

Innovation in Endourology and Minimally Invasive Surgery

Highlights From the 29th World Congress of Endourology and SWL 2011, November 30-December 3, 2011, Kyoto, Japan

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KEY WORDS

Endourology • Percutaneous nephrolithotomy • Small renal mass • Active surveillance

The 29th World Congress of Endourology and SWL was held in Kyoto, Japan, from November 30 to December 3, 2011. Innovation was the theme of the meeting across a wide array of topics in endourology and minimally invasive surgery. This review highlights just some of the exciting presentations.

Stone Disease

As the rates of shock wave lithotripsy continue to decline, a major focus of the meeting centered on ways to improve the performance of ureteroscopy and percutaneous nephrolithotomy (PCNL). During ureteroscopic laser lithotripsy, one problem is ensuring good clearance of residual stone fragments.

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A novel technique for this was presented using magnetic-coated amino acids that interact with the stone, allowing for magnetic-assisted fragment retrieval.¹

For PCNL, the importance of flexible endoscopy during the initial procedure was emphasized to avoid the need for repeat procedures. With regard to technical improvements, one of the significant hurdles to PCNL for many urologists may be obtaining their own percutaneous access. To this end, several novel solutions were presented ranging from ureteroscopic placement of magnets into the collecting system to guide the incoming percutaneous needle, or alternatively, the ureteroscopic placement of a puncture wire in a retrograde fashion.^{2,3} Although these options would conceptually allow for more precise access into the targeted calyx, they remain technically challenging in some cases and additional refinement of these techniques is necessary.

The Clinical Research Office of the Endourological Society (CROES) prospectively collected data on 5803 patients who underwent PCNL as part of the PCNL Global Study. Five papers were presented in addition to a plenary session summarizing the results. Overall, 10% of patients experienced postoperative fever, irrespective of whether stones were treated with pneumatic, ultrasonic, or laser lithotripsy.⁴ The risk of postoperative fever significantly increased for patients with a positive preoperative urine culture, diabetes, stag-horn calculus, or preoperatively placed nephrostomy tube.⁵ For the entire cohort, the stone-free rate was 83%, and postoperative computed tomography (CT) scan was more accurate than radiography or ultrasound in evaluating residual fragments.⁶

Small Renal Masses

As with prostate cancer, there is increasing concern about overdiagnosis and overtreatment of small renal masses (SRMs). Although specific imaging features have been associated with more favorable prognosis (ie, slow growth rate, smaller size, exophytic, presence of an angular interface on magnetic resonance imaging [MRI]), there remain significant limitations in our ability to assess tumor aggressiveness noninvasively and determine the need for intervention. A panel of experts on the treatment of SRMs was convened to present the most recent data and recommendations.

The new American Urological Association guidelines for the management of SRMs were reviewed, providing several options based on tumor size and comorbidities.⁷ On one end of the spectrum

is active surveillance (AS). Data presented from several contemporary series suggest that for tumors < 3 cm, metastasis occurs in approximately 1% to 2% of patients over a 3- to 5-year interval.⁸ Given approximately 99% cancer-specific survival during this period, AS represents a viable option, particularly for patients with significant comorbidities.

Alternative management options include percutaneous or laparoscopic cryotherapy and radiofrequency ablation, although there are limited data on their long-term survival outcomes. Of these techniques, cryotherapy may be preferred due to the presence of skip lesions in some series of radiofrequency ablation.

Overall, local recurrence-free survival rates with these ablative techniques appear inferior to those obtained with extirpative surgery, although rates of metastasis are comparable. There is evidence that partial nephrectomy continues to be underutilized as compared with radical nephrectomy for SRMs.⁹ This is unfortunate given the adverse sequelae of renal insufficiency and the importance of nephron sparing. On the other hand, the use of robot-assisted partial nephrectomy (RAPN) has dramatically increased. A study of RAPN across 25 institutions encompassing 33 surgeons of varying experience levels demonstrated acceptable perioperative results. For 1269 patients with a mean tumor size of 3.1 cm, mean operative time was 203 minutes, warm ischemia time was 25.2 minutes, estimated blood loss was 184 mL, positive margin rate was 4%, and the overall complication rate was 15.7%.¹⁰

Finally, there was discussion about an increasing role for renal mass biopsy in guiding therapy,

and the importance of using a coaxial technique for core biopsy instead of fine needle aspiration. In modern series, > 80% of core biopsies are diagnostic for the presence or absence of renal cell carcinoma, although it is not always possible to discern the specific grade or histology. Also, due to the risk of hemorrhage, postbiopsy imaging was recommended.

Imaging

Traditionally, the follow-up of renal masses has relied heavily on CT. However, there is increasing concern about the adverse consequences of radiation exposure. Although MRI is an alternative, both techniques may be problematic for patients with renal insufficiency (eg, after partial nephrectomy). To avoid these issues, there has been investigation into the use of contrast-enhanced ultrasound.¹¹ The contrast agents used for this technique are not nephrotoxic, and the identification of concerning features (eg, septae, enhancing nodules) could then trigger additional evaluation. Additional prospective studies on this technique are necessary to better assess its performance characteristics compared with the more traditional modalities.

Technology Assessment

Because this meeting emphasized novel techniques in urologic surgery, there was significant discussion about technology assessment. The Innovation, Development, Exploration, Assessment, and Long-Term Evaluation (IDEAL) guidelines were presented as a stepwise approach to evaluate a new technology, whereby evidence from case series is ultimately replaced with prospective technique development studies and later registries.¹²

Surgical Education

As surgical technique continues to evolve, teaching the vast array of skills presents new challenges for residency and fellowship training. To this end, a novel online teaching tool was presented that includes a video library of surgical procedures (www.onlinemasterclass.com). In a format similar to the *Choose Your Own Adventure* books, participants must choose the next step in management of complex surgical situations. The results of these choices are then shown with video, facilitating a more interactive learning process for surgical decision making. At the completion of the exercise, participants are provided with a report card providing useful feedback on areas for improvement.

World Congress of Endourology 2012

The 30th annual World Congress of Endourology will be held in Istanbul, Turkey, from September 4-8, 2012. The theme of the congress will be bridging science and technology. ■

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