CUA 2022 Annual Meeting Abstracts – Poster Session 8: Endourology, Renal Transplant

Sunday, June 26, 2022 • 07:30–09:00

Cite as: *Can Urol Assoc J* 2022;16(6Suppl1):S78-86. http://dx.doi.org/10.5489/cuaj.7930

MP-8.2

Assessing the risks of a positive urine culture in uncomplicated renal colic patients

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Introduction: Though septic stones are well-recognized as a medical emergency, patients with uncomplicated renal colic (without systemic inflammatory responses or renal impairment) and positive urine cultures (UC) pose a dilemma in management considerations. Therefore, the objective of this study was to: 1) assess the rate of 'incidental' positive urine cultures in patients with ureteral stones referred to our stone clinic; and 2) determine the risk of infectious adverse events (IAE) in patients with ureteral stones and positive urine cultures.

Methods: A retrospective chart review was performed for all acute stone clinic referrals between November 10, 2019, and October 1, 2020. Urgent referrals necessitating immediate intervention were excluded. Demographics, investigations, procedures, unscheduled visits, and IAE were all documented. Descriptive statistics were used to group patients based on their UC.

Results: Over the study period, 1029 patients were identified and 35.4% (n=374) of them had UC drawn at presentation. Of the 655 patients without UC, 0.6% (n=6) eventually developed sepsis and required urgent renal decompression. Most (87%, n=333) UC completed at presentation were negative (no growth or mixed flora), and none of these patients went on to have an IAE. Of the 13% of UCs that were positive (n=39), only two IAEs (5.13%) were identified, 2–30 days after initial presentation. Both patients had normal acute phase reactants (white blood cells, C-reactive protein) and a history of recurrent urinary tract infections.

Conclusions: Approximately one-third of patients referred to our acute stone clinic had UC at presentation, with an overall delayed IAE rate of 0.7%. Of those with positive UC, only 5% experienced an IAE, suggesting conservative management may be a reasonable consideration in this patient population.

MP-8.4

Impact of median lobe on continence outcomes of robotic-assisted radical prostatectomy

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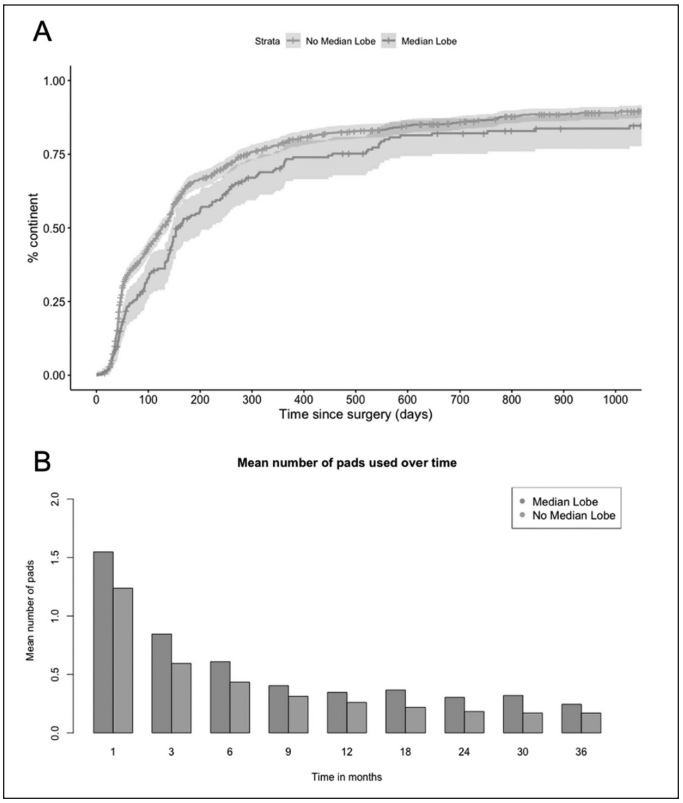
Introduction: This study aimed to assess the impact of intraoperatively identified median lobes (ML) on postoperative urinary continence recovery in Canadian men undergoing robotic-assisted radical prostatectomy (RARP).

Methods: A retrospective review was performed on a prospectively maintained database of 1737 patients who underwent RARP for localized prostate cancer between 2007 and 2019. Patients were divided into two groups based on the presence (ML group, n=196) or absence (NoML group, n=1158) of a median lobe. Functional outcomes, including continence pad use, International Prostate Symptom Score (IPSS), and Sexual Health Inventory for Men (SHIM) were assessed up to 36 months. Log-rank analyses were performed to compare the time to recovery of pad-free continence.

Results: Patients with ML had a significantly higher baseline age, transrectal ultrasound (TRUS) prostate size, and IPSS score. Continence recovery rates (Figure 1) of the ML and NoML groups were, respectively, 78.9% and 70.8% at one-year followup (p<0.01), and 89.1% and 83.7% at three-year followup (p<0.01). Median time to recovery of continence was 126 and 156 days, respectively. Furthermore, despite no significant differences across groups in postoperative IPSS score, the IPSS change from baseline was significantly higher in ML patients. Among men who remained incontinent, patients from the NoML group required significantly less pads at one-, three-,18-, 24-, and 30-month followup.

Conclusions: The presence of a ML is associated with significantly lower rates of continence recovery, longer time to recovery of continence, and more severe cases of incontinence after RARP.



MP-8.4. Figure 1. Postoperative outcomes over time. **(A)** Continence recovery of all patients after surgery in each group. **(B)** Mean number of pads used over time in patients who were still incontinent in each group.

MP-8.6

Ureteroscopy with thulium fiber laser lithotripsy vs. percutaneous nephrolithotomy for the treatment of renal stones 15–20 mm

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Introduction: Endourology has experienced revolutionary inventions in the last few decades. Thulium fiber laser (TFL) is the latest laser technology that has shown promising advantages in both pre-clinical and clinical settings, which may allow larger stones to be treated ureteroscopically. This study aimed to compare the effectiveness of TFL ureteroscopy vs. percutaneous nephrolithotomy (PCNL) in the management of renal stones 15–20 mm.

Methods: We retrospectively analyzed the medical records of 42 patients who underwent either TFL lithotripsy (n=21) or PCNL (n=21) for 15–20 mm renal stones. Stone-free rate (SFR) was assessed with one or combined imaging modalities with either non-contrast computed tomography (CT), kidney-bladder-ureter (KUB) ultrasound, or X-ray. Other variables, including operative time, stone size and density, and prior ureteral stenting, were recorded. In the case of multiple stones, the total stone surface area was measured.

Results: Characters such as patients' age (years), prior ureteral stenting, number of stones, stone density, and total stone surface area (mm^2) were similar between the groups (Table 1). The length of surgery was significantly lower in the TFL group (p=0.002) (Table 1). Compared to TFL, the PCNL group had longer hospital stays (p=0.0001) (Table 1). Our data showed no statistically significant difference in SFR between the TFL and PCNL groups.

Conclusions: This study revealed that TFL lithotripsy produced a similar SFR to PCNL, with significantly lower operative time and hospital stay. TFL can be an effective alternative to PCNL in the management of 15–20 mm renal stones; however, further randomized trials are warranted.

MP-8.6. Table 1. Stone and operative outcome thulium fiber laser lithotripsy vs. PCNL

	Thulium	PCNL	p
Number of subjects	21	21	-
Age, years	57.57	54	0.5019
Pre-stented, % yes	33% (7/21)	19% (4/21)	0.4876
Surgery length, MM: SS (SD)	51:48 (23.98)	93:10 (52.43)	**0.0020**
Number of stones, mean (SD)	2.86 (1.85)	2.43 (2.20)	0.4990
Total stone surface area (mm^2), mean (SD)	355.63 (341.72)	569.70 (720.59)	0.2259
Total stone density, HU (SD)	1031.24 (443.97)	1151.71 (299.79)	0.3089
Ureteral/renal pelvis injury, % yes	5% (1/21)	10% (2/21)	1.000
Length of hospital stay, days (SD)	0.52 (1.29)	2.19 (0.60)	**0.0001**
Stone-free, % yes	52% (11/21)	76% (16/21)	0.1971

MP-8.7

The impact of bilateral stone disease on patients' disease progression and quality of life

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Introduction: Kidney stone disease is associated with significant morbidity and functional impairment. Few studies have examined the impact of bilateral kidney stones on disease progression. We sought to determine the impact of bilateral stone disease on age of onset, number of stone events, and individual patient Health-Related Quality of Life (HRQOL) by querying the validated and prospectively collected Wisconsin Stone Quality of Life (WISQOL) database.

Methods: Cross-sectional data were obtained from 2906 kidney stone formers from 14 institutions in North America who completed the WISQOL questionnaire from 2014–2019. The 28-question survey has a 1–5-point scale for each item (total score range 0–140). Kidney stone formers were further stratified according to the presence of bilateral or unilateral kidney stones. Categorical variables were reported and compared using a Chi-squared test. A multivariable linear regression model assessed the impact of bilateral kidney stone disease on HRQOL.

Results: Of 2906 kidney stone formers, 1340 had unilateral kidney stones and 1566 had bilateral kidney stones. Bilateral kidney stone formers had a younger mean (standard deviation) age of kidney stone onset (37.2±15.8 vs. 46.4±15.9 years of age, p<0.001). Bilateral kidney stone formers had a higher number of stone events than unilateral kidney stone formers (p<0.001). Bilateral kidney stone formers had a higher mean (standard deviation) number of comorbidities (2.02±1.82 vs. 1.87±1.77, p<0.05). Among those comorbidities, bilateral kidney stone disease was associated with an increased number of depression/anxiety symptoms (350, [22.4%] vs. 247 [18.4%], p<0.05). Bilateral and unilateral kidney stone formers did not differ for calcium oxalate, calcium phosphate, uric acid, and mixed stone composition (p>0.05) (Table 1). On multivariable analysis, bilateral kidney stone disease was an independent predictor of worse HRQOL (β=-11.2, confidence interval -19.5 to -3.0 points, p<0.05) (Table 2).

Conclusions: Bilateral kidney stone formers had a younger age of kidney stone onset and a higher number of stone events than unilateral kidney stone formers. The presence of bilateral kidney stones negatively impacted HRQOL. Therefore, clinicians should pay closer attention to bilateral kidney stone patients on clinical presentation and their risk for disease progression.

MP-8.7. Table 1. Baseline demographics and clinical variables of kidney stone formers from the Wisconsin Stone Quality of Life database from 2014–2019 according to side of kidney stone

	Overall (n=2438)	Bilateral (n=1225)	Unilateral (n=1050)	p
Age (yr), median (IQR)	55 (43–65)	55 (43–64)	55 (43–65)	>0.05
Gender, n (%)				>0.05
Male	1265 (51.9)	632 (51.6)	549 (52.3)	
Female	1173 (48.1)	593 (48.4)	501 (47.7)	
Age of onset (yr), median (IQR)	40 (28–54)	35 (24–49)	45 (33–59)	<0.05
Duration of disease (yr), median (IQR)	8 (1–20)	13 (5–25)	3 (0–11)	<0.05
WISQOL score (points), median (IQR)	117 (89–132)	114 (85–131)	119 (94–133)	<0.05
Occupation, n (%)				<0.05
Homemaker/stay-at-home caregiver	163 (6.7)	84 (6.9)	66 (6.3)	
Management	1055 (43.3)	536 (43.8)	460 (43.8)	
Manual labor	162 (6.6)	69 (5.6)	85 (8.1)	
Sales	356 (14.6)	195 (15.9)	134 (12.8)	
Unemployed	196 (8.0%)	109 (8.9)	72 (6.9)	
Retired	506 (20.8%)	232 (18.9)	233 (22.2)	
BMI, n (%)				>0.05
Underweight	22 (0.9%)	12 (1.0)	8 (0.8)	
Normal	591 (24.2)	299 (24.4)	254 (24.2)	
Overweight	786 (32.2)	376 (30.7)	350 (33.3)	
Obese	774 (31.7)	384 (31.3)	348 (33.1)	
Super-obese	228 (9.4)	135 (11.0)	81 (7.7)	
Number of events, n (%)				<0.05
Single (0–1)	841 (34.5%)	213 (17.4)	548 (52.2)	
Recurrent (2–5)	1003 (41.1%)	541 (44.2)	400 (38.1)	
Severe recurrent (≥6)	594 (24.4%)	471 (38.4)	102 (9.7)	
Family history, n (%)				<0.05
Yes	853 (35.0)	466 (38.0)	331 (31.5)	
No	527 (21.6)	227 (18.5)	263 (25.0)	

*Non standardized. WISQOL score was used (min–max is 28–140).

MP-8.7. Table 2. Multivariable linear regression of clinical variable effects on kidney stone former health-related quality of life

	Multivariable		
	β	CI	p
Presence of bilateral stones (points)	-11.2	(-19.5 to -3.0)	<0.05
Presence of unilateral stones (points)	-10.3	(-18.5 to -2.1)	<0.05

Adjusted according to: ethnicity, body mass index (BMI), bothersome urination (LUTS) or overactive bladder (OAB), urinary tract infections (more than 1 within last 12 months), renal tubular acidosis, depression and anxiety symptoms, occupation category, inflammatory bowel disease or irritable bowel syndrome (Crohn's, celiac, chronic diarrhea, idiopathic), short bowel or gastric bypass, diabetes mellitus type 2, gender, number of stone previous kidney stone events, medullary sponge kidney and osteopenia/osteoporosis.

MP-8.8

What is the incidence and significance of incidental findings of fatty liver on ultrasound of patients followed for nephrolithiasis?

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Introduction: Non-alcoholic fatty liver disease (NAFLD) is often diagnosed incidentally on imaging reports when surveying for renal stones. The incidence and implications of these findings on ultrasound reports of kidney stone patients are unknown. Considering that delayed management of significant hepatic steatosis can lead to progression and poor outcomes, we sought to determine the incidence and predictors of incidental ultrasound findings of hepatic steatosis and characterize the management of these patients.
Methods: The medical records of 318 consecutive nephrolithiasis patients between January and February 2018 were retrospectively reviewed. Patients with no previous liver disease, 35 years of age or older, and with available ultrasound imaging were included. Ultrasound reports were reviewed for any incidental finding of hepatic steatosis and the degree of steatosis. Patient demographic predictors of incidental hepatic steatosis were identified using univariable logistic regression models.
Results: One-hundred-sixty-two patients met the inclusion criteria, of which 76 (46.9%) had a finding of hepatic steatosis of any severity and 22 (13.6%) of moderate-to-severe severity. Predictors of finding incidental hepatic steatosis included a higher body mass index (BMI) (odds ratio [OR] 1.2, 95% confidence interval [CI] 1.1–1.2, p<0.001) and smoking (OR 2.6, 95% CI 1.4 –5.1, p=0.004). Of the patients with any-severity

incidental finding of hepatic steatosis, steatosis progression was noted for 13 (17.1%) and regression was noted for two (2.6%). Twelve patients were referred to hepatology for further liver investigations. Among these patients, one (8.3%) had cirrhosis, two (16.7%) had fibrosis, and two (16.7%) had moderate-to-severe steatosis.
Conclusions: The incidental finding of fatty liver on ultrasound of patients followed for nephrolithiasis is common, especially in overweight or smoker patients. While only a small proportion of these patients have significant fibroscan-confirmed fibrosis or cirrhosis, urologists could initiate lifestyle changes that improve outcomes for both liver and kidney stone diseases and refer to gastroenterology/hepatology when appropriate.

MP-8.9

Thulium fiber laser vs. holmium:YAG: A clinical comparison of laser lithotripsy efficiency in a retrospective of 73 patients at a tertiary stone center

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Introduction: Since its first use by Dr. Denstedt in 1993, the holmium (Ho):YAG laser has been the gold standard laser for lithotripsy. The thulium fiber laser (TFL) is a new laser technology that has shown promising results in several preclinical studies. This new technology may expand the boundaries of laser lithotripsy. This study aimed to compare the efficacy of TFL and Ho:YAG in terms of stone fragmentation rate, operative time, and stone-free rate (SFR).
Methods: A retrospective analysis was conducted at a tertiary stone center to identify patients treated with Ho:YAG or TFL laser lithotripsy. Seventy-three cases were included: 42 patients in the Ho:YAG group and 31 in the TFL group. Operative time was calculated from scope introduction to removal. SFR was assessed with one or multiple imaging modalities; non-contrast computed tomography (CT), kidney-bladder-ureter (KUB) ultrasound, or X-ray. Other variables, including stone size, density, and prior ureteral stenting, were recorded. In the case of multiple stones, the total stone surface area was measured.
Results: Patient age (years), prior ureteral stenting, procedure time (min:sec), and total stone surface area were similar between groups. The number of treated stones was higher in the TFL group (p=0.0015). Compared to Ho:YAG, TFL showed a significantly higher rate of stone fragmentation per mm^2 stone surface area (p=0.02). The data showed a similar SFR between Ho:YAG and TFL groups, as well as the size of residual fragments (<4 mm or >4mm) (Table 1).
Conclusions: This study demonstrates that the TFL has a more efficient lithotripsy effect per mm^2 stone surface area than Ho:YAG. SFR was similar for both Ho:YAG and TFL; however, this is confounded by the fact that a significantly higher number of stones have been treated with TFL. In our study, TFL produced a similar SFR to Ho:YAG at a more efficient rate of lithotripsy. Further clinical studies are warranted to tease out the above results and to determine whether thulium can truly challenge holmium as the default laser in urology.

MP-8.9. Table 1. Stone and operative outcomes holmium vs. thulium

	Holmium	Thulium	p
Number of subjects	42	31	
Age, years	57.14 (16.00)	58.48 (14.32)	0.72
BMI (SD)	29.49 (5.29)	24.43 (8.36)	**0.035***
Pre-stented, % yes	14.29% (6/42)	25.81% (8/31)	0.22
Surgery length, MM: SS (SD)	00:48:32 (18:54)	00:41:12 (25:24)	0.17
Total laser energy, Joules (SD)	4100.61 (5616.82)	16850.03 (7523.32)	**0.00039***
Number of stones, mean (SD)	1.26 (0.69)	2.22 (1.67)	**0.0015***
Total stone surface area (mm^2), mean (SD)	96.37 (82.87)	95.13 (67.93)	0.94
Total stone density, HU (SD)	860.03 (361.83)	781.95 (368.00)	0.37
Rate of stone fragmentation, mm^2/minute (SD)	2.27 (1.67)	3.40 (2.30)	**0.02***
Ureteral lesion, % yes	4.76% (2/42)	12.90% (4/31)	0.216
Stone-free, % yes	59.52% (25/42)	45.16% (14/31)	0.15
Fragments <4 mm	73.68% (28/38)	58.62% (17/29)	0.20
Fragments >4 mm	28.32% (10/38)	41.38% (12/29)	0.20

Tests used: numerical variables = Student's T-test; categorical variables = Fisher's exact test.

MP-8.10

Retrograde ureteral stent vs. percutaneous nephrostomy tube drainage for obstructive urolithiasis: Predictors for spontaneous stone passage

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Introduction: Acute obstruction of the urinary system caused by urolithiasis is a common urological emergency that necessitates immediate action. Retrograde ureteral stent (RUS) and percutaneous nephrostomy tube (PCN) are considered the standard methods of urinary drainage. The effect of ureteral stents on ureteric peristalsis has been experimentally studied and has shown that the ureteric stent is associated with ureteric dilatation, diminished ureteric peristalsis, and impairment of stone passage. However, there is currently no evidence supporting the superiority of one of them. The study aimed to compare the probability of spontaneous stone passage and its predictors after drainage by RUS and PCN.
Methods: A total of 298 patients with obstructive urolithiasis were identified retrospectively from two tertiary centers from May 2018 to April 2019. The patients were divided into three groups: RUS (104 patients), PCN (93 patients), and spontaneous stone passage (SSP) (101 patients). The patients were followed up with a non-contrast computed tomography until the stone was passed or surgical intervention was planned. The following characteristics were assessed: age, gender, body mass index (BMI), side of the stones, location, size (total stone surface area), density, duration of followup, and rate of stone passage at final followup.
Results: The age was significantly highest in the PCN group (61 years) (p=0.003), while BMI and gender distribution were similar among groups. Stone size was larger in the PCN group than in the other two groups (p=0.0001) (Table 1). The stones were located mainly in the distal ureter in the SSP group, while in the PCN and RUS groups, the stones were significantly located in the proximal ureter (Table 1). The stones' width, length, surface area, and density were highest in the PCN group, followed by the RUS group, and lastly the SSP group, with significant differences between groups (p<0.0001). Stone passage rate was significantly higher in the PCN group (39.8%) than in the RUS group (36.5%) (p<0.0001). Length of followup was longer in the double-J stent group, followed by the PCN group, and lastly SSP group, with significant differences between groups (p<0.0001).
Conclusions: In our study, a higher stone passage rate was noticed in the PCN group, despite a larger stone size. In our experience, PCN can

MP-8.10. Table 1. Demographic characteristics of the patients and characteristics of the stones and outcome of interventions (overall and in subgroups)

Characteristics	Over all patients (n=298)	Spontaneous stone passage (n=101)	Retrograde ureteral stent (n=104)	Percutaneous Nephrostomy tube (n=93)	p
Age, years (SD)	55.90 (16.99)	51.80 (14.37)	56.74 (18.44)	59.41 (17.17)	**0.003**
BMI (SD)	27.60 (5.00)	26.82 (4.89)	28.03 (5.09)	27.70 (4.98)	0.133
Gender					0.111
Male	207 (69.5%)	77 (76.2%)	72 (69.2%)	58 (62.4%)	
Female	91 (30.5%)	24 (23.8%)	32 (30.8%)	35 (37.6%)	
Side of stone					0.506
Right ureter	146 (49.0%)	46 (45.5%)	50 (48.1%)	50 (53.8%)	
Left ureter	152 (51.0%)	55 (54.5%)	54 (51.9%)	43 (46.2%)	
p-value	0.728	0.371	0.695	0.468	
Location of stone					**0.0001**
Proximal ureter	110 (36.9%)	15 (14.9%)	49 (47.1%)	46 (49.5%)	
Middle ureter	30 (10.1%)	6 (5.9%)	14 (13.5%)	10 (10.8%)	
Distal ureter	158 (53.0%)	80 (79.2%)	41 (39.4%)	37 (39.8%)	
p	**0.0001**	**0.0001**	**0.0001**	**0.0001**	
Width of stone (mm) (SD)	3.91 (1.69)	3.02 (1.28)	4.15 (1.58)	4.60 (1.79)	**0.0001**
Length of stone (mm) (SD)	5.29 (2.90)	3.74 (1.76)	5.47 (2.27)	6.78 (3.63)	**0.0001**
Surface area of stone (mm^2) (SD)	77.06 (81.83)	40.90 (33.95)	78.62 (57.64)	114.60 (117.40)	**0.0001**
Stone density (Hounsfield unit) (SD)	584.92 (329.94)	400.76 (247.42)	648.17 (331.86)	714.19 (320.86)	**0.0001**
Stone passage at final time of followup	176 (59.1%)	101 (100.0%)	38 (36.5%)	37 (39.8%)	**0.0001**
Length of followup (days) (SD)	45.59 (31.64)	29.99 (18.42)	57.12 (33.39)	49.65 (34.36)	**0.0001**

be used as a preferred method of urinary drainage, especially in frail patients' group who are at higher risk of surgical intervention as urinary drainage with PCN showed a higher rate of spontaneous stone passage rate. Further clinical studies are warranted.

MP-8.12
Baseline frailty and physical functioning status of kidney transplant recipients: A need for prehabilitation

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Support: Canadian Frailty Network. American Society of Transplant Surgeons (ASTS)
Introduction: Frailty is associated with poor health outcomes after kidney transplantation.[1-3] However, no current guidelines objectively assess the frailty and physical functioning status of kidney transplant candidates. We sought to quantify frailty status and its relationship to physical functioning.
Methods: We analyzed the baseline frailty and physical functioning status for (n=86) kidney transplant recipients enrolled in a prospective cohort study at Vancouver General Hospital. Frailty was determined using the Fried Frailty Phenotype (FFP). Physical functioning was assessed using the six-minute walk, 30-second sit-to-stand, and timed-up-and-go (TUG) tests. Comparisons between frailty status and physical functioning were made using one-way Anova and post-hoc Tukey HSD.
Results: A total of 80 participants performed the baseline frailty and physical functioning assessment, with a mean age of 56.5±14.2. Patients were predominately male (56.3%) and on hemodialysis (53.8%). Using the FFP, the prevalence of frailty was 21.3%; this increased to 28.0% for those receiving hemodialysis. The mean distance (443.5±196.5 m) covered during the six-minute walk test in the frail group was significantly less than the mean distance (518.4±177.2 m) covered by the non-frail group (p=0.0045). There was also a significant difference between the non-frail and frail groups for the 30-second sit-to-stand (p=0.014) and TUG (p=0.0025) tests, as well as the fatigue questionnaire (p=0.042).
Conclusions: Frailty is highly prevalent in BC patients who are being considered for kidney transplantation. Furthermore, there is a significant decrease in physical functioning associated with increasing levels of frailty. These preliminary results highlight the potential utility of prehabilitation as a means to improve physical functioning and slow the progression of frailty preoperatively. Further study is required to determine the impact that prehabilitation and frailty status may have on postoperative recovery.
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MP-8.13

Robotic-assisted laparoscopic pyeloplasty for ureteropelvic junction obstruction: The St. Michael's Hospital experience

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Introduction: Robotic-assisted laparoscopic pyeloplasty (RALP) has been demonstrated to have a 90–95% success rate in treating ureteropelvic junction obstruction (UPJO). At present, there is no literature on the outcomes of RALP in a Canadian context. Our objective was to perform a retrospective review of RALP cases at a high-volume Canadian center.

Methods: We performed a retrospective chart review of patients that underwent RALP at St. Michael's Hospital, between January 2012 and May 2019. Demographics, intraoperative details, and pre- and postoperative imaging results (ultrasounds, computed tomography [CT] scans, and renal Lasix scan [RLS]) were recorded. Patients were excluded if at least one-year followup data was unavailable. Our primary outcome was clinical and radiological improvement defined as: 1) symptom improvement; 2) stable/improved split renal function on RLS; and 3) either improvement in the degree of hydronephrosis on ultrasound or CT, or improved drainage time on RLS. Secondary outcomes included postoperative complications, need for diagnostic intervention (retrograde pyelogram or diagnostic ureteroscopy), and reintervention for recurrent UPJO

Results: A total of 156 patients underwent RALP over the study time frame after exclusions. The median age was 42 years and 66% were female (Table 1). Mean followup was 2.5 years. In terms of our primary outcome, 87% had clinical and radiological improvement. Diagnostic investigation for possible recurrent/persistent obstruction, based on symptoms and/or imaging results, was required in 17% of cases, but only 3% required reintervention for recurrent UPJO. Accordingly, the overall treatment success was 97%. The most common postoperative complication was urinary tract infection (18%), and urine leak was seen in only 2% of patients.

Conclusions: The results of our retrospective review compare favorably with currently reported outcomes in the literature and demonstrate the safety and high level of success of RALP at a high-volume Canadian center.

MP-8.13. Table 1. Patient demographics and operative details

Study sample (n)	156
Median age at OR (IQR)	42 (28–58)
Gender, n (%)	
M	53 (34)
F	103 (66)
Mean BMI (SD)	25 (6)
ASA status, n (%)	
I	27 (17)
II	84 (54)
III	40 (27)
IV	3 (2)
Hypertension, n (%)	25 (16)
Type 2 diabetes, n (%)	8 (5)
Prior history of nephrolithiasis, n (%)	14 (9)
Prior endoscopic surgery, n (%)	19 (12)
Prior endopyelotomy, n (%)	9 (6)
Side of surgery, n (%)	
L	71 (46)
R	85 (54)
Mean OR duration, min (SD)	178 (47)
Concurrent stone removal, n (%)	14 (9)
Crossing vessel, n (%)	46 (30)
Mean stent duration, days (SD)	35 (7)
Mean LOS, nights (SD)	2 (1)

MP-8.14

Robotic-assisted laparoscopic partial nephrectomy results in reduced operative time, length of stay, and high-grade complications when compared to laparoscopic and open partial nephrectomy

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Introduction: In 2019, the Queen Elizabeth II Health Sciences Centre in Halifax, Nova Scotia, introduced a robotics program. Since then, our group has transitioned all partial nephrectomies (PNs) to robotic surgery. Robotic-assisted surgeries add additional costs when compared to traditional techniques. Therefore, using Canadian-specific data allows us to analyze whether the use of robotics technology is justifiable. Herein, we compared outcomes among patients undergoing robotic-assisted laparoscopic PN (RALPN), open PN (OPN), and laparoscopic PN (LPN).

Methods: This is a single-center, retrospective cohort study comparing perioperative and postoperative outcomes of patients undergoing RALPN, OPN, or LPN at our institution. We used a contemporary series of OPNs and LPNs performed just before the introduction of RALPNs at our institution (February 1, 2019). The OPN and LPN cohort consisted of PNs performed from February 1, 2015, until February 1, 2019 (well-established program). The RALPN cohort consisted of PNs performed from February 1, 2019, to July 31, 2021 (early phase of our robotics program). Primary surgical and perioperative outcomes included estimated blood loss (EBL), warm ischemia time (WIT), operating room (OR) time, procedure time, length of stay (LOS), and intraoperative complications. Postoperative outcomes include creatinine, postoperative complications, and tumor pathology.

Results: Overall, 273 patients with 304 tumors underwent PNs consecutively during this study period. Twenty of the 273 patients had more than one tumor resected per renal unit; 108 patients had OPNs, 83 LPNs, and 82 RALPNs. Baseline characteristics are shown in Table 1. RALPNs were found to have a shorter LOS ($p<0.0005$) (Table 2), shorter procedure time ($p<0.005$) (Table 2), and shorter mean OR time ($p<0.0005$) (Table 2), with no significant differences in intraoperative and postoperative complications between the three. There were no Clavien-Dindo grade IV or V complications for the RALPN group (Table 2). RALPNs were found to have a greater EBL than LPNs, but less than OPNs ($p<0.05$) (Table 2). Additionally, we found statistically significant differences in clamp time, postoperative creatinine, tumor stage, and tumor size between the three groups.

Conclusions: This study demonstrated that during the early phase of our robotics program, RALPNs had similar rates of low-grade complications with less high-grade complications, required less OR time, had shorter procedure times, and had lower LOS when compared to LPNs and OPNs.

MP-8.15

Successful same-day discharge for robot-assisted radical prostatectomy: A systematic review and meta-analysis

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Introduction: Same-day discharge (SDD) following robot-assisted radical prostatectomy (RARP) is emerging as a standard of care. We conducted a systematic review and meta-analysis to summarize published pathways and to evaluate the differences in perioperative characteristics, complication rates, and satisfaction/cost data between in-patient (IP) RARP and SDD-RARP.

Methods: This study was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines and

MP-8.14. Table 1. Baseline characteristics

	Overall	Open	Laparoscopic	Robotic	p
Number of patients	273	108	83	82	
Patient characteristics					
Sex, n (%)					
Male	173 (63.4%)	73 (67.6%)	50 (60.2%)	50 (61.0%)	0.501
Female	100 (36.6%)	35 (32.4%)	33 (39.8%)	32 (39.0%)	
Age (years)					
Mean (range)	55.1 (24.0–75.0)	55.2 (25.0–75.0)	52.1 (30.0–74.0)	58.0 (24.0–75.0)	<0.005
BMI (kg/m^2)					
Mean (range)	30.6 (16.3–54.7)	30.5 (16.3–54.7)	30.4 (19.0–50.4)	30.8 (20.9–52.9)	0.88
Baseline creatinine (μmol/L)					<0.005
Mean (range)	81.1 (42.0–239.0)	87.2 (48.0–221.0)	75.5 (42.0–105.0)	78.8 (42.0–239.0)	
Number of tumors per renal unit					<0.05
1	253	93	83	77	
≥2	20	15	0	5	
Tumor size (cm)					<0.0005
Mean (range)	3.47 (0.80–15.50)	4.09 (1.30–15.50)	2.66 (0.80–7.00)	3.48 (1.40–8.20)	

MP-8.14. Table 2. Intraoperative and postoperative outcomes

	Overall	Open	Laparoscopic	Robotic	p
Estimated blood loss (mL) Mean (range)	278.7 (0.0–2500.0)	353.1 (10.0–2500.0)	215.7 (0.0–2000.0)	241.8 (0.0–1300.0)	<0.05
Clamp, n (%)					0.570
Yes	233 (85.7%)	96 (88.9%)	66 (83.5%)	71 (86.6%)	
No	36 (13.2%)	12 (11.1%)	13 (16.5%)	11 (13.4%)	
Clamp time (minutes)					<0.05
Median (range)	15.0 (7.0–49.0)	14.5 (7.0–32.0)	15.0 (7.0–35.0)	17.0 (7.0–49.0)	
Operating room time (minutes)					<0.005
Mean (range)	159.2 (87.0–324.0)	170.3 (104.0–324.0)	152.9 (94.0–221.0)	151.7 (87.0–279.0)	
Procedure time (minutes)					<0.0005
Mean (range)	100.1 (24.0–231.0)	110.3 (40.0–231.0)	97.5 (41.0–179.0)	89.4 (24.0–225.0)	
Intraoperative complications, n (%)					0.918
Yes	9 (3.3%)	4 (3.7%)	3 (3.6%)	2 (2.4%)	
No	264 (96.7%)	104 (96.3%)	80 (96.4%)	80 (97.6%)	
Length of stay (days)					<0.0005
Median (range)	4.0 (1.0–25.0)	4.0 (2.0–25.0)	3.0 (2.0–8.0)	2.0 (1.0–14.0)	
Postoperative creatinine (μmol/L)					<0.005
Mean (range)	93.0 (46.0–268.0)	100.2 (49.0–268.0)	84.0 (46.0–125.0)	91.6 (47.0–249.0)	
Clavien-Dindo grade, n (%)					0.485
0	178 (65.9%)	64 (59.8%)	58 (69.9%)	56 (70.0%)	
I-II	64 (23.7%)	28 (26.2%)	19 (22.9%)	17 (21.3%)	
IIIa-IIIb	26 (9.6%)	14 (13.1%)	5 (6.0%)	7 (8.8%)	
IV-V	2 (0.7%)	1 (0.9%)	1 (1.2%)	0 (0.0%)	

was prospectively registered with PROSPERO. A comprehensive search of PubMed, Embase, Cochrane Central Register of Controlled Trials, and conference abstract publications was performed comparing outcomes between IP-RARP and SDD-RARP. A leave-one-out sensitivity analysis was performed to control for heterogeneity and risk of bias.

Results: A total of 14 studies (eight prospective and six retrospective cohort studies) were included, with a pooled population of 3795 patients, including 2348 (61.9%) IP-RARPs and 1447 (38.1%) SDD-RARPs. SDD pathways varied, though many commonalities were present in patient selection (minimal comorbidities), perioperative recommendations (judicious intra-operative fluids and short-acting narcotics), and postoperative management (immediate ambulation and diet, and non-narcotic analgesia). When compared to IP-RARP, SDD-RARP had no differences in ≥grade 3 Clavien–Dindo complications (relative risk [RR] 0.4, 95% confidence interval [CI] 0.2, 1.1), 90-day readmission rates (RR 0.6, 95% CI 0.3, 1.1), or unscheduled emergency department visits (RR: 1.0, 95% CI 0.3, 3.1). Cost savings per patient ranged from $466–2678 CAD, and overall satisfaction was high, between 87.5–100%.

Conclusions: SDD following RARP is both feasible and safe while offering healthcare cost-savings with high patient satisfaction rates. Data from this study will further inform the uptake and development of future SDD pathways in contemporary urological care such that it may be offered to a broader Canadian population.

UP-8.1

Clinical applications of machine learning for urolithiasis and benign prostatic hyperplasia: A systematic review

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Introduction: Currently, studies have looked at the use of machine learning (ML) in aiding with the diagnosis, outcome prediction, and management of urological conditions.[1-3] Previous systematic reviews related to ML in urology failed to thoroughly review the literature related to endourology.[4-6] Therefore, we aim to conduct a more focused systematic review examining the use of ML algorithms for the management of benign prostatic hyperplasia (BPH) or urolithiasis.

Methods: Searches of MEDLINE, Embase, and the Cochrane CENTRAL databases were conducted from inception through July 12, 2021. Keywords included those related to ML, endourology, urolithiasis, and BPH. Original research articles were included without any language restrictions. Two reviewers screened the citations that were eligible for title, abstract, and full-text screening, with conflicts resolved by consensus. Two reviewers extracted information from the studies, with discrepancies resolved by consensus. The data collected was then qualitatively synthesized.

Results: After identifying 459 unique citations, 63 articles were retained for data extraction. Most articles consisted of tabular (n=23) and computer vision (n=31) tasks. The two most common problem types were classification (n=40) and regression (n=12). In general, most studies used neural networks as their ML algorithm (n=36). Of the 63 studies retrieved, 58 were related to urolithiasis and five to BPH. The urolithiasis studies were designed for outcome prediction (n=21), disease classification (n=15), predicting disease occurrence (n=11), diagnostics (n=8), and therapeutics (n=3). The BPH studies helped with outcome prediction (n=2), diagnostics (n=2), and treatment of BPH (n=1).

Conclusions: The majority of the retrieved studies successfully helped with outcome prediction, disease classification, disease prediction, diagnostics, and therapeutics for both urolithiasis and BPH. While ML shows great promise in improving patient care, it is important to adhere to the recently developed STREAM-URO guidelines to ensure the development of high-quality ML studies.

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UP-8.3

Outcomes of urinary tract calculi treatment with holmium 2.0 mode dusting at 0.3 J and 120 Hz

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Introduction: Moses 2.0 mode allows dusting settings of 0.3 J and 120 Hz. There is little data examining clinical outcomes on stone treatment using these settings. Our objective was to describe the use of this technology and settings during percutaneous nephrolithotomy (PCNL) and ureteroscopy (URS) at a high-volume academic center.

Methods: With institutional review board approval, we queried our clinical registry to identify consecutive patients that underwent calculi treatment using laser lithotripsy with 2.0 mode set to 0.3 J and 120 Hz between January 1, 2021, and September 2021. Patient demographics were examined in the context of total cumulative stone burden. Our primary objectives were to assess the efficiency of stone treatment by operative time, 90-days stone-free rate, and complications.

Results: Overall, 44 patients (24 male, 20 female) underwent 60 total procedures (16 bilateral cases). There were 21 right URS, 26 left URS, six right PCNL, and seven left PCNL. One (2.3%) case resulted in an unplanned admission, with 68.2% discharged same-day and 29.5% planned admissions. Average operating room duration was one hour and 21 minutes (minimum: 31 minutes, maximum: two hours and 43 minutes) to treat a total cumulative average stone burden of 20.9 mm (interquartile range 11.3–23.8) for total average operative efficiency of 0.26 mm/minute. On computed tomography scan within six weeks postoperative, 31/35 patients (88.6%) were stone-free. At 90 days, only 1/44 patients had no imaging and 2/43 (4.7%) had residual stone. Overall, 90-day complication rate was 20.5% (two with Clavien-Dindo 1, six with Clavien-Dindo 2, one with Clavien-Dindo 3a, and none with Clavien-Dindo ≥3b).

Conclusions: In our single-center cohort of patients using holmium 2.0 mode technology (0.3 J and 120 Hz), we observed effective stone treatment with no Clavien-Dindo ≥3b complications.

UP-8.4

Refining prognostication of pathological outcomes based on stratification of Gleason pattern 4/5 disease in patients undergoing radical prostatectomy

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Introduction: The utility of the percentage of Gleason pattern 4/5 disease (% 4/5) on the prognosis of surgically treated men with prostate cancer is debated. We sought to explore how different strata of % 4/5 could optimally predict risk of adverse pathological outcomes (APO) and biochemical recurrence (BCR) in patients undergoing radical prostatectomy (RP).

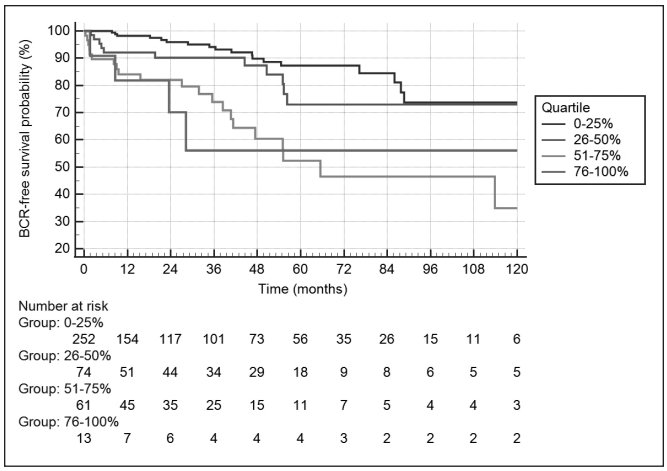
Methods: Patients who underwent RP between Jan 2000 and Aug 2021 at our institution were reviewed. Clinicopathological variables including age, BMI, PSA, Gleason Grade Group (GGG), % positive cores, and % 4/5 were used in logistic regression models to assess the probability of an APO (defined as upstaging in GGG from biopsy, extraprostatic extension, seminal vesicle invasion, regional lymph node involvement, lymphovascular invasion, or positive surgical margins). These predictors and APOs were used to build a Cox proportional hazards model to determine the probability of BCR. % 4/5 disease at the case level was stratified by quantitative percent, tertile, quartile, and decile, and each examined for association with APO and BCR.

Results: A total of 756 men were included (Table 1). Mean follow-up time was 41.4 months. Approximately 66 and 15% of patients had an APO and BCR, respectively. There was strong agreement between biopsy and

UP-8.4. Table 1. Clinicopathological characteristics of the study cohort (n=756)	
Clinical factors	
BMI (kg/m^2)	27.01±8.9
Age at surgery	60.96±7.4
Pathological factors	
Preoperative PSA (ng/mL)	8.29±6.3
Prostate volume	36.59±21.2
Biopsy – Gleason grade group, n (%)	
1	171 (24.1)
2	358 (50.4)
3	120 (16.9)
4	34 (4.8)
5	28 (3.9)
Biopsy – Quartile of Gleason pattern 4/5, n (%)	
0–25%	424 (68.0)
26–50%	77 (12.3)
51–75%	68 (10.9)
76–100%	55 (8.8)
Biopsy – Tissue Involvement (%)	12.4±12.2
Specimen – Gleason grade group, n (%)	
1	93 (12.9)
2	427 (59.1)
3	149 (20.6)
4	25 (3.5)
5	29 (4.0)
Pathological staging, n (%)	
T0	4 (0.68)
T1	1 (0.17)
T2	293 (50.1)
T3	287 (49.1)
Any adverse pathological outcome, n (%)	483 (65.5)
Seminal vesicle invasion, n (%)	84 (11.5)
Extra-prostatic extension, n (%)	319 (43.76)
Lymphovascular invasion, n (%)	76 (11.8)
Positive margins, n (%)	247 (33.6)
Regional lymph node invasion, n (%)	17 (2.2)
Biochemical recurrence, n (%)	110 (14.6)
Followup time (months)	41.4±42.2

specimen GGG (R=0.72), however, 9 and 22% of patients were understaged and over-staged from initial biopsy, respectively. Stratification of % 4/5 disease by quartile was found to be significantly associated with all APOs on multivariable analysis, with the exception of positive surgical margins. For patients with GGG 2 or 3 disease on biopsy, higher quartile of % 4/5 disease was associated with reduced BCR-free survival ($p<0.001$, Figure 1).

Conclusions: Percentage of Gleason pattern 4/5 disease may have independent and clinically significant prognostic value. Stratification by quartiles appears to have an optimal balance between ease-of-use and prognostication of APOs and BCR.



UP-8.4. Figure 1. Kaplan-Meier curves of biochemical recurrence-free survival stratified by quartile of Gleason pattern 4/5 disease in patients with Gleason grade group 2 or 3 disease on prostate biopsy.

UP-8.6

Meningeal metastases in castrate resistant prostate cancer: Institutional series and systematic review

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Introduction: Contemporary studies suggest that the incidence of meningeal metastases (MM) is rising in castrate-resistant prostate cancer (CRPC). The natural history and survival of patients with MM is not well-characterized, especially in the era of novel hormonal therapies. We set out to describe MM in a contemporary series of CRPC patients.

Methods: We reviewed a CRPC cohort at Trillium Health Partners from 2012–2020. Patient and disease features, imaging characteristics, and survival outcomes were included in this analysis. MM was defined by intracranial or intraspinal tumor localization without contiguous osseous involvement. We also conducted a systematic review and included all studies on patients with prostate cancer progressing to MM (PROSPERO: CRD42021232801).

Results: Six of the 275 patients (2.2%) with CRPC at our institution developed MM. At the time of CRPC, the patients who developed MM were significantly younger, had lower baseline hemoglobin, higher lactate dehydrogenase (LDH), and elevated alkaline phosphatase (ALP) compared to those who did not develop MM. The systematic review yielded an additional 11 observational studies (135 patients) that were pooled with our series. The most common presenting symptoms were cranial nerve deficits, headache, or gross motor deficits. Mean age at progression to MM was 63.0 years (range 58.4, 70.9). Mean time from first diagnosis of prostate cancer to MM was 54.6 months (range 21.0, 101.5). The mean time from MM to death was 9.0 months (range 2.6, 23.0). Patients requiring resection for MM (i.e., from subdural hemorrhage) had shorter survival compared to patients receiving only radiation or supportive therapy ($p=0.01$).

Conclusions: We describe the largest pooled analysis of patients with MM in CRCP. Neurological symptoms of any kind in the setting of CRPC, and especially in younger patients, warrants urgent radiographic investigation. Further studies to assess for clinical and biological predictive factors is warranted.