

Nephron Sparing Surgery on Renal Tumors



A new age in surgical techniques

**By Jason K. Sprunger, MD
& Robert A. Batler, MD**

Improved understanding of the biologic activity of kidney cancer and advances in surgical technique have resulted in improvement in the care of patients with kidney cancer.

Approximately 2% of all cancers diagnosed in the United States yearly are kidney cancers. In the year 2000, there were an estimated 31,000 new cases and approximately 12,000 deaths related to this cancer.

Kidney cancer, in a large part, has always been considered a “surgical disease” For patients who present

with suspicious kidney tumors, most will be offered surgery. In years past, kidney cancers, (independent of the size of the tumor) were treated by radical nephrectomy (removal of the entire kidney)

Over the past 25 years, however, as urologist have learned more about the biology of kidney cancer there

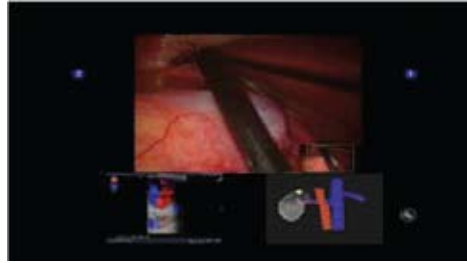
has been a paradigm shift. We have learned that tumors less than 4cm in diameter can often be safely treated by partial nephrectomy (wedge resection of the tumor with sparing of the healthy kidney). No difference in cancer control or survival has been observed in patient undergoing partial nephrectomy.

Initially, partial nephrectomies were performed only when tumors occurred in the solitary kidney or in patients with underlying renal

disease. However, there has been increasing evidence to support the expansion of partial nephrectomy to patients who do not have a solitary kidney or underlying renal insufficiency.^{1,2}

As partial nephrectomy has become accepted as the standard of care for many small renal masses, we have also seen our surgical techniques become less and less invasive.

space” and a camera is then used to allow visualization of the abdominal cavity. The surgeon uses specially designed instruments to complete



about the collecting system are more easily approached.

Many people mistakenly believe robotic partial nephrectomy is performed “by the robot”. However, like all other surgeries on the kidney, the surgeon performs the operation. With the robotic technique, the patient is positioned on their side, in the lateral decubitus position, a

“A new age” of surgical techniques have been born out of the need for less invasive techniques.

Originally, partial nephrectomies were performed in an open standard fashion through an incision on the patient’s flank. However, with the increase in the detection of these tumors, came the drive for minimally invasive procedures to decrease surgical morbidity to our patients.

“A new age” of surgical techniques have been born out of this need for less invasive techniques. Ablative techniques, laparoscopic partial nephrectomies, and most recently robotic partial nephrectomy are now commonly being employed at many centers for small renal masses.

The laparoscopic approach involves small incisions carefully positioned on the body to allow placement of devices called trochars which allow the surgeon to insufflate the abdominal cavity with carbon dioxide gas. This creates a “working

the operation. The benefits of this approach have been well-documented and include decreased morbidity, shorter hospital stays and earlier returns to full activity. We also perform cryoablation of renal masses in selective cases.

The newest technique being performed is laparoscopic robotic partial nephrectomy. This technique utilizes the da Vinci robotic system.

This robotic system is being used for everything from heart surgery to radical prostatectomy. The robotic assistance may facilitate advanced maneuvers which are required for performing delicate surgeries in small spaces. In the case of partial nephrectomies, robotics may allow the surgeon to tackle more difficult cases. Tumors that are in the hilum or the middle of the kidney or that

beanbag positioner is used to fix position securely and safely. Usually three to five incisions are used. Three to four of the incisions will be for the robotic instrumentation and the fourth or fifth will be used for the bedside assistant.

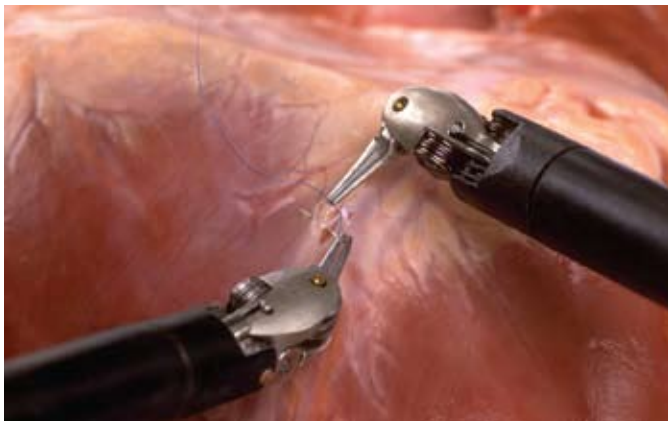
Once the trochars are properly placed, the robot is then docked. The surgeon will sit at the console. The robot then becomes “the puppet” to the surgeon’s every movement. The surgeon will have seven degrees of freedom and movement with the instrumentation and simulated three-dimensional visualization. There is an assistant standing by the patient at all times.

First the surgeon mobilizes the colon to exposes the retroperitoneum (this is the space in which the kidney

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To date, Urology of Indiana has performed one of the largest robotic series in the country.

lies). The artery is then identified and mobilized. Once the artery is mobilized, the tumor is identified and the capsule around the tumor is marked with cautery. A small clamp is placed by the assistant on the artery. At this point, the tumor is then excised and placed into a pouch and retrieved by the assistant. The collecting system is reconstructed using the robotic arms. Blood vessels are oversewn and the capsule is reapproximated. This all takes place under 30 minutes of warm ischemia time. The small clamp is then removed off the artery. The surgery generally takes less than 3 hours.

To date, we have performed over 50 robotic partial nephrectomies. Urology of Indiana's experience represents one of the largest robotic series in the country. Additionally, we are privileged to have performed nearly 1000 other laparoscopic kidney surgeries in the past 5 years.

It is our belief, that the robotic technology enhances the ability to excise larger tumors and as well as tumors in complicated locations. In this "new age" of robotic



surgery, we can now offer minimally invasive and nephron sparing surgery to selected patients who might have otherwise undergone a total nephrectomy or open partial nephrectomy.

REFERENCES

¹Huang, WC, Leve AS, Serio AM, Snyder M, Vickers AJ, Raj JD, et al., Chronic Kidney Disease After Nephrectomy in Patients with Renal Cortical Tumors: A Retrospective Cohort Study, *Lancet Oncol.* 2006; 7:735.

²Go AS, Chertow GM, Fan D, McCollette CE, Hsu CY, Chronic Kidney Disease and Risk of Death, Cardiovascular Events and Hospitalization, *New England Journal of Medicine* 2004; 351:1296.



Jason K. Sprunger, M.D. is a graduate of Wabash College, Crawfordsville, Indiana, where he was awarded the Presidential Scholarship for Academic Achievement and where he received his BA in Psychology. After pursuing graduate studies in Biology at Purdue University, he earned his medical degree from the Indiana University

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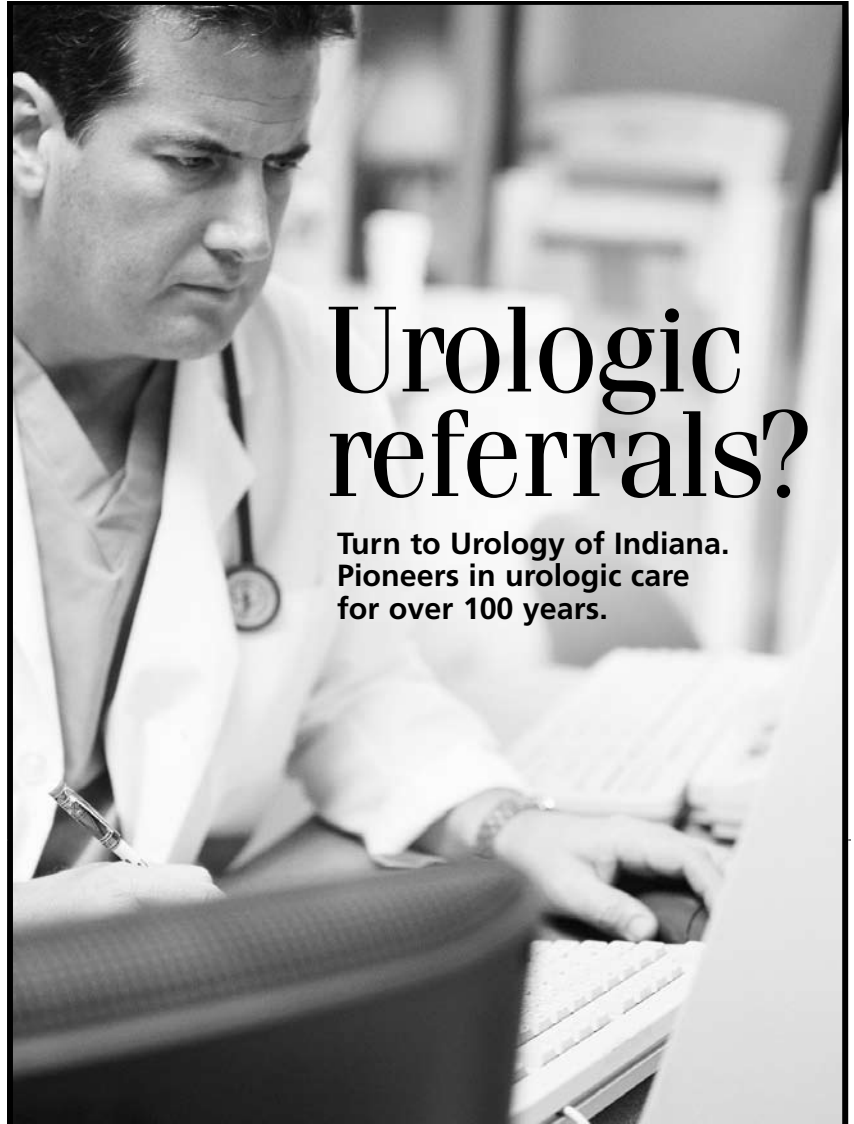
Dr. Sprunger is a member of the American Urologic Association, Vanderbilt Urologic Society, Endourology Society, and the American College of Surgeons. His areas of special interest include laparoscopic and endoscopic techniques in urologic surgery.



Robert A. Batler, M.D. is a graduate of Northwestern University, in Evanston, Illinois, where he received his BA in Psychology. He then earned his medical degree from the University of Illinois at Chicago College of Medicine. He completed his Urology residency at Northwestern University. He

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Dr. Batler is a member of the American Urologic Association and the Chicago Urologic Society. He is widely published and has been a presenter at the 20th World Congress on Endourology, the American Urologic Association 2001 and 2002 Annual Meetings, and the 2001 International Bladder Symposium. His areas of special interest include laparoscopic, robotic and endoscopic techniques in urologic surgery.



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