pelvic floor reconstruction before orthotopic bladder replacement after radical cystectomy for bladder cancer

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abstract
female incontinence and pelvic organ prolapse have been defined as contraindications to orthotopic bladder substitution. a 75-old-year woman with slight stress incontinence, stage iii cystocele, and vaginal vault prolapse after subtotal hysterectomy underwent radical cystectomy for stage t2 bladder cancer. after radical cystectomy, pelvic floor integrity was restored by colposacropexy with a rectangular polypropylene mesh and an ileal reservoir to urethra was constructed. after 1 year of follow-up, she had complete daytime continence and only needed to wear a pad during the night. her postvoid residual urine volume was constantly less than 100 mL.


intestinal continent reservoirs to the urethra in women undergoing radical cystectomy have not been routinely considered until recently. the initial reported experiences were encouraging and suggested that preservation of the urethra resulted in good functional urinary continence in most patients with a minimal risk of locoregional tumor recurrence. however, chronic urinary retention due to posterior prolapse of the neobladder occurs in a significant proportion of cases (4% to 70%), so that a history of pelvic organ prolapse has been considered an absolute contraindication to orthotopic neobladder construction.1–7 we describe a new solution combining orthotopic bladder replacement and pelvic floor reconstruction.

case report

a 75-year-old woman presented with recurrent bladder cancer that had been treated by transurethral resection and intravesical mitomycin. the last recurrence had involved the left ureteral orifice, and a left percutaneous nephrostomy had been inserted after incomplete transurethral resection. the pathologic diagnosis was stage t2g3 urothelial carcinoma. the patient had no significant concomitant comorbidities and was strongly concerned about her body image. she accepted radical cystectomy but preferred it to be followed by orthotopic bladder replacement. her medical history included subtotal hysterectomy and bilateral ovariectomy, performed approximately 20 years before for benign uterine disease. the patient complained at presentation of slight stress incontinence and urinary urgency and frequency. when she was examined, she was wearing only one pad per day and had a positive stress test. the physical examination revealed a stage iii cystocele and vaginal vault prolapse. the abdomen and chest contrast-enhanced computed tomography scans did not show pelvic lymph node metastasis or distant metastasis. left hydronephrosis was present.

a median incision was made from above the umbilicus to the pubic symphysis. the peritoneum was entered in the upper half, and the median umbilical ligament and obliterated umbilical arteries were secured. the ureters were sectioned at their exit from the paracervical tunnel. the endopelvic fascia was prepared, and the urethra was isolated immediately below the bladder neck. the proximal urethra was then severed just distal to the bladder neck, in anticipation of the insertion of the endopelvic fascia. nerve-sparing retrograde dissection between the bladder and vagina was performed for 3 to 4 cm. a transverse incision of the peritoneum of the anterior wall of the cul-de-sac was carried out and a peritoneal flap was prepared.

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until the rectum was reached. The vagina was then incised posteriorly around the scar from the previous hysterectomy. The incision was continued ventrally and caudally, and the ventral wall of the vagina was partially removed, together with the bladder specimen. Biopsy specimens from the bladder neck were sent for pathologic examination, together with the distal ureters, and were confirmed to be free of cancer. Standard bilateral pelvic lymphadenectomy was performed with removal of the distal common iliac, external iliac, obturator, and internal iliac lymph nodes. The rectum was gently displaced to the left and the sacral promontory evidenced. A rectangular-shaped polypropylene mesh 3 cm in width and 10 cm long was prepared. It was fixed posteriorly to the periosteum of the sacral promontory with two 2-0 polypropylene sutures and anteriorly to the posterior vaginal wall with 2-0 polypropylene sutures (Fig. 1). The sutures were then tied without tension. The previously developed peritoneum was sutured posterolaterally to the edges of the parietal peritoneum and anterolaterally to the edges of the pelvic fascia over the vaginal stump, so that the mesh was entirely covered (Fig. 2). An adequate ileal segment was then isolated and an ileal neobladder was created. The ureters were implanted using a serous-lined extramural tunnel and then anastomosed to the urethra with six interrupted 4-0 polydioxanone sutures over a 22Ch Foley catheter. Thus, we created a hammock providing support and preventing downward migration of the pouch. Her convalescence was uneventful. The pouchogram performed on day 12 did not evidence any leakage. The patient was discharged on day 14 after catheter removal. The double-J stents were removed by flexible cystoscopy 1 month after surgery. The final pathologic diagnosis was pT2bN1, grade 3. The patient refused adjuvant chemotherapy. After 1 year of follow-up, abdominal and chest computed tomography scan did not show local or distant recurrence; slight, but not clinically significant, bilateral hydronephrosis was the only pathologic finding. Her physical examination did not reveal any pelvic prolapse. Moreover, continence was reached without chronic retention. Daytime continence was complete, and the patient complained only of occasional night incontinence (one or two events per week). The median number of voids per day was five (range four to seven) and per night was two (range one to three). The median urinary volume per void was 250 mL (range 180 to 350), and the postvoid residual urinary volume, measured by catheter insertion, was constantly less than 100 mL for a period of 1 month before her last follow-up visit. Her serum creatinine level was 1.1 mg%.

**COMMENT**

Incontinence and pelvic organ prolapse are currently considered contraindications to orthotopic bladder replacement to avoid disappointing complications, such as incontinence or, more frequently, chronic urinary retention, which leads to intermittent self-catheterization (Table 1). Many possible causes of chronic retention in female neobladders exist. A mechanical factor is frequently advocated, including the length and configuration of the intestinal segments used for reservoir creation, the position and fixation of the pouch in the pelvis, the handling of the vesicopubic-urethropelvic ligaments, the amount of straining by the patient to assist in voiding, and the acute angulation...
of the pouch-urethral junction. Also, resection of the autonomic innervation could be implied in the development of hypercontinence. In addition to nerve-sparing dissection between the bladder and vagina, the creation of a posterior support to the neobladder has been advocated by Ali-El-Dein et al. who proposed a peritoneal flap from the peritoneal cul-de-sac fixed to the vaginal stump. Stein et al. and Stenzl et al. proposed an omental flap interposed between the vagina and the pouch, and Mills and Studer fixed the anterior neobladder wall to the posterior aspect of the symphysis. We recently introduced a technical variation of the technique of Ali-El-Dein et al. by fixing the peritoneal flap to the endopelvic fascia, covering the vaginal suture. However, in all of these reports, a history of significant incontinence or pelvic organ prolapse was an absolute contraindication to orthotopic bladder replacement, because the usual techniques for supporting the pouch might not be sufficient if the pelvic floor deficiency were significant. In our case, the patient was extremely concerned about her body image and requested an orthotopic neobladder. Her incontinence and, in particular, her severe pelvic organ prolapse were predictive of a bad functional outcome and suggested the addition of pelvic floor reconstruction with colposacropexy to the nervesparing and vagina-sparing radical cystectomy. The pelvic floor support was restored using polypropylene mesh, as we usually do for vaginal vault prolapse. Her functional results were excellent and perfectly comparable to the other patients with no previous pelvic floor deficiency. No report of a similar technique and result have been published. We believe that, even if this is the first successful experience, pelvic organ prolapse should no longer be considered a formal contraindication to orthotopic neobladder construction in women.

REFERENCES


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