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# Outcomes for Radical Prostatectomy: Is It the Singer, the Song, or Both?

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Radical prostatectomy is one of the many treatment options available to men with clinically localized prostate cancer, and it may be the preferred option for some on the basis of cancer risk and patient age, comorbidity, and preferences.<sup>1</sup> The procedure is associated with excellent cancer control rates. Overall prostate cancer–specific survival at 15 years after prostatectomy has been shown to be approximately 93%; even for those with advanced stage (T3, N+) and/or high-grade disease (Gleason grade 8-10), that figure is 63% to 74%.<sup>2</sup> Radical prostatectomy is the most highly used treatment for prostate cancer, with approximately 40% to 50% of men selecting this treatment initially.<sup>3</sup> The procedure can be performed by using various approaches, including retropubic, perineal and laparoscopic approaches. Laparoscopic prostatectomy can be facilitated by using robot assistance. Until recently, the vast majority of prostatectomies were performed using the open, retropubic approach, whereas the past decade has witnessed a rapid uptake of robot-assisted radical prostatectomy (RARP) nationwide.

The robot is impressive technology, allowing the surgeon to sit at a console and direct a camera and two or three laparoscopic arms with six degrees of wristed motion for cutting, retracting, cauterizing, or suturing—all with high magnification and three-dimensional visualization. However, technology that is rapidly adopted should have clear benefits—increased effectiveness, less morbidity, more accessibility, and/or decreased cost. Many argue that the increased use of robotic technology may not be primarily driven by such benefits but rather by heavy marketing, whether by the company that produces the technology, by hospitals that have acquired it (at high cost), or by physicians who promote it to gain market share. Hospitals that acquire a robot appear to have the largest increases in surgical volume.<sup>4,5</sup> Indeed, a review of hospital Web sites demonstrates a mix of manufacturer and hospital claims of superior outcomes for robot-assisted surgery, without disclaimers regarding the limitations of existing outcomes data.<sup>6</sup> The problem of potentially misleading marketing is by no means unique to robot-assisted surgery; similar marginally founded claims are frequently made about other treatments as well.

Although the number of prostatectomies performed has increased, the location and costs of installed robotic systems has centralized care. Whereas outcomes may be improved, centralization leads to decreased access resulting from longer travel times, which disproportionately affect patients with limited financial means.<sup>7</sup> RARP also tends to be more costly; on average, robotic surgery adds approx-

imately \$2,200 (20%) to the cost of a prostatectomy as a result of increased supply costs and operating room time.<sup>8,9</sup> To be fair, though, these costs should also be compared with those of other treatment alternatives, such as intensity modulated radiation (IMRT) or proton-beam therapy, whose costs—both capital and marginal—are far greater.<sup>10</sup>

If more efficient care, increased access, and lower costs are not driving the greater use of robotic surgery, then what is? There is no question that RARP is associated with less blood loss, lower transfusion rates, and slightly faster convalescence.<sup>11,12</sup> It appears to be essentially equivalent to open surgery in terms of cancer control rates.<sup>13,14</sup> The critical question, however, is whether RARP compares favorably with open surgery in terms of patient-centered health-related quality-of-life outcomes. In the article that accompanies this editorial, Barry et al<sup>15</sup> are the latest to suggest that it may not. Using a population of patients drawn from a 20% Medicare sample, the authors assessed urinary and sexual bother after open prostatectomy and RARP, reporting a nonsignificant trend toward greater urinary bother and equivalent sexual bother after RARP compared with open prostatectomy.

Although methodologically much more sound than an earlier analysis that tried to determine health-related quality-of-life outcomes on the basis of claims data alone,<sup>16</sup> the study by Barry et al<sup>15</sup> still has significant limitations, many of which are acknowledged by the authors. Given the use of a Medicare data set, all patients were 65 years of age or older. All operations were performed in 2008, when many surgeons may have been climbing the RARP learning curve. There was no baseline functional assessment, and as the authors note, the two groups may not be comparable in that respect. Results are further clouded by the authors' use of a brief, dichotomized instrument that assessed only bother rather than both function and bother using a standardized, validated instrument such as the Prostate Cancer Index (PCI)<sup>17</sup> or the Expanded Prostate Cancer Index Composite (EPIC).<sup>18</sup> Patient perception of bother is clearly a key outcome of interest and may associate best with use for health outcome states. However, bother does not correlate perfectly with functional outcomes<sup>19</sup> and may also reflect baseline function and pretreatment expectations. Whether resulting from misleading advertising or counseling or simply from misplaced faith in technology, men opting for RARP tend to have higher expectations than those undergoing open surgery and

have been shown to be more likely to regret their decision postoperatively, even controlling for their functional outcomes.<sup>20</sup>

Despite these limitations, the results are sobering given that both rates were high for both types of surgery. Does this mean that men cannot expect improvements in surgical outcomes for prostate cancer? The answer is resoundingly no. Outcomes for any prostate cancer treatment are based not only on the technology but also on the skill and experience of the provider and the hospital system. A substantial body of literature confirms that provider and facility practice volumes are associated with improved patient outcomes.<sup>21</sup> Currently, low-volume surgeons provide a large proportion of prostate cancer care; a recent study defined high-volume surgeons as those performing only 24 surgeries or more annually.<sup>22</sup> Surgeons performing fewer than 5 prostatectomies per year account for approximately half of the national volume, whereas those performing more than 30 annually account for only 20% of the overall volume.<sup>23</sup> Although the exact learning curve for robot-assisted surgery remains unclear, it has been estimated that high proficiency in this technique may require that more than 200 surgeries be performed.<sup>24</sup> Of course, there is also a learning curve for open surgery—one that may be as long or even longer—and practice volume and learning curves surely affect outcomes of nonsurgical treatments as well.

Given these concerns, the hypothesis that RARP is superior to open surgery has not been adequately tested and remains a high priority, as noted by the Institute of Medicine in their ranking of top national priorities for comparative effectiveness research.<sup>25</sup> Although a randomized trial would be the preferred tool to answer this question, such a trial would be unlikely to accrue at this point. However, multiple contemporary, prospective studies currently underway in a variety of clinical contexts will fully and accurately compare outcomes across surgical approaches. Considering the favorable outcomes reported by high-volume surgeons using RARP, the procedure should not be dismissed as surgeons and patients consider options for newly diagnosed prostate cancer. The robot will not transform a bad surgeon into a good one,<sup>26</sup> but it may help high-volume surgeons further improve their outcomes and ultimately shorten the learning curve for surgeons in training and early in their careers.

Although the article by Barry et al<sup>15</sup> focuses on the outcomes of prostate cancer surgery, it should be noted that all treatment modalities require greater scrutiny in terms of their outcomes (functional and oncologic) and their costs and appropriateness. For most prostate cancer disease states, there remains insufficient evidence to definitively recommend one treatment option over another.<sup>27</sup> In addition, widespread screening and rescreening with serum prostate-specific antigen has resulted in a profound downward risk migration.<sup>28</sup> Many patients with low-risk disease may not need any definitive treatment, yet they are the ones classified by some as ideal cases for RARP. This trend toward overtreatment leads to unnecessary morbidity endured by patients and additional expense to an already strained health care system.<sup>29</sup> Conversely, some men with higher-risk disease who are likely to benefit most from surgery are the least likely to receive either surgery or radiation on the basis of their age alone.<sup>30</sup>

The ready availability of technology should not be a reason to apply it, particularly for those whom it may not benefit. Indeed, a higher-order priority on the Institute of Medicine's priority list for comparative effectiveness research is comparing *all treatments* for localized prostate cancer. The concerns and issues raised by Barry et al<sup>15</sup> are hardly unique to surgery, given that IMRT and proton-beam

therapy also entail morbidity and greater cost. Indeed, the question at the end of the article regarding whether Medicare should cover RARP is, if anything, more relevant to novel radiation techniques, given that although additional costs of robot-assisted surgery are mostly absorbed by hospitals with small increases in reimbursement compared with open surgery, IMRT and proton-beam therapy are reimbursed at much higher rates by Medicare and other payers than either conventional radiation or surgery by any approach.

Treatment decisions should be driven by cancer risk and patient preferences for outcomes rather than by financial incentives or availability of technology, be it a robot or a proton accelerator. If clinicians aim to improve the quality, effectiveness, and efficiency of prostate cancer care in the United States and to retain control of disease management in an era of increasingly concerned regulators, we must begin collecting and disclosing patient-reported, risk-adjusted outcomes prospectively across multiple treatment modalities, facilities, and individual providers, and we should advocate for a health care system that rewards quality and efficiency rather than volume and technology alone.

#### AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

The author(s) indicated no potential conflicts of interest.

#### AUTHOR CONTRIBUTIONS

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