

## **Consequences of Negative Ureteroscopy for Pediatric Urolithiasis: Single-Institutional Cohort**

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**INTRODUCTION:** Ureteroscopy (URS) for pediatric urolithiasis is often the first-line treatment. Rarely, a negative URS (NURS) occurs where no stone is seen at the time of surgery. If this occurs, the patient is subject to extra anesthesia and risk of operation-related complications. Rates of NURS have been described in the general patient population, but to our knowledge, no study has focused on its consequences in pediatric patients. Our aim was to investigate the rate, complications, and risk factors of NURS in our pediatric cohort.

**METHODS:** An IRB-approved prospective single institutional registry was used to retrospectively identify all patients  $\leq 18$  years of age who underwent URS for stone disease from July 2012 to July 2021. Patients undergoing diagnostic URS, those with bladder stones, and those who passed stone before planned URS were excluded. Preoperative details including prior procedures, presenting symptoms, pre-operative renal bladder ultrasound (RBUS) and/or CT findings, intra-operative parameters, and 30-day complications and readmissions were aggregated.

**RESULTS:** Of the 295 patients collected, 20 (6.7%) had a NURS: 14 (70%) had presumed renal stones and 6 (30%) presumed ureteral stones. Of these 20 patients, 10 (50%) underwent only 1 pre-operative RBUS. Median time from imaging to URS was 35 days (IQR: 25.5, 48.5). Pain (N=16, 80%) was the most common indication for surgery. Randall's Plaques were noted intra-operatively in 5 patients (25%) [Table 1]. 12 patients (60%) required pre-stenting or passive dilation. 11 patients (55%) underwent intra-operative ureteral stenting, and 3 of these (33%) had stent removal under general anesthesia. Patients averaged 1.75 surgeries under general anesthesia (includes pre-operative stenting, URS, and stent removal in the OR). 30-day complications occurred in 6 patients (30%) with majority due to pain (n=5, 83%), and 4 required readmission within 30 days of surgery for pain management.

**CONCLUSION:** While the incidence of NURS is rare, its consequences extend beyond the single procedure. Complications and the need for additional operation makes understanding factors leading to NURS important. In the era of ALARA ("as low as reasonably achievable") in pediatric practice, the role that cross-sectional imaging may play in avoiding a NURS needs to be further investigated.

<b>Table 1: Negative URS Surgical Details and Outcomes</b>	
N	20
Age at Surgery (median), median (IQR)	13.8 (8.8, 17.5)
Pre-stented/Passive Dilatation	12 (60%)
Intra-operative Findings	
Randall's Plaques	5 (25%)
Narrowing	5 (25%)
Calyceal Diverticulum	2 (10%)
Debris	4 (20%)
No findings	5 (25%)
Intra-operative stent placement	11 (55%)
Stent removal in OR	3 (33%)
Procedure Length (min)	48.5 (40.5, 60.5)
Clavien-Dindo Classification	
Grade I	3 (15%)
Grade II	3 (10%)
Rate of 30-day complication	6 (30%)
Pain	5 (83%)
Febrile UTI	1 (17%)
Inability to Urinate	1 (17%)
Post-op fever	1 (17%)
Hematuria	1 (17%)
Nausea/Vomiting	1 (17%)
Rate of 30-day readmission	4 (20%)
Total # of Surgeries Required*	
One procedure	6 (30%)
Two procedures	13 (65%)
Three procedures	1 (5%)
Mean Surgeries Per Patient	1.75