

**VP09****Robotic flexible ureteroscopy, safety, effectivity and early results of a new concept**O. Traxer¹, A. Smith², R. Saglam³, J. Rassweiler⁴, G. Preminger⁵, D. Hoenig², S. Kabakci⁶, E. Koruk⁷, M. Binbay⁸, K. Sarica⁹¹ *Marie Curie University, Tenon Hospital, Paris, France*² *Smith's Urology Clinic, New York, NY, USA*³ *Medicana International Hospital, Ankara, Turkey*⁴ *SLK Kliniken, Heilbronn, Germany*⁵ *Duke University, Durham, NC, USA*⁶ *Hacettepe University, Ankara, Turkey*⁷ *Department of Research and Development, ELMED, Ankara, Turkey*⁸ *Bagcilar Training and Research Hospital, Ankara, Turkey*⁹ *Kartal Training and Research Hospital, Istanbul, Turkey*

Objective: Despite the progress in the design of the ureteroscopes and accessories for flexible ureteroscopy, the surgeon has to perform flexible ureteroscopy procedure in a standing position with suboptimal ergonomics, which may result in orthopaedic complaints among endourologists. The radiation during the procedure is another risk for the surgeon.

The Turkish company ELMED designed and developed a new robotic manipulator to remotely control all of the functions of the flexible ureteroscope. We aimed to use this robotic manipulator precisely to dust the stone, while sitting on an ergonomic chair, out of the radiation zone, to protect the device and to treat larger kidney stones.

Material-Method: The Avicenna Roboflex consists of a console and manipulator of flexible ureteroscope. The surgeon controls two joysticks to manipulate the endoscope: The right one enables deflection, a central wheel enables fine adjustment of the deflection. The left joystick allows rotation as well as advancing and retracting the scope. The speed of rotation and advancement can be regulated at the screen of the console. The laser fiber can be remotely moved forward and backward. Integrated water pump can be adjusted also to increase or decrease the flow rate for optimal endoscopic vision.

Results: In the meantime, we treated eighty one kidney stones by seven 7 different urologists. An access sheath was used in the majority of patients (n=72). Mean fragmentation time was 46 (15-118) minutes, a mean fragmentation speed of 29.1 (18-46) mm³ per minute increasing to 32.7 mm³/min after 42 cases. Mean console time was 53 (23-135) minutes and mean operative time including placement of the access sheath and DJ-stent 74 (40-182) minutes. Complete stone disintegration was accomplished in 79 patients (96%). Based on a questionnaire, we found a there is a significant difference when comparing the ergonomics of classical versus robot-assisted flexible ureteroscopy (total score 31.3 vs. 5.6; p< 0.01) and this is true for all domains.

Conclusion: We could demonstrate safe and efficacious application of the device with a short learning curve by seven experienced endourologists. Future studies have to evaluate the impact of the device on clinical outcome of FURS.