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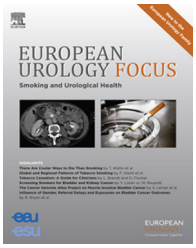

Prostate Cancer

A Clinician's Guide to Avoiding and Managing Common Complications During and After Robot-assisted Laparoscopic Radical Prostatectomy

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Abstract

Context: Robot-assisted radical prostatectomy (RARP) is on the advance globally, and it is essential for surgeons and patients to know the rates of perioperative complications.
Objective: To provide evidence-based clinical guidance on avoiding and managing common complications during and after RARP in the context of a comprehensive literature review.
Evidence acquisition: In concordance with the Preferred Reporting Items for Systematic Reviews and Meta-analysis 2015 statement guidelines, a literature search of the PubMed database from August 1, 2011, to August 31, 2015, using the predefined search terms *robot* AND radical prostatectomy*, was conducted. The search resulted in 653 unique results that were subsequently uploaded to DistillerSR (Evidence Partners, Ottawa, Canada) for team-based screening and processing of references.
Evidence synthesis: Overall, 37 studies met the inclusion criteria and were included. Median rate of overall complication was 12.6% (range: 3.1–42%). Most of the complications were minor (Clavien-Dindo grades 1 and 2). Grade 3 complications comprised the bulk of the major complications with a median rate of 2.7%; grade IV and V complications were exceedingly rare in all reports.
Conclusions: Despite continued adoption of the RARP technique globally, rates of overall complication remain low. Many of the complications experienced during and after RARP can be mitigated and prevented by experience and the implementation of safe techniques.
Patient summary: Despite continued adoption of the robot-assisted radical prostatectomy (RARP) technique globally, rates of overall and major complications remain low at 12.6% and 2.7%, respectively. Complications can be minimized and successfully managed using established techniques. RARP is a safe and reproducible technique.

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1. Introduction

In 2010, an estimated 85% of radical prostatectomies (RPs) performed in the United States were conducted using the robotic platform [1], and over the last several years robot-assisted radical prostatectomy (RARP) has continued to gain preeminence globally [2]. It is essential for surgeons and patients to be aware of rates of perioperative complications, and several authors have conducted robust systematic reviews concerning this topic [3–5]. In studies published through 2009 and utilizing the Clavien system, overall RARP complication rates ranged from 12% to 26%, and a meta-analysis of RARP outcomes through 2010 calculated a total perioperative complication rate of 7.8% [3,4]. Most recently, Novara et al. conducted a systematic review of studies through August 2011 specifically evaluating perioperative RARP complications and reported rates of overall complications ranging from 3% to 26% [5]. Therefore, given the rapid diffusion and adoption of this technique, a more contemporaneous assessment of published outcomes is warranted. However, the primary aim of this work is to provide clinicians with an evidence-based resource on how to avoid and manage common complications during and after RARP.

2. Evidence acquisition

We conducted a systematic review according to the Preferred Reporting Items for Systematic Review and Meta-analysis protocols (PRISMA-P) 2015 statement [6]. In compliance with PRISMA-P guidelines, our systematic review protocol was registered online with the International Prospective Registrar of Systematic Reviews (PROSPERO) on October 5, 2015 (registration number: CRD42015026812) and did not duplicate a prior systematic review of perioperative complications following RARP [5].

We conducted a literature search of the PubMed database from August 1, 2011, to August 31, 2015, using the predefined search terms *"robot*" AND "radical prostatectomy."* Our search resulted in 653 unique results that were subsequently uploaded to DistillerSR (Evidence Partners, Ottawa, Canada), an Internet-based software that facilitates team-based screening and processing of references (https://distillercer.com). Four levels of review were undertaken: title screening, abstract screening, manuscript screening, and data extraction.

Two review authors (D.P. and L.C.) independently screened each title and abstract at levels 1 and 2, respectively. Titles consistent with the study aim and abstracts meeting the inclusion criteria were advanced to level 3, if unanimity was not achieved, conflicts were mediated and resolved by a third author (J.D.S.). At level 3, full-text articles were scrutinized to ensure all inclusion criteria were present. At level 4, data were extracted in accordance with desired outcomes. At level 4, reference lists of included studies were reviewed for pertinent references not captured in the literature search.

Studies were considered if published after August 1, 2011, and explicitly reporting perioperative rates of complication (excluding functional outcomes of continence and potency) following at least 100 consecutive RARPs. Both comparative and noncomparative studies were considered for inclusion. Studies reporting outcomes following simple prostatectomy for benign disease were excluded. Studies not in English, abstracts, reports from meetings, comments, and editorials were not considered. When studies reported outcomes from the same institution, only the most recent publication was included, unless reporting a different cohort or complication.

Although the sequential, level-based systematic review technique is commonly used, it is not without limitation. For example, the title of a paper may allude that the work is primarily about functional and oncologic outcomes yet not state explicitly that the text also includes data regarding perioperative complications. In this scenario, works that should be included may inadvertently be excluded. To combat this phenomenon, liberal criteria were used to advance a work from level 1 to 2; however, despite best efforts, some works may be erroneously excluded from this review. Even with this significant limitation, this methodology allows for the inclusion of most of the appropriate texts.

3. Evidence synthesis

3.1. Study selection

Figure 1 depicts the flowchart summarizing this systematic review. Our initial search yielded 659 records of which 10 were duplicates. Two records were added after bibliography review, and reviewers noted an additional two records after submission, resulting in 653 records screened. Adhering to the previously mentioned exclusion criteria, 591 records were excluded. Most of the exclusions were for non–English language, failure to report perioperative rates of complication, or series comprising <100 consecutive cases. Sixty-three full-text articles were assessed; 37 studies were ultimately included [7–43].

3.2. Overall complication rates and rates of complication by Clavien-Dindo classification

Table 1 summarizes the overall complication rates and rates of complication stratified by Clavien-Dindo grade. The median rate of overall complications was 12.6%, with a range of 3.1–42%. Most of the complications in each study were minor (Clavien-Dindo grades 1 and 2). Grade 3 complications comprised the bulk of major complications with a median rate of 2.7% (range: 0–9.5%). Grade 4 (range: 0–1%) and 5 (range: 0–0.5%) complications were exceedingly rare in all reports. Di Pierro et al. reported the highest rate of overall complication, 42% [28]. This group prospectively recorded and reported outcomes of the first 233 RARPs plus extended pelvic lymph node dissection (ePLND) cases performed by a single surgeon with experience in both laparoscopic (>50 cases) and open (>100 cases) approaches [28]. Upon review, the markedly higher rate of overall complication in this report is driven by 47 episodes of "pressure skin redness" recorded as a grade 1 complication. The incidence of