

Treatment for Localized Prostate Cancer: Surgical Approaches

Eric M. Wallen, MD

Men who are diagnosed with prostate cancer face a dizzying and growing array of treatment options. These include watchful waiting, two forms of radiation, and three types of surgery. In addition, ever more therapies are entering the field of prostate cancer treatment, such as cryosurgery and high-frequency ultrasound therapy.

Each option comes with a set of risks, including inadequate treatment of the cancer, rectal problems, urinary incontinence, and erectile dysfunction. In the medical field, a great deal of controversy exists regarding the treatment of prostate cancer, and the patient is faced with a great deal of uncertainty when considering his treatment options. The patient's urologist and his primary care physician play crucial advisory roles in the patient's treatment decision. Ultimately each patient must navigate this complex process and make the decision himself.

Most, if not all, urologists are trained to be capable of discussing three major pathways for patients to consider once the diagnosis of prostate cancer is made. These are watchful waiting, radiation therapy, and surgery. Unlike many medical diagnoses, there is not an absolutely correct treatment for prostate cancer, and given this uncertainty, the patient (and his spouse or partner) must participate in the decision-making process. Notably, research has shown that most patients are comfortable in this role.¹

Watchful Waiting

Watchful waiting is an important option for urologists to discuss with patients and for patients to seriously consider. The rationale for watchful waiting is based on the high incidence but low mortality of prostate cancer in the United States. As of

2005, a man in the United States has a one in six chance of being diagnosed with prostate cancer during his lifetime.² However, due to the biologic nature of prostate cancer, most men are destined to die from other causes before they die from prostate cancer—the likelihood of a man dying from prostate cancer is approximately one in 34.² More than ever, it is becoming clear that many men do not need to undergo treatment for prostate cancer. Given the risks and the costs of treatment, watchful waiting is an important option to consider, both as a patient and for healthcare systems.

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Watchful waiting requires that patients have semi-annual examinations and testing for changes in the prostate-specific antigen (PSA) blood test. In addition, watchful waiting in healthy patients mandates that the patient undergo a repeat prostate biopsy to assess for changes in cancer grade and volume. This should be performed approximately one year after the initial biopsy.

Radiation or Surgical Treatment?

The next level of discussion regarding treatment for prostate cancer involves consideration of intervention in the form of radiation or surgery (i.e., local radical treatment in an attempt to cure what is expected to be organ-confined disease). Both radiation and surgery in all forms generally confer a disease-

Eric M. Wallen, MD, is Assistant Professor of Surgery at the University of North Carolina and Director of Urologic Laparoscopy at UNC Hospitals. Dr. Wallen can be reached at ewallen@med.unc.edu or CB# 7235 Chapel Hill, NC 27599-7235. Telephone: 919-966-9251.

specific survival of at least ten years. Of course, disease-specific survival varies greatly based on the individual patient's disease biology. Most patients with screen-detected prostate cancer have a disease with slow biological progression and can expect little, if any, impact on their lives for 15-20 years. A smaller proportion of patients have more aggressive disease as identified by PSA levels found in their blood and Gleason^a parameters and may indeed, succumb to the cancer.

Urologists are familiar with the efficacy and side effects of both radiation and surgical treatment, and they can discuss both with patients. Ideally, the radiation modality should be discussed with a radiation oncologist familiar with both brachytherapy (permanent or temporary implantation of the prostate with radioactive seeds) and external beam radiation therapy, so the patient may obtain a balanced view of his treatment options. It is well known that urologists, as surgeons, and radiation oncologists each favor their own treatment modality, and the best way for a patient to navigate this complexity is to discuss treatment with both specialists. However, many urologists perform brachytherapy and can discuss this treatment with the patient in terms of disease control and the potential side effects of lower urinary tract symptoms and erectile dysfunction.



Dr. Wallen controls the robotic instruments using sophisticated joysticks.

Surgical Options

Radical Retropubic Prostatectomy

The discussion of surgery for prostate cancer has become more complex in the past five years, as laparoscopic approaches to surgery have increased the number of surgical techniques available to the patient. The current standard of care, radical retropubic prostatectomy (RRP), has been performed and refined for several decades. This technique, also known as "open surgery," is performed through a vertical incision made below the umbilicus. Data on disease control and the two major functional outcomes, erectile dysfunction and urinary continence, are well known, and these complications are much less common than even ten years ago.³ Research into healthcare quality is also well defined and indicates that outcomes are better and complications are fewer at medical centers where many RRP's are performed.⁴ Similar findings have also

been demonstrated when looking at individual surgeons. In the community setting, this information may be difficult for the patient to obtain. Patients who research their treatment options usually learn that an important question to ask their urologist is how many RRP's he or she has performed and how often.

Laparoscopic Radical Prostatectomy

Laparoscopic techniques for performing radical prostatectomy have become more common since the start of the new millennium. Laparoscopy has supplanted open surgery for many surgical procedures, including gall bladder removal, appendectomy, adrenal surgery, Nissen fundoplication (a procedure to alleviate gastroesophageal reflux), and some gynecologic surgeries. Laparoscopic surgery is performed through buttonhole-sized incisions with the aid of a scope placed internally to visualize the operation. The major driving force for laparoscopic surgery is decreased pain and faster recovery; additional benefits are improved visualization of anatomic structures and cosmetic outcomes.

Initially, laparoscopic radical prostatectomy (LRP) was developed as a standardized series of steps by surgeons in France. Adoption of this technique worldwide was limited due to the difficulty in learning this procedure, and it was



At the robotic console, the surgeon views the operation through a 3-D viewfinder and controls the instruments.

^a The Gleason scoring system grades prostate cancer patterns from 1 (well-differentiated malignancy) to 5 (poorly differentiated malignancy). For more information see page 123 of Dr. Culley Carson's article in this issue of the Journal.

abandoned by many urologists after their initial efforts. At a small number of medical centers, however, the technique for LRP has been mastered and is the standard surgical treatment offered to patients. Data evaluating outcomes for cancer control, complications, continence, and erectile function show that LRP is equivalent to RRP in experienced, capable hands.³

Robotic-Assisted Radical Prostatectomy

Robotics came to the field at approximately the same time that laparoscopic prostatectomy was being attempted around the world. Surgical robotics was developed over the past two decades by the military, and private companies brought these instruments to the bedside in the late 1990s. Only one surgical robotic platform, the da Vinci® Surgical System, is in widespread use today, with approximately 300 of these systems in place around the United States. The major benefit of this instrument is that it makes LRP feasible for many more surgeons, by virtue of creating a three dimensional (3-D), immersive environment for the surgeon and providing instruments with superior manipulation. The downside of this tool is its cost—more than \$1 million—to individual hospitals and to the healthcare system in general.

Due to widespread purchase and use of the da Vinci® Surgical System, robotic-assisted radical prostatectomy (RARP) is rapidly becoming a new standard of care in the surgical treatment of prostate cancer. Access to the prostate is very similar to LRP, in the sense that small incisions are made to permit scope and instrument placement. However, the instruments used to perform the operation are controlled by a surgeon who sits away from the patient at a console. There, the surgeon looks into a viewfinder that provides 3-D visualization of the surgical field, and controls the instruments with sophisticated joysticks and foot pedals. Compared to traditional laparoscopic instruments, the robotic-controlled instruments have more flexibility to perform the delicate nerve sparing and sewing parts of the procedure. In addition, the robot eliminates tremor, thereby steadying the surgeon's hands.

Results from RARP appear to be at least as good as RRP and LRP, and some studies have claimed that oncologic and functional outcomes are even better.^{5,6} Compared to RRP, LRP and RARP have shorter hospitalizations and lower rates of blood transfu-

sion.⁷ The results of RARP, as with the other techniques, are best at medical centers where many of the procedures are performed.⁸ Indeed, patients undergoing surgery for prostate cancer by an experienced surgeon can expect to have an excellent chance for recovery of urinary control and baseline sexual function, regardless of the technique. Currently, the field of urology is witnessing patient migration to centers where RARP is performed, based on good results and effective marketing of the robot. I expect that over the next decade, robotic-assisted laparoscopic radical prostatectomies will become the most common surgery performed for patients with prostate cancer.

Conclusion

Prostate cancer as a disease entity is rife with controversy. As common as it is, it certainly does not warrant aggressive treatment in many patients. This is a difficult concept for physicians and patients alike to understand. Over and beyond the next decade, the option of watchful waiting will be further explored by researchers and recommended for more and more patients, spurred by the recognition that most prostate cancer is not lethal. The presence of newer surgical techniques should not obscure this, and urologists, as well as other physicians must recognize this.

At the same time, surgery for prostate cancer is in a state of evolution. The emergence of RARP as a less invasive option has encouraged more physicians and patients to consider surgical treatment. So how are patients supposed to make sense of these developments? Urologists play a crucial role in facilitating patient education through discussion, providing or recommending written material, and directing them to appropriate Internet resources. Patients should be made aware of all options, including watchful waiting, and should understand that the slow pace of the disease process allows them time to carefully consider these options. Patients should advocate for their healthcare by inquiring about the experience of their potential surgeon, investigating outcomes through prostate cancer support groups, becoming educated via media resources, and discussing options with their partner and other family members. At the conclusion of this process a patient is empowered to make a choice with which he is comfortable. **NCMedJ**

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