancer
June 30, 2019; 1150–1250

POD-3.1

Phase 3 study of androgen-deprivation therapy (ADT) with enzalutamide (ENZA) or placebo (PBO) in metastatic hormone-sensitive prostate cancer (mHSPC): The ARCHES trial

Cristiano Ferrario[1], Andrew J. Armstrong[2], Russell Szmulewitz[3], Daniel Petrylak[4], Arnauld Villers[5], Arun Azad[6], Antonio Alcaraz[7], Boris Alekseev[8], Taro Iguchi[9], Neal D. Shore[10], Brad Rosbrook[11], Jennifer Sugg[12], Benoit Baron[13], Lucy Chen[12], Arnulf Stenzl[14]

[1]Jewish General Hospital and McGill University, Montréal, QC, Canada; [2]Duke Cancer Institute Center for Prostate and Urologic Cancers, Durham, NC, United States; [3]The University of Chicago, Chicago, IL, United States; [4]Yale Cancer Center, New Haven, CT, United States; [5]University Hospital Centre, Lille University, Lille, France; [6]Monash Health, Melbourne, Australia; [7]Hospital Clinic de Barcelona, Barcelona, Spain; [8]Hertzen Moscow Cancer Research Institute, Moscow, Russian Federation; [9]Osaka City University Graduate School of Medicine, Osaka, Japan; [10]Carolina Urologic Research Center, Myrtle Beach, SC, United States; [11]Pfizer Inc., San Diego, CA, United States; [12]Astellas Pharma Inc., Northbrook, IL, United States; [13]Astellas Pharma Inc., Leiden, Netherlands; [14]University Hospital, Eberhard Karls University, Tübingen, Germany

Introduction: Enzalutamide (ENZA), a potent androgen receptor inhibitor, has demonstrated benefit in men with metastatic and non-metastatic castration-resistant prostate cancer (CRPC). Efficacy of ENZA with androgen-deprivation therapy (ADT) in men with metastatic hormone-sensitive prostate cancer (mHSPC) is unknown.

Methods: ARCHES is a multinational, double-blind, phase 3 study (NCT02677896). Patients with mHSPC were randomized 1:1 to ENZA (160 mg/day) + ADT or placebo (PBO) + ADT, stratified by disease volume (CHAARTED criteria) and prior docetaxel therapy. Primary endpoint was radiographic progression-free survival (rPFS) assessed centrally or death within 24 weeks of treatment discontinuation. Secondary endpoints included time to prostate-specific antigen (PSA) progression, PSA and radiographic responses, and overall survival (OS). Treatment continued until disease progression or unacceptable toxicity.

Results: A total of 1150 men were randomized to ENZA (n=574) or PBO (n=576); baseline characteristics were balanced between groups. Overall, 67% had distant metastasis at initial diagnosis; 63% had high-volume disease, 18% had prior docetaxel. Median followup was 14.4 months. ENZA + ADT significantly improved rPFS (Table 1); similar significant improvements in rPFS were reported in prespecified subgroups of disease volume, pattern of spread, region, and prior docetaxel (hazard ratios [HRs] 0.24–0.53). Secondary endpoints improved with ENZA + ADT (Table 1); OS data are immature. Grade 3–4 adverse events (AEs) were reported in 23.6% of ENZA patients vs. 24.7% of PBO patients with no unexpected AEs.

Conclusions: ENZA + ADT significantly improved rPFS and other efficacy endpoints vs. PBO + ADT in men with mHSPC, with a preliminary safety analysis that appears consistent with the safety profile of ENZA in previous CRPC clinical trials.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/275

This study was funded by Astellas Pharma Inc. and Medivation LLC, a Pfizer Company, the co-developers of enzalutamide. Medical writing and editing assistance provided by Stephanie Rippon, MBio, and Lauren Smith from Complete HealthVizion, funded by the study sponsors.

POD-3.2

A novel predictor of clinical progression in patients on active surveillance for prostate cancer

Guan Hee Tan[1], Antonio Finelli[1], Ardalan Ahmad[1], Marian Wettstein[1], Alexandre Zlotta[1], Neil E. Fleshner[1], Robert Hamilton[1], Girish S. Kulkarni[1], Gregory Nason[1], Khaled Ajib[1], Nathan Perlis[1]

[1]Division of Urology, University Health Network, Toronto, ON, Canada

Introduction: To minimize morbidity of surgery or radiation, active surveillance (AS) is standard of care in low-risk prostate cancer (PCa). Predicting which men on AS will progress and require active treatment is challenging. This study describes a novel total cancer location (TCLo) density index and aims to determine its performance in predicting clinical progression (CP) and grade progression (GP).

Methods: This was a retrospective study of patients on AS after confirmatory biopsy (CBx). We excluded patients with Gleason ≥7 at CBx, less than two years' followup, and incomplete data. TCLo was the number of locations with positive cores at diagnosis (DBx) and CBx. TCLo density was TCLo/prostate volume (PV). CP was progression to any active treatment while GP occurred if Gleason ≥7 was identified on repeat biopsy or surgical pathology. Independent predictors of time to CP or GP were estimated with Cox regression. Kaplan-Meier analysis compared progression-free survival curves between TCLo density groups. Test characteristics of TCLo were explored with receiver operating characteristic (ROC) curves

Results: Between 2012 and 2015, 421 patients had a CBx. We included 181 patients who met inclusion criteria. The mean age of patients at the start of AS was 62.6 years (standard deviation [SD] 7.13) and the median prostate-specific antigen (PSA) at diagnosis was 5.16 ng/mL (interquartile range [IQR] 3.44). Mean PV was 45.0 mL (SD 18.1). The median TCLo density was 0.049 (IQR 0.06). A high TCLo density score (>0.05) was independently associated with time to CP, with hazard ratio (HR) 4.7 (95% confidence interval [CI] 2.62–8.42; p<0.001) and GP, with HR 4.25 (95% CI 2.06–8.74; p<0.001) (Fig. 1). TCLo density performed better than percentage positive cores at CBx in predicting CP (Fig. 2).

Conclusions: TCLo density has the potential to stratify patients into low- or high-risk for CP and GP while on AS for low-risk PCa. This should be validated with a larger, prospective sample population.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/32

POD-3.3

Comparison of bone scintigraphy and 18F-fluorocholine positron emission tomography-computed tomography (18F-FCH PET/CT) to stage high-grade prostate cancers shows 18FDG-PET/CT has a better accuracy to detect bone metastasis

Samuel Otis-Chapados[1], Louis Lacombe[1], Yves Fradet[1], Vincent Fradet[1], Paul Toren[1], Thierry Dujardin[1], Michele Lodde[1], Rabi Tiguert[1], Frédéric Pouliot[1]

[1]Department of Surgery, Urology Division, CHU de Québec, Université Laval, Québec City, QC, Canada

Introduction: The accuracy of computed tomography (CT)-coupled ^{18}F-fluorodeoxyglucose positron emission tomography (FDG-PET/CT) for prostate cancer (PCa) staging has not been studied in depth. We have shown recently in a series of Gleason 8 PCa at biopsy, that high intraprostatic FDG uptake (SUVmax) was predictive of adverse pathological prognostic features after surgery, earlier biochemical recurrence, and earlier castration resistance. High intraprostatic FDG uptake in the primary tumour, therefore, defines patients at very high risk of failure and death. In this study,

we compared the diagnostic accuracy between FDG-PET/CT and bone scintigraphy to determine if FDG-PET/CT alone can be used as a staging procedure for Gleason 8 PCa.
Methods: Between 2010 and 2016, 261 patients with Gleason 8 PCa at biopsy were staged by a bone scan and FDG-PET/CT at CHU de Québec. We compared the accuracy of the two imaging modalities, taking inter-modality agreement as truth standard. In case of disagreement, biopsy of lesions or re-imaging were used as reference standards.
Results: A total of 157, 97, and seven patients had Gleason 8, 9, and 10, respectively, at biopsy and 33 of 261 patients had bone metastases at diagnosis. Median prostate-specific antigen (PSA) was 8, 2, and 157 for M0 vs. M1 patients. FDG-PET/CT identified 33 bone metastatic patients vs. 26 for bone scintigraphy. Sensitivity, specificity, positive predictive value, and negative predictive value for FDG-PET/CT were 100%, 99%, 92%, and 100%, respectively, compared to 79%, 98%, 84%, and 97% for bone scintigraphy. Of eight patients who had positive FDG-PET/CT but negative bone scintigraphy, seven were assigned as true positives. No patient with a positive bone scan and a negative FDG-PET/CT had metastasis diagnosed.
Conclusions: For patients with Gleason 8 PCa at biopsy, FDG-PET/CT is accurate and superior to bone scintigraphy for bone metastases detection. FDG-PET/CT can, therefore, be used alone to stage these cancers preoperatively in order to identify very high-risk PCa without compromising bone metastases detection.
Reference
1. Lavallée E, Bergeron M, Buteau FA, et al. Increased prostate cancer glucose metabolism detected by 18F-fluorodeoxyglucose positron emission tomography/computed tomography in localized Gleason 8–10 prostate cancers identifies very high-risk patients for early recurrence and resistance to castration. *Eur Urol Focus* 2018. [Epub ahead of print]. https://doi.org/10.1016/j.euf.2018.03.008

POD-3.4

Widespread use of multiparametric magnetic resonance imaging in an active surveillance cohort results in earlier identification and treatment of clinically significant prostate cancer

Alice Yu[1], Timothy Baloda[1], Eduoard Nicaise[1], Andrew Gusev[1], Amirkasra Mojtahed[2], Mukesh Harisinghani[2], Douglas Dahl[1], Matthew Wszolek[1], Anthony Zietman[3], Adam Feldman[1]
[1]Urology, Massachusetts General Hospital, Boston, MA, United States; [2]Radiology, Massachusetts General Hospital, Boston, MA, United States; [3]Radiation Oncology, Massachusetts General Hospital, Boston, MA, United States
Introduction: Multiparametric magnetic resonance imaging (mpMRI) has led to improved detection of clinically significant prostate cancer and is now increasingly used in active surveillance (AS) patients. However, most AS cohorts in the literature were described prior to widespread use of mpMRI. Our investigation compares outcomes in AS in the pre- and post-MRI era at our institution.
Methods: We used an institutional database of 1295 men who started AS between September 1996 and December 2016. The cohort was divided into pre- and post-MRI era, with the cutoff in January 2014, when mpMRI was routinely incorporated into our AS protocol. Clinical outcomes were compared using Wilcoxon rank sum and Chi-square tests. Treatment-free survival was analyzed using Kaplan-Meier plots.
Results: All patients (251) in the post-MRI era had at least one mpMRI performed compared to 5.3% (55/1044) of those enrolled earlier. There was no significant difference in baseline prostate-specific antigen (PSA) (p=0.36) or Gleason score (GS) (p=0.395). Mean time to followup in the post-MRI era was 3.0±0.9 years compared to 8.0±5.1 years in the pre-MRI era. At two years, 21.8% of patients in the post-MRI era were treated as compared 15.7% in the pre-MRI era. By Kaplan-Meier, patients in the post-MRI group had a shorter time to treatment (1.5 vs. 2.8 years; p<0.001) (Fig. 1). Among those treated, 288 underwent radical prostatectomy (RP). On surgical pathology, 4.2% of patients in the pre-MRI group had GS 8 or 9 disease, 59.0% had GS 7, and 36.8% had GS 6 disease. This is compared to 0%, 75.0%, and 25.0%, respectively, in the post-MRI group. There was no difference in pathologic T stage, N stage, and positive margin rates.
Conclusions: With widespread use of mpMRI, patients on AS are treated earlier. However, further followup will be needed to see if this earlier identification and treatment of clinically significant disease ultimately results in a plateau in long-term treatment-free survival.

POD-3.5

Comparison of salvage prostatectomy vs. salvage ablative therapy for biopsy-proven radio-recurrent localized prostate cancer

Victor A. McPherson[1], Shiva M. Nair[2], Amy L. Tin[3], Malcolm Dewar[2], Khurram Siddiqui[2], Daniel D. Sjoberg[3], Andrew Vickers[3], James Eastham[1], Joseph Chin[2]
[1]Surgery; Urology, Memorial Sloan Kettering Cancer Center, New York, NY, United States; [2]Surgery; Urology, University of Western Ontario, London, ON, Canada; [3]Epidemiology and Biostatistics, Memorial Sloan Kettering Cancer Center, New York, NY, United States
Introduction: After radiation therapy for prostate cancer, there is a 15–20% recurrence rate. Patients with localized recurrence are candidates for salvage therapy, however, there is no clear consensus on modality. Registries at Memorial Sloan Kettering Cancer Center (MSKCC) and University of Western Ontario (UWO) were used to compare salvage radical prostatectomy (SRP), and two salvage ablation (SA) therapies: cryotherapy and high-frequency focused ultrasound (HIFU).
Methods: Data from two registries were retrospectively analyzed. SRP was performed at MSKCC, while SA was used at UWO. An equivalence test for metastasis-free survival (MFS) was used for cryotherapy and HIFU; there was no difference (p=0.3) and thus data were combined. A total of 444 patients were available for analysis; however, due to differences in treatment groups, propensity score methodology was used to identify a cohort of 378 patients with more similar pre-salvage prostate-specific antigen (PSA), Gleason grade, and radiation treatment.
Results: Forty-eight patients died of disease and median followup time for survivors was 6.0 years from salvage treatment (interquartile range [IQR] 3.0, 9.7); 88 developed metastasis, and median followup time was 4.6 years from therapy (IQR 2.3, 7.9). There were no differences between SA and SRP in cancer-specific survival (CSS; hazard ratio [HR] 1.02; 95% confidence interval [CI] 0.51, 2.06; p=0.9) or MFS (HR 0.71; 95% CI 0.44, 1.13; p=0.15). Among 377 patients with data, 143 received hormonal treatment after salvage, with higher rates of androgen-deprivation therapy (ADT) in SA (HR 1.42; 95% CI 0.97, 2.08; p=0.068); this did not reach conventional levels of statistical significance.
Conclusions: This analysis of two independent registries of salvage therapy for radio-recurrent prostate cancer identified no difference in CSS or MFS between SRP and SA. However, there was some evidence of a lower risk of ADT with SRP. Therefore, SRP and SA have comparable oncological outcomes, but the analysis is limited by differences between cohorts, which may not be fully accounted for by propensity score analysis.

POD-3.6

Impact of bone-targeted therapies in patients with chemotherapy-naive metastatic castration-resistant prostate cancer on enzalutamide: A post-hoc analysis of PREVAIL

Fred Saad[1], Neal D. Shore[2], Karim Fizazi[3], Joyce Steinberg[4], Janet Kim[4], Ping Lin[5], Katharina Modelska[5], Tomasz M. Beer[6]
[1]Centre Hospitalier de l'Université de Montréal/CRCHUM, Montréal, QC, Canada; [2]Carolina Urologic Research Center, Myrtle Beach, SC, United States; [3]Institut Gustave Roussy, University of Paris-Sud, Villejuif, France; [4]Astellas Pharma Inc., Northbrook, IL, United States; [5]Pfizer Inc., San Francisco, CA, United States; [6]OHSU Knight Cancer Institute, Oregon Health and Science University, Portland, OR, United States.
Funding: Astellas Pharma Inc. and Medivation LLC, a Pfizer Company. Medical writing and editorial support: Complete HealthVizion.
Introduction: Enzalutamide (ENZA) prolongs radiographic progression-free survival (rPFS) and overall survival (OS) in men with chemotherapy-naive metastatic castration-resistant prostate cancer (mCRPC). Men with mCRPC are at high risk of developing bone metastases; skeletal complica-

tions of bone metastases contribute to morbidity, pain, and death. In this exploratory post-hoc analysis of PREVAIL, we analyzed clinical outcomes associated with bone-targeted therapies (BTT) and ENZA vs. ENZA alone.
Methods: The phase 3 PREVAIL study (NCT01212991) randomized men with mCRPC 1:1 to ENZA (160 mg) or placebo (PBO) with continued androgen-deprivation therapy. Target population was men with bone metastases at baseline, grouped by pre-study baseline BTT use. Co-primary endpoints were rPFS and OS. Eastern Cooperative Oncology Group performance status (ECOG PS) deterioration was defined as time from randomization to first evidence of ECOG PS deterioration by ≥1 grade. Results are presented as hazard ratio (HR) (95% confidence interval [CI]).
Results: Of 1429 men, 410 had pre-study BTT use. The risk of radiographic progression was similar between ENZA + BTT and ENZA alone (HR [95% CI] 1.05 [0.69, 1.60]; p=0.4408), whereas the risk of death was higher in ENZA + BTT vs. ENZA alone (1.44 [1.08, 1.92]; p=0.0076) (Table 1). There was a 31% lower risk of radiographic progression in PBO + BTT vs. PBO alone (0.69 [0.52, 0.93]; p=0.0075), and the risk of death was similar between PBO + BTT and PBO alone (0.90 [0.69, 1.19]; p=0.2669). The risk of ECOG PS deterioration was similar between ENZA + BTT and ENZA alone (p=0.6367), and between PBO + BTT and PBO alone (p=0.3615).
Conclusions: Pre-study BTT use with ENZA was not associated with improved clinical outcomes vs. ENZA alone. rPFS was improved in men taking PBO + BTT vs. PBO alone. These results suggest that BTTs do not improve outcomes in combination with first-line ENZA in mCRPC. Further analysis of optimal timing and combinations when using BTTs remains relevant.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/36

Poster Session 6: Pediatrics
July 1, 2019 0730-0900

MP-6.1
Revisiting risk factors for febrile urinary tract infection in infants with prenatal hydronephrosis

Luis H. Braga[1], Smruthi Ramesh[1], Melissa McGrath[1], Anthony Herndon[2]
[1]Surgery, McMaster University, Hamilton, ON, Canada; [2]Urology, VCU, Richmond, VA, United States

Introduction: Risk factors for febrile urinary tract infection (fUTI) in infants with prenatal hydronephrosis (HN), such as female gender, uncircumcised status, high-grade HN, and non-refluxing primary megaureter (NRPM), have been consistently documented in several small sample size series; however, the same cannot be said regarding continuous antibiotic prophylaxis (CAP). Herein, we revisit this clinically important outcome using a large, single-centre database to confirm or refute these previous findings.

Methods: Since 2009, we have prospectively followed 876 consecutive prenatal HN infants <12 months of age with the following conditions: ureteropelvic junction obstruction (UPJO)-like, NRPM and vesicoureteral reflux (VUR). Patients with <6 months followup were excluded. A priori collected variables included: HN Society of Fetal Urology (SFU) grade (low: I/II vs. high: III/IV), HN etiology, CAP, gender, and circumcision status. Primary outcome was catheter specimen fUTI. Time to event curves (hazard ratio [HR]) were analyzed by Cox proportional regression to adjust for confounders. Analyses were done with and without VUR patients.

Results: Of 848 included patients, 632(75%) were male and 36% were circumcised. Seventy-three (9%) had a fUTI at a median age of six months (interquartile range [IQR] 9). Mean followup was 30 months (6–120). High-grade HN was seen in 467 (55%) infants and CAP prescribed for 450 (53%). VUR (68% grades IV–V) was detected in 168/572 (29%) patients who had a voiding cystourethrogram (VCUG). Upon univariate analysis, a significantly higher fUTI rate was seen in females, uncircumcised males, patients with NRPM, and those with high-grade HN (Table 1). In the Cox proportional regression model, NRPM (HR 4.8; p<0.01), VUR (HR 7.0; p<0.01), uncircumcised male (HR 2.3; p=0.03), females(HR 2.5; p=0.02), and lack of CAP (HR 3.7; p<0.01), were significantly associated with fUTI (Table 2). HN grade was not found to be associated with fUTI. Kaplan-Meier curves for fUTI risk factors are shown in Fig. 1.

Conclusions: This study validates previous findings, confirming NRPM, VUR, uncircumcised status, and female gender as important risk factors for fUTI. According to our large dataset analysis, CAP significantly reduced fUTIs and should be offered to these high-risk HN patients.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/155

MP-6.2
Scoring system for grading hypospadias severity and quantifying risk of postoperative complications

Melissa McGrath[1], James Elmore [2], Melise Keays[3], Farough Farrokhyar [4], Luis H. Braga[1,4]
[1]Surgery, McMaster University, Hamilton, ON, Canada; [2]Urology, Emory University, Atlanta, GA, United States; [3]Surgery, Urology, Children's Hospital of Eastern Ontario, Ottawa, ON, Canada; [4]Epidemiology and Biostatistics, McMaster University, Hamilton, ON, Canada

Introduction: In the original Glans-Urethral Meatus-Shaft (GMS) score description, quality of the urethral plate (UP) and glans size were subjectively classified into four categories, potentially creating difficulty for reproducibility of study results and research collaboration. Aiming to overcome these shortcomings, we developed a modified, more objective GMS (mGMS) scoring system to grade hypospadias severity and sought to investigate its association with urethralcomplications (UC) post-tubularized incised plate (TIP) repair.

Methods: A total of 680 patients of a prospective, single-centre hypospadias database were graded preoperatively using the mGMS score. Patients with followup <3 months, redos, and staged repairs were excluded. Age at surgery, preoperative testosterone, glans groove depth, glans width (mm), meatal location, ventral curvature (VC), and complications (fistula, glans dehiscence, and meatal stenosis) were collected. Primary outcome was to objectively describe the mGMS scoring system (4–12) (Table 1). Secondary outcome was to investigate the association of mGMS severity score groups (mild: 4–5; moderate: 6–7; severe: 8–10) with UC. Chi-square and Fisher's exact tests were used to compare UC between groups.

Results: UC developed in 40/445 (9%) patients, most commonly fistulas (47%). Median age at surgery was 16 months (interquartile range [IQR] 8) and mean followup was 21 months (3–104). Mean mGMS score was 6.3. UC rates according to the three mGMS severity scores categories are shown in Table 2. Patients in the severe group had a significantly higher complication rate vs. those in the mild category (19% vs. 5%; p<0.01).

Conclusions: We have found the mGMS scoring system to be an objective, easy to standardize, and statistically useful instrument for describing the severity of hypospadias phenotypes and for quantifying the risk of UC. We have also identified an association between mGMS severity scores groups and UC rates. Boys in the severe mGMS score category had a four-fold higher complication rate than those with mild hypospadias phenotype. This information can be useful for managing parental expectations during discussion of surgical risks at preoperative consultation.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/156

MP-6.3
Pain outcomes in pediatric circumcision patients after administration of ketorolac as a preoperative adjunct therapy

Alec Mitchell[1], Adam Spencer[1], Andrew Walker[1], Mary Brindle[1], Anthony J. Cook[1], Carolina Fermin Risso[1], Bryce A. Weber[1]
[1]Division of Urology, University of Calgary, Calgary, AB, Canada

Introduction: Circumcision is a common surgical intervention in children. Controlling postoperative pain is essential to decrease patient morbidity and improve patient and parent satisfaction. With current analgesia practices, pediatric surgical patients are often at risk of being undertreated for postoperative pain.[1] Ketorolac is an effective non-steroidal anti-inflammatory drug (NSAID) that is able to provide an analgesic effect comparable to opioids, without postoperative nausea and vomiting.[2]

Methods: We conducted a prospective, randomized, single-blinded study from February 2017 to July 2018. Patients with planned circumcision surgery were initially identified by the surgeon and randomized into treatment (perioperative ketorolac) or control groups (no ketorolac). The anesthesiologist injected the study medication (ketorolac vs. normal saline) prior to surgical incision. Patients in the treatment group received a 0.5 mg/kg (maximum 30 mg) intravenous dose of ketorolac. Postoperative pain was evaluated through the use of the Face, Legs, Activity, Cry, Consolability (FLACC) or numeric rating scale (NRS). Parents were contacted 24 hours following their surgery to complete the Parents' Postoperative Pain Measure (PPPM).

Results: Twenty-nine patients were enrolled in this pilot study. Fifteen patients were assigned to the control group and 14 to the treatment group. Neither the FLACC scale or NRS displayed statistical significance. Post-discharge, the PPPM for the control group was 4.0 (0–8) and for the treatment group was 1.0 (0–2.5) (p=0.010).
Conclusions: With just a single dose of ketorolac given intraoperatively, parental perception of pain was significantly lower in the ketorolac group when compared to the control. To better delineate these results, we are moving forward with enrollment for a randomized controlled at Alberta Children's Hospital, aiming to further evaluate the use of ketorolac as an adjunct analgesic in pediatric patients.
References
1. American Society of Anesthesiologists Task Force on Acute Pain Management. Practice guidelines for acute pain management in the perioperative setting: An updated report by the American Society of Anesthesiologists Task Force on Acute Pain Management. *Anesthesiology* 2012;116: 248-73. https://doi.org/10.1097/ALN.0b013e31823c1030
2. Ketorolac compound summary. Pubchem Substance Website. National Center for Biotechnology, US National Library of Medicine. Available at: http://pubchem.ncbi.nlm.nih.gov/compound/3826. Accessed June 24, 2015.

MP-6.4
Challenging the status quo: A prospective study of early discontinuation of continuous antibiotic prophylaxis in children with vesicoureteral reflux

Catherine Lovatt[1], Melissa McGrath[2], Smruthi Ramesh[2], Alanna Webster[1], Kornelia Palczek[2], Luis H. Braga[1,2]
[1]Surgery, McMaster Children's Hospital, Hamilton, ON, Canada; [2]Surgery, McMaster University, Hamilton, ON, Canada
Introduction: Continuous antibiotic prophylaxis (CAP) has been recommended for children with vesicoureteral reflux (VUR) until toilet-training to prevent urinary tract infections (UTI). We had the chance to investigate this concept at our institution by prospectively following two cohorts managed by two surgeons with differing practices regarding the age of CAP discontinuation (CAP-DC). Our objective was to compare febrile (f) UTI rates between these two cohorts. We hypothesized that UTI rates would be similar for both cohorts, with the early CAP-DC group having a more favourable antibiotic resistance profile.
Methods: We prospectively followed two cohorts of patients with primary VUR (0–18 years) from 2009–2018 (n=275): CAP-DC occurred at 12–18 months of age in cohort 1 and at toilet-training age (24–36 months) in cohort 2. Age at and mode of presentation, gender, VUR and hydronephrosis (HN) grades, ureteral dilation, UTI and surgery rates, and followup time were collected. Our primary outcome was development of fUTI post-CAP-DC in both groups. We performed subgroup analyses to determine risk factors for UTI post-CAP-DC in both cohorts. Statistical analyses consisted of Chi-square for categorical data and t-tests for continuous variables.
Results: Of 275 patients, 174 (63%) (cohort 1) stopped CAP at a mean age of 16 months interquartile range [IQR] 11) and 101 (37%) (cohort 2) at 27 months (IQR 25). Patient characteristics are shown in Table 1. The median ages at presentation were 10.4 (IQR 7) and 7 (IQR 16) months for cohort 1 and 2, respectively. Followup was 40+26 months for cohort 1 vs. 54+34 months for cohort 2 (p<0.01). There were more patients with dilating VUR (3–5) (152/174, 87%) in cohort 1 vs. cohort 2 (80/101, 79%) (p=0.05). A total of 32 patients developed UTI post-CAP-DC (19/174 [11%] vs. 13/101 [13%]; p=0.63] and the mean time to the development of UTI post-CAP-DC was 7+8 months for cohort 1 vs. 14+20 months for cohort 2 (p=0.19) (Table 2). Both groups had similar rates of VUR-correcting surgery (25% vs. 24% for cohort 1 and 2, respectively).
Conclusions: Stopping CAP in VUR children at a median age of 16 months did not result in more UTIs when compared to the traditional approach. By adopting such a strategy, duration of antibiotic exposure may be decreased without adversely increasing UTI rates. Discontinuation of CAP early may be more beneficial for males, as 75% of patients who had UTIs post-CAP-DC were females and had more frequent bladder bowel dysfunction and dilating VUR.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/158

MP-6.5
Voiding cystourethrograms for infants with isolated high-grade prenatal hydronephrosis and hydroureteronephrosis without a history of previous urinary tract infection: Is it really necessary?

George Goucher[1], Melissa McGrath[1], Alanna Webster[1], Luis H. Braga[1]
[1]Urology, McMaster University, Hamilton, ON, Canada
Introduction: Several guidelines have been published in an attempt to standardize the use of voiding cystourethrogram (VCUG) to identify those at a higher risk of recurrent urinary tract infections (UTI). There remains a lack of uniformity in this practice, particularly in infants without prior history of UTI. Here, we evaluate the yield of vesicoureteral reflux (VUR) detection on VCUG and determine the risk of subsequent febrile UTIs and the need for surgical intervention to assess the clinical utility of this test.
Methods: We reviewed our prospectively collected prenatal hydronephrosis database of patients 0–12 months from 2008–2018, including those with Society of Fetal Ultrasound (SFU) III/IV or urinary tract dilation (UTD) grade II/III without a previous history of UTI who underwent VCUG. Rates of subsequent febrile UTI and surgical intervention were compared between those in whom VUR was detected and those in whom it was absent. Results were stratified between those with isolated HN and those with hydroureteronephrosis (HUN).
Results: A total of 306 patients were included for analyses: 193 (63.1%) with isolated HN and 113 (36.9%) with HUN. VUR was detected on VGUG more often in patients with HUN (28.3%) than int hose with isolated HN (9.3%) (p<0.001). The overall rate of febrile UTI was low (7.1%); however, those with VUR detected on VCUG with HUN were more likely to experience febrile UTIs then those without VUR (12.5% vs. 3.7%; p=0.015). This association was not found in the isolated HN group. Patients in the isolated HN group were more likely to require surgical intervention (40.8% vs. 20.3%).
Conclusions: The rate of VUR detection was significantly higher in patients with HUN compared to HN, and only in infants with HUN was VUR detection correlated with an increased risk of febrile UTI. This study would suggest that the clinical utility of VCUG was greater in those with HUN compared to those with HN. Reviewing current guidelines could prevent unnecessary testing, radiation exposure, and lead to costs savings.

MP-6.6
Bladder Bowel Dysfunction Scorings System (BBDSS): A new questionnaire for evaluation of voiding dysfunction in children

Amr Hodhod[1], Tuan Hoang [1], Mohamed El-Sherbiny[1], J.-P. Capolicchio[1], Roman Jednak[1]
[1]Pediatric Urology, McGill University Health Centre, Montréal, QC, Canada
Introduction: Most published questionnaires are long and time-consuming, and constipation is evaluated by one or a few questions that may be considered vague for many parents. Poor information about a child's bowel habits could lead to inappropriate management of the underlying problem. We evaluated the reliability and validity of a newly illustrated questionnaire (Bladder Bowel Dysfunction Symptom Score [BBDSS) in the assessment of overactive bladder (OAB)/bladder bowel dysfunction (BBD) (Fig. 1).
Methods: The BBDSS questionnaire consisted of 12 structured questions. The questionnaire is designed with two groups of questions: one to evaluate the bladder symptoms and the other to assess the bowel dysfunction (according to ROME criteria 4) during the last month. Every answer had a specific score related to the condition severity. We prospectively collected untreated patients who were referred to our voiding dysfunction clinic for the first time. A control group of healthy children was recruited to assess the reliability of the BBDSS. The provisional diagnosis was collected from patients' charts at the time presentation.

Results: The questionnaire was administrated by 92 children (44 in the diseased group and 48 in the control group). The age at presentation was similar in both groups (117 months). The mean total score for the diseased group was 8.7 (3–14) while it was 1.19 (0–5) for the control group ($p<0.001$). There was a strong correlation between the total BBDSS score and both groups ($r=0.88$; $p<0.001$). Using the ROC curve, the BBDSS showed to be an excellent tool in differentiating normal and diseased patients (area under the curve [AUC] 0.98; $p<0.001$) (Fig. 2a). When total BBDSS was ≥6, the positive predictive value was 1, while the negative predictive value was 0.89. The defecation part of the BBDSS was a good tool in differentiating OAB from BBD patients (AUC 0.89; $p<0.001$) (Fig. 2b). No patient with OAB had a bowel score >3.

Conclusions: The BBDSS is a reliable and valid instrument in BBD/OAB diagnosis. The questionnaire was easily administrated by parents or children. Moreover, it can differentiate between OAB and BBD.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/160

MP-6.7

Identifying systems delays in the assessment, diagnosis, and operative management of testicular torsion at a Canadian tertiary care centre

Ernest Chan[1], Zhan Tao (Peter) Wang[1,2], Frank Myslik[3], Hanny Chen[5], Sumit Dave[1,2,4]

[1]Department of Surgery, Division of Urology, Schulich School of Medicine & Dentistry, London, ON, Canada; [2]Department of Surgery, Division of Paediatric Surgery, Schulich School of Medicine & Dentistry, London, ON, Canada; [3]Department of Medicine, Division of Emergency Medicine, Schulich School of Medicine & Dentistry, London, ON, Canada; [4]Department of Pediatrics, Schulich School of Medicine & Dentistry, London, ON, Canada; [5]Schulich School of Medicine & Dentistry, London, ON, Canada

Introduction: Testicular torsion (TT) is a common pediatric urological emergency. Management of TT is time-sensitive, and often confirmed on Doppler ultrasound (DUS). Acquiring DUS, however, can result in delays in the management of TT, affecting testicular salvage rates. The objective of this study was to identify delays in the assessment and diagnosis for patients presenting with TT to a Canadian academic hospital using patient flow analysis.

Methods: A retrospective review was performed for patients presenting to our emergency department (ED) who received a scrotal DUS to rule out possible TT from 2012–2017. Our primary outcome measured cycle-time measurements (median time) between different points along the clinical flow pathway for a patient with suspected TT. The secondary outcome assessed diagnostic sensitivity and specificity, as well as positive (PPV) and negative predictive values of standard scrotal DUS.

Results: A total of 609 patients presented with an acute scrotum warranting DUS to rule out TT, of which 46 underwent scrotal exploration. Testicular salvage rate was 82.6% (38 testes were salvaged, eight underwent orchiectomy). Median time from onset of symptoms to presentation to the ED for patients with possible TT was four hours. Following triage, a median of 79.8 minutes was required for emergency physician assessment and an additional 48 minutes for DUS to be performed. Absence of Doppler flow on scrotal DUS had a 97.4% PPV for diagnosing TT confirmed during scrotal exploration.

Conclusions: Patient flow delays to surgical intervention for patients with TT represents a preventable cause of orchiectomy in young men. This study identifies intervention points in patient care flow pathways where delays to surgical intervention can be up to two hours. This represents an opportunity for use of point-of-care ultrasound (POCUS), a previously validated tool[1] that can aid in the earlier diagnosis of TT. Our findings support the need for further investigation of POCUS to replace DUS to expedite the diagnosis of TT.

Reference

1. Yagil Y, Naroditsky I, Milhem J, et al. Role of Doppler ultrasonography in the triage of acute scrotum in the emergency department. *J Ultrasound Med* 2010;29:11-21. https://doi.org/10.7863/jum.2010.29.1.11

MP-6.8

Nephrolith-nothing: Clearing-up the 'possible kidney stone' conundrum on abdominal ultrasounds in pediatric patients

Kristen McAlpine[1,2,3], Raees Cassim[3], Khaldoun Koujok[3,4], Luke T. Lavallée[1,3,5], Carl van Walraven[3,5,6], Michael Leonard[2,3], Luis Guerra[2,3], Melise Keays[2,3]

[1]Division of Urology, The Ottawa Hospital, Ottawa, ON, Canada; [2]Division of Urology, Children's Hospital of Eastern Ontario, Ottawa, ON, Canada; [3]University of Ottawa, Ottawa, ON, Canada; [4]Department of Diagnostic Imaging, Children's Hospital of Eastern Ontario, Ottawa, ON, Canada; [5]Ottawa Hospital Research Institute, Ottawa, ON, Canada; [6]Department of Medicine, The Ottawa Hospital, Ottawa, ON, Canada

Introduction: Ultrasound (US) is the primary imaging modality to detect urolithiasis in children. Small calcifications on US that lack posterior shadowing or twinkling artifact are frequently reported as 'possible stones.' Little is known regarding the clinical significance of this imaging finding. We sought to determine the radiologic and clinical outcomes of patients with an US reporting a possible stone to guide future practice.

Methods: Transcribed radiology reports for all patients at our pediatric tertiary care centre receiving an abdominal US between 2011 and 2016 were searched using key terms for kidney stones. Identified studies were manually reviewed and studies where a radiologist expressed uncertainty regarding the diagnosis of kidney stones were included in this study. Images of possible stones were reviewed to obtain characteristics, including size, location, presence of shadowing, or twinkle artifact. Demographic and clinical information was collected for each patient. Followup imaging reports and clinical information were reviewed to determine outcome.

Results: Of 51 518 abdominal US performed during the study period, 124 reports were flagged for possible stones (0.2%). Inclusion criteria were met by 98 reports representing 93 patients. Mean size of possible stones was 3 mm. Mean and median patient age were 2 and 5.8 years, respectively. Followup imaging was available for 85% of patients. Resolution of the possible calculus was seen in 61% by an average of 13 months. Twenty-two patients (24%) had followup US with persistent possible stones. Most patients had seen a urologist and/or nephrologist (77%). None required intervention.

Conclusions: In our series, radiologists commented on a possible kidney stone in 1/500 abdominal US. More than half of the possible stones resolved, indicating stone passage or resolution of an insignificant finding. Given the high rate of persistence on US, we suggest a one-year followup US for possible stones.

MP-6.9

Validation of hydronephrosis severity score in a larger prospective database

Smruthi Ramesh[1], Melissa McGrath[1], Kornelia Palczek[1], Catherine Lovatt[2], Luis H. Braga[1,2]

[1]Surgery, McMaster University, Hamilton, ON, Canada; [2]Surgery, McMaster Children's Hospital, Hamilton, ON, Canada

Introduction: The hydronephrosis severity score (HSS), which relies on Society for Fetal Urology (SFU) hydronephrosis (HN) grades, differential renal function (DRF), and drainage curve patterns, was previously described to assess the severity of ureteropelvic junction obstruction (UPJO)-like cases and the likelihood of surgical intervention.[1] Herein, we sought to validate this scoring system in our prenatal hydronephrosis (PHN) population with UPJO-like cases, specifically looking at identifying better cutoffs to predict which patients would be more likely to undergo pyeloplasty.

Methods: A prospectively collected PHN database was reviewed to extract UPJO-like patients. Children with vesicoureteral reflux (VUR), primary megaureter, bilateral HN, and other associated anomalies were excluded. Only patients who had ultrasound and MAG-3 renal scan at a minimum of two time points were included. HSS was calculated at the initial, interim, and last followup clinic visits. Scores were analyzed regarding its usefulness to predict which patients would be more likely to undergo pyeloplasty.

Results: Of 167 patients, 131(78%) were male, 119 (71%) had left UPJO-like, and 113 (67%) had a pyeloplasty. The median age at baseline was

two months (interquartile range [IQR] 1–4). According to initial (first clinic visit) HSS, 5/36 (14%) patients with a 0–4 score, 93/116 (80%) with a 5–8 score, and 15/15 (100%) with a 9–12 score underwent pyeloplasty, respectively (p<0.01) (Table 1). When HSS cutoff values were changed to mild (0–3), moderate (4–6), and severe (7–12), the modified mild group was more representative of a true low-risk category, with no patients requiring surgery, and the new severe group included 98% of patients who had pyeloplasty (Table 2). The modified risk categories allowed for proper discrimination between patients who can be discharged, those who require monitoring, and those who would undergo pyeloplasty (p<0.01) (Fig. 1).

Conclusions: The new proposed HHS system for UPJO-like patients is reproducible; however, cutoff values need to be reassessed to accurately reflect true risk categories, as the purpose of this system is to differentiate those who have UPJO severe enough to require intervention from those who can be managed conservatively. Changing risk groups to mild (0–3), moderate (4–6), and severe (7–12) allowed for better discrimination between patients who would undergo surgical intervention from those who no longer needed monitoring.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/163

Reference

1. Babu R, Venkatachalapathy E, Sai V. Hydronephrosis severity score: An objective assessment of hydronephrosis severity in children — a preliminary report. *J Pediatr Urol* 2019;15:68.e1-68.e6. https://doi.org/10.1016/j.jpurol.2018.09.020

MP-6.11

Healthcare resource utilization: Cost associated with the variability among Canadian pediatric urologists and pediatric surgeons in the rate of hernia sac submission for pathology examination

Min Joon Lee[1,2], Jin K. Kim[1,2], Martha Pokarowski[1], Patricia Mitton[3], Andreea Popescu[3], Amre Kesavan[1], Mitchell Shiff[1], Catherine Chung[4], Jacob Langer[5], Joseph Milner[3], Armando J. Lorenzo[1], Martin A. Koyle[1]

[1]Department of Urology, Hospital for Sick Children, Toronto, ON, Canada; [2]Faculty of Medicine, University of Toronto, Toronto, ON, Canada; [3]Rotman School of Management, University of Toronto, Toronto, ON, Canada; [4]Department of Pathology, Hospital for Sick Children, Toronto, ON, Canada; [5]Department of Surgery, Hospital for Sick Children, Toronto, ON, Canada

Introduction: Inguinal hernia and hydrocele (IHH) are among the most common pediatric conditions that are surgically managed by both pediatric urologists (U) and pediatric surgeons (S). Despite extensive studies on surgical approaches and outcomes, little is known about how U and S approach healthcare resource utilization when treating pediatric IHH. Here, we assessed the variability in the rate of submission of hernia sacs for pathological evaluation among U and S following IHH repair at a tertiary pediatric referral centre. The value of routine hernia sac examination was evaluated using a cost-effectiveness analysis for each physician group practice to optimize the use of medical resources.

Methods: A retrospective chart review was performed for patients who underwent unilateral or bilateral inguinal hernia (IH) and/or hydrocele (H) repair at the Hospital for Sick Children, Toronto, Canada, between January 2015 and January 2018. Descriptive statistical analysis was performed for all the variables collected for the study. Multiple linear regressions were performed to evaluate the factors associated with hernia sac submissions and abnormal findings.

Results: A total of 1074 IH patients were identified, from which 922 (86%) and 152 (14%) were managed by S and U, respectively. Younger patients (p<0.001) and more females (p=0.005) were seen by S than U. A total of 157 H patients were identified, from which 95 (61%) and 62 (39%) were managed by S and U, respectively. A greater number of patients operated by S (n=441) underwent hernia sac analysis than those by U (n=5) (p<0.001). Of 531 specimens evaluated, 97% were normal. No malignancy was detected, and other findings did not change clinical management. The total direct cost of analyzing specimens during the study period was approximately $30 798 CAD, an average cost of $10 266 CAD annually. The cost-effectiveness for patients managed by U was determined to be $51.97 per case, while the cost-effectiveness for those managed by S was significantly higher at $1025.58 per case.

Conclusions: Compared to U, many S submitted hernia sacs for pathology examination despite significant costs and predominantly non-significant findings with pediatric IHH repair. Hernia sac evaluation should, therefore, be reserved for patients with a high clinical suspicion of injuries or abnormalities.

MP-6.12

A case-control study on the first reported successful use of magnetic stents in pediatric populations

Alec Mitchell[1], Stéphane J. Bolduc[2], Katherine Moore[2], Anthony J. Cook[1], Carolina Fermin Risso[1], Bryce A. Weber[1]

[1]Division of Urology, Alberta Children's Hospital, Calgary, AB, Canada; [2]Division of Urology, CHU de Québec-Université Laval, Québec City, QC, Canada

Introduction: Ureteral stents with magnetic tips were recently approved for use in Canada. To our knowledge, this is the first published evidence of their use in pediatric patients. Traditionally, pediatric stent insertion and removal are performed under general anesthetic (GA). However, there exists debate as to the safety of using GA in pediatric populations.[1,2] As well, operating room (OR) costs are continually rising; it's been estimated at over $62/minute.[3] Therefore, magnetic stents have three main benefits in pediatric patients: reduced GA exposure, cost savings, and decreased OR time.

Methods: This study was a proof of concept pilot, and ran from May 2017 to May 2018 to demonstrate the safety and efficacy of magnetic stents in pediatric patients. Patients undergoing ureteroscopy, ureteric re-implantation, and pyeloplasty with simultaneous magnetic stent insertion were included. Forty patients had regular double J stents removed under anesthesia and served as control cases. Forty patients had magnetic double J stents at initial surgery at two different sites, CHU de Québec and Alberta Children's Hospital.

Results: Overall, 39 magnetic stents were successfully retrieved without general anesthetic, representing a retrieval failure rate of only 2.5%. Additionally, the rate of complications between the control group and the treatment group was not statistically different. Lastly, as seen in the control group, each retrieval took 30 minutes of OR time, which is saved in magnetic retrieval.

Conclusions: This study represents the first report of successful use of magnetic stents in pediatric patients. Thirty-nine of our 40 patients were able to avoid OR time, translating to 2.5 days of freed-up OR. Additionally, as the cost of OR time has been estimated at $62/minute, this means over $1800 is saved per stent removal. Lastly, as the developmental effects of GA are not fully understood, additional exposure is avoided.

References

1. Mellon RD, Simone AF, Rappaport BA. Use of anesthetic agents in neonates and young children. *Anesth Analg* 2007;104:509-20. https://doi.org/10.1213/01.ane.0000255729.96438.b0
2. Dimaggio C, Sun LS, Kakavouli A, et al. A retrospective cohort study of the association of anesthesia and hernia repair surgery with behavioural and developmental disorders in young children. *J Neurosurg Anesthesiol* 2009;21:286-91. https://doi.org/10.1097/ANA.0b013e3181a71f11
3. Chang RS, Liang HL, Huang JS, et al. Fluoroscopic guidance of retrograde exchange of ureteral stents in women. *AJR Am J Roentgenol* 2008;190:1665-70. https://doi.org/10.2214/AJR.07.3216

MP-6.13

Bowel bladder dysfunction: Should primary care providers be doing more?

Jonathan V. Riddell[1], Melanie P. Fortin[2], Lawrence J. Becht[2], John F. Buczek[2], Ranya A. Hamdan[2], Matthew D. Mason[1]

[1]Pediatric Urology, SUNY - Upstate Medical University, Syracuse, NY, United States; [2]Physician Assistant Program, LeMoyne College, Syracuse, NY, United States

Introduction: Bowel-bladder dysfunction (BBD) accounts for up to 40% of referrals to pediatric urology; however, this entity can be reasonably

diagnosed and treated at the primary care level. While BBD has been recently defined in the literature, research and education at the primary care level are sparse. The purpose of this study is to assess the nature of BBD referrals to pediatric urologists and determine what proportion of these referrals could be appropriately dealt with at the primary care level.
Methods: Retrospective review of all new referrals to a tertiary care urology practice was conducted from January 1, 2018 to June 30, 2018. All cases of BBD in children aged 4–12 years were identified on the basis of ICD-10 code K59.04 after history, physical exam, and Vancouver questionnaire. Primary outcome variables included: 1) overt identification of BBD at time of referral; 2) pre-referral initiation of bowel treatment; and 3) the need for specialty intervention. Other data included the referral provider type, setting, and diagnosis, as well as the presence of essential BBD evaluation criteria in the referring provider's note (see essential elements, Table 1).
Results: A total of 190 patients met our criteria (Fig. 1), none of whom were identified at the time of referral as having BBD; 77% had not received any form of bowel treatment, and only 7% required specialist intervention. Referral provider type and setting were not predictive of the pre-referral initiation of bowel treatment or the need for specialist intervention (Table 2). Thoroughness of the pre-referral evaluation was the only factor that predicted the initiation of bowel treatment ($p<0.001$). The odds of receiving bowel treatment increased by 3.2X and 8.7X, respectively, when three or four of the essential evaluation criteria were met. In terms of specialty intervention, 11 patients required voiding cystourethrogram and two meatotomy. For specialty intervention, the only predictive factor was referral diagnosis; a non-voiding dysfunction diagnosis was 35X more likely to require specialist intervention ($p<0.001$), and dysuria 7X more likely ($p=0.01$) than a voiding dysfunction diagnosis.
Conclusions: In addition to the high prevalence of BBD in referrals to pediatric urologists, there appears to be a lack of association between urinary symptoms and constipation, the cornerstone of the BBD diagnosis. While a thorough pre-referral evaluation can result in constipation treatment, this is likely system-based rather than recognition of underlying cause and effect. The vast majority (>90%) of BBD patients do not require specialized care. These conclusions necessitate more comprehensive BBD education for primary care providers.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/167

MP-6.14
Tubularized incised plate repair complications: How low can we go?
Fadi Zu'bi[1], Michael Chua[1], Mitchell Shiff[1], Ali El Ghazzaoui[1], Mandy Rickard[1], Anne Sophie Blais[1], Walid Farhat[1]
[1]Division of Urology, The Hospital for Sick Children, Toronto, ON, Canada
Introduction: Hypospadias complications has been a heavily published topic, resulting in many well-known contributing classic risk factors. A seemingly obvious contributing factor would be the experience of the surgeon, hypothesizing that more complications occur with less surgeries performed. Herein, we review the experience of a single surgeon with distal tubularized incised plate (TIP) repairs in an academic institution. Our objective was to determine the number of cases, operative time (OT), and complications, and identify the lowest achievable complication rate (CR), hypothesizing that complication rates and duration of cases would be lower with higher volumes.
Methods: We reviewed all distal TIP repairs of a single surgeon from 2001–2017. Collected data included: age, meatal location, OT, development of complications, and followup duration. A cumulative sum control chart was used to determine trends in the CR and OT over the study period. In order to account for surgical experience with time, the highest peak in both OT and CR was identified on the plot and was set as the transition point between learning phase (1) and experienced phase (2).
Results: During the study period, 571 children underwent distal TIP repairs. Patient characteristics are summarized in Table 1. The peak for OT and CR was at the 239th and 273rd cases, respectively (Fig. 1). The median OT in phase 1 was 74 minutes (interquartile range [IQR] 61–88), which was significantly higher than phase 2, where the median OT was 62 minutes (53–77) ($p< 0.0001$). The CR in phase 1 was significantly higher than in phase 2 (27.5% vs; 11.4%; $p<0.0001$). Seemingly, there was no correlation between the OT and CR in phase 2. Hence, decreasing OT had no impact on the outcome.
Conclusions: Despite a standardized approach by a single surgeon, complications after TIP repair do occur. In this study, the lowest achievable complication rate after distal hypospadias repair, after the learning curve had been achieved, was 11.4%. It is evident that as surgeon experiences increases, OT decreases, but in our hands, complications continue and are not as low as reported.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/168

MP-6.15
1000 hypospadias repairs: Have we been overlooking important extrinsic risk factors?
Fadi Zu'bi[1], Michael Chua[1], Mitchell Shiff[1], Mandy Rickard[1], Ali El Ghazzaoui[1], Anne Sophie Blais[1], Walid Farhat[1]
[1]Division of Urology, The Hospital for Sick Children, Toronto, ON, Canada
Introduction: Hypospadias repair is considered the trademark of pediatric urology, however, there continues to be controversy surrounding techniques and causes of complications. Extrinsic risk factors, including surgeons' experience, trainee factors (early vs. late in academic year), and even time of day (early vs. late or fatigue factor) that could impact outcomes are less clear. Herein, we examine the impact of these potential extrinsic risk factors on the outcome of hypospadias.
Methods: We reviewed our single-surgeon cohort of children undergoing primary hypospadias repair from 2001–2017. The following variables were extracted: age, severity, curvature, surgical technique, type of sutures, academic period, time of day (AM vs. PM), use of skin glue, type of regional block, type of urethral stent, and postoperative outcomes. Complications were defined as any outcome necessitating a surgical reintervention. Patients were divided into five equal clusters in a chronological manner. We performed univariate analysis, and multivariate logistic regression was done for the significant variables noted on univariate analysis.
Results: A total of 1021 children underwent primary hypospadias repair; we excluded 69 who were lost to followup. Age at surgery was 12 months (interquartile range [IQR] 9.0–19), and followup was 20 months (IQR 3–48). Patient characteristics are summarized in Table 1. Multivariable analysis showed that hypospadias severity and the presence of curvature were the only factors associated with re-operation. Re-operation rate was not different among children who underwent hypospadias repair at the start vs. end of the academic year, nor whether it occurred in the AM vs. PM cases (Table 2).
Conclusions: Our data suggest that despite inevitable practice changes, hypospadias severity and the presence of curvature are the only independent predictive factors for reoperation, which is in keeping with previous studies. In our series, the evolution of surgical technique had no impact on outcomes, nor did trainee and fatigue factors.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/169

UP-6.1
Induced pluripotent stem cells as an alternative source of epithelial and mesenchymal cells for reconstruction of urological tissues by tissue engineering
Christophe Caneparo[1], Stéphane Chabaud[1], Geneviève Bernard[1], Stéphane J. Bolduc[1]
[1]Surgery, CHU de Québec-Université Laval Research Centre, Québec City, QC, Canada
CUA-Astellas Research Grant
Introduction: To reduce complications resulting from enterocystoplasties, we generated a bladder mucosa model where bladder fibroblasts secrete and assemble their own scaffold. The uroepithelial cells (UC) seeded on this construct differentiate appropriately, creating a barrier function. Nevertheless, we used cells from healthy patients while tissue-specific primary cells may be absent or diseased in some patients. Moreover,

taking a biopsy is an invasive process for patients, which could result in comorbidities. To circumvent these issues, induced pluripotent stem (iPS) cells could be an alternative cell source. iPS cells are differentiated somatic cells reprogrammed to acquire embryonic stem cell-like properties. The iPS cells can be indefinitely expanded, providing large amounts of cells able to differentiate into all lineages needed for tissue-engineered constructs.

Methods: Reprogrammed iPS obtained either from urine, blood, or skin samples, were treated for five days by a mixture in order to obtain definitive endoderm (DE) cells. The expression of markers of DE cells (Sox17 and FoxA2) was verified. Double-positive cells were then treated for six days with another mixture or with UC-conditioned medium (UCM) to induce the cells into UC progenitors. Expression and localization of K8/18 were then checked using 2D cultures. Reconstruction of 3D models was done to assess the potential of the induced cells.

Results: The Activin A/Wortmanin mix for five days provided the best results to obtain DE cells. The cells treated with UCM showed high similarity with the original UC culture and presented a high degree of differentiation on 3D models. The origin of the iPS did not impact the final result, but a larger number of cells were obtained when extracted from blood samples.

Conclusions: The iPS cells could be used to reconstruct human-derived 3D urological tissues by tissue engineering. Further studies, e.g., graft on animals, are needed to confirm the safety of the technique.

UP-6.2

A tailored surgical approach to the palpable undescended testis

Amos Neheman[1], Max Levitt[2], Zvi Steiner[3]
[1]Department of Urology, Division of Pediatric Urology, Assaf Harofeh Medical Center, Tzrifin, Israel; [2]Division of Urology, University of Ottawa, Ottawa, ON, Canada; [3]Department of Urology, Meir Medical Centre, Kefar Saba, Israel.

Introduction: Orchiopexy for a palpable undescended testis can be approached through a traditional inguinal incision or trans-scrotally. Despite the possible advantages of the scrotal approach, including reduced postoperative pain and shorter recovery, it is not consistently advocated. The objective of this study was to present the experience with a tailored approach to orchiopexy based on physical findings.

Methods: The mobility of the testis as described at examination under anesthesia informs the choice of surgical approach. If a 'low' palpable testis (defined as the testis that can be manipulated to the scrotum) was found, a scrotal approach was used. In cases of 'high' palpable testis (the testis that cannot be manipulated to scrotum), the inguinal approach was used. Success was defined by location and size of the testis three months after surgery.

Results: A total of 259 orchiopexies were performed in 181 boys (78 bilateral). Scrotal approach was used in 125 (48%) and inguinal in 134 (52%) orchiopexies. Operative time was significantly shorter for the scrotal approach, 25 minutes vs. 40 minutes for inguinal orchiopexy ($p<0.05$). The overall success rate was 98% with no statistical difference between the groups. Three children from the inguinal group and two from the scrotal group required an additional procedure for persistent undescended testis. The rates of testicular atrophy and hypotrophic testis were higher in the inguinal group than the scrotal group (5/134 vs. 0/125; $p<0.05$ and 17/134 vs. 6/126; $p<0.05$, respectively).

Conclusions: This tailored approach to a palpable undescended testis appears simple, safe, and effective, providing high success rate with marginal complications. It is considered a preference in cases of low undescended testis, whereas the standard two-incision inguinal orchiopexy may better serve those with high undescended testis.

UP-6.3

Can the urinary tract dilation classification system be more helpful than the Society of Fetal Ultrasound system for vesicoureteral reflux patients?

Amr Hodhod[1], J.-P. Capolicchio[1], Roman Jednak[1], Mohamed El-Sherbiny[1]
[1]Pediatric Urology, McGill University Health Centre, Montréal, QC, Canada

Introduction: The urinary tract dilation (UTD) classification system was introduced in 2014 to categorize congenital hydronephrosis regarding the risk of developing complications like febrile urinary tract infection (fUTI) or surgery. In the current study, we tried to evaluate the ability of the UTD system to categorize vesicoureteral reflux (VUR) according to the risk of developing fUTI or undergoing surgical interventions.

Methods: We retrospectively reviewed patients' charts who had antenatal hydronephrosis from 2008–2016. Only patients who were diagnosed with VUR were recruited. We collected patients' characteristics. Moreover, the grade of VUR, followup period, fUTI occurrence, and surgical interventions were collected. We graded hydronephrosis using both the Society for Fetal Urology (SFU) and UTD grading systems. Thereafter, we compared the ability of both grading systems to categorize VUR regarding the occurrence of fUTI or surgical interventions (clinically significant VUR).

Results: We recruited 64 patients with 89 refluxing renal units. Patient demographics are presented in Table 1. Notably, 70.8% (63/89) of VURs were categorized as UTD P2 or P3 in comparison with 34.8% (31/89) that were considered as SFU grade 3 or 4 ($p<0.001$). Of total included VURs, 35/89 (39.3%) units had high-grade VUR (HG-VUR). Nineteen HG-VURs (54.3%) were considered as SFU grade 3 or 4, while 32 HG-VURs (91.4%) were considered UTD P2 or P3 ($p<0.001$). During a median followup of 42.9 months, 29 patients with 44 VUR units developed fUTI. Of these units, 39/44 units (88.6%) were graded as UTD P2 or P3, while only 18/44 VURs (40.9%) were graded as SFU grade 3 or 4 ($p<0.001$) (Table 2). Regarding surgical interventions (23 VURs), 95.7% were either P2 or P3, while only 13/23 (56.5%) VURs were either SFU grade 3 or 4 ($p=0.002$) (Table 2). Of surgically managed VURs, 20 units had surgical interventions due to recurrent fUTI while three units were operated due to worsening hydronephrosis.

Conclusions: The UTD system was able to classify more than 90% of HG-VUR as moderate or high-risk hydronephrosis (P2 or P3). Moreover, either UTD P 2 or 3 were the hydronephrosis grade for 88.6% of VURs that experienced fUTI and 95.7% that underwent surgical interventions.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/171

UP-6.4

How far are they coming from?

Samuel Otis-Chapados[1], Karolane Coderre[1], Stéphane J. Bolduc[1], Katherine Moore[1]
[1]Urology, CHU de Québec - Université Laval, Québec City, QC, Canada

Introduction: In the province of Québec, eight pediatric urologists practice in three tertiary centres. Each centre covers a large territory. As part of an effort to improve the availability of pediatric urology to distant families and reduce the economic burden on those families, we examined the chart of all patients attending the pediatric urological outpatient clinic in a one-year period. Our objectives were to evaluate the distance travelled by each pediatric patient visiting the outpatient urology clinic and to report the most frequent urological referral complains.

Methods: From July 2016 to June 2017, we retrospectively reviewed the charts of all the 3609 pediatric patients seen in the outpatient urological clinic in CHU de Québec. We specifically focused on the travelling distance covered by families and the purpose of referral.

Results: Most patients were boys (78%) and the mean age was 7.2 years. The average one-way distance traveled by each family was 69 km. The patients came more frequently from Capitale-Nationale (64%) and Chaudière-Appalaches (22%), the closest regions. In smaller proportions, 124 patients (3,46%) came from Saguenay-Lac-St-Jean and about 200 children came from either Bas-St-Laurent-Gaspésie (3,67%) or Mauricie (3%). The most common reasons for consultations were postoperative followups (15%), phimosis and adherence (14%), enuresia (14%), hydronephrosis

(13%), micturition disorder (11%), and cryptorchidism and retractile testicles (8%). Of all patients seen for phimosis or cryptorchidism, only 24% and 36% of them, respectively, were scheduled for surgery.
Conclusions: Phimosis, cryptorchidism, and voiding disorders were the most frequent pediatric urological reasons for consultation. Continuing medical education for the primary care providers is worthwhile and would save families unnecessary travelling. It would, perhaps, be more beneficial for all to have the pediatric urologists travelling to perform clinics and surgeries in distant regions to save more than 300 km round trip for several families.

UP-6.5

Amniocentesis performance for genetic disorders in fetuses with isolated ultrasonographic urological abnormalities

Samuel Otis-Chapados[1], Katherine Moore[1], Kathy Gouin[2], Jean Gekas[2]
[1]Pediatric Urology, CHU de Québec (CHUL) - Université Laval, Québec City, QC, Canada; [2]Mother and Child Centre, CHU de Québec - Université Laval Research Centre, Québec City, QC, Canada

Introduction: Hydronephrosis is one of the most common anomalies detected prenatally. We aimed to determine the association between genetic disorders and frequent urological abnormalities found on prenatal ultrasonography and to determine whether invasive diagnostic techniques, like amniocentesis with standard karyotype (ASK) or comparative genomic hybridization (CGH), are relevant.

Methods: Between 2004 and 2017, prospective data were collected on all patients and their fetuses who underwent ASK or a CGH (n=7688 and 643) for second- or third-trimester ultrasonographical abnormality. Of these patients, 262 fetuses (3,14%) had ultrasonographic urological abnormalities (205 ASK and 57 CGH).
Results: Genetics abnormalities were found in nine fetuses that had ASK (only eight pathogenic) (3,86%). All seven genetics abnormalities found with CGH were pathogenic (12.28%). In the ASK group, the incidence of genetic abnormalities was greater in fetuses with renal agenesis (16.67%) and megacystis (8.33%). Abnormal CGH results were linked to renal agenesis (15.79%) and multicystic dysplastic kidney (15.38%). When urological malformations were detected, 127 (48.47%) abnormalities in other systems were seen. All eight fetuses with a pathogenic result on ASK had two or more ultrasonographic abnormalities. We found no genetic or chromosomal abnormality with only isolated urological abnormality in the ASK group. Except for one case of multicystic kidney, the same conclusion can be applied to fetuses with available CGH results.
Conclusions: An amniocentesis is relevant in fetuses with multiple ultrasonographic malformations. However, the amniocentesis performance for genetic disorders seems weak in patients with a single, isolated urological abnormality. This outcome could avoid several invasive procedures.

Poster Session 7: BPH, Robotics, Infertility, Sexual Dysfunction
July 1, 2019; 0730–0900

MP-7.1

One-year outcomes of the top-down holmium laser enucleation of prostate (HoLEP)

Fabiola Oquendo[1], Amr Hodhod[1], Cale Leeson[1], Ahmed Kotb[1], Owen Prowse[1], Walid Shahrour[1], Hazem Elmansy[1]
[1]Urology, Northern Ontario School of Medicine, Thunder Bay, ON, Canada

Introduction: Holmium laser enucleation of prostate (HoLEP) has similar outcomes but fewer morbidities than open prostatectomy for large prostates. However, the major drawback for its wide application is the relatively long steep learning curve required to efficiently master the technique. In 2017, the "top-down" technique was introduced to shorten the operative time and lessen the procedure number required to master the technique. In this study, we present the one-year results of the top-down technique performed at our institution.

Methods: We retrospectively reviewed the charts of prospectively collected patients who underwent top-down HoLEP from 2017–2018. All cases were operated upon by a single urologist (HE). We used a 100 W holmium:YAG laser (VersaPulse PowerSuite, Lumenis, Yokneam, Israel) with a 550 µm laser fiber and a 2 8Fr continuous flow resectoscope (Karl Storz, Germany). Enucleated tissue was morcellated using a Karl Storz DrillCut Morcellator. We collected the enucleation time, morcellation time, and intraoperative and postoperative complications. All patients had postoperative followups at one, three, six, and 12 months. The evaluation included the International Prostate Symptom Score (IPSS), quality of life assessment (QoL), maximum flow rate (Qmax), and post-void residual (PVR).

Results: Sixty consecutive patients were recruited. Patients characteristics and preoperative data are demonstrated in Table 1. The median prostatic volume, resected prostatic weight, and resected prostatic tissue percentage were 124 cc (70– 266), 90 g (44–242), and 76% (46–97%), respectively. The median enucleation and morcellation times were 80 (25–200) and 14.5 (4–58) minutes, respectively. A single patient had a simple bladder mucosal injury and another developed clot retention. Within the first three months of followup, four patients (6.6%) had stress urinary incontinence (SUI), and urge incontinence (UI) was present in eight patients (13.3%). At the last followup, one patient (1.7%) manifested by persistent SUI and three patients (5%) had UI. One patient had a meatal stenosis. The IPSS, QoL, and PVR were significantly improved during the entire followup ($p<0.001$, <0.001, 0.005, respectively) (Table 2).

Conclusions: Our one-year results of the top-down technique are satisfactory and comparable to those of the classic HoLEP. However, the top-down technique may reduce the complexity and operating time of HoLEP.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/174

MP-7.2

Feasibility and safety of monopolar transurethral resection of the prostate in the outpatient setting

Marie-Pier St-Laurent[1], Samuel Tremblay[1], Geneviève Nadeau[1]
[1]Department of Urology, University Hospital of Québec – Université Laval, Québec City, QC, Canada

Introduction: Transurethral resection of the prostate using monopolar current (mTURP) is still the gold standard treatment of benign prostatic hyperplasia (BPH).[1] Newer technologies have been advocated to reduce complications and length of hospital stay.[2,3] Traditionally, mTURP is performed in an inpatient setting (postoperative hospitalization [POH]). At our centre, many patients have undergone mTURP in an outpatient setting, as a day care surgery (DCS). To our knowledge, only two smaller contemporary studies have reported on the feasibility and safety of this method.[4,5] Herein, we review our experience with regards to the safety and efficacy of patients undergoing outpatient mTURP.

Methods: The records of patients treated at our institution between January 2016 and March 2018 who had undergone mTURP for BPH were reviewed. Patients' demographics, complications and outcomes were recorded.

Results: Of the 362 mTURP procedures, 187 (52%) were DCS and 175 were POH. Patients in the POH group were slightly older than the DCS group (73 vs. 70 years; p=0.002). There were no significant differences between the two groups for American Society of Anesthesiologists (ASA) score, body mass index (BMI), surgery performed under acetylsalicylic acid (13% in each group), and mean reduced prostate weight (17.4 vs, 18.9 g). Mean resection time of 48 minutes in the DCS group and 52 minutes in the POH group were comparable (p=0.06). In each group, 22% of patients consulted in the emergency room within the first 30 postoperative days, with similar rates of hematuria (11.3%), acute retention (9.6%), or urinary tract infection (9.4%). Readmission rate was 4.4% overall (eight patients in each group). Blood transfusion was required for six patients in the DCS group and one in the POH group (p=0.06). Re-operation (clot evacuation and fulguration) within 30 days occurred for eight cases in the POH group. No death occurred. Long-term complication rate was similar.

Conclusions: In our study, comparable 30-day complication rates were observed between both groups, suggesting that mTURP is suitable for an outpatient setting in carefully selected patients.

References

1. Wein AJ, et al. Campbell-Walsh urology. 11e ed. 2016, Philadelphia, Pennsylvania: Elsevier.
2. Anderson BB, Pariser JJ, Helfand BT. Comparison of patients undergoing PVP vs. TURP for LUTS/BPH. *Curr Urol Rep* 2015;16:55. https://doi.org/10.1007/s11934-015-0525-7
3. Thangasamy IA, Chalasani V, Bachmann A, et al. Photoselective vaporisation of the prostate using 80 W and 120 W laser vs. transurethral resection of the prostate for benign prostatic hyperplasia: A systematic review with meta-analysis from 2002-2012. *Eur Urol* 2012;62:315-23. https://doi.org/10.1016/j.eururo.2012.04.051
4. Khan A. Day care monopolar transurethral resection of prostate: Is it feasible? *Urol Ann* 2014;6:334-9. https://doi.org/10.4103/0974-7796.140998
5. Bright E, Stocker M, Koupparis A, et al. Day-case monopolar and bipolar transurethral resection of the prostate. *J Clin Urol* 2014;8:63-7. https://doi.org/10.1177/2051415814548475

MP-7.3

Urgent and elderly transurethral resection of the prostate patients suffer alarming readmission rates: Calgary NSQIP data confirmed by Alberta provincial data

Hilary L. Brotherhood[1], Trafford Crump[2], Asher Khan[3], Kevin Carlson[2], Richard J. Baverstock[2]
[1]Reconstructive and Functional Urology, University of Calgary, Calgary, AB, Canada; [2]Department of Urology, University of Calgary, Calgary, AB, Canada; [3]Department of Urology, University of Calgary, Calgary, AB, Canada

Introduction: Hospital readmission after surgery is a topic of interest and is a key metric for healthcare quality. Transurethral resection or laser vaporization of the prostate (TURP) may have complications, leading to return to the emergency department (ED) and readmission. We identified all TURPs

in the Calgary zone from 2015–2017, with National Surgical Quality Improvement Program (NSQIP) data, the Discharge Abstract Database (DAD), and the National Ambulatory Care Reporting System (NACRS). Primary outcomes were the 30-, 60-, and 90-day post-TURP ED revisit rates and hospital readmission rates. Secondary outcomes were to identify predictors of readmission to hospital.
Methods: We reviewed all NSQIP data for TURPs in the Calgary zone between 2015 and 2017. We validated this data using the DAD and NACRS databases in the same time frame. The 30-, 60-, and 90-day hospital readmission rates and ED visit rates were collected and stratified based on age, Charlson comorbidity index (CCI), and surgical urgency.
Results: NSQIP data from 2015–2017 was reviewed in 195 patients who underwent TURP in the Calgary zone. The 30-day hospital readmission rate was 8.2%. DAD and NACRS data from the same time period for 3059 consecutive patients who underwent TURP was then analyzed. The 30-, 60-, and 90-day readmission rates were 7.4%, 9.5%, and 11.1%, respectively. The 90-day readmission rate for elective vs. urgent/emergent TURPs was 10.7% vs. 26.4%, respectively. ED visit rates after TURP at 30-, 60-, and 90-days were 21.4%, 26%, and 28.6%, respectively. Multivariable logistic regressions analysis revealed age, urgency of surgery, and CCI to be independent predictors of readmission.
Conclusions: This study will be practice-changing for the Calgary zone, with the most significant finding being that the urgent/emergent TURP group has a significantly higher ED visit rate and hospital readmission rate. We will also carefully consider TURP in the elderly or those with comorbidities.

MP-7.4
Complications after surgery for benign prostatic enlargement and medication use: A population-based cohort study in Ontario, Canada

Rano Matta[1], Joseph R. LaBossiere[2], Christopher Wallis[1], Amanda Hird[1], Girish S. Kulkarni[1,3], Ronald T. Kodama[1,4], Lesley Carr[1,4], Sidney B. Radomski[1,3], Sender Herschorn[1,4], Robert K. Nam[1,4]
[1]Division of Urology, University of Toronto, Toronto, ON, Canada; [2]Division of Urology, University of Alberta, Edmonton, AB, Canada; [3]Division of Urology, University Health Network, Toronto, ON, Canada; [4]Division of Urology, Sunnybrook Health Sciences Centre, Toronto, ON, Canada
Functional Urology Research Group, University of Toronto
Introduction: Patients with benign prostatic enlargement (BPE) may eventually undergo surgery after conservative or medical management becomes ineffective. The relationship between the duration of non-surgical management and the rates of complications from BPE surgery are unknown.
Methods: We conducted a retrospective, population-based cohort study of men ≥66 years who underwent their first surgery for BPE from January 1, 2003 to December 31, 2014 in Ontario, Canada. The primary outcome was 30-day overall complications. To test the association between preoperative covariates and our outcomes, adjusted relative risks were computed using multivariable Poisson regression.
Results: Over the study period, 52 162 men underwent BPE surgery, with the majority receiving a transurethral resection of the prostate (TURP; n=45 463, 87%). The 30-day overall complication rate was 2828 events/10 000 procedures. The risk of complications increased by year of surgery (relative risk [RR] 1.02 per year; 95% confidence interval [CI] 1.02–1.03; p<0.0001), increasing age (RR 1.01 per year; 95% CI 1.01–1.02; p<0.0001), and increasing comorbidity (RR 1.06; 95% CI 1.04–1.07; p<0.0001). Receipt of an α-blocker prescription alone in the previous year increased the risk of 30-day complications (RR 1.05; 95% CI 1.00–1.09; p=0.033), while receipt of 5-alpha-reductase inhibitor alone or in combination with an α-blocker did not have a significant effect. Among the ≥80-year-old group, the effect of year of surgery was highest (RR 1.03; 95% CI 1.02–1.04), which directly correlated with the duration of medical management, increasing steadily from a mean of 4.3 years in 2007 to 6.4 years in 2014 (p<0.0001 for trend). Receipt of an antithrombotic in the year prior to surgery also significantly increased the risk of overall complications (RR 1.27; 95% CI 1.22–1.32; p<0.0001).
Conclusions: Among elderly men receiving BPE surgery, increasing age and comorbidity are associated with a higher risk of 30-day complications. Alpha-blocker medication is associated with an increased risk of complications, and in the oldest patients, the risk increases the longer they are managed medically.

MP-7.5
Are basic robotic surgical skills transferable from the simulator to the operating room? A randomized, double-blinded, prospective educational study

Ahmad Almarzouq[1], Jason Hu[1], Anne Yin[1], Yasser Noureldin[1], Maurice Anidjar[1], Franck Bladou[1], Simon Tanguay[1], Wassim Kassouf[1], Armen G. Aprikian[1], Sero Andonian[1]
[1]Urology Division, Department of Surgery, McGill University, Montréal, QC, Canada
Introduction: Several robotic simulators have been shown to improve basic robotic skills, but there are no studies showing that basic robotic skills could be transferred to the operating room (OR). The aim of this study was to assess the transferability of basic robotic skills from the daVinci Surgical Skills Simulator (dVSSS) to the OR.
Methods: Fourteen robotic-naive urology residents were randomized to two groups: group A were required to practice three sessions on the simulator, whereas group B was required to practice until reaching competency as defined by the norm-referenced method with five experts. All experts and candidates performed nine exercises on the dVSSS and were recorded. Both groups were progressed to perform bladder mobilization and chief residents were also performed urethro-vesical anastomosis (UVA) during robot-assisted radical prostatectomy (RARP). Recordings were assessed blindly using GEARS by C-SATS. Wilcoxon rank-sum test was used to assess differences between groups. Spearman's correlation coefficient (rho) was used to assess relationships between dVSSS and GEARS scores.
Results: There was no difference in total GEARS scores between the two groups. GEARS' efficiency component score during "Energy and dissection" task on the dVSSS correlated with GEARS' efficiency component during bladder mobilization (rho= 0.62; p= 0.03). GEARS' force sensitivity score during "Ring and rail" and "Dots and needles" tasks on the dVSSS correlated with GEARS' force sensitivity score during bladder mobilization (rho=0.58, p=0.047; rho=0.65, p=0.02, respectively). Total GEARS scores for "Ring and rail" and "Suture sponge" tasks correlated with the total GEARS scores during UVA (rho=0.86; p=0.007) and (rho=0.90; p=0.002).
Conclusions: There is correlation between objective blinded assessment of simulator performance and bladder mobilization and UVA during RARP. Therefore, basic robotic skills could be transferred to the OR. Competency on the dVSSS was achieved with two sessions of nine exercises for most residents.

MP-7.6
WATER vs. WATER II: Potential volume independence of Aquablation

David-Dan Nguyen[1], Steven A. Kaplan[2], Dean S. Elterman[3], Alan I. So[4], Ryan F. Paterson[4], S. Larry Goldenberg[4], Kevin Zorn[5], Naeem Bhojani[5]
[1]Faculty of Medicine, McGill University, Montréal, QC, Canada; [2]Department of Urology, Icahn School of Medicine at Mount Sinai, Mount Sinai Health System, New York, NY, United States; [3]Division of Urology, University of Toronto, Toronto, ON, Canada; [4]Department of Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; [5]Department of Urology, Université de Montréal Hospital Centre, Montréal, QC, Canada
Introduction: There is a need for novel surgical approaches when treating large (>80 cc) prostates for lower urinary tract symptoms (LUTS) due to benign prostatic hyperplasia (BPH). Aquablation (AquaBeam System, PROCEPT BioRobotics, Inc., U.S.), an ultrasound-guided, robotically executed waterjet ablative procedure, could be this novel tool. We compare the outcomes of Aquablation in 30–80 cc prostates with the outcomes in 80–150cc prostates.
Methods: WATER is a prospective, double-blind, multicentre, international clinical trial comparing the safety and efficacy of Aquablation and transurethral resection of the prostate (TURP) for LUTS/BPH in men with

a prostate between 30 cc and 80 cc.[1] WATER II is a prospective, multicentre, single-arm international clinical trial of Aquablation in men with a prostate between 80 cc and 150 cc.[2] We compare baseline parameters and six-month outcomes in 116 WATER (W-I) and 101 WATER II (W-II) study subjects undergoing Aquablation. Students' t-test or Wilcoxon tests were used for continuous variables and Fisher's test for binary variables.
Results: Mean operative time was 33±17 minutes in W-I and 37±13 minutes in W-II. The average length of stay post-procedure was 1.4±0.7 days (W-I) vs. 1.6±1.1 days (W-II). Mean changes in International Prostate Symptom Score (IPSS) and IPSS quality of life were substantial and averaged (at six months) 16.9 and 3.5 points, respectively, in W-I and 17.4 and 3.2 points in W-II (p=0.6046 and 0.2607, respectively). By three months, Clavien-Dindo grade 2 or higher events occurred in 19.8% of W-I subjects and 34.7% of W-II subjects (p=0.4680). One W-I subject (0.9%) and six W-II subjects (5.9%) required postoperative blood transfusion (p=0.0517). Both cohorts preserved erectile function. Additional outcomes are listed in Table 1.
Conclusions: Aquablation clinically normalizes outcomes between patients with a 30–80 cc prostate and patients with an 80–150 cc prostate treated for LUTS/BPH with an expected increase in the risk of complication. It is an effective and potentially volume-independent treatment of BPH with acceptable complications.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/180
References

1. Gilling PJ, Barber NJ, Bidair M, et al. WATER: A double-blind, randomized, controlled trial of Aquablation vs. transurethral resection of the prostate in benign prostatic hyperplasia. *J Urol* 2018;5:1252-61. https://doi.org/10.1016/j.juro.2017.12.065
2. Desai M, Bidair M, Bhojani N, et al. WATER II (80–150 mL) procedural outcomes. *BJU Int* 2019;123:106-12. https://doi.org/10.1111/bju.14360

MP-7.7
Robotic competency and perception among Canadian chief urology residents

Michael A. Di Lena[1], Gregory Hosier[1], Richard D. Di Lena[1], Naji J. Touma[1], Michael J. Leveridge[1]
[1]Urology, Queen's University, Kingston, ON, Canada

Introduction: Robotic-assisted surgery is continuing to expand in popularity, with its use becoming more ubiquitous in Canada in both the academic and community settings. As was seen previously with laparoscopic surgery, its implementation does have significant implications on residency training. There is now a need for graduating residents to have competencies in robotics while maintaining competencies in more traditional surgical modalities. With robotic integration well underway, we aim to report on current trainee exposure, competencies, and attitudes to robotic surgery in graduating Canadian residents.
Methods: All 2019 graduating Canadian urology residents were asked to participate in a survey designed to assess current resident exposure, surgical competency, and perception of robotic-assisted surgery. Descriptive statistics and non-parametric testing were used to summarize the findings.
Results: A total of 33 graduating chief urology residents completed the survey; 84.8% of residents reported having a robot at their training centre. For those in hospitals with access to robotics, 60.7% of residents participated in more than 10 cases as a console operator, however, 39.3% of residents spent, on average, less than 10 minutes as the primary operator. Of all residents, 69.7% felt that robotics will become the gold standard in certain urological surgeries but only 39.4% anticipate using robotic surgery in their future practice. When assessing future training of residents, 57.6% believe that all residents should receive training on robotic surgery during their residency, with 36.3% believing that trainees should leave residency competent to perform robotic procedures.
Conclusions: This national survey shows that overall there is an increase in robotic exposure to Canadian urology residents, however, it may not translate to console operative experience. Going forward, residency curricula will need to be adapted to formalize robotic surgical experience for Canadian surgical residents.

MP-7.9
The role of p75NTR receptor in the urothelial and smooth muscle cell response to lipopolysaccharide

Laura Ran Yan[1,2], Abubakr Mossa[1], Philippe Cammisotto[1], Lysanne Campeau[1,2]
[1]Department of Surgery, Lady Davis Institute, Montréal, QC, Canada; [2]Faculty of Medicine, McGill University, Montréal, QC, Canada

Introduction: In cystitis, bacterial lipopolysaccharide (LPS) binds to toll-like receptors (TLRs) on urothelial cells, producing inflammatory mediators such as tumour necrosis factor alpha (TNF-α) and nuclear factor kappa B (NFkB).[1] Inflammation is also accompanied by an increased activation of p75NTR, an intrinsic receptor present in bladder tissue.[2] Intriguingly, p75NTR activation produces similar inflammatory mediators as TLRs and both receptors share common pathways that lead to caspase activation.[3,4] Nonetheless, communication between the two receptors has not been shown to augment the latter outcomes. The objective of this research was to determine if p75NTR can enhance the inflammatory response of urothelial and bladder smooth muscle cells in response to LPS.
Methods: Urothelial and smooth muscle cells cultured from Sprague Dawley rat bladders were subjected to one of the four treatments: control, 4 mg/mL THX-B (p75NTR antagonist), 1 mg/mL LPS, or LPS+THX-B. Their expression of TNF-α and NFkB was measured by immunoblotting and immunocytochemistry. Urothelial tight junctions' integrity was measured by immunoblotting of occludin expression and confirmed by immunocytochemistry.
Results: We found that LPS induced an increase in TNF-α in urothelial cells, an effect that was significantly weakened by the p75NTR antagonist (Fig. 1). Furthermore, p75NTR inhibition in urothelial cells prevented occludin reduction by LPS as seen in the protein level and immunocytochemistry (Fig. 2). We demonstrated that in smooth muscle cells, LPS activated NFkB instead of TNF-α, an effect attenuated by p75NTR antagonism (Fig. 3).
Conclusions: Together, our findings suggest that the p75NTR intracellular pathway enhances the LPS-induced inflammation in urothelial cells through TNF-α by promoting desquamation and in smooth muscle cells via NFκB. This research strongly suggests that blocking p75NTR could be an effective drug target in different inflammatory conditions of the bladder in order to decrease the activation of TLRs by LPS.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/184
We acknowledge Dr. Uri Saragovi for providing the p75NTR blocker (THX-B).
References

1. Pålsson-McDermott E, O'Neill L. Signal transduction by the lipopolysaccharide receptor, toll-like receptor-4. *Immunology* 2004;113:153-62. https://doi.org/10.1111/j.1365-2567.2004.01976.x
2. Ryu J, Tooke K, Malley S, et al. Role of proNGF/p75 signaling in bladder dysfunction after spinal cord injury. *J Clin Invest* 2018;128:1772-86. https://doi.org/10.1172/JCI97837
3. Bhakar A, Howell J, Paul C, et al. Apoptosis induced by p75NTR overexpression requires Jun kinase-dependent phosphorylation of BAD. *J Neurosci* 2003;23:11373-81. https://doi.org/10.1523/JNEUROSCI.23-36-11373.2003
4. Barcelona PF, Sitaras N, Galan A, et al. p75NTR and its ligand proNGF activate paracrine mechanisms etiological to the vascular, inflammatory, and neurodegenerative pathologies of diabetic retinopathy. *J Neurosci* 2016;36:8826-41. https://doi.org/10.1523/JNEUROSCI.4278-15.2016

MP-7.10
Environmental contaminants impair male fertility over four generations: Partial rescue by folic acid supplementation

Maryse Lessard[1], Pauline M. Herst[1], Phanie L. Charest[1], Pauline Navaro[2], Sarah Kimmins[3], Jacquetta Trasler[4], Amanda J. MacFarlane[5], Mathieu Dalvai[1], Janice L. Bailey[1]
[1]Centre for Research on Reproduction, Development and Intergenerational Health, Université Laval, Québec City, QC, Canada; [2]School of Nutrition, Faculty of Agricultural and Food Sciences, Université Laval, Québec City, QC, Canada; [3]Department of Pharmacology and Therapeutics, McGill

University, Montréal, QC, Canada; [4]Department of Pediatrics, McGill University, Montréal, QC, Canada; [5]Nutrition Research Division, Health Canada, Ottawa, ON, Canada

Introduction: Semen quality is a predictor of later pathologies in men, thus it is alarming that sperm counts have declined 60% since 1970. A man's environment can impact the quality of his sperm and reports have shown that the health of his subsequent generations can also be impaired. Many persistent organic pollutants (POPs) are environmental endocrine disruptors that could affect men's fertility. Folic acid (FA) has been reported to improve sperm production, hence we hypothesized that prenatal exposure to environmentally relevant POPs impair male reproductive health over three generations and FA protects the sperm from these adverse effects.

Methods: Four treatment groups (n=8) of SD female rats received environmentally relevant POPs or corn oil before mating and until parturition. Diets contained standard (2 mg/kg) or supplemented (6 mg/kg) levels of FA. F1-F4 generations received standard FA diets without POPs. Fertility parameters were assessed in F1-F4 males (n=12/group) following mating with untreated females. Statistical analyses considered main effects and interactions. Significance was $p \leq 0.05$.

Results: Prenatal POP exposure decreased sperm viability and motility across three generations. Sperm quality was partly rescued by FA supplementation in F1-F2, with minimal protection in F3-F4. Fertility was not affected in F1 or F2, but ancestral POPs and/or FA supplementation induced poorest pregnancy outcomes of F3 fathers (F4 litters). We observed fewer fetuses from POP-exposed lineages, and the combination of ancestral POP+FA decreased fertility rate and increased preimplantation losses.

Conclusions: Ancestral POP exposure harms male reproductive parameters. Although FA supplementation improved many parameters, it only mitigated several POPs' effects across four generations. Nonetheless, FA supplementation and male development merit further study, especially considering recent reports that, in men, impaired semen quality is an early predictor of disease.

MP-7.11

Preclinical testing of sympathetic nerve function within the porcine aortic plexus: Implications for retroperitoneal nerve-sparing to prevent retrograde ejaculation

Adam M.R. Groh[1], Nicholas E. Power[2,3], Tyler S. Beveridge[1]

[1]Department of Anatomy and Cell Biology, University of Western Ontario, London, ON, Canada; [2]Department of Surgery, Division of Urology, London Health Sciences Centre, London, ON, Canada; [3]Department of Oncology, Division of Surgical Oncology, London Health Sciences Centre, London, ON, Canada

Introduction: Iatrogenic injury to the aortic/superior hypogastric plexuses supplying the internal urethral sphincter (IUS) can cause retrograde ejaculation, the most prevalent postoperative complication following retroperitoneal lymph node dissection for testis cancer patients. A prudent nerve-sparing approach would preserve only the fibers responsible for IUS contraction; however, this is not possible given the specific function of the constituent nerves remains unknown. Thus, our group endeavoured to investigate the function of two large contributing fibers in bladder neck contraction — the intermesenteric nerves (IMNs) and caudal-most lumbar splanchnic nerves (LSNs).

Methods: Using a translational porcine model (n=3; weight=85.6±6.4 kg), we evaluated the relative contributions of the IMNs and LSNs in IUS contraction using a pressure-sensing balloon catheter. Bipolar electrostimulation (10 Hz, 3 0mA, 1 ms pulse width, 200 V, 30 s) was applied to the 1) hypogastric nerve (HN); 2) LSN; and 3) IMN in an intact state (to determine respective contributions) and following an ipsilateral HN lesion (to determine path of innervation).

Results: The average IUS contraction following LSN stimulation was approximately 3.5x greater (157.3±79.7 mmHg·s) than the ipsilateral IMN stimulation (44.0±70.2 mmHg·s; $p<0.05$). Further, LSN stimulation produced an average IUS contraction integral that rivaled the response generated by ipsilateral HN stimulation (82.1% of total; 193.4±107.9 mmHg·s; $p>0.05$). Lastly, the response from the LSN was significantly reduced following a lesion to the ipsilateral HN (87.2% reduction; 13.8±14.2 mmHg·s; $p<0.05$) indicating minimal fiber decussation at the aortic plexus.

Conclusions: These data suggest that caudal-most LSNs provide the majority of sympathetic innervation to the IUS, and should thus be preferentially spared in comparison to the IMNs. Future studies seek to verify translatability to the clinic.

MP-7.13

Public interest in men's health: Analysis of search engine trends of common men's health topics

Max Levitt[1], Luke Witherspoon[1], J. Stuart Oake[1]

[1]Division of Urology, University of Ottawa, Ottawa, ON, Canada

Introduction: Assessing patient interest in specific healthcare topics or finding areas in which patient education is lacking can be challenging. Internet search engine data may provide an honest and data-rich representation of what health topics are currently capturing the interest of Canadians. In this study, we used Google Trends data to assess search engine patterns of the 10 most common causes of death in men and how Canadian patients are investigating these topics online.

Methods: We used Google Trends to assess search data regarding the 10 leading causes of death (LCOD) in men according to the CDC in 2015, as they were searched between 2014 and 2018 in Canada. Google Trends is a free online service allowing analysis at a population level of all search queries of a term or topic. Interest in a subject is condensed into a search volume index (SVI). SVI trends can be reported based on either time or geographic region. SVIs are normalized values with the most popular time or geographic area being given a score of 100, with all other variables related to this value.

Results: Of the 10 search queries assessed with Google Trends, the top three geographic regions (mean SVI ± standard deviation [SD]) that were searching these topics were Saskatchewan (85.3±10.4), Newfoundland and Labrador (78.9±29.9), and Ontario (75.2±10.8). The most commonly searched LCOD terms (mean SVI ± SD) of the 10 assessed were diabetes (80.1±7.5), heart disease (66.2±12.0), and Alzheimer's disease (63.7±14.1). Searches about diabetes peaked in December 2015, heart disease peaked in February 2018, and Alzheimer's disease peaked in January 2015.

Conclusions: This study shows some of the first evidence that analysis of online activity can reveal real-time interest of the general public regarding men's health topics. Implications of this work include directing educational materials and assistance in policy-making guided by geographical interest in specific men's health issues.

MP-7.15

The presence of metabolic syndrome features is not sufficient to predict the presence of erectile dysfunction or lower urinary tract symptoms in men

Ioana Fugaru[1], Karim Courtemanche[2], Peter Chan[3]

[1]Faculté de Médecine, Université Laval, Québec City, QC, Canada; [2]Sanford Health Clinics, Clinic, Bismark, ND, United States; [3]Division of Urology, McGill University Health Centre, Montréal, QC, Canada

Introduction: Metabolic syndrome (MS) is a global burden.[1,2] Erectile dysfunction (ED) is known to share similar features: age, obesity, hypertension, dyslipidemia, diabetes, and smoking.[3] Among middle-aged and aged men, lower urinary tract symptoms (LUTS) can also cause a significant degree of bother, affecting quality of life. In this Canadian cross-sectional study, we aim to examine the relationship between MS features and the presence of ED and LUTS.

Methods: Data were collected from 979 consenting adult male volunteers who participated in a free public awareness event in Montréal between 2007 and 2013. International Index of Erectile Function (IIEF)-5 score, International Prostate Symptom Score (IPSS), Berlin score, body mass index (BMI), and lipid studies were available for 407 patients. Only benign prostatic hyperplasia (BPH) treatment-naive patients were considered in this study (n=389). One point was given each of the following: BMI ≥30, diabetes type II, total cholesterol level ≥6.2 mmol/L, high-density lipoprotein (HDL) level <1.03 mmol/L, and Berlin high-risk group.

Patients with ≥4 features were considered at high risk for MS. Data was analyzed using IBM SPSS software. Independent-samples t-test, Fisher's or Chi-square tests were used as needed.
Results: In our cohort, of the 31 men who had ≥ 4 MS features, 58.1% had mild LUTS and 54.8% had ED. In the 358 men with ≤ 3 MS features, 62.3% had mild LUTS and 49.4% had ED. Men at high risk for MS did not experience more LUTS nor more ED than men who had less MS features (p=0.7010, OR = 0.8382, 95% CI: 0.4120-1.697 and p=0.5805, OR = 0.8053, 95% CI: 0.3746-1.640). In our study, 194 (49.9%) men had ED ranging from mild to severe. 11.3% of men with ED were younger than 40 years and 51.0% were between the ages of 40 to 60. Only 1.03% of patients with ED reported the use of PDE5-inhibitor therapy.
Conclusions: In BPH treatment-naive men, the presence of four or more MS features does not predict the presence of ED or LUTS. For middle-aged and aged men, clinicians should specifically question for ED and treat accordingly. Only 1.03% of patients with ED reported the use of PDE5-inhibitor therapy.
References
1. Alberti KG, Zimmet P, Shaw J, et al. The metabolic syndrome-a new worldwide definition. *Lancet* 2005;366:1059-62. https://doi.org/10.1016/S0140-6736(05)67402-8
2. Eckel RH, Grundy SM, Zimmet PZ. The metabolic syndrome. *Lancet* 2005;365:1415-28. https://doi.org/10.1016/S0140-6736(05)66378-7
3. Raheem OA, Su JJ, Wilson JR, et al. The association of erectile dysfunction and cardiovascular disease: A systematic critical review. *Am J Mens Health* 2017;11:552-63. https://doi.org/10.1177/1557988316630305

UP-7.1
Holmium laser vaporesection of the prostate (HoLVRP): A step-by-step approach
Hazem Elmansy[1], Amr Hodhod[1], Ahmed Kotb[1], Owen Prowse[1], Walid Shahrour[1]
[1]Urology, Northern Ontario School of Medicine, Thunder Bay, ON, Canada
Introduction: Laser procedures are an innovative surgical treatment alternative to transurethral resection of the prostate secondary to prostatic obstruction. Herein, we introduce the first known experience of prostate vaporesection using the side-firing holmium laser fiber.
Methods: Twenty patients underwent holmium laser vaporesection of the prostate (HoLVRP) from July to September2018. We used a 100 W holmium: YAG laser (VersaPulse PowerSuite, Lumenis, Yokneam, Israel) with a side-firing Xpeeda™ laser fiber. All patients were managed by a single surgeon (HE). Two posterior grooves were created at the 5 and 7 o'clock positions up to the veromontanum, allowing vaporesection of the median lobe. The fiber was then rotated under the adenoma from the 7 o'clock to 11 o'clock position, starting from the bladder neck to the verumontanum. The other lateral lobe was resected similarly. Patients' demographics and preoperative data were collected, including transrectal ultrasound prostate sizing, and preoperative prostate-specific antigen (PSA) and International Prostate Symptom Score (IPSS). The laser energy and operative times were recorded. Intra- and postoperative complications were recorded, in addition to catheter time and hospital stay. A trial of void was done (TOV) after two hours. The short-term followup data included IPSS and PVR at one-month postoperatively.
Results: Twenty patients with a median prostatic volume of 50 cc (37–63) had HoLVRP. The median age at surgery was 66 years. Lower urinary tract symptoms was the main presentation in 85% of patients, with median post-void residual (PVR) of 168 mL (23–470) (Table 1). The median IPSS score was 22 (4–30). There were no intraoperative complications or blood transfusions. All patients had a catheter removal at two hours postoperatively. Only three patients (15%) had failed TOV initially but succeeded after 1–3 days. No patients had stress urinary incontinence. IPSS and PVR significantly improved at one month (p=0.006, 0.003, respectively).
Conclusions: HoLVRP is a promising and safe technique in the management of moderate-sized prostates. Further studies with longer followup are warranted to evaluate this technique.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/191

UP-7.2
Modeling in vitro urinary tract infections caused by uropathogenic Escherichia coli using tissue engineering
Élodie Dufresne[1], Stéphane Chabaud[1], Christophe Caneparo[1], Stéphane J. Bolduc[1]
[1]Surgery, CHU de Québec-Université Laval Research Centre, Québec City, QC, Canada
CUASF-Astellas Research Grant
Introduction: Throughout a lifetime, 60% of women will have a urinary tract infection (UTI)[1] and uropathogenic *Escherichia coli* (UPEC) will be isolated in >85% of these cases.[2] Among UTI-affected patients, 20–30% will be exposed to recurrences (rUTI).[2] Indeed, some bacteria can invade uroepithelial cells, providing protection through an F-actin network. It allows bacteria to divide while being protected from antibiotics and the immune system. Bacteria can also invade deeper uroepithelial cell to create a quiescent intracellular reservoir (QIR).[3] Complications associated with UTI lead to a greater social and economic cost. Antibiotics are not constantly effective, as demonstrated by rUTI, and their use can lead to significant complications, such as antibiotic resistance. Therefore, new strategies are required to prevent rUTI. Due to the low average rate of successful translation of 2D cell culture and in vivo animal models to clinical trials, innovative models, such as those produced by tissue engineering, are required.
Methods: A bilayer urological tissue is reconstructed using collagen gels seeded with bladder mesenchymal cells. After 24 hours, urothelial cells are seeded on top of constructs. After a week of horizontal expansion in submerged condition, tissues are transferred in air/liquid interface for three weeks. The epithelium quality is evaluated and tissues are infected with control BL21 *E. coli* or UPEC UTI-89, both expressing GFP. They are infected for a six-hour period before being rinsed and incubated for three additional weeks with antibiotics.
Results: After a six-hour infection and three weeks of incubation, we have detected the presence of IBC in our tissue only when uropathogenic UTI-89 was used. IBC has not been detected with non-pathogenic BL21 *E. coli*. QIR had not yet been detected after a three-week incubation period.
Conclusion: Our bladder mucosa tissue-engineered construct can replicate UTI. The presence of IBC is still a rare occurrence. Therefore, we will continue to optimize the infection parameters to increase it because QIR number depends on the number of IBC.
References
1. Al-Badr A, Al-Shaikh G. Recurrent urinary tract Infections management in women: A review. *Sultan Qaboos Univ Med J* 2013;13:359-67. https://doi.org/10.12816/0003256
2. Terlizzi ME, Gribaudo G, Maffei ME. UroPathogenic Escherichia coli (UPEC) infections: Virulence factors, bladder responses, antibiotic, and non-antibiotic antimicrobial strategies. *Front Microbiol* 2017;8:1566. https://doi.org/10.3389/fmicb.2017.01566
3. Flores-Mireles AL, Walker JN, Caparon M, et al. Urinary tract infections: Epidemiology, mechanisms of infection, and treatment options. *Nat Rev Microbiol* 2015;13: 269-84. https://doi.org/10.1038/nrmicro3432

MP-7.16
One-year safety and efficacy outcomes on a novel drug coated balloon (DCB) for urethral stricture disease – The ROBUST I Study
Ramon Virasoro[1], Jessica DeLong[1], Rafael Estrella[2], Merycarla Pichardo[3], Ramon Rodriguez Lay[4], Gustavo Espino[5], George Suarez[6], George Webster[7], Gerald Jordan[8], Sean Elliott[9]
[1]Department of Urology, Eastern Virginia Medical School, Norfolk, VA, United States; [2]Clinica Union Medica, Santiago de los Caballeros, Dominican Republic; [3]URUS, Santo Domingo, Dominican Republic; [4]Cirujano Urology Royal Center, Panama City, Panama; [5]Centro Especializado San Fernando, Panama City, Panama; [6]Jackson Memorial Hospital, Miami, FL, United States; [7]Duke University, Durham, NC, United States; [8]Urology, Eastern

Virginia Medical School, Virginia Beach, VA, United States; [9]Department of Urology, University of Minnesota, Minneapolis, MN, United States

Introduction: Urethral strictures are most commonly treated via minimally invasive techniques such as dilation or direct vision internal urethrotomy (DVIU); but in men who have undergone more than 1 prior treatment, recurrence rates with repeat dilation or DVIU are over 50%, with an average time to recurrence of 3 months[1]. A novel drug coated balloon for urethral dilation (Optilume™ DCB) was designed to mechanically dilate a stricture while delivering paclitaxel, an anti-proliferative drug intended to reduce the rate of stricture recurrence. The ROBUST I study is a multi-center, prospective, non-randomized trial designed to determine the safety and efficacy of the Optilume™ DCB.

Methods: Men with bulbar urethral strictures ≤ 2cm with 1-3 prior endoscopic treatments were enrolled at 4 study sites in the Dominican Republic and Panama following Ethics Committee approvals. The Optilume™ DCB was inflated under cystoscopic visualization and placement confirmed via fluoroscopy. Subjects were evaluated at 2-5 days, 14-days, 3, 6- and 12-months post-treatment. Primary efficacy endpoint was improvement in IPSS and primary safety endpoint was serious complications through 3 months. Secondary endpoints included anatomic success, defined as the urethral lumen caliber ≥14F based on ability to pass a flexible cystoscope or a 14F catheter and change in uroflowmetry.

Results: Fifty-three subjects were enrolled, and all successfully treated. Average subject age was 51 years (range 22-81). Stricture etiology was traumatic (51%), iatrogenic (45%) and idiopathic (4%). Average number of prior treatments was 1.7 per subject (range 1-4). Prior treatments included rigid dilation and DVIU, however most subjects were on a "dilation program" or self-catheterization at home. Self-catheterizations were not counted in the number of prior treatments. There were no serious or unexpected device related adverse events. Overall anatomic success rate at 12 months was 75% (35/47). The 12 failures were composed of 5 retreatments, 4 who failed the urethral lumen test; 3 exited the study for symptoms of recurrence without retreatment or failing the urethral lumen test and were considered failures. Mean IPSS decreased from 25.2±4.5 (baseline) to 4.9±5.6 ($p<0.001$) in 42 men with 12-month data. Mean peak urinary flow (Qmax) increased from 5.0±2.6 ml/sec (baseline) to 19.5±9.9 ($p<0.001$) ml/sec, again in 42 men at 12 months.

Conclusions: One-year data indicates the Optilume™ DCB treatment is safe and the device produces urethra luminal gain that achieves significant clinical results with meaningful increased Qmax and decreased IPSS.

Reference

1. Heyns CF, Steenkamp JW, de Kock ML, et al. Treatment of male urethral strictures: Is repeated dilation or internal urethrotomy useful? *J Urol* 1998;162:356-8. https://doi.org/10.1097/00005392-199808000-00016

Poster Session 8: Community Urology and Management
July 1, 2019; 0730–0900

MP-8.1

Efficacy and safety of pharmacological prophylaxis for venous thromboembolism in patients undergoing non-cardiac surgery: A network meta-analysis

Maura Marcucci[1], Itziar Etxeandia[1], Arnav Agarwal[2], Shyla Gupta[1], Federico Germini[1], Stephen Yang[1], Matthew Ventresca[1], Shaowen Tang[3], Kari A.O. Tikkinen[4], Gordon H. Guyatt[1], Philippe D. Violette[1,5]

[1]Health Research Methods Evidence and Impact, McMaster University, Hamilton, ON, Canada; [2]Medicine, University of Toronto, Toronto, ON, Canada; [3]Epidemiology, School of Public Health, Nanjing Medical University, Nanjing, People's Republic of China; [4]Urology and Public Health, University of Helsinki, Helsinki, Finland; [5]Surgery, Division of Urology, Division of Urology, London, ON, Canada

American Society of Hematology (ASH), MacGRADE Centre, McMaster University

Introduction: Low-dose low molecular weight heparin (LMWH) and direct oral anticoagulants (DOAC) may be reasonable alternatives for postoperative thromboprophylaxis in urology. We, therefore, performed a systematic review and network meta-analysis (NMA) of randomized controlled trials (RCTs) of these agents.

Methods: We searched Medline, Embase, and Central Cochrane library up to August 2018 to identify RCTs evaluating LMWH or DOAC in head-to-head comparisons or compared with placebo or no treatment in patients undergoing non-cardiac surgery. Outcomes included symptomatic pulmonary embolism (PE), symptomatic venous thromboembolism (VTE), and major bleeding. We used the Cochrane Collaboration risk of bias tool, and GRADE assessments of quality are pending.

Results: We included 72 RCTs (62 792 patients) of which 56 involved orthopedic surgery, nine general, four thoracic, two gynecologic, and one urologic surgery, typically comparing LMWH to DOAC (32%) or placebo (36%). Studies reported 99 (0.24%) symptomatic PEs in 40 791 patients, 191 (0.66%) symptomatic VTEs in 29 085 patients, and 345 (0.86%) major bleedings in 39 921 patients. The majority of studies were generally low risk of bias (Fig. 1). Compared to LMWH, DOACs may reduce symptomatic VTE (odds ratio [OR] 0.49; 0.30–0.80; p=0.005) without increase in major bleeding (OR 1.13; 0.81–1.57; p=0.469). LMWH did not reduce symptomatic VTE (OR 0.54; 0.20,1.45; p=0.219) but did increase major bleeding (OR 1.79; 1.00, 3.23; p=0.049). Both DOACs and LMWH increased major bleeding relative to placebo (Table 1).

Conclusions: DOACs may be more effective than LMWH at reducing symptomatic VTE. Difference in efficacy between LMWH and DOAC in reducing symptomatic PE could not be demonstrated likely due to low event rates. Our NMA emphasizes the need for an RCT to directly evaluate the efficacy of pharmacological thromboprophylaxis in urological surgery.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/194

MP-8.2

New beginnings: Canada's first publically funded transition-related surgery program

Yonah I. Krakowsky[1,2], Alexandra (Alexi) L. Millman[1], Emery Potter[2], Ethan D. Grober[1,2]

[1]Urology, University of Toronto, Toronto, ON, Canada; [2]Urology, Women's College Hospital, Toronto, ON, Canada

Introduction: In 2018, Ontario's Ministry of Health, with support from the University of Toronto and Women's College Hospital (WCH), opened the first publicly funded transition-related surgery (TRS) program in Canada. Prior to this, transgender patients in Ontario were forced to seek surgical care in Québec, the United States, Europe, or Asia.

Methods: The TRS program currently consists of two urologists, three plastic surgeons, a gynecologist, a dedicated nurse practitioner (NP), and administrative support at WCH. Surgeons have augmented their training through mentorship with experts in the United States and attendance of surgical workshops and conferences. Referrals are centralized through the NP, who triages them to appropriate surgeons. Referral volumes and surgical bookings were categorized and analyzed.

Results: The first six months of the TRS program saw 79 referrals for lower and 66 for upper surgery. Lower surgery consultations were for orchiectomy +/- scrotectomy (n=17), vaginoplasty complications (n=21), phalloplasty support or complications (n=15), vaginoplasty (n=19), and hysterectomy (n=7). Lower surgery cases included penile implant revision (n=3), urethral or vaginal stricture repair (n=4), and orchiectomy +/- scrotectomy (n=7). Upper surgery consultations were for breast augmentation (n=14) and chest masculinization (n=52). Four chest masculinization and one breast augmentation procedures were performed and 24 patients are awaiting surgery.

Conclusions: The TRS program serves as a model for the development of a government-supported, publically funded program to offer transgender patients surgical care. The first six months of the program have demonstrated a need for local surgical expertise in managing surgical complications, which is now being met. The TRS program demonstrates the importance of collaboration between government, hospital administration, and clinical staff in the establishment of publicly funded surgical options for the trans community.

MP-8.3

Exploring the patterns of practice and satisfaction among female urologists in Canada

Amanda Hird[1], Marie-Pier St-Laurent[2], Geneviève Nadeau[2], Lesley Carr[1], Monica Farcas[3]

[1]Urology, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada; [2]Urology, University Hospital of Québec, Université Laval, Québec City, QC, Canada; [3]Urology, St. Michael's Hospital, Toronto, ON, Canada

Introduction: Our aim was to explore the satisfaction, personal and professional challenges, and practice barriers among female leaders in urology in Canada.

Methods: A literature review was completed. Trends with respect to career and personal satisfaction were identified, including academic advancement, mentorship, professional challenges, workplace discrimination, personal/family satisfaction, as well as remuneration, among others. These key themes were formatted into 44 questions and distributed electronically as a survey to 67 female urology staff across Canada.

Results: Fifty-nine (88%) women responded to our survey. Most had been in practice <5 years (43%) and 90% completed a fellowship. The most common fellowship training programs included female urology (20%), neurourology (16%), and pediatrics (12%). Most (96%) of women were very satisfied or somewhat satisfied with their career. Seeing more time-consuming patients and financial constraints within the healthcare system were the greatest sources of dissatisfaction. Sixty percent of respondents reported that they received significant mentorship during their training and 43% felt that it was difficult to find a mentor. Fifty-seven percent experienced gender discrimination during their career, most commonly from a

colleague (22%) or a patient (22%). Most respondents were married (65%) or in a relationship (19%), and 76% of women had at least one child. The mean time for maternity leave was 15 weeks and 33% reported a pregnancy-related complication triggered by their work (pre-eclampsia, miscarriage, hypertension, and premature contractions). Most women (83%) were very satisfied with their family life. However, 74% felt their career had compromised their personal life and family responsibilities. Increasing female presence in leadership roles, providing mentorship opportunities, and improving negotiation strategies were areas women felt needed more attention. Overall, 64% of women surveyed would choose urology again.

Conclusions: It is important to advocate for the wellness of our current female urologists and to attract and maintain the most talented physicians in our field. To accomplish this, we need to address the challenges revealed in this survey. A formal circle of support, mentorship, and promotion within the urology community is important to help achieve these goals.

MP-8.4

Creating patient-centred radiology reports (PACERR) to empower patients undergoing prostate magnetic resonance imaging

Nathan Perlis[1], Guan Hee Tan[1], Antonio Finelli[1], Amelia Di Meo[1], Michael Nesbitt[1], Odelia Lee[1], Adam Badzynski[1], Mike Lovas[2], Kristin Foster[3], Joseph Cafazzo[4], Janet Papadakos[5], Vasiliki Bakas[6], Alejandro Berlin[1], David Wiljer[7], Sangeet Ghai[8], Masoom Haider[8]

[1]Division of Urology, University Health Network, Toronto, ON, Canada; [2]Healthcare Human Factors, University Health Network, Toronto, ON, Canada; [3]Patient Engagement Innovations, University Health Network, Toronto, ON, Canada; [4]Centre for Global eHealth Innovations, Toronto, ON, Canada; [5]Patient Education, Cancer Care Ontario, Toronto, ON, Canada; [6]myUHN Patient Portal, University Health Network, Toronto, ON, Canada; [7]Education Technology and Innovation, Education Technology and Innovation, Toronto, ON, Canada; [8]Joint Department of Medical Imaging, University Health Network, Toronto, ON, Canada

Introduction: As we progress to an era when patient autonomy and shared decision-making are highly valued, we feel that there is a need to also have effective patient-centred communication tools. Radiology reports can be very technical and difficult for our patients to understand, and yet patients are often expected to make potentially life-changing decisions based on these reports. Therefore, we aimed to create a patient-centred prostate magnetic resonance imaging (MRI) report in order to give our patients a better understanding of their clinical condition.

Methods: A prototype patient-centred radiology report (PACERR) was created by identifying items to include based on opinions sought from a group of patients undergoing prostate MRI and medical experts using modified Delphi approach in semi-structured interviews. After informed consent, patients were interviewed based on a salient belief question in person prior to their MRI. A prototype PACERR was created in collaboration with human factors engineering and design, medical imaging, biomedical informatics, and cancer patient education groups.

Results: Fifteen patients and eight experts from urology, radiation oncology, radiology, and nursing participated in this study. Patients were particularly interested to have a report with laymen terms, concise language, contextualization of values, defining medical terms, and next course of action. The experts placed importance on getting across how severe the condition is, Prostate Imaging Reporting and Data System (PI-RADS) score and the context for it in laymen terms, and the course of action. Everyone felt the report should include the risk of MRI findings actually being cancer in the subsequent biopsy and whether the images showed extra-prostatic disease. A prototype PACERR was created as shown in Fig. 1.

Conclusions: A prostate MRI PACERR has been developed to communicate the most important findings relevant to decision-making in prostate cancer. The ability of this tool to improve patient knowledge and communication will be explored.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/197

MP-8.5

Patient-centred reconstruction and evaluation of the Canadian Urological Association's prostate cancer information materials

Alexander E. Kiciak[1], Thomas Dymond[1], Andrew Dawson[1], Michael J. Leveridge[1], D. Robert Siemens[1], Jason P. Izard[1]

[1]Urology, Queen's University, Kingston, ON, Canada

Funded by a research grant from the Canadian Urological Association Scholarship Foundation

Introduction: The Canadian Urological Association (CUA) publishes freely accessible patient information materials (PIM) on a range of urological issues, including prostate cancer. Previous work has established that the prostate cancer PIM are written at a grade 11 reading level, which may be too complex for low-literacy patients. We sought to directly compare the standard CUA PIM to a reconstructed patient-centred PIM.

Methods: PIM covering radical prostatectomy (RP) and radiation therapy (RT) for prostate cancer were rewritten in a simplified format to a 6th-grade reading level and published in a graphical format identical to the original PIM. Patients who had undergone previous treatment for localized prostate cancer or were on active surveillance were recruited from Kingston Health Sciences Centre from May 2017 to September 2018. Participants evaluated both "standard" and "patient-centred" formats of both RP and RT topics. PIM formats and topics were randomized in order of presentation. We collected demographic, educational, and disease-specific details of our participants. Health literacy was assessed using the REALM-SF. Semi-structured interviews were used to obtain qualitative feedback on all PIM. Participants were asked to score the PIM formats on a Likert scale with respect to usefulness, comprehension, and preference of one format over the other.

Results: There were 61 participants with complete information for analysis. The median age of our participants was 70 years (range 50–86), with a median REALM-SF score of 7 (5–7) and 62% (38/61) had at least some college or university education. Patients had been treated with surgery (35/61), radiation (24/61), and active surveillance (18/61). Usefulness ratings were high for all PIM format but did not vary statistically between formats ($p=0.84$). Comprehension ratings were significantly higher in the patient-centred PIM ($p<0.01$). Preference for PIM format did not reach statistical significance ($p=0.32$ for RP; $p=0.19$ for RT). However, within the qualitative feedback, 16% of patients commented without prompting that the language within the standard PIM was too complex. Participants also expressed the desire for more information regarding care after treatment.

Conclusions: Within this group of highly educated participants with high health literacy, a simplified written structure improves patient comprehension ratings of informational materials but does not impact participant preferences for specific PIM format. Future work will focus on revising the informational content of our PIM in an iterative format based on participant feedback.

MP-8.6

Potential for cost-savings through urological medication prescribing habits in Ontario

Patrick Anderson[1,2], Christopher Langley[2], Neal E. Rowe[1,2]

[1]Department of Surgery, Division of Urology, The Ottawa Hospital, Ottawa, ON, Canada; [2]University of Ottawa, Ottawa, ON, Canada

Introduction: North Americans pay the highest drug prices in the world. Funding for prescription medications is provided either by government, private insurance, or directly out-of-pocket. With limited resources, there is a responsibility for all physicians to consider medication costs as part of their role as managers. Significant differences in the cumulative costs of medical treatment between name brand and generic drugs can occur over time, as well as large cost differences between equally efficacious therapies. Here, we present a cost analysis of common medications in urology practice as an illustration of potential cost-savings.

Methods: The Ontario Drug Benefit/Comparative Drug Index Formulary was used to determine the costs associated with prescription formulations commonly used in urology practice. Benign prostatic hyperplasia (BPH) and castration-sensitive metastatic prostate cancer were selected as index diseases due to relative commonality and prolonged duration of medical treatment. The cumulative cost of treatment with brand name and generic

formularies were trended over time and were also compared to the cost of a definitive surgical intervention. The costs of surgery represented a maximum total cost associated with the procedure and were provided by The Ottawa Hospital.
Results: Substantial differences were found in cost between brand name and generic formulations for drugs commonly used to treat BPH (Fig. 1A). Substantial differences were also demonstrated in the cumulative cost of androgen-deprivation therapy (ADT) treatments for metastatic prostate cancer (Fig. 1B). The costs of all ADT regimens studied surpassed the cost of surgical castration by two years of treatment.
Conclusions: The formulation of medications prescribed by urologists has a direct impact on the cost to payers. Surgical castration is far less costly than medical castration. Where efficacy is equivalent, careful consideration of treatment costs should be a further consideration when choosing therapy.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/199

MP-8.7
Risk factors for emergency visits following urological outpatient surgery
Luke Witherspoon[1], Christopher Langley[1], Christopher Knee[2], Ranjeeta Mallick[2], Rodney H. Breau[1,2], Ilias Cagiannos[1], Christopher Morash[1], J. Stuart Oake[1], Luke T. Lavallee[1,2]
[1]Urology, The Ottawa Hospital, Ottawa, ON, Canada; [2]Ottawa Hospital Research Institute, The Ottawa Hospital, Ottawa, ON, Canada
Introduction: Urological surgeries have been previously identified as having high rates of readmission compared to other surgeries. This study aims to identify risk factors leading to presentation to the emergency department (ED) following urological outpatient surgery.
Methods: We examined all outpatient surgeries performed by urology, general surgery, thoracic surgery, and gynecology occurring at three hospitals within The Ottawa Hospital system between April 1, 2008, and February 28, 2018. We captured all ED visits within 90 days of the outpatient procedure. Surgical characteristics included hospital campus, procedure end time, and day/month/year of procedure. Patient characteristics assessed included age, sex, marital status, presence of primary care provider, socioeconomic status (SES), American Society of Anesthesiologists (ASA) score, and Elixhauser comorbidity index.
Results: A total of 55 681 outpatient procedures were performed by the four services assessed over our time period; 7447 ED visits within 90 days were identified (13.4% of total). Urological procedures accounted for 59.5% (n=4427) of the patients returning to the ED. Univariable analyses of individual variables found that increased age, male sex, low SES, increased ASA score, unmarried status, increased Elixhauser comorbidity index, and hospital campus were all associated with higher rates of ED visits ($p<0.05$). There did appear to be a significant difference in the rate of ED visits between year of procedure ($p<0.0001$) with a noted decreasing trend.
Conclusions: ED visits following urological outpatient procedures are common. This study identifies risk factors to identify patients that may benefit from additional education or support after outpatient urological surgery to reduce ED care needs.

MP-8.8
Virtual clinics: Our cost analysis and efficiency assessment
Elizabeth Osinibi[1], Helen A. Teixeira[1], Thomas Smith[1]
[1]Urology, Maidstone and Tunbridge Wells NHS Trust, Maidstone, United Kingdom
Introduction: Virtual clinics (VC) can increase patient satisfaction and service efficiency. Traditional face-to-face consultations can contribute to costs incurred by patients, loss of earnings by attending outpatient appointments (OPA), and often anxiety while awaiting results. We sought to assess the efficiency and departmental cost savings of two VC by creating a more streamlined, one-stop hematuria pathway and a virtual stone clinic (VSC) assessing emergency stone referrals.
Methods: We conducted a prospective analysis of a once-weekly, consultant-led VSC between April 2018 and December 2018 and a pilot virtual results clinic (VRC) between October 2018 and December 2018. VSC patients were referred following emergency presentation with a renal tract stone. VRC reviewed scans of patients referred for hematuria but at the time of a normal flexible cystoscopy were yet to have completed renal tract imaging (RTI). All patients subsequently received a letter with either their VC outcome or further OPA.
Results: In total 346 patients (male=163, female=183) were reviewed, 287 and 59 patients within the VSC and VRC, respectively. All (100%) had a VC appointment within two weeks of completed RTI or emergency stone referral. Eighty-nine (31%) VSC patients were discharged following one VSC review and 261 (91%) within two VSC. Four percent of VSC patients required ureteroscopy and laser stone fragmentation. Forty-nine (83%) VRC patients were discharged following one VC; of these, three patients required referral to another specialty due to RTI findings. Nineteen of 346 patients (5%) required OPA for benign urological conditions. The cost of 674 OPA avoided with VC was £40 440. There were no patient complaints or reported adverse events.
Conclusions: With VC, we can more efficiently deliver results and discharge or refer patients on to other specialties, while reducing service costs and overall OPA volume. Our patient satisfaction survey with the expansion of our VC will determine the overall effect on patient experience.

MP-8.9
Does "MyChart" benefit "MY" surgery? – A look at the impact of electronic patient portals on patient experience
Naveen Kachroo[1], Sri Sivalingam[1]
[1]Department of Urology, Cleveland Clinic, Cleveland, OH, United States
Introduction: Electronic patient portals can benefit both patient and provider, especially during the perioperative period, by providing timely direct engagement and much-needed clarity to avoid unnecessary extra provider encounters. Our study assessed patient portal usage among endourology patients and whether this affected telephone call frequency, unscheduled provider visits, and emergency room (ER) presentations.
Methods: We undertook a retrospective review of the electronic medical records (EMR) of all patients undergoing elective endourology procedures (shockwave lithotripsy [SWL], ureteroscopy [URS], and percutaneous nephrolithotomy [PCNL]) by a single surgeon at a tertiary urology referral centre over a one-year period (July 2017 to July 2018). Patient demographics, operative details, patient portal (MyChart) registration, patient-initiated MyChart messages, telephone encounters, unscheduled provider visits, and ER presentations during a one-month period before and after the procedure, were identified. Logistic regression analysis assessed relationships between MyChart use and study outcomes.
Results: We identified 313 patients (200 MyChart users, 113 non-users) who underwent 374 procedures (SWL=3, URS=268, PCNL=103). MyChart users were younger (mean age 56 vs. 61; p=0.0011) and more likely to be married (69.5% vs. 48.7%; p=0.0004). MyChart users made less provider telephone calls, both prior to (mean calls 1.1 vs. 1.5; p=0.0037) and post-procedure (mean calls 0.9 vs. 1.3; p=0.021) and had less ER visits (8 vs. 19; p=0.0002). On multivariable analysis, non-users of MyChart were 7.69 (95% confidence interval [CI] 2.44–25) times more likely to have an unscheduled provider clinic visit (p=0.0004) and were 1.79 (95% CI 1.001–3.125) times more likely to have an ER visit.
Conclusions: Patients undergoing endourology procedures who use our patient portal make fewer telephone calls and are significantly less likely to make an unscheduled clinic or ER visit, which will undoubtedly have a beneficial impact on their overall experience.

MP-8.10
Gone girls: Where are all the women in urology?
Leandra Stringer[1], Heather Morris[1], Alp Sener[1], Ailsa May[2]
[1]Urology, Western University, London, ON, Canada; [2]Medicine, Schulich School of Medicine and Dentistry, London, ON, Canada
Introduction: The number of female medical students and physicians entering the workforce is increasing. Despite this trend, some surgical specialties are still considered male-dominant. Urology has a significant male predominance in both residency and independent practice. This

male predominance could have an impact on the physician work force, mentorship opportunities for females pursuing surgery, and on medical student attraction to urology as a specialty. Research conducted in the United States has shown that although fewer females enter the field of urology, acceptance rates between the two genders are similar. This study aims to identify if a trend towards gender-specific acceptance into urology residency exists within Canada.

Methods: Canadian Residency Matching Services (CARMS) data from the previous 10 years was analyzed. Logistic regression analyses were used to assess if any significant difference exists between the rates of female and male applicant acceptance into urology. These rates were then compared to the rates of female and male acceptance into surgical residency as a whole.

Results: Within urology applicants, there is no evidence that the success rate over time between males and females differs (p=0.47). Within surgical residency applicants, there is no evidence that the success rate over time differs between male and female applicants (p=0.84). In comparing these two rates, there is also no significant difference between rates of acceptance to urology vs. surgery in general for female applicants (p=0.45). General surgery has a higher growth of females entering into the specialty compared to urology (p=0.026).

Conclusions: Our data identifies that there is no significant trend toward male acceptance into urology over female applicants. There is no significant difference related to female acceptance specifically into urology or any difference between rates of females accepted into urology as compared to all other surgical subspecialties combined.

References

1. Halpern JA, Lee UJ, Wolff EM, et al. Women in urology residency, 1978–2013: A critical look at gender representation in our specialty. *Urology* 2016;92:20. https://doi.org/10.1016/j.urology.2015.12.092
2. Association of Canadian Medical Colleges. Canadian medical education statistics. Statistiques relatives à l'enseignement médical au Canada. 2017. Available at: https://afmc.ca/sites/default/files/CMES2017-Complete.pdf. Accessed Oct. 15, 2018
3. Canadian Institute for Health Information. Physicians in Canada, 2016: Summary report. 2017. Available at: https://www.cihi.ca/en/access-data-reports/. Accessed Oct. 15, 2018.
4. Canadian Medical Association. Number of physicians by specialty and age, Canada, 2017. CMA Masterfile. 2017. Available at: https://www.cma.ca/En/Pages/physician-historical-data.aspx. Accessed Oct. 15, 2018.
5. Canadian Medical Association. Urology profile. CMA masterfile. 2018. Available at: https://www.cma.ca/Assets/assets-library/document/en/advocacy/profiles/urology-e.pdf. Accessed Nov. 25, 2018.
6. American Urological Association. The state of urology workforce and Ppractice in the United States 2016. Linthicum, Maryland, U.S.A. 2017. Available at: https://www.auanet.org/research/research-resources/aua-census/census-results. Accessed Oct. 15, 2018.
7. Anderson K, Tennankore K, Cox A. Trends in the training of female urology residents in Canada. *Can Urol Assoc J* 2018;12:E105-11. https://doi.org/10.5489/cuaj.4697
8. Kim S, Farrokhyar F, Braga LH. Survey on the perception of urology as a specialty by medical students. *Can Urol Assoc J* 2016;10:349-54. https://doi.org/10.5489/cuaj.3621.
9. Mayer KL, Perez RV, Ho HS. Factors affecting choice of surgical residency training program. *J Surg Res* 2001;98:71-5. https://doi.org/10.1006/jsre.2001.6143.
10. Baxter N, Cohen R, McLeod R. The impact of gender on the choice of surgery as a career. *Am J Surg* 1996;172: 373-6. https://doi.org/10.1016/S0002-9610(96)00185-7.
11. Buddeberg-Fischer B, Klaghofer R, Abel T, et al. The influence of gender and personality traits on the career planning of Swiss medical students. *Swiss Med Wkly* 2003;133:535-40. https://dx.doi.org/10.1186%2F1472-6963-6-137.

MP-8.11

Is it time to rethink how we page physicians? Understanding paging patterns in a tertiary care hospital

Luke Witherspoon[1], Emily Nham[2], Hamidreza (Hamid) Abdi[1], Ali Dergham[3], Thomas A. Skinner[1], J. Stuart Oake[1], James D. Watterson[1], Luke T. Lavallee[1]

[1]Urology, The University of Ottawa/The Ottawa Hospital, Ottawa, ON, Canada; [2]Medicine, The University of Ottawa, Ottawa, ON, Canada; [3]Medicine, Queen's University, Kingston, ON, Canada

Introduction: Frequent pages can disrupt workflow, interrupt patient care, and may contribute to physician burnout. The purpose of this study was to determine the volume and temporal relationship of pages received by three surgical services and one medical service at one tertiary care centre.

Methods: We conducted a retrospective review of paging data collected from four services at The Ottawa Hospital. Using the hospital paging system database, resident paging data from April 1 to July 31, 2018 were collected from orthopedic surgery, general surgery, neurology, and neurosurgery. We then examined the trends in paging volume during the four-month period.

Results: Between April 1 and July 31, 2018, 25 797 pages were received by the services, averaging 211.45 (± standard deviation [SD] 12.17) calls per day; 19 371 (75.10%) were calls from in-hospital units, while 6426 (24.90%) were pages from the emergency room. The median interval between pages across all specialties was 22:30 minutes. In-hospital units peaked between 5:30 pm and 6:30 pm (Fig. 1a), while emergency room pages peaked between 4:30 pm and 8:00 pm (Fig. 1b).

Conclusions: All specialties experienced frequent paging with similar patterns of marked increases at specific times. This study thus identifies areas for future study about what the factors are that contribute to the paging patterns observed.

This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/205

MP-8.12

Urological conditions in nonagenarians

Anjali Lobo[1], Tarek Lawen[1], Ashley R. Cox[1]

[1]Urology, Dalhousie University, Halifax, NS, Canada

Introduction: Nonagenarians represent a growing population of challenging patients in North America. Limited data exists on urological health in this population. This study's objectives were to: 1) assess the current pattern of urological referrals for nonagenarians; 2) identify investigations and treatment modalities being used; and 3) identify how frequently management was being altered due to patient age.

Methods: A retrospective chart review of urological referrals in patients above 90 years was done. Referrals to 11 academic urologists from 2007–2017 were reviewed. Data was collected via electronic health records and was analyzed using descriptive statistics.

Results: One hundred and seventeen charts were reviewed to date (77% male). Mean age at the time of consultation was 92.2 years. Referrals were received from family doctors (58%), specialists (22%), and emergency room physicians (15%). The top three reasons for referral were hematuria (27%), lower urinary tract symptoms (21%), and retention (13%). The most common investigations were cystoscopy (56%), uroflow and post-void residual (23%), and ultrasound (21%). Digital rectal exam was performed in 21% of men. The top three diagnoses in this population were benign prostatic hypertrophy, prostate cancer, and bladder cancer. Conservative management was used in 52% of cases. Only 13% of patients underwent a surgical intervention (53% transurethral resection of prostate, 27% transurethral resection of bladder tumour). There were 37 (32%) documented instances where management was altered due to age; in 43% of these instances, the patient refused care.

Conclusions: This is the first study to describe urological issues in nonagenarians in North America. Nonagenarians are referred to urology for common symptoms and are often managed conservatively. Management plans may vary due to their advanced age and comorbidities. In order to prepare our specialty for the provision of excellent care, it is imperative to gain an understanding into the urological issues arising in this patient population.

Poster Session 9: Kidney, Penis, and Testis Cancer
July 1, 2019; 0730–0900

MP-9.1

Development of a patient decision aid for the management of small renal masses

Kristen McAlpine[1], Rodney H. Breau[1,2], Dawn Stacey[2,3], Christopher Knee[2], Michael A. Jewett[4], Ilias Cagiannos[1,2], Christopher Morash[1,2], Luke T. Lavallée[1,2]

[1]Division of Urology, The Ottawa Hospital, Ottawa, ON, Canada; [2]Ottawa Hospital Research Institute, Ottawa, ON, Canada; [3]School of Nursing, University of Ottawa, Ottawa, ON, Canada; [4]Departments of Surgery (Urology) and Surgical Oncology, Princess Margaret Cancer Centre, University Health Network and the University of Toronto, Toronto, ON, Canada

Funding: IKCC, KCRNC-CUOG, CUASF, TOHAMO

Introduction: Patients with small renal masses are candidates for surgery, ablation, or surveillance. The choice of management requires an assessment of benefits and risks of each option and incorporation of patients' values. We sought to develop a patient decision aid to facilitate shared decision-making and patient-centred care for individuals with small renal masses.

Methods: A structured development process was used following the International Patient Decision Aid Standards and the Ottawa Decision Support Framework. A literature review was performed to identify outcomes related to the management of small renal masses. An iterative feedback process by a steering committee of content and process experts was used to determine the draft decision aid content. Figures and narrative text were developed to explain management options and outcome rates. A 10-question survey was created to assess the acceptability of the decision aid with patients, patient advocates, urologists, and methodological experts.

Results: An evidence-based decision aid was created. Management options included were partial nephrectomy, radical nephrectomy, ablation, and surveillance. Benefits included were rates of overall survival, metastasis-free survival, and length of hospital stay. Risks included were rates of post-procedural urine leak, bleeding, and renal failure. A validated tool was included to explore patients' values and preferences. Pictures, diagrams, and plain language were used to allow use by patients of various educational backgrounds. Knowledge questions were included to assess patients' understanding. The decision aid met the International Patient Decision Aids Standards defining (6 of 6), certification (6 of 6), and quality criteria (17 of 23).

Conclusions: A novel patient decision aid was created for the management of small renal masses following a systematic and evidence-based process. Acceptability testing is being performed in a prospective fashion with stakeholders.

MP-9.2

Renal biopsy: When will it change management?

Douglas C. Cheung[1], Patrick Richard[2], Diana E. Magee[1], Luke T. Lavallée[3], Frédéric Pouliot[4], Maria Komisarenko[1], Lisa Martin[1], Jean-Baptiste Lattouf[5], Shabbir M. Alibhai[6], Murray Krahn[6], Antonio Finelli[1]

[1]Urology, University of Toronto, Toronto, ON, Canada; [2]Urology, Université de Sherbrooke, Sherbrooke, QC, Canada; [3]Urology, University of Ottawa, Ottawa, ON, Canada; [4]Urology, Université Laval, Québec City, QC, Canada; [5]Urology, Centre Hospitalier de l'Université de Montréal, Montréal, QC, Canada; [6]Internal Medicine, University of Toronto, Toronto, ON, Canada

Introduction: Despite strong safety and accuracy data, renal biopsy use remains low. Proponents of no-biopsy argue that it would not change management since biopsy cohorts in existing studies may not be representative of those progressing to treatment. In a multi-institutional nephrectomy (treatment) cohort, we perform a cost-effectiveness analysis of renal biopsy to alter management in patients who have (would have) undergone intervention.

Methods: We completed a decision analysis populated by a multi-institutional, multi-provincial Canadian cohort from 2013–2015 (Fig. 1, TreeAgePro software). Outcomes and cost data were compared against reference literature values for generalizability to other jurisdictions. Non-diagnostic biopsies were re-biopsied once. Given our low event rate and risk of bias, literature rates were used for false negative and false positive biopsy rates.

Results: Of 542 patients, 192 (35%) received preoperative biopsy and 58 (10.7%) had benign disease on nephrectomy pathology. Fourteen (7.3%) had discordant pathology between biopsy and nephrectomy; however, many of these would not have altered management (renal cell carcinoma subtype misclassification). Seven (3.6%) were non-diagnostic. Using final pathology as gold standard and accounting for biopsy accuracy, we found a number needed to biopsy (NNTB) of 10.4 biopsies per nephrectomy avoided. Results were most sensitive to parameter uncertainty around probability of benign disease, cost of surgery and of biopsy. After 50 000 simulations, biopsy was cost-saving ($11 933 vs. $12 416, threshold 6.9% likelihood of preoperative benign disease). In subanalysis of non-biopsy centres (16% benign disease), cost savings increased and NNTB fell to 7.0.

Conclusions: Even prior to incorporating quality of life benefits from avoiding unnecessary operating rooms and surgical complications, we demonstrate the clinical and cost-effectiveness of incorporating renal biopsy as a useful preoperative planning tool.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/208

MP-9.4

Incidence and management of penile cancer in Manitoba: A 10-year experience

Samir Ksara[1], Darrel E. Drachenberg[1], Robert H. Wightman[2]

[1]Urology, University of Manitoba, Winnipeg, MB, Canada; [2]Pathology, University of Manitoba, Winnipeg, MB, Canada

Introduction: Squamous cell carcinoma (SCC) of the penis is a relatively rare malignancy in the Western world, with an incidence of less than one case per 100 000 men per year. Early lymphadenectomy in high-risk patients is paramount in managing the disease. The primary objective of this study is to assess the patterns of practice and adherence to guidelines in the management of SCC in Manitoba. The secondary objective is to determine incidence, stage at presentation, and pathological characteristics of the disease in this population.

Methods: Using the provincial pathology data, we were able to identify all penile cancer specimens taken from 2007–2017. We then conducted a retrospective electronic chart review of each patient diagnosed with the disease.

Results: We identified 83 new cases of penile cancer from 2007–2017 corresponding to an age-adjusted incidence rate of 1.5 per 100 000 men per year. Approximately 49% of patients were found to have T2 disease or higher on presentation. A large proportion of patients met the criteria for early inguinal exploration (45%) but only 5% of these patients underwent the procedure. Pathology reports were incomplete in 36%, and 12% were missing key information that would have impacted management.

Conclusions: The incidence of penile SCC in Manitoba is significantly higher than the national average. A large proportion of patients with high-risk disease were undertreated.

Reference
1. Christodoulidou M, Sahdev V, Houssein S, et al. Epidemiology of penile cancer. *Curr Probl Cancer* 2015;39:126-36. https://doi.org/10.1016/j.currproblcancer.2015.03.010

MP-9.5

Oncological outcomes of patients with sporadic, non-metastatic renal cell carcinoma with renal vein or inferior vena cava tumour thrombus

Benjamin Shiff[1], Rodney H. Breau[2], Alan I. So[3], Frédéric Pouliot[4], Anil Kapoor[5], Jun Kawakami[6], Jean-Baptiste Lattouf[7], Ricardo A. Rendon[8], Simon Tanguay[9], Ranjeeta Mallick[10], Rahul Bansal[1]

[1]Urology, University of Manitoba, Winnipeg, MB, Canada; [2]Urology, University of Ottawa, Ottawa, ON, Canada; [3]Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; [4]Urology, Université Laval, Québec City, QC, Canada; [5]Department of Surgery, McMaster University, Hamilton, ON, Canada; [6]Urology, University of Calgary, Calgary, AB, Canada; [7]Surgery, Université de Montréal, Montréal, QC, Canada; [8]Urology, Dalhousie University, Halifax, NS, Canada; [9]Urology, McGill University, Montréal, QC, Canada; [10]Ottawa Hospital Research Institute, Ottawa, ON, Canada

Introduction: Tumour extension into the venous circulation is a well-described feature of renal cell carcinoma (RCC), and aggressive surgical management has been shown to provide cure in a substantial proportion of patients. However, the factors that contribute to variability in outcomes are poorly understood. This study was conducted to examine factors associated with survival in patients who had undergone surgery for non-metastatic RCC with venous tumour thrombus.

Methods: The Canadian Kidney Cancer information system (CKCis) database was used to identify a historical cohort of patients who underwent radical nephrectomy and renal vein or inferior vena cava (IVC) tumour thrombectomy for non-metastatic pathological T3 RCC from 2011–2018. Association of level of tumour thrombus was examined with recurrence-free survival (RFS) and overall survival (OS). Univariate and multivariate analyses were performed.

Results: Of the 165 patients identified from the database who satisfied the study criteria, 100, 37, and 28 patients had level 0–1, 2, and 3–-4 thrombus, respectively. Mean age was 65 (standard deviation [SD] 10.9) years. Fuhrman tumour grade 4 was associated with poor RFS on univariate analysis (hazard ratio [HR] 0.47; 95% confidence interval [CI] 0.24–0.94; p=0.032), although this association only trended towards significance on multivariate analysis when adjusted for tumour size, margin status, and level of tumour thrombus (HR 0.51; 95% CI 0.24–1.09; p=0.081). Thrombus level did not impact the RFS or OS. Predicted five-year survival rates were 63.7%, 68.3%, and 60.8% for tumour thrombus level 0–1, 2, and 3–4, respectively, with no significant difference between them (log-rank test p-value=0.25).

Conclusions: According to our data, level of venous tumour thrombus is not associated with survival metrics in patients undergoing surgery for non-metastatic RCC with renal vein or IVC thrombus. Tumour grade may be associated with RFS in these patients.

MP-9.6

Simultaneous vs. sequential retroperitoneal and thoracic resection of post-chemotherapy residual masses in patients with metastatic non-seminomatous germ cell tumours of the testis

Ishan Aditya[1], Gregory Nason[1], Laura Donahoe[2], Marc De Perrot[2], Michael A. Jewett[1], Philippe Bedard[3], Aaron R. Hansen[3], Peter Chung[4], Padraig Warde[4], Lynn Anson-Cartwright[1], Joan Sweet[5], Martin O'Malley[6], Robert Hamilton[1]

[1]Division of Urology, Department of Surgery, Princess Margaret Cancer Centre, Toronto, ON, Canada; [2]Division of Thoracic Surgery, Toronto General Hospital, University of Toronto, Toronto, ON, Canada; [3]Division of Medical Oncology and Hematology, Princess Margaret Cancer Centre, Toronto, ON, Canada; [4]Division of Radiation Oncology, Princess Margaret Cancer Centre, Toronto, ON, Canada; [5]Division of Pathology and Lab Medicine, University Health Network, University of Toronto, Toronto, ON, Canada; [6]Division of Abdominal Imaging, Joint Department of Medical Imaging, University Health Network, University of Toronto, Toronto, ON, Canada

Introduction: Resection of residual masses (>1 cm) after chemotherapy is recommended in patients with testicular non-seminomatous germ cell tumour (NSGCT). Traditionally, resections in the abdomen and chest are performed as separate surgical procedures. The aim of this study was to compare a simultaneous vs. sequential approach to residual mass resections.

Methods: A retrospective review was performed of all patients who underwent both retroperitoneal and thoracic resection of post-chemotherapy residual masses at the Princess Margaret Cancer Centre between 2002 and 2018. Patients were divided into two groups: group 1 – simultaneous (combined retroperitoneal and thoracic resections at the same sitting) and group 2 – sequential (retroperitoneal and thoracic resections at separate dates).

Results: During the study period, 35 simultaneous and 17 sequential resections were performed. The mean age of the patient at surgery was 28 years (range 16–61). The mean followup from final surgery was 48.3 months (range 1–239). Histology revealed teratoma in 38 (73.1%) patients, necrosis in eight (15.4%), and viable tumour in six (11.5%). Discordant pathology findings between thoracic and abdominal resections were noted in 16 (30.8%) patients. There was no difference in overall mean length of operating time (minutes) between the two groups (635 vs. 405+218; p=0.77). There was no difference in overall blood loss (ml) between the two groups (1904 vs. 2258+301; p=0.39). There was no difference in overall mean length of stay (days) between the two groups (14.8 vs. 9.5+8.2; p=0.72). Patients who underwent sequential surgeries had a longer time from consent to completion of surgery (8.4 months vs. 2.1 months; p=0.0001). Overall, there was a recurrence rate of 30.8% (n=16). Two patients have died of testicular cancer.

Conclusions: Simultaneous resection of retroperitoneal and thoracic post-chemotherapy metastases is a feasible and safe approach. It does entail multidisciplinary co-operation and a longer primary procedure.

MP-9.7

Determining generalizability of the Canadian Kidney Cancer information system (CKCis) to the entire Canadian kidney cancer population

Camilla Tajzler[1], Anil Kapoor[1], Ranjeeta Mallick[2], Beau Ahrens, Luke T. Lavallée[2], Rodney H. Breau[2], Naveen Basappa[3], Simon Tanguay[4], Daniel Heng[5], Frédéric Pouliot[6], Darrel E. Drachenberg[7], Georg Bjarnason[8], Denis Soulieres[9], Nicholas E. Power[10], Patrick Richard[11], Christian Kollmannsberger[12], Antonio Finelli[13], Lori A. Wood[14]

[1]Division of Urology, McMaster Institute of Urology, Hamilton, ON, Canada; [2]Division of Urology, University of Ottawa, Ottawa, ON, Canada; [3]Department of Oncology, University of Alberta, Edmonton, AB, Canada; [4]Division of Urology, McGill University, Montréal, QC, Canada; [5]Department of Oncology, University of Alberta, Calgary, AB, Canada; [6]Division of Urology, Université Laval, Québec City, QC, Canada; [7]Division of Urology, University of Manitoba, Winnipeg, MB, Canada; [8]Department of Oncology, University of Toronto, Toronto, ON, Canada; [9]Department of Medicine, Université de Montréal Hospital Centre, Montréal, QC, Canada; [10]Division of Urology, Western University, London, ON, Canada; [11]Division of Urology, Université Sherbrooke, Sherbrooke, QC, Canada; [12]Department of Oncology, The University of British Columbia, Vancouver, BC, Canada; [13]Division of Urology, University of Toronto, Toronto, ON, Canada; [14]Department of Medicine, Dalhouse University, Halifax, NS, Canada

Canadian Kidney Cancer information system (CKCis)

Introduction: The Canadian Kidney Cancer information system (CKCis) has prospectively collected data on patients with renal cell carcinoma (RCC) since January 1, 2011 from 14 academic centres in six provinces. CKCis data have been used by Canadian researchers for several research initiatives. The goal of this study was to determine if the CKCis cohort appears generalizable to the entire Canadian RCC population, specifically regarding demographic and geographic distributions.

Methods: The CKCis cohort was analyzed up to December 31, 2017. Baseline demographics were examined. Geographic info was analyzed, including province and rural vs. urban residence via postal code info (sec-

ond digit=0 and Canadian urban boundary files). Trends in the data over time were analyzed. The most contemporary data from CKCis (2016/2017) was compared to the 2016/2017 Canadian Cancer Society (CCS)[1] statistics to help determine generalizability of the data.
Results: The CKCis cohort includes 10 294 patients: 66% male (vs. 64% CCS, 2017), median age 62 years (vs. 64 years Amercian Cancer Society, 2017),[2] 23% de novo metastatic disease, and 71.4% clear-cell pathology (vs. 69.5% NS data, 2010).[3] More detailed data are presented by province in Table 1. The CKCis cohort in 2016/2017 includes 2065 patients, which represents 18% and 14%, respectively, of the total number of patients diagnosed with RCC in Canada. This proportion of patients captured per province did vary from 10–43%. Rural patients make up 16% of patients (18.9% Statistics Canada, 2011). Canadian heat maps detailing patient location will be presented.
Conclusions: CKCis currently contains prospective data on >10 000 Canadian RCC patients over seven years, making it an invaluable resource for RCC research. The baseline demographic and geographic data do appear to include a broad cross-section of patients and are generalizable to the Canadian RCC population. Moving forward, CKCis should maximize the overall patient capture rate in all participating provinces.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/207
References

1. Canadian Cancer Society (CCS).
2. American Cancer Society.
3. Himmelman J, Merrimen J, Matheson K, et al. Accuracy of kidney cancer diagnosis and histological subtype within Canadian cancer registry data. *Can Urol Assoc J* 2017;11:E326-9. https://doi.org/10.5489/cuaj.4269

MP-9.8
Long-term outcomes after radical or partial nephrectomy for T1a kidney cancer: A population-based study

Madhur Nayan[1], Olli Saarela[2], Keith Lawson[1], Lisa Martin[1], Maria Komisarenko[1], Antonio Finelli[1]
[1]Division of Urology, Departments of Surgery and Surgical Oncology, University of Toronto, Toronto, ON, Canada; [2]Dalla Lana School of Public Health, Toronto, ON, Canada

Introduction: Nephrectomy is primary treatment for localized renal cell carcinoma (RCC). However, there remains uncertainty whether type of nephrectomy, partial (PN) or radical (RN), is associated with survival and risk of developing significant chronic kidney disease (CKD). Therefore, the objective of this study was to compare outcomes in patients undergoing PN or RN for T1a RCC.
Methods: We performed a population-based study of patients in Ontario undergoing a single PN or RN for T1a RCC between 1995 and 2014. The primary outcome was overall survival (OS). Secondary outcomes were cancer-specific survival (CSS), diagnosis of CKD, and development of end-stage renal disease (ESRD), defined as receipt of chronic dialysis or renal transplant. We used multivariable Cox proportional hazard models to evaluate the association between PN or RN and these outcomes.
Results: A total of 5670 patients met inclusion criteria, of which 2503 (44.1%) underwent PN. PN patients were more likely to be male, younger, have lower Charlson scores, smaller tumour sizes, and have surgery in more recent years. With a median followup of 6.4 years (interquartile range [IQR] 3.9–10.7), 1187 patients died. Multivariable Cox proportional hazard models found that PN was associated with significantly improved OS (hazard ratio [HR] 0.73; 95% confidence interval [CI] 0.63–0.84), CSS (HR 0.44; 95% CI 0.30–0.65), and a reduced risk of CKD (HR 0.18; 95% CI 0.12–0.28). Fifteen patients developed ERSD; univariate analysis found no significant association with type of surgery (HR 0.25; 95% CI 0.06–1.12).
Conclusions: Our population-based study comparing PN vs. RN for T1a RCC found that PN was associated with significantly improved OS, CSS, and CKD-free survival. Importantly, ESRD occurred infrequently regardless of type of surgery. PN should be the preferred approach for T1a RCC.

MP-9.9
Prognostic impact of paraneoplastic syndromes on patients with non-metastatic renal cell carcinoma undergoing surgery: Results from Canadian Kidney Cancer

Ryan Sun[1], Anil Kapoor[2], Antonio Finelli[3], Frédéric Pouliot[4], Ricardo A. Rendon[5], Alan I. So[6], Adrian Fairey[7], Simon Tanguay[8], Luke T. Lavallée[9], Rodney H. Breau[9], Jean-Baptiste Lattouf[10], Jun Kawakami[11], Lori A. Wood[5], Daniel Heng[12], Naveen Basappa[7], Georg Bjarnason[13], Ranjeeta Mallick[14], Rahul Bansal[1]
[1]Urology, University of Manitoba, Winnipeg, MB, Canada; [2]Urology, St. Joseph's Hospital, Hamilton, ON, Canada; [3]Urology, University Health Network, Toronto, ON, Canada; [4]Urology, CHUQ, Québec City, QC, Canada; [5]Urology, Dalhousie University, Halifax, NS, Canada; [6]Urology, University of British Columbia, Vancouver, BC, Canada; [7]Urology, University of Alberta, Edmonton, AB, Canada; [8]Urology, McGill University, Montréal, QC, Canada; [9]Urology, University of Ottawa, Ottawa, ON, Canada; [10]Urology, CHUM, Montréal, QC, Canada; [11]Urology, Alberta Health Services, Calgary, AB, Canada; [12]Medical Oncology, University of Calgary, Calgary, AB, Canada; [13]Urology, Sunnybrook Hospital, Toronto, ON, Canada; [14]Ottawa Hospital Research Institute, Ottawa, ON, Canada

Introduction: The impact of paraneoplastic syndromes (PNS) on survival in patients with renal cell carcinoma (RCC) is uncertain. This study was conducted to analyze the association of PNS with recurrence-free survival (RFS) and overall survival (OS) in patients with non-metastatic RCC undergoing nephrectomy.
Methods: From the Canadian Kidney Cancer information system (CKCis) database, a prospective cohort of patients who underwent nephrectomy for non-metastatic RCC from 2011–2018 was identified. Patients with PNS were identified and compared to patients without PNS. PNS identified were one or more of anemia, polycythemia, hypercalcemia, and weight loss. Association of PNS with RFS and OS was examined. Univariate and multivariate analyses were performed.
Results: Of 2724 patients, 1004 (36.9%) had evidence of one or more PNS. Mean age was 60.6 years (standard deviation [SD] 11.6) and 1769 (64.9%) were males. Median Charlson comorbidity index (CCI) score was 3 (interquartile range [IQR] 1–4). There was no significant difference between groups with regards to gender, race, or family history of kidney cancer. In the group with PNS, patients were of advanced age, had higher CCI score, and advanced clinical tumour stage as compared to patients without PNS. The five-year projected OS in patients without PNS was 87.8% (95% confidence interval [CI] 84.2–90.6) as compared to 80.3% (95% CI 75.5–84.3) in patients with PNS ($p<0.0001$). On univariate analysis, presence of PNS adversely affected RFS (hazard ratio [HR] 1.68; 95% CI 1.47–1.92; $p<0.0001$) and OS (HR 1.90; 95% CI 1.38–2.63; $p<0.0001$) (Table 1). On multivariate analysis, PNS did not predict RFS or OS when adjusted for age, CCI score, tumour size, grade, pathological stage, and tumour margin (Table 2).
Conclusions: In non-metastatic RCC patients undergoing surgery from CKCis database, the presence of PNS (one or more of anemia, polycythemia, hypercalcemia, and weight loss) is associated with advanced age, higher CCI score, and advanced tumour stage but not with poor RFS or OS.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/215

MP-9.10
Outcomes of cytoreductive nephrectomy (CN) in metastatic renal cell carcinoma (mRCC) patients using real-world data from Canadian hospital centres

Alice Dragomir[1], Sara Nazha[1], Simon Tanguay[1], Anil Kapoor[2], Sebastien Hotte[2], Ricardo A. Rendon[3], Antonio Finelli[4], Aaron Hansen[4], Naveen Basappa[5], Adrian Fairey[5], Christian Kollmannsberger[6], Alan I. So[6], Jean-Baptiste Lattouf[7], Georg Bjarnason[8], Daniel Heng[10], Neil M. Reaume[9], Rodney H. Breau[9], Frédéric Pouliot[11], Bimal Bhindi[12], Lori A. Wood[3]
[1]Urology, McGill University Health Centre, Montréal, QC, Canada; [2]Urology, Juravinski Cancer Centre, McMaster University, Hamilton, ON, Canada; [3]Urology, Queen Elizabeth II Health Sciences Centre, Halifax, NS, Canada; [4]Urology, Princess Margaret Cancer Centre, University of

Toronto, Toronto, ON, Canada; [5]Urology, Cross Cancer Institute, University of Alberta, Edmonton, AB, Canada; [6]Urology, BC Cancer Agency Vancouver Cancer Centre, Vancouver, BC, Canada; [7]Urology, Centre Hospitalier de l'Université de Montréal, Montréal, QC, Canada; [8]Urology, Sunnybrook Odette Cancer Centre, University of Toronto, Toronto, ON, Canada; [9]Urology, The Ottawa Hospital Cancer Centre, Ottawa, ON, Canada; [10]Medical Oncology, Tom Baker Cancer Centre, University of Calgary, Calgary, AB, Canada; [11]Urology, Centre Hospitalier Universitaire de Québec, Université Laval, Québec City, QC, Canada; [12]Medical Oncology, Southern Alberta Institute of Urology, Alberta, AB, Canada
KCRNC

Introduction: The objective of this study was to use real-world data (RWD) to evaluate and compare the outcomes of metastatic renal cell carcinoma (mRCC) patients who underwent cytoreductive nephrectomy (CN) with or without targeted treatment (TT) compared to patients who only received TT.

Methods: The Canadian Kidney Cancer information system (CKCis) database was used to identify patients diagnosed with mRCC after January 2011. Patients were stratified into four different groups: CN without TT, CN followed by TT, TT followed by CN, TT alone. Kaplan-Meier curve was used to estimate the overall survival (OS) from diagnosis of mRCC to death from any cause for the following groups: 1) CN without TT; 2) CN before or after TT; and 3) and TT alone. A Cox proportional hazards model was used to assess the impact of the CN while adjusting for potential confounding variables.

Results: A total of 813 patients were included in the analysis; 663 (81.6%) patients underwent CN and 150 (18.5%) did not. Of the 663 patients in the CN group, 202 did not receive any TT and 461 received TT (383 preceded by CN and 78 followed by CN). The median time between CN to TT initiation and between TT initiation to CN was three (interquartile range [IQR] 2–8] and five (IQR 3–9) months, respectively, with a median TT duration of five (IQR 2–11) and seven (IQR 3–14) months, respectively. The median OS for patients undergoing CN without TT, CN with TT, and TT alone was not reached, 37 months (95% confidence interval [CI] 29–43), and 13 months (95% CI 10–19), respectively. Having a metastasectomy (hazard ratio [HR] 0.51; 95% CI 0.37–0.73) and clear-cell histology (HR 0.69; 95% CI 0.54–0.87) were associated with improved survival. Compared to patients in the CN before or after TT group, CN without TT patients presented an improved survival (HR 0.57; 95% CI 0.41–0.80), but patients in the TT group alone presented a decreased survival (HR 2.14; 95% CI 1.68–2.74).

Conclusions: Our study presents the clinical impact of CN in mRCC patients using RWD. Further analyses will be conducted in subgroups of patients and using matched analysis to decrease confounding by indication in this population.

MP-9.11

Can preoperative imaging predict the biology of renal cell carcinoma? A study of the relationship between dual phase 18F-fluorocholine positron emission tomography-computed tomography findings and Ki-67 levels in renal cell carcinoma

Uttam Mete[1], Tushar Aditya Naryan[2], Ashwani Sood[3], Nandita Kakkar[4]
[1]Urology, PGIMER, Chandigarh, Chandigarh, India; [2]Urology, PGIMER, Chandigarh, Chandigarh, India; [3]Nuclear Medicine, PGIMER, Chandigarh, Chandigarh, India; [4]Pathology, PGIMER, Chandigarh, Chandigarh, India

Introduction: Renal cell carcinoma (RCC) is one of the most lethal tumours of the genitourinary tract. A continuing concern has been the varying clinical behaviour and different rates of local and systemic recurrence in patients with similar clinical stage, grade, and pathology. In this work, we evaluated whether a dual-phase ^{18}F-flurodeoxyglucose positron emission tomography-computed tomography (^{18}F-FDG PET-CT) can provide a better understanding of this variability in tumour behaviour; predict aggressiveness and risk of recurrence preoperatively by correlating it with tumoural tissue Ki-67 levels; and help formulate an appropriate treatment and surveillance scheme for the patient.

Methods: Twenty-three patients with a suspected RCC underwent a dual-time ^{18}F-FDG PET-CT scan and estimation of Ki-67 levels in the tumoural tissue by immunohistochemistry. A correlation was derived between the two to determine if findings of the PET-CT scan predicted the Ki-67 levels, indicating tumour aggressiveness.

Results: Dual-phase PET-CT findings correlated well with tumour, node, and metastases stage of the tumour. It also correlated positively with tumour Ki-67 levels, although this association failed to reach statistical significance. The retention index obtained from dual-time PET images were positive for clear-cell and papillary cancer, while it was negative for chromophobe tumour and benign variants, including angiomyolipoma and oncotyoma.

Conclusions: Dual-phase ^{18}F-FDG PET-CT may preoperatively be able to predict the biology, aggressiveness, and underlying pathology of renal masses and guide an appropriate management and surveillance scheme for patients with RCC.

MP-9.12

Perioperative chemotherapy for upper tract urothelial carcinoma: A microsimulation Markov model

Diana E. Magee[1,2], Amanda Hird[1,2], Douglas C. Cheung[1,2], Beate Sander[2,3], Srikala S. Sridhar[2], Robert K. Nam[1,2], Girish S. Kulkarni[1,2]
[1]Division of Urology, University of Toronto, Toronto, ON, Canada; [2]Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, ON, Canada; [3]Toronto Health Economics and Technology Assessment Collaborative, University of Toronto, Toronto, ON, Canada; [4]Department of Medical Oncology, University of Toronto, Toronto, ON, Canada

Introduction: Upper tract urothelial carcinoma (UTUC) accounts for less than 5% of all urothelial cancers.[1] As a result, this disease is clinically understudied and there are no definitive recommendations regarding use and timing of perioperative chemotherapy.[2] The objective of this study was to create a decision model comparing three treatment pathways in UTUC: nephroureterectomy (NU) alone, neoadjuvant chemotherapy (NAC), and adjuvant chemotherapy (AC).

Methods: A Markov microsimulation model was constructed using TreeAge Pro to compare treatment strategies for patients with UTUC (Fig. 1). Our primary outcome was quality-adjusted life expectancy (QALE). Secondary outcomes included rates of adverse chemotherapy events, bladder cancer diagnoses, and crude survival. Markov cycle length was three months to mimic the followup interval used in clinical practice for patients with UTUC. A systematic literature review was used to generate probabilities to populate the model. The base case was a 70-year-old patient with a radiographically localized upper tract tumour. Patients could have evidence of nodal disease but no distant metastasis.

Results: A total of 100 000 microsimulations were generated. NAC was preferred, with an estimated QALE of 7.52 years vs. 6.80 years with NU alone and 7.20 years with AC. Overall, 39.6% of patients in the AC group with invasive pathology received and were able to complete chemotherapy. A total of 37.5% of patients in the NAC group experienced an adverse chemotherapy event compared to 15.1% of patients in the AC group. Bladder cancer recurrence rates were 64.9%, 66.0%, and 67.1% over the patient's lifetime in the NU, NAC, and AC groups, respectively.

Conclusions: This study provides evidence to support the increased use of NAC in UTUC until robust randomized trials can be completed. While the use of NAC in this population appears favourable, the ultimate choice rests with the clinician and should be based on patient and tumour factors.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/221

References

1. Rouprêt M, Babjuk M, Compérat E, et al. European Association of Urology guidelines on upper urinary tract urothelial cell carcinoma: 2015 update. *Eur Urol* 2015;68:868-79. https://doi.org/10.1016/j.eururo.2015.06.044
2. Leow JJ, Martin-Doyle W, Fay AP, et al. A systematic review and meta-analysis of adjuvant and neoadjuvant chemotherapy for upper tract urothelial carcinoma. *Eur Urol* 2014;66:529-41. https://doi.org/10.1016/j.eururo.2014.03.003

MP-9.13

Machine learning to predict recurrence of localized renal cell carcinoma

Yanbo Guo[1], Luis H. Braga[1], Anil Kapoor[1]
[1]Urology, McMaster University, Hamilton, ON, Canada

Introduction: The increased incidence of renal cell carcinoma (RCC) has been largely explained by the increased use of diagnostic imaging and discovery of localized disease. Localized RCC has a five-year survival rate of nearly 90% but there remains a 20–30% risk of recurrence.[1] Current guidelines stratify patients between risk categories based upon their pathologic grade and TMN stage.[2,3] Nomograms that incorporate other variables are available but they also rely mainly upon pathologic findings. Our objective is to use a cloud-based machine learning (ML) platform to develop a model for recurrence after curative treatment of localized RCC using pre- and postoperative variables.

Methods: A de-identified RCC database from our institution was uploaded to the Microsoft® Azure Machine Learning Studio. The dataset was then split into a training and a testing group. Two ML models were trained, a two-class neuro network model and a two-class boosted decision tree model, both fundamental approaches in ML.[4] These models were then evaluated using the area under curve (AUC) of a ROC curve.

Results: A total of 697 patients were part of the dataset. Seven variables were included in our model. The optimized model achieved an AUC of 0.877. Setting a threshold to maximize sensitivity, there was a sensitivity of 89.47%, a specificity of 71.95 %, and positive predictive value of 3.19.

Conclusions: We built an accurate RCC recurrence prediction model using an accessible cloud-based ML platform. This approach offers advantages over traditional statistics, including the ability to easily incorporate new data and distribute updates. Our dataset is a part of a larger national dataset, which we aim to incorporate into future iterations. Currently, this model's performance favourably compares to existing nomograms.[5] With more accurate prognostication of recurrence, we can better counsel patients, individualize surveillance strategies, minimize ineffective investigations, and identify high-risk patients who truly benefit from close followup.

References

1. Chin AI, Lam JS, Figlin RA, et al. Surveillance strategies for renal cell carcinoma patients following nephrectomy. *Rev Urol* 2006;8:1-7.
2. Kassouf W, Monteiro LL, Drachenberg DE, et al. Canadian Urological Association guidelines for followup of patients after treatment of non-metastatic renal cell carcinoma. *Can Urol Assoc J* 2018;12:231-8. https://doi.org/10.5489/cuaj.5462
3. Ljungberg B, Bensalah K, Canfield S, et al. EAU guidelines on renal cell carcinoma: 2014 update. *Eur Urol* 2015;67:913-24. https://doi.org/10.1016/j.eururo.2015.01.005
4. Kotsiantis SB. Supervised machine learning: A review of classification techniques. *Informatica* 2007;31.
5. Sorbellini M, Kattan MW, Snyder ME, et al. A postoperative prognostic nomogram predicting recurrence for patients with conventional clear cell renal cell carcinoma. *J Urol* 2005;173:48-51. https://doi.org/10.1097/01.ju.0000148261.19532.2c
6. Sorbellini M, Kattan MW, Snyder ME, et al. A postoperative prognostic nomogram predicting recurrence for patients with conventional clear-cell renal cell carcinoma. *J Urol* 2005;173:48-51. https://doi.org/10.1097/01.ju.0000148261.19532.2c

UP-9.1

Outcomes of ablation therapy for small renal masses from a single centre

Samir Sami[1], Shiva Nair[1], Lucy Saimalov[2], Khalil Hetou[1], Stephen E. Pautler[1], Amol Mujoomdar[3], Joseph Chin[1]
[1]Division of Urology, Western University, London, ON, Canada; [2]Medicine, Western University, London, ON, Canada; [3]Radiology, Western University, London, ON, Canada

Introduction: The prevalence of imaging has lead to an increase in the incidence of small renal masses (SRMs). SRMs presumed to be malignant are most commonly treated with a partial nephrectomy. Non-invasive ablative techniques are increasingly used in patients (pts) who are poor surgical candidates or due to patient preference. This study describes functional and oncological outcomes of ablation therapy for SRMs at our centre.

Methods: A total of 166 patients who underwent ablation therapy for SRM at London Health Sciences Centre (LHSC) between 2011 and 2017 were retrospectively reviewed. Ablation therapy included radiofrequency ablation (RFA), cryoablation (CRA), and microwave ablation (MWA). Patients with renal lesions ≤4 cm with recorded followup (FU) to 12 months were included. Patients with simultaneous multiple renal lesions, known metastatic diseases, or ablations for recurrences were excluded. Oncological and functional outcomes were assessed.

Results: Median FU was 25 months (interquartile range [IQR] 13–41). Most patients (70%) were male. Mean age was 68.2 years (standard deviation [SD] 10.6) with a mean body mass index (BMI) of 30.7 (SD 7.9); 8.5% had solitary kidney. Median Charlson comorbidity index was 5 (IQR 4–6). Mean tumour diameter was 2.6 cm (SD 0.8). A total of 62.9%, 33.1%, and 4.0% of patients had low, intermediate, and high RENAL nephrometry scores, respectively. RFA occurred in 112 patients, 47 patients underwent CRA, and seven underwent MWA. Biopsy showed clear-cell histology (63.4 %), papillary (21.7%), chromophobe (6.9%), and oncocytoma (6.1%). There was no difference in serum creatinine post- and pre-ablation (112.3 vs. 100.2; p=0.13). Complete radiographic response was seen in 81.9% and 10% needed repeated ablation for residual disease; 11.3% had local recurrences (RFA=8 vs. CRA=8 vs. MWA=2; p=0.089). Two patients died of progression and metastasis. Six patients had Clavien 1, three patients had Clavien II, and four patients had Clavien III complications (one urine leak, two ureteral injuries, and one pneumothorax).

Conclusions: Ablation therapy, with different available modalities at our institution, is a viable option with a low-risk profile and low recurrence rates.

UP-9.2

Clinical features and outcomes of secondary somatic malignancy arising from teratoma in late relapse germ cell tumour

Nathan C. Wong[1], Shawn R. Dason[1], Lucas Dean[1], Sumit Isharwal[2], Mark Donoghue[3], Liwei Jia[4], William Tap[5], Gabriella Joseph[5], Samuel Funt[5], Deaglan McHugh[5], Hikmat Al-Ahmadie[4], Victor E. Reuter[4], Robert J. Motzer[5], George J. Bosl[5], Joel Sheinfeld[1], David B. Solit[5], Darren R. Feldman[5]
[1]Department of Surgery, Urology Services, Memorial Sloan Kettering Cancer Center, New York, NY, United States; [2]Department of Urology, University of Virginia Health System, Charlottesville, VA, United States; [3]Department of Molecular Oncology, Memorial Sloan Kettering Cancer Center, New York, NY, United States; [4]Department of Pathology, Memorial Sloan Kettering Cancer Center, New York, NY, United States; [5]Department of Medicine, Memorial Sloan Kettering Cancer Center, New York, NY, United States

Introduction: Late relapse (LR) (>2 years) germ cell tumour (GCT) is associated with an increased rate of secondary somatic malignancy (SSM). We report our experience with SSM in the setting of LR and determine predictors of overall survival (OS).

Methods: From 1985–2018, 46 patients with GCT and SSM at LR were identified and underwent chart review. The Kaplan-Meier method was used to estimate OS from time of LR and a Cox proportional hazards model to assess predictors of OS.

Results: Of 46 men (44 testicular primary, two mediastinal), median time to LR with SSM was 10.4 years. Most (n=27) were symptomatic at presentation but 11 were detected by elevated tumour markers and eight by imaging. SSMs were predominately adenocarcinoma (25), sarcoma (14), Wilms tumour (two), primitive neuroectodermal tumour (PNET) (one), and other (four). Median time to LR was longer for adenocarcinoma vs. other histotypes of SSM (14.6 vs. 4.1 years; p<0.001). The initial site of LR was the retroperitoneum (RP, 26), pelvis (seven), lung (six), retrocrural space (three), mediastinum (two), and other (two). Only 10/26 men with LR in the RP had undergone prior retroperitoneal lymph node dissection (RPLND) (all at outside institutions; variable templates) with teratoma in 7/10. The other 16 men had received chemotherapy only (eight), orchiectomy only for stage I (three), RPLND aborted (one), and unknown (four). All LR were managed with surgery; 26 also received chemotherapy (16 SSM-directed, 10 GCT-directed). Overall, 12 patients died and the median OS was 14.2 years. On univariable analysis, symptomatic presentation

(hazard ratio [HR] 3.1), SSM at multiple sites (HR 3.9), extra-RP disease (HR 3.9), and incomplete resection of SSM (HR 3.6) predicted mortality. On multivariable analysis, only extra-RP disease (HR 4.8) was independently associated with inferior OS (five-year OS 82% vs. 52%; p=0.017).
Conclusions: SSM is an important potential complication of LR GCT and seems to be associated with the lack of resection of RP metastases. Early identification and complete resection prior to SSM arising in extra-RP sites are critical to optimizing outcomes.

UP-9.3

Development and validation of a risk score based on patient characteristics to predict major complications after partial nephrectomy

Melissa J. Huynh[1], Ye Wang[2], Ross E. Krasnow[3], Benjamin I. Chung, Steven L. Chang[1,5]
[1]Urology, Brigham and Women's Hospital, Boston, MA, United States; [2]Center for Surgery and Public Health, Brigham and Women's Hospital,, Boston, MA, United States; [3]Urology, MedStar Washington Hospital Center, Washington, DC, United States; [4]Urology, Stanford University, Stanford, CA, United States; [5]Dana-Farber Cancer Institute, Boston, MA, United States

Introduction: Partial nephrectomy has become the gold standard in the treatment of clinical T1a renal masses. While tumour characteristics have been shown to correlate with complication rates in some studies, fewer studies have focused on the impact of patient comorbidities. We, therefore, sought to develop and validate a risk score to predict the probability of major complications following partial nephrectomy based on patient characteristics.
Methods: The Premier Healthcare Database (Premier Inc., Charlotte, NC, U.S.) was used to identify patients who had undergone elective partial nephrectomies. Through review of available ICD9 codes, we identified comorbidities and major surgical complications (Clavien grade 3–5). We used half of the set as the training cohort to develop our risk score and the other half as a validation cohort. Covariates with a p<0.20 in the univariate analysis were included as candidate variables in the multivariable logistic regression to identify predictors of major complications.
Results: From 2003–2015, 25 451 partial nephrectomies were performed. The overall rate of major complications for the whole cohort was 4.9%. The final risk score consisted of 10 predictors (Table 1) and stratifies patients into low-, intermediate-, high-, and very high-risk categories. In the training cohort, the area under the receiver-operator characteristic curve (AUC) was 0.75 (95% confidence interval [CI] 0.73–0.78) for major complications, while the AUC for the validation cohort was 0.73 (95% CI 0.70–0.75) (Fig. 1). The predicted probabilities of major complication in patients in the low-risk (≤10 points), intermediate-risk (11–20 points), high-risk (21–30 points), and very high-risk (>30 points) categories were 3% (95% CI 2.6–3.2), 8% (95% CI 7.2–9.2), 24% (95% CI 20.5–27.8), and 41% (95% CI 34.5–47.8), respectively.
Conclusions: We developed and validated a risk score to predict the risk of complications following partial nephrectomy based on patient characteristics. Calculation of a risk score can enhance the informed consent process for those planning to undergo partial nephrectomy for the management of a renal mass.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/223

UP-9.4

Management of complex cysts in Canada: Results of a survey study

Patrick Richard[1], Amélie Tétu[1], Luke T. Lavallée[2], Philippe Violette[3], Anil Kapoor[4], Wassim Kassouf[5], Antonio Finelli[6]
[1]Division of Urology, Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, QC, Canada; [2]Division of Urology, The Ottawa Hospital, Ottawa, ON, Canada; [3]Division of Urology, Woodstock General Hospital, Woodstock, ON, Canada; [4]Division of Urology, St. Joseph Healthare Centre, Hamilton, ON, Canada; [5]Division of Urology, McGill University Health Network, Montréal, QC, Canada; [6]Division of Surgical Oncology, Princess Margaret Cancer Centre, Toronto, ON, Canada

Introduction: Given their high-risk of malignancy (>50% risk), Bosniak III and IV cysts have traditionally been managed with surgical excision.[1] There is growing evidence suggesting that many of these cysts behave in an indolent fashion.[2] Therefore, active surveillance (AS) has been proposed as a possible treatment alternative.[3-5] The objectives of this study were to characterize the use of AS in the management of complex renal cysts in Canada and to identify the perceived barriers to its greater adoption.
Methods: A web-based survey was sent to all practicing urologists (n=583) of the Canadian Urological Association (CUA) in October 2018. The survey examined the physician's management of complex renal cysts and perceived barriers to adoption of AS. Chi-squared tests were used to assess for differences between respondents.
Results: The response rate was 24.7%. Of eligible respondents, 13.7% never or rarely offer AS (<5% of cases), while 33.1% offer AS in >50% of patients with a Bosniak III cysts in whom surgical extirpation is considered a viable treatment option. In contrast, for Bosniak IV cyst, 60.1% of urologists never or rarely offer AS, while only 10.1% offer it >50% of cases. A greater proportion of academic urologists compared to non-academic urologists viewed AS as a viable treatment option for patients with a Bosniak III (p=0.03) or IV (p=0.002) cysts. The most commonly reported barriers to greater adoption of AS were: concerns regarding the safety and/or benefits of AS, the lack of data to support AS in patients with Bosniak III–IV cyst and the lack of specific triggers for intervention for patient managed by AS.
Conclusions: Although AS is reported by the CUA guidelines as a possible treatment option for complex cysts, most urologists are still reluctant to offer this option to their patients, mostly due to the lack of data supporting its role. Thus, future studies are required to better define the role of AS in patients with Bosniak III or IV cysts.
References

1. Schoots IG, Zaccai K, Hunink MG, et al. Bosniak classification for complex renal cysts re-evaluated: A systematic review. *J Urol* 2017;198:12-21. https://doi.org/10.1016/j.juro.2016.09.160
2. Bhatt JR, Jewett M, Richard PO, et al. Multilocular cystic renal cell carcinoma: Results of a long-term, large population-level study: Pathologic T-staging makes no difference to favourable outcomes and should be reclassified. *J Urol* 2016;196:1350-5. https://doi.org/10.1016/j.juro.2016.05.118
3. Chandrasekar T, Ahmad AE, Fadaak K, et al. Natural history of complex renal cysts: Clinical evidence supporting active surveillance. *J Urol* 2018:199:633-40. https://doi.org/10.1016/j.juro.2017.09.078
4. Pruthi DK, Liu Q, Kirkpatrick IDC, et al. Long-term surveillance of complex cystic renal masses and heterogeneity of Bosniak 3 lesions. *J Urol* 2018;200:1192-9. https://doi.org/10.1016/j.juro.2018.07.063
5. Richard PO, Violette PD, Jewett MAS, et al. CUA guideline on the management of cystic renal lesions. *Can Urol Assoc J* 2017;11:E66-73. https://doi.org/10.5489/cuaj.4484

UP-9.5

The evaluation of non-neoplastic kidney tissue at time of nephrectomy to predict postoperative renal function

Mohammad Mohaghegh[1], Yong Jia[2], Ian Gibson[2], Rahul Bansal[1], Thomas McGregor[3], Deepak Pruthi[4], Darrel E. Drachenberg[1], Corey J. Knickle[2], Jasmir G. Nayak[1]
[1]Surgery, University of Manitoba, Winnipeg, MB, Canada; [2]Pathology, University of Manitoba, Winnipeg, MB, Canada; [3]Urology, Queen's University, Kingston, ON, Canada; [4]Urology, University of Texas Health Sciences Center, San Antonio, TX, United States

Introduction: Impaired renal function is a potentially serious and morbid complication from renal surgery. Currently, we are limited in our ability to predict postoperative renal function and rely on serological investigations to monitor for this occurrence. The histological evaluation of non-neoplastic kidney (NNK) tissue at the time of renal surgery may offer unique insight into the postoperative renal function.
Methods: This study was performed as a combined prospective pathological review and retrospective clinical chart review. A blinded expert pathologist assessed NNK tissues for four histological elements to report scores on glomerular sclerosis, tubulointerstitial changes, arterioscle-

rosis, and arteriolar changes. Patients undergoing nephrectomy at our centre were identified and included. Exclusion criteria included: loss to followup, obstructive nephropathy, preoperative end-stage renal disease, and bilateral nephrectomies. Patient demographics were described using descriptive statistics. Multivariate logistic regression models were created to assess the effect of NNK and other clinical factors on renal function.

Results: Sixty-three of 101 patients were deemed eligible for statistical analysis at one year; 70% had a radical nephrectomy and the remainder had a partial nephrectomy. The mean age and tumour size for patients were 62 years and 5.5 cm, respectively. History of smoking, hypertension, and diabetes was present in 38%, 43%, and 11%, respectively. Twenty percent of patients had CKD stage 3 or greater at baseline vs. 57% after one year. Mean estimated glomerular filtration rate (eGFR) prior to surgery was 68, while at one year it was reduced to 55. Glomerular sclerosis severity on NNK assessment was predictive of decline in renal function and rise in serum creatinine. Having had a radical procedure and high glomerular sclerosis score was associated with CKD stage progression and thus renal function deterioration.

Conclusions: This study demonstrated that NNK evaluation can be helpful in identifying patients who are at risk for the development or progression of CKD.

UP-9.7

Management of small renal masses: Identifying barriers to the use of renal tumour biopsy and interventions to optimize its use in Ontario

Ranko Savic[1], Anna R. Gagliardi[2], Shabbir M. Alibhai[3], Lisa Martin[1], Maria Komisarenko[1], Patrick Richard[4], Antonio Finelli[1]

[1]Princess Margaret Cancer Centre, University Health Network and University of Toronto, Toronto, ON, Canada; [2]Toronto General Hospital Research Institute, University Health Network and University of Toronto, Toronto, ON, Canada; [3]Department of Medicine, University Health Network and University of Toronto, Toronto, ON, Canada; [4]Faculty of Medicine and Health Sciences, Université de Sherbrooke, Sherbrooke, QC, Canada

Introduction: Despite having high performance and low complication rates, renal tumuor biopsy (RTB) is underused in Canada. Some barriers to the use of RTB have been previously identified using surveys. This study used open-ended interviews in Ontario to examine barriers and facilitators to the use of RTB, and identify potential interventions to overcome the barriers.

Methods: Recruitment packages were mailed to all currently active urologists in Ontario (n=307) using contact information from the publicly available Canadian Physicians and Surgeons of Ontario database. Followup recruitment packages were sent two weeks later. Semi-structured, open-ended telephone interviews were conducted with urologists who agreed to participate. Interviews were audio-recorded and transcribed verbatim. Themes were identified using a basic descriptive qualitative approach.

Results: Twenty-four urologists were interviewed (response rate 8%). Participants were from academic (n=12) and community (n=12) hospital settings. The main themes for RTB barriers were clinician barriers, RTB guideline and literature factors, patient barriers, resources, and organizational/system factors. "Lack of radiologist experience in performing RTB" was a novel subtheme identified through this work. When considering RTB facilitators, multidisciplinary teamwork facilitators, and institutional factors were the main themes. "Good interaction between different clinicians" was identified as a subtheme. The key recommended interventions by urologists were resources for RTB, education on RTB, and guidelines for RTB. A novel recommended intervention was "teach urologists to perform their own RTBs."

Conclusions: This research elucidated barriers not previously identified in the literature. Barriers from the interviews, along with potential interventions to overcome them, are currently being ranked by a panel of experts to determine which intervention is the most appropriate to optimize the use of RTB in Ontario.

UP-9.8

Impact of time-to-surgery and surgical delay on oncological outcomes for renal cell carcinoma

Benjamin Shiff[1], Rodney H. Breau[2], Premal Patel[3], Anil Kapoor[4], Frédéric Pouliot[5], Alan I. So[6], Ricardo A. Rendon[7], Ronald B. Moore[8], Antonio Finelli[9], Simon Tanguay[10], Luke T. Lavallée[2], Jean-Baptiste Lattouf[11], Jun Kawakami[12], Daniel Heng[12], Ranjeeta Mallick[13], Darrel E. Drachenberg[1]

[1]Urology, University of Manitoba, Winnipeg, MB, Canada; [2]Urology, University of Ottawa, Ottawa, ON, Canada; [3]Urology, University of Miami, Miami, FL, United States; [4]Urology, McMaster University, Hamilton, ON, Canada; [5]Surgery, Université Laval, Québec City, QC, Canada; [6]Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; [7]Urology, Dalhousie University, Halifax, NS, Canada; [8]Urology, University of Alberta, Edmonton, AB, Canada; [9]Urology, University of Toronto, Toronto, ON, Canada; [10]Urology, McGill University, Montréal, QC, Canada; [11]Surgery, Université de Montréal, Montréal, QC, Canada; [12]Medical Oncology, University of Calgary, Calgary, AB, Canada; [13]Ottawa Hospital Research Institute, Ottawa, ON, Canada

Introduction: Surgical wait times (SWT) are a major concern in healthcare. In 2005, the Canadian Surgical Wait Time Consensus statement suggested wait times of <90 days for T1a and <28 days for ≥T1b asymptomatic renal masses.[1] Few reports have examined the effect of prolonged SWT for renal cancer surgery on oncological outcomes and those that exist were conducted on a single-institution level.[2-4] We aimed to evaluate whether SWT is associated with treatment outcomes for renal masses on a multi-institution level.

Methods: The Canadian Kidney information system (CKCis) is a national multi-institution database of patients with kidney tumours. This database was used to identify a historical cohort of patients who underwent surgery for ≥ clinical stage T1b renal cell carcinoma (RCC) from 2011 onwards. Time from final imaging prior to surgery to the date of surgery was used as a measure of SWT. Oncological outcomes, such as recurrence-free survival (RFS), cancer-specific survival (CSS), and overall survival (OS) were stratified by clinical stage and SWT to assess for associations between SWT and outcomes.

Results: Of 1395 patients included in the analysis, 664 (47.6%) were categorized as stage cT1b, 387 (27.7%) as stage cT2, and 344 (24.7%) as stage cT3/4. Mean followup duration was 28.80 months. Mean SWT was 61.6 days, 39.3 days, and 31.5 days for stages cT1b, cT2, and cT3/4, respectively. Among cT1b, cT2, and cT3/4 patients, SWT exceeded 12 weeks in 27.4%, 11.6%, and 8.1% of patients, respectively. There was no association between SWT and RFS, margin status, or lymph node status for tumours of all clinical stages.

Conclusions: Mean SWTs for renal cancer surgery appear to be within recommendations, although a significant proportion of cT1b patients are experiencing prolonged wait times. Patients who had longer SWTs in this study did not experience negative oncological outcomes, such as positive margins, positive lymph nodes, or worse RFS among all clinical stages.

References

1. Aprikian A, Bagnell S, Bell D, et al. Consensus document: Recommendations for optimal surgical wait times for patients with urological malignancies. *Can J Urol* 2006;13Suppl 3:62-4.
2. Stec AA, Coons BJ, Chang SS, et al. Waiting time from initial urological consultation to nephrectomy for renal cell carcinoma — does it affect survival? *J Urol* 2008;179:2152-7. https://doi.org/10.1016/j.juro.2008.01.111
3. Martínez CH, Martin P, Chalasani V, et al. How long can patients with renal cell carcinoma wait for surgery without compromising pathological outcomes? *Can Urol Assoc J* 2011;5:148-51. https://doi.org/10.5489/cuaj.10035
4. Hyun Kim K, You D, Gab Jeong I, et al. The impact of delaying radical nephrectomy for stage II or higher renal cell carcinoma. *J Cancer Res Clin Oncol* 2012;138:1561-7. https://doi.org/10.1007/s00432-012-1230-2

UP-9.10

Disparities associated with disease presentation and poor survival among Asian patients with upper tract urothelial carcinoma

Dixon Woon[1], Jaime O. Herrera-Cáceres[1], Zachary Klaassen[1], Hanan Goldberg[1], Thenappan Chandrasekar[1], Guan Hee Tan[1], Khaled Ajib[1], Greg Nason[1], Omar Alhunaidi[1], Girish S. Kulkarni[1], Neil E. Fleshner[1]
[1]Surgical Oncology, University Health Network, Toronto, ON, Canada

Introduction: In most cancers, minority populations, such as African Americans and Hispanics, have shown poorer outcomes than Caucasians. To our knowledge, most epidemiological data on upper tract urothelial cancer (UTUC) has mainly focused on African Americans and Caucasians, and thus neglected the Asian populations, which represent >5% of the U.S. population and are rapidly increasing. Our study aimed to evaluate potential differences in disease stage at diagnosis, surgical management for localized disease, and survival outcomes for Asian patients with UTUC.

Methods: Patients diagnosed with UTUC from 1988–2014 were identified in the Surveillance, Epidemiology, and End Results (SEER) database. Demographic and socioeconomic variables, such as marital and insurance status, were analyzed. Multivariable logistic regression was used to assess predictors of metastatic disease at diagnosis. Fine and Gray competing risks analyses were used to identify predictors of cancer-specific mortality (CSM) and Cox proportional hazard models was performed to evaluate overall survival (OS).

Results: A total of 12 124 patients with UTUC were identified. Of these, 10 638 (87.7%) were Caucasians, 793 (6.5%) Asian, 578 (4.8%) African American, and 115 (1%) patients of other races; 1193 (9.8%) patients had metastasis at diagnosis. Rates of Caucasian and Asian patients who presented with metastatic disease at diagnosis were 9.5% and 12.6%, respectively. Compared to Caucasian patients, Asians were 38% (odds ratio [OR] 1.38; 95% confidence interval [CI] 1.1–1.7) more likely to present with metastatic disease and were 27% more likely to die of UTUC (hazard ratio [HR] 1.27; 95% CI 1.1–1.5). There were no differences in surgical management or OS between Caucasians and Asians.

Conclusions: Asian patients with UTUC are more likely to present with metastatic disease at diagnosis and have worse CSM compared to Caucasian patients. Further research should be conducted to evaluate the underlying reason for these findings in order to improve the outcomes for Asian patients with UTUC.

This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/231

UP-9.11

Clampless vs. on-clamp partial nephrectomy: Comparing perioperative renal outcomes

Akshay Sathya[1], Michael K. Organ[2], David Harvey[2], Paul H. Johnston[2], Robert Wilson[1], Christopher French[2]
[1]Faculty of Medicine, Memorial University of Newfoundland, St. John's, NL, Canada; [2]Division of Urology, Memorial University of Newfoundland, St. John's, NL, Canada

Introduction: Clampless partial nephrectomy, while technically challenging, is a method of minimizing long-term risks associated with renal ischemia during partial nephrectomies. The aim of this study was to examine outcomes in one centre by comparing clampless and on-clamp partial nephrectomies, focusing largely on short-term renal outcomes.

Methods: A retrospective analysis of 219 partial nephrectomy cases performed by six urologists in St. John's, Newfoundland from 2012–2017 was completed. Primary outcomes were preoperative estimated glomerular filtration rate (eGFR), discharge eGFR, six-month eGFR, and one-year eGFR. Secondary parameters were estimated blood loss (EBL), margin status, and clamp time. Patient and tumour characteristics were collected including RENAL nephrometry scores.

Results: Of the 219 patients, 54 (24.6%) were laparoscopically performed and 165 (75.4%) were open; 117 (54%) of the 219 cases were clampless partial nephrectomies and 101 (46%) were on-clamp. In the clampless group, mean preoperative eGFR was 84. Mean discharge eGFR was 82, while six-month and one-year eGFR were 75 and 76, respectively. Mean EBL in the clampless group was 450 mL, while mean operative time was 92 minutes. In the on-clamp group, mean pre-operative eGFR was 81, while discharge eGFR was 69. Mean six-month and one-year eGFR were both 72. Additionally, mean clamp time was 12.62 minutes. Mean EBL for the on-clamp group was 556 mL, while mean operative time was 121 minutes.

Conclusions: This preliminary data suggests that in the early postoperative timeframe, renal function in patients receiving clampless partial nephrectomy demonstrate consistently better eGFR compared to the on-clamp group, even with short mean clamp times. However, this difference narrows with time. Long-term data and further study are needed to gain an understanding of how intraoperative ischemia can affect renal function and whether zero-ischemia procedures translate to better long-term renal function.

UP-9.12

Immunological impact of the surgical resection of renal tumours: Implications for cytoreduction in the immune checkpoint inhibitor era

Bimal Bhindi[1,2], Paras Shah[2], Christine Lohse[2], Ross Mason[2,3], Henan Zhang[2], Lance Pagliaro[2], Brian Costello[2], R. Houston Thompson[2], Stephen Boorjian[2], John Cheville[2], Haidong Dong[2], Bradley Leibovich[2]
[1]Surgery, Section of Urology, University of Calgary, Calgary, AB, Canada; [2]Urology, Mayo Clinic, Rochester, MN, United States; [3]Urology, Dalhousie University, Halifax, NS, Canada

Introduction: Immune checkpoint inhibitors are increasingly being used for renal cell carcinoma (RCC). The role of nephrectomy in conjunction with these agents remains unclear and the mechanisms of the potential benefit of cytoreduction require further exploration. We sought to evaluate whether surgical resection of renal tumours influences anti-tumour immune markers.

Methods: We prospectively enrolled 28 patients undergoing partial (10), radical (13), or cytoreductive nephrectomy (5) for a unilateral primary renal tumour from 2016–2018. Immunosuppressed patients were excluded. Blood was drawn preoperatively, on postoperative day one (POD1), and at three months (3MO). Peripheral blood mononuclear cells (PBMCs) were isolated and flow cytometry was used to assess the percent of PMBCs that were CD11a+CD8+ (to identify tumour-reactive cytotoxic T-lymphocytes; CTLs) and the percent of CTLs that were Bim+ (downstream pro-apoptotic mediator of PD-1 pathway), CX3CR1+GZMB+ (to identify effector memory T-cells), and Ki67+ (marker of proliferation). Changes in immune markers preoperatively to POD1 and 3MO were compared using Wilcoxon signed rank tests. Comparisons between aggressive (pT3-4, N1, M1, or aggressive histology [high-grade, coagulative necrosis, sarcomatoid differentiation, or specific RCC-variant histologies]) vs. indolent tumours were made using a Wilcoxon rank sum test.

Results: Nineteen, six, and three patients had clear-cell RCC, non-clear cell RCC, and oncocytoma, respectively. At 3MO, there was a significant rise in the percent of CTLs among PMBCs (median change +1.6; p=0.008). On POD1, there was a significant rise in the percent of CTLs that were proliferating (median change +0.7; p=0.016) and a significant decrease by 3MO vs. preoperatively (median change -0.9; p<0.001). There was a non-significant decline by 3MO in the percent of Bim+ CTLs (median change -1.8; p=0.14). At 3MO, the percent of effector memory CTLs was increased among patients treated for aggressive tumours but not indolent tumours (median change +2.7 vs. -0.4; p=0.048).

Conclusions: These findings suggest potential beneficial effects on the anti-tumour immune response with surgical resection of the primary renal tumour. These data have important implications in an era when immune checkpoint inhibitors are being used in the metastatic setting and are being evaluated in the adjuvant setting.

Poster Session 10: Prostate Cancer II
July 1, 2019; 0730–0900

MP-10.1

Median five-year oncological outcomes of salvage high-intensity focused ultrasound for prostate cancer recurrences after primary radiotherapy

Shiva M. Nair[1], Max Peters[2], Haider Abed[1], Jochem van der Voort van Zyp[2], Marieke van Son[2], Joseph Chin[1]
[1]Division of Urology, Department of Surgery, University of Western Ontario, London, ON, Canada; [2]Department of Radiotherapy, University Medical Centre Utrecht, Utrecht, Netherlands

Introduction: Recurrent prostate cancer after primary radiotherapy occurs, especially in higher-risk groups. Local recurrence can be treated using salvage therapy, thereby deferring subsequent non-curative systemic treatments. Tumour control results of salvage high-intensity focused ultrasound (HIFU) at median five years followup are reported.

Methods: From April 2006 to March 2017, patients with histologically confirmed recurrent prostate cancer were treated using whole-gland salvage HIFU (Sonablate, whole gland). Bone scan and computed tomography were negative for clinical metastatic disease. Data before salvage HIFU was collected to predict oncological outcomes. Overall survival (OS), prostate cancer-specific survival (PCSS), and metastases-free survival (MFS) were calculated using the Kaplan-Meier method. Cox regression was used to assess predictive factors for OS.

Results: Eighty-seven patients with complete data were analyzed. Median followup was 65 months (interquartile range [IQR] 36–122). Median age before salvage was 71 years (IQR 66–74), median prostate-specific antigen (PSA) pre-salvage 3.8 ng/ml (IQR 2.3–5.1), and median PSA nadir post-HIFU 0.44 (IQR 0.04–1.41). Most patients had Charlson comorbidity score 4 (31%), 5 (33.3%), or 6 (18.4%);14.9% had primary Gleason 6 before radiation and 78.2% Gleason 7 or greater. Five-year OS was 83% (confidence interval [CI] 75–92), PCSS was 89% (CI 82–97), and MFS was 85% (CI 77–94). Pre-salvage PSA predicted overall mortality in univariate analysis ($p<0.0001$), but not in multivariate analysis. Fifty-one patients (58.6%) were androgen-deprivation therapy (ADT)-free at last followup, with a median time to ADT at 118 months (CI 84 – 210).

Conclusions: Salvage HIFU can achieve high OS, PCSS, and MFS in the medium-term in appropriately selected patients with radio-recurrent prostate cancer. Urologists should include this in the options discussed for localized radio-recurrent disease, especially in men who may not be suitable for salvage radical prostatectomy.

MP-10.2

Predictors of poor pathological outcomes following radical prostatectomy among patients initially on active surveillance for intermediate-risk and low-risk prostate cancer

Justin Oake[1], Premal Patel[2], Jeffery W. Saranchuk[1], Darrel E. Drachenberg[1], Jay Nayak[1]
[1]Section of Urology, University of Manitoba, Winnipeg, MB, Canada; [2]Department of Urology, University of Miami, Miami, FL, United States

Introduction: Active surveillance (AS) is a means to avoid treatment-associated morbidity in men with low-risk prostate cancer (PCa) and select men with intermediate-risk PCa. We sought to determine predictors of poor pathological outcomes among AS patients who underwent radical prostatectomy (RP). Our secondary objective was to compare pathological and biochemical outcomes between subgroups of intermediate-risk vs.low-risk disease.

Methods: AS patients followed at the Manitoba Prostate Centre from January 1, 2004 to December 31, 2015 were identified by a retrospective electronic chart review. AS patients were divided into low-risk, favourable intermediate-risk, and unfavourable intermediate-risk groups according to National Comprehensive Cancer Network (NCCN) guidelines based on their initial biopsy. Poor pathological outcomes included: upgrading to Grade Group (GG) 3–5 on final surgical pathology, positive surgical margins, and a composite adverse pathology variable defined as GG 3–5, extracapsular extension, seminal vesicle invasion, or positive lymph nodes. Multivariable logistic regression was used to identify predictors of poor pathological outcomes.

Results: A total of 270 PCa patients were included. Median overall followup was 72 months (interquartile range [IQR] 28–119). prostate-specific antigen density (PSAD) >0.15 was a significant predictor of upgrading to GG 3–5 (odds ratio [OR] 10.96; 95% confidence interval [CI] 1.32–91.15), positive surgical margins (OR 4.86; 95% CI 1.10–21.50), and the composite adverse pathology variable (OR 13.89; 95% CI 2.24–86.05). There were no significant differences between RP pathological outcomes between low-risk, favourable intermediate-risk, and unfavourable intermediate-risk groups.

Conclusions: Among AS patients who underwent RP, PSAD >0.15 was a consistent predictor of poor pathological outcomes. Among patients who received RP, there were similar adverse pathological outcomes at the time of RP. Our findings suggest that select patients with intermediate-risk disease may be safely managed with AS.

MP-10.3

Improving quality of prostate cancer surgery by providing feedback to surgeons: The Surgical Report card (SuRep) study

Ravi Kumar[1], Luke T. Lavallée[1,2], Christopher Morash[1], Ilias Cagiannos[1], Dean Fergusson[2], David Sands[1], Sonya Cnossen[2], Ranjeeta Mallick[2], Michael Horrigan[2], Dawn Stacey[2,3], Rodney H. Breau[1,2]
[1]Division of Urology, Department of Surgery, The Ottawa Hospital, University of Ottawa, Ottawa, ON, Canada; [2]Ottawa Hospital Research Institute, Ottawa, ON, Canada; [3]Faculty of Health Sciences, University of Ottawa, Ottawa, ON, Canada

Introduction: Goals of radical prostatectomy include complete tumour resection and optimization of urinary and erectile function. In this Surgical Report card (SuRep) study, we aimed to monitor cancer, urinary, and sexual outcomes and provide surgeons with report cards assessing their performance.

Methods: Prospective radical prostatectomy patients at The Ottawa Hospital consented for participation in SuRep. All eight prostate cancer surgeons also consented to participation. Feasibility goals for the study were 95% patient enrollment, with 70% participation at 12 months. Patient-reported outcomes were assessed using validated questionnaires (Expanded Prostate Cancer Index Composite [EPIC] and EQ-5D). The patient data was analyzed and report cards were provided to surgeons every four months starting one year after the first patient was enrolled.

Results: During the study period, 422 of 436 (97%) radical prostatectomy patients participated in the study. Followup data was available for 356 (84%) patients at 12 months following surgery. Two-hundred and ten (50%) patients were included in the first year (pre-report card) and 212 (50%) patients in the second year (post-report card). Baseline characteristics were similar in the pre- and post-report card cohorts. Almost all patients were continent (98%) and the majority were potent (61%) prior to surgery. Nerve-sparing surgery increased from 148 (70%) pre-report card to 173 (82%) post-report card. There was a non-statistically significant increase in the

proportion of patients with a positive surgical margin (32% pre-report card vs. 39% post-report card; p=0.09). There was no difference in postoperative erectile function (24% vs. 26%; p=0.69) and a decrease in continence (76% vs. 63.2%; p=0.01).
Conclusions: A surgical report card program is feasible. With one year of surgical report cards, overall patient outcomes did not improve. We believe that specific initiatives and longer duration of feedback are needed for positive change to occur.

MP-10.4

Assessment of magnetic resonance imaging-fusion prostate biopsy with comparison to concurrent standard systematic ultrasound-guided biopsy

Ryan Sun[1], Jeffery W. Saranchuk[1]
[1]Urology, University of Manitoba, Winnipeg, MB, Canada
Introduction: The current standard for prostate cancer diagnosis involves a systematic, ultrasound-guided prostate biopsy, which may be limited by suboptimal detection rate. Recent development of magnetic resonance imaging (MRI)-guided fusion biopsy has emerged as a promising technique for cancer detection that potentially allows for more accurate sampling of suspicious lesions using real-time MR image registration. In this study, we aim to assess the diagnostic accuracy and clinical impact of MRI-fusion.
Methods: Patients with suspicious prostate lesions on MRI who underwent MRI-fusion and concurrent systematic biopsy were included in this retrospective study. The results of fusion biopsies were compared with corresponding standard biopsies. The primary outcome was the sensitivity for clinically significant prostate cancer and whether the fusion biopsies led to clinically impactful changes in patient management.
Results: A total of 42 patients and 52 lesions were included; 76% of patients were found to have clinically significant prostate cancer. The sensitivity of systematic and fusion biopsies were 75% and 88%, respectively (p=0.057). Fusion biopsies alone missed 16% of clinically significant cancer, compared to 22% in systematic biopsies. A potential change in clinical management of prostate cancer as a result of MRI-fusion biopsy was seen in 10 (29%) cases compared to 16 (47%) from a repeat systematic biopsy.
Conclusions: Preliminary data showed a trend toward improved overall prostate cancer detection rate with fusion biopsies, but traditional systematic biopsies detected some significant cancer that would be otherwise missed or under-graded if only fusion biopsies were performed. Additional systematic sampling should still be performed for maximal cancer detection.

MP-10.5

The neutrophil-to-lymphocyte ratio (NLR) as a predictive marker of response to abiraterone acetate: A retrospective analysis of the COU302 study

Thomas Loubersac[1], Molière Nguile Makao[2], Frédéric Pouliot[2,3], Vincent Fradet[2,3], Paul Toren[2,3]
[1]Urology, Centre Hospitalier Universitaire (CHU) Nantes, Nantes, France; [2]Division of Oncology, Centre de Recherche CHU de Québec-Université Laval, Québec City, QC, Canada; [3]Department of Surgery, Université Laval, Québec City, QC, Canada
Introduction: The neutrophil-to-lymphocyte ratio (NLR) is an inexpensive and accessible prognostic marker for many cancers, including metastatic castration-resistant prostate cancer (mCRPC). In this study, we assess its role as a predictive biomarker through a retrospective analysis of the pivotal COU302 study of abiraterone acetate (AA) as first-line therapy for men with asymptomatic or minimally symptomatic mCRPC.
Methods: Descriptive statistics, as well as Kaplan-Meier and Cox survival models, were used to assess the effect of baseline NLR and changes in NLR on response to AA plus prednisone (P) vs. prednisone, with adjustment for important covariates.
Results: Among the 1082 patients who received treatment, baseline NLR values showed no significant differences according to baseline covariates except for albumin. Baseline variables were similar between dichotomous groups, with a NLR cutoff of 2.5, except for a lower proportion of patients with >10 bone metastases in the NLR <2.5 group. Our survival results demonstrate that higher NLR values corresponded to a poorer overall survival and prostate-specific antigen (PSA) response to AA but not placebo (Figs. 1A, C), which was confirmed in our adjusted regression models. No significant differences were seen in time to radiographic progression (Fig. 1B). In separate analyses, an increase or decrease NLR by two from treatment baseline did not clearly signal subsequent lack of benefit with continued AA.
Conclusions: Our results suggest that baseline NLR may be able to predict response to AA in men with asymptomatic mCRPC, but that changes in NLR during treatment are insufficient to guide treatment. Further validation studies are warranted.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/240
This study, carried out under YODA Project # 2016-1103, used data obtained from the Yale University Open Data Access Project, which has an agreement with Janssen Research & Development, L.L.C. The interpretation and reporting of research using this data are solely the responsibility of the authors and does not necessarily represent the official views of the Yale University Open Data Access Project or Janssen Research & Development, L.L.C.

MP-10.6

Targeted ablation using ultrasound-guided irreversible electroporation of index prostate tumours (TARGET Study): Pilot development study evaluating patient-reported outcomes and oncological efficacy

Taehyoung Lee[1], Arjun Sivaraman[1], Emily Vertosick[1], Gregory Chesnut[1], Jonathan Fainberg[2], Stephen B. Solomon[1], Samson W. Fine[1], James Eastham[1], Jonathan Coleman[1], Behfar Ehdaie[1]
[1]Memorial Sloan Kettering Cancer Center, New York, NY, United States; [2]Department of Urology, New York-Presbyterian Weill Cornell Medical College of Cornell University, New York, NY, United States
Introduction: We studied the patient-reported functional and sexual outcomes, and oncological efficacy of focal irreversible electroporation (IRE) as a primary treatment for intermediate-risk prostate cancer (PCa).
Methods: Between February 2015 and April 2017, 20 consecutive patients initiated IRE and underwent 22 treatments. All patients underwent magnetic resonance imaging (MRI)-targeted and systematic transrectal (ST) biopsies. Eligibility criteria were Gleason grade group (GrdGrp) 2/3 PCa in a maximum of two adjacent sextant prostate sectors in one hemigland without extraprostatic extension on MRI. Ablation was performed with 5 mm cancer margin and any GrdGrp 1 cancer outside of mapped index lesion was untreated. Outcome measures were based on prostate quality of life survey, Male Sexual Health Questionnaire, and MRI-targeted and ST biopsies at three and 12 months.
Results: Nineteen patients completed IRE. One patient had electrocardiogram (ECG) changes and IRE was aborted. Patient and disease characteristics are listed in Table 1. The rate of no cancer at 12 months after initial IRE was 72% (95% confidence interval [CI] 47%, 90%). GrdGrp 2/3 PCa was identified in the treated area by biopsy at three months in 1/19 (5%) patients and at 12 months in 2/18 (11%) patients. ST biopsy identified GrdGrp 2/3 PCa in non-treated areas in 3/18 (17%) patients at 12 months. Three (16%) patients had repeat IRE and four (21%) underwent radical prostatectomy. At six months, no statistically significant deterioration was detected in urinary or sexual domains, or health-related quality of life index (Table 2). Ejaculation quality and bother worsened, while volume decreased at 12 months (Table 3). Complications are listed in Table 4. All complications resolved by three months.
Conclusions: Focal IRE as primary treatment of intermediate-risk PCa is safe and associated with high one-year treatment success. Urinary and sexual functions were well-maintained. Ejaculatory function was negatively impacted by IRE. Patients should be counselled about the need for possible re-treatment.
This paper has figures, which may be viewed online at: https://2019.cua.events/webapp/lecture/241

MP-10.7

Leisure-time physical activity and circulating insulin-like growth factor-1 level in men at high-risk of prostate cancer: The BIOCaPPE-GRéPEC study

Lamoussa Diabate[1], Laurence Bettan[1], Molière Nguile-Makao[1], Hélène Hovington[1], Pierre Julien[1], Fred Saad[2], Michel Carmel[3], Armen Aprikian[4], BIOCaPPE Network[1,2,3,4], Yves Fradet[1], Vincent Fradet[1]

[1]CHU de Québec Research Centre–Université Laval, Québec City, QC, Canada; [2]CHUM Research Centre, Montréal, QC, Canada; [3]CHUS Research Centre, Sherbrooke, QC, Canada; [4]CUSM Research Institute, Montréal, QC, Canada

Introduction: In Canada, 58 men are diagnosed with prostate cancer (PCa) every day. Physical activity is associated, at least in part, with PCa risk in this population. The preventive role of physical activity remains to be clarified but likely implies modulation of biomarkers that could be used to risk-stratify PCa. We believe that physical activity is associated with circulating insulin-like growth factor-1 (IGF-1) level, which in turn, may influence the risk of PCa. In this study, we aimed at assessing the relationship between leisure-time physical activity (LTPA) and IGF-1 level in men at high risk of developing PCa.

Methods: Study participants are men at high risk of PCa currently enrolled in a prospective, multicentre clinical trial (BIOCaPPE_GRéPEC trial). This trial aims at evaluating the role of environmental exposures on PCa development. At study baseline, LTPA score was calculated using the validated Godin Leisure-Time Exercise Questionnaire. This LTPA score was used to categorize participants into active or inactive groups. IGF-1 level was also collected at study baseline. The association between LTPA score and IGF-1 level was assessed using multivariate linear regression.

Results: The mean age of the first 1067 participants was 63 years old (±7) and the mean circulating IGF-1 level was 110 ng/mL (±30). Most participants were active (n=743, 69.6%). The multivariable model was adjusted for confounding factors (age, alcohol, body mass index, waist circumference, self-rated health, education level, marital status) and showed that inactive participants had a higher IGF-1 level compared to active participants (β=-4.73, I 95% confidence interval -8.86;-0.60; p=0.02).

Conclusions: LTPA was inversely associated with circulating IGF-1 level among men at high risk of PCa. Our data support IGF-1 level as a putative biomarker to stratify PCa development risk and warrant further analyses. IGF-1 should also be considered an intermediate factor in epidemiological studies.

MP-10.8

18-Fluoro-2-deoxy-D-glucose positron emission tomography/computed tomography-detected incidentalomas of the prostate

Miles Mannas[1,3], Taeweon Lee[1], Maral Pourghiasian[2], Don Wilson[2], Peter C. Black[1,3].

[1]Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; [2]Functional Imaging, BC Cancer, Vancouver, Canada; [3]Vancouver Prostate Centre, Vancouver, BC, Canada

Introduction: Prostate incidentalomas (PI) are prostatic lesions discovered by imaging patients without a known history of prostatic cancer (CaP). ^{18}Fluoro-2-deoxy-D-glucose positron emission tomography/computed tomography (FDG PET) is an imaging modality used to diagnose, stage, and assess response to treatment for many cancers.[1] FDG PET is not routinely used in the diagnosis or management of CaP. We aimed to describe the incidence, characteristics, rate of malignancy, and management of PI.

Methods: A retrospective review was conducted of FDG PET performed on male patients between 2005 and 2017 to identify patients with PI. Demographic, clinical data, investigations, and management were collected from regional databases and outcomes were assessed.

Results: A total of 31 019 FDG PET scans were performed revealing 309 (1%) patients with a PI. Based on age-standardized prostate-specific antigen (PSA) (<2.5 ng/ml if <50 years, <3.5 ng/ml if 50–59 years, <4.5 ng/ml if 60–69 years, and <6.5 ng/ml if >70 years) or tissue diagnosis, 130 (42.1%) patients PI were deemed likely benign, 34 (11.0%) suspicious for CaP, 77 (24.9%) had no PSA testing, and 33 (11.0%) were diagnosed with CaP. T-testing showed no differences in age or maximum standardized uptake value (SUVmax) between patients with PI likely benign, suspicious for CaP, having no PSA testing, and CaP. Only 40.1% of patients underwent PSA testing within six months of PI identification, although 64.1% eventually underwent PSA testing or obtained a tissue diagnosis. Six patients underwent a dedicated prostate multiparametric magnetic resonance imaging (mpMRI), of which one identified Gleason 3+4 CaP. Twenty-seven (79.4%) of the patients diagnosed with CaP had intermediate-risk, high-risk, or metastatic disease. Many patients with a PI were diagnosed with CaP within one year of the FDG PET; however, 15 (44.1%) patients had delayed PSA testing and subsequently a delayed diagnosis of CaP.

Conclusions: A FDG PET PI may represent clinically significant CaP. We recommend patients with a PI be referred for urological assessment, allowing for timely investigation if indicated.

Reference

1. Sone Y, Sobajima A, Kawachi T, et al. Ability of 18-fludeoxyglucose positron emission tomography/CT to detect incidental cancer. *Br J Radiol* 2014;87:20140030-7. https://doi.org/10.1259/bjr.20140030

MP-10.9

Prostate cancer-derived anti-GRP78 autoantibodies compromise the blood-brain barrier and accelerate atherosclerosis progression in vivo

Ali Al-Hashimi[1], Kevin Won[1], Richard Austin[1], Bobby Shayegan[1]

[1]Department of Surgery and Medicine, McMaster University, Hamilton, ON, Canada

Introduction: Pathological conditions of prostate cancer (PCa) drive the translocation of the endoplasmic reticulum-resident chaperone, GRP78, to the cell surface (cs), where it acts as an antigenic protein with signaling properties. In PCa, csGRP78 drives the production of anti-GRP78 autoantibodies (AutoAbs) that engage csGRP78 and promote PCa survival/progression. New studies now demonstrate csGRP78 expression on endothelial cells (EC) that line the arterial vasculature and the blood-brain barrier (BBB), suggesting that these AutoAbs can affect other systems in the body. The engagement of anti-GRP78 AutoAbs to csGRP78 on EC can contribute to EC dysfunction that can promote atherosclerosis and compromise the integrity of the BBB.

Methods: Anti-GRP78 AutoAbs were purified from PCa patients (St. Joseph's Healthcare Hamilton); human aortic EC and the ApoE$^{-/-}$ mouse model were used for in vitro and in vivo investigations, respectively. EC or mice were treated with anti-GRP78 AutoAbs or IgG control (60 µg/mL); EC dysfunction was investigated by measuring attachment protein expression in vitro. In vivo evaluation was carried out by studying atherosclerotic plaque progression (immunohistochemistry; aorta); the BBB integrity was examined using the Evans Blue dye.

Results: Mice injected with anti-GRP78 AutoAbs demonstrated larger atherosclerotic plaque volume and hallmarks of a leaky BBB. In terms of a mechanism, in vitro studies demonstrated that treating EC with anti-GRP78 AutoAbs resulted in activation of the NFκB pathway that led to increased expression of attachment proteins. All these effects were reversed by using a recombinant molecule that interferes with the binding of the AutoAb to csGRP78.

Conclusions: We have identified anti-GRP78 AutoAb as a driver of EC dysfunction that promotes atherosclerotic plaque progression and damage to the BBB. Our results indicate that interfering with anti-GRP78 AutoAb:csGRP78 complex can reverse the pathological effects of the AutoAbs.

MP-10.10

Relationship between metabolic syndrome, physical activity, and prostate-specific antigen levels, prostate volume, and subsequent cancer in men at high risk of prostate cancer with a first negative prostate biopsy

Jonathan Fadel[1], Pierre Douville[1], Laurence Bettan[1], Alain Bergeron[1], Hélène Hovington[1], François Meyer[1], Isabelle Bairati, Fred Saad[2], Armen G. Aprikian[3], Michel Carmel[4], Vincent Fradet[1], BIOCaPPE Network[1], Yves Fradet[1]

[1]CHU de Québec Research Centre, Université Laval, Québec City, QC, Canada; [2]CHUM Research Centre (CRCHUM), Université de Montréal, Montréal, QC, Canada; [3]Research Institute of McGill Hospital Centre, McGill University, Montréal, QC, Canada; [4]CHU de Sherbrooke Research Centre, Université de Sherbrooke, Sherbrooke, QC, Canada

Introduction: Growing data show an association between metabolic syndrome and prostate cancer. The aims of this study were to evaluate the relationship between metabolic syndrome and physical activity on prostate volume, prostate-specific antigen (PSA) levels, and the occurrence of prostate cancer on subsequent biopsy in men with a recent negative first prostate biopsy.

Methods: We recruited prospectively, in a multicentre, observational study, a cohort of 669 men at high risk of prostate cancer, who underwent a first prostate biopsy with a negative result. Evaluation of metabolic syndrome was established with at least three criteria from the following: waist circumference above 102 cm, low high-density lipoprotein (HDL) cholesterol level, and medication taken to treat high blood pressure, dyslipidemia, and diabetes. Physical activity was evaluated with the Godin Leisure-Time Exercise questionnaire and data collected from biobanked blood samples, medical questionnaires, prostate ultrasound, and biopsy results.

Results: A total of 143 patients presented a metabolic syndrome (21.38%). Spearman correlation, Box plot, Chi-square, and Kruskal-Wallis nonparametric tests were used for analysis. Results showed no association between physical activity and/or metabolic syndrome with PSA levels and prostate volume. However, prostate volume was significantly higher with increasing age, body weight, and body mass index ($p<0.0001$). We observed 52 new cancer patients over two years' followup and no changes were noticed in relation to the level of physical activity and metabolic syndrome. However, PSA levels were slightly higher at initial evaluation for patients who developed cancer ($p=0.0323$).

Conclusions: We found a significant and strong relationship between age, obesity, and prostate volume. However, metabolic syndrome criteria and physical activity didn't show any relationship with prostate volume and PSA levels. PSA level at first biopsy shows an increased risk of cancer on subsequent biopsies despite the limited number of events so far.

MP-10.11

Impact of autophagy in the development of PARP inhibitor resistance in prostate cancer

Maxime Cahuzac[1,2,3], Benjamin Péant[2,3], Anne-Marie Mes-Masson[1,2,3], Fred Saad[2,3,4].

[1]Biologie Moléculaire, Université de Montréal, Montréal, QC, Canada; [2]Institut du Cancer de Montréal, Montréal, QC, Canada; [3]Centre de Recherche du CHUM, Montréal, QC, Canada; [4]Chirurgie, Université de Montréal, Montréal, QC, Canada

Introduction: Prostate cancer (PCa) is the most frequently diagnosed cancer in North American men. Over time, one in four men develop a resistance against actual compound, making it difficult to treat. Recently, new therapies like PARP inhibitors (PARPi) have been tested in clinic for PCa. Several studies show that they ameliorate life expectancy but resistance can appear. Autophagy is knows to induce resistance to different treatments in cancers. Actually, no studies have yet shown the link between autophagy and PARPi resistance in PCa. The goal of this project is to determine if autophagy can promote resistance to PARPi in PCa cell lines.

Methods: Autophagy has been measured in different PCa cell lines (LNCaP, 22Rv1, PC3, and DU145), after treatment with PARPi (olaparib) by Western blot. To confirm our results, we established LC3 double-tagged cell lines and observed autophagy using confocal microscopy. We have also determined the effect of autophagy over-activation (rapamycin) and inhibition (bafilomycin A1 and CRISPR Atg5/16L1) on the survival of PCa cells to olaparib.

Results: Our results show that PC3 and DU145 have a higher basal level of autophagy compare to other cell lines. The double-tagged LC3 cells show that olaparib increases the autophagic flux in PC3 only. These cells are more resistant to olaparib. Rapamycin reduces sensitivity to PARPi for all cell lines. We observed a modification of PC3 and DU145 cells morphology after PARPi treatments.

Conclusions: The autophagic flux seems to play in the development of resistance. We will intend to determine how this resistance is regulated. We will measure the role of senescence in the sensitivity to PARPi. Understanding the role of autophagy in PCa progression may lead to strategies to inhibit this resistance mechanism. Combinations of autophagy inhibitors with PARPi may increase the durability of response and further improve outcomes of patients with aggressive PCa.

MP-10.13

Liquid biopsy in prostate cancer: Novel predictive test for screening and treatment response

Michael A. Di Lena[1], Christopher R. Mueller[1], D. Robert Siemens[1]

[1]Urology, Queen's University, Kingston, ON, Canada

Introduction: The use of prostate-specific antigen (PSA) as a screening tool has grown increasingly controversial, secondary to poor test characteristics. There is a need for a better prostate cancer detection tool, one that is able to differentiate aggressive from indolent cancers and that has some predictive value. Research is looking into methylation profiles of urologic tumours in hopes that identification can assist in cancer prognosis, diagnosis, and treatment. This information can be obtained non-invasively from patients' serum as part of a "liquid biopsy." This study looks at DNA methylation patterns as gathered from blood samples in men with prostate cancer and assesses its ability to replace PSA for primary screening, for active surveillance, and for management of men on androgen-depravation therapy (ADT).

Methods: Blood samples were collected from 20 men with prostate cancer on ADT treatment at a single academic centre. Ten of these men had stable PSA on ADT and 10 had PSA progression on ADT. DNA methylation of the patients' serum was assessed at 27 specific gene loci. Relevant patient demographics were obtained and correlated with the circulating DNA analysis. Assay performance was characterized using area under the curve (AUC) analysis for overall sensitivity, specificity, and likelihood ratio.

Results: Twenty male patients were included in this study, half of whom whose PSA remained stable on ADT and half who were progressing on ADT. A total of 27 gene sites were analyzed to assess for specific methylation patterns. Overall, the test was shown to have excellent performance as a predictor of PSA progression on ADT, with an AUC of 0.9821, a sensitivity of 100%, and a specificity of 85%. This index was not found to be correlated with PSA levels or PSA doubling times as would be expected for an independent marker.

Conclusions: These results demonstrate the ability of methylation markers to provide deep insight into prostate cancer development and produce diagnostic and prognostic information that would be vital for management of the disease.

MP-10.14

Early oncological and functional outcomes of magnetic resonance-guided focal high-intensity focused ultrasound for intermediate-risk prostate cancer

Nathan Perlis[1], Guan Hee Tan[1], Antonio Finelli[1], Eugen Hlasney[2], Robert Hamilton[1], Alexandre Zlotta[1], Girish S. Kulkarni[1], Kateri Corr[1], Rosanna Chan[2], Stuart McCluskey[3], Walter Kucharczyk[2], Sangeet Ghai[2]

[1]Division of Urology, University Health Network, Toronto, ON, Canada; [2]Joint Department of Medical Imaging, University Health Network, Toronto, ON, Canada; [3]Department of Anesthesia and Pain Management, University Health Network, Toronto, ON, Canada

Introduction: Focal ablation with high intensity focused ultrasound (HIFU) reduces complications with promising oncological results. Magnetic resonance image (MRI)-guided HIFU (MRgFUS) using MR-thermometry allows

real-time temperature and energy monitoring. We present early oncological and functional outcomes of MRgFUS in intermediate-risk localized prostate cancer (PCa) treated with the ExAblate 2100 device.
Methods: Men with grade group 2 or 3 PCa, prostate-specific antigen (PSA) ≤20 ng/mL, ≤cT2a, and unilateral index lesions smaller than 2 cm were enrolled. MRgFUS was performed using an endorectal focused ultrasound ablation system (ExAblate 2100, InSightec, Israel) guided by a 1.5T MRI scanner (GE Healthcare, U.S.). Patients were followed for two years on trial with scheduled early (five months) and intermediate (24 months) oncological followup. Five months following treatment, multiparametric MRI, PSA, and 4–8 targeted biopsies from the ablation site (Artemis, Eigen) were taken. Functional parameters were evaluated using the International Prostate Symptom Score, International Index of Erectile Function-15, and International Consultation on Incontinence Questionnaire-Short Form at baseline and followup.
Results: Between July 2016 and October 2018, 34 patients had undergone MRgFUS and 27 patients completed their five-month followup. The mean age was 67 years (range 58–79), and the mean PSA at baseline and five months were 7.60 ng/mL (range 1.55–20.75) and 4.11 ng/mL (range 0.34–18.43), respectively. At five months, 24 of 27 (88.9%) men had no persistent disease on biopsy of the ablated zone. Of the three patients with evidence of disease at the ablation site, two had grade group 1 PCa, while one had low-volume grade group 2 PCa. The trend of the functional outcomes between baseline and five months are as shown in Fig. 1.
Conclusions: MRgFUS demonstrates encouraging short-term oncological and functional outcomes in intermediate-risk PCa. Longer followup is required to assess the durability of this approach.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/249

UP-10.1

Prediction of pathological progression of prostate cancer based on percentage of high-grade disease in surgically treated men

Adrian I. Cozma[1], Jethro Kwong[2], Ashkan Javidan[2], Ishan Aditya[2], Amna Ali[3], Munir A. Jamal[3,4], Thomas Short[3,4], Frank Papanikolaou[3,4], John R. Srigley[5], Andrew H. Feifer[3,4]
[1]Department of Radiation Oncology, University of Toronto, Toronto, ON, Canada; [2]Faculty of Medicine, University of Toronto, Toronto, ON, Canada; [3]Carlo Fidani Regional Cancer Centre, Credit Valley Hospital, Trillium Health Partners, Mississauga, ON, Canada; [4]Department of Surgery, University of Toronto, Toronto, ON, Canada; [5]Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, ON, Canada
Introduction: Although total Gleason score is a well-validated metric for prostate cancer (PCa) prognosis, emerging evidence suggests that percentage of Gleason pattern 4/5 (%4/5) is also a valuable prognostic indicator. However, it is not well-known whether %4/5 within a prostate biopsy has independent prognostic value for biochemical recurrence (BCR). The purpose of this study is to compare and contrast classic pathological determinants of BCR with %4/5 in surgically treated men with locally advanced PCa.
Methods: A retrospective chart review was performed at our institution on all patients with locally advanced PCa (pT3 disease) who underwent radical prostatectomy from January 2002 to December 2016. Primary outcomes were the diagnosis of BCR (prostate-specific antigen [PSA] >0.2 ng/mL) and time to BCR. Patient clinical and pathological parameters, notably quantitative %4/5 on biopsy, were assessed for predictive capacity of the primary outcomes.
Results: A total of 287 patients were included, of which 62 patients (21.6%) developed BCR. The first (Q1), second (Q2), third (Q3), and fourth (Q4) quartiles for %4/5 on biopsy were 5, 17.5, 60, and 100%, respectively. Median times of BCR-free survival were: Q1: 47 months; Q2: 21 months; Q3: 36 months; Q4: three months (p=0.003). On multivariate analysis of our pT3 cohort, higher %4/5 was associated with an increased risk of BCR (odds ratio [OR] 4.35; 95% confidence interval [CI] 1.45–13.08; p=0.01). In subset analysis of patients with total Gleason score 7 (4+3 and 3+4), higher percentage of Gleason pattern 4 remained a risk factor for BCR (OR 4.68; 95% CI 1.27–17.20; p=0.02).
Conclusions: Quantitative %4/5 helps predict BCR in patients with locally advanced disease. In patients with total Gleason score 7, those with more Gleason pattern 4 demonstrated a higher risk for BCR. These findings suggest that %4/5 may serve as a useful prognostic tool to predict BCR in surgically treated men with locally advanced disease.

UP-10.2

Factors associated with orchiectomy use in prostate cancer: Population-based study

Jason Hu[1], Armen G. Aprikian[1], Alice Dragomir[1]
[1]Division of Urology, McGill University, Montréal, QC, Canada
Introduction: Androgen-deprivation therapy (ADT) can be delivered either surgically by orchiectomy or medically via luteinizing hormone-releasing hormone (LHRH) drugs (either agonists or antagonists). Use of orchiectomy has drastically decreased since the approval of LHRH drugs in the 1990s. The objective is to describe the use of orchiectomy for prostate cancer (PCa) and analyze factors associated with orchiectomy treatment over medical castration in the province of Québec.
Methods: The cohort consists of men diagnosed with PCa from 2004–2012 and treated by ADT (either by LHRH drugs or by bilateral orchiectomy) extracted from a random sample from Québec public healthcare databases. The primary study outcome was the use of orchiectomy. Multivariable logistic regression analysis was performed to identify variables associated with orchiectomy treatment.
Results: We identified 6551 patients treated by ADT, of which 101 (1.5%) underwent orchiectomy. Among the 101 patients treated by orchiectomy, 36 (35.6%) received LHRH drugs prior to orchiectomy. Following multivariable analyses, age over 80 (odds ratio [OR] 1.60; 95% confidence interval [CI] 1.06–2.43; p=0.018) and higher Charlson comorbidity score (OR 1.09; 95% CI 1.01–1.17; p=0.024) were associated with increased odds of orchiectomy. Patients treated with a local radical treatment prior or within three months after ADT initiation (OR 0.18; 95% CI 0.07–0.46; p<0.001), residing in a major metropolitan region (OR 0.39; 95% CI 0.26–0.58; p<0.001) were associated with lower odds of orchiectomy treatment. Also, year of ADT initiation was associated with lower odds of orchiectomy (OR 0.88 for each increasing year from 2004–2014; 95% CI 0.81–0.95; p=0.002).
Conclusions: A minority of PCa patients are treated by orchiectomy in Québec. These men were likely to be older, more comorbid, not treated by local radical treatment, living in a major metropolitan region, and initiated ADT in earlier years compared to patients treated by medical castration.

UP-10.3

Effects of an omega-3-rich dietary intervention in men with low-risk prostate cancer: Preliminary results on fatty acid intake and fatty acid profiles of red blood cells and prostate tissue

Hanane Moussa[1,2], Marie-Helene Guertin[1], Karine Robitaille[1], Molière Nguile Makao[1], Janie Allaire[3], Jean-François Pelletier[1], Benoit Lamarche[3], Pierre Julien[4], Vincent Fradet[1,2,3]
[1]Oncology Axis, Centre de Recherche du CHU de Québec, Université Laval, Québec City, QC, Canada; [2]Faculty of Medicine, Université Laval, Québec City, QC, Canada; [3]Institute of Nutrition and Functional Foods, Université Laval, Québec City, QC, Canada; [4]Endocrinology and Nephrology Axis, Centre de Recherche du CHU de Québec, Université Laval, Québec City, QC, Canada
Introduction: Men with low-grade prostate cancer under active surveillance could benefit from dietary interventions to prevent cancer progression. Pre-clinical and clinical studies showed that high omega-3 (Ω3) fatty acid (FA) intake might have protective effects against prostate cancer progression. Here, we aimed to evaluate the effect of a dietary intervention (increase of Ω3 intake) compared to 5α-reductase inhibitor dutasteride on Ω3 intake and FA profiles of red blood cell membranes (RBC) and prostate tissue.
Methods: A total of 120 men with low-grade prostate cancer who elected an active surveillance program were recruited into a randomized controlled trial. The participants were randomized to either a nutritional intervention or dutasteride for a six-month period. The dietary intervention

aimed at increasing the intake of Ω3, especially long-chain Ω3, while decreasing Ω6, saturated and trans fat intake. FA intake was assessed using a validated food frequency questionnaire online and their level was measured in RBC and prostate tissue using gas chromatography. Patients' total intake of Ω3 (in grams), long-chain Ω3 (in grams) and Ω6/Ω3 ratio were measured at baseline and at six months. Changes in FA between both groups were compared using the Wilcoxon rank-sum test.

Results: After six months, long-chain Ω3 intake was significantly higher in the nutritional intervention group (p=0.003) and Ω6/Ω3 intake ratio was significantly lower (p=0.01), while no difference was noted in the dutasteride group. FA intake changes were reflected in the FA profile of RBC at six months. No difference was observed in the FA profile of prostate tissue in either group.

Conclusions: Our nutritional intervention resulted in a significant increase of long-chain Ω3 intake and a decrease of Ω6/Ω3 ratio in men with low-grade prostate cancer under active surveillance. These changes were translated in the FA profile of RBC but not in prostate tissue.

Podium Session 4: Mixed Oncology
July 1, 2019; 0910–1010

POD-4.1

TLD-1433 photodynamic therapy for Bacillus Calmette-Guerin-unresponsive non-muscle-invasive bladder cancer: A phase 1b clinical study

Girish S. Kulkarni[1], Lothar D. Lilge[2], Arkady Mandel[3], Roger White[3], Nathan Perlis[1], Michael Nesbitt[1], Michael A. Jewett[1]

[1]Surgery and Surgical Oncology, University of Toronto, Toronto, ON, Canada; [2]Medical Biophysics, University of Toronto, Toronto, ON, Canada; [3]Research and Product Development, Theralase Inc., Toronto, ON, Canada

Introduction: TLD-1433 is a ruthenium-based photodynamic compound that demonstrates preferential uptake into bladder cancer cells. Upon exposure to green light (525 nm), TLD-1433 is activated to release free radicals that cause cell death. Our aim was to assess the safety, tolerability, pharmacokinetics, and exploratory efficacy of TLD-1433 photodynamic therapy (PDT) in non-muscle-invasive bladder cancer (NMIBC) Bacillus Calmette-Guerin (BCG)-unresponsive patients.

Methods: TLD-1433 was instilled intravesically in the preoperative holding area for one hour. Upon induction of general anesthesia, drug activation was performed using a 525 nm, 3 W laser with a target dose of 90 J/cm^2. A 3+3 dose escalation strategy, starting with the maximum recommended starting dose (MRSD) of 0.35 mg/cm^2 with an increase to the planned therapeutic dose of 0.70 mg/cm^2 was followed. Safety, tolerability, and pharmacokinetics were reviewed by an independent data safety and monitoring board. Patients underwent cystoscopy at three and six months post-treatment to assess efficacy, defined as recurrence-free survival.

Results: Three patients were treated at the MRSD (0.35). At 30 days post-treatment, all patients tolerated the procedure well with no grade 3, 4, or 5 adverse events (AEs). Pharmacokinetic analysis demonstrated minimal systemic absorption of drug with no photosensitivity reactions. All drug was cleared from the plasma within 72 hours of activation. Three patients were then treated at the therapeutic dose (0.70) with no grade 3, 4, or 5 AEs and an identical pharmacokinetic profile to half-dose. At half-dose, all patients had developed recurrent, but not progressive, NMIBC by the 180-day cystoscopy. At therapeutic dose, two of three patients were tumour-free at the 180-day cystoscopy. Moderate bladder irritability was reported at full-dose that mostly resolved within 90 days.

Conclusions: TLD-1433 PDT is safe and tolerable at the therapeutic dose. The efficacy signal at 180 days post-treatment warrants further study in a phase 2 trial.

POD-4.2

The prognostic value of the neutrophil-to-lymphocyte ratio in patients with muscle-invasive bladder cancer treated with neoadjuvant chemotherapy and radical cystectomy

Anna Black[1], Homayoun Zargar[1,2], Kamran Zargar-Shoshtari[3,4], Adrian S. Fairey[5], Laura S. Mertens[6], Colin P. Dinney[7], Maria C. Mir[8,9], Laura-Maria Krabbe[10,11], Michael S. Cookson[12], Niels-Erik Jacobsen[5], Nilay Gandhi[13], Joshua Griffin[14], Jeffrey S. Montgomery[15], Nikhil Vasdev[16,17], Evan Y. Yu[18], Evanguelos Xylinas[19,20], Nicholas J. Campain[21], Wassim Kassouf[22], Marc A. Dall'Era[23], Jo-An Seah[24], Cesar E. Ercole[8], Simon Horenblas[6], John S. McGrath[21], Jonathan Aning[21,25], Shahrokh F. Shariat[19,26], Jonathan L. Wright[27], Andrew C. Thorpe[17], Todd M. Morgan[15], Jeff M. Holzbeierlein[14], Trinity J. Bivalacqua[13], Scott North[28], Daniel A. Barocas[29], Yair Lotan[10], Petros Grivas[18,30], Andrew J. Stephenson[8], Jay B. Shah[7,31], Bas W. van Rhijn[6], Philippe E. Spiess[3], Siamak Daneshmand[32], Srikala S Sridhar[24], Peter C. Black[1]

[1]Department of Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; [2]Western Health, Melbourne, Australia; [3]Department of Genitourinary Oncology, H Lee Moffitt Cancer Center and Research Institute, Tampa FL, United States; [4]University of Auckland, Auckland, New Zealand; [5]University of Alberta, Edmonton, AB, Canada; [6]Department of Urology, The Netherlands Cancer Institute - Antoni van Leeuwenhoek Hospital, Amsterdam, The Netherlands; [7]Department of Urology, MD Anderson Cancer Center, Houston, TX, United States; [8]Glickman Urological and Kidney Institute, Cleveland Clinic, Cleveland, OH, United States; [9]Department of Urology, Fundacion Instituto Valenciano de Oncologia, Valencia, Spain; [10]Department of Urology, University of Texas Southwestern Medical Center, Dallas, TX, United States; [11]Department of Urology, University of Münster, Münster, Germany; [12]Department of Urology, University of Oklahoma College of Medicine, Oklahoma City, OK, United States; [13]Department of Urology, The James Buchanan Brady Urological Institute, The Johns Hopkins School of Medicine, Baltimore, MD, United States; [14]Department of Urology, University of Kansas Medical Center, Kansas City, KS, United States; [15]Department of Urology, University of Michigan Health System, Ann Arbor, MI, United States; [16]Hertfordshire and Bedfordshire Urological Cancer Centre, Department of Urology, Lister Hospital, Stevenage, United Kingdom; [17]Department of Urology, Freeman Hospital, Newcastle Upon Tyne, United Kingdom; [18]Department of Medicine, Division of Oncology, University of Washington School of Medicine and Fred Hutchinson Cancer Research Center, Seattle, WA, United States; [19]Department of Urology, Weill Cornell Medical College, Presbyterian Hospital, New York, NY, United States; [20]Department of Urology, Cochin Hospital, APHP, Paris Descartes University, Paris, France; [21]Department of Surgery, Exeter Surgical Health Services Research Unit, Royal Devon and Exeter NHS Trust, Exeter, United Kingdom; [22]Department of Surgery (Division of Urology), McGill University Health Centre, Montréal, QC, Canada; [23]Department of Urology, University of California at Davis, Davis Medical Center, Sacramento, CA, United States; [24]Princess Margaret Hospital, Toronto, ON, Canada; [25]Bristol Urological Institute, North Bristol NHS Trust, Bristol, United Kingdom; [26]Department of Urology, Medical University of Vienna, Vienna General Hospital, Vienna, Austria; [27]Department of Urology, University of Washington, Seattle, WA, United States; [28]Cross Cancer Institute, Edmonton, AB, Canada; [29]Department of Urologic Surgery, Vanderbilt University Medical Center, Nashville, TN, United States; [30]Department of Hematology and Medical Oncology, Taussig Cancer Institute, Cleveland Clinic, Cleveland, OH, United States; [31]Department of Urology, Stanford University School of Medicine, Stanford, CA, United States; [32]USC/Norris Comprehensive Cancer Center, Institute of Urology, University of Southern California, CA, United States

Introduction: The neutrophil-to-lymphocyte ratio (NLR) is an attractive marker because it is derived from routine bloodwork. NLR has shown promise as a prognostic factor in muscle-invasive bladder cancer (MIBC), but its value in patients receiving neoadjuvant chemotherapy (NAC) before radical cystectomy (RC) is not yet established. Since NLR is related to an oncogenic environment and poor anti-tumour host response, we hypothesized that a high NLR would be associated with a poor response to NAC and would remain a poor prognostic indicator in patients receiving NAC.

Methods: A retrospective analysis was performed on patients with non-metastatic MIBC who received NAC prior to RC between 2000 and 2013 at one of 19 centres across Europe and North America. The pre-NAC NLR was used to split patients into a low (NLR ≤3) and high (NLR >3) group. Demographic and clinical parameters were compared between the groups

using Student's t-test, Chi-squared, or Fisher's exact test. Putative risk factors for disease-specific and overall survival were analyzed using Cox regression, while predictors of response to NAC (defined as absence of MIBC in RC specimen) were investigated using logistic regression.
Results: Data was available for 340 patients (199 NLR ≤3, 141 NLR >3). Other than age and rate of lymphovascular invasion, demographic and preoperative characteristics did not differ significantly. More patients in the NLR >3 group had residual MIBC after NAC than the NLR ≤ 3 group (70.8% vs. 58.3%,; p=0.049). In logistic regression for predictors of response, NLR was the only significant risk factor (odds ratio [OR] 0.36; p=0.003). NLR was a significant risk factor for both disease-specific and overall survival (hazard ratio [HR] 2.4; p=0.006 and HR 1.8; p=0.02).
Conclusions: NLR >3 is associated with a decreased response to NAC and worse patient outcomes, including reduced disease-specific and overall survival. This suggests that NLR is a simple tool that can aid in MIBC risk-stratification in clinical practice.

POD-4.3

Statin use and mortality in bladder cancer patients undergoing radical cystectomy in Québec, 2000–2014

Michel Wissing[1,2], Ana O'Flaherty[1], Alice Dragomir[1], Simon Tanguay[1], Wassim Kassouf[1], Armen G. Aprikian[1,2]
[1]Surgery, McGill University Health Centre, Montréal, QC, Canada; [2]Oncology, McGill University, Montréal, QC, Canada

Introduction: Bladder cancer (BCa) patients who use statins may have a better outcome, but the topic remains controversial, as biases may have affected results.[1-5] We studied the association of statin use with overall (OS) and disease-specific survival (DSS) in a Québec cohort.
Methods: Using provincial health administrative databases, we identified all BCa patients who underwent radical cystectomy (RC) in Québec from 2000–2014, and collected data from two years before RC to September 2016 or death. Survival analyses were conducted using the Kaplan-Meier method, log-rank tests, and Cox proportional hazard models. Covariates in the multivariable analyses were age, sex, Charlson's comorbidity index, region of residence, year of RC, distance to hospital, hospital type (academic), hospital's and surgeon's RC volume, neoadjuvant chemotherapy, and type of bladder diversion. We compared patients who received a statin before RC or within a year following RC to never-statin users. To eliminate immortal time bias, we conducted a subgroup analysis excluding patients who died <1 year of RC.
Results: Of 3087 BCa patients included, 1448 (46.9%) were statin users. Median OS and DSS were 2.5 years (95% confidence interval [CI] 2.1–2.8) and 4.6 years (95% CI 3.5–5.5) for non-statin users, respectively, vs.4.5 years (95% CI 3.6–5.4) and 10.7 years (95% CI 9.1–not reached) for statin users (p<0.001). In multivariable analyses, hazard ratios (HR) for death and DSM were 0.83 (95% CI 0.75–0.91) and 0.81 (95% CI 0.71–0.91), respectively, for statin users. A total of 2215 patients (71.8%) had a followup >1 year post-RC, of whom 1082 (48.8%) were statin users. Adjusted HR for death and DSM were 0.81 (95% CI 0.71–0.94) and 0.81 (95% CI 0.69–0.96), respectively, in this subgroup. OS/DSS did not differ between patients who started statins after RC compared to those who already used statins before RC (adjusted HR 1.14; 95% CI 0.80–1.64 and 1.11; 95%CI 0.72–1.70, respectively)
Conclusions: Statin users had improved OS and DSS in our large BCa cohort.

References

1. Pastore A, Palleschi G, Fuschi A, et al. Can daily intake of aspirin and/or statins influence the behaviour of non-muscle-invasive bladder cancer? A retrospective study on a cohort of patients undergoing transurethral bladder resection. *BMC Cancer* 2015;15:120. https://doi.org/10.1186/s12885-015-1152-x
2. Richard PO, Ahmad AE, Bashir S, et al. Effect of statins as a secondary chemopreventive agent among individuals with non-muscle-invasive bladder cancer: A population-based analysis. *Urol Oncol* 2017;35:342-8. https://doi.org/10.1016/j.urolonc.2016.12.009
3. Crivelli JJ, Xylinas E, Kluth LA, et al. Effect of statin use on outcomes of non-muscle-invasive bladder cancer. *BJU Int* 2013;112:E4-12. https://doi.org/10.1111/bju.12150
4. Emilsson L, Garcia-Albeniz X, Logan RW, et al. Examining bias in studies of statin treatment and survival in patients with cancer. *JAMA Oncol* 2018;4:63-70. https://doi.org/10.1001/jamaoncol.2017.2752
5. da Silva RD, Xylinas E, Kluth L, et al. Impact of statin use on oncologic outcomes in patients with urothelial carcinoma of the bladder treated with radical cystectomy. *J Urol* 2013;190:487-92. https://doi.org/10.1016/j.juro.2013.02.003

POD-4.4

IDENTIFY: The investigation and detection of urological neoplasia in patients referred with suspected urinary tract cancer: A multicentre analysis

Mark Assmus[1], Miles Mannas[2], Taeweon Lee[2], Sinan Khadhouri[3], Kevin M. Gallagher[4], Kenneth R. MacKenzie[5], Taimur Shah[6], Chuanyu Gao[7], Sacha Moore[8], Eleanor Zimmerman[9], Eric Edison[10], Matthew Jefferies[11], Arjun K. Nambiar[5], John S. McGrath[12], Veeru Kasivisvanathan[13]
[1]Department of Surgery, Division of Urology, University of Alberta, Edmonton, AB, Canada; [2]Department of Urology, University of British Columbia, Vancouver, BC, Canada; [3]Department of Urology, Aberdeen Royal Infirmary, Aberdeen, United Kingdom; [4]Department of Urology, Western General Hospital, Edinburgh, United Kingdom; [5]Department of Urology, Freeman Hospital, Newcastle, United Kingdom; [6]Department of Surgery and Cancer, Charing Cross Hospital, Imperial College Healthcare NHS Trust, London, United Kingdom; [7]Department of Urology, Peterborough City Hospital, Peterborough, United Kingdom; [8]Department of Urology, Wrexham Maelor Hospital, Wrexham, United Kingdom; [9]Department of Urology, Weston General Hospital, Weston-super-Mare, United Kingdom; [10]Department of Urology, North Middlesex Hospital, London, United Kingdom; [11]Department of Urology, Morriston Hospital, Swansea, United Kingdom; [12]Department of Urology, University of Exeter Medical School, Exeter, United Kingdom; [13]Department of Urology, West Hertfordshire NHS Trust, London, United Kingdom
The IDENTIFY Study Group

Introduction: The investigation of hematuria represents a huge healthcare burden worldwide. This study aimed to determine contemporary urinary tract cancer rates and diagnostic test performance in patients referred to secondary care with suspected urothelial cancer.
Methods: IDENTIFY is the largest ever prospective, international study of patients referred to secondary care with hematuria. Extensive data on consecutive patients' demographics, presenting features and diagnostic test results, were recorded.
Results: Over 11 000 patient records were collected from 111 hospitals in 28 countries (December 2017 to October 2018). The prevalence of bladder cancer (BC) overall was 14.2%; 18.1% in visible hematuria (VH), 3.7% in non-VH. Upper tract urothelial cancer (UTUC) prevalence was 1% overall, renal cell carcinoma (RCC) 0.9%, and prostate cancer 1.2%. Variables significantly associated with BCa included type of hematuria, age, smoking history, anticoagulation, storage urinary tract symptoms, and having had >1 episode of VH (25.5%) vs. only one (17.9%). UTUC was significantly associated with type of hematuria, age, smoking, and anticoagulation. The rate of BCa found in those with culture proven urinary tract infections (UTIs) was 7.0%, which was significantly lower than in those without UTI (19.7%). The diagnostic performance of ultrasound (US) and computed tomography (CT) is given in Table 1.
Conclusions: IDENTIFY provides contemporary cancer detection rates in a global population alongside extensive predictive data and diagnostic test performance for multiple urological malignancies. The detailed data will allow complex interactions between predictive variables in order to develop a personalized approach to investigating hematuria. Ultimately, this can improve shared decision-making and optimize cancer detection while minimizing investigative burden.
This paper has a figure, which may be viewed online at: https://2019.cua.events/webapp/lecture/40

POD-4.5

Natural history of renal angiomyolipoma favours surveillance as an initial approach

Jake Morris[1], Gregory J. Nason[1], Jaimin Bhatt[2], Patrick Richard[3], Lisa Martin[1], Michael A. Jewett[1], Kartik Jhaveri[4], Alexandre Zlotta[1], Robert Hamilton[1], Antonio Finelli[1]

[1]Division of Urology, Department of Surgery, Princess Margaret Cancer Centre, University of Toronto, Toronto, ON, Canada; [2]Department of Urology, University Hospital Ayr, Scotland, United Kingdom; [3]Division of Urology, Departments of Surgery, Centre Hospitalier Universitaire de Sherbrooke and Centre de Recherche du CHUS, Sherbrooke, QC, Canada; [4]Division of Abdominal Imaging, Joint Department of Medical Imaging, University Health Network, University of Toronto, Toronto, ON, Canada

Introduction: Traditionally, renal angiomyolipoma (AML) >4 cm were treated (with embolization, radiofrequency ablation, surgery) due to the risk of hemorrhage. The aim of this study was to delineate the natural history of AMLs, including growth rates and need for intervention.

Methods: A retrospective review and update were performed of a previously reported AML series from a radiology database that identified all renal AML lesions between 2002 and 2013 at the Princess Margaret Cancer Centre, which have now been followed until 2018.[1] We defined lesion size by maximum axial diameter and categorized lesion size at baseline as ≤4 or >4 cm. The primary endpoint was the growth rate of untreated AMLs. We used a linear mixed-effects model to evaluate the association between baseline lesion size and growth rate.

Results: A total of 458 patients with 593 AMLs were identified during the study period, with a median followup of 65.2 months; 534 (90.1%) lesions were ≤4 cm at diagnosis. Thirty-two (7%) patients required interventions; 43 interventions were required on 34 (5.7%) AMLs. The initial indications for intervention included 22 for growth, six due to a bleed, two for patient anxiety, and two for pain. The median size at intervention was 4.9 cm (range 1.1–29 cm). The average number of scans per lesion (prior to treatment) was 4.5 (range 1–23). Most (94%) lesions grew slowly (growth rate of <0.25 cm per year) during the period of observation. The linear mixed-effects model showed that the growth rate (slope) of log-transformed maximal axial diameter was not significantly different between lesions ≤4 cm (0.02 log cm per year) and those >4 cm (0.01 log cm per year) (p=0.23).

Conclusions: This large, single-institution, updated series on renal AMLs demonstrates early intervention is not required regardless of the traditional 4 cm cutoff. The vast majority of AMLs are indolent lesions that are predominantly asymptomatic and slow-growing. Followup should be no more frequent than annually.

Reference

1. Bhatt JR, Richard PO, Kim NS, et al. Natural history of renal angiomyolipoma (AML): Most patients with large AMLs >4 cm can be offered active surveillance as an initial management strategy. *Eur Urol* 2016;70:85-90. https://doi.org/10.1016/j.eururo.2016.01.048

POD-4.6

Post-nephrectomy upstaging of cT1a to pT3a renal tumour: Is renal tumour biopsy a predisposing factor?

Charles Asselin[1], Rodney H. Breau[2,3], Ranjeeta Mallick[3], Anil Kapoor[4,5], Antonio Finelli[6], Ricardo A. Rendon[7], Simon Tanguay[8], Frédéric Pouliot[9], Adrian Fairey[10], Luke T. Lavallée[2], Franck Bladou[11], Jun Kawakami[12], Alan I. So[13], Patrick Richard[1]

[1]Urology, Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, QC, Canada; [2]Urology, Ottawa Hospital, Ottawa, ON, Canada; [3]Urology, Ottawa Hospital Research Institute, Ottawa, ON, Canada; [4]Urology, St. Joseph Healthcare, Hamilton, ON, Canada; [5]Urology, Juravinski Hospital, Hamilton, ON, Canada; [6]Urology, University Health Network, Toronto, ON, Canada; [7]Urology, Capital Health - QEII, Halifax, NS, Canada; [8]Urology, McGill University Health Centre, Montréal, QC, Canada; [9]Urology, Centre Hospitalier Universitaire de Québec, Québec City, QC, Canada; [10]Urology, Alta Health Services, Edmonton, AB, Canada; [11]Urology, Jewish General Hospital, Montréal, QC, Canada; [12]Urology, Alberta Health Service, Calgary, AB, Canada; [13]Urology, British Columbia Cancer Care, Vancouver, BC, Canada

Introduction: Many small renal masses (SRM) are unlikely to metastasize and should be managed with surveillance. Renal tumour biopsies (RTB) have been proposed as a tool to decrease overtreatment of SRMs.[1,2] A potential concern of RTB is tumour seeding along the biopsy tract.[3,4] The objective of this study was to evaluate whether preoperative RTB increases the risk of tumour upstaging to pT3a among patients with a SRM who underwent a radical or partial nephrectomy.

Methods: The Canadian Kidney Cancer information system (CKCIS), a multi-institutional, prospectively maintained database, was used to identify patients with a SRM (cT1a) who underwent either a partial or radical nephrectomy between January 1, 2011 and September 31, 2018. Rates of upstaging to pT3a were compared between subjects that had a preoperative RTB and the ones that did not. A multivariable analysis was used to evaluate factors associated with upstaging.

Results: The cohort consisted of 1794 patients, of which 424 (24%) had a preoperative RTB. There was no difference in the rate of tumour upstaging to pT3a between patients that had a RTB and those that did not (6.8% vs. 6.4%; p=0.8). On multivariable analysis, RTB was not associated with pathological upstaging (odds ratio [OR] 0.76; confidence interval [CI] 0.41–1.41; p=0.4). Year of surgery (OR 1.3; CI 1.07–1.58; p=0.008), nuclear grade >2 at surgery (OR 3.23; CI 1.54–6.74; p=0.002) and tumours larger than 2 cm (OR 1.89; CI 1.47–1.98; p=0.006) were all associated with higher rate of upstage.

Conclusions: In a large cohort of patients, RTB was not associated with increased risk of tumour upstaging. Hence, tumour tract seeding, although possible, should not be a clinical deterrent to using RTBs as a triage tool to decrease overtreatment of SRMs.

References

1. Marconi L, Dabestani S, Lam TB et al. Systematic review and meta-analysis of diagnostic accuracy of percutaneous renal tumour biopsy. *Eur Urol* 2016;69:660-73. https://doi.org/10.1016/j.eururo.2015.07.072
2. Richard PO, Jewett MAS, Tanguay S, et al. Safety, reliability, and accuracy of small renal tumour biopsies: Results from a multi-institution registry. *BJU Int* 2017;119:543-9. https://doi.org/10.1111/bju.13630
3. Richard PO, Martin L, Lavallée LT, et al. Identifying the use and barriers to the adoption of renal tumour biopsy in the management of small renal masses. *Can Urol Assoc J* 2018;12:260-6. https://doi.org/10.5489/cuaj.5065
4. Salmasi A, Faiena I, Lenis AT, et al. Association between renal mass biopsy and upstaging to perinephric fat involvement in a contemporary cohort of patients with clinical T1a renal cell carcinoma. *Urol Oncol* 2018;36:527e13-9. https://doi.org/10.1016/j.urolonc.2018.08.009

Author Index