

Urologic Laparoscopy: Advancing a Tradition

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Laparoscopic kidney surgery offers patients a faster recovery



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Urology has a long tradition of employing minimally invasive surgery. This tradition continues in Central Iowa with the introduction of laparoscopic kidney surgery by The Iowa Clinic, P.C.-Iowa Urology.

Urology's involvement with minimally invasive surgery began with the invention of the cystoscope, a device that allows endoscopic inspection of the lower urinary tract (bladder and urethra,) in 1877 by Nitze.¹ In 1901, Kelling of Germany utilized a Nitze cystoscope to peer into the abdominal cavity of a dog. Jacobeus applied this technique to the human abdomen nine years later, and laparoscopy was born! Gynecologists adopted the new modality and slowly improved the techniques and instrumentation, though until the 1980's it was used primarily for diagnosis rather than therapeutic intervention.^{2,3} In 1988, F. Dubois of France reported the first laparoscopic cholecystectomy.⁴ That same year Winfield and Ryan in the U.S. began performing laparoscopic pelvic lymph node dissection (Lap-PLND) and other urologic procedures in animals.⁵ By late 1989, Schuessler of Germany performed the first Lap-PLND in a human.⁶

Despite Urology's long involvement with minimally invasive surgery, there was little interest in laparoscopy by urologists until the end of the 1990's. Over the course of the decade, laparoscopic nephrectomy (1990), varicocele ligation (1991), adrenalectomy (1992), prostatectomy (1995), pyeloplasty (1995), and cystectomy (1998) were reported.^{7,8} While these procedures could be performed by skilled laparoscopic urologic surgeons on an experimental basis, the safety, feasibility, and efficacy of the individual procedures had to be established, especially in comparison to their traditional open counterparts. The guiding principle in the development of these new minimally invasive surgical techniques was (and is) to maintain the established standards offered by a traditional procedure while offering patients decreased morbidity.

In the last 3-4 years, laparoscopic kidney surgery has emerged as a viable alternative to traditional open surgery. Both ablative and reconstructive procedures have been demonstrated to be efficacious and safe while offering substantially decreased morbidity in the form of decreased length of hospital stay, decreased requirement for narcotic pain medication, and a quicker return to work.⁹ An additional benefit is of improved cosmesis as a large flank or upper abdominal incision is unnecessary with laparoscopy.

Laparoscopic ablative procedures such as nephrectomy and partial nephrectomy are performed for both benign and malignant processes of the kidney. In the case of the latter, oncologic efficacy has been proven. The five-year survival rate for *organ-confined* tumors of the kidney is equivalent for open and laparoscopic radical nephrectomy and exceeds 90%.^{8,9} Laparoscopic reconstructive

procedures (primarily pyeloplasty for congenital or acquired obstruction of the ureteropelvic junction) are similarly equivalent to their open counterparts with success rates of 98%.¹⁰ Laparoscopic kidney surgery can be performed purely laparoscopically using instruments inserted through trocars (airtight sheaths that allow access to the abdominal cavity) or can be performed with a hand-assisted technique. Hand-assisted laparoscopy utilizes the surgeon's non-dominant hand inserted into the operative field through a hand-port device (fig 1) to facilitate tactile sensation, a three-dimensional spatial orientation, tissue palpation, blunt dissection, retraction, and intact organ retrieval. Both pure and hand-assisted laparoscopy have equivalent low morbidity but hand-assistance offers faster operating time and therefore less time under anesthesia for the patient.¹¹ Patients typically spend one to two days in the hospital after laparoscopic renal surgery and are allowed to eat the same day.

Figure 1



Of course, no surgical technique is universally applicable, and very large kidney tumors or those involving the renal vein or vena cava are not considered amenable to a laparoscopic nephrectomy. Furthermore, very complex anatomic variants or failed prior surgery is a relative contraindication to

laparoscopic reconstruction. Additionally, complex laparoscopic urologic procedures in children are limited due to the size of the currently available instruments and impaired mobility within the child's smaller abdominal cavity.

The future of laparoscopy in urology is truly exciting. Surgical robots are being studied as a tool to speed up and simplify certain complex reconstructive procedures and to facilitate those that were previously thought impossible. The development of laparoscopic versions of tried-and-true open procedures such as radical prostatectomy continues.^{12,13} While most operations can be done laparoscopically, not all should. Patient outcome should not be compromised in the name of "progress." Laparoscopic kidney surgery meets the stringent criteria of offering equivalent benefit to conventional open surgery but with less morbidity.

The Iowa Clinic, P.C.-Iowa Urology, is currently performing laparoscopy and other minimally invasive urologic procedures. Please call (515) 244-8000 for more information. ●

Works Cited

- Engel, RM et al. Milestones in Urology: Advances in patient care. AUA Office of Education, 2002.
- Gunning, JC. History of laparoscopy. In Phillips, JM (editor): Laparoscopy. Williams and Wilkins, 1977.
- Winfield, HN. Laparoscopic Surgery. In Taniguchi, EA and McAninch, JW (editors): Smith's General Urology 15th ed. McGraw-Hill, 2000.
- Dubois, F et al. Coelioscopic cholecystectomy. Preliminary report of 35 cases. Ann Surg 211:60, 1990.
- Winfield, HN and Ryan, KI. Experimental laparoscopic surgery: Potential applications in urology. J Endourol 4:37, 1990.
- Schuessler, WW et al. Transperitoneal endoscopic lymphadenectomy in patients with localized prostate cancer. J Urol 145: 988, 1991.
- Clayman, RV et al. Laparoscopic nephrectomy [letter]. N Eng J Med 324:1370, 1991.
- Albala, DM. Laparoscopy. In AUA Annual Review Course Book. AUA Office of Education, 2002.
- Matin, SF et al. Outcome of laparoscopic radical and open partial nephrectomy for the sporadic 4cm. or less renal tumor with a normal contralateral kidney. J Urol 168:1356-1360, 2002.
- Jarrett, TW et al. Laparoscopic pyeloplasty: the first 100 cases. J Urol 167:1253-1256, 2002.
- Sethi, M, et al. Hand-Assisted Laparoscopic Surgery. AUA Update 19(24):186-191, 2000.
- Steinberg, AP and Gill, IS. Laparoscopic radical prostatectomy: Progress, problems, and promise. Contemp Urol 14(5):34-49, 2002.
- Manon, M et al. Laparoscopic and robot assisted radical prostatectomy: establishment of a structured program and preliminary analysis of outcomes. J Urol 168:945-949, 2002.