Robotic Prostatectomy Improves Outcomes—After the Potentially Risky Adoption Phase

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By Christopher J. Kane, MD [1]

In summary, both RALP and ORP are excellent operations in experienced hands. They are also technically difficult to perform consistently well, so in my view, surgeons should attempt to master the operation they perform rather than hastily switching to robotic surgery, unless they have an opportunity for significant mentorship and surgical volume.

I am glad to comment on position papers by Dr. Moul and by Drs. Patel and Sivaraman concerning the current status of robot-assisted laparoscopic radical prostatectomy (RALP) and open retropubic radical prostatectomy (ORP). It is interesting that two well-informed prostate cancer surgeons have such different perspectives on the relative merits—or lack of merit—of RALP. There is some validity to both sides of the question.

I think the most concerning aspects of the launch of robotic surgery were in two domains. The first was its aggressive marketing by hospitals and physicians, supported by industry, who oversold the relative merits of RALP during the early-adoption phase. Dr. Moul highlights this in his article. I differ from Dr. Moul somewhat in that I think much of the enthusiasm for robotics was sincere and was based on the hope that the new technology would improve outcomes for patients. However, the enthusiasm and pace of early adoption clearly outstripped the high-quality comparative literature that supported an advantage for RALP over ORP. This phenomenon of new technology being adopted prior to the availability of high-quality comparative literature is well described and has been seen with other new medical devices.[1] Wilson discusses a number of examples in neurosurgery in which overenthusiasm and adoption prior to good quality data led to patient risk and ultimately to abandonment of the new technology.

Concerning RALP, there is some evidence that the early-adoption phase was associated with higher rates of complications and worse patient safety indicators. Parsons et al recently examined the Nationwide Inpatient Sample (NIS) and found that at the “tipping point” of adoption, defined as about the 10% market saturation level, there was an increase in patient safety events, suggesting that during the adoption phase robotic surgery was “less safe.”[2] Interestingly, the same analysis now suggests that RALP is “more safe” than ORP—presumably because surgeons are now beyond their learning curve. The data supporting the increased safety (fewer complications, readmissions, and deaths) of robotic surgery is growing. Yu et al examined costs and outcomes of robotic, open, and laparoscopic surgery and found that compared with open surgery, robotic surgery was associated with fewer complications, shorter length of stay, fewer blood transfusions, and fewer deaths; however, it was more expensive.[3] Kowalski et al compared RALP vs ORP in a 100% Medicare sample and found again that RALP was associated with fewer blood transfusions, shorter length of stay, and fewer postoperative deaths than ORP.[4] In their analysis, it appeared that ORP complications increased between 2003 and 2007, perhaps due to the migration of high-volume surgeons to robotic surgery, or perhaps because the open surgeons were doing fewer cases. So we must acknowledge that new technology presents significant risks in the early adoption phase—even new technology, like robotics, that ultimately improves patient safety and outcomes.

The second domain in which I think we must learn from our experience with robotics is in the training and credentialing of new users. Soon after Dr. Menon and others published their impressive early experience with robotic prostatectomy,[5] many individual surgeons got trained (console certified) and began performing robotic surgery, often with the proctorship of an experienced surgeon. However, the early proctors, many of whom had relatively little experience, were actually acting as “coaches” to inexperienced surgeons, rather than as proctors, who act as assessors of competency. Too often, the number of “proctored” cases was only two, and the newly trained robotic surgeon was operating independently with very little laparoscopic or robotic experience, within weeks of initial console training. Also, in these proctored cases, if there was poor progress or a complication, the proctor was essentially unable to assist since the proctors were often not credentialed at that
particular hospital. A number of professional organizations recognized the problems associated with training and certifying competency, and published excellent recommendations for robotic credentialing.[6,7] However, credentialing is a local hospital activity, so standards have varied widely. Competency assessment, training, and credentialing procedures are areas that sorely need improvement and more research and validation.

I think Dr. Moul’s argument that RALP is potentially more invasive because it enters two body cavities is not supported by any relevant increase in complications for RALP. Also, the argument citing the “tactile feedback superiority” of ORP, in my view is also not valid, since if tactile feedback improved clinical outcomes one would anticipate lower positive margin rates or improved sexual function outcomes with ORP, and I don’t think evidence of such results exists. The main drawback of robotics compared with open surgery remains cost. Although decreased blood transfusion risk and decreased hospital stay can diminish the difference, most recent studies confirm significant increased costs with the robotic approach.[3,8]

The discussion concerning the training of residents and fellows is interesting. I think that laparoscopic and robotic training are different from training for open surgery, with both benefits and downsides. The benefits are the great imaging and magnification and the fact that the operative field and surgical maneuvers are very well seen by all of the assistants and trainees. However, the primary console surgeon is most “in control,” even though the instructor can certainly guide the trainee by being the bedside assistant, or through the telestrator function, or by the new dual-console robotic system. I believe I can instruct trainees in both approaches equally well, although there are certainly differences between robotic and open instruction. The ethical considerations concerning the transparency of the involvement of trainees and degree of faculty involvement are not unique to robotic surgery and certainly apply equally to open surgery.

With regard to the current status of RALP compared with ORP, I think there are some areas of superiority that are quite clear and consistent in the literature. First, I think there is less blood loss and lower transfusion rates with RALP. Both single-institution series of high-volume open surgeons and evaluations of national databases support this advantage.[9] I think it is statistically and clinically significant. Secondly, RALP is associated with shorter hospital stays than ORP.[10-12] The difference is not large and may not be very clinically significant, but it is statistically significant and does diminish cost. Third, there are fewer bladder neck contractures (BNC) with RALP compared with ORP.[13,14] I think this difference is very clinically relevant, since the treatment of BNC is a risk factor for incontinence. I think less clear but emerging in the literature are the improved patient safety, lower number of postoperative complications, and perhaps lower mortality in patients treated with RALP. On average, robotic prostatectomy takes longer in the operating room than open prostatectomy, but for experienced surgeons there is likely no difference. My opinion is that the ergonomics of robotics for the surgeon are vastly superior to those of open surgery.

Areas in which there is still some controversy are oncologic adequacy, and continence and potency outcomes; these are nicely reviewed by Dr. Patel. Although we do not yet have long-term mortality data, margin status and biochemical recurrence appear similar for RALP and ORP. Both continence and potency are primarily related to surgeon experience rather than to approach, but I think current studies suggest equivalence or some superiority for RALP vs ORP.

In summary, both RALP and ORP are excellent operations in experienced hands. They are also technically difficult to perform consistently well, so in my view, surgeons should attempt to master the operation they perform rather than hastily switching to robotic surgery, unless they have an opportunity for significant mentorship and surgical volume. Current residents and fellows will be primarily taught RALP in most US training programs.

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