Revolutionizing renal stone treatment: Flexible ureteroscopy with Thulium fiber laser lithotripsy for staghorn stones.

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Study design, materials and methods
Thulium fiber laser (TFL) provides high ablation rate, and less stone retropulsion. The goal of this study was to investigate the safety and efficacy of flexible ureteroscopy (FURS) with TFL lithotripsy for management of renal staghorn stones.

METHODS: Sixty patients with staghorn renal stones were recruited. Stone width, length, volume, shape and density were assessed using preoperative CT scan. A single-use FURS (OTU) was utilized. Lithotripsy was done using TFL delivered via 200 µm fiber. The primary outcome was to assess stone free rate (SFR) that was classified into: Grade A (no residual fragments (RF), Grade B: clinically insignificant RF ≤ 2 mm and Grade C: sizable RF >2mm. Secondary outcomes included: postoperative. complications, hospital stay and TFL efficiency measures.

RESULTS: The mean patient age was 41.7±9.3. Four patients were on anticoagulants. Complete staghorn stones were seen in 20 (33.4%) patients. The median stone width and volume were 28 (21-32.7) mm and 11535 (3183-53838) mm3 , respectively.

Median operative and lasing time were 140 (70-270) and 120 (50-260) minutes, respectively. The median ablation speed was 1.53 (0.5-4.9) mm3/sec (Table1).

Postoperative complications occurred in 9 patients with a rate of 13.8%, and all were of minor grades (Grade I, II).

After the first session, 31 patients (51.7 %) were stone free with no RF, while 14 (23.4%) were Grade B (RF ≤ 2 mm) and 15 (25%) had RF > 2 mm (Grade C) .

A second intervention was needed in 8 cases. The overall SFR (zero fragments) after completion of treatment was 86.7%.

CONCLUSIONS: Flexible ureteroscopy with TFL lithotripsy emerges as a highly effective and reliable alternative for treating staghorn stones, offering stone-free rates comparable to traditional PCNL. This approach boasts minimal morbidity, reduced blood loss, and a significantly shorter recovery period, making it a favorable option for patients seeking a less invasive treatment with excellent outcomes