

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

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ABSTRACT

Objective: 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 the irrigation flow and 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 extraction 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 200 μ 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 (usually 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.
- Coloplast offers small, 1.5 Fr no-tip and frontal nitinol baskets which are among the smallest diameter urology baskets on the market.

BRIEF STATEMENT

Indications: For stone removal during the course of rigid and flexible ureterorenoscopy, cystoscopy, endoscopic retrograde cholangioscopy (ERC), endoscopic retro- grade cholangiopancreatography (ERCP).

Intended Purpose: Stone retrieval devices serve for the endoscopic removal of stones and their fragments from the urogenital and gastroenterological tract during the course of retrograde interventions.

Contraindications: The contraindications of the above endoscopic interventions apply. The stone retrieval devices may not be used for Percutaneous Nephrolithotomy (PCNL). Stone retrieval devices may not be used for intravascular applications or other application areas, as sufficient clinical experience is lacking for this.

Warnings and Precautions: If used improperly, stone retrieval devices can cause the perforation of tissue, in particular if the stones are lodged on the vessel wall. The stone bed is then frequently very fragile. The use of contrast media can lead to adhesions that can limit the functionality of the stone retrieval device. Some stones may be too large to be removed with the stone retrieval device through the endoscope because the stone could get stuck in the working channel of the endoscope during removal. Therefore, always the complete system of endoscope and retrieval device shall be removed and the retrieval device shall be emptied outside the human body. Stone retrieval devices may not be used for mechanical stone crushing (lithotripsy). This type of device must be used only by trained and experienced professionals. Do not use the stone retrieval device if the stone is too large. If excessive force is used, there is a potential for vessel wall tear.

Potential Complications: The following complications are possible when using stone retrieval devices for stone removal:

- Entrapment of large stones
- Inability to disengage the dislodger from irretrievable stones requiring the application of other interventions
- Tissue perforation
- Breakage of the stone retrieval device
- Infection
- Non-retrievable stones

The risks and benefits of using Dormia® Front Stone Extractor should be considered in patients.

The information provided is not comprehensive with regard to product risks. For a comprehensive listing of indications, contraindications, warnings and precautions refer to the product's Instructions for Use. Alternatively, you may contact a Coloplast representative at 1-800-258-3476 and/or visit the company Website at www.coloplast.com.

Complications from the use of this device should be brought to the attention of your Coloplast Representative and your physician.

Caution: Federal (USA) law restricts this device to sale by or on the order of a physician.