

Robotic Assisted Laparoscopic Salvage Prostatectomy for Radiation Resistant Prostate Cancer

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Purpose: We report on outcomes of robotic assisted laparoscopic radical prostatectomy as salvage local therapy for radiation resistant prostate cancer.

Materials and Methods: We retrospectively reviewed the charts of all patients who underwent robotic assisted laparoscopic radical prostatectomy for biopsy proven prostate cancer after primary radiation treatment. Patient characteristics, intraoperative and perioperative data, and oncological and functional outcomes were assessed.

Results: A total of 18 patients were identified with a median followup of 18 months (range 4.5 to 40). Primary treatment was brachytherapy in 8 patients and external beam radiation in 8, while 2 underwent proton beam therapy. Median age at salvage robotic assisted laparoscopic radical prostatectomy was 67 years (range 53 to 76). Median preoperative prostate specific antigen was 6.8 ng/ml (range 1 to 28.9) and median time to surgery after primary treatment with radiation was 79 months (range 7 to 146). Median operative parameters for estimated blood loss, surgery length and hospital stay were 150 ml, 2.6 hours and 2 days, respectively. No patient required conversion to open surgery or a blood transfusion, or experienced a rectal injury. Perioperative complications occurred in 7 patients (39%) of which the most common was urine leak identified by postoperative cystogram. Five patients (28%) had a positive surgical margin. Although some patients had limited followup, 6 (33%) were continent and 67% were free of biochemical progression.

Conclusions: Robotic assisted laparoscopic radical prostatectomy can be performed safely as salvage local therapy after failed radiation therapy. Outcomes are comparable to those of large series of open salvage prostatectomy.

Key Words: prostate, prostatic neoplasms, robotics, prostatectomy, salvage therapy

RADIATION therapy is an accepted treatment for localized prostate cancer.¹ However, the development of BCR after RT for localized prostate cancer occurs in up to 50% of patients.^{2,3} Of the many options for treatment of radiation resistant prostate cancer only salvage RP has consistently demonstrated a benefit for long-term disease-free survival.⁴⁻⁸ Recently it has been shown

that 92% of men with post-RT BCR will receive systemic ADT while only 2% will undergo potentially curative salvage RP.⁹

Historically open salvage RP has been fraught with a high complication rate and poor functional outcomes. Most notable was the high incidence of intraoperative rectal injury, prolonged postoperative urinary extravasation

Abbreviations and Acronyms

ADT = androgen deprivation therapy
BCR = biochemical recurrence
PLND = pelvic lymph node dissection
PSA = prostate specific antigen
RALP = robotic assisted laparoscopic radical prostatectomy
RP = radical prostatectomy
RT = radiation therapy
SRALP = salvage robotic assisted laparoscopic radical prostatectomy

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† Financial interest and/or other relationship with Pfizer and Intuitive.

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sation, development of bladder neck contracture and urinary incontinence.^{6,10,11} More recent studies have shown an improvement in morbidity from this procedure.^{4–8,11}

With the rapidly expanding application of robotics in urological surgery, RALP has become a common surgical treatment modality for localized prostate cancer. Advantages of RALP include reduced blood loss and a shorter hospital stay with a more rapid convalescence, and oncological, continence and potency outcomes comparable to those of the open approach.^{12–16} As more experience is gained with robotic techniques, surgeons have expanded its application to more technically challenging procedures. In fact, recent case reports have described the feasibility of salvage RALP.^{17–19}

We report on the largest series of patients to our knowledge to undergo salvage RALP for radiation resistant prostate cancer. This evaluation of perioperative complications as well as functional and oncological outcomes contributes significantly to the small yet growing body of literature for salvage RALP.

MATERIALS AND METHODS

After institutional review board approval a retrospective chart review was performed to identify all patients who underwent RALP for biopsy proven prostate cancer after primary RT from June 2004 to April 2008. Biochemical failure after irradiation was defined according to the American Society for Therapeutic Radiology and Oncology criteria.²⁰ All recurrences were diagnosed based on 3 consecutive increases in PSA. Systematic transrectal ultrasound guided prostatic biopsies were performed to document the persistence of cancer.

All patients underwent a thorough evaluation before surgery with appropriate imaging including bone scan and computerized tomography to rule out the presence of metastases. Data were collected on all aspects of care including patient demographics, pre-radiotherapy tumor characteristics, radiotherapy treatment features, preoperative tumor characteristics, operative parameters, intraoperative and perioperative complications, surgical specimen characteristics, and oncological and functional outcomes. BCR after salvage therapy was defined as PSA 0.2 ng/ml or greater. Continence was defined as no pad use or 1 small liner used for security purposes only.

All RALPs were performed transperitoneally with our institutional modifications to the Montsouris technique.²¹ Our specific technique for RALP has been previously described.²² A 4-arm da Vinci® S robot with 2 assistant ports for 6 ports in all was used. All patients underwent standard bilateral obturator PLND.

All patients underwent a cystogram typically 10 to 14 days after surgery to evaluate for anastomotic urinary extravasation before catheter removal. If urine leak was present the cystogram was repeated weekly until there was no evidence of extravasation, at which time the catheter was removed.

RESULTS

Salvage RALP was performed in 18 patients from June 2004 to April 2008. Patient characteristics are shown in table 1. Before salvage RALP 4 patients received ADT. Two patients continued the ADT that was given in combination with the initial RT and 2 were placed on ADT after biochemical failure.

Median preoperative PSA was 6.8 ng/ml and 3 patients had a PSA greater than 10 ng/ml before undergoing salvage RALP. Median (range) operative parameters for estimated blood loss, surgery length and length of hospital stay were 150 ml (50 to 350), 2.6 hours (1.7 to 3.7) and 2 days (1 to 5), respectively. Operative duration was calculated as the time from placing the Veress needle until skin closure. There was no conversion to an open approach. One patient experienced an enterotomy during lysis of adhesions at the beginning of the operation because he had undergone repair of a perforated gastric ulcer 23 years earlier. The injury was repaired intraoperatively and the patient did not experience any adverse sequelae except for the slow advancement of his diet postoperatively, which led to the longest hospitalization in our series of 5 days. There were no rectal or ureteral injuries and no patient required a blood transfusion during hospitalization. There was no perioperative mortality or morbidity such as myocardial infarction or pulmonary embolism.

Median catheterization time for the entire cohort was 14 days (range 8 to 61). All patients underwent a cystogram to evaluate for urinary leak at the scheduled catheter removal. Leak was present in 6 patients (33%) at the initial cystogram which led to prolonged catheterization. Mean catheterization time for the 12 patients without urine leak was 11.7 days, whereas the 6 with urine leak had a mean catheterization time of 38 days.

Oncological Outcomes

Table 2 lists oncological and functional outcomes. Postoperative followup ranged from 4.5 to 40

Table 1. Patient characteristics

No. pre-radiation biopsy Gleason score:	
6 or Less	13
7	5
8 or Greater	0
No. ADT:	
With external beam RT	2
With interstitial RT	1
Median ng/ml post-radiation PSA nadir	0.7
No. ng/ml PSA nadir:	
0.5 or Less	8
1.0 or Less	12
No. post-radiation biopsy Gleason score:	
6 or Less	4
7	5
8 or Greater	6
Unable to be graded	3

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