Robotic Prostatectomy and Obesity

This modality is gaining in acceptance, but its pluses and minuses for obese patients is unclear.

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DURING THE PAST eight years, the use of robotic-assisted laparoscopic prostatectomy (RALP) for prostate cancer has grown tremendously and at a pace almost unparalleled in modern surgery. Current estimates indicate that half of all prostatectomies done in the United States are done robotically, and that figure is likely to increase as more and more surgeons gain robotic experience. An abundance of reports in the literature tout the technical advantages of robotic surgery. Many of those reports pertain to various technical aspects of robotic surgery as it applies to radical prostatectomy (RP). Now that most urologists have accepted some role of robotics in the surgical treatment of prostate cancer, it is important to get back to discussing many of the oncologic and disease-related aspects of this malignancy. One area that has received considerable attention over the past few years is the impact of obesity on both robotic surgery and prostate cancer itself. According to current estimates, more than 30% of the U.S. population is considered to be obese (BMI >30 kg/m2) and more than 70% of men over the age of 40 are obese or overweight. These numbers will likely continue to rise over the next several decades. An aging U.S. population means that urologic practitioners will begin to see more and more patients with prostate cancer who meet World Health Organization (WHO) criteria for obesity.

Obesity’s effect on prostate cancer

Reports regarding obesity and its impact on pathologic variables in prostate cancer abound. Although a true consensus has not been reached, it is generally agreed that obesity is a negative risk factor in prostate cancer. In particular, obesity has been found to be an independent factor associated with aggressive prostate cancer and risk of disease-related death (NEEngl J Med. 2003;348: 1625-1638).3 Further, obesity is associated with higher Gleason score, an increased rate of positive surgical margins, and a higher progression rate in patients with a low likelihood of recurrence following therapy (e.g., JClin Oncol. 2004;22: 439-445; J Urol. 2005;174:919-922; and Urology.2005;66:1060-1065). In addition, while investigating the effect of BMI on primary treatment of cancer, Davies et al found that PSA screening is less effective in obese patients (Urology.2008;72:406-411). Not everyone is in agreement, however. A 10-year study at the Mayo Clinic followed more than 5,000 men who underwent RP. The researchers found that while a higher BMI was associated with worse pathologic features at the time of surgery, BMI was not an independent prognostic variable for biochemical recurrence or disease-free survival (Cancer. 2006; 107:521-529). Other investigators have shown that
obesity is associated with higher pathologic grade and stage but not with biochemical failure after prostatectomy (Urology. 2008; 72:1106-1110). There exists some evidence in Europe as well that an elevated BMI is not associated with worse clinicopathologic outcomes. A recent study evaluated 1,538 consecutive patients treated by open RP; 11% had a BMI greater than 30 (Urology. 2008; published online ahead of print. Results showed that elevated BMI was unrelated to extracapsular disease, seminal-vesicle invasion, lymph-node metastases, or positive margin rate. This raises the possibility of differences between obesity in Europe and obesity in the United States. Additionally, other factors not appreciated in Europe may be contributing to worse pathologic features in this country.

**Impact of obesity on RALP**

While we await further analyses regarding obesity and prostate cancer, including an investigation into specific dietary factors (e.g., saturated fats, soy intake, selenium, red wine, etc.), we must be prepared to manage the growing number of obese patients receiving this diagnosis. Urologists will surely encounter obese patients and must be ready to counsel them and direct them toward appropriate treatment. Robotic surgery is obviously at the forefront of prostate cancer management, but most patient counseling today centers around anecdotal accounts and personal physician experience without any true understanding of the impact of an elevated BMI and RALP. The table below depicts the international experience with RALP in obese individuals. The data clearly show that robotic prostatectomy can be accomplished in patients whose BMI is greater than 30 without any significant increase in morbidity compared with patients whose BMI is 25 or less. There is certainly a trend toward longer operative time, increased blood loss, and a higher complication rate with the higher BMI, although most differences are not statistically significant. In addition, most of the reported experience in the table on page 11 is from quite early in the process, as the institutions began to undertake RALP. With growing experience, the differences between obese and nonobese patients will become indistinguishable. What is most apparent from the table are the higher rates of positive margins in obese men undergoing RALP. This is in line with the experience in open RP. One would expect, now that experience with RALP has grown, that the increase in visualization and magnification would translate into a lower rate of positive margins. And yet positive margin rates are nearly double in obese patients as compared with normal-weight individuals undergoing RALP. Whether these positive margins are biologic (associated with extracapsular extension [pT3a]) or iatrogenic (not associated with extracapsular extension [pT2]) is unknown. If the majority of positive margins turns out to be pT2, then one would expect that the physical state and anatomic layout of obese patients precludes adequate surgical resection. Further analysis is warranted in this area, but with growing robotic experience in large-volume centers, the positive margin rates between obese and non-obese individuals will likely become similar.

**Surgical outcomes in the obese**

Published data on functional outcomes related to obesity and prostate surgery
are much scarcer than data on the impact of obesity on prostate cancer itself. Researchers at the University of California at Irvine report that obese patients had a slight delay in recovery as compared with nonobese men (Urology. 2005; 65:740-744). In particular, BMI was found to be an independent predictor of return to continence at six months. Additionally, urinary bother scores were significantly worse for obese patients. Results on erectile function were too premature to report in this analysis. At the University of Chicago, investigators observed no difference in return to continence for obese patients vs. nonobese patients. In fact, obese patients subjectively had the best continence rates until 12 month (Urology. 2006;67:774-779). The research group observed no difference in return of sexual function in obese patients as compared with nonobese men. The largest reported analysis of the effect of an elevated BMI on RALP is from the Mayo Clinic (J Endourol. 2008;22:1471-1476). After following patients for a median 1.3 years, the group at Mayo reported that 93.8% of men in the obese cohort were continent at one year and no individuals required a secondary procedure for incontinence. Again, there was no difference as compared with the nonobese group in this series. Of the patients in the Mayo analysis who had preoperative potency and for whom data were available, 69% of obese patients reported potency at one year as compared with 80.6% of normal weight individuals. It is worth noting that this analysis was performed with a non-validated institutional questionnaire. More mature data and further analysis in this area will help define the functional outcomes of obese patients undergoing RALP in the future.

Treatment decisions

One area that is quite interesting concerns the role obesity plays in treatment decisions of prostate cancer. In an analysis of the Cancer of the Prostate Strategic Urologic Research Endeavor (CaPSURE) database undertaken during their previously described study, Davies et al looked at the odds ratio of receiving each type of prostate cancer treatment as compared with RALP according to BMI categories. In this cohort of 5,041 men, approximately 21% met the criteria for obesity. The likelihood of a physician and/or patient choosing a nonsurgical form of treatment clearly increased as BMI increased. Whether this is the result of the obese patient’s opting for nonsurgical therapy or physician bias, more obese individuals are receiving nonsurgical therapy than their identically matched nonobese cohorts.

Data yet to come

The reported experiences of RALP as it relates to obesity are limited and suffer from several deficiencies. First, all the reported data are retrospective. There has never been a prospective, randomized study comparing obese vs. nonobese patients, and there has never been a comparison of open RP vs. RALP as the two relate to obesity. Second, most of the reported series are an early snapshot of each institution’s robotic experience. Many, if not all, of the institutions listed in Table 1 now have a quite robust experience in RALP, and current perioperative parameters and functional outcomes may very well be different, since we know that the learning curve is important (Eur Urol. 2007;52: 1090-1096; Eur Urol. 2006;49:866-872; and Urology...
2007;70:96-100). Third, at this point, most of the functional outcomes following RALP as they relate to obesity are limited and lacking in the use of consistent, validated questionnaires. Despite these drawbacks, I suspect that in the next year, emerging data will shed new light on the functional results of RALP in obese patients. For patients with a BMI greater than 30 who are diagnosed with prostate cancer, numerous surgical treatments are now available. Practitioners can choose between open RP, RALP, laparoscopic prostatectomy, and perineal prostatectomy. Thus far, there is insufficient evidence in the literature to support one form of surgical therapy over another, and the decision should rest with the experience of the individual surgeon. As experience with RALP grows, however, we will learn more about its potential advantages and disadvantages in men with prostate cancer who meet the WHO criteria of obesity.

![Table of Comparing Robotic-Assisted Laparoscopic Surgery in Patients with a BMI of 30 vs. a BMI 25 kg/m²](#)