



Standardizing Suction Ureteral Access Sheath Technique in Retrograde Intrarenal Surgery (RIRS): Tips, Tricks & Troubleshooting

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ABSTRACT

Introduction: Suction ureteral access sheaths (FANS, S-UAS) are reshaping retrograde intrarenal surgery (RIRS) by improving stone-free rates and reducing complications compared to traditional UAS (1–5). Since their use requires significant technical adjustments with limited standardization, we present an instructional video detailing setup, operative choreography, and troubleshooting.

Methods: Single-center instructional case from a tertiary unit. Index patient: 67-year-old man with a 25-mm right pelvic stone (1560 HU; ~3500 mm³). Preoperative considerations included selective prior stenting and off-label α -blockers. We typically use 10/12 or 11/13 Fr suction UAS with 7.5–8.5 Fr flexible ureteroscopes. Setup: pressurized irrigation to the ureteroscope; lateral suction port connected to a labeled collector cup via a vacuum regulator, creating a closed-loop, pressure-aware system. Under fluoroscopy, the sheath is positioned above the ureteropelvic junction (UPJ) with careful advancement into the target calyx. Laser strategy combines dusting and fragmentation with suction. Fragments are evacuated through coordinated suction bursts and slow scope withdrawal. Final inspection defines stent placement and dwell.

Results: Operative time was 115 min, with 25 min of laser use. POD-1 CT confirmed stone-free status. The patient was discharged after 24 h, and the double-J stent with string was removed on day 5. The high-definition video illustrates connections, target pressures, inflow/outflow rules, and provides concise troubleshooting algorithms for common issues: impassable UPJ (use as conventional UAS), friction/kinks, clogging, and system collapse (increase inflow, reduce suction, or reopen outflow).

Conclusion: A standardized suction-UAS technique is feasible and reproducible, optimizing visualization, fragment clearance, pressure control, and safety during RIRS for large stones (6–8). Standardization videos such as this may enhance training, support wider adoption, and improve consistency of outcomes.

CONFLICT OF INTEREST

None declared.

REFERENCES

1. Gauhar V, Traxer O, Fong KY, Seitz C, Chew BH, Bin Hamri S, et al. Comparing thulium fiber versus high-power holmium laser lithotripsy combined with the flexible and navigable suction access sheath in flexible ureteroscopy for kidney stone disease: a propensity score matched analysis by the Global FANS Collaborative Group. *J Endourol.* 2025;39(1):42-9. doi:10.1089/end.2024.0653.
2. Candela L, Gauhar V, Somani B, Fong KY, Persaud S, Castellani D, et al. Acute kidney injury following retrograde intrarenal surgery (RIRS) with flexible and navigable suction ureteral access sheath (FANS): results from a prospective multicenter study. *Minerva Urol Nephrol.* 2025;77(3):356-64. doi:10.23736/S2724-6051.25.06274-3.
3. Shrestha A, Traxer O, Seitz C, Corrales M, Castellani D, Chew BH, et al. Assessing flexible ureteroscopy outcomes for lower pole versus non-lower pole stones using the flexible and navigable suction ureteric access sheath: a prospective multicenter study by EAU Endourology and PEARLS group. *World J Urol.* 2025;43(1):41. doi:10.1007/s00345-024-05384-5.
4. Yildirim Ü, Uslu M, Ezer M, Erdoğan Ç, Kocaaslan R, Sarica K. Comparison of flexible ureteroscopic suction techniques: efficacy and safety of flexible and navigable access sheath (FANS) vs. direct in-scope suction (DISS) in the management of 2-3 cm lower pole renal stones. *Urolithiasis.* 2025;53(1):75. doi:10.1007/s00240-025-01748-7.
5. Gauhar V, Traxer O, Castellani D, Seitz C, Chew BH, Fong KY, et al. Could use of a flexible and navigable suction ureteral access sheath be a potential game-changer in retrograde intrarenal surgery? Outcomes at 30 days from a large, prospective, multicenter, real-world study by the European Association of Urology Urolithiasis Section. *Eur Urol Focus.* 2024;10(6):975-82. doi:10.1016/j.euf.2024.05.010.
6. Zhu W, Liu S, Cao J, Wang H, Liang H, Jiang K, et al. Tip bendable suction ureteral access sheath versus traditional sheath in retrograde intrarenal stone surgery: an international multicentre, randomized, parallel-group, superiority study. *eClinicalMedicine.* 2024;74:102724. doi:10.1016/j.eclinm.2024.102724.
7. Pellanda AB, Torricelli FCM, Denstedt J, Danilovic A, Marchini GS, Vicentini FC, et al. Endoscopic combined intrarenal surgery: best practices and future perspectives. *Int Braz J Urol.* 2024;50(6):714-26. doi:10.1590/S1677-5538.IBJU.2024.9921.
8. Santa Cruz JAC, Danilovic A, Vicentini FC, Brito AH, Batagello CA, Marchini GS, et al. Ureteral access sheath: does it improve the results of flexible ureteroscopy? A narrative review. *Int Braz J Urol.* 2024;50(3):346-58. doi:10.1590/S1677-5538.IBJU.2024.9907. PMID:38498688.

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