

Abstract Submitted
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Fluid dynamic modelling of renal pelvic pressure during endoscopic stone removal ALEXANDROS ORATIS, JOHN SUBASIC, JAMES BIRD, Boston University, BRIAN EISNER, Massachusetts General Hospital Harvard Medical School — Endoscopic kidney stone removal procedures are known to increase internal pressure in the renal pelvis, the kidneys urinary collecting system. High renal pelvic pressure incites systemic absorption of irrigation fluid, which can increase the risk of postoperative fever and sepsis or the unwanted absorption of electrolytes. Urologists choose the appropriate surgical procedure based on patient history and kidney stone size. However, no study has been conducted to compare the pressure profiles of each procedure, nor is there a precise sense of how the renal pelvic pressure scales with various operational parameters. Here we develop physical models for the flow rates and renal pelvic pressure for various procedures. We show that the results of our models are consistent with existing urological data on each procedure and that the models can predict pressure profiles where data is unavailable.

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