

## ENDOUROLOGY & LAPAROSCOPY

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### **Robot assisted laparoscopic partial nephrectomy: a viable and safe option in children**

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**Purpose:** The safety, benefits and usefulness of laparoscopic partial nephrectomy have been demonstrated in the pediatric population. We describe our technique, and determine the safety and feasibility of robot assisted laparoscopic partial nephrectomy based on our initial experience.

**Materials and Methods:** We retrospectively reviewed robot assisted laparoscopic partial nephrectomy performed at our institution between 2002 and 2005. The technique was conducted via a transperitoneal approach with the da Vinci Surgical System using standard laparoscopic procedural steps. Clinical indicators of outcomes included estimated blood loss, complications, in hospital narcotic use and length of stay.

**Results:** Robot assisted laparoscopic partial nephrectomy was completed successfully in 9 cases. Mean patient age was 7.2 years and mean follow-up was 6 months. Mean operative time was 275 minutes and mean estimated blood loss was 49 mL. Operative times improved significantly with experience. Overall patients had a mean hospitalization of 2.9 days and required 1.3 mg morphine per kg. All patients had a normal remaining renal moiety confirmed on Doppler ultrasound. The only complication was an asymptomatic urinoma discovered on ultrasound, which was treated with percutaneous drainage and ultimately resolved.

**Conclusions:** Our initial experience shows the safety and feasibility of robot assisted laparoscopic partial nephrectomy in children. Operative time decreases with experience. The enhanced visualization and dexterity of a robotic system potentially offer improved efficiency and safety over standard laparoscopy. Robot assisted laparoscopy is an option for partial nephrectomy and may become the minimally invasive treatment of choice.

### **Editorial Comment**

This report on robotic assisted laparoscopic partial nephrectomy in the pediatric population is another pioneering manuscript that raises the everlasting question of minimally invasive surgery in children and the true benefits that this treatment modality offers. Another similar major query is the advantage of robotic surgery versus standard laparoscopic procedure.

The later would allow the surgeon to reach the lowest more distal ureteral cuff when performing the ureterectomy to prevent stump infection and other complications, with ease without docking and docking the robot to re-position the patient. Cost is also a major consideration since the economics of health care has been influencing somewhat how we practice medicine today. These issues do not take any merit from the authors that developed a very nice minimally invasive approach to a common pediatric dilemma with minimal complications.

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### **Histological evaluation of cold versus hot cutting: clinical impact on margin status for laparoscopic partial nephrectomy**

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**Purpose:** While most laparoscopic nephron sparing surgery is performed using cold scissors, energy based devices may also be used. A criticism of this approach has been the potential thermal destruction of the cellular architecture at the tumor margin, precluding the ability to accurately determine whether tumor cells are present. We clinically characterized the histological appearance of tumor margins excised with cold scissors, and bipolar and ultrasonic shears.

**Materials and Methods:** We evaluated 40 renal mass excisions performed by a total of 3 urologists at our institution between February 2003 and March 2007. There were 10 bipolar (5 mm LigaSure), 20 ultrasonic (Harmonic Scalpel) and 10 cold excisions. All slides were randomly evaluated twice by a single pathologist blinded to surgeon and excision method. Histological interpretation of the margin was scored as clear vs. indeterminate. Variables, including margin fragmentation, artifact, extravascular blood clot, parenchymal hemorrhage, capillary congestion and vessel sealing, were assessed and scored on a scale of 0 to 3, that is 0--none, 1-1% to 25%, 2-26% to 50% and 3--greater than 50%.

**Results:** The pathologist was able to confidently identify cells at the margin as being malignant or benign in all cases. Histologically the ultrasonic scalpel demonstrated increased fragmentation and extravascular blood clotting compared with those of the other cutting methods ( $p < 0.025$  and  $< 0.026$ , respectively). The ultrasonic scalpel also showed increased artifact depth compared to that of cold cutting ( $p < 0.001$ ). There were no statistical differences between the groups regarding margin artifact, parenchymal hemorrhage or capillary congestion. No statistical significance was observed in any variables between bipolar and cold cutting.

**Conclusions:** Despite some degree of cellular damage the ability to determine whether cells at the margin were benign or malignant was not affected by using an energy based bipolar or ultrasonic device.

### **Editorial Comment**

Laparoscopic partial nephrectomy remains to be challenging technically due to reconstructive steps but also oncological principles should be maintained.

The optimal laparoscopic instrument to excise the renal mass during laparoscopic partial nephrectomy would be the one that not only precisely removes the mass but also performs coagulation of renal parenchymal vessels so bleeding would not be relevant during this procedure.

The dilemma is whether energy could also destroy possible cancer cells during the excision of the mass, allowing coagulation but not disturbing the histology so the pathological examination is well evaluated to accurately grade and stage the tumor and its surgical margins. The authors examined the preference of 3 surgeons and although the possible artifacts maybe increased with the harmonic scalpel when compared to “cold” cut (no energy) and Ligasure, the ultrasonic device did not distort the histological sample to evaluate its margin status.

Finally, renal hilar clamping may decrease margin positivity due to better visualization compared to excision of renal masses with no vascular control.

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