

# Radical Retropubic Prostatectomy: A Review of 8 Years of Experience

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## ABSTRACT

**Objectives:** Different modalities for treating prostate cancer are evolving worldwide. Radical prostatectomy is still ranking on top of the list for organ-confined disease. This study was conducted out to describe the indications, surgical technique, complications and outcome of radical retropubic prostatectomy for prostate cancer over an 8-year period at Prince Hussein Center of Urology and Organ Transplant, King Hussein Medical Center.

**Methods:** Between August 1999 and June 2007, a total of 81 patients (age range 50-68 years) underwent radical retropubic prostatectomy for organ-confined prostate cancer (stage T1a-T2c) based on Prostate Specific Antigen values, histopathology reports (Gleason Score 4-7) and negative metastatic work up. Follow-up of these patients ranged between 1 and 7 years. The medical records of these patients were reviewed, and analyzed regarding indications, surgical technique, complications, and outcome.

**Results:** None of the patients had pelvic lymph node involvement, and surgery accomplished in 2.5-3.5 hours. Estimated blood loss was between 500 and 2000ml. Early continence, within 4 weeks after surgery, was achieved in 51/81 (62.9%) and in 98.7% after one year. Potency within 1 year was achieved in 42 patients (51.8%), but with medications this number reached 52 (64%). Margin-positive histopathology reports were seen in 12 patients (14.8%) warranting further treatment with either radiotherapy or hormonal therapy. Mortality rate in the study group was 2.5% as a result of disease progression and dissemination.

**Conclusions:** Radical Retropubic Prostatectomy stands the gold standard method of treatment for localized prostate cancer with excellent results in cure and tumor control.

**Key words:** Radical Retropubic Prostatectomy, Prostate cancer, Prostate Specific Antigen.

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## Introduction

Prostate cancer ranks number one in male malignancies in Europe and North America<sup>(1)</sup> and the second leading cause of cancer-related death.<sup>(2-4)</sup> In Japan, the incidence is rising and approaching that of western countries.<sup>(5,6)</sup> With radical retropubic prostatectomy being the gold-standard method of treating localized prostate cancer,<sup>(7-10)</sup> thanks to the

improvement in the diagnostic techniques, mainly the Prostate Specific Antigen (PSA) which aided and added a lot to the early detection of the disease that in turn increased the number of patients undergoing radical prostatectomy worldwide,<sup>(11,12)</sup> as well as in Jordan.

Treatment options for localized prostate cancer, in which there is no extension of the malignancy beyond the prostatic capsule,<sup>(13)</sup> varies from

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watchful waiting, external beam radiation, brachytherapy, hormonal therapy and radical prostatectomy.<sup>(2,5,14,15)</sup>

Many international published reports were written and still, talking about open radical prostatectomy as the gold standard method of treating organ confined prostate cancer, and some reports are emerging talking about laparoscopic and robotic assisted prostatectomy,<sup>(16-21)</sup> but still those need further follow up regarding the margin positive biopsies, continence rates and potency.

This study was conducted to describe the indications, surgical technique, complications and outcome of radical retropubic prostatectomy for prostate cancer over an 8- year period at Prince Hussein Center of Urology and Organ Transplant, King Hussein Medical Center.

## Methods

Between August, 1999 and June, 2007, a total of 81 patients underwent radical retropubic prostatectomy at Prince Hussein Urology Center for localized prostate cancer (Stage T1a-T2c) as per the TNM of Schroder *et al*, 1992.

Age of these patients ranged between 50 and 68 years with a mean of 59.3 years. The total PSA was between 3.2 and 28ng/ml. All of these patients had transrectal ultrasound (TRUS) guided biopsies and the Gleason Score was between 5 and 7/10.

Metastatic work up was negative for all of them which included a computerized axial tomography (CT) scan of the chest, abdomen and pelvis, in addition to a bone Isotope scan.

Bowel preparation was performed for the patients before surgery, and 4 units of blood cross matched and prepared.

### ***Surgical Technique:***

The patient is placed in supine position, with slight flexion of the table. Eighteen or 20 Fr Foleys catheter is inserted.

In all of the 81 patients, a lower midline incision was utilized, and the extraperitoneal space of Retzius was entered. The procedure was started with pelvic lymph node dissection and frozen section except in patients with favorable features. Those are: 1- PSA of 10 ng/ml or below, 2- Gleason Score of 6/10 or below, and 3- Tumor involvement of 25% of tissue submitted for histology or less. Then the endopelvic fascia is incised and the puboprostatic ligament is cut with the electrocautery. The dorsal vein plexus is dissected and a right angle clamp is

passed around it and tied with 1 Vicryl tie distally and proximally. With the use of electrocautery, the dorsal vein plexus is hemostatically divided and the anterior surface of the prostate gets exposed completely.

The urethra is then incised with a 10 blade just at the apex of the prostate without touching the external sphincter muscle.

Then dissection of the prostate is carried out in a retrograde manner until we reach the base of the prostate posteriorly. At this point the Denonvillier's Fascia is incised between the base of the prostate and the anterior rectal wall to expose the seminal vesicles and the vas deference. These then dissected and the vas is ligated with 3/0 vicryl tie at the tip of the seminal vesicles.

The prostate is then dissected from the bladder neck with sharp dissection until it is completely removed en block with the seminal vesicles and both vasa.

To decrease the incidence of bladder neck contracture, the mucosa of the bladder is reflected with 4 – 6 stitches of 3/0 vicryl.

After meticulous hemostasis the anastomotic ends are clear, and anastomosing the urethra with the bladder neck is carried out clearly with 6 3/0 vicryl sutures over a Foleys catheter.

The anastomosis and the surgical field are then inspected to ensure proper hemostasis. A tube drain is laid anterior to the anastomosis and the wound is closed.

In all patients the procedure was completed in 2.5-3.5 hours, and average blood loss was 2 units.

The patients were discharged in 6-7 days after surgery with a Foleys catheter in place for three weeks.

The patients were seen in 3 weeks after surgery, when the Foleys catheter is removed and the patients instructed to do pelvic exercises which helps in early recovery of the continence.

Follow-up of the patients ranged between 1 and 7 years (Mean of 3 years). Patients were followed up every 4 weeks during the first 3 months, then every 3 months for 2 years, then annually afterward. During follow up visits the following were assessed:

- PSA
- Continence
- Erectile function

## Results

In all the patients, surgery was completed in 2.5 - 3.5 hours. Estimated blood loss was between

**Table I.** The duration of hospital stay for the study group

Number of hospital days	Number of patients
7	3
8	25
9	41
10	8
11	4
Average hospital stay	8.81 days

**Table III.** Erectile function improvement with the time and with the use of drugs among the study group.

Time of assessment	# of patients	%
4 weeks	1/81	1.2
3 months	12/81	14.8
6 months	20/81	24.7
9 months	34/81	42
12 months	43/81	53
With Sildenafil or Tadalafil after 12 months	49/81	60.4

**Table V.** Comparison of our study with other published data regarding urine incontinence

#	Authors and Journal	Continenace at 4 weeks %	Continenace at 1 year %
1	Mariotti G, <i>et al.</i> J Urol 2009 Feb	63.3	96.7
2	Loeb S, <i>et al.</i> Urology 2008 Oct	NA	93
3	Rocco F, <i>et al.</i> Eur Urol 2007 Aug	NA	94
4	Ali M, <i>et al.</i> BJU int 2003 Sep	63.5	99.5
5	Our Study	62.9	98.76

**Table II.** The number and percentage of continent patients after RRP in correlation with time.

Time of Assessment	# of Continent Patients	%
Immediate (4 weeks) after Surgery	51/81	62.9
3 months	58/81	71.6
6 months	67/81	82.7
9 months	75/81	92.6
12 months	80/81	98.76

**Table IV.** The patients who were treated with adjuvant therapy and the outcome

Margin Positive Biopsy Patients	External Beam Radiotherapy Group	Hormonal Therapy Group
# of Patients and Percentage	6/12=50%	6/12=50%
PSA* nadir > 0.2 ng/ml	4/6=66.7%	2/6=33.3%
Follow up Bone scan after treatment completion	2/6=33.3%	1/6=16.7%
Disease Specific Mortality	2/6=33.3%	None

PSA\* : Prostate Specific Antigen.

**Table VI.** Comparison of our results with other published data regarding recovery of erectile function 1 year after surgery

Authors and Journal	Patients having adequate erection at 1 year
Finley DS, <i>et al.</i> BJU int 2009 April	68 %
Riesz P, <i>et al.</i> Orv Hetil 2009 May	60 %
Takenaka, <i>et al.</i> Int Urol Nephrol 2008 Sep	80 %
Our Study	60.4 %

500 and 2000ml with an average of 1000ml. All the patients were out of the operating room with a Foleys catheter and a pelvic drain.

Patients were hospitalized for 7-11 days as illustrated in Table I and discharged with indwelling Foleys catheter to be seen 3 weeks after surgery for assessment and removal of the catheter.

The continence was assessed early after removal of the Foleys catheter, and then on 3 month basis. Early continence (within 4 weeks post-operatively) was achieved in 51/81 patients (62.9%). With Kiegel's exercises, this figure increased to 98.76%

after 1 year. Table II shows the continence rate during the follow up period.

Regarding recovery of erectile function, only 43/81 patients reported preoperative levels within 1 year accounting for 53%. With the use of Sildenafil or Tadalafil, was raised to 60.5% (49 patients) as demonstrated in Table III.

Histopathology reports revealed 12/81 (14.8%) specimens with margin positive results. Six of these patients were further managed with external beam radiotherapy (Group A) and the other 6 patients with hormonal therapy (Group B). In group A, 2/6

patients showed disseminated disease that got out of control and died within 2 years accounting for a disease mortality rate of 2.5%, while the other 4 patients and all patients in group B showed good response to adjuvant therapy and their PSA was unpredictable as presented Table IV.

One patient (1.23%) developed bladder neck contracture and was managed with cystoscopy and endoscopic opening of the contracture.

PSA readings dropped to unpredictable levels (< 0.2 ng/ml) one month after surgery.

## Discussion

Despite the continued development of alternative treatments, surgical removal of the prostate by radical prostatectomy which was first described by Millin in 1947<sup>(23)</sup> remains the preferred treatment for most men with clinically localized carcinoma of the prostate and at least a 10-year life expectancy.<sup>(5,24)</sup>

Radical retropubic prostatectomy remains one of the major forms of therapy for localized disease.<sup>(16,17,19,21)</sup> Goals of radical surgery should be cure and disease control, followed by recovery of the preoperative urinary and erectile function.<sup>(13,25)</sup> Selection of the candidates depends on the aggressiveness of the tumor with the Gleason Score being the single most important prognostic variable for the patient<sup>(8)</sup> and life expectancy of the patient.<sup>(2,5,24,25)</sup> Therefore, candidates should be those patients in whom the natural course of the disease can be altered by definitive local surgery and to spare the remaining patients the morbidity and mortality of unnecessary treatment.<sup>(2)</sup>

In our study, 81 patients underwent radical retropubic prostatectomy for localized prostatic cancer (stage T1a-T2c). All of these patients were admitted to the hospital 48 hours prior to surgery. Bowel preparation was done and prophylactic intravenous antibiotics instituted 24 hours before surgery. The average hospital stay was 10.2 days (ranging from 9-13 days). The average operative time was 3 hours (2.5-3.5 hours) with an estimated blood loss of 2 units per person.

The recovery course was smooth in all patients. Complete continence was achieved in 62.9% of patients at 4 weeks postoperatively which was increased to 98.76% at 1 year with the help of Kiegel's exercises. These results are consistent with other international studies as presented in Table V.

Regarding erectile function, 53% of our patients showed normal return of function and this number increased to 60.5% with the help of Sildenafil or

Tadalafil treatment, these figures are also similar to other international studies.<sup>(26,27)</sup> Table VI compares our results with other published data.

Regarding complications, there was one case of bladder neck contracture (1.23%), which was treated by bladder neck excision, and his problem is not yet solved radically, which is sometimes the case.<sup>(28)</sup>

With greater experience and refinement in surgical technique and better understanding of the surgical anatomy, perioperative morbidity with radical prostatectomy has diminished markedly compared to historical series.<sup>(16,24,25)</sup> Furthermore, selection of patients most likely to be cured by surgery has improved while the benefit of local control is recognized even in those who may develop recurrent disease. Long-term follow-up after surgery has shown radical prostatectomy to be the most proven definitive therapy for men with clinically confined prostate cancer.

Radiation therapy and hormonal therapy are better saved as the second defense lines of treatment for patients with margin positive biopsies before encountering the biochemical failure or recurrence of the disease.<sup>(1,29,30)</sup>

Regarding the immediate post-operative complications, 2/81 patients (2.5 %) had superficial wound infection which was managed by repeated dressings. None of the patients had urinary leak or lymphocele.

Prostate cancer diagnosis is increasing worldwide as well as in Jordan due to the widespread use of PSA in the diagnosis and screening of the disease. Many treatment options are available ranging from watchful waiting to radical surgery. So far, radical retropubic prostatectomy is accepted as the gold standard method in the treatment of clinically localized disease.

Radical prostatectomy has its own complications but, the advent of newer technologies and medications, and time and experience, render them treatable and accepted by the patients as long as the main goal of surgery which is, disease control and cure is achieved.

Our technique of radical retropubic prostatectomy with meticulous hemostasis that provides a clean surgical field helps in better recognition of the surgical anatomy and thus, reduces the complication of the surgery.

## Conclusion

Radical Retropubic Prostatectomy stands the gold standard method of treatment for localized prostate

cancer with excellent results in cure and tumor control.

Further studies are required to further assess the surgical technique in the management of organ-confined tumor which will reassure the patients to consider radical prostatectomy as the definitive treatment for prostate cancer.

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