

Original article

The effect of minimally invasive prostatectomy on practice patterns of American urologists

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Abstract

Introduction and objectives: To determine how robotic prostatectomy affects practice patterns of urologists, we examined the case volume characteristics among certifying urologists for the surgical treatment of prostate cancer. We hypothesized that the utilization of open and robotic prostatectomy as well as lymph node dissection changed dynamically over the last 10 years.

Methods: A total of 6-month case log data of certifying urologists from 2003 to 2013 were obtained for the American Board of Urology. Cases were identified using Current Procedural Terminology codes for open radical prostatectomy (ORP) and laparoscopic or robotic-assisted laparoscopic prostatectomy (RALP) with a corresponding diagnosis of prostate cancer as defined by ICD-9 code 185.0.

Results obtained: A total of 6,563 urologists submitted case logs, of which 68% (4,470/6,563) reported performing at least one radical prostatectomy (RP), totaling 46,030 RPs logged. There was a 376% increase in the performance of RALP over the study period with robotic volume increasing from 22% of all RP in 2003 to 85% in 2013.

Among surgeons performing ORP, the median number performed was 2; of surgeons who performed RALP, the median number performed was 8 ($P < 0.001$). Overall, 39% of surgeons logging ORP performed 2 or fewer RP, whereas 19% of surgeons who performed RALP performed 2 or less RP ($P < 0.001$). The highest volume robotic surgeons (top 10% surgical volume) performed 41% of all RALP with the highest performing robotic surgeon recording 658 prostatectomies over 6 months. Oncologists represented 4.1% of all surgeons performing RP and performed 15.1% of all RP ($P < 0.001$); general urologists performed the majority of RP (57.8%). When performed open, there was no influence of surgeon specialty on the performance of lymph node dissection (LND); if performed robotically, oncologists were significantly more likely to perform LND compared with general surgeons (47% vs. 25.9%, respectively, $P < 0.001$).

Conclusions: Robotic prostatectomies are performed 5 times more commonly than open prostatectomy and represent 85% of all RP performed by board-certified urologists in 2013. Compared to RALP, ORP are significantly more likely to be performed by lower volume surgeons. Oncologists perform a higher relative percentage of RPs and are significantly more likely to perform LND if performed robotically when compared with general urologists. © 2016 Elsevier Inc. All rights reserved.

Keywords: Prostate cancer; Robotic prostatectomy; Practice patterns; American board of urology

1. Introduction

Prostate cancer (PC) is the most commonly diagnosed noncutaneous malignancy among men in the United States [1]. An estimated 240,000 men are diagnosed each year and approximately one-third of these men go on to receive treatment with radical prostatectomy (RP) [2]. Historically,

open RP (ORP) was the gold standard for surgical treatment of PC, yet over the last 15 years, the introduction of robotic-assisted (RA) surgical technologies has changed the surgical approach to RP [3].

Although the absolute proportion of RPs performed robotically is not known, estimates have ranged from 45% to 80% in the US today [4]. Despite the rapid expansion and dissemination of RALP, the effect of the adoption of robotic surgery on physician practice patterns remains undescribed. Therefore, we aim to analyze clinician practice patterns among urologists performing RP in the United States

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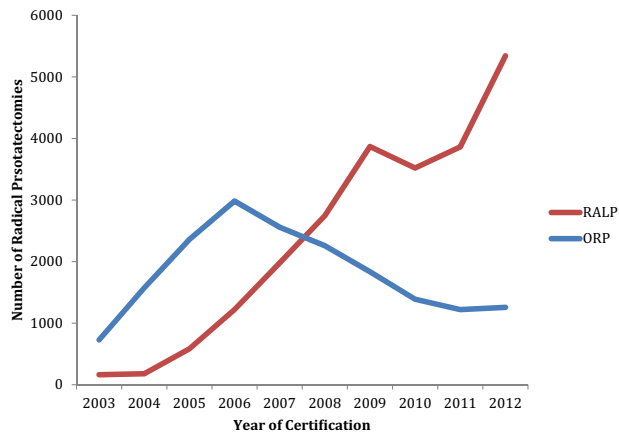


Fig. 1. Changing trends in surgical management of prostate cancer over time (2003–2012).

utilizing case log data from urologists certifying with the American Board of Urology (ABU).

2. Methods

The ABU is a surgical specialty board organized to facilitate the improvement of standards, promote competency, and improve monitoring and standards of education in the field of urology. Urologists may apply for certification by the ABU after completing residency and demonstrating an appropriate level of knowledge and expertise in the management of urological conditions [5,6].

Recertification is necessary every 10 years for those urologists initially certifying after 1985. An important portion

of certification is the completion of surgical case log reflecting a consecutive 6-month period before certification. These logs include both patient demographics (age, gender, and diagnosis code) and surgeon-specific characteristics (surgeon age, certification cycle, practice type, and state of practice). Surgeons also have the option to report a sub-specialization in 1 of 5 domains (oncology, endourology, pediatrics, andrology, and female urology) or identify themselves as general urologists.

Surgical procedures are identified by their corresponding Current Procedural Terminology code. The codes 55810 and 55840 were used to identify ORP without pelvic lymph node dissection (PLND). The codes 55812, 55815, 55842, and 55845 were used to identify ORP with PLND. The code 55866 was used to identify laparoscopic or robotic-assisted radical prostatectomies (RALP). Current Procedural Terminology coding cannot differentiate conventional laparoscopic prostatectomy from RA techniques; therefore, when referring to the robotic RP cohort, this population includes a small number of laparoscopic RP cases without robotic assistance. Previous studies from 2008 to 2009 confirm that traditional laparoscopic RP represent less than 1% of all RP [7]. The additional codes 38570-38572 were utilized to identify RALP with concurrent PLND. All cases were associated with the ICD-9 code designation for PC (185.0). No cases were coded with female patient gender or patient age < 18 years.

Case logs are received from the ABU are reported as 6 month representation of individual surgeon practice volume. We analyzed case logs from 2003 to 2013 for trends in the performance of RP for treatment of PC associated with certification cycle, submission year, state, practice type (academic affiliation vs. private practice) and surgical case volume using Fisher's exact test and student's *t*-test.

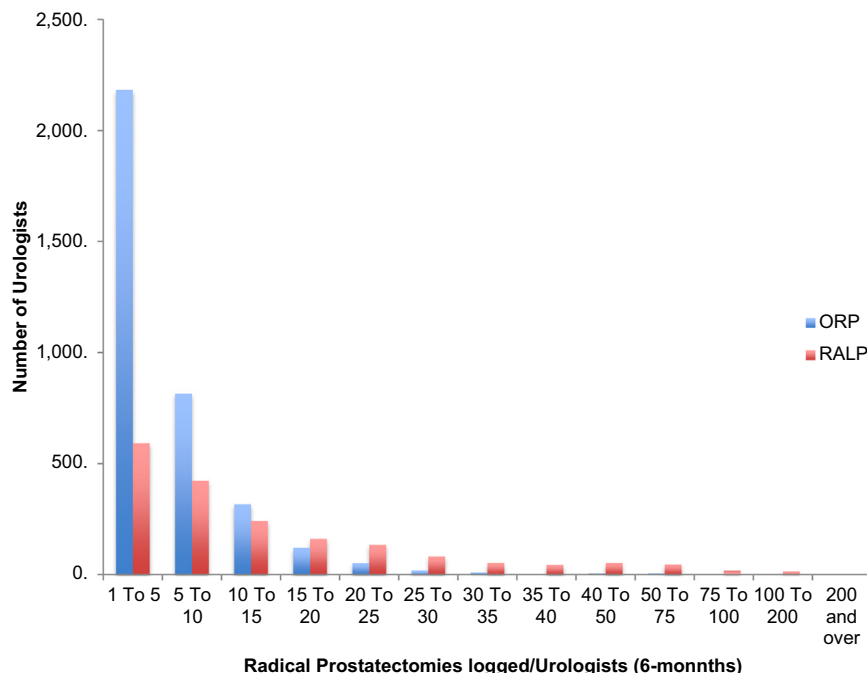


Fig. 2. Individual Robotic Surgical Volume (minimum number logged = 1, maximum logged 658).

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