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Abstract 69

Ultrasound vs. fluoroscopy guidance for shockwave lithotripsy in adult and pediatric renal calculi: A systematic review and meta-analysis

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Introduction: Extracorporeal shockwave lithotripsy (ESWL) is a common procedure for the management of renal stones and is usually performed using fluoroscopic (FS) guidance. The usage of ultrasound (US) guidance is emerging as an alternative with the benefit of minimizing exposure to radiation. We aimed to compare the efficacy and safety of US and FS-guided ESWL. Thus, stone-free rates (SFR) and overall complication rates were our primary outcomes, and secondary outcomes were re-intervention rates and individual complication rates, such as urinary tract infection (UTI).

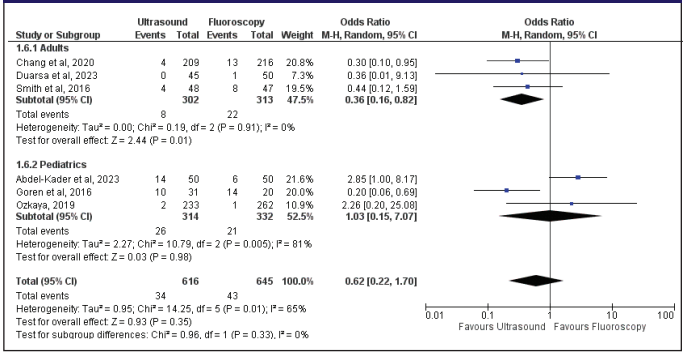
Methods: We conducted a systematic review with meta-analysis in adherence to PRISMA guidelines. Following Prospero protocol registration (CRD42024511335), we searched MEDLINE, EMBASE, Cochrane CENTRAL, and Web of Science from inception to February 15, 2024. The search was supplemented by snowballing techniques and a Google Scholar search for grey literature. Our search included adult and pediatric populations, and a separate subgroup analysis was conducted for each population.

Results: Eleven studies were included yielding 2383 patients (US=1021, FS=1362), with eight studies (n=1737 patients) completing the adult subgroup, and three studies (n=646 patients) completing the pediatric subgroup. Patients treated with US had a 63% increased likelihood of achieving SFR status (OR=1.63; 95% CI [1.23,2.16]; P=0.0007, I^2= 29%). Subgroup analysis demonstrated this difference to be only present in the adult subgroup. Complication rates were 64% less likely for adult patients exposed to US conditions (OR=0.36, 95% CI [0.16,0.82], P=0.01, I^2= 0%); however, no such difference was observed in pediatric samples. There was no difference in re-intervention rates and postoperative UTI in both ESWL approaches.

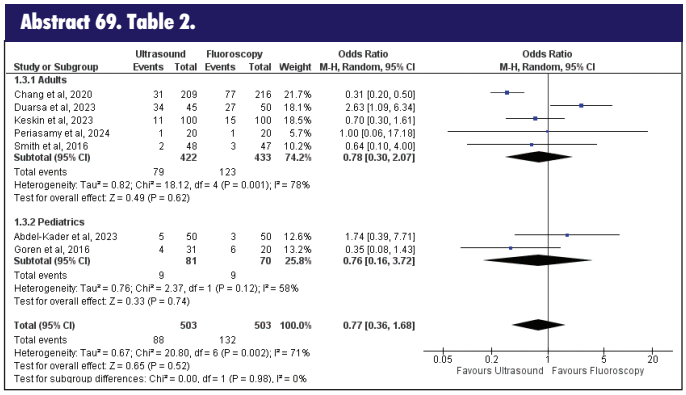
Conclusions: Our analysis demonstrated that ultrasound guidance achieved superior ESWL outcomes in terms of SFR rates and complications compared to fluoroscopy-guided ESWL. However, this difference was only observed in the adult subgroup, which raises the question of age being a factor or whether there are other contributing factors. Our results should be interpreted with caution as the number of randomized controlled trials (RCTs) was limited, and heterogeneity existed between the studies. More research is needed, especially in pediatric populations, to further elucidate and confirm the benefits of US guidance in ESWL.

Funding: N/A

Abstract 69. Table 1.



Abstract 69. Table 2.



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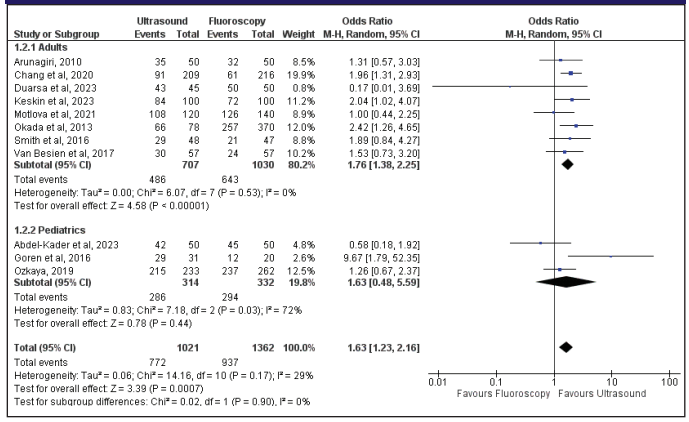
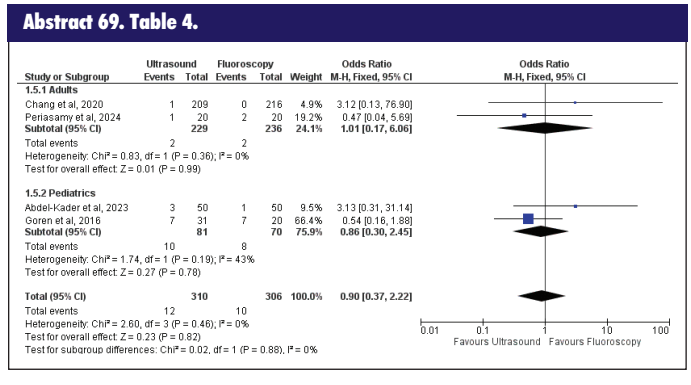


Abstract 69. Table 4.



Abstract 70

Urinary flow rate improvements maintained through two years after treatment with Optilume BPH

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Introduction: Optilume BPH is a novel minimally invasive surgical therapy (MIST) that combines mechanical dilation with the delivery of paclitaxel for the treatment of lower urinary tract symptoms (LUTS) secondary to BPH. Mechanical dilation with Optilume BPH achieves an anterior commissurotomy, while delivery of paclitaxel is intended to maintain luminal patency during healing. The PINNACLE study was a randomized, sham-controlled study evaluating Optilume BPH against a sham procedure, with long-term followup limited to the active (Optilume BPH) treatment group.

Methods: One hundred forty-eight subjects were randomized in a 2:1 fashion (100 Optilume BPH, 48 sham) at 18 centers in the US and Canada. Subjects and evaluating personnel were blinded to the treatment received through 12 months; subjects randomized to receive treatment with Optilume BPH continued followup through two years. Symptom improvement was measured utilizing the International Prostate Symptom Score (IPSS); functional improvement measured by peak urinary flow rate (Qmax). Erectile and ejaculatory function were evaluated utilizing validated questionnaires.

Results: Seventy-eight subjects have completed the two-year followup in the per-protocol set. A total of two subjects (2/100, 2%) have pursued additional surgical management (PAE, TURP) through the two-year timepoint. Improvement in IPSS was maintained through two years (23.4 vs. 10.5, Δ-12.6). Qmax improved from 8.9 mL/second at baseline to 19.0 at 12 months and was maintained at 18.7 mL/second through two-year followup. Paired analysis showed minimal changes in IPSS and Qmax from 12-month to two-year followup. There were no changes in perceived sexual or ejaculatory function.

Conclusions: Treatment with Optilume BPH results in impressive and durable functional improvements in flow rate and symptomology. Minimal surgical retreatment has occurred in the cohort of patients randomized to receive Optilume BPH as part of the pivotal randomized, sham-controlled trial.

Funding: N/A

Abstract 71

Same-day discharge Aquablation for BPH treatment: First world experience report in an ASC

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Introduction: Benign prostatic hyperplasia (BPH) is a prevalent condition among aging men, often leading to bothersome lower urinary tract symptoms (LUTS). Aquablation, a novel minimally invasive technique utilizing high-velocity water jet for precise, image-guided prostatic tissue resection, has emerged as a promising approach for BPH management. We sought to investigate the feasibility, safety, and efficacy of same-day discharge (SDD) after Aquablation specifically in an ambulatory surgical center (ASC).

Methods: A prospective cohort of men diagnosed with significant BPH underwent Aquablation at a single ASC between July 2023 and February 2024. Comprehensive preoperative assessments were conducted, including uroflowmetry, International Prostate System Score (IPSS), and postvoid residual (PVR). Aquablation was performed as morning cases using the AquaBeam™ Robotic System, under general anesthesia, coupled with Olympus plasma-bipolar focal bladder neck cautery and standardized recovery irrigation pathway using a three-way, Rusch 24F catheter with 60cc balloon inflation. Following the procedure, men were assessed for immediate postoperative outcomes, including pain levels, hematuria, and voiding efficiency.

Results: A total of 59 of 60 consecutive men (98%) underwent SDD Aquablation during the study period. The procedure demonstrated a significant improvement in urinary flow rates and a substantial reduction in IPSS at the one-month postoperative period. Pain scores were found to be minimal, and the incidence of postoperative complications, including hematuria and urinary retention, was low and comparable to previously published outcomes. Despite more meticulous focal cautery, no differences in erectile, ejaculatory, or adverse outcomes were observed.

Conclusions: A total of 59/60 consecutive men (98%) with an average prostate size of 115 ml underwent SDD Aquablation. No transfusions or return to the OR were noted. The procedure demonstrated a significant improvement in urinary flow rates and a substantial reduction in IPSS at the one-month postoperative period. Despite more meticulous focal cautery, no differences in erectile, ejaculatory, or adverse outcomes were observed. SDD after Aquablation for BPH at an ASC appears to be a safe and effective approach, yielding favorable outcomes in terms of symptom relief and patient satisfaction. Morning procedures, more attentive cautery, and streamlined patient pathways appear to be essential for SDD. Early discharge not only enhances patient experience but also optimizes healthcare resources, paving the way for a more efficient and patient-centered approach to BPH management.

Funding: N/A

Abstract 71. Table 1. Perioperative outcomes following SDD Aquablation surgery

Preoperative parameters	N=60
Mean age, years (range)	68.8 (54–80)
Mean BMI, kg/m² (range)	25.8 (19–41)
Mean TRUS prostate volume, cc (range)	114.2 (41–270)
Median lobe (%)	40 (66%)
Foley retention (%)	29 (48%)
Mean preoperative IPSS (range)	29.7 (17–35)
Mean preoperative QOL (range)	5.2 (3–6)
Mean preoperative Qmax, mL/sec (range)	5.9 (2–10)
Mean preoperative PVR, mL (range)	408 (84–1300)
Mean preoperative SHIM (range)	20.1 (11–25)
Mean preoperative MSHQ Function (range)	9.3 (8–11)
Mean preoperative MSHQ Bother (range)	2.2 (1–3)
Mean preoperative PSA, ng/dL (range)	7.5 (1.9–23)
Perioperative parameters	
Mean ASA (range)	1.9 (1–3)
Mean aquablation passes (range)	2.1 (2–3)
Mean operative time, min (range)	65 (37–109)
Mean bipolar cautery time, min (range)	34.8 (14–83)
Mean preoperative Hgb, g/L (range)	142 (103–170)
Mean postoperative recovery room Hgb, g/L (range)	139 (129–147)
Mean postoperative recovery time, hours (range)	4.8 (4–9)

BMI: body mass index; ER: emergency room; IPSS: International Prostate Symptom Score; MSHQ: Male Sexual Health Questionnaire; OR: operating room; PSA: prostate-specific antigen; PVR: postvoid residual; Qmax: maximum urinary flow rate; QOL: quality of life; SDD: same-day discharge; SHIM: Sexual Health Inventory for Men; TRUS: transrectal ultrasound; VAS: visual analog scale..

Abstract 71. Table 1 (cont'd). Perioperative outcomes following SDD Aquablation surgery

Postoperative parameters	N=60
Same calendar day discharge	59 (98%)
Mean foley removal day (range)	2.9 (2–5)
Mean posterative pain VAS	
1 week	3.8
2 weeks	2.2
4 weeks	0.9
Complications (30 days), (%)	
ER visit	2 (3%)
Hematuria requiring manual clot irrigation	5 (8%)
Return to OR for bleeding/hemostasis	0 (0%)
Hospitalizations	1 (2%) – shortness of breath
Infection (requiring antibiotics)	3 (5%)
Stress urinary incontinence (using pads/protection)	2 (3%)-both Foley catheter >12m preop
Blood transfusion	0 (0%)
Retrograde ejaculation	9 (15%)
Mean 1-month IPSS (range)	6.6 (4–12)
Mean 1-month QOL (range)	0.9 (0–3)
Mean 1-month Qmax, mL/sec (range)	26.3 (14–50)
Mean 1-month PVR, mL (range)	39 (0–120)
Mean 1-month SHIM (range)	18.9 (11–25)
Mean 1-month MSHQ function (range)	9.3 (8–12)
Mean 1-month MSHQ bother (range)	1.9 (1–3)

BMI: body mass index; ER: emergency room; IPSS: International Prostate Symptom Score; MSHQ: Male Sexual Health Questionnaire; OR: operating room; PVR: post-void residual; QOL: quality of life; SHIM: Sexual Health Inventory for Men; TRUS: transrectal ultrasound; VAS: visual analog scale.

Abstract 72

Incomplete distal renal tubular acidosis: An overlooked risk factor for urolithiasis

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Introduction: Distal renal tubular acidosis (dRTA) is characterized by the distal nephron's inability to acidify urine and is associated with calcium phosphate (CaP) urinary stones, nephrocalcinosis, and bone disease. The incomplete form of dRTA (idRTA), in which the biochemical traits are less conspicuous and there is no overt systemic acidosis, is therefore often underrecognized. In this study, we aimed to evaluate stone-formers (SFs) with features of idRTA to identify the prevalence and better characterize the clinical presentation compared to other SFs without idRTA.

Methods: A prospectively collected metabolic stone clinic database was reviewed. SFs with incomplete data, incorrectly collected 24-hour urine, or utilizing RTA-causing medications were excluded. SFs with urinary pH ≥5.5, hypocitraturia (<1.6 mmol/d), and serum potassium <3.8 mmol/L were considered suggestive for idRTA and compared to SFs without evidence of idRTA.

Results: A total of 1170 SFs were included, and 5.2% had suggestive features of idRTA. Sex was similar between groups (p=0.428); however, median age (p=0.003), and body mass index (BMI) (p=0.032) were significantly lower in SFs with idRTA. Stone composition was available in 682 SFs, of which 12% had predominantly CaP stones, but no association was found between CaP stone composition and idRTA (p=0.574). Moreover, idRTA was associated with low vitamin D (p=0.023) and urinary phosphate (p=0.001). Furthermore, 6.6% of SFs with idRTA had nephrocalcinosis. Bone mineral density had been performed in seven SFs with idRTA, with four (57%) showing below-normal bone mass.

Conclusions: idRTA is an underdiagnosed risk factor for urinary stone disease and may be found in up to 5% of SFs. SFs with idRTA may present at a younger age, with lower BMI, and low vitamin D levels compared to SFs without idRTA. Recognition of idRTA is essential to providing optimized care for SFs.

Funding: N/A

Abstract 73

The prevalence of vitamin D deficiency among patients in a tertiary metabolic stone clinic in Ontario, Canada

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Introduction: Metabolic stone disease is becoming increasingly common worldwide due to a variety of factors. Vitamin D deficiency has been implicated as a variable, although its exact role in the development of calcium oxalate stones is uncertain and its management controversial. In this study we sought to determine the prevalence of vitamin D deficiency among a cohort of stone-formers (SFs) in southern Ontario and compare their clinical and metabolic data with patients with normal vitamin D levels.

Methods: Data from patients seen in the Metabolic Stone Clinic at St. Joseph's Hospital in London, Ontario between 2005–2019 was retrospectively reviewed. Clinical data as well as results of 24-hour urine collections and serum biochemistry values were recorded. Vitamin D levels were defined as deficient if <50 mmol/L, insufficient if between 50–75 mmol/L, and sufficient when between 75–250 mmol/L. Clinical and metabolic data were compared between the low and normal vitamin D subjects.

Results: A total of 748 SFs were included. Two hundred and seventy-four patients (36.5%) had a normal vitamin D whereas 474 (63.5%) had low vitamin D [220 deficient (29.5%), and 254 insufficient (34%)]. SFs with low vitamin D were younger, [53 (42.5–61) vs. 57 (44–67) years, p<0.001], had higher body mass index (BMI) [29.3 (25.7–33.3) vs. 27.5 (24.3–31.9) kg/m^2, p<0.001], and were predominantly female [55.6 vs. 46.4%, p=0.019]. In the metabolic workup, SFs with low vitamin D had lower urinary volume [1.66 (1.24–2.35) vs. 1.97 (1.40–2.70) L/day, p<0.001], slightly lower serum calcium [2.30 (2.23–2.36) vs 2.32 (2.25–2.39) mmol/L, p=0.015], and higher parathyroid hormone (PTH) [4.3 (3.2–5.8) vs. 3.8 (3–4.8) pmol/L, p<0.001]. Among patients with low vitamin D, 13.3% had evidence of secondary hyperparathyroidism. Stone composition was comparable between groups.

Conclusions: Vitamin D deficiency is common in SFs from southern Ontario. Vitamin D deficiency was found in predominantly female, younger stone-formers with higher BMI than in those with sufficient vitamin D. The implications of these findings are significant in that failure to correct vitamin D deficiency in these patients, in addition to potentially contributing to ongoing stone formation, may also have deleterious effects on bone health.

Funding: N/A

Abstract 74

Predicting calcium vs. non-calcium kidney stone composition using a machine learning model: Implications for treatment and pathophysiological insights

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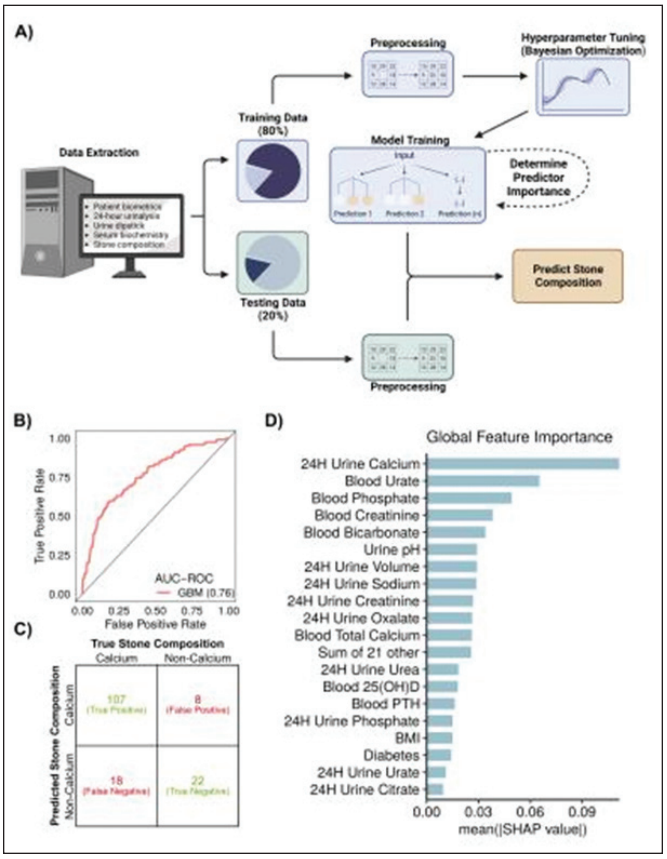
Introduction: Preventative strategies and surgical treatment for urolithiasis depend on accurate knowledge of stone composition. However, stone composition is often unknown until the stone is passed or surgically managed. Earlier determination of the stone's composition will therefore improve the prevention and treatment of the disease. Given that stone composition likely reflects the physiological parameters during its formation, this study aimed to use clinical data from stone-formers to predict calcium vs. non-calcium stone composition.

Methods: Stone composition, 24-hour urine collection, serum biochemistry, and biometric data were prospectively collected from 625 calcium stone patients and 152 non-calcium stone patients at a tertiary care metabolic stone clinic. Eighty

per cent of the data was used to train a binary gradient boosted tree model (Figure 1A). Class imbalance was addressed by up sampling the minority class, and hyperparameters were tuned using Bayesian optimization. The remaining 20% of the data was used as a testing dataset to evaluate the model's performance.
Results: The model demonstrated acceptable performance, with an area under the receiver operating characteristics (AUC-ROC) curve of 0.76 (Figure 1B). The sensitivity and specificity were 0.86 and 0.73, respectively (Figure 1C). The most important predictors for the classification were 24-hour urine calcium, blood urate, and blood phosphate (Figure 1D).
Conclusions: This study shows that clinical data can be used to predict stone composition, which may help urologists determine stone type and guide their management plan before stone treatment. Moreover, the model provides insights into the key clinical features associated with stone disease, shedding light on the underlying pathophysiology. By extending machine learning algorithms, it will be possible to determine specific stone compositions and ultimately improve treatment and prevention strategies for stone-formers.
Funding: N/A



Abstract 74. Figure 1. (A) Binary gradient boosted tree model. (B) Performance of the model. (C) Sensitivity and specificity. (D) Predictors for classification. AUC: area under the curve; BMI: body mass index; GBM: generalized boosted regression; PTH: parathyroid hormone; ROC: receiver operating characteristic; SHAP: SHapley Additive exPlanations.

Abstract 75

Conservative management of staghorn stones: An assessment of long-term safety and clinical outcomes

Anindyo Chakraborty[1], *Iman Sadri*[2], *Hend Alshamsi*[2], *Sero Andonian*[2], *Nader Fahmy*[2], *Fadl Hamouche*[2]
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Introduction: Staghorn stones are associated with significant morbidity including worsening renal function, renal scarring, recurrent urinary tract infections (UTI), and sepsis. Thus, surgical intervention and stone clearance is considered standard of care. However, there is a paucity of contemporary data on the conservative management of patients with staghorn stones. The aim of this study is to elucidate the safety and efficacy of conservative non-operative management of staghorn stones.
Methods: A retrospective chart review of a single surgeon's entire cohort of staghorn stone patients managed conservatively was executed. Reviewed data include patient and stone characteristics, medical management, and clinical outcomes, including disease-specific mortality and progressive renal function deterioration.
Results: Twenty-four patients with staghorn stones managed conservatively were included in the study, with an average followup of 8.4 years. Twenty patients (83%) were treated non-operatively due to being deemed at high risk for operative complications. Nineteen patients (79%) were on active medical therapy. Progressive renal deterioration occurred in three patients (13%), with one patient (5%) requiring eventual dialysis due to longstanding hypertension and diabetes. We noted recurrent UTIs among 16 patients (67%), with pyelonephritis occurring in five patients (21%) and urosepsis in one patient (4%). Three patients (13%) died from non-stone related causes including cancer and muscular dystrophy, and no patient died from a stone-related complication.
Conclusions: Conservative management of selected patients with staghorn stones is a viable option. Detailed metabolic workup and active medical therapy are adjuncts to surveillance and may have contributed to reducing morbidity and mortality.
Funding: N/A

Abstract 76

Establishing incidence rate ratios for kidney stone operations after bariatric surgery

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Introduction: Surgery that impacts nutritional absorption such as laparoscopic cholecystectomy (LC) and laparoscopic Roux-en-Y gastric bypass (LRGB) is known to be associated with kidney stone formation, whereas laparoscopic sleeve gastrectomy (LSG) does not have such association. The potential impact of these procedures on incidence of kidney stone surgery (KSS) remains unclear. This study assesses the effect of LC, LRGB, and LSG on incidence of KSS.
Methods: This is a retrospective analysis of patients at a single institution who underwent either LC, LRGB, or LSG from May 2015 to September 2023. Instances of KSS were recorded in each group before and after each intervention. Incidence rates were calculated in each group, using person-time at risk for kidney stone surgery in years. Results were also stratified by type of KSS, including extracorporeal shockwave lithotripsy (ESWL), ureteroscopy (URS), and percutaneous nephrolithotripsy (PCNL).
Results: The study included 10 857 patients who underwent LC, 2441 who underwent LRGB, and 2283 who underwent LSG over the study period. Baseline characteristics are described in Table 1. The LRGB group had a higher incidence rate after surgery of KSS compared to LC or LSG (1100 cases/person-year vs. 600 and 500; $p<0.001$). All three groups had an increased rate ratio for KSS (LC 1.45, 95% CI: 1.20–1.75; LRGB 4.13, 95% CI:2.74-6.125; LSG 2.05, 95% CI:1.21–3.46). There were no significant differences in distributions of type of KSS before or after surgery (Table 2).
Conclusions: Surgery that impacts nutritional absorption not only increases kidney stone formation, but also increases the rate of needing surgical treatment for kidney stones. Dietary guidance should be provided to minimize kidney stone formation in these vulnerable groups.
Funding: N/A

Abstract 76. Table 1. Baseline patient characteristics

	Laparoscopic cholecystectomy	Laparoscopic Roux-en-Y gastric bypass	Lap sleeve gastrectomy	p
Number of patients	10 857	2441	2283	
Baseline characteristics				
Age at date of surgery	50.98±17.52	42.15±10.72	44.41±12.03	<0.001
Race	W: 8973 NW: 1884	W: 1866 NW: 555	W: 1519 NW: 764	<0.001
Ethnicity	Latinx: 1040 NL: 9817	Latinx: 339 NL: 2102	Latinx: 335 NL: 1948	<0.001
Comorbidity	7844	1927	1862	<0.001
Gender	M: 3311 F: 7540	M: 444 F: 1997	M: 414 F: 1869	<0.001
Stone operations	440	143	66	
Before surgery	200 (45.5%)	28 (19.6%)	20 (30.3%)	<0.001
After surgery	240 (54.5%)	115 (80.4%)	46 (69.7%)	
Person-years at risk	90 778	20 408	19 082	
Before surgery	49 714	10 237	8990	<0.001
After surgery	41 064	10 171	10 092	
Incidence rate				
Before surgery	0.0040	0.0027	0.0022	<0.001
After surgery	0.0058	0.0113	0.0046	
Incidence rate ratio	1.45 (1.20–1.75)	4.13 (2.74–6.25)	2.05 (1.21–3.46)	<0.001

Abstract 76. Table 2. Differences in distributions of type of KSS before or after surgery

	Laparoscopic cholecystectomy	Laparoscopic Roux-en-Y gastric bypass	Lap sleeve gastrectomy	p
Stone operations before surgery				
ESWL	58 (29%)	8 (28.5%)	7 (35%)	NS
URS	135 (67.5%)	19 (67.9%)	13 (65%)	
PCNL	7 (3.5%)	1 (3.6%)	0 (0%)	
Stone operations after surgery				
ESWL	37 (15.4%)	8 (7%)	5 (10.9%)	NS
URS	190 (79.2%)	104 (90.4%)	40 (87%)	
PCNL	13 (5.4%)	3 (2.6%)	1 (2.1%)	

ESWL: extracorporeal shockwave lithotripsy; KSS: kidney stone surgery; PCNL: percutaneous nephrolithotripsy; URS: ureteroscopy.

Abstract 77

The role of PSA kinetic, biopsy, and multiparametric MRI for detection of residual prostate cancer post Holmium laser enucleation of the prostate (HoLEP)

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Introduction: The study aimed to assess the role of prostate-specific antigen (PSA) reduction as well as biopsy and multiparametric (MP)-MRI for the detection of residual prostate cancer (PCa) post-holmium laser enucleation of the prostate (HoLEP).

Methods: We retrospectively collected data on patients who underwent HoLEP for clinically diagnosed benign prostatic hyperplasia (BPH), which was later confirmed to be PCa via final pathology reports (n=27). The collected data comprised patient age, preoperative PSA levels, and PSA levels three months post-operation. Our investigation encompassed patients who had undergone MP-MRI three months following HoLEP upon receiving a PCa diagnosis followed by TRUS-guided prostatic biopsy and targeted biopsy if required. The study also incorporated a control group of 27 patients who were treated with HoLEP and subsequently confirmed to have benign prostatic pathology.

Results: Of 27 PCa patients (median age=74 years old), postoperative TRUS biopsy did not show cancer in 18 cases (66.6%), while low risk and favorable intermediate risk accounted for seven patients (26.0%), and those with unfavorable intermediate risk or high risk were reported in two patients (7.4%). The median PSA reduction was 91% in the control group. The median PSA reduction in the PCa group with benign pathology, low risk, and higher risk groups was 89%, 82%, and 67% respectively. MP-MRI did not add diagnostic value when it was done three months post-HoLEP, with 28% of patients with benign pathology having PIRADS score of four and five (Table 1).

Conclusions: The study suggests that a post-HoLEP PSA decrease of less than 70% may be indicative of high-grade PCa, whereas a decrease of more than 80% tends to correspond with either no remaining cancer or low-grade PCa. Monitoring with a PSA test and biopsy three months after HoLEP appears to be an effective strategy for patients with identified PCa. However, the additional use of MRI at this three-month mark did not enhance diagnostic accuracy. Due to the limited sample size, these observations should be interpreted cautiously, and larger studies are needed to confirm these preliminary findings.

Funding: N/A

Abstract 77. Table 1- PSA kinetics, 3-month post-HoLEP biopsy, and MRI in patients with PCa on HoLEP-pathology

HoLEP pathology	3-mo postoperative biopsy (n)	Age (median)	PSA kinetics (%reduction) Median (range)	3-mo post-op MRI		
				PIRAD I/II n (%)	PIRAD III n (%)	PIRAD IV/V n (%)
PCa	Benign (n=18)	75	85% (34–98%)	10 (55.5%)	3 (16.7%)	5 (27.8%)
	Low or favorable intermediate risk* (n=7)	67	82% (40–94%)	2 (28.6%)	2 (28.6%)	3 (42.8%)
	Unfavorable intermediate or high risk** (n=2)	71	67% (67%)	0 (0%)	1 (50%)	1 (50%)
Benign (control)	NA	73	92 (8–100%)	NA	NA	NA

*Gleason scores 3+3 or 3+4; ** Gleason score 4+4 was only found. MRI: magnetic resonance imaging; HoLEP: holmium laser enucleation of the prostate; PCa: prostate cancer; PIRAD: Prostate Imaging Reporting and Data System; PSA: prostate-specific antigen.

Abstract 78

Anticholinergic medications are associated with increased fluid intake in kidney stone formers

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Introduction: Kidney stones and urinary frequency are both managed by urologists and are commonly comorbid. Increasing fluid intake is an important intervention for preventing kidney stone recurrence; however, patients suffering from urinary frequency often report restricting fluid intake as a management strategy. Currently, there are no studies examining the relationship between medications used to treat urinary frequency and daily urine output in kidney stone formers. We hypothesize that anticholinergic medications, which are known to induce dry mouth and constipation, may stimulate increased fluid intake either through side effects and correction of urinary frequency symptoms.

Methods: Patients who underwent 24-hour urinalysis at our clinic between 2003 and 2020 were retrospectively reviewed. Patients who had been on no anticholinergics at the time of their 24-hour urinalysis and then had a repeat 24-hour urinalysis while on an anticholinergic medication were identified. Using SPSS 26, paired t-test was used to compare 24-hour urine volumes before and after starting anticholinergic medications. We then identified age, gender, and body mass index (BMI)-matched controls who had undergone at least two 24-hour urinalyses and were never on anticholinergics at the time of 24-hour urinalyses. The change in 24-hour urine volumes for these patients were then compared to that of the anticholinergic group.

Results: In total, 1024 patients underwent 4189 24-hour urinalyses. Twenty-four patients had undergone a 24-hour urinalysis while not on an anticholinergic medication and a subsequent urine study while on an anticholinergic. Mean age was 50 (31–72) and 75% of patients were female. Mean 24-hour urine output of patients off anticholinergics was 1.92 L/day (SD 1.12), compared to 2.47 L/day (SD 0.83) on an anticholinergic ($p<0.001$). Matched controls had a mean 24-hour urine volume of 2.05 L/day (SD 0.96) followed by 2.14 L/day at least one day later (SD 0.98, $p=0.75$). A cross calculation was done comparing the initial 24-hour volume means of the test and control group, as well as the follow-up means (values stated above). Neither was significantly different with p values of 0.24 and 0.15, respectively.

Conclusions: Anticholinergic use was associated with a statistically significant increase in 24-hour urine output, whereas the same effect was not seen in controls matched for age, sex, and weight. We conclude that this supports the hypothesis that anticholinergic medications facilitate behavioral modifications related to increased fluid intake due to either side effects or improvement in urinary frequency.

Funding: N/A

Abstract 79

A prospective cohort study on surgical and patient-reported outcomes of ureteroscopy under sedation for nephrolithiasis

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Introduction: Ureteroscopy (URS) is a mainstay in the treatment of nephrolithiasis. URS is often performed under general anesthesia (GA); however, URS under procedural sedation has recently been described. Notably, surgical and patient-reported outcomes (PROs) of URS under sedation vs. GA have yet to be reported.

Methods: Patients undergoing URS for nephrolithiasis from June to August 2023 at our provincial stone center were prospectively recruited. A small representative cohort of GA patients were included for PRO measures comparison. Intra- and perioperative variables were collected. A validated questionnaire was used to assess patient tolerability. Two-tailed t-test and Fisher's exact test were used for analysis. The primary outcome was patient tolerability of URS under sedation vs. GA. Secondary outcomes included operative time, percentage of operative time devoted to surgery, stone-free rate, and perioperative complications.

Results: Sixty URSs from 58 patients were included: 51 (85%) under sedation and 9 (15%) under GA. Mean total stone burden was 19 mm [2–72] and similar between sedation (18 mm [2–129]) and GA (23 mm [6–57], $p=0.56$). Mean operative time was 37 minutes [5–109] and similar between sedation (36 minutes [5–90]) and GA (45 minutes [11–109], $p=0.30$). Mean percentage of operative time devoted to surgery was 73% and significantly higher under sedation (77% [25–92]) vs. GA (46% [23–73], $p<0.00001$). Mean stone-free rate was 82% and similar between sedation (80%) and GA (89%, $p=0.99$). There were no postoperative septic events nor admissions. There were three (5%) 30-day postoperative emergency visits, all from the sedation cohort for colic. Forty-two questionnaire responses were obtained (response rate 72%). Mean patient tolerability was 7.8/10 and similar between sedation (7.5) and GA (9.2, $p=0.16$). Seventy-two per cent of those who received sedation would choose it again.

Conclusions: In this single-center, prospective cohort study, URS under sedation had acceptable patient tolerability compared to a subset of similarly matched patients who underwent URS under GA. URS under sedation was safe, effective, and efficient; there were comparable stone-free and complication rates to GA; and it allowed for more time spent on operative components than GA.

Funding: N/A

Abstract 80

Validation of the patient activation measure in kidney stone disease patients

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Introduction: The Patient Activation Measure (PAM) is a questionnaire that assesses an individual's knowledge and skill regarding self-management of their health. This study aims to validate the PAM within a kidney stone disease (KSD) population. Secondary objectives include determining the variability of patient activation within this population and establishing correlations between activation and other variables such as demographics, quality of life (QOL), and health literacy.

Methods: This single-center, cross-sectional study includes individuals 18 or older who currently have, or have had, kidney stones. A survey was administered to gather demographic data and responses for PAM-13, the Wisconsin Stone Quality of Life scale, and the Health Literacy Questionnaire (HLQ). Only dimensions 3 (actively managing my health), 7 (navigating the healthcare system), 8 (ability to find good health information), and 9 (understand health information well enough to know what to do) of the HLQ were administered. Data analysis was performed using a multivariable linear regression analysis after forward stepwise variable selection using Akaike Information Criterion. Validation of the PAM was performed using Rasch analysis.

Results: Two-hundred individuals with KSD were included. One-hundred twenty-four respondents were male (62.0%) and 76 were female (38.0%). Median age was 58. Mean PAM score was 66.6 (SD=14.4). It was noted that 8.5%, 12.0%, 45.5%, and 34.0% of respondents had PAM levels of 1, 2, 3, and 4, respectively. Females, and those who missed at least one dose of medication, had lower predicted activation. All HLQ dimensions correlated significantly to PAM, but only dimensions 3, 7, and 9 predicted higher activation. No associations between income, education, employment, ethnicity, or QOL were found. Rasch analysis revealed the PAM to have good item reliability (0.81), person reliability (0.98), and internal consistency (Cronbach's alpha=0.88). Regarding item fit, item 1 of the questionnaire fit the model poorly, with INFIT and OUTFIT statistics of 1.42 and 1.86 respectively. Evidence of an unknown second dimension with an eigenvalue of 2.089 and accounting for 9.0% of variation in observed responses was found.

Conclusions: It was established that activation in KSD patients is predicted by sex, medication adherence, and health literacy. Rasch analysis found that the PAM is valid in KSD patients although slight evidence of multidimensionality was discovered.

Funding: This work was supported in part by the 2023 Urology Care Foundation Summer Medical Student Fellowship Program and the Herbert Brendler, MD, Research Fund.

Abstract 81

Aquablation for the treatment of benign prostatic hyperplasia: A prospective monocentric single-arm clinical trial of same-day discharge

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Introduction: One of the latest techniques for the treatment of benign prostatic hyperplasia (BPH) is Aquablation therapy. The technology is based on a heat-free water jet that ablates prostatic tissue, guided by ultrasound imaging. The objective of this study is to determine the safety and efficacy of same-day Aquablation therapy when using the AQUABEAM Robotic system and the Apogee 2300 ultrasound system.

Methods: Fifty men aged from 51 to 81 years with moderate-to-severe BPH symptoms underwent Aquablation in a prospective, single-arm clinical trial between April and December 2023. All patients received followup at three months. The primary efficacy end point was the change of the International Prostate Symptoms Score (IPSS) from baseline to three months and the number of patients successfully sent home the same day of the procedure. The primary safety end point was the rate of

Abstract 80. Table 1. PAM-13 with item calibrations for KSD population

Item	Calibration†	Standard Error Measure§	INFIT¶	OUTFIT△
1. When all is said and done, I am the person who is responsible for taking care of my health.	35.13	1.28	1.42	1.86
2. Taking an active role in my own health care is the most important thing that affects my health.	37.65	1.20	0.98	0.91
3. I am confident I can help prevent or reduce problems associated with my health.	42.57	1.11	1.05	1.04
4. I know what each of my prescribed medications do.	52.63	0.99	1.31	1.32
5. I am confident that I can tell whether I need to go to the doctor or whether I can take care of a health problem myself.	48.20	1.02	0.91	0.91
6. I am confident that I can tell a doctor concerns I have even when he or she does not ask.	42.35	1.10	1.23	1.10
7. I am confident that I can follow through on medical treatments I may need to do at home.	43.13	1.10	0.73	0.90
8. I understand my health problems and what causes them.	56.28	0.95	1.08	1.07
9. I know what treatments are available for my health problems.	53.52	0.98	0.95	0.91
10. I have been able to maintain (keep up with) lifestyle changes, like eating right or 11. exercising.	53.26	0.98	1.01	1.00
11. I know how to prevent problems with my health.	55.82	0.95	0.77	0.77
12. I am confident I can figure out solutions when new problems arise with my health.	61.66	0.91	0.80	0.81
13. I am confident that I can maintain lifestyle changes, like eating right and exercising, even during times of stress.	54.16	0.97	0.96	0.97

† Calibration is a measure of item difficulty and corresponds to level of activation that is required in order to endorse the item. Item measure outputs from Winsteps were rescaled from a scale of 0 to 100 in order to generate these item calibrations. § Standard error measure corresponds to the precision of item difficulty estimation. It reflects the standard error of measurement in the estimation of item calibrations. ¶ INFIT is the inlier-sensitive fit statistic. This is an information-weighted residual of observed responses from model expected responses and is sensitive to unexpected patterns of observation close to a person's scale location. △ OUTFIT is the outlier-sensitive fit statistic. It is more sensitive to unexpected observations by persons on items that are relatively easy or difficult for them, and therefore far from their scale location. KSD: kidney stone disease; PAM-13: Patient Activation Measure-13.

unanticipated serious adverse effect (USADE) observed up to the three-month followup visit. Other measures at baseline and three-month followup included urinary flow rate (Qmax), quality of life (QOL), and post-void residual volume (PVR). We performed paired t-tests using SPSS version 29.0, and a p value of <0.05 was considered clinically significant.
Results: Mean prostate volume was 80.59 mL. Mean Aquablation time was 7.50 minutes, mean bipolar cauterization time was 20.37 minutes, and mean operative time was 58 minutes. Almost half of the patients (48%) were discharged home the same day of the procedure within 6.43 hours. Among hospitalized patients (52%), three patients (11.5%) stayed for social reasons, 22 patients (84.6%) stayed for hematuria, and one patient stayed for sepsis (3.8%). Mean hospitalization time was 35.30 hours. The majority of adverse events (n=45) were classified as Clavien-Dindo Grade II or lower (96%). Two patients had to be taken back to the operating room for bleeding complications. There was no USADE. IPSS improved from 22.72 at baseline to 6.90 (15.82 point improvement, p<0.001) and IPSS quality of life from 5.18 to 1.24 (3.94 point improvement, p<0.001). Both urinary flow rate and post-void residual volume improved respectively from 8.25 mL/s at baseline to 14.00 ml/s (p=0.002) and from 135.47 mL at baseline to 57.89 mL (p<0.001). There was no *de novo* erectile dysfunction and 87% of patients (44/50) maintained their antegrade ejaculation.
Conclusions: Results show that Aquablation therapy is effective and safe in treating men with BPH. In properly selected patients undergoing Aquablation therapy, same-day discharge is possible.
Funding: PROCEPT BioRobotics

Abstract 82

BPH surgical trifecta outcomes: Comparison of Aquablation vs. TURP from WATER clinical trials

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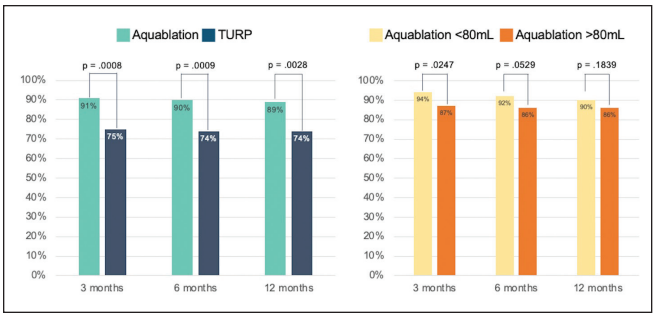
Introduction: The concept of "success" in surgical procedures is crucial in any field, and standardization is needed to 1) effectively assess patients' postoperative benefits; 2) evaluate the surgical quality within centers and operators; and 3) perform reliable comparisons among techniques. The present study sought to describe and analyze the patient level trifecta success of Aquablation and transurethral resection of the prostate (TURP) for the treatment of benign prostatic obstruction. Clinical and surgical predictors of failure to achieve trifecta were investigated.
Methods: A retrospective analysis of prospectively conducted clinical trials WATER (NCT02505919), WATERII (NCT03123250), and OPEN WATER (NCT02974751) included patients from the United States, Canada, Germany, Australia, New Zealand, Lebanon, and the United Kingdom between 2017 and 2021. Trifecta was defined as the contemporary efficiency and safety presence of 1) freedom from procedure-related sexual dysfunction (either erectile or ejaculatory dysfunction); 2) no pad-use urinary incontinence, and 3) no interventional retreatment due to lower urinary tract symptoms (LUTS). The trifecta success rates were assessed at three, six, and twelve months postoperatively. Subanalysis in the Aquablation cohort was also conducted for prostate volumes <80cc and >80cc. Multivariate logistic regression analysis was performed to assess predictors of trifecta failure.
Results: The cohort included 395 Aquablation patients that treated prostates up to 150cc and 65 TURP patients that treated prostates up to 80cc. Mean prostate volumes and age for the Aquablation patients and TURP patients were 70cc and 52cc, and 67 and 66 years old, respectively. The achievement of trifecta success at one year was 88.6% for Aquablation and 73.8% for TURP (p=0.0014). Trifecta success at three and six months for the Aquablation cohort compared to the TURP cohort were. 91.4% vs. 75.4%, and 89.9% vs. 73.8%, respectively. Subanalysis within the Aquablation cohort <80cc and >80cc demonstrated trifecta rates at 12M of 90.3% and 85.5%, respectively. Patient age, preoperative PVR ≥250 mL, and larger prostate volume were independent predictors of trifecta failure.
Conclusions: Aquablation has demonstrated better trifecta success compared to TURP while treating a much broader range of prostate sizes, particularly with the preservation of antegrade ejaculation.
Funding: N/A



Abstract 82. Figure 1. Trifecta success. TURP: transurethral resection of the prostate.

Abstract 83

An analysis of BPH treatment reimbursement trends across Canada: Examining provincial changes over the recent decade with comparison to cost of living changes

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Introduction: A variety of procedures for the endoscopic surgical treatment of symptomatic benign prostatic hyperplasia (BPH) refractory to medical therapy has existed for decades. The present study examines trends in surgeon compensation for these treatments within Canada.
Methods: The physician fee schedule for BPH surgery across ten Canadian provinces for the years 2010 and 2023 were obtained. A descriptive study examined firstly the provincial reimbursement for transurethral resection of the prostate (TURP) and laser ablative/enucleation surgery; secondly, the difference in TURP reimbursement between 2010 and 2023; and thirdly, the annual change in TURP reimbursement juxtaposed with the annual change in the provincial Consumer Price Index (CPI) and annual salary for the working population aged 35 to 44.
Results: Seven out of ten Canadian provinces reimburse laser BPH surgery equally to TURP. The average provincial TURP reimbursement is $545, ranging from $451 in Ontario to $688 in Saskatchewan. Since 2010, TURP reimbursement has varied by province from a 0% net change in Ontario to an increase of 21% in Nova Scotia. Reimbursement for TURP has increased at a slower pace than the local CPI, and for half of the provinces at a slower pace than the annual salary for people aged 35 to 44.
Conclusions: The compensation model for endoscopic BPH surgery does not have a unified structure in Canada that is consistent across provinces, nor does it keep up with inflation, possibly impacting future recruitment, increasing geographic disparities, and most importantly, limiting the adoption of new BPH therapies.
Funding: N/A

Abstract 84

Kidney stone disease: Practice patterns among urologists in Canada

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Introduction: Kidney stone disease (KSD) constitutes an important health issue in Canada. Despite the presence of KSD guidelines, there is a lack of high-quality evidence for the management and followup of KSD. We sought to evaluate the practice patterns and preferences of urologists across Canada in the management and followup of KSD, as well as existing barriers to clinical practice.
Methods: A cross-sectional survey of Canadian urologists was developed and advertised through the mailing lists of the Canadian Urological Association (CUA),

Abstract 83. Table 1. National TURP and laser reimbursement codes for Canadian urologists for 2023

2023	NB	PEI	NL	AB	BC	MB	NS	QC	ON	SK
TURP										
Code	1394	8584	97 640	72.1A	8311	4321	72.1B	6247	S655	123R
Physician fee CAD ($)	542	618	489	513	475	569	656	458	451	688
PVP										
Code	SAME*	SAME	97 641	72.1C	SAME	SAME	72.1D	SAME	SAME	SAME
Physician fee CAD ($)	SAME	SAME	487	770	SAME	SAME	656	SAME	SAME	SAME
LEP										
Code	SAME	SAMESAME	SAME	72.1C	>60gS81311	SAME	SAME	SAME	SAME	SAME
Physician fee CAD ($)	SAME		SAME	770	949	SAME	SAME	SAME	SAME	SAME

*SAME refers to the procedure code/fee being identical to TURP.

Quebec Urological Association (QUA), and Canadian Endourology Group (CEG). The survey was also directly sent to multiple urology departments across the country. We used descriptive statistics to present our most salient findings.

Results: Of the 93 urologists who completed the survey, 44 (47%) were from academic centers, 40 (43%) were from community hospitals, and the remaining nine (10%) practiced in mixed or private settings. The majority were from Quebec (32%), Ontario (29%), British Columbia (15%), Alberta (11%), and the rest (13%) from other provinces. Most respondents performed over 75 ureteroscopies and fewer than 25 percutaneous nephrolithotomies (PCNLs) annually (67% and 58%, respectively). The availability of the holmium:YAG laser was reported in 85% of hospitals, followed by the thulium fiber laser (70%) and the holmium:YAG laser with pulse modulation (Moses) (28%). For KSD surgery, most urologists preferred the thulium fiber laser (74.5%), followed by the holmium:YAG laser (24.2%) and the Ho:YAG laser with Moses effect (21.7%). Within the cohort, 57% performed percutaneous access themselves, predominantly using fluoroscopy alone (52%) or using combined ultrasound and fluoroscopy (24%). Regarding metabolic assessment, 38% delegated metabolic workup to nephrologists or specialized KSD clinics, mainly citing lack of time (25%) and expertise (25%). Additionally, 71% of urologists lacked access to multidisciplinary KSD clinics at their institution, 76% of whom believed such clinics would benefit their institutions. Compared to non-endourology fellowship-trained urologists (n=44, 46%), those who completed an endourology fellowship (n=49, 53%) exhibited higher rates of performing their own PCNL access (23% vs. 90%, p<0.001) and metabolic workup (48% vs. 73%, p=0.02), and expressed a greater comfort level in prescribing prophylactic and medical treatment for KSD (50% vs. 86%, p<0.01).

Conclusions: Our study reveals heterogeneity in criteria used for in-depth evaluation, imaging assessment protocols, availability of surgical devices between centers, and access to subspecialized clinics. Future guidelines and healthcare policies should consider addressing the practice barriers faced by Canadian urologists and providing solutions.

Funding: N/A

Abstract 85

The calcium conundrum: Exploring the link between dysregulated handling and kidney stone formation

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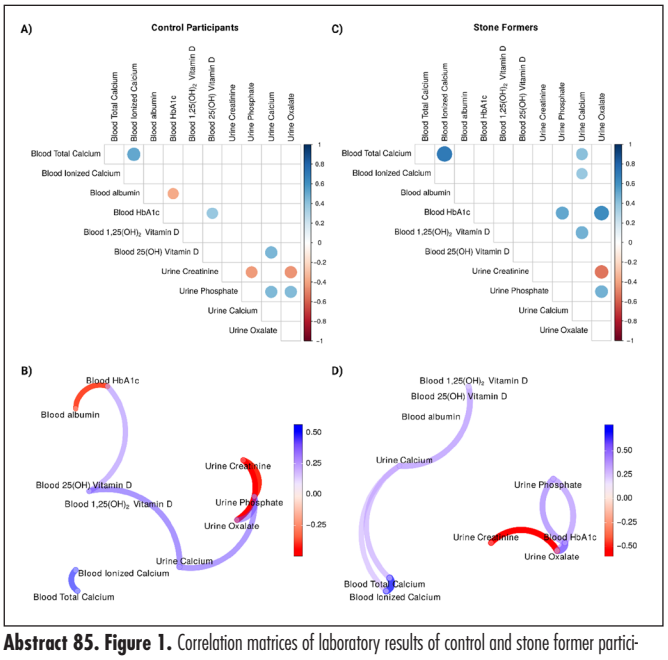
Introduction: Calcium-based kidney stones account for nearly 80% of renal calculi, yet the underlying pathophysiology of these calculi remains poorly understood. This cross-sectional, single-center study investigated the relationship between calcium homeostasis and calcium urolithiasis in an adult population. By elucidating the complex interplay between dysregulated calcium handling and stone formation, this research aimed to improve our understanding of this prevalent yet perplexing condition.

Methods: This study recruited 30 participants with no history of kidney stones and 31 participants who currently or previously (within the last 12 months) had at least one calcium-containing kidney stone. During a single study visit, comprehensive data were collected from all participants, including serum, plasma, spot urine samples, and detailed medical histories.

Results: Preliminary findings from this study revealed that individuals with a history of calcium-based stones exhibit distinct abnormalities in calcium handling compared to healthy controls. Stone-formers had elevated levels of calcium in both their blood and urine, suggesting typical calcium metabolism was disrupted. In fact, correlation network analysis (Figure 1) unveiled a unique calcium handling network that was specific to the stone-forming participants that might explain these differences. Stone-formers also exhibited increased titers of 1,25(OH)2 vitamin D (the active form of the vitamin; calcitriol), despite similar levels of 25(OH) vitamin D (the storage form), between the two groups.

Conclusions: T study provided the initial evidence to substantiate the impact of impaired calcium regulation, influenced by the active form of vitamin D (calcitriol), in the pathogenesis of kidney stone disease. Further research is needed to gain insight into the specific changes in the calcium handling pathways associated with stone disease and the precise role of calcitriol in this process.

Funding: 1. Northeastern Section of the AUA; 2. Lawson Health Research Institute - Internal Research Fund



Abstract 85. Figure 1. Correlation matrices of laboratory results of control and stone former participants.

Abstract 86

Treatment modalities of small-sized urolithiases and their impact on quality of life

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Introduction: Quality of life (QOL) is often reduced in a urolithiasis event. Stones vary widely in size and multiple therapeutic options exist, including active surveillance, medical expulsive therapy (MET), shockwave lithotripsy (SWL), and ureteroscopy (URS). This study aimed to perform a systematic review to describe reported QOL in different treatment modalities for urolithiases with a diameter smaller or equal to 10 mm.

Methods: Electronic databases (Medline, Embase, Cochrane Central Register of Controlled Trials, and Web of Science) were searched with no language or date restrictions to identify case reports, case series, case-control, cohort, and randomized control studies, which were included if they reported: adult patients (≥18 years old), renal or ureteral stone(s) on imagery, validated reporting of QOL, and stone diameter equal to or smaller than 10 mm undergoing active surveillance or management.

Results: Of 672 citations, nine articles were eligible (Table 1). Five studies reported QOL according to the medical management of stones, all in the ureter. Of these studies, three found that patients treated with MET had better QOL than those treated with conservative management only, and two studies found no difference in QOL between the groups. Four studies reported QOL according to the surgical management of stones, with three being ureteral and one being renal. Of the ureteral stone studies, two found that patients treated with URS had better QOL, while one study found no difference between the groups. In the renal stone study, patients treated with SWL had better QOL.

Conclusions: Literature shows that patients with urinary stones 10 mm or smaller have better QOL when treated with MET over conservative pain management only, when treated with SWL over URS for renal stones, and when treated with URS over SWL for ureteral stones. In addition to stone location, several other factors, such as stone size and postoperative stenting, should be considered. There is an important need for more studies on this topic.

Funding: N/A

Abstract 86. Table 1. Summary of included articles on medical, surgical, and procedural management

Author, year	Stone location	Postoperative stenting	QOL tool and measure timing	Comparators	Age (SD)	Sex (male)	Secondary treatment rate (%)	Stone passage rate (%)
Eryildirim et al, 2015		No	EuroQOL, 4 weeks	Conservative management	37.23 (1.56)	NA	16.7%	36.7%
				MET	37.07 (2.26)	NA	11.7%	43.3%
Eryildirim et al, 2016		NA	EuroQOL, 4 weeks	Conservative	39.81 (14.21)	NA	NA	NA
				MET	39.04 (12.00)	NA	NA	NA
Ju et al, 2020	Ureter	Yes	Quality of Life scale, 1 week	Conservative management	44.2 (12.2)	63.6%	NA	65.5%
				Terazosin	42.8 (12.2)	69.1%	NA	81.8%
				Terazosin + nifedipine	43.6 (12.9)	65.5%	NA	94.5%
Lee et al, 2014		No	EuroQOL, 4 weeks	Conservative management	47.9 (11.4)	61.1%	20.4%	46.3%
				MET	43.6 (12.4)	64.8%	7.4%	74.1%
Pickard et al, 2015		No	EuroQOL and SF-36, 4 and 12 weeks	Conservative management	42.8 (12.3)	77.9%	NA	79.9%
				Tamsulosin	43.1 (11.5)	82.2%	NA	81.2%
				Nifedipine	42.3 (11.0)	82.8%	NA	80.2%
Ceylan et al, 2018	Ureter	No	SF-36, 4 weeks	SWL	41.3 (12.6)	45.3%	NA	NA
				URS	40.4 (11.0)	46.6%	NA	NA
Pearle et al, 2005	Renal	SWL 3.1%	SF-36, 4 weeks	SWL	52.5 (12.3)	59.4%	15.6%	NA
		URS 88.6%		URS	49.3 (14.2)	48.6%	2,9%	NA
Sarica et al, 2016	Ureter	No	EuroQOL, 4 weeks	SWL	38.73 (2.48)	NA	26.5%	70.6%
				URS	42.27 (2.41)	NA	16.1%	83.9%
Sonmez et al, 2021	Ureter	SWL No	SF-36, 2 weeks	SWL	33.0 (7.8)	34.5%	NA	NA
		URS No		URS	29.2 (7.6)	41.0%	NA	NA
		URS + 4.8 French Yes		URS + 4.8 French	30.3 (7.8)	32.6%	NA	NA
		URS + 6 French Yes		URS + 6 French	32.3 (8.9)	26.2%	NA	NA

MET: medical expulsive therapy; QOL: quality of life; SD: standard deviation; SWL: shockwave lithotripsy; URS: ureteroscopy.

Abstract 87

The impact of kidney stone composition on a patient's health-related quality of life

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Introduction: Kidney stone events lead to a significant impairment of a patient's physical health. Stone composition analysis often helps guide a patient's therapeutic and preventative treatment. However, it is not yet known whether kidney stone composition has an impact on a patient's health-related quality of life (HRQOL). We aim to assess the effect of stone type on patient's HRQOL.

Methods: We studied 2860 stone patients from 16 tertiary care centers who completed the Wisconsin Stone Quality of Life Questionnaire (WISQOL) from June 2014 to March 2020. A higher score indicates a better HRQOL. Clinical variables and stone composition were identified at enrollment. Kidney stone composition was grouped into four different groups: pure calcium oxalate (CaOx), pure calcium phosphate (CaP), pure uric acid (UA), and mixed CaOx/CaP stones. The WISQOL score was assessed using the Wilcoxon rank test, followed by a multivariable linear regression model considering all variables of interest.

Results: Of the 2860 kidney stone formers who completed the WISQOL questionnaire, 815 underwent stone composition analysis. The overall cohort was primarily composed of Caucasians (90%) with a predominance of patients being obese or overweight (77%) with bilateral (52%) and recurrent (76%) kidney stone disease. Of the 815 patients, 554 patients (68%) had pure CaOx stones, 129 patients (16%) had pure CaP stones, 72 patients (8.8%) had pure UA stones and 60 (7.4%) patients had mixed CaOx/CaP stones. The WISQOL scores did not significantly differ across all kidney stone subgroups and were found to have no impact on the HRQOL in multivariable analysis ($p>0.05$).

Conclusions: Our study shows that stone composition has no impact on a patient's HRQOL. However, stone composition analysis may still provide valuable insights to guide preventative therapy.

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Local anesthesia in flexible ureteroscopy: A retrospective analysis of patient outcomes and predictors of pain

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Introduction: Ureteroscopy (URS), a common technique in the minimally invasive management of urolithiasis and urothelial carcinoma, traditionally depends on general anesthesia to ensure patient comfort and optimize surgical outcomes. However, the shift towards flexible URS, empowered by advancements in endourological technologies, challenges this norm, proposing local anesthesia (LA) as a viable alternative to reduce perioperative risks and enhance recovery. This study evaluates patient-reported outcomes of LA in flexible URS, aiming to redefine anesthesia protocols for this urological approach to treatment.

Methods: We conducted a retrospective cohort study at McGill University Healthcare Centre (MUHC), analyzing flexible URS procedures performed under LA by a single surgeon from May 2020 to March 2023. Patient demographics, procedural details, and post-procedural pain scores using a visual-analogue scale were collected. A multivariate OLS regression, processed through RStudio, was utilized to evaluate predictors of pain, including demographic attributes, procedural indications, and operative techniques.

Results: We included a total of 61 LA URS procedures in 38 patients, resulting in an average pain score of 2.05, indicating overall low pain experiences. Within the sample, indications for URS included upper tract urothelial cancer (47.5%), stricture (32.8%), and urolithiasis (19.7%). The procedure was highly tolerable, with only one patient dropping out due to discomfort. Our multivariate model accounted for 31% of the variance in pain outcomes ($R^2=0.314$, $F(9, 51)=2.599$, $p=0.015$). The use of guidewire increased pain scores by 1.87 units ($\beta=1.869$, $p=0.004$) compared to free-hand URS. Conversely, male patients experienced reduced pain scores by 1.38 units compared to their female counterparts ($\beta=-1.380$, $p=0.029$).

Conclusions: These findings suggest that LA could be a viable alternative to general anesthesia for certain patient populations undergoing URS, offering valuable insights into pain outcomes within patients receiving URS care for urothelial cancer, stricture, and urolithiasis. The identification of significant pain predictors, such as the utilization of guidewires and differences in pain experiences between genders, suggest that both patient and procedural factors affect patient comfort during LA URS. Future prospective studies and randomized controlled trials are essential to validate these preliminary observations and to fully elucidate the role of LA in enhancing patient outcomes in flexible URS. The adaptation of URS procedures, informed by evidence, could lead to significant improvements in patient care, optimizing both safety and comfort during minimally invasive urological surgeries.

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Abstract 89

Characteristic derangements and associated changes with the correction of low urine volume among kidney stone-formers on 24-hour urinalysis

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Introduction: The mainstay of empiric kidney stone prevention is a high-fluid, low-sodium, normal calcium diet with moderated protein intake. Kidney stone patients may undergo 24-hour urine collection to guide stone prevention efforts and be found to be profoundly oliguric with various other urinary derangements despite these initial dietary recommendations. We hypothesized that there are characteristic changes in urinary solute parameters in the sub-set of oliguric patients who correct urine volume after an initial 24-hour urinalysis.

Methods: All patients at one institution who underwent 24-hour urine collection from 2003 to 2020 were included. Patients with an initial urinary volume <1.5 liters who increased their urine output by at least 1 liter were selected. Metabolic abnormalities including cystinuria and renal tubular acidosis, and patients who were taking medications for stone prevention were excluded. Select 24-hour urine parameters were categorized as low, normal, or high based on established ranges. Proportions were compared by McNemer-Bowker test with a Bonferroni correction.

Results: A total of 1024 patients underwent 4089 collections; 69 patients (6.7%) (138 collections) were included (Table 1). Initial average volume was 0.99 (±0.28) liters and 2.70 (±0.74) liters on repeat. A total of 19 patients (18%) were hypercalciuric on first collection and 29 (42%) were hypercalciuric on repeat collection. With urinary volume increase, hypercalciuria became more prevalent (18% to 42%, $p=0.0063$) as did hypernatriuria (26% to 68%, $p<0.001$; normal vs. high) and hyperoxaluria (12% to 34%, $p=0.018$; normal vs. high). Hypocitraturia became less common (23% vs. 6%, $p<0.001$), hyperuricosuria more common (9% vs. 29%, $p<0.001$) and urinary pH was noted to increase (5.79 to 6.36, $p<.05$ for proportions).

Conclusions: Oliguric stone-formers tend to have aciduria and hypocitraturia but acceptable levels of calcium, oxalate, sodium and uric acid. Upon correction of urine volume without pharmacologic intervention, patients tended to demonstrate improvement in aciduria and hypocitraturia but developed worsened hypercalciuria, hypernatriuria, hyperoxaluria, and hyperuricosuria. These data suggest that initial efforts to increase urine alkali citrate may not be as important as counseling regarding dietary salt, oxalate, and sources of animal protein as the 24-hour urinary parameters associated with these solutes worsened upon correction of low urine volume.

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Abstract 89. Table 1. Baseline and clinical characteristics of patients meeting inclusion criteria

Characteristic	Litholink #1	Litholink #2	p
Average age in years	48.4	49.7	
Average BMI	31.4	31.1	
Gender			
Male	24 (35%)		
Female	45 (65%)		
24-hour volume average (std)	0.99 (0.28)	2.7 (0.74)	
24-hour calcium median (IQR)	163.9 (126.9)	171.1 (186.5)	0.0063
Normal (male <250 mg/d, female <200 mg/d)	50 (72%)	40 (58%)	
High (male >250 mg/d, female >200 mg/d)	19 (18%)	29 (42%)	
24-hour Oxalate median (IQR)	24.7 (12.9)	36.7 (15.6)	low to normal: 0.009
Low (<20 mg/d)	21 (30%)	5 (7%)	
Normal (20–40 mg/d)	40 (58%)	41 (59%)	normal to high: 0.018
High (>40 mg/d)	8 (12%)	23 (34%)	
24-hour Citrate median (IQR)	512.0 (368.5)	613.0 (386.1)	<0.001
Low (male <450 mg/d, female <550 mg/d)	16 (23%)	5 (7%)	
Normal (male >450 mg/d, female >550 mg/d)	53 (77%)	64 (93%)	
pH median (IQR)	5.79 (0.74)	6.36 (0.77)	low to normal: 0.0375
Low (<5.8)	35 (51%)	15 (22%)	
Normal (5.8–6.2)	12 (17%)	11 (16%)	low to high: <0.001
High (>6.2)	22 (32%)	43 (62%)	
24-hour uric acid median (IQR)	0.46 (0.23)	0.64 (0.36)	<0.001
Normal (male <0.8 g/d, female <0.75 g/d)	63 (91%)	49 (71%)	
High (male >0.8 g/d, female >0.75 g/d)	6 (9%)	20 (29%)	
24-hour sodium median (IQR)	118.1 (67.4)	177.4 (133.5)	normal to high: <0.001
Low (0–50 mmol/d)	4 (6%)	2 (3%)	
Normal (50–150 mmol/d)	47 (68%)	21 (30%)	
High (>150 mmol/d)	18 (26%)	46 (68%)	

Statistical significance determined with McNemer-Bowker Test and Bonferroni correction, if needed. "d" = day within table. BMI: body mass index; IQR: interquartile range.

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Thulium fiber laser compared to holmium laser with Moses technology for prostate enucleation: A prospective study

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Introduction: Benign prostatic hyperplasia (BPH) is a common condition in men where the prostate enlarges and can lead to lower urinary tract symptoms. A procedure called laser enucleation of the prostate is a modern treatment that reduces urinary obstruction by resecting a significant portion of the prostate. The study aims to compare the safety profile and clinical outcomes of Holmium laser enucleation of the prostate (HoLEP) and Thulium laser enucleation of the prostate (ThuLEP).

Methods: Sixty-one patients aged from 54 to 90 years with BPH underwent HoLEP (n=30) or ThuLEP (n=31) procedures in a prospective, non-randomized, multicenter study between September 2021 and December 2023. Two surgeons experienced with HoLEP and ThuLEP performed all procedures in two centers. Followup was assessed at three months after surgery. The primary end points were non-inferior International Prostate Symptom Score (IPSS) and quality of life (QOL) at three months. Secondary end points were rate of postoperative complications, peak flow (Qmax), post-void residual (PVR), International Index of Erectile Function (IIEF), International Consultation on Incontinence Questionnaire - Short Form (ICIQ-SF), and operation, catheterization, and hospitalization times.

Results: Mean operative time was 127 minutes and 100.17 minutes in the HoLEP group and the ThuLEP group respectively (p=0.70). Weight of specimen postoperatively was comparable (96.32 cc vs. 92.35 cc, p=0.75). At three months, there were no statistically significant differences between the HoLEP group and the ThuLEP group regarding IPSS (6.25 vs. 5.42, p=0.52), QOL (1.21 vs. 1.27, p=0.88), IIEF (10.05 vs. 13.23, p=0.27), and ICIQ-SF (5.65 vs. 5.65, p>0.9). In addition, uroflowmetry was comparable with no statistically significant differences regarding Qmax (18.13 mL/s vs. 14.52 mL/s, p=0.16) and PVR (26.80 mL vs. 30.60 mL, p=0.79). Among the HoLEP arm, 84% of the patients had a catheterization duration lower than 24 hours, whereas 80% of the patients in the ThuLEP arm had a catheterization duration between 24 and 48 hours. Mean hospitalization time was 17.52 hours in the HoLEP group and 12.08 hours in the ThuLEP group (p=0.15). Complications rate was 13% (n=4) and 3% (n=1) in the HoLEP group and ThuLEP group respectively. One patient required a transfusion in the HoLEP arm.

Conclusions: Both ThuLEP and HoLEP relieve lower urinary tract symptoms with comparable results in terms of functional outcome.

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