



Robotic nephrolithotomy and pyelolithotomy with utilization of the robotic ultrasound probe

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ABSTRACT

Introduction: The treatment of large renal stones in children can be challenging often requiring combination therapy and multiple procedures. The purpose of this video is to describe our technique of robotic nephrolithotomy and pyelolithotomy for complex renal stone disease in children, and to demonstrate the utility of the robotic ultrasound probe to aid with stone localization.

Materials and Methods: Robotic nephrolithotomy/pyelolithotomy was carried out in four consecutive patients. A robotic ultrasound probe (Hitachi-Aloka, Tokyo, Japan) under console surgeon control was used in all cases.

Results: Two patients underwent robotic pyelolithotomy, one patient underwent robotic nephrolithotomy, whilst the fourth patient underwent robotic pyelolithotomy and nephrolithotomy along with Y-V pyeloplasty for concurrent ureteropelvic junction obstruction. Mean operative time, blood loss and hospital stay was 216 minutes, 37.5 mL and 2 days, respectively. The robotic ultrasound probe aided identification of calculi within the kidney in all cases. For nephrolithotomy it was helpful in planning the incision for nephrotomy. After nephrotomy or pyelotomy, stones were removed using a combination of robotic Maryland forceps, fenestrated grasper or Prograsp. Antegrade nephroscopy introduced through a laparoscopic port was used in all patients for confirmation of residual stone status. Two patients did not require a ureteral stent in the post-operative period. One patient had a minor complication (Clavien Grade 2 - dislodged malecot catheter). All patients were stone free at last follow-up.

Conclusions: Robotic nephrolithotomy and pyelolithotomy with utilization of the robotic ultrasound probe offers a one-stop solution for complex renal stones with excellent stone-free rates.

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EDITORIAL COMMENT

The video by Ghani et al. nicely demonstrates the techniques of robotic pyelolithotomy and nephrolithotomy in children. The video highlights the use of intraoperative ultrasonography using a specially designed probe that can be manipulated by the operating surgeon. Newer probes

allow the surgeon to directly control the probe with standard robotic instruments (1). Intraoperative ultrasonography has proven useful during partial nephrectomy for tumor identification to facilitate complete resection (2,3). It is useful in parenchymal incision planning. It is especially helpful in difficult cases such as the completely intraparenchymal tumor (4).

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