

## Determinants of Stone Free Status After a Single Session of Flexible Ureteroscopy with Laser Lithotripsy for Renal Calculi

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**Abstract :** Background: Flexible ureteroscopy (fURS) has dramatically improved the minimally invasive management of complex nephrolithiasis. fURS is increasingly being used as the first-line treatment for patients with renal stones. Stone-free status (SFS) is the primary goal in the management of patients with urolithiasis. However, substantial variations exist in the reported SFS following fURS. Objectives: This study determines the predictors of SFS after a single session of fURS with holmium laser lithotripsy (HLL) for renal calculi. Methods: A retrospective review of prospectively collected data was performed for all consecutive patients undergoing fURS and HLL for renal calculi at a tertiary care center. Patients with previous ipsilateral URS for the same stones were excluded. All patients underwent JJ ureteral stent insertion at the end of the procedure. SFS was defined as the presence of no residuals or  $\leq 4$ -mm non-obstructing stone and was assessed by CT/KUB imaging after 3-4 weeks post-operatively. Multivariate logistic regression was used to detect possible predictors of SFS. Results: A total of 212 patients were included with a mean age of  $52.3 \pm 8.3$  years and a stone burden  $< 20$  mm (49.1%), 20-30 mm (41.0%) and  $> 30$  mm (9.9%). Overall SFS after a single session of fURS was 71.7%, 92% and 52% for stones less and larger than 20 mm, respectively. Patients with stones  $> 20$  mm need retreatment with a mean number of 1.8 (1.3-2.7) fURS. SFS was significantly associated with male gender, stone bulk  $< 20$  mm (95.7% vs. 56.2%), non-lower pole stones, hydronephrotic kidney, low stone intensity, ureteral access sheath, and preoperative stenting. SFS was associated with a lower readmission rate (5.9% vs. 38.9%) and urinary tract infections (3.8% vs. 25.9%). In multivariate regression analysis, SFS maintains its significant association with low stone burden of  $< 20$  mm (OR: 5.21), stone intensity  $< 600$  HFU (OR: 2.87), and non-lower caliceal stones (OR: 3.84). Conclusion: Best results after a single-session fURS for renal stone were obtained for the stone burden of less than 20 mm and low stone attenuation. Lower calyceal stones may influence stone clearance and need a different approach than fURS, especially for higher stone burden.

**Keywords :** ureteroscopy, kidney stone, lithotripsy, stone-free, predictors

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