Ureteropyeloscopic Treatment of Large, Complex Intrarenal and Proximal Ureteral Calculi

Introduction and Objective: In this study, we address complex upper urinary tract calculi with retrograde ureteroscopy in a select group of patients who were poor candidates for percutaneous therapies. We define the safety and efficacy of retrograde endoscopic lithotripsy in treating large, noninfectious stone burdens.
Materials and Methods: A total of 145 patients with 164 large (2 cm or greater diameter on standard imaging) upper urinary tract stone burdens were chosen for retrograde ureteroscopy. Patients were treated with small diameter fiberoptic ureteroscopes and holmium laser lithotripsy by a single surgeon. Second-look ureteroscopy was performed in patients in whom there was a high index of suspicion of significant residual fragments. We defined stone clearance as no fragments or a single fragment less than or equal to 4 mm in diameter on standard radiograph and sonography at 3 month follow-up.
Results: Our study included 103 male patients and 42 female patients with an average age of 55 years (range 16 to 86). The mean stone diameter was 29 mm (range 20 to 70 mm) and included 36 partial staghorn stone burdens (mean diameter 37 mm) and 10 bilateral simultaneous stone burdens. Overall, 266 ureteroscopies were performed on 164 stone burdens (1.6 procedures per stone burden), clearing 143 stone burdens (87%). Highest clearance rates were observed for proximal ureteral stones (97%), and renal pelvic stones (94%), while the lowest clearance rates were observed for lower pole renal calculi (83%), and staghorn calculi (81%). Three patients progressed to percutaneous therapy due to infectious material encountered at the time of ureteroscopy or inaccessible stone burdens because of infundibular stenosis. There were five minor post-operatative complications, including 4 fevers and one patient with gross hematuria and clot retention, and no major intra-operative complications.
Conclusions: In select patients, large, complex upper urinary tract calculi can be treated safely and efficiently with retrograde endoscopic techniques. Staged, retrograde, flexible ureteroscopy is an alternative to percutaneous therapy with acceptable efficacy and low morbidity.