

Radical Cystectomy and Ileal Orthotopic Bladder Substitution after Radical Retropubic Prostatectomy: Functional and Oncological Results

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Key Words

Bladder cancer · Prostate cancer · Prostatectomy · Radical cystectomy · Ileal neobladder · Reconstruction · Continence · Sexual function

Abstract

Men with good functional results following radical retropubic prostatectomy (RRP) and requiring radical cystectomy (RC) for subsequent bladder carcinoma seldom receive orthotopic bladder substitution. Four patients aged 62–72 years (median 67 years), who had undergone RRP for prostate cancer of stage pT2bN0M0 Gleason score 6 (n = 1), pT2cN0M0 Gleason score 5 and 6 (n = 2) and pT3bN0M0 Gleason score 7 (n = 1) 27 to 104 months before, developed urothelial bladder carcinoma treated with RC and ileal orthotopic bladder substitution. After radical prostatectomy three were continent and one had grade I stress incontinence, and three achieved intercourse with intracavernous alprostadil injections. Follow-up after RC ranged between 27 and 42 months (median 29 months). At the 24-month follow-up visit after RC daily urinary continence was total (0 pad) in one patient, two used one pad for mild leakage, and one was incontinent following endoscopic incision of anastomotic stricture. One patient died of progression of bladder carcinoma,

while the other three are alive without evidence of disease. The three surviving patients continued to have sexual intercourse with intracavernous alprostadil injections. Men with previous RRP have a reasonable chance of maintaining a satisfactory functional outcome following RC and ileal orthotopic bladder substitution. © 2014 S. Karger AG, Basel

Introduction

The widespread use of radical retropubic prostatectomy (RRP) for clinically localized prostate cancer and its good oncological and functional results have created worldwide a population of patients who are at risk of developing subsequent bladder carcinoma, potentially requiring radical treatment. Radical cystectomy (RC) in this subgroup is a challenging procedure, since the changes induced by the previous removal of the prostate potentially increase the risk of damage to the pelvic structures and of suboptimal functional results concerning urinary continence and sexual potency. Therefore, the choice of urinary diversion in these cases is still controversial, and ileal orthotopic bladder substitution has been performed in a very limited number of cases [1–4].

Table 1. Demographic, clinical and pathologic characteristics of the four patients treated with RC and ileal orthotopic bladder substitution after RRP

Patient No.	Age at RC, years	Interval between surgeries, months	Pathologic stage and grade of prostate cancer	Urinary continence after RRP	Potency after RRP	Pathologic stage and grade of bladder cancer	Comorbidities	Follow-up after RC, months	Urinary continence after RC		Potency after RC	Follow-up status
									day	night		
1	67	69	pT2cN0 GS 6	yes	alprostadil	pT1G3N0	diabetes mellitus	27	yes	yes	alprostadil	alive, NED
2	72	104	pT2bN0 GS 6	yes	alprostadil	pT1G3N0	diabetes mellitus	29	no	no	alprostadil	alive, NED
3	62	45	pT2cN0 GS 5	yes	alprostadil	pT1TisG3N0	diabetes mellitus	48	yes	yes	alprostadil	alive, NED
4	70	27	pT3bN0 GS 7	stress incontinence I	impotent	pT2TisG3N0	cardiovascular disease	42	1 pad	1 pad	NA	DOD

DOD = Dead of disease; GS = Gleason score; NA = not available; NED = no evidence of disease.

Table 2. Urinary continence outcomes in published series of RC and ileal orthotopic bladder substitution after RRP

Reference (first author)	Patients evaluable for urinary continence	Continent patients, daytime		Time point of evaluation, months
		n	%	
Schuster, 2003 [1]	3	3	100	NA
Miotto, 2004 [2]	1	1	100	1
Jayram, 2010 [3]	6	2	33	NA
Huang, 2012 [4]	19	11	58	12
Present series	4	3	75	24
Total	33	20	61	

NA = Not available.

The aim of the present study was to report the functional and oncological results in a series of patients treated with open RC and ileal orthotopic bladder substitution after open RRP at two academic tertiary care referral centres.

Patients and Methods

During the period 2009–2011 four patients aged between 62 and 72 years (median 67 years) who had previously undergone open RRP for tumours of stage/grade pT2bN0M0 Gleason score 6 (n = 1), pT2cN0M0 Gleason score 5 and 6 (n = 2) and pT3bN0M0 Gleason score 7 (n = 1) 27 to 104 months (median 45 months) before, required open RC and ileal orthotopic bladder substitution with the Studer technique, performed at Inselspital Bern (n = 2) and at Pisa University Hospital (n = 2) (table 1). No pelvic radiation therapy was administered before or after RC. Final pathology revealed non-muscle-invasive high-grade urothelial bladder carcinoma in three cases and muscle-invasive high-grade urothelial bladder carcinoma in one. Comorbidities were type II diabetes in three men and cardiovascular disease in one.

Following open RRP three patients were completely continent (0 pad) day and night, while one presented grade I stress incontinence. No preoperative measures were taken to enhance the likelihood of erections, and postoperatively three patients (all diabetic) were able to achieve sexual intercourse with intracavernous injections of alprostadil, while one was impotent.

At the time of the second procedure, extension of the pelvic lymph node dissection performed during RRP was performed at the surgeon's discretion in two cases, removing 17 and 22 lymph nodes, respectively, which proved to be harbouring transitional cell carcinoma in one patient. RC was performed in a descending fashion, the vesicourethral junction was isolated by sharp retropubic dissection and opened. Ileal orthotopic bladder substitution was performed with the technique previously described [5].

Perioperative complications were assessed with the modified Clavien system [6]. Urinary continence and potency were defined as previously reported [7, 8] and were assessed at the 24-month follow-up visit after RC.

Results

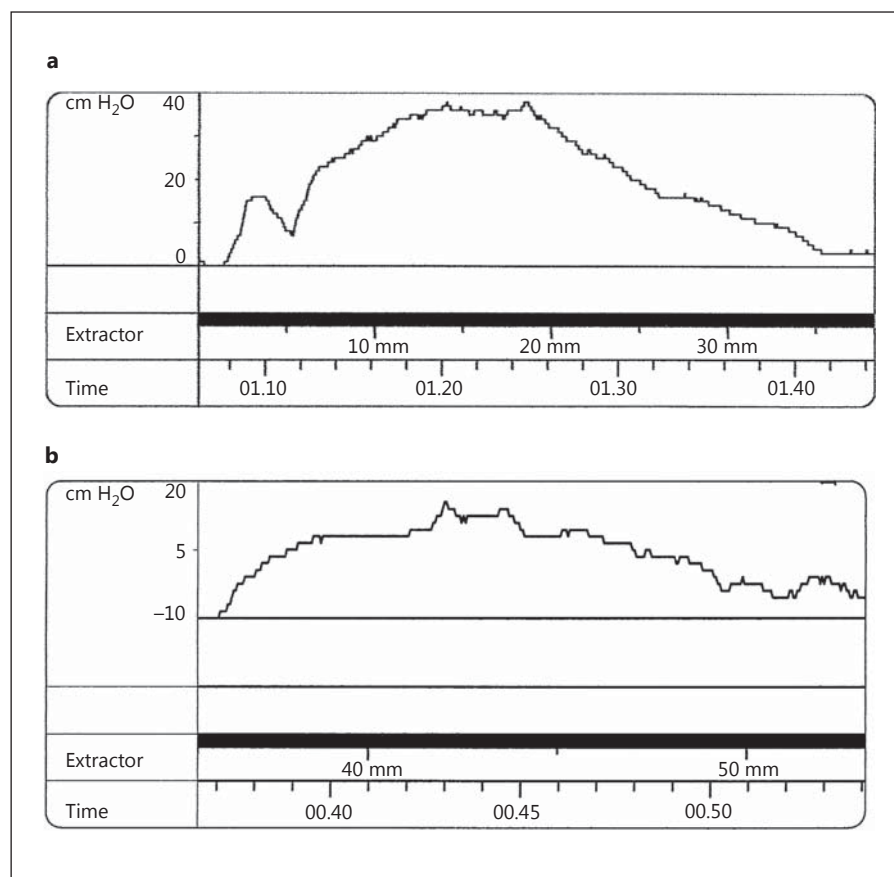
Operative time ranged between 360 and 420 min and estimated blood loss between 400 and 1,000 ml.

Intraoperatively, in one patient a small rectal tear was determined and promptly sutured with interrupted 3-0 sutures (Clavien grade 3b complication), with an uneventful outcome. One patient required also transfusion of one blood unit (Clavien grade 2).

Postoperatively, one patient developed pneumonia (Clavien grade 2), which prolonged the hospitalization length by 3 days. Postoperative hospital stay ranged between 14 and 22 days (mean 17.25 days).

One patient was studied with video-urodynamics before and after RC, documenting a decrease in the functional urethral length from 33 to 15 mm and in the maximal urethral closure pressure from 38 to 17 cm H₂O (fig. 1). Daily urinary continence was total (0 pad) in one

Fig. 1. Case 4. Urethral pressure profiles after RRP (a) and after RC and ileal orthotopic bladder substitution (b), demonstrating a decrease in functional urethral length from 33 to 15 mm and in maximal urethral closure pressure from 38 to 17 cm H₂O. The patient remained continent due to the low pressure of the ileal reservoir.



man, two used one pad for mild leaks, while one was incontinent. The latter developed a stricture of the urethro-ileal anastomosis 10 months after RC, successfully treated with endoscopic cold-knife incision. Subsequent implantation of an Advance male sling after 23 months failed to cause significant improvement, and the placement of an artificial urinary sphincter is planned.

All the three surviving patients continue to have satisfactory sexual intercourse with intracavernous alprostadil injections.

With a follow-up after RC ranging between 27 and 42 months (median 29 months), one patient died of progression of bladder carcinoma, while the other three are alive without evidence of disease.

Discussion

The widespread use of PSA testing has induced a stage migration in prostate cancer, and RRP either with the open or robotic approach is the most common form of

treatment for clinically localized prostate cancer [9, 10]. These patients have usually good functional results and are willing to maintain them if the need of further surgery for bladder carcinoma arises. The occurrence of subsequent tumours of the genitourinary tract is no longer exceptional, and treatment options must also take into account quality of life issues.

Patients developing muscle-invasive bladder cancer after RRP have the options of radiotherapy or radical surgery, which represent the only logical solution for recurrent high-grade non-muscle-invasive tumours. RC after prostate surgery may be challenging due to adhesions which obliterate the anatomic cleavage planes, and there is an increased risk of damage to the rectum and to the continence mechanism at the level of the pelvic floor. Therefore the form of urinary diversion is still debated, and in the literature there are only 29 reported cases of ileal orthotopic bladder substitution after RRP with available data for functional results [1–4] (table 2).

The functional results are variable, with a median reported daytime continence of >50%, but with a high inci-

dence of urethro-ileal anastomosis stricture at some institutions (67%) [3]. Moreover long-term follow-up is unavailable, and urodynamic evaluation has never been reported. The largest published series from an academic US centre reflects the experience of different surgeons using different forms of orthotopic bladder substitution, which may increase the variability of perioperative outcomes [4]. Patients with locally advanced bladder tumours were included and artificial urinary sphincters were placed in two cases simultaneously with RC.

We believe that the indication for continent orthotopic bladder substitution after RRP should be reserved to motivated patients presenting bladder tumours with a relatively low risk of systemic progression.

The dissection of the vesicourethral junction is the most challenging aspect of the procedure, and only after accurate urethral preparation can the surgeon decide to proceed further with the confection of an orthotopic ileal reservoir with safety.

The cumulative experience of two academic centres using the same technique for both RRP and RC with ileal orthotopic bladder substitution indicates that following RRP there is a reasonable chance of maintaining satisfactory functional outcomes with RC and ileal orthotopic bladder substitution.

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