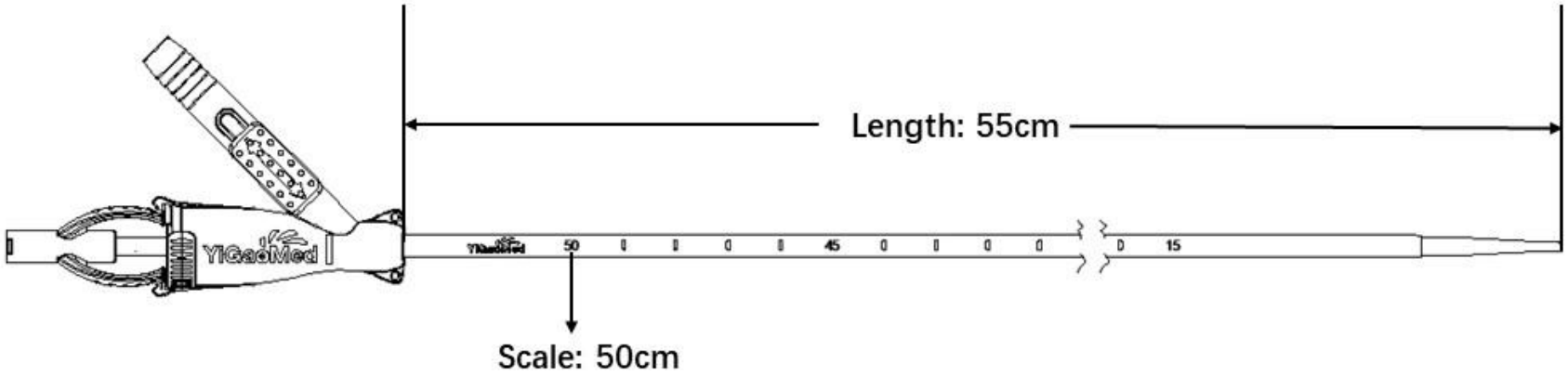
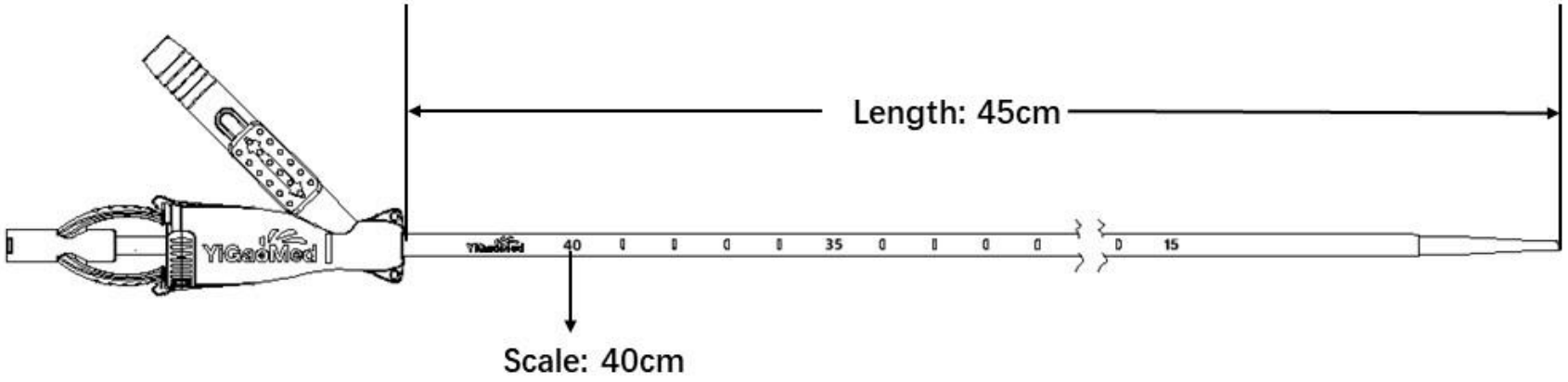
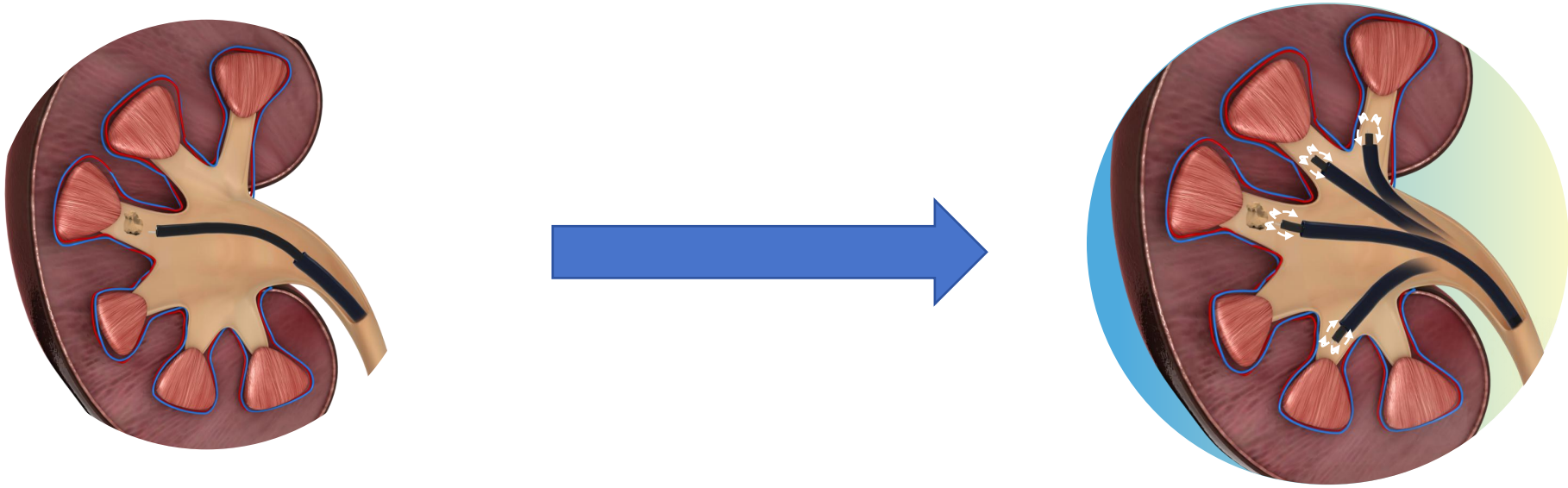
Definition of length on YIGAO ELEPHANT II

YIGAO Sheath Specifications





Operation Tips: Insert ELEPHANT II near to stone, create high efficienct suction vortex



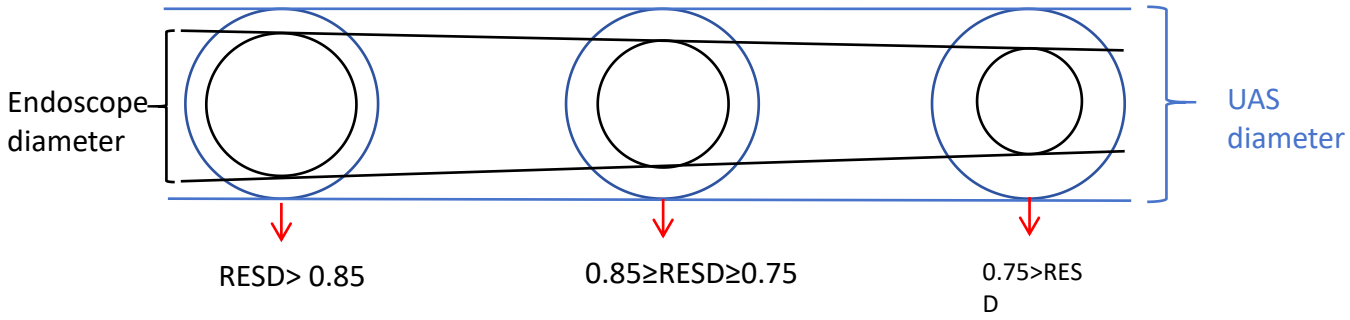
Two steps of placement of ELEPHANT II during RIRS

- **Get to UPJ:** Placement of the ELEPHANT II to UPJ is having the same procedure like the conventional sheath. After the ELEPHANT II is placed to UPJ, the extra 5-10 cm length will be left outside urethra.
- **Reach to calyx:** Insert the ELEPHANT II together with the ureteroscope to calyces, get closer to calculi. Better suction performance is guaranteed.

Possible reason: if there is always too much extra sheath is left outside during the whole surgery:

- The calculi is close to UPJ, no need to go further into calyx;
- The sheath didn't go into calyces together with scope;
- Short length of urethra.

Operation Tips: Choose proper ureteroscope, keep RESD at 0.75-0.85, to keep suction performance in best status



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ORIGINAL ARTICLE

The optimal ratio of endoscope-sheath diameter with negative-pressure ureteral access sheath: an in vitro research

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Abstract

Purpose To maintain safe intrarenal pelvic pressure (IPP), the combination of flexible ureteroscope (fURS) and traditional ureteral access sheath (T-UAS) should maintain a basic rule that is the ratio of endoscope-sheath diameter (RESD) ≤ 0.75. However, the negative-pressure ureteral access sheath (NP-UAS) may break the rule of negative pressure suction. This study aimed to examine the effect of NP-UAS on IPP and flow rate (FR) with varying RESD.

Methods In a 3D-printed renal model, flexible ureteroscopy lithotripsy (fURL) was replicated. Six sizes of fURS paired with 12Fr T-UAS and NP-UAS resulted in six distinct RESDs of 0.63, 0.78, 0.87, 0.89, 0.90, and 0.91. While the irrigation pressure (IRP) was set between 100 and 800 cmH_2O and the sucking pressure (SP) was set between 0 and 800 cmH_2O, the IPP and FR were measured in each RESD.

Results NP-UASs can reduce the IPP and increase the FR at the same RESD compared to T-UASs. The IPP decreased with increasing SP with NP-UAS. When RESD ≤ 0.78, T-UAS and NP-UAS can maintain IPP < 40 cmH_2O in most circumstances. When RESD = 0.87, it is challenging for T-UAS to sustain IPP < 40 cmH_2O; however, NP-UAS can do so. When RESD ≥ 0.89, it is difficult to maintain an IPP < 40 cmH_2O even with NP-UAS.

Conclusion NP-UAS can decrease IPP and increase FR compared with T-UAS. To maintain a safe IPP, it is recommended that RESD < 0.85 when utilizing NP-UAS.

Keywords Negative-pressure ureteral access sheath · Ratio of endoscope-sheath diameter · Flexible ureteroscopy lithotripsy · Intrarenal pelvic pressure · Sucking pressure

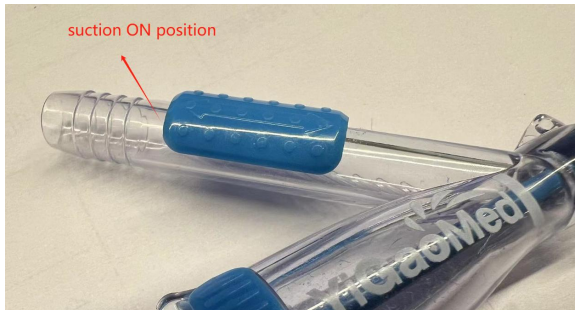
RESD: Ration of Endoscope and Sheath Diameter

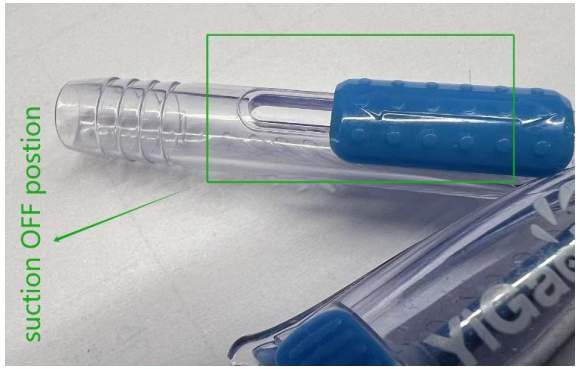
REDS= Diameter of endoscope/Diameter of UAS

When RESD is smaller than 0.85, the suction performance would be good in bendable UAS**. The recommended RESD is to keep it no bigger than 0.85.**

Operation Tips: Regulate suction and irrigation flow, keep a balanced suction performance

150mmHg
0.02Mpa

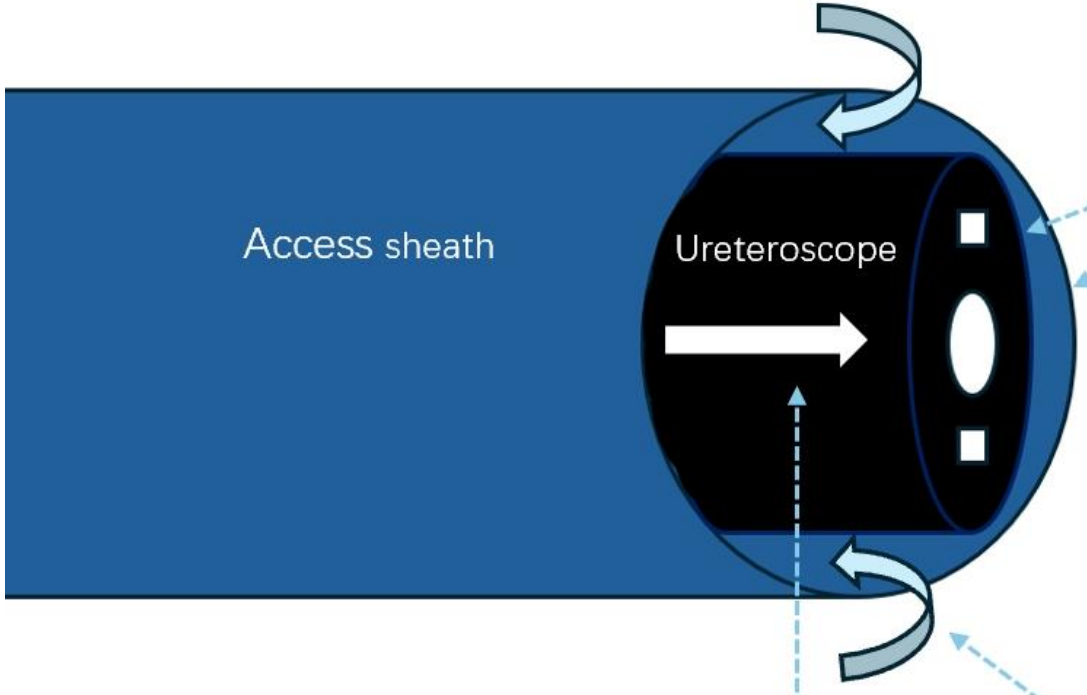




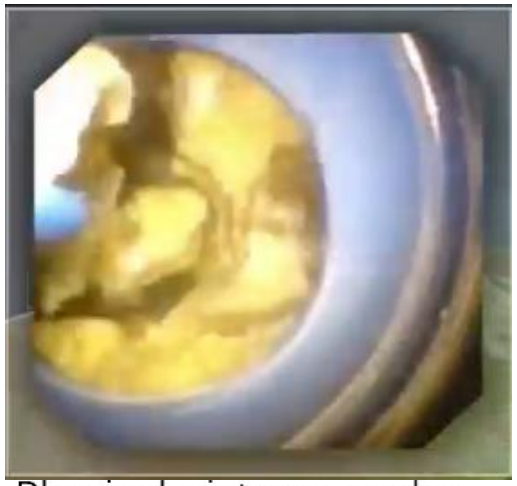
- To maintain a balanced IRP condition and better suction performance, it can be achieved by adjusting suction and irrigation flow. To maintain a better suction performance. The recommended negative pressure parameter is: **0.02-0.024MPA/150-200mmHg,** while the irrigation flow is kept at **150-200ml/min**
- During the RIRS, it is recommended to **adjust the negative pressure and irrigation flow dynamically to maintain a balanced IRP(Intrarenal Pressure) inside kidney.**

Operation Tips: Better suction performance by placing the ureteroscope to correct postion to sheath

Suggested Usage of Tip-Flexible Access Sheath



Tip of ureteroscope is better to align with tip of access sheath or withdraw into tip or access sheath to realize suction.



Physical pictures under ureteroscope lens, better to show edge of inner sheath tip.

Negative Pressure Suction

Continuous Irrigation