

# HOLMIUM LASER LITHOTRIPSY FOR URETERAL AND RENAL STONES: IS DUSTING EQUIVALENT TO FRAGMENTING?

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## INTRODUCTION & OBJECTIVES

Ureteroscopy became the treatment option of first choice for upper tract stones, even for larger stone sizes. This development led to an increasing interest in optimizing the settings of the holmium laser. Factors as frequency, energy, pulse length or shape do substantially influence the effect of the laser on the stone. Aim of our prospective study was to evaluate the outcomes of ureteroscopic stone treatment in two high-volume stone centers comparing two typical laser settings for fragmenting and dusting.

## MATERIALS & METHODS

Patients with solitary ureteral or renal stones were included in the prospective data assessment. All patients were treated under general anesthesia and fluoroscopic control. Perioperative antibiotic prophylaxis was applied or UTIs were treated preoperatively. Ureteroscopy was performed using rigid or flexible scopes (7-8.5 F, Karl Storz Endoscopes, Germany). Stone disintegration was performed using a holmium laser (Dornier Medilas<sup>®</sup> H Solvo<sup>®</sup>, Germany) and 275 $\mu$ m ball-tip laser fibers. The lithotripsy settings (dusting (D)= 18-20 Hz, 0.4-0.6J, or fragmenting (F)= 8-12 Hz, 1.2-1.8 J) were chosen according to the surgeon's preference. A total of 177 patients were treated. Statistical analysis was performed by two-sided t-test.

## RESULTS

Stones sizes in both groups were comparable (D: 93 vs. F: 76 mm,  $p=0.2$ ). Pre-stenting was common (D: 83% vs. F: 87%; n. s.). 116 stones were in the kidney, 61 stones in the ureter. Ureteral access sheaths were used in 83% of renal stones. Fragmenting was chosen for 49/116 renal and 43/61 ureteral stones. Overall OR time was comparable (D: 47 vs. F: 50 min.; n. s.) but laser time was significantly longer for dusting (456 sec. vs. 63 sec.;  $p<0.01$ ). Dusting had a negative impact on intraoperative vision in 46% compared to 27% (F),  $p<0.05$ ). On day 1, all but one patients with ureteral stones were stone free with both settings. With fragmenting, SFR was 91.8% for renal stones, while after dusting stone residuals were seen on KUB in 34%. Intra- and postoperative complications were comparable.

## CONCLUSION

Both concepts for laser lithotripsy demonstrated efficacy. However, by definition, dusting cannot achieve an immediate stone free status thus close follow-up is mandatory. We therefore recommend dusting settings for patients with large stone mass or when direct extraction seems difficult due to anatomic factors. Fragmenting and direct stone extraction should be attempted whenever possible. In general, a laser with a wide range of energy and frequency settings significantly improves stone management.

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