Individualized Seminal Vesicle Sparing Cystoprostatectomy Combined With Ileal Orthotopic Bladder Substitution Achieves Good Functional Results

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Purpose: We review the functional and oncologic outcomes of seminal vesicle and prostate capsule sparing cystectomy combined with ileal orthotopic bladder substitution.

Materials and Methods: Between May 2003 to April 2009 a select group of 31 patients (median age 61 years, range 30 to 77) underwent seminal vesicle sparing cystoprostatectomy for transitional cell carcinoma of the bladder. Preoperatively all 31 patients were continent, and 23 (74%) were potent and sexually active. Of these patients 17 (55%) underwent unilateral and 14 (45%) underwent bilateral seminal vesicle sparing cystoprostatectomy. Pathological disease stage was pTa/pT1 in 15 patients (48%), pT2 in 9 (29%), pT3 in 2 (7%) and pT2–4 pN1 in 5 (16%). Urinary continence and potency outcomes were assessed with validated questionnaires. All patients were followed for local tumor recurrence and distant metastasis.

Results: Median followup was 18 months (range 3 to 63). At 6 months 25 of the 30 evaluable patients (83%) had daytime continence and 13 of 30 (43%) had nighttime continence. At last followup (median 18 months) 27 of 29 evaluable patients (93%) had daytime continence and 19 of 29 (66%) had nighttime continence. In terms of postoperative potency 15 of 19 evaluable patients (79%) remained potent, 9 with oral medications. There was pelvic recurrence in 1 patient (3%), distant metastases developed in 4 (13%) and 1 (3%) died of metastatic transitional cell carcinoma.

Conclusions: Individualized seminal vesicle and nerve sparing cystoprostatectomy resulted in a high probability of preserving potency, at least with oral medication, without putting patients at undue risk.

Key Words: urinary bladder neoplasms, cystectomy, seminal vesicles, urinary continence, erectile dysfunction

Abbreviations and Acronyms

CIS = carcinoma in situ
ED = erectile dysfunction
NVB = neurovascular bundle
RC = radical cystectomy
TCC = transitional cell carcinoma

Submitted for publication July 21, 2009.

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Prostate and seminal vesicle sparing cystectomy has been reported to improve functional results because there is less risk of damaging the autonomic nerves and the sphincter area.[1,2] However, there are concerns regarding oncological radicality because of possible urothelial cancer in the prostatic ducts, prostate cancer etc. In this study we review 31 cases of RC with preservation of seminal vesicle(s) and neurovascular bundle combined with ileal orthotopic bladder substitution to assess the preliminary functional and oncological outcomes.

PATIENTS AND METHODS

During the 6 years between May 2003 and April 2009 a total of 218 patients in our department underwent RC combined with

0022-5347/10/1834-1337/0
THE JOURNAL OF UROLOGY®

Vol. 183, 1337–1342, April 2010
Printed in U.S.A.
DOI:10.1016/j.juro.2009.12.017

orthotopic ileal bladder substitution. Of these patients 31 (14.2%) had sparing of 1 or both of the seminal vesicles and the prostate capsule adjacent to the NVB during cystoprostatectomy.

All 31 patients (median age 61 years, range 30 to 77) had histologically proven high grade TCC diagnosed on transurethral resection biopsies. In addition to the usual indications for RC these patients met several inclusion criteria for seminal vesicle sparing cystectomy such as organ confined bladder tumor stage T2 or less based on preoperative assessment, bladder tumor located away from the bladder posterior wall and trigone, negative tumor histology on paracollicular prostatic urethral biopsies and/or staged transurethral resection of the prostate, and strongly expressed desire to preserve potency and/or continence.

All patients underwent preoperative clinical assessment including a thorough history, physical examination, digital rectal examination, routine blood tests, urinalysis, chest x-ray, and computerized tomography of the abdomen and pelvis. Rigid cystoscopy and transurethral biopsies of the prostatic urethra at the paracollicular region were performed in all patients. All patients had assessment of preoperative erectile function and continence using validated questionnaires of the International Index of Erectile Function 15[3] and of Bristol's lower urinary tract symptoms.[4]

On preoperative clinical staging 5 patients (16%) had recurrent stage cTa disease, 11 (36%) had stage cT1 disease with or without CIS and 14 (45%) had stage cT2 disease with or without CIS. One patient (3%) had stage cT1 disease with previously diagnosed, radiologically positive pelvic lymph nodes that had responded completely to neoadjuvant chemotherapy. Based on the American Society of Anesthesiologists classification 2 cases were Class I, 20 were Class II and 9 were Class III.

Surgical Technique

All operations were performed with the patients under general anesthesia in the supine 30-degree Trendelenburg position with a lower midline incision. Bilateral pelvic lymph node dissection was performed using a standard template as previously described.[5] After pelvic lymph node dissection the skeletonized superior and inferior vesical arteries were ligated and divided where they branched off from the internal iliac arteries. The endopelvic fascia was sharply incised medial to the tendinous arc up to the bladder neck. The deep Santorini's plexus was then bunched with a curved Babcock clamp and ligated over the apical prostate and bladder neck, exposing the lateral aspects of the prostate.

The ureters were then transected approximately 4 cm cephalad to the bladder. A sharp transverse incision of the peritoneum was made approximately 4 cm ventral to the rectovesical pouch. Seminal vesicle(s) were then identified, and a plane of dissection was developed bluntly between the seminal vesicle(s) and the dorsal bladder wall when dividing the dorsomedial pedicle. Care was taken to keep dissection ventrolateral to the seminal vesicle(s) and, thus, away from the pelvic plexus, which is located lateral and dorsal to the seminal vesicle. Dissection then proceeded caudally toward the angle of the vesicoprostatic junction (fig. 1). A lateral incision of the prostatic capsule ventral to the NVB was next made running from the base to the apex, and the prostatic parenchyma was then dissected off the posterior capsule. The prostatic apex was approached directly along the lateral aspect of the prostatic capsule toward the membranous urethra, which was developed out of the donut-shaped prostatic apex. The urethra was transected sharply at the level of the distal verumontanum and the bladder was removed en bloc together with the prostatic parenchyma. Finally the dorsal prostatic capsule between the NVBs and any visible remnant of prostatic tissues attached to the prostatic capsule covering the NVBs was removed until only the capsule of the prostate adjacent to the NVB was left in situ.

Whenever feasible, attempts were made to preserve both seminal vesicles with the adjacent NVB. However, in patients in whom the tumor was proximal to the seminal vesicle on 1 side only the contralateral seminal vesicle was preserved. Finally we reconstructed an orthotopic ileal low pressure bladder substitute combined with an afferent isoperistaltic tubular segment as previously described, and anastomosed it directly to the urethral stump, with care to avoid a funnel-shaped outlet.[6]

Followup

After discharge home the patients came for followup visits at least every 3 months for the first 12 months, and every 6 months thereafter until 5 years. Apart from the usual followup examinations the patients were also asked to complete the validated International Index of Erectile Function 15 and Bristol questionnaires to evaluate the functional outcomes of erection and continence.[3,4] We defined potency as ability to achieve erection for completion of sexual intercourse. We defined postoperative continence as completely dry with or without occasional loss of a few drops of urine. The patients were instructed to maintain nighttime continence by having an alarm clock to time-void at least once at night. For patients who were incon-

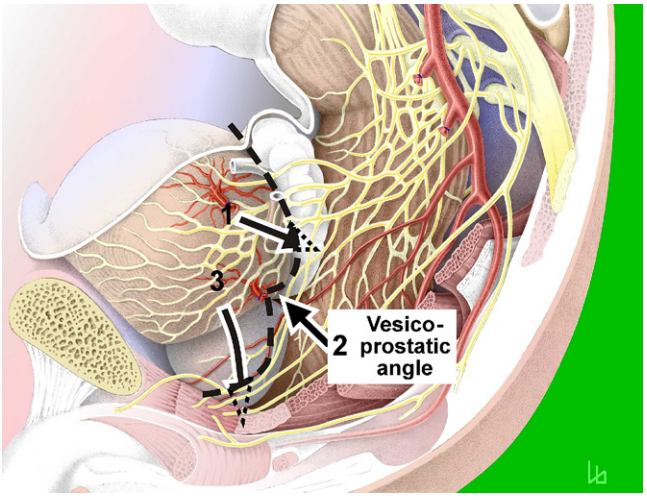

Figure 1. Plane of dissection ventral to seminal vesicle and sequence of dissection with emphasis on 3 important steps of 1) dissection of plane anterior to seminal vesicle, 2) resection close to vesicoprostatic angle and 3) incision of lateral prostatic capsule to cleave it together with NVB.