Comparison of Peditrol® Irrigation Device and Common Methods of Irrigation

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Author information
Brian D.M. Blew, M.D., FRCSC
Division of Urology, Department of Surgery, St. Michael’s Hospital, University of Toronto, Toronto, Ontario, Canada.
A. Joel Dagnone, M.D., FRCSC
Queensway Professional Centre, Etobicoke, Ontario.
Kenneth T. Pace, M.D., M.Sc., FRCSC
Division of Urology, Department of Surgery, St. Michael’s Hospital, University of Toronto, Toronto, Ontario, Canada.
R. John D’A. Honey, M.A. MB.B. Chir. FRCS(Eng), FRCSC
Division of Urology, Department of Surgery, St. Michael's Hospital, University of Toronto, Toronto, Ontario, Canada.

ABSTRACT

Background and Purpose: The Peditrol® is a novel hands-free irrigation device that delivers a bolus of irrigant through the ureteroscope when the foot pedal is deployed. The purpose of this study was to compare the flow and pressures created by the Peditrol with those of commonly used methods of irrigation.

Materials and Methods: Flows through a flexible 6.9F Olympus ureteroscope (F-URS) and a 7.5F semi-rigid ACMI ureteroscope (S-URS) were measured in duplicate with the working channel empty and with a 2.2F Nitinol basket or a laser fibre in the working port. Irrigant flow was pressurized by gravity drainage at 100 cm H₂O (GI), pressurized irrigant bag at 300 cm H₂O (PI), handheld 60-cc syringe (HS), and the Peditrol. A 20-gauge angiocatheter was placed through the parenchyma into the renal pelvis of an ex-vivo cadaveric porcine kidney and attached to a pressure transducer. Pressures were measured in triplicate using the same irrigation techniques.

Results: With a basket or 200-µm laser fibre in the working port of the F-URS, Peditrol mean flows were superior to those of PI (3.3 and 6.3 times, respectively; P < 0.001) but similar to those of HS (0.7 to 1.1 times). All irrigation types resulted in intrarenal pressures greater than gravity irrigation (P < 0.05). The Peditrol demonstrated intrapelvic pressures <40 cm H₂O when used with a 12/14F ureteral access sheath (AS). Without an AS, the intrapelvic pressure reached 92 cm H₂O, similar to the pressures reached with the S-URS under various irrigation conditions (84–287 cm H₂O) and comparable to the HS method through the F-URS (97 cm H₂O).

Conclusions: The Peditrol irrigation device generates superior flow through an F-URS compared with GI or PI, particularly with an instrument in the working port. Intrarenal pressures when used with an F-URS and AS are low. When an AS is not used, the intrarenal pressure is similar to or lower than pressures obtained using an S-URS with different irrigation modalities.
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