

# Robotic-assisted laparoscopic radical prostatectomy after aborted retropubic radical prostatectomy

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**Abstract** Robotic-assisted laparoscopic prostatectomy (RALP) has surged in popularity since US Food and Drug Administration approval in 2000. Advantages include improved visualization and increased instrument dexterity within the pelvis. Obesity and narrow pelvises have been associated with increased difficulty during open retropubic radical prostatectomy (RRP), but the robotic platform theoretically allows one to perform a radical prostatectomy despite these challenges. We present an example of a RALP performed following an aborted RRP. A 49-year-old male with intermediate risk prostate cancer and body mass index of 38 kg/m<sup>2</sup> presented for RALP after RRP was aborted by an experienced open surgeon following incision

of the endopelvic fascia due to poor visualization, a prominent pubic tubercle, and a narrow pelvis. The enhanced visualization and precision of the robotic platform allowed adequate exposure of the prostate and allowed us to proceed with an uncomplicated prostatectomy, which was not possible to perform easily via an open approach. The bladder was densely adherent to the pubis and the anterior prostatic contour and apex were difficult to develop due to a dense fibrotic reaction from the previous endopelvic fascia incision. However, we were able to successfully complete RALP with subtle technical modifications. Estimated blood loss was 160 mL and operating time was 145 min. The patient's pathology was significant for a positive peri-prostatic lymph node and he has been referred to radiation oncology for adjuvant radiotherapy and androgen deprivation therapy. At 3 months follow-up he had a prostate-specific antigen level of 0.06 ng/mL, partial erections, and mild urinary incontinence requiring one pad per day. Superior intracorporeal laparoscopic visualization and improved instrument dexterity afforded by the robotic surgical platform may make RALP the preferred approach in obese men or men with difficult pelvic anatomy who are deemed poor RRP candidates.

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## Background

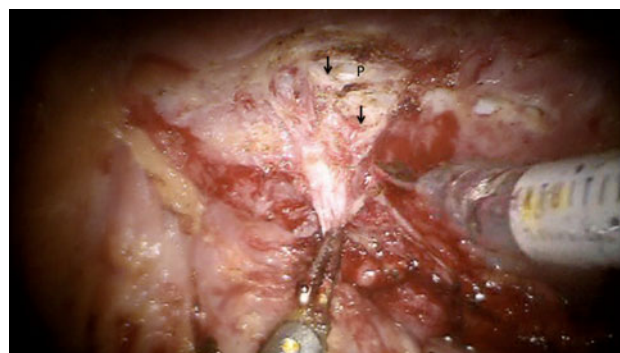
The utilization of robotic-assisted laparoscopic prostatectomy (RALP) has surged in the United States since FDA approval of the robotic platform in 2000. Initial single-surgeon series at high volume centers touted the advantages of laparoscopic and robotic-assisted approaches and proved that RALP was at least as effective as open

retropubic radical prostatectomy (RRP) in terms of cancer control and functional outcomes [1]. Advantages of the robotic surgical system include increased magnification and increased instrument range of motion, which improves visualization and dexterity within the pelvis. Variations in anatomy, such as obesity [body mass index (BMI) > 30 kg/m<sup>2</sup>] and a narrow pelvis, are associated with greater difficulty during RRP [2], and obesity leads to longer operative times and greater blood loss during RALP [3, 4]. Theoretically, the improved visualization and dexterity afforded by the robotic surgical system may facilitate RP in obese men and men with difficult pelvic anatomy in whom RRP would prove to be too difficult. To our knowledge, however, there have been no reports of performance of RALP on a patient in whom previous RRP could not be performed. We present a case of RALP performed successfully after aborted RRP due to patient obesity and difficult pelvic anatomy.

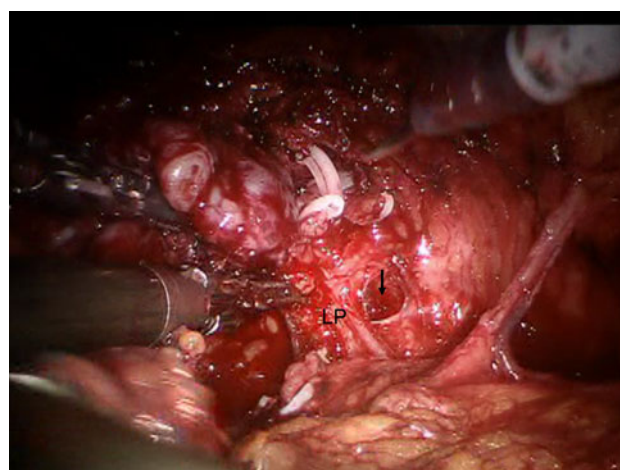
### Case presentation

A 49-year-old African–American male underwent a prostate biopsy due to a prostate-specific antigen (PSA) level of 4.98 ng/mL. This revealed Gleason 3 + 4 prostate cancer in 5 of 12 cores (4 from the right and 1 from the left side) with up to 90 % core involvement. His medical history is remarkable for hypertension, sarcoidosis, migraine headaches, hyperlipidemia, and mild erectile dysfunction. Digital rectal examination revealed a 30-g prostate without nodules, and his BMI was 38 kg/m<sup>2</sup>. He pursued a retropubic radical prostatectomy (RRP) with an experienced open surgeon at an academic training center. Difficult exposure was encountered due to the combination of a narrow pelvis, prominent pubic tubercle, and high BMI. The endopelvic fascia was incised and blunt finger dissection was used to push levator fibers away from the mid and apical prostate in an attempt to mobilize the prostate and improve exposure. However, visualization remained poor, and RRP was aborted without pelvic lymph node dissection. The patient was referred for RALP versus external beam radiation therapy.

Six weeks following the aborted RRP, the patient opted to proceed with a transperitoneal RALP. The previous extraperitoneal approach and a healing lower midline incision did not affect our usual port placement [5]. The retropubic space was entered after dividing the urachus and medial umbilical ligaments [6]. Due to prior RRP, the bladder was adherent to the pubis and anterior abdominal wall (Fig. 1), and it was peeled off without cystotomy. After establishing exposure in the retropubic space, the fourth arm Prograsp was used to tent and retract the bladder in an antero-cephalad direction, and we proceeded with bladder neck dissection and completely anterograde RALP.



**Fig. 1** Dissection of adherent anterior bladder wall (*arrows*) from the pubis (*P*)



**Fig. 2** Fibrotic inflammation due to RRP endopelvic fascia and blunt levator dissection precluded lateral pelvic fascia separation and establishment of the anterior prostate contour prior to ligation of the *LP*. Blunt dissection used to create window (*arrow*) for clips on right lateral vascular pedicle prior to anterograde nerve sparing

After bladder neck, seminal vesicle, and posterior dissection were completed routinely, we attempted to define the anterior prostatic contour by separating the lateral pelvic fascia [7]. However, we encountered inflammation and fibrosis resulting from previous RRP endopelvic fascia incision and blunt apical dissection that hindered definition of the anterior contour bilaterally. Therefore, we proceeded with athermal lateral pedicle division and anterograde interfascial nerve sparing using only the posterior prostate contour as a landmark (Fig. 2). The nerve-sparing plane was difficult to develop initially; however, blunt and sharp dissection eventually established the interfascial plane and the antero–lateral prostate contour. A dense fibrotic reaction was also encountered at the apex, requiring more sharp dissection to develop the apical interfascial nerve-sparing plane. Prior to division and selective suture ligation of the dorsal vein complex [8], bilateral pelvic lymphadenectomy was performed for intermediate risk disease.

With good visualization throughout, operative time was 145 min and estimated blood loss was approximately 160 mL. Hospital course was uneventful with discharge on postoperative day 1. The urethral catheter was removed on postoperative day 9. Final pathology revealed Gleason 4 + 3 disease bilaterally with negative surgical margins; however, metastatic prostate cancer involved <0.1 cm of an anterior, apical peri-prostatic lymph node, yielding pathologic T2cN1Mx disease. He was referred to radiation oncology for consideration of adjuvant hormonal and radiation therapy, given his node-positive disease. Post-operative 3-month PSA was 0.06 ng/mL. He had regained partial erections firm enough for sexual activity and had mild urinary leakage requiring only 1 pad per day.

## Conclusion

While robot malfunction or technical difficulty may lead to conversion to pure laparoscopic radical prostatectomy, RRP, or aborting RALP altogether [9], to our knowledge there are no reports of RALP performed after aborted RRP. Although challenging anatomy resulted in poor RRP exposure in this patient, RALP visualization and magnification with the intracorporeal lens was adequate throughout, and the laparoscopic vantage may be superior under these circumstances. In fact, Smith commented that the enhanced RALP visualization makes this the easier surgical approach for obese men and may even lead to better outcomes [4].

Robotic-assisted laparoscopic prostatectomy with history of previous abdominal surgery has previously been described. Kim described favorable RALP outcomes in 7 men with prior abdominal cancer surgeries, although 1 patient with prior hemicolectomy experienced a rectal injury [10]. Siddiqui et al. showed no difference in outcomes in 1,049 men with versus 2,901 men without prior abdominal or inguinal surgeries [11]. Similarly, Ginzburg et al. noted similar peri-operative outcomes for RALP with and without prior abdominal surgery [12]. However, to our knowledge this is the first report of RALP following aborted RRP.

Our case demonstrates that RALP is feasible following aborted RRP, although technical modifications demonstrated in the video (Electronic Supplementary Material) were required. The bladder was adherent to the pubis and anterior abdominal wall, similar to what is encountered after inguinal hernia repair with a broad patch of mesh. Moreover, we modified our usual nerve-sparing approach [7] due to prior RRP endopelvic fascia and apical dissection. Instead of using both the anterior and posterior prostatic contours as landmarks for lateral pedicle dissection, we relied on the posterior contour alone for this step

and subsequent anterograde interfascial nerve sparing until eventually overcoming the fibrotic reaction and separating the lateral pelvic fascia at the mid-prostate.

Regarding the positive peri-prostatic lymph node, Finley et al. reported that 15 % of men have lymph nodes present in the anterior prostatic fat that communicate directly with the obturator lymph node chain, and 2 % of their series demonstrated metastatic disease in these nodes [13]. Kotahari et al. reported that peri-prostatic lymph node metastases has similar outcomes to pelvic lymph node metastases, and should be treated in the same manner (i.e., hormonal therapy with or without radiation therapy) [14].

Proponents of RRP cite tactile sensation as an advantage over RALP [15]. However, the combination of obesity, narrow pelvis, and prominent pubic tubercle in our case contributed to aborted RRP followed by the successful completion of RALP. This suggests that the superior intracorporeal laparoscopic visualization and instrument dexterity afforded by the robotic surgical platform may be preferred under these circumstances. Additionally, RALP may be preferred in young, obese men deemed poor RRP candidates.

**Conflicts of interest** None.

**Consent section** Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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