For those undergoing cystectomy, a new option is being studied; minimally invasive, laparoscopic surgery using advanced technology, the "da Vinci" robot, which is approved for surgeries involving the abdomen, pelvis, and chest.

As with any operative technique, experience is crucial; if you are considering this option, be sure to inquire as to how many cystectomies the surgeon has performed using the robot. Is it in the clinical trial setting? Another possible drawback is the lack of long term data regarding cancer control. Though general consensus of researchers until now is that cancer control - the goal of any oncological procedure - does not appear suffer, the approach is too new to be certain at this point in time. Also, until the urinary diversion can be performed using the robot, much of the advantage offered by this technique in other cancer procedures is lost, since the surgeon does have to make an open incision (albeit a bit smaller) to perform this part of the procedure.

For younger people interested in the latest cystectomy techniques, be sure to ask if the surgeon is capable of doing the state of the art, orthotopic neobladder (which allows for normal voiding through the natural urethra), as reports indicate that more people undergoing robotic surgery end up with either the continent reservoir or the external bag.

Potential benefits of minimally invasive cystectomy using the da Vinci robot generally means less blood loss and less pain medication needed post-op. Recovery is generally shortened from 6-8 weeks to 2-3 weeks for the patient. The incision is smaller than with conventional, open cystectomy surgery and a shorter hospital stay is required.

Studies using the da Vinci robot for radical prostatectomy have shown better results with nerve-sparing, and it's hoped that this added benefit will translate over to cystectomy patients.

The surgeon is able to operate with more precision, and experiences less fatigue than when performing conventional cystectomy surgery. Visualization in 3D provides the surgeon with a better view of the operating field, and the robot's arm provides improved dexterity while performing bladder removal and reconstruction.

The surgeon's finger motions, conveyed through sophisticated joy sticks, direct the minute maneuvers carried out by two robotic hands holding surgical instruments. The surgeon views the surgery on a computer screen, which shows an enlarged and three-dimensional view of the surgical area. The images are transmitted by a tiny camera with multiple lenses, which is attached to a third robotic hand.

Data indicate that robot-assisted laparoscopic surgery has a shorter learning curve than conventional laparoscopic surgery, and that operative time can be reduced.1

**Surgeon Factors**

"There is a steep learning curve for advanced laparoscopic procedures &ndash; e.g. radical prostatectomy, cystectomy,
adrenalectomy etc. These procedures involve extensive reconstruction which is technically difficult to master laparoscopically without substantial experience. The robot allows the relatively less experienced laparoscopist to offer minimally invasive surgery with improved technical performance. The robot (e.g. daVinci®) with motorized camera arms contains two lenses, providing a steady tireless, nonfogging, 3-dimensional magnified image. The operating surgeon controls the camera. The camera images are absolutely stable at all times. Robotic instruments provide 7 degrees of freedom, closely mimicking the actual movements of the human hand and wrist. It allows for finer maneuvers in tight spaces and improves surgical precision. The 3D image and easily manipulated articulating instruments have shortened the learning curve for the laparoscopically naïve surgeon. The use of filters for hand/arm tremors and addition of motion scaling have helped the surgeon significantly” 2

Where is da Vinci?

At present, there are more than 300 robotic systems installed worldwide. Around 240 systems are installed in US. All the major cancer centers and major teaching hospitals have robots. The remaining 60 systems are installed in Europe - Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Sweden, Switzerland and the United Kingdom; Japan, Australia and Canada (St. Joseph's Hospital in London, Ontario). There are currently 6 centers using this technique in the U.K, 4 of which are part of the NHS.

Roswell Park Cancer Institute, New York; Experts from the urologic-oncology department -pioneering this technique since 2005 - are currently doing one of the largest series on the use of robotically assisted cystectomy for bladder cancer .

New articles:

March 2007:

Also, an article from this team on the use of da Vinci for female cystectomy patients in now in press (3-2007). Roswell Park Cancer Institute is the only designated cancer center in upstate NY. Dr. Khurshid A Guru, director of robotic surgery Vattikuti Urology Institute, Henry Ford Hospital, 2799 West Grand Boulevard, Detroit, MI 48202, USA; this team has published on this technique for women: Pub Med

October 2007

Robotic vs open radical cystectomy: prospective comparison of perioperative outcomes and pathological measures of early oncological efficacy Gerald J. Wang, Daniel A. Barocas, Jay D. Raman, Douglas S. Scherr; Department of Urology, New York-Presbyterian Hospital, Weill Medical College of Cornell University, New York, NY, USABJU International doi:10.1111/j.1464-410X.2007.07212.x

Summary: Case control study from one surgeon, comparing outcomes between 21 open surgeries and and 33 robotic cystectomies;

- The robotic cohort had decreased blood loss, reduced transfusion requirement but increased operative duration (390 vs 300 min, P = 0.03).

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- The time to resumption of a regular diet was 4 vs 5 days in favor of robotic surgery
- The hospital stay was 5 vs 8 days
- Overall the complication rates were similar (24% open, 21% robotic.
- There were three patients in the open group and two in the robotic with positive margins. The median number of lymph nodes removed was similar in the open and robotic cohorts - 20 vs 1

Conclusions: Robotic-assisted RC appears to offer some operative and perioperative benefits compared with the open approach without compromising pathological measures of early oncological efficacy, such as lymph node yield and margin status. Larger, randomized studies with long-term follow-up are required to confirm these findings and establish oncological equivalence. Pub Med Abstract

1. Technology Insight: surgical robots-expensive toys or the future of urologic surgery? N Peter Wiklund; Department of Urology, Karolinska University Hospital, 171 76 Stockholm, Sweden Nature Clinical Practice Urology (2004) 1, 97-102 doi:10.1038/ncpuro0055

2. SHAH G, HAAS G Using of daVinci Robot(R) in U.S. and Worldwide