Poster Session 2: Endourology
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MP 2.1

Preliminary assessment of a consolidated care pathway to expedite definitive management of septic stones

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Introduction: Traditional management (TM) for septic stone events includes early goal-directed therapy (EGDT) with fluid resuscitation, broad-spectrum antibiotics, and source control. Once drainage is achieved, patients are typically discharged after microbial speciation and remaining afebrile for 24 hours. Once discharged with 10 days of antibiotics, they are seen in our stone clinic and booked for ureteroscopy with one of our endourologists. Given contemporary guidelines for pyelonephritis recommend five days of antibiotics, we created a care pathway to offer patients ureteroscopy while in hospital. This study sought to characterize the timelines and infectious complications associated with our consolidated care pathway (CCP) for septic stones.

Methods: A retrospective review (IRB Pro137196) of patients was completed six weeks after instituting the CCP, with a 60-day followup period at a single tertiary care academic center in Edmonton Alberta, Canada. Consensus guidelines, created by our endourologists and infectious disease specialists, included: response to source control and EGDT within 72 hours, afebrile >48 hours, normalized labs, and no complicating features warranting longer courses of antibiotics.

Results: Twenty-three septic stone events were reviewed (n=16 TM, n=7 CP), identifying shorter admissions (4 vs. 6.5 days, p<0.05), with longer time to definitive management (38.5 vs. 5 days, p<0.05) for traditionally managed patients. The majority of stones were <7 mm (68% TM, 57% CP), and only one infectious complication was identified in a traditionally managed patient. No patient undergoing CCP had a documented complication related to their stone management within 60 days.

Conclusions: A preliminary assessment of our consolidated septic stone clinical pathway suggests expedited ureteroscopy can be safe in these patients. This information seeks to inform the construction of a prospective quality-improvement initiative to assess relevant patient outcomes and healthcare utilization metrics associated with this delivery model.

MP 2.2 - WITHDRAWN

MP 2.3

Decreasing narcotic use in shockwave lithotripsy

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Introduction: The opioid crisis is a significant concern in Canada. It has been suggested that narcotic usage in kidney stone treatment may be a risk factor for subsequent opioid misuse. Shockwave lithotripsy (SWL) is a non-invasive, outpatient procedure to treat urolithiasis. Many Canadian lithotripsy centers (including ours) administer fentanyl and midazolam during the procedure for pain management and sedation. Intravenous (IV) acetaminophen was approved by Health Canada in 2019 and is accessible and inexpensive ($5.84/1 g). We endeavored to determine if the addition of IV acetaminophen decreases narcotic use in SWL.

Methods: We conducted a retrospective review of 110 consecutive SWL procedures. Group 1 (55 patients) received IV fentanyl and midazolam. In addition to fentanyl and midazolam, group 2 (55 patients) received 1 g of IV acetaminophen in 100 cc NaCl 15 minutes prior to SWL. The total amount of fentanyl and midazolam administered was based on patient comfort. Patients with known liver disease, alcohol use disorder, or elevated liver function tests were excluded. We recorded patient age, gender, stone location/laterality, stone size, presence or absence of a stent, maximum achieved power level, pain visual analog scale (VAS), use of supplemental medications, and amount of fentanyl and midazolam (Table 1). The primary outcomes were total narcotic dosage of medication and VAS pain scores.

Results: Patient demographics and stone characteristics were similar between groups. Fentanyl use decreased from an average of 122 mcg to 73.5 mcg with the addition of IV acetaminophen (p<0.001). Pain VAS was 1.88 in group 1 and 1.08 in group 2; however, the difference was not statistically significant. Maximum power was achieved in 85% of patients in group 1 and 100% of patients in group 2. Supplemental medications (ondansetron and ketorolac) were required in two and four patients, respectively, in group 1, and four and one patients, respectively, in group 2.

Conclusions: The cost-effective addition of IV acetaminophen to fentanyl and midazolam in SWL significantly reduces narcotic use while not increasing patient discomfort. Based on these preliminary results, we are optimizing the timing of IV acetaminophen administration and initiating a double-blind, placebo-controlled study to further validate these findings and decrease narcotic dose further.

MP 2.3. Table 1. Patient demographics and results

	Group 1 (fentanyl and midazolam)	Group 2 (fentanyl, midazolam, and acetaminophen)
Number of patients	55	55
Age	27–85 (57.2)	27–79 (54.4)
Gender	Male: 27 Female: 28	Male: 41 Female: 14
Stone location	Kidney: 36 Ureter: 19 Right: 24 (44%) Left: 31 (56%)	Kidney: 36 Ureter: 19 Right: 30 (55%) Left: 25 (45%)
Stone size	3–20 mm (9.2)	4–20 mm (9.3)
Stent	3/55	3/55
Number achieving maximum power	47/55 (85%)	55/55 (100%)
Visual analog scale (0-10)	1.88 (0–7)	1.08 (0–7) (p>0.05)
Supplemental medication	Ondansetron: 2 Ketorolac: 4	Ondansetron: 4 Ketorolac: 1
Midazolam dosage	1–2 mg (1.85)	0–2 mg (1.83)
Fentanyl dosage	100–300 mcg (122)	25–125 mcg (73.5) (p<0.001)

MP 2.4

Medical management vs. active surveillance for hypercalciuria: Is there a difference in outcomes?

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Introduction: Unfortunately, like many chronic disease states, initiating and complying with medical management for hypercalciuria can be challenging. Therefore, this study sought to determine differences in clinical outcomes patients face when started on thiazides vs. those who choose active surveillance as a management strategy.

Methods: A retrospective review of a prospective dataset was completed with patients found to have hypercalciuria (>7.5 mmol/L on 24-hour urine collection). Patients with >12 months of followup were reviewed from 2019–2024. Comparisons were made between those prescribed thiazide diuretics (TZD) and those on active surveillance (AS) with routine 6–12-month imaging followup. SPSS was used for all statistical analyses.

Results: A total of 118 hypercalciuric patients were identified, with 35 patients who agreed to start thiazides (TZD) and 83 who declined medical management, but continued with routine active surveillance imaging and followup (AS). TZD patients were 49.8 years old (58% female) compared to AS patients, who were 53 years old (50% women). Of the 35 TZD patients, 37% of patients discontinued treatment within 4.5 month (five of these patients never started) and 13% of AS patients started therapy at 30 months. When comparing serial 24-hour urines, TZD patients on therapy and AS patients showed improved volumes and calcium levels, while all groups displayed worsening sodium levels (Table1). Though TZD had more stone events (stone passage ± colic ± surgery) (72% vs. 68%, p=0.032), there were more events per patient on AS, and no significant difference in new stone growth over the respective followup periods (Table 1).

Conclusions: This retrospective review of 118 patients shows that simply prescribing TZD does not guarantee a therapeutic advantage. Rather, optimizing compliance, concomitant metabolic abnormalities, and routine followup likely all play a role in the many composite outcomes faced by recurrent stone formers.

MP 2.4. Table 1. Demographic and outcome data

	TZD (n=35)		AS (n=83)
Demographics			
Age, years	50		53y
Female, %	57.8%		50.1%
Months followed	56		53
Therapeutic switch	37% (13) stopped treatment at 4.5 months (mean)		13.3% (11) started treatment at 30 months (mean)
Change in 24hr urine: (final–initial)	TZD (on therapy)	TZD (on + off therapy)	AS
Volume	0.289	-0.136	0.183
Calcium	-2.12	-1.56	-0.247
Sodium	2.83	0.800	8.9
Citrate	0.76	0.597	-0.012
Stone composition			
Calcium oxalate	71% (17)		70.5% (43)
Calcium phosphate	21% (5)		23% (14)
Mixed	2% (2)		7% (4)
Event rates	72% (n=25)		68% (n=57)*
No. event per patient	1.25		1.67
No. of patients with new stone growth	71% (25)		69% (57)

*Signifies p<0.05.

MP 2.5

Holmium MOSES laser vs. thulium fiber laser for ureteroscopic management of 1–2 cm kidney stones: A prospective, randomized controlled trial

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Introduction: We aimed to compare the laser efficiency and clinical outcomes of two widely used systems — the holmium MOSES laser and the thulium fiber laser (TFL) — in the ureteroscopic management of 1–2 cm renal calculi.

Methods: In this ongoing, randomized controlled trial (RCT), we included 71 patients who underwent flexible ureteroscopy (f-URS) for a solitary 1–2 cm kidney stone between August 2022 and July 2024 at our institution. Patients were randomized to undergo treatment with either the holmium MOSES laser or TFL. All patients had postoperative computed tomography (CT) scans at one month and three months. Patient demographics and stone parameters were recorded, including stone site, size, volume, and density. Intraoperative data were collected and analyzed, including total operative time, ureteroscopy time, lasing time, total energy delivered, and stone composition. We recorded the presence of residual stones and the percentage of stone volume reduction. Ablation efficiency was calculated by dividing the energy used (J) by the stone volume (mm^3). The ablation speed was calculated by dividing the stone volume (mm^3) by the lasing time (sec). Patients with a stone size of 0 cm were deemed stone-free.

Results: The MOSES and TFL groups comprised 35 and 36 patients, respectively, with no significant differences in baseline patient demographics or stone characteristics between the cohorts. The two modalities had comparable total energy, laser time, efficacy, and ablation speeds. Ablation efficiency was 25.7 J/mm^3 in the MOSES group and 30 J/mm^3 in the TFL group (p=0.98). Additionally, ablation speed was 1.1 mm^3/sec in the MOSES group and 0.89 mm^3/sec in the TFL group (p=0.26) (Table 1). No differences were observed in stone-free or retreatment rates.

Conclusions: The MOSES and TFL laser systems demonstrate comparable efficacy for lithotripsy of renal calculi during f-URS, with neither technology showing a distinct clinical advantage.

MP 2.6

Assessing potential effects on renal function with thulium fiber laser lithotripsy

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Introduction: Thulium fiber laser (TFL) has advanced ureteroscopic (URS) management of kidney stones. Following its initial clinical adoption, there have been anecdotal concerns regarding the impact of TFL lithotripsy on postoperative renal function. A retrospective analysis was performed to evaluate renal outcomes associated with use of higher total energy and maximum power settings during TFL lithotripsy.

Methods: A retrospective review was conducted on patients that underwent TFL URS between November 1, 2022, and August 3, 2024, at three academic hospitals in Edmonton. We analyzed preoperative characteristics, intraoperative surgical and laser data, and postoperative renal function. The association between change in creatinine with intraoperative laser data was the primary outcome. Change in serum creatinine (sCr) levels were measured with two postoperative sCr measurements, first postoperative sCr within 90 days and last postoperative measurement at any time after 90 days. T-test assessed the impact of various factors on postoperative renal function.

Results: Approximately 1000 patients met inclusion criteria, and after excluding for preoperative AKI (sCr >100 µmol/L), 140 patients were included. Mean preoperative sCr 75.19±15.88 µmol/L increased to 83.19±23.91 µmol/L (p=0.0011) within 90 days postoperative and was 80.79±19.76 µmol/L (p=0.0096) on their last postoperative sCr measurement after 90 days. With groups subdivided into

MP 2.5. Table 1. Preoperative, operative, and followup data (up to 3 months)

Parameter		MOSES™ 35 patients	TFL 36 patients	p
Patient demographics and preoperative data				
Age at presentation years median (range)		61.33 (27–81)	60.04 (39–80)	0.59
Gender	Male n (%)	21 (60)	18 (50)	0.28
	Female n (%)	14 (40)	18 (50)	
BMI kg/m^2 median (range)		27.4 (24.6–33.7)	26.9 (22.9–32.6)	0.55
Comorbidities	None n (%)	15 (42.9)	17 (47.2)	0.56
	HTN n (%)	8 (22.9)	7 (19.4)	
	DM n (%)	5 (14.3)	3 (8.3)	
	HTN + DM n (%)	3 (8.6)	4 (11.1)	
	HTN + CAD n (%)	4 (11.4)	5 (13.9)	
Stone site	Ureteropelvic junction n (%)	9 (25.7)	10 (27.8)	0.56
	Upper calyx n (%)	6 (17.1)	3 (8.3)	
	Middle calyx n (%)	3 (8.6)	5 (13.9)	
	Lower calyx n (%)	17 (48.6)	18 (50)	
Stone size cm median (range)		1.31 (1–2)	1.35 (1–1.9)	0.44
Stone volume mm^3 median (range)		652.3 (210–2140)	767.6 (218–2838)	0.55
Stone density HU median (range)		785.7 (435–1267)	892.2 (340–1245)	0.14
Prior stent insertion n (%)		4 (11.4)	4 (11.1)	0.7
ASA score median (range)		2.6 (1–4)	2.46 (1–4)	0.43
Operative data				
Total operative time min median (range)		50 (35–80)	56.1 (32–114)	0.38
Ureteroscopy time min median (range)		32.5 (15–58)	39.8 (13–98)	0.13
Lasing time sec median (range)		711.5 (150–2160)	1027 (188–2880)	0.12
Energy kJ median (range)		16.2 (3.75–74.03)	17.8 (3.6–46.8)	0.58
Ablation efficiency J/mm^3 median (range)		25.7 (7.8–40.1)	30 (8.3–115.4)	0.98
Ablation speed mm^3/sec median (range)		1.1 (0.39–3.35)	0.89 (0.16–2.29)	0.26
Postoperative pain score median (range)		1.3 (0–5)	0.96 (0–5)	0.61
Analgesia in recovery n (%)		5 (14.3)	2 (5.6)	0.07
Hospital stay hours median (range)		3.56 (3–5)	3.83 (3–6)	0.28

*American Society of Anaesthesiologists, ASA; Calcium Oxalate Dihydrate, COD; Calcium Oxalate Monohydrate, COM; Calcium Phosphate, CP; Coronary Artery Disease, CAD; Diabetes Mellitus, DM; Hounsfield Unit, HU; Hypertension, HTN; Uric Acid, UA

positive and negative sCr deltas for both within and after 90 days postoperatively, a significant result was seen (Figure 1), in total energy (p=0.0001 vs. 0.0003) and laser time (p=0.0001 vs. 0.0002). Significant results were seen for joules/minute (p=0.0157) and power (p=0.0090) parameters for <90 days postoperative, in contrast to frequency at >90 days postoperative (p=0.0210). Increased settings in all but joules/minute were associated with greater postoperative sCr, with total energy 14.12±1.81 kJ (SEM) vs. 6.302±5.74 kJ (SEM) and total laser time 13.30±1.4 minutes (SEM) vs. 7.13±0.7 minutes (SEM) at <90 days postoperative, for +ΔsCr vs. – ΔsCr, respectively.

Conclusions: The study found that in patients with an increased postoperative creatinine, higher energy use and total laser time were both significant risk factors for reduced renal function, with power and frequency settings also significant at differing time points.

MP 2.7

Supine vs. prone percutaneous nephrolithotomy: A Gold Coast Hospital experience

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Introduction: Percutaneous nephrolithotomy (PCNL) is the preferred approach for the treatment of large renal stones. The prone position was first developed largely intuitively, however, recently supine positioning has become more popular. The current literature has reported comparable stone-free rates but some evidence indicates the supine position may be associated with quicker operative times and less significant bleeding. In other perioperative outcomes, there has not been clear advantages of either positioning. Further comparative studies in this field are required to help elucidate whether one position is superior. Our study aimed to identify differences in perioperative and postoperative outcomes and stone-free rates between the two approaches.

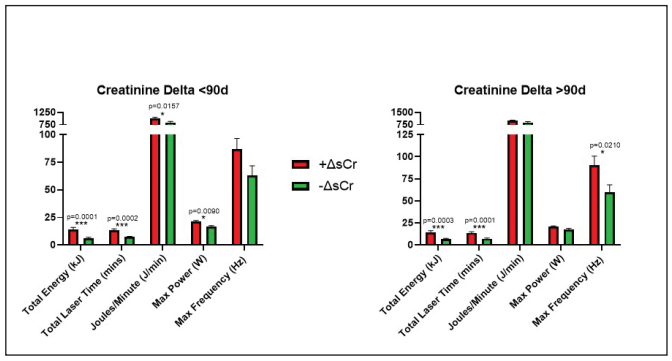
Methods: We retrospectively analyzed all prone and supine PCNL cases at a single hospital from 2014–2021. Patient demographics and perioperative outcomes, including operative time, blood loss, complications, stone-free rates, and length of hospital stay were compared. Statistical analysis was performed using GraphPad Prism 7 software.

Results: A total of 83 PCNL cases were performed between 2014 and 2021 (supine=27, prone=56). Patient demographics were largely similar except we did note the prone cohort to have a significantly high average weight (81 vs. 91 kg, p<0.05). Mean stone diameter between supine and prone groups was 25 mm and 22 mm, respectively (p=0.29, ns). There were no significant differences in operative time, bleed rates, PRBC requirements, and abandoned PCNL. Postoperatively, we saw supine PCNL was associated with significant less Hb drop compared to prone PCNL (11.2 vs. 17.8, p=0.029). Length of stay was significantly shorter in the supine PCNL group compared to prone PCNL (2.2 vs. 4.0 days, p=0.001). Supine PCNL also tended to have a higher rate of successful stone clearance where the requirement for second procedure was less (22% vs. 32%, p=0.44).

Conclusions: Our study highlights how supine PCNL is an operator-friendly, effective, and safe approach for PCNL. When comfortable with the supine approach, urologists tend to feel the positioning is more ergonomic, comfortable, and allows for concurrent retrograde access as well. Ultimately, we highlight that if urologists are comfortable with the supine position, it is a safe and effective technique that may improve anesthetic risks and blood loss, as well as reduce hospital stay. More large, prospective trials and systematic reviews of the literature are required to ultimately comment on whether one technique is superior.

MP 2.5. Table 1 (cont'd). Preoperative, operative, and followup data (up to 3 months)

Parameter		MOSES™ 35 patients	TFL 36 patients	p
One-month followup				
Stone-free rate (0 cm) n (%)		14 (40)	15 (41.7)	0.86
Residual stone size cm median (range)		0.41 (0–1.2)	0.37 (0–1.2)	0.77
Residual stone volume mm^3 median (range)		82 (0–566)	58.6 (0–467)	0.91
Stone composition	COM n (%)	14 (40)	16 (44.4)	0.44
	COD n (%)	14 (40)	15 (41.7)	
	CP n (%)	3 (8.6)	2 (5.6)	
	UA n (%)	4 (11.4)	3 (8.3)	
Three-month followup				
Stone-free rate (0 cm) n (%)		22 (62.9)	23 (63.9)	0.93
Residual stone size cm median (range)		0.22 (0–0.9)	0.19 (0–0.8)	0.83
Residual stone volume mm^3 median (range)		25.6 (0–179.9)	41.5 (0–467.22)	0.99
% volume reduction median (range)		94.4 (69.4–100)	93.1 (50.9–100)	0.64
Retreatment n (%)		1 (2.9)	1 (2.8)	0.83



MP 2.6. Figure 1. Serum creatinine delta comparison of TFL parameters. (A) Comparison for first creatinine measurement <90 days postoperative. (B) Comparison for last creatinine measurement >90 days postoperative.

MP 2.8

Emergent ureteric stent vs. percutaneous nephrostomy tube placement in patients with urosepsis: A real-world, population-based study in Ontario, Canada

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Introduction: We aimed to examine a population-based cohort of patients diagnosed with urosepsis secondary to urolithiasis, comparing mortality rates between those treated with emergent ureteric stents vs. percutaneous nephrostomy tubes (NT) during hospitalization and within 90 days post-discharge.

Methods: We conducted a retrospective cohort study of adult patients hospitalized in Ontario, Canada, between April 2010 and December 2022, with an admitting diagnosis of urosepsis secondary to obstructive urolithiasis. Patients with sepsis who had no concurrent urolithiasis or a history of dialysis, end-stage renal disease or transplant, cystectomy, or genitourinary cancers were excluded. We compared all-cause mortality during hospitalization and at 90 days post-discharge between those who underwent decompression via a percutaneous NT vs. a ureteric stent, using generalized linear and Cox regression models, respectively. Confounders were balanced using propensity weighting to ensure a fair and unbiased comparison and minimize treatment selection bias risk. Furthermore, our 90-day analysis accounted for definitive management received after the initial hospitalization.

Results: Among the 4573 patients included in the study, 620 underwent NT placement and 3953 received a ureteric stent. After adjusting for confounders, patients who received a NT had a 2.84-fold higher risk of all-cause in-hospital mortality (RR 2.84 [1.98, 3.92]) and 1.52-fold higher risk of 90-day post-discharge mortality (HR 1.52 [1.01, 2.30]) compared to those who received a ureteric stent (Table 1). Furthermore, patients who received definitive management had a 62% lower risk of all-cause mortality than those who did not (HR 0.38 [0.23, 0.63]).

Conclusions: While both interventions aim to relieve obstruction and facilitate the resolution of infection, they differ in terms of invasiveness and complication rates. NT, however, is linked to a higher risk of all-cause in-hospital mortality and an increased risk of 90-day post-discharge mortality. Understanding the differences in outcomes can inform clinical decision-making and optimize treatment strategies for patients with urosepsis. Randomized controlled trials are warranted.

MP 2.9

Optimizing irrigation protocols in endoscopic urologic surgeries: Evaluating efficiency and resource use with a staggered bag system

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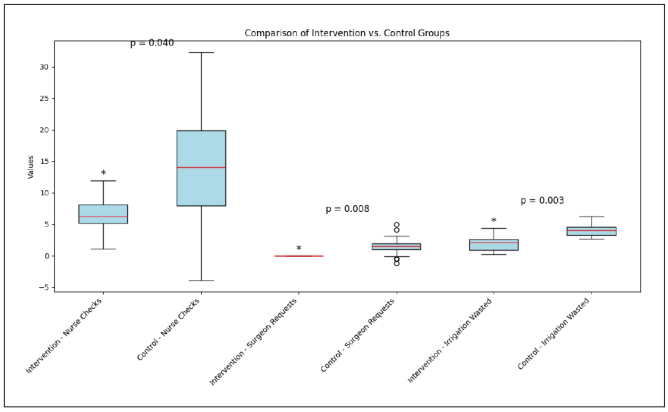
Introduction: Intraoperative irrigation is crucial in endoscopic surgery for maintaining a clear surgical field. Standard gravity-fed setups rely on nurses to monitor and switch bags, increasing their workload. Interruptions during bag changes can obscure the surgical field and impact outcomes. Staggered irrigation systems, with bags positioned at different heights, aim to reduce these interruptions. This study evaluated the effects of such a system on surgical efficiency and OR workflow.

Methods: The intervention used four irrigation bags, with one placed six inches lower to maintain continuous flow. The control protocol used two sequential bags. Metrics assessed included operation duration, surgeon irrigation requests, nurse checks, irrigation volume, waste, and complications. Data were collected over three months from PCNL and TURP procedures at St. Michael's Hospital, Toronto.

MP 2.8. Table 1. Risk of all-cause mortality associated with percutaneous nephrostomy tube vs. ureteric stent procedures in patients with urosepsis

Population	Clinical endpoint	Observed rates	Effect estimate (95%CI)[1]
Full cohort	Death in hospital	10.0% vs. 2.4%	Nephrostomy tube vs ureteric stent (reference): 2.84 (1.98, 3.92)[2]
Cohort surviving hospitalization	90-day mortality	6.6% vs. 2.8%	Nephrostomy tube vs ureteric stent (reference): 1.52 (1.01, 2.30)[3]
Cohort surviving hospitalization	90-day mortality	49.8% vs. 50.2%	Definitive management vs no definitive management (reference): 0.38 (0.23, 0.63)[3]

[1]Balanced on age, sex, northern residency, remoteness index, distance from patient residence to hospital (in km), sepsis severity, comorbidity, frailty, days elapsed from ED arrival to decompression, weekend admission, and ICU admission. [2]Risk ratio. [3]Hazard ratio.



MP 2.9. Figure 1. Comparison of intervention and control groups across key outcome variables in PCNL procedures.

Results: A total of 43 procedures were analyzed: 17 TURPs (eight control, nine intervention) and 26 PCNLs (16 control, 10 intervention). In PCNLs, the intervention group showed reduced surgeon requests (0 vs. 1.5), fewer nurse checks/hour (7 vs. 14), and less waste (2.1 vs. 3.6 L) (Figure 1). For TURPs, the intervention group showed fewer surgeon requests (0 vs. 0.6), similar nurse check rates (18 vs. 20/hour), and comparable irrigation usage (9.6 vs. 10.2 L). Notably, TURPs in the intervention group had significantly less irrigation waste (1.8 vs. 5.0 L). No complications were attributed to irrigation quality.

Conclusions: The staggered irrigation system demonstrated significant improvements in irrigation management for PCNL procedures, including statistically significant reductions in surgeon requests, nurse workload, and irrigation waste. TURP procedures also showed promising trends, with fewer surgeon requests and a statistically significant reduction in irrigation waste. These findings highlight the potential of staggered irrigation to enhance surgical efficiency and resource utilization. Continued data collection may further reinforce these results.

MP 2.10

Comparison between bedside and traditional operative placement of ureteric stent for acute obstructive pyelonephritis: A retrospective cohort study

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Introduction: Bedside ureteric stent placement has previously been shown to be safe and feasible, especially in cases of acute ureteric obstruction. Limited evidence exists comparing its effectiveness to traditional stent placement in the operating room with fluoroscopy. This study aimed to compare the clinical outcomes of bedside stent placement without fluoroscopy to the current standard of care.

Methods: A retrospective cohort study was performed for all patients diagnosed with acute obstructive pyelonephritis between July 2023 and July 2024. Patients were excluded if their treatment did not require hospital admission or was in the absence of obstructing ureteric calculi and systemic inflammatory response syndrome criteria. Baseline demographics, including degree of sepsis and stone characteristics, were recorded. Clinical outcomes, including time to upper tract drainage, successful stent placement, and length of hospital stay, were compared using the independent sample t-test method, with $p<0.05$ considered statistically significant.

Results: Fifty-five patients met the inclusion criteria, of which 17 underwent bedside ureteric stenting (BS) and 38 received traditional stent placement in the operating room (OR). No statistically significant differences were found between the groups regarding baseline demographics, sepsis criteria measures, stone characteristics, or degree of hydronephrosis (Table 1). Patients in the BS group had reduced time to stenting (286.8±227.2 vs. 508.8 ±372.3 minutes,

MP 2.10. Table 1. Baseline demographics

	Bedside (n=17)	Operating room (n=38)	p
Baseline demographics			
Age	64.1±16.4	61.8±16.1	0.641
Female	65% (n=11)	63% (n=24)	0.909
CCI	3.5±2.5	2.7±2.1	0.214
qSOFA	1.1±1.1	0.6±0.8	0.087
SIRS criteria	2.0±1.0	2.1±0.9	0.639
Tmax	37.8±0.9	37.5±1.3	0.387
WBC	16.1±8.9	17.7±6.3	0.472
Stone characteristics			
Laterality			
Right	53% (n=9)	29% (n=11)	
Left	47% (n=8)	71% (n=27)	0.873
Stone size (mm)	7.4±3.3	7.61±3.8	
Location			
Distal	47% (n=8)	32% (n=12)	0.297
Mid	6% (n=1)	21% (n=8)	
Proximal	47% (n=8)	47% (n=18)	
Degree of hydronephrosis			
Mild	29% (n=5)	37% (n=14)	0.831
Moderate	53% (n=9)	50% (n=19)	
Severe	18% (n=3)	13% (n=5)	

MP 2.10. Table 2. Outcomes between groups

	Bedside (n=17)	Operating room (n=38)	p
Success rate	100% (n=17)	95% (n=36)	0.344
Time to stent (min)	286.8±227.2	508.8±372.3	**0.021**
Urine aspirate obtained	100% (n=17)	76% (n=29)	**0.028**
Length of stay	13.1±19.5	8.8±9.7	0.296
Complications	0% (n=0)	3% (n=1)	0.500

Bolded values indicate statistical significance.

p=0.021) and achieved higher rates of urine aspirate retrieval (100% vs. 76%, p=0.028) compared to the OR group. The two groups had no statistically significant differences in stent success rates (100% vs. 95%, p=0.344) or complication rates (0% vs. 3%, p=0.500) (Table 2).

Conclusions: Bedside stent placement in patients with obstructive pyelonephritis offers faster source control and more reliable urine aspirate retrieval while maintaining comparable success and complication rates to stenting in the operating theatre.

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MP 2.11

SGLT2 inhibitors and urinary stone prevention: Understanding possible mechanisms of action

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Introduction: Type 2 diabetes mellitus has been linked to an increase in uric acid stones due to hyperuricemia, low urine pH with impaired ammoniagenesis, and insulin resistance. In the past, stone prevention among type 2 diabetics had focused on optimizing blood sugar control with oral hypoglycemic agents and/or insulin. The addition of sodium-glucose cotransporter-2 (SGLT2) inhibitors to the armamentarium has been theorized to also exert direct stone prevention capabilities. Unproven mechanisms of action include the promotion of diuresis, urinary alkalinization, and anti-inflammatory effects. This study aimed to investigate the metabolic effects of SGLT2 inhibitors among diabetic stone formers compared to those on metformin to determine if any unique effects may facilitate stone prevention.

Methods: We performed a retrospective review of a prospectively collected database of patients seen in our tertiary care metabolic stone clinic between January 2019 and December 2023. Patients with urolithiasis and type 2 diabetes mellitus on SGLT2 inhibitors or metformin were identified. Data collected included: age, gender, body mass index (BMI), anti-diabetic medication, including dosage and duration of therapy, HbA1c while on treatment, stone analysis, and results of two 24-hour urine collections and serum values. Mean± standard deviation laboratory parameters for each group were then compared and analyzed using IBM SPSS statistics, version 29.0.

Results: We identified 64 patients: 32 receiving an SGLT2 inhibitor and 32 patients on metformin. No demographic differences were noted between groups. Stone composition was predominantly calcium oxalate, with uric acid stones in 26.4% of patients on SGLT2 inhibitors and 18.4% among those on metformin. Comparison of 24-hour urine results showed no statistically significant differences in mean pH, sodium, creatinine, phosphate, uric acid, calcium, oxalate, or citrate. The mean 24-hour urinary volume for patients on SGLT2 inhibitors was higher (2500 ml/day) compared to those on metformin (1916 ml/day) ($p<0.05$). No statistically significant differences in serum parameters were observed.

Conclusions: We were unable to confirm that increases in urine pH or fluid diuresis are mechanisms of action of SLGT2 inhibitors in stone prevention. While a higher mean 24-hour urinary volume in the SGLT2 inhibitor cohort was noted, other factors, such as variations in daily fluid consumption and the use of other diuresis-inducing agents, must also be accounted for. The potential anti-inflammatory effect of SGLT2 was not evaluated in this work and deserves further investigation.

MP 2.12

Comparative effectiveness of vacuum-assisted and conventional mini-percutaneous nephrolithotomy in adult kidney stone treatment: A systematic review and meta-analysis of randomized controlled trials

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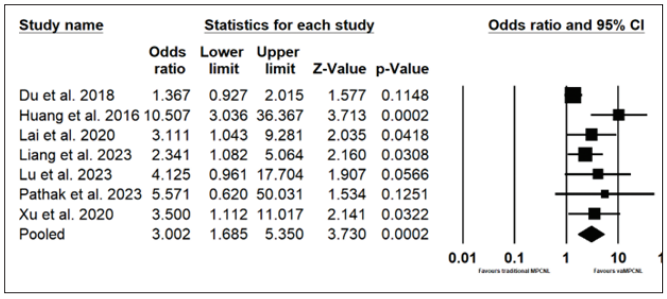
Introduction: Vacuum-assisted mini-percutaneous nephrolithotomy (vaMPCNL) has gained attention as a modified approach that may improve stone clearance and reduce complications compared with conventional mini-percutaneous nephrolithotomy (MPCNL). We performed a systematic review and meta-analysis of randomized controlled trials to elucidate the comparative safety and efficacy of vaMPCNL and traditional MPCNL for adult patients with renal calculi.

Methods: A comprehensive literature search was conducted in Medline, Embase, CINAHL, Web of Science, and Scopus, guided by our PROSPERO-registered protocol (CRD42024530363). Out of 518 initially screened articles, seven RCTs met inclusion criteria and were analyzed using random-effects models. Outcomes included stone-free rates, operative time, complication profile, and other clinical endpoints.

Results: Compared to traditional MPCNL, vaMPCNL significantly increased the likelihood of achieving stone-free status by approximately threefold (k=7, OR 3.002, $p<0.001$) (Figure 1). Operative time was reduced by an average of 16.76 minutes in the vaMPCNL group (k=6, MD −16.758, 95% CI -21.938, -11.579, $p<0.001$, $I^2=76.5\%$). VaMPCNL patients were also over six times more likely to require only a single tract (k=2, OR 6.522, 95% CI 4.505, 9.441, $p<0.001$). Additionally, vaMPCNL was associated with lower rates of minor complications (OR 0.375, p=0.005) and postoperative fever (OR 0.430, $p<0.001$), while major complication rates (grade 3 and above), length of hospital stay, need for auxiliary procedures, hemoglobin reduction, and transfusion requirements were comparable between the two techniques.

Conclusions: These findings suggest that vacuum-assisted MPCNL offers superior stone-free outcomes, reduces operative time, and lowers minor complication rates and postoperative fever without increasing major complications. This procedure may therefore present a safer and more effective alternative to traditional MPCNL for adults undergoing surgical management of renal stones.



MP 2.12. Figure 1. Comparison of vaMPCNL and PCNL on stone-free rate outcomes.

MP 2.13

Real-time monitoring of intrarenal pressures while using the flexible and navigable suction ureteral access sheath

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Introduction: We aimed to report on in-vivo intrarenal pressure (IRP) during flexible ureteroscopy for treatment of kidney stones while using the novel flexible and navigable suction ureteral access sheath (FANS).

Methods: A retrospective, observational analysis was performed for 25 patients undergoing routine flexible ureteroscopy for the treatment of renal stones between February 2024 and June 2024 from two centers in Canada. The LithoVue EliteTM ureteroscope (Boston Scientific Corp., Marlborough, MA, U.S.) with pressure-sensing capability was used together with the Clearpetra Ureteral Access Sheath System (Well Lead Medical Co. Ltd., Guangzhou, China) for all cases. Irrigation was via a pressure bag set at 250 mmHg, where possible, and the access sheath was connected to wall suction at 200 mmHg. Median and maximum IRP, as well as the distribution of cumulative procedure times according to various IRP ranges, were analyzed.

Results: The median age of the patients was 56 years, with a median BMI of 26.7 kg/m2 (Table 1). The median (interquartile range [IQR]) IRP for all the cases was 22.0 (15.0–36.5) mmHg, with a median (IQR) procedure time of 35.9 (16.4–54.8) minutes. The IRP remained below 40 mmHg in 76.2% of the total time in all procedures and was below 60 mmHg 94.1% of the time (Figure 1). Significant variables associated with lower IRP were having a prior endourologic procedure, pre-stenting, larger ureteral access sheath size, and use of preoperative alpha blocker. Age, BMI, and total stone volume did not significantly affect IRP.

Conclusions: Low intrarenal pressures can be achieved with the use of FANS, even with higher irrigation pressures. Alpha-blocker use, larger sheath size, prior endourologic procedures, and pre-stenting are all associated with lower IRP.

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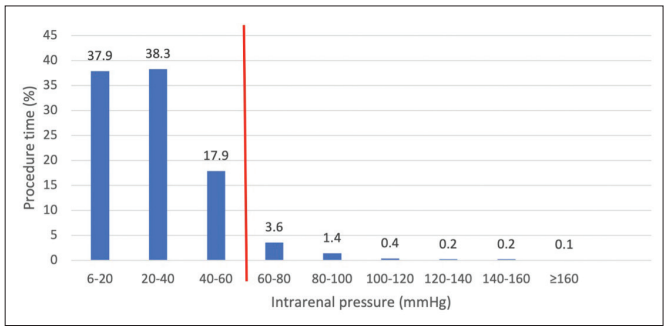

MP 2.13. Figure 1. Distribution of procedure time according to IRP ranges. IRP sustained <60 mmHg 94.1% of the time.

MP 2.13. Table 1. Characteristics of patients

Characteristics	Value
Total number of patients	25
Median age	56
Gender, male, n (%)	19 (76%)
Race, Caucasian, n (%)	18 (72%)
BMI, kg/m^2, median	26.7
Diabetes mellitus, n (%)	1 (4%)
Hypertension, n (%)	6 (24%)
Number of stones treated per case, median	3
Total stone volume, mm^3, median	374
Prior ESWL, n (%)	5 (20%)
Preoperative α-blocker use, n (%)	6 (24%)
Pre-stenting, n (%)	10 (40%)
Prior endourologic intervention, n (%)	14 (56%)
Tight ureter, n (%)	3 (12%)
UAS size, n (%)	
11/13 Fr	16 (64%)
12/14 Fr	9 (36%)
Location of UAS, n (%)	
Calyx	18 (72%)
Renal pelvis	7 (28%)
Basket use	1 (4%)
Postoperative complications, n (%)	
Sepsis	1 (4%)

MP 2.14

Determining concordance of preoperative urine cultures and stone cultures in neurogenic bladder patients undergoing percutaneous nephrolithotomy

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Introduction: Percutaneous nephrolithotomy (PCNL) is the standard of care for large renal stones and is associated with a significant risk for postoperative sepsis. Prevention of post-PCNL sepsis is dependent on appropriate treatment of preoperative bacteriuria and appropriate antibiotic prophylaxis, both of which rely on preoperative urine cultures; however, studies have demonstrated that preoperative urine cultures are not always concordant with stone cultures, the latter most closely representing the bacterial burden. Accuracy of urine and stone cultures are even more critical in the neurogenic bladder (NB) subpopulation, as they are high-risk stone formers who often have infected or infectious stones. In this study, we aimed to assess the concordance of preoperative urine cultures and stone cultures in NB patients as compared to non-neurogenic bladder (non-NB) patients undergoing PCNL.

Methods: We performed a retrospective chart review of all patients ≥18 years old undergoing PCNL at our institution from 2022–2024. Baseline characteris-

MP 2.14. Table 1. Baseline characteristics, concordance rates of preoperative urine cultures and stone cultures, and urosepsis rates in neurogenic and non-neurogenic bladder patients undergoing PCNL

	Neurogenic patients	Non-neurogenic patients	p
Baseline characteristics			
Age (Mean, SD)	44 (16.7)	61 (15.6)	<0.001
BMI (Mean, SD)	30 (11.1)	35 (25.6)	0.031
ASA			
1	0	8 (2.6%)	<0.001
2	0	95 (31.2%)	
3	52 (91.2%)	188 (61.6%)	
4	5 (8.8%)	14 (4.6%)	
Concordance rates			
Yes	22 (38.6%)	182 (62.1%)	0.001
No	35 (61.4%)	111 (37.9%)	
Perioperative complications			
Yes	13 (22.8%)	31 (10.2%)	0.007
No	44 (77.2%)	274 (89.8%)	
Perioperative UTI/Urosepsis			
Yes	2 (3.5%)	8 (2.6%)	0.66
No	55 (96.5%)	297 (97.4)	
30-day ED visit			
Yes	4 (7.0%)	30 (9.8%)	0.626
No	53 (93%)	275 (90.2%)	
30-day readmission			
Yes	3 (5.3%)	17 (5.6%)	1.00
No	54 (94.7%)	288 (94.4%)	
30-day UTI/urosepsis			
Yes	3 (5.3%)	7 (2.3%)	0.20
No	54 (94.7%)	298 (97.7%)	

tics, preoperative urine culture, stone culture, concordance rates, perioperative complication, and urosepsis rates were collected and compared between NB and non-NB patients. Numeric variables were compared using t-test and categorical variables using Chi-squared.

Results: A total of 362 patients underwent PCNL from 2022–2024; 57 were NB patients and 305 were non-NB patients. Compared to non-NB patients, NB patients were younger (mean age 44 vs. 61 years, p<0.001) and had higher ASA (Table 1). NB patients had a lower concordance rate between preoperative urine culture and stone cultures compared to non-NB patients (38.6% vs. 62.1%, p=0.001). NB patients were also more likely to have perioperative complications (22.8% vs. 10.2%, p=0.007); however, this was not due to higher rates of urosepsis, which were comparable in both groups in the immediate perioperative (3.5% vs. 2.6%, p=0.66) and 30-day period (5.3% vs. 2.3%, p=0.20).

Conclusions: NB patients undergoing PCNL tend to be younger, more comorbid, and have a higher rate of perioperative complications. NB patients are also more likely to have discordant preoperative urine culture and stone cultures compared to non-NB patients, but this did not translate into higher rates of postoperative urosepsis.

MP 2.15

Flexible and navigable suction ureteric access sheaths for the treatment of urolithiasis: Systematic review and meta-analysis

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Introduction: Innovation of a flexible and navigable suction (FANS) ureteral access sheath (UAS) during retrograde intrarenal surgery (RIRS) may improve the stone-free rate (SFR) and decrease complications. We conducted a systematic review and meta-analysis of the available literature to evaluate the differences in efficacy and safety between the FANS-UAS vs. the traditional-UAS (T-UAS).

Methods: A comprehensive search of medical databases was conducted in December 2024 for studies that compared the FANS-UAS to the T-UAS for upper urinary stones of any size. This was conducted following PRISMA guidelines and was registered with PROSPERO. Pre-planned subgroup analysis was performed for studies that: used a strict definition of SFR (<2 mm residual fragment on computed tomography), compared FANS-UAS to a T-UAS with suction (straight non-flexible tip), or excluded ureteral stones.

Results: A total of 16 studies (one randomized controlled trial, two prospective, and 13 retrospective studies) were included, with 10 studies included in the meta-analysis. There was a total pooled population of 3202 patients, including 2201 FANS-UAS (68.7%) and 1001 T-UAS (31.3%). Among the T-UAS group, 181 (18.1%) had concurrent suction. When compared to the T-UAS, FANS-UAS was associated with higher SFR (by both strict and any definition), higher zero fragment rate, with lower infectious and total complication rates, and no difference in operative time (Table 1). The improvement in SFR was not statistically significant in the T-UAS with suction subgroup analysis.

Conclusions: In the first meta-analysis of this subject, we found that FANS-UAS, when compared to the T-UAS, was associated with higher SFR, lower perioperative complications, and no evidence of increased operative time. It is unclear whether the combination of a soft navigable tip with suction leads to an improved efficacy of stone clearance, as there was no evidence for a difference in SFR in the small subgroup of studies comparing FANS-UAS to a T-UAS with suction.

MP 2.16

Evaluating local anesthesia for flexible ureteroscopy: A retrospective analysis of patient pain and influencing factors

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Introduction: Flexible ureteroscopy (URS) is commonly employed in the minimally invasive management of urolithiasis, stricture, and upper tract urothelial carcinoma. Although general anesthesia remains the standard for optimizing patient comfort, emerging evidence suggests that local anesthesia (LA) may offer a less invasive alternative with favorable risk and recovery profiles. We conducted a retrospective analysis to assess patient-reported pain outcomes under LA during flexible URS and to identify key predictors influencing discomfort.

Methods: We reviewed flexible URS procedures performed under LA at a single institution between May 2020 and March 2023. Demographic data, clinical indications, operative details, and post-procedural pain scores (using a visual analogue scale) were collected. To determine factors that significantly affected pain levels, a multivariate ordinary least squares regression was conducted in R, incorporating variables such as patient characteristics, procedural indications, and operative techniques.

Results: A total of 61 LA URS procedures were performed, with the following indications: upper tract urothelial carcinoma (47.5%), stricture (32.8%), and

MP 2.15. Table 1. Meta-analyses of outcomes from studies comparing the flexible and navigable suction (FANS) ureteric access sheath (UAS) vs. the traditional (T)-UAS

Outcome	Studies	Sample	Effect estimate†	Heterogeneity (I^2)	Subgroup analysis for studies with suction T-UAS as the comparatorΩ †	Subgroup analysis for studies that excluded ureteral stones†
Stone-free rate (strict definition)Δ	7	1466	**1.16 [1.08, 1.24] p<0.001**	61%	1.05 [0.94, 1.19] p=0.38	**1.13 [1.04, 1.22] p<0.001**
Stone-free rate (by any definition)	10	2059	**1.30 [1.14, 1.48] p<0.001**	90%	1.20 [0.94, 1.54] p=0.15	**1.34 [1.13, 1.58] p<0.001**
Zero fragment rate	2	394	**8.42 [4.90, 14.46] p<0.001**	26%	**6.00 [2.81, 12.82] p<0.001**	**8.42 [4.90, 14.46] p<0.001**
Infectious complication rate	9	1853	**0.39 [0.25, 0.60] p<0.001**	38%	0.74 [0.23, 2.45] p=0.63	**0.40 [0.24, 0.68] p<0.001**
Urosepsis rates	9	1755	0.38 [0.11, 1.27] p=0.12	0%	1.36 [0.13, 14.4] p=0.80	0.39 [0.11, 1.43] p=0.16
Total complication rate	9	1853	**0.42 [0.25, 0.71] p=0.001**	72%	0.70 [0.18, 2.72] p=0.60	**0.45 [0.25, 0.79] p<0.001**
Major complication rate (CD ≥ 3)	8	1615	0.49 [0.23, 1.03] p=0.06	0%	0.80 [0.30, 2.11] p=0.65	0.50 [0.23, 1.07] p=0.07
Operative rime (mins)	10	2059	-0.46 [-6.63, 5.71] p=0.88	50%	4.98 [-3.23, 13.1] p=0.23	-0.71 [-8.46, 7.03] p=0.86

†Effect estimates shown as a risk ratio with 95% confidence interval, followed by p-value. ΩStraight tip suction ureteral access sheath. ΔNo residual fragments >2 mm on non-contrast computed tomography imaging (NCCT) at least 30 days after surgery.

urolithiasis (19.7%). Overall pain experiences were modest, yielding a mean score of 2.05. Only one individual discontinued treatment due to discomfort. The multivariate model explained 31% of the variance in pain levels (R^2=0.314, F(9, 51)=2.599, p=0.015). Guidewire usage was associated with a 1.87-point rise in reported pain (β=1.869, p=0.004), whereas male sex was associated with a 1.38-point decrease compared to female patients (β=-1.380, p=0.029). **Conclusions:** Our findings suggest that LA is a feasible option for flexible URS in selected patients. While pain levels were generally low, specific procedural and patient factors, such as guidewire usage and patient sex, significantly influenced pain outcomes. Further prospective investigations, including larger cohort studies and randomized trials, are warranted to refine LA protocols, improve patient comfort, and ultimately broaden the role of LA in minimally invasive urologic procedures.