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Fluoro-less retrograde intrarenal surgery with a ureteral access sheath modified with a scale marker: a randomized and feasibility trial

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Objectives: To evaluate the feasibility of the ureteral access sheath modified with a scale marker (sUAS) in reducing fluoroscopy guidance time during retrograde intrarenal surgery (RIRS).

Methods: A technique was devised to allow sUAS placement with less fluoroscopy guidance. In a clinical trial, 120 consecutive patients undergoing RIRS were randomly assigned into two groups to compare the feasibility of the sUAS (group 1, n = 60) with the traditional nonscale UAS (tUAS) (group 2, n = 60), with respect to the X-ray exposure time as well as the outcome of RIRS.

Results: There was no significant difference between group 1 and group 2 regarding to age, gender, stone locations and stone size (19.4 ± 6.2 vs. 20.3 ± 6.3 mm), as well as the initial stone free rate (77% vs. 73%), operative time (48 vs. 50 minutes) and complication rate (13.3% vs. 15%) between the two groups. All 60 sUAS placements (100%) were performed successfully without the use of all-the-way tracking of fluoroscopy. There were no ureteral false passage formations or perforation in all patients. The mean placement time and fluoroscopic time for UAS placement in group 1 and group 2 were 65.5 ± 7.2 seconds vs. 54.6 ± 4.4 seconds, and 4.9 ± 1.0 seconds vs. 31.9 ± 3.3 seconds, (each $p < 0.001$), respectively.

Conclusions: Compared to the use of tUAS, the sUAS placement with less fluoroscopic guidance is feasible and maintains a similar stone-free and complication rates during RIRS. It allows reduced X-ray radiation exposure for patients and surgeons when patients require an UAS placement.