

# Frequency of Post-URS Urosepsis in Patients with Uretric Stone

Post-URS  
Urosepsis in  
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Uretric Stone

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## ABSTRACT

**Objective:** The objective of the study is to assess the frequency of post-URS urosepsis in patients with uretric stones admitted to the Urology Department.

**Study Design:** Cross-sectional study

**Place and Duration of Study:** This study was conducted at the Department of Urology, CMC Hospital, SMBBMU Larkana, from September 2022 to March 2023.

**Methods:** During the study period, a total of 106 URS procedures were carried out among patients with ureteric stones admitted to the hospital. The patient's age ranges between 18 and 75 years. URS was accomplished according to study protocol, and stone size, duration of illness, and postoperative results were noted. The data was analyzed on SPSS version 17.

**Results:** A total of 106 patients with uretric stones were managed by the URS procedure; 9 (8.5%) patients showed postoperative urosepsis. Gender-wise, male patients seemed to have more, and the mean age was  $56.1 \pm 13.2$  and ranged from 18 years to 75 years. All the pathological laboratory tests and radiological protocols were carried out during treatment. In a study, all related variables, such as duration of symptoms, WBC count, and size of the stone, were calculated.

**Conclusion:** Urosepsis, a potentially life-threatening ureteroscopic procedure-related infection, is increasing due to widespread ureteroscopy adoption. Efforts are underway to reduce post procedure infections in device development and clinical treatment.

**Key Words:** Post\_URS, Urosepsis, Ureteric stone, UTI

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## INTRODUCTION

The amount of minimally invasive endourological operations conducted reflects the global increase in the incidence of kidney stone disease (KSD)<sup>[1]</sup>. Ureteroscopy (URS) has become a widely adopted and effective intervention for the management of ureteric stones, offering high success rates and minimal invasiveness. Despite its advantages, URS is not without risks; postoperative complications, particularly infectious ones, remain a significant concern.

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Among these, urosepsis—a severe, systemic infection originating from the urinary tract—stands out due to its potential for high morbidity and mortality. The urinary tract is often colonized by microbial pathogens. Infection of the urinary tract, simply known as urinary tract infection (UTI), occurs due to the activity of these pathogens. *E. coli* accounts for most of the cases of non-complicated UTIs or acute pyelonephritis<sup>[2]</sup>. Postoperative fever and the more clinically dangerous sepsis, while rare, can nonetheless occur. According to latest EAU standards, the post-URS sepsis incidence can be as high as 5%<sup>[3]</sup>.

Another study emphasized that nearly half of post-URS complications are infection-related, with urosepsis rates varying between 0.2% and 17.8%. The study underscored the importance of preoperative antibiotic prophylaxis, prompt treatment of existing urinary tract infections, and minimizing operative time to reduce infection risks.<sup>[4]</sup>

Sepsis is a response of the body to infection that may cause failure of multiple organs and may result in death. The most serious consequence of UTI is urosepsis, which has a death rate of 20-40%. The underlying infection is frequently a complex UTI affecting a urogenital organ, such as the prostate or kidney. The most prevalent cause of urosepsis is obstructive pyelonephritis caused by urolithiasis, however

urological procedures account for around 17% of cases. The elderly, diabetics, and immunocompromised people are at highest risk.

Patients can become susceptible to urosepsis if they are elderly or immune-compromised. Patients with a history of urinary tract calculi or prior intervention are also at risk.<sup>[5]</sup> Septic shock is the primary cause of intensive care unit (ICU) admission and mortality in cases with urosepsis, a disease with a high death rate that can vary from 20% to 50%<sup>[6]</sup>.

Recent studies have highlighted the incidence of urosepsis following URS. A systematic review and meta-analysis encompassing 13 studies with a total of 5,597 patients reported a pooled postoperative urosepsis incidence of 5%<sup>[7]</sup>. This finding is particularly noteworthy, as it challenges the previously held perception of URS as a procedure with minimal infectious complications. Given the significant incidence and potential severity of post-URS urosepsis, there is a pressing need for further research to elucidate additional predictive factors and to develop effective preventive measures. Older persons, those with diabetes, ischemic heart disease, preoperative stent installation, positive urine culture, and longer operation times had increased postoperative urosepsis risk<sup>[7]</sup>.

Urosepsis is a syndrome that may present with fever, tachypnoea, multi organ failure and hypotension and requires aggressive management<sup>[5]</sup>. Following ureteroscopy, infectious complications might result in morbidity and even death. Even though the majority of these are modest, efforts must be made to reduce them, especially in patients who are at high risk<sup>[4]</sup>.

**METHODS**

**Study objectives:** To evaluate the frequency of post-URS urosepsis among ureteric stone patients.

**Study setting and duration:** This cross-sectional study was carried out at Urology ward CMC hospital SMBB Medical University Larkana from September 2022 to March 2023. In this study, a hospital admitted 106 patients with ureter stones from the Urology Department of CMC Hospital Larkana to find out the frequency of urosepsis after the URS treatment procedure.

**Methodology:** In this study, 106 patients were included to access urosepsis after an urestoscopy who presented with an ureteric stone and were admitted to the department of urology at SMBBMU Larkana. All the patients were selected according to selection criteria, and written consent was obtained from all participating patients. During the treatment, all the pathological laboratory tests and radiological protocols were carried out. All the data regarding demographic and other variables, such as size of stone and duration of symptoms, was recorded.

**Inclusion criteria:**

- Age between 18 and 75 years
- Either gender
- Patients with urethric stones in accordance with the operational definition

**Exclusion criteria:**

- Patients with already-known urosepsis
- Patients already know about UTIs.
- Patients with already-known pyelonephritis
- Patient who declined to participate in the research.

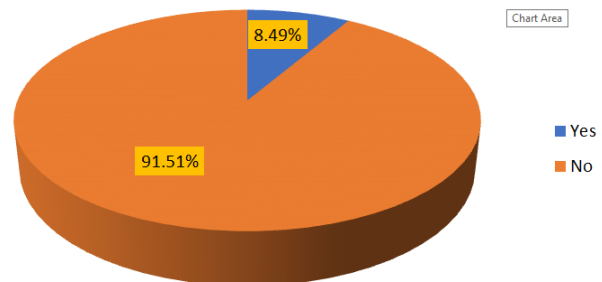
**RESULTS**

In a total of 106 patients, the mean age of patients was 56.1±13.2 and ranged in age 18 to 75 years, and gender-wise, increased male presentation seemed 62 (58.49%) as compared to female 44 (41.51%).

In a study of 106 ureter stone patients, urosepsis 9 (8.5%) was observed after a URS procedure. Graph. 01 The distribution of continuous variables was tested through Shapiro-Wilk test for age (P=0.065), duration of symptoms (P=0.087), WBC count (P=0.101) and size of stone (P=0.075) as shown in Table 1.

The mean ± SD of the size of the stone was 2.3± 0.9 with C.I (2.12...2.47) c.m and other variables such as WBC count, mean ± SD was 7506.8 ± 88.2 with C.I (7489.81.....7523.79) U/L as shown in Table 2. Furthermore, mean ± SD of duration of symptoms was 21.6 ±4.7 with (20.69.....22.50) days and mean ± SD of size of stone was 2.3± 0.9 cm with C.I (2.12...2.47) c.m as shown in Table 2.

**FREQUENCIES OF UROSEPSIS**



**Figure No. 1: Frequency of Urosepsis**

**Table No. 1: Shows Descriptive statistics of Shapiro-Wilk Test n=106**

VARIABLE	MEAN+_SD	P-VALUE
Age (years)	56.1 ±13.2	0.065
Duration of symptoms (days)	21.6 ± 4.7	0.087
WBC Count (u/L)	7506.8±88.2	0.101
Size of stone (cm)	2.3±0.9	0.075

**Table No. 2: Shows Descriptive statistics of Shapiro-Wilk Test(n=106)**

Variable	Mean+_SD	(95% ) Conf: Int.	Range
Age (years)	56.1±13.2	53.55...58.66	18-75 years
Duration of symp (days)	21.6 ± 4.7	20.69...22.50	03 -25 days
WBC Count (u/L)	7506.8± 88.2	7489.81..7523.79	4500-11000
Size of stone (cm)	2.3±0.9	2.12...2.47	1.2 – 3.1 cm

**DISCUSSION**

Treatments for uretic and renal stones include stone fragmentation and ureteroscopy (URS). Ureteral stent discomfort, ureteral wall injury and stone migration are the most frequently reported complications. The worst complications include urosepsis, multi-organ failure and death. Incidence rates on these and other complications varied extensively between the reviewed reports<sup>[8]</sup>.

We found that nearly 1 in 40 patients are hospitalized with an infection-related complication following URS for urinary stones in diverse practices in Michigan<sup>[9]</sup>.

UTI is the most common post-operative complication related to stone intervention with progression to urosepsis as a rare but serious consequence<sup>[10]</sup>.

Understanding of patient, stone, and operative factors associated with increased risk of post-operative urosepsis is required to identify higher-risk patients and to better counsel patients pre-operatively regarding their personal risk. Prior research examining these variables has not yielded a consensus, frequently involved a small number of patients, and frequently lacked clinically meaningful outcome measures. Urinary stone surgery typically involves ureteroscopy lithotripsy (URSL), or the endoscopic destruction of kidney and ureter stones. Prior research has demonstrated that ureteroscopy lithotripsy is a relatively safe procedure with a success rate of up to 85.6 percent and few side effects<sup>[11]</sup>. With a frequency of 1–18%, infection complications—including acute febrile episodes and urinary tract infections—are the most frequent postoperative problems, one of the worst outcomes following ureteroscopy lithotripsy is urosepsis<sup>[12]</sup>. UTI is the most prevalent post-operative complication after stone intervention, with development to urosepsis being an uncommon but catastrophic outcome. A multitude of variables increase infection risk, including co-morbidities, anatomical anomalies, past surgical treatments, and local anti-microbial susceptibility<sup>[13]</sup>

Infectious complications from ureteroscopy can result in morbidity and death. Although the majority of these

are small, efforts must be made to reduce them, particularly in high-risk individuals.<sup>[4]</sup>

**CONCLUSION**

We may conclude that patients with uretic stones have a lower incidence of urosepsis. To verify the present findings, more well-controlled, prospective studies are required.

**Author’s Contribution:**

Concept & Design or acquisition of analysis or interpretation of data:	Khubchand Rohra, Riaz Hussain Mangrio
Drafting or Revising Critically:	Om Parkash, Lubna Naz, Suhail Aman Jokhio, Kaleemullah Abro
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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