

LRP Goes Mainstream

Less painful, less bloody laparoscopic radical prostatectomy is favored over open radical prostatectomy.

By Arnon Krongrad, MD

Prostate cancer affects one in six men and kills approximately 500 male Americans every week. These numbers prove the necessity for effectively managing prostate cancer.

Theoretically, we can do this in three ways: prevent prostate cancer from occurring, cure it when it happens and cure it after it spreads.

Prevention, for all of its hype, simply isn't happening. The incidence of new cases still remains high. Likewise, even as some cases of metastatic disease are put into remission for years, cure is not possible. Early detection—using prostate-specific antigen testing and digital rectal examinations, combined with curative treatment—remains the solitary route to effective management.

Curative prostate cancer treatments, however, are emotionally and physically traumatic. Whether they're based in radiation or surgery, all manner of treatments for early-stage prostate cancer can bring complications, urinary and sexual dysfunction, pain, bleeding, inconvenience and long recovery. Furthermore, all treatments are associated with a possibility of failure.

But recent technical advances—specifically, laparoscopic radical prostatectomy (LRP)—have changed the landscape of curative prostate cancer treatment. In fact, the American Cancer Society states that laparoscopic radical prostatectomy has several advantages over the historical open radical prostatectomy, including less blood loss and pain, and shorter hospital stays. In experienced hands, patients who have laparoscopic radical prostatectomy can get out of the hospital after just an overnight, narcotic-free stay.

Difficulties of Staging

Quantifying risk is among the most-subtle and pervasive problems of counseling a man newly diagnosed with prostate cancer. This problem is partly explained by the imprecise nature of characterizing prostate cancer. Consider cancer stage, for example. We have every reason to believe that stage at diagnosis is associated with prognosis and that specific treatments work only at a specific stage; we have reason to measure stage before treatment. However, despite advances in imaging, we stage with imprecision.

Consider a common scenario: A 60-year-old man whose father and brother had prostate cancer now has a PSA of 11.0 ng/ml, a nodule on his right prostatic base and a biopsy showing bilateral Gleason 4+3=7 adenocarcinoma in five of six cores. In his case, 5 percent to 90 percent of individual cores are involved, which is associated with perineural invasion.

Measuring prostate nodules by -digital rectal examination notoriously is not reproducible. A biopsy like this may be read by another pathologist as Gleason 3+4=7 or Gleason 4+4=8, which carries different implications for stage. Perhaps the only truly reproducible measure is his PSA. A man with this tumor would be treated with the realistic chances of having organ-confined disease, tumor into fat, tumor into seminal vesicles and involvement of his lymph nodes. He goes into treatment with substantial uncertainty.

Compounding the problems of characterization is the lack of clarity about the relative merits of standard treatments. This problem originates in the absence of randomized, prospective comparisons of such modern treatments as radical prostatectomy and intensity-mod-

ulated radiation therapy. Even if such trials could be initiated, the required follow-up would take more than a decade, by which point technologies would change, and we would have to restart the studies.

Prostate cancer is common, progressive and often fatal. We typically can detect prostate cancer in early stages, but we do not precisely stage it when we do. The treatments can be curative, but are traumatic, and we're not sure which is best for which patient. Overall, managing prostate cancer is saturated with uncertainty and risk.

Birth of Laparoscopic Radical Prostatectomy

Prostate cancer surgery is done with radical prostatectomy and is complicated by the physical location of the prostate deep in the pelvis. Anterior to the prostate is the pubic symphysis, a rigid and tightly restricting structure that represents a bony cage within which to work. Moreover, the anatomical attachments of the prostate, including the pubo-prostatic ligaments, are recessed so they're often hidden from view. As these ligaments are cut, the surgeon must take care of a venous plexus that can transmit copious amounts of blood.

Many of the anatomical requisites of radical prostatectomy are further complicated by varying and subtle anatomy. Unlike the kidney, the prostate varies enormously in size and shape. Some prostates weigh 10 grams while others weigh more than 150 grams. Some are shaped like simple cones and others have enormous, pedunculated, intravesical lobes hanging from them. Moreover, the junction of prostate and bladder, unlike the junction of kidney and psoas muscle, is poorly defined and covered in fat. The anatomy of the nerves abutting the prostate, the preservation of which can improve return of erections, is also poorly defined.

For these and other reasons, prostate cancer surgery has historically been technically challenging, bloody, painful and associated with dysfunction. Therefore, most surgeons do few, if any, prostate cancer operations.

In the early 1990s, abdominal laparoscopy entered the field. Urology led the specialties in using operative scopes, as was the case with operative cystoscopy and, later, nephroscopy. However, abdominal laparoscopy languished due to few applications. There was sporadic use in prostate cancer staging, as in laparoscopic lymphadenectomy, but little else.

Laparoscopic radical prostatectomy was first described in an abstract in 1992.¹ At that time, only two cases had been completed, and forming the vesicourethral anastomosis was exceedingly time-consuming. Indeed, equipment for suturing in the early 1990s was rather crude, and the needle holders commonly did not firmly grip the needle. Likewise, experience in intracorporeal and extracorporeal knotting was still in its earliest stages. From 1992 to 1996, no information was published on laparoscopic radical prostatectomy.

In 1996, Price et al. reported laparoscopic radical prostatectomy in the dog model.² Among six dogs, four had a good outcome. Also in 1996, Raboy et al. completed a clinical case of extraperitoneal radical prostatectomy; negative margins and excellent continence were reported.³ In 1997, Schuessler et al. formally published their early experience.⁴ To this point, no one had published a clinical series, and laparoscopic



The American Cancer Society projects 27,050 prostate cancer deaths in 2007. Divide this number by 52 weeks in a year, and more than 500 American men will die per week from this disease. Source: American Cancer Society.

radical prostatectomy went into a decade of dormancy.

In the late 1990s, a duo of French surgeons in Paris resurrected laparoscopic radical prostatectomy and began to refine the technical aspects. In 1999, with this duo, I published the technical manual for laparoscopic radical prostatectomy and opened the first North American program for its application. Despite faltering steps and obstacles early in its development, laparoscopic radical prostatectomy is increasingly in use and standardized. In the words of the American Cancer Society:

"Laparoscopic prostatectomy has advantages over the historical open radical prostatectomy, including less blood loss and pain, and shorter hospital stays and recovery times. In experienced hands, laparoscopic radical prostatectomy is as efficient as open radical prostatectomy — laparoscopic radical prostatectomy is associated with greater precision and control than open radical prostatectomy — the factor most determining clinical success is the surgeon's experience, commitment and focus."

Laparoscopic Radical Prostatectomy Advantages

Laparoscopic radical prostatectomy offers several advantages over open radical prostatectomy. The latter is often bloody and done with cell savers and transfusion of autologous blood. Laparoscopic radical prostatectomy, on the other hand, is associated with minimal blood loss. In my hands, for example, the average blood loss is 50 ccs. As of this writing, it has been more than five years since a laparoscopic radical prostatectomy patient had a transfusion of any kind.

The benefits of pain reduction are equally impressive. Contrasted with open pelvic surgery, laparoscopic radical prostatectomy is not associated with the need for narcotic analgesia. On average, my patients take two acetaminophen tablets in the first 24 hours.

Moreover, laparoscopic radical prostatectomy is associated with reduced bleeding, operative volatility, post-op anemia, transfusion reactions and narcotic side effects. This makes laparoscopic radical prostatectomy a cleaner, safer, more pleasant operation than open rad-

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ical prostatectomy. Almost all patients are ready for discharge after an overnight stay. Most are ready to drive within two to three days.

In experienced hands, laparoscopic radical prostatectomy takes, on average, two hours. Analysis shows that obesity and prostate size are individually associated with operative time. Thus, in thin men with small prostates, I have done laparoscopic radical prostatectomy in as few as 80 minutes. My heaviest patient, who weighed 350 pounds, took considerably longer. Like most patients, however, he was discharged after an overnight stay in the hospital.

Potential Complications of

Laparoscopic Radical Prostatectomy

As with any treatment, laparoscopic radical prostatectomy is associated with risk, which falls into the following categories:

Cardiovascular. Laparoscopic radical prostatectomy is major surgery and requires general anesthesia. In the background is the risk of thrombi, emboli, myocardial infarction, stroke and death. Any patient at risk for these complications, (e.g., the obese and people with diabetes) requires special attention, such as a stress test.

To minimize the risk of these complications, I do laparoscopic radical prostatectomy with patients in the Trendelenburg position, wearing venous compression devices. Because laparoscopic radical prostatectomy is associated with little blood loss and pain, I routinely give my patients preoperative LMW heparin. This offers an extra layer of protection for patients with specific problems, such as atrial fibrillation.

Conversion. All endoscopic surgery is associated with the risk of having to convert to open surgery. This risk increases with previous abdominal surgery and decreases with surgeon experience. In my hands, the non-conversion rate stands at 99.9 percent.

Infertility. This is the most common complication, occurring in all cases, but the most overlooked. For most patients, this is a nonissue. Nevertheless, there is no reason to assume that a man with prostate cancer doesn't want children. Therefore, we should mention the opportunity to bank sperm.

Infection. Urinary tract infections can occur in rare cases and are easy to treat. I have not seen wound infections. One patient was readmitted with sepsis, which was effectively treated. His pathology report showed prostatic abscess.

Injury. The pelvis is a complicated region. Laparoscopic radical prostatectomy can be associated with injury to adjacent organs: rectum, ureters, iliac veins, to name a few. The likelihood of injury drops with surgeon experience and increases with histories of radiation and infection. Previous surgery can complicate laparoscopic radical prostatectomy. For example, a hernia mesh can fix tissues and make maneuvering stiff. However, laparoscopic radical prostatectomy is feasible, at times through extra-peritoneal paths, even after such complicated abdominal surgery as repair of abdominal aortic aneurysm, pancreatic resection and colectomy.

Incontinence. We do not understand variations in recovery of continence. While it's unlikely that incontinence will be permanent, almost all men have temporary incontinence. Some have none at all. In most

cases, nocturnal continence returns first, and morning continence returns before evening continence. During the period of incontinence, patients can help manage the problem by limiting intake of fluids and emptying their bladders regularly.

Pain. By general surgical standards, peri-operative pain is mild and resolves quickly. Many patients develop longer-term but uniformly transient perineal pain. This type of pain is relieved by lying down, and taking hot baths and anti-inflammatory medication.

Scar. Laparoscopic radical prostatectomy requires suturing of the bladder to the urethra. The suture line forms a scar, which holds the organs together when the suture material dissolves. In rare cases, the scar forms so densely that it interrupts the flow of urine. This is known as a bladder neck contracture, which is remediable by numerous means, including simple incision.

Erectile dysfunction. Sensation and orgasm are not affected, but erectile capacity can be affected. Preserving the neuro-vascular bundles maximizes the return of function, but it doesn't guarantee it because structure and function are not perfectly correlated. In this light, and given that most patients emphasize this concern in their decision-making, many variables affect the likelihood of erection return: age, baseline function, illness (diabetes), smoking history, obesity, aerobic condition, mood, fatigue and other factors.

In the postoperative period, doctors can play a critical role in helping patients cope with dysfunction. This role takes on special prominence in the context of incontinence and impotence. Both are replete with high expectation, frustration and misconception.

Factors to Stress

Almost all men recover continence after laparoscopic radical prostatectomy. However, the rate of recovery varies enormously from man to man. I uniformly share this with patients before surgery. But postoperative incontinence seems to eliminate any recollection of this discussion. No matter the pre-op discussion, men hate incontinence and want it to stop immediately.

In this light, we must stress several things. First, incontinence resolves in almost all cases. Second, return of function varies by period of the day. Stress that nocturnal continence returns first, and morning continence returns before evening continence. Thus, the appearance of one is usually a signal of the next, serving as a sign of progress.

We should help patients understand observations that have prognostic meaning. We also should recognize that in patients with perineal discomfort, continence is slow to appear. In this, perineal discomfort and its resolution can serve as a measure of progress.

In a similar fashion, a urinary stream is a sign of progress because it defines the bladder's capacity to store urine: No storage, no stream. Patients don't think in these terms but find meaning and hope when these concepts are explained to them.

Patients also focus heavily on erectile dysfunction. In this, a loving and supportive partner becomes a key ally in the coping strategy. Still, men who functioned well before surgery often become anxious when they don't function well after surgery. As with continence, it's useful to know the dynamics of return of function and to identify variables that can be modified to help

men in this area.

Most patients and, indeed, most doctors, don't understand that erections return on a dynamic that varies from that of return of continence. Erections almost always return after continence is restored, which is usually after the patient feels fine.

Indeed, I can remember only one reverse case, a 39-year-old man who had his first postoperative erection three days after surgery, with his catheter still in place. Nobody knows the reason for these varying rates of recovery.

Furthermore, most patients and doctors seem to believe that erections return in the first few months after surgery, or never. This pervasive belief is problematic for two reasons. First, it raises unrealistic and frustrated expectations, which lead to anxiety and depression.

Second, it can lead to premature, irreversible and unneeded interventions, such as placement of penile prosthesis. We must vigorously guard against unwittingly introducing unrealistic expectations to our patients.

In many cases, patients report return of function in the second year after laparoscopic radical prostatectomy. This phenomenon has been reported to me by numerous patients and has this year been documented and reported in endo-urological meetings. In managing postoperative erectile dysfunction, patience is indeed a virtue.

Prostate cancer surgery is unpleasant, scary and risky under the best of circumstances. However, laparoscopic radical prostatectomy reduces the pain and bleeding associated with curative prostate cancer treatment. In the right hands, patients can get out of the hospital after just an overnight stay, quickly getting back on the road to recovery.

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REFERENCES

- Schuessler WW, Kavoussi LR, Clayman RV, Vancaille TH. Laparoscopic radical prostatectomy: initial case report. *J Urol.* 1992;147:246A.
- Price DT, Chari RS, Neighbors JD, Eubanks S, Schuessler WW, Preminger GM. Laparoscopic radical prostatectomy in the canine model. *J Laparoendosc Surg.* 1996;6:405-412.
- Raboy A, Ferzli G, Albert P. Initial experience with extraperitoneal endoscopic radical prostatectomy. *Urology.* 1997;50:849-854.
- Schuessler WW, Schulam PG, Clayman RV, Kavoussi LR. Laparoscopic radical prostatectomy: initial short-term experience. *Urology.* 1997;50:854-858.