Clinical Article Summary

Impact on Active Scope Deflection and Irrigation Flow of All Endoscopic Working Tools during Flexible Ureteroscopy

Abstract

Objectives: Flexible ureteroscopy is nowadays an alternative effective option for treatment of upper urinary tract stones, especially in the lower renal pole. Access in this case is often limited by active deflection capabilities of the instrument which is always deteriorated by the passage of different tools through the working channel. Insertion of them limits also the irrigation flow and so that the visibility. These deteriorations vary largely following the tool inserted. We performed an in vitro evaluation of deterioration of active deflection, possibility of tool insertion in maximal active deflection and irrigation flow in 6 different flexible ureteroscopes with almost all of tools available.

Methods: A total of 546 measures of maximal deflection, test of passage of tools in maximal deflection and measures of irrigation flow passage through the working channel were made on 6 different ureteroscopes, the ACMI DUR-8, the ACMI DUR-8 "Elite", the Karl Storz 11274 AA, the Karl Storz 11278 AU1 "Flex-X", the Wolf 7325.172 and the Olympus URF/P-3 without any tool inserted and with 22 different tools (14 extraction devices and 8 lithotripsy probes).

Results: Larger caliber tools resulted in more deflection degradation than smaller ones, but it is more evident in case of use of non-nitinol tools instead of the nitinol ones. Generally, lithotripsy probes affected active deflection more than nitinol extractions tools but different brand laser fibers present different results. Usually, 1.6 and 1.9F electrohydraulic probes offer a slightly better deflection than does the 200µ laser fiber. Ballistic shock probes are so stiff that cannot be used for treating lower renal pole stones.

Conclusions: An array of different instruments are nowadays available for upper renal endoscopic treatment but they differ largely on stiffness and on obstruction to irrigation flow. Laser probes are very problematic to insert in the already deflected instruments, something that is less evident with the EHL probes and the smaller nitinol extraction tools. Irrigation flow is inversely proportional to the diameter of the tool inserted. Tools with a diameter of 3 French or more block totally the flow.

Coloplast Key Takeaways

- Larger caliber instruments result in more scope deflection degradation than smaller ones. Nitinol tools affect scope deflection less than instruments constructed of alternative materials.
- Irrigation flow is inversely proportional to the diameter of the tool inserted. The larger diameter of the instrument the less irrigation flow.
- Larger caliber instruments (over 3 Fr) results in almost zero irrigation flow in a ureteroscope working channel. This is true even when pressure of the irrigation flow is increased.

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