

STONE DISEASE

Computed tomography-determined stone-free rates for ureteroscopy of upper-tract stones

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J Endourol. 2009; 23: 379-82

Background and Purpose: Most series on ureteroscopy for urolithiasis use postoperative plain radiography of the kidneys, ureters, and bladder (KUB) or intravenous urography (IVU) to determine outcomes. These imaging modalities, however, are not very sensitive and may overestimate stone-free rates (SFRs). The aim of our study was to assess SFRs after ureteroscopy for urolithiasis using CT follow-up.

Patients and Methods: A total of 92 patients underwent 113 ureteroscopic procedures for either renal or ureteral stones. Success of ureteroscopy was then determined by the absence of any stone fragments (stone-free). Stone-clearance rates (SCRs) were also calculated for ≤ 2 mm and ≤ 4 mm residual stone fragments.

Results: Each renal unit contained a mean of 1.87 stones with a mean stone diameter of 8 ± 6 mm. The overall SFR was 50.4%. SFRs were significantly higher for ureteral stones (80%) than renal stones (34.8%) ($P = 0.0001$). Renal units with multiple stones were less likely to be stone free than those with single stones ($P = 0.011$). No difference in SFRs was found between lower pole and non-lower-pole stones.

Conclusions: Overall SFRs by CT were lower than SFRs reported by radiography of the KUB or IVU criteria. Further studies to identify the clinical significance and natural history of residual stone fragments on CT scan after ureteroscopy are needed.

Editorial Comment

The study spanned a seven-year period - such that the average number of patients treated was 1 per month. It is feasible that a center with a higher volume of ureteroscopic procedures might have different stone-free results. Indeed, though the authors attribute the lower stone-free rate to the sensitivity of CT scan detecting "tiny" stones, 16% of patients in this study had residual stones > 4 mm in size. In addition, technology has evolved and improved over the study period - indeed the ureteroscopes utilized in this study lacked exaggerated active deflection and are no longer available on the market. This characteristic of the scopes might have affected stone free rates. The authors state that larger fragments were basket extracted while stones < 2 mm in size were left to pass. The authors do not describe what visual cues they utilized to determine stone size - for example were all fragments larger than the safety wire diameter basket extracted?

The authors did not standardize the time of post-operative imaging. Indeed some patients were imaged on day 1 (too early for clinical relevance) and some were imaged after 16 months (residual or recurrence of stones)? CT scan imaging at a predetermined time point (ex. 1 month) would have added clarity to the findings.

Twenty-six percent of patients were pre-stented. While this may facilitate ureteroscopy by ureteral dilation, it may also lead to edema, clot and/or debris that prevent an adequate visualization of the entire collecting system.

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