



The effects of retropubic and perineal radical prostatectomy techniques on postoperative urinary continence after surgery: Results of 196 patients

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ABSTRACT

Objective: The aim of this study was to examine the effects of the retropubic and perineal radical prostatectomy techniques on postoperative urinary continence.

Material and methods: This study included patients who had undergone radical retropubic (RRP) (n=54) or radical perineal prostatectomies (RPP) (n=142) in our clinic between December 2006 and December 2010 with the indication of localized prostate cancer. Preoperative, and postoperative continence levels of the patients were evaluated on the day of catheter removal, and at 3., 6. or 12. months using University of California-Los Angeles (UCLA) prostate cancer index query forms completed by the patients themselves in outpatient clinics.

Results: Mean ages of the perineal, and retropubic groups were 62.3 (48-77), and 62.5 (50-74) years, respectively. The absolute urinary control rates of the RPP patients on the first days, and the first, third, sixth, and twelfth months were 44.3, 63.6, 76.2, 79.5, and 86.1%, respectively. The same rates were 51.4, 75.7, 78.4, 89.2, and 91.9% for the RRP group, respectively.

Conclusion: There was no significant difference between RRP groups as for the frequency of urinary incontinence.

Key words: Radical perineal prostatectomy; radical retropubic prostatectomy; urinary incontinence.

Introduction

Prostate cancer (PCa) is the most prevalent solid neoplasm with its higher incidence. Its mortality rate ranks second among cancer-related deaths.^[1,2]

In the treatment of localized prostate cancer, radical prostatectomy (RP) has been an increasing source of interest starting with widespread use of prostate-specific antigen (PSA), and growing with definitions of Walsh related to the technical aspects of RP.^[3] Increasing experience, and diagnosis of the disease at its earlier stages together with excellent outcomes achieved as for quality of life, and cancer control, RP has become the most preferred mode of therapy.^[4]

In recent years, despite increase in the application of minimally invasive techniques with the industrial support predominantly in the United

States of America, and Europe, in the 2010 guideline of European Association of Urology (EAU) these techniques reportedly caused genitourinary complications, incontinence, and erectile dysfunction with shorter hospital stay, and comparable oncological results.^[5]

The purpose of this study is to evaluate the effects of retropubic, and perineal radical prostatectomy techniques which use different dissection techniques, on postoperative incontinence.

Material and methods

This study included patients (n=54) who had undergone radical retropubic prostatectomy (RRP) or radical perineal prostatectomy (RPP) (n=142) procedures in our clinic between December 2006 and December 2010 with the indication of localized prostate cancer after informed consent forms of the patients were

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obtained. Though in our clinic, 3 surgeons could perform RPP, and RRP, the cases operated by the most experienced surgeon who completed his learning curves in both techniques were preferred. In the preference of the surgical technique, preoperative PSA values, results of digital rectal examination (DRE), and TRUS (transrectal ultrasonographic) biopsy were taken into consideration. Among cases with an indication of radical prostatectomy, RPP was performed on patients with prostate volumes <80 cc, Gleason score <7, and prostate-specific antigen <10 ng/mL. Patients without these characteristics who had marked obesity, and lower abdominal quadrant surgery were especially selected for RPP, cases with elevated prostate as detected during DRE underwent RRP. Based on Partin nomograms, laparoscopic pelvic lymph node dissection was performed on 5 cases among patients had a risk of pelvic lymph node positivity in whom retropubic approach was predicted to be risky.^[6] RPP was carried on patients with lymph node negativity. Five patients who preoperatively received maximal androgen blockage therapy, and then underwent RRP, 3 RRP, and 7 RPP patients who had internal urethrotomy because of postoperative anastomotic stricture, 2 RPP patients who had urodynamically proved flask type neuropathic bladder, 9 RRP, and 11 RPP patients who were lost to follow-up for postoperative social reasons were excluded from the study.

Pre-, and postoperative continence levels of the patients were evaluated according to the University of California-Los Angeles (UCLA) Prostate Cancer Index^[7] query form interrogating lower urinary system symptoms. These levels were measured in outpatient clinics and were based on the dates of the removal of the preoperative and postoperative urethral catheters. Questionnaire forms were completed by the patients themselves (in cases of need, with the aid of the physician) in polyclinics after they were adequately informed about the survey. Since any experimental study was not performed on the patients, and patients were interrogated within the context of routine controls, approval of the ethics committee was not obtained. The continence level of the patients was evaluated based on the number of urinary pads used, and frequency of incontinent episodes. The patients who didn't use urinary pads or used a single urinary pad for a 24-hour period for the purpose of control, fully continent individuals or those become incontinent once in a while were accepted as continent participants. Continence levels of the patients were interrogated during ambulatory polyclinic controls on catheter removal times, namely, on the first postoperative day, then at the first, third, sixth or twelfth postoperative months. On the day of the catheter removal, for the evaluation of continence, physiological miction time of the patients was awaited. Continent patients on the day of catheter removal were termed as "immediate continent", individuals who became continent within the first three months were

described as "early continent", and those continent at 6., and 12. months were defined as "late continent" patients.

Statistical analysis

For the evaluation of data SPSS (Statistical Package For Social Sciences) for Windows v. 10.0 was used. For the comparisons, Student's t test, Mann-Whitney U test, *chi*-square, and Fisher's exact test were used. $P < 0.05$ was accepted as the level of statistically significance.

Results

Following exclusion of the patients who underwent retropubic (n=17) or 20 RPP, a total of 37 retropubic, and 122 RPP patients were included in the study. Demographic data of the groups were summarized in Table 1, clinical, and pathological stages in Table 2.

Any statistically significant difference was not detected between RPP, and RRP arms of the continent, and incontinent groups as for age, prostate volume, clinical, and pathologic stage, state of nerve-sparing surgery, amount of bleeding, operative times, surgical margin positivity, and preoperative PSA values. A statistically significant difference was not detected between both study arms as for mean age ($p > 0.05$), while in the RRP group, increased prostate volume (PV) ($p < 0.001$) prebiopsy PSA values, total Gleason score ($p < 0.001$), amount of bleeding ($p < 0.001$), and operative times ($p < 0.001$) were noted. In the perineal prostatectomy group, any statistically significant difference was not detected between continent, and incontinent patients with respect to age, pH, clinical, and pathological stage, state of nerve-sparing surgery, amount of bleeding, operative time, surgical margin positivity, and postoperative PSA values ($p > 0.05$).

Nerve-preserving surgery was not performed for 35 RPP (29.7%), and 26 (70.3%) RRP patients. All RPP, and RRP patients included in the study underwent bladder-sparing surgery. In the RPP technique, urethrovaginal anastomosis was performed using a double-needle 4/0 polydioxanone (PDS) suture material passed through bladder neck at 11-1 o'clock positions from outside-in, and through corresponding quadrants of membranous urethra from inside-out. Then an 18 F Foley catheter was inserted through transurethral route into the bladder, and continuous sutures were passed through the left, and right sides of the membranous urethra using both needles up to the 6 o'clock position. RRP was performed using anatomical RRP technique described by Walsh.^[3] Urethral catheters were removed on postoperative 10. (10.-25.) days in RPP, and 14. (14.21.) days in RRP patients.

Table 1. Age, prostate volume (PV), prebiopsy prostate-specific antigen (PSA) values, biopsy material total Gleason scores (GS), amount of blood loss, and operative times of the patients in the perineal, and retropubic prostatectomy groups

	Perineal group		Retropubic group		p
	Mean	±SD	Mean	±SD	
Age (years)	62.36	6.53	62.54	6.07	.882
PV (cc)	39.27	13.94	60.49	28.74	.0001
Prebiopsy PSA (ng/mL)	8.223	6.925	20.972	18.559	.0001
Biopsy GS (total)	6.00	.70	6.54	.93	.0001
Blood loss (mL)	302.79	260.91	482.43	276.44	.0001
Operative time (min)	143.56	37.56	165.41	28.34	.001

Table 2. Clinical and pathological stages of the groups

	Perineal group		Retropubic group	
	n	%	n	%
Clinical stage				
T1a	2	1.6		
T1b			2	5.4
T1c	94	77.0	21	56.8
T2a	19	15.6	6	16.2
T2b	7	5.7	1	2.7
T2c			3	8.1
T3a			4	1.8
Pathological stage				
T0	2	1.6		
T2a	20	15.3	6	16.2
T2b	23	18.8	1	2.7
T2c	53	43.4	13	35.1
T3a	13	10.7	8	21.6
T3b	9	7.4	5	13.5
T4	2	1.6	2	5.4
T4N1			2	5.4

The continence state of the patients was evaluated based on their frequency of urinary pad use. In the RPP group complete continence rates were 50.8% on the day of catheter removal, and 70.5, 79.5, 86.9, and 93.4% at the end of postoperative 1., 3., 6, and 12. months, respectively. However the corresponding rates of continence in the RRP group were 59.5% at the time of catheter removal, and increased afterwards as seen in the perineal group (78.4, 89.2, 91.9, and 91.9, at the end of postoperative 1., 3., 6., and 12.months, respectively). A statistically significant difference was not detected between RPP, and RRP groups of

patients, as for frequency of urinary pad use, and urinary incontinence ($p>0.05$).

Usually continence was evaluated based on the frequency of urinary pad use according to the University of California-Los Angeles (UCLA) Prostate Cancer Index query, However, since our RPP, and RRP groups consisted of only incontinent patients, we assessed continent, and incontinent patients based on frequency of incontinent episodes. Consequently, in the continent, and incontinent perineal groups mean age (62 ± 6 vs. 61 ± 8

years), mean PV (39±14 cc vs. 35±11 cc), mean prebiopsy PSA (8.2±6.9 ng/mL vs. 6.6±3.6 ng/mL), biopsy total GS (6±0.7 vs. 6.3±0.4), amount of blood loss (302±260 mL vs. 276±198 mL), and the mean operative time (143±37 min vs. 163±37 min) were determined as indicated within parentheses. Any statistically significant intergroup difference was not found in any time period as for the frequency of incontinent episodes ($p>0.05$).

Since only two incontinent patients were found in the radical prostatectomy group, any statistical comparisons could not be performed between continent, and incontinent patients in that group.

Discussion

In radical prostatectomies, improvement in the postoperative functional, as well as oncological outcomes are desired. On one hand the most extensive, extirpative resections as far as possible should be made in accordance with the principles of cancer surgery, while on the other hand improvement in the quality of life should be maintained. However despite all advancements in the prostate cancer surgery, post-RP urinary incontinence still remains the most important complication effecting quality of life of the patients.^[8]

In various prostatectomy series, assessments of urinary continence rates pose challenging difficulties because of directly incomparable definitions of continence, data collection methods, and follow-up periods. Many studies performed so far have been conducted using non-validated questionnaire forms which can be interpreted in various formats dependent on the assessors.

Initial series of radical prostatectomy reported in 1905 were performed through perineal route and paved the way for increased use of RPP for the most part of the twentieth century.^[9] Application of RPP decreased gradually with the introduction of external radiotherapy in 1970s for the treatment of PCa. Besides, requirement of a second incision for pelvic node dissection (PLND), and description of nerve-sparing RRP in 1980s have also reduced the application rates of radical prostatectomy. Because of widespread use of PSA, predictability of rates of lymph node metastasis using various nomograms including Partin's, questionable necessity, and value of PLND in low-risk prostate cancer, lesser pain, and shorter hospital stay in RPP in comparison to RRP, RRP has rapidly dropped down the scale of desirability.^[10,11] Thanks to comparable oncological, and functional outcomes between RPP, and RRP, minimally invasive, and cost-effective characteristics of RPP, as asserted in many current updated articles, RRP has been withdrawn from the therapeutic armamentarium of localized PCa.^[12]

In a review article, Coelho et al.^[13] analyzed the results of the studies related to retropubic, laparoscopic, and robot-assisted radical prostatectomies performed in high-volume centers where patients who didn't use daily urinary pads or employed only one urinary pad a day for the purpose of control of dryness during one-year follow-up period were considered to be continent, and authors reported continence rates for RRP, LRP, and RYRP, as 79, 84.8, and 92%, respectively. In our study, at the end of one year, complete continence (100%) rates was achieved for RPP, and RRP as assessed by the number of urinary absorbent pads. In none of the evaluation intervals any statistically significant intergroup difference was found between number of incontinence pads, and frequency of urine leakage ($p>0.05$).

Comploj et al.^[14] released the outcomes of 212 RPPs performed by a single surgeon, and reported a continence rate of 81% (173/212) based on their definition of continence as perfect urinary control. Fourteen percent (30/212) of their patients rarely lose their urinary control, and they did not use protective incontinence pads, while 3.7% (30/212) of their patients had Grade 2 stress incontinence.

Gray et al.^[15] compared urinary functions after RPP, and RRP, and reported complete continence rates as 57%, and total or minimal incontinence rates as 75% in 167 (71 RPP, and 96 RRP) with available feedback. Within the first postoperative two years, continence rates did not differ between perineal, and retropubic methods, while at the end of two years continence rates were slightly better in the perineal group. The authors reported that nerve-sparing surgery was not performed in the RPP group, while in 68 cases who had undergone RRP, uni- or bilateral nerve sparing surgery was performed. Better continence rates in the RRP group were explained by more satisfactory exposure of bladder neck, and proximal urethra through perineal route.^[15]

Contribution of nerve-sparing surgery to post-RP continence has been supported or rejected in separate literature studies.^[16-23]

Lepor et al.^[21] evaluated post-RRP urinary incontinence in 500 patients using UCLA Prostate Cancer Index questionnaire forms, and reported continence rates based on the frequency of urinary pad usage, and incontinence rates in consideration of frequency of urine leakage at postoperative 3., 6., 12., and 24. months as 70.9 vs. 80.6%; 87.2 vs. 91.2%; 92.1 vs. 95.2%, and 98.5 vs. 98.5%, respectively. In the same study, the authors reported that, age, preoperative AUA (American Urological Association) symptom score, biopsy material Gleason score, amount of bleeding, nerve-sparing surgery, and intraoperative apical soft tissue margin biopsy were not predictive for early postoperative continence.^[21]

Imperatore et al.^[24] compared postoperative complete postoperative continence rates in their age-matched RPP, and RRP patients with similar PSA values, Gleason score, and clinical stage who had previously undergone prostate surgery (transurethral resection, and open adenectomy), and found higher complete continence rates in the RPP group. They reported complete continence rates at the end of 3, 6, and 12. postoperative months in the group of patients who had undergone RPP or RRP as 83% (n=49) vs. 66.1% (n=39); 86.4% (n=51) vs. 71.1% (n=42), and 93.2% (n=55) vs. 79.6% (n=47) respectively.^[24]

Recovery of continence after radical prostatectomy is a time-dependent process, and at the end of the first postoperative year after retropubic or perineal surgery, most of the patients become continent. Very high incidence rates we obtained in our study (100% at 1. postoperative year) when compared with the highly variable rates of continence reported in the literature, can be possibly attributed both to inclusion of patients using one pad a day and/or cases with complaints of urine leakage once in a while in the continent group as is recommended originally in the UCLA questionnaire forms, our patient exclusion criteria, and possibly presence of incontinent individuals among those who were lost-to-follow-up. However at face-to-face interviews with the patients during the study period, we should indicate that patients expressed postvoiding dribbling as 'occasional urine leakage' which is frequently encountered in this age group as an acceptable nonspecific urinary symptom. In the literature we haven't encountered any study which evaluated these types of complaints specifically. We think that special consideration should be exerted while evaluating results of our study, and other investigations which assessed postprostatectomy urinary incontinence.

In the literature, some studies have evaluated outcomes related to urinary continence, and erectile function in combination as "functional results." Because of their association with common surgical- anatomical structures, and difficulties in obtaining objective results using pre-, and postoperative assessment tools, it may be appropriate to consider outcomes of urinary continence, and erectile function in combination.

In conclusion, very different postoperative continence rates have been reported after retropubic, perineal, laparoscopic or robot assisted laparoscopic radical prostatectomies which can be related to non-standardization of the patient populations studied, questionnaire forms, and surgical techniques used. Some patients use urinary pads for a few days as a protective measure with the concern of potential urine leakage. Though some of the patients are mildly incontinent, and they don't use urinary pads. Inquiries about incontinence should especially take heed of these differences. Questions in the survey forms can be interpreted variably dependent on the physician, and the

patient. Difficulties in the definition of post-RP incontinence explain in part differences in the outcomes cited in the literature.

If we kept in mind that patient groups who had undergone radical prostatectomy were not comparable as for preoperative functional, and oncological parameters, in addition to inability to apply each technique in every clinic with the same facilities, and standards, increasing, and orientable demands for minimally invasive techniques, it seems not possible to test the techniques in question in one-to-one, and comparative studies.

In conclusion, improved preservation of endopelvic fascia, accessory pudendal artery, and pubovesical ligaments which especially affect functional postprostatectomy outcomes in the perineal approach demonstrates superiority of RPP over retropubic methods.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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