

Comparison of Transvaginal and Retropubic Bladder Neck Closure with Suprapubic Catheter in Women

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Abbreviations and Acronyms

BNC = bladder neck closure
CT = computerized tomography
GFR = glomerular filtration rate
HCT = hematocrit
NGB = neurogenic bladder
NM = nuclear medicine
RP = retropubic
RUS = renal ultrasound
SPC = suprapubic catheter
TV = transvaginal

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Purpose: Bladder neck closure is an uncommon procedure that is usually reserved for patients with severe urethral incompetence. It may be an acceptable alternative to procedures involving bowel reconstruction. Bladder neck closure can be performed using a transvaginal or a retropubic approach. We compared urethral continence rates, perioperative outcomes, short-term and long-term complications, subsequent procedures and changes in renal function between transvaginal and retropubic bladder neck closure in females at our institution.

Materials and Methods: We retrospectively reviewed the records of 64 female patients who underwent bladder neck closure with suprapubic catheter placement from May 1990 to February 2013. Baseline variables and the mentioned outcomes were compared between transvaginal and retropubic bladder neck closure.

Results: There were 35 women in the transvaginal group and 29 in the retropubic group. Urethral erosion due to a chronic indwelling urethral catheter was the most common indication for bladder neck closure. The urethral continence rate after the first bladder neck closure did not significantly differ between the transvaginal and retropubic groups (85.7% vs 81.5%, $p = 0.74$). The transvaginal group had significantly shorter mean operative time (78.0 vs 137.5 minutes, $p = 0.002$) and hospital stay (1.5 vs 4.9 days, $p = 0.0003$), and fewer short-term complications (5.7% vs 31.0%, $p = 0.02$) than the retropubic group. The remaining outcomes did not differ between the 2 groups.

Conclusions: There was no difference between transvaginal and retropubic bladder neck closure in achieving urethral continence. Transvaginal bladder neck closure was associated with a shorter operative time and hospital stay as well as fewer short-term complications.

Key Words: urethra, urinary bladder, cystostomy, urinary incontinence, female

BLADDER neck closure is an uncommon procedure that is reserved for patients with severe urethral incompetence, such as those with NGB in whom a patulous urethra has developed from chronic indwelling urethral catheters (fig. 1). BNC may be offered as an alternative to more extensive procedures involving bowel reconstruction.^{1,2}

Using a SPC for urinary diversion eliminates the need for bowel reconstruction, intermittent catheterization and stoma appliances.

BNC can be performed using a RP or a TV approach. Although retropubic BNC is effective, it has the morbidity of an abdominal procedure.³ Transvaginal BNC is associated with less

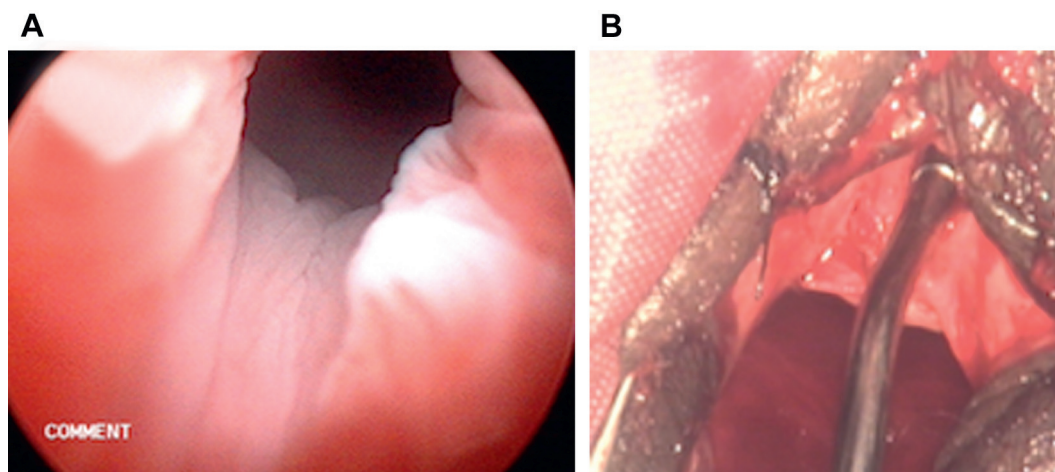


Figure 1. A, cystoscopic view shows patulous bladder neck dilated by sequentially increasing indwelling urethral catheter size. B, dilated urethral meatus easily accommodated Yankauer tonsil tip suction device.

morbidity but a higher rate of vesicovaginal fistula formation in some studies.^{3–6} Data comparing the outcomes of the 2 approaches have been limited by small patient numbers and differences in surgical technique.

Based on the experience at our institution we hypothesized that TV BNC was equally effective as RP BNC and associated with less morbidity. Therefore, we compared urethral continence rates, perioperative outcomes, complications and the change in renal function in females who underwent TV or RP BNC at our institution.

MATERIALS AND METHODS

After obtaining institutional internal review board approval we retrospectively reviewed the medical records of female patients treated with BNC with a SPC from May 1990 to February 2013 at our institution. Patients were excluded from study if they underwent any urinary diversion other than a SPC before or at BNC. Baseline characteristics compared between the 2 groups included age at surgery, time from injury to surgery if applicable, indication for BNC, preoperative renal function based on serum creatinine and GFR estimated by the MDRD (Modification of Diet in Renal Disease) formula, neurological injury level in patients with spinal cord injury and concomitant procedures. Assignment of comorbidities such as diabetes mellitus, decubitus ulcers and obesity was based on documentation of these diagnoses as a part of the medical history, hospital discharge diagnoses or physical examination.

Outcomes included the urethral continence rate after initial BNC, subsequent urinary diversion, operative time, intraoperative estimated blood loss, postoperative HCT, change in HCT from preoperative value, blood transfusion (intraoperatively or during postoperative hospitalization), hospital duration, short-term (within 30 days of surgery) and long-term (greater than 30 days

postoperatively) complications, change in renal function and subsequent procedures.

The change in renal function was assessed by laboratory and radiographic tests. Patients with normal serum creatinine, GFR greater than 60 ml/minute/1.73 m², normal RUS, abdominal CT, NM renal scan or a combination were considered to have normal renal function. Any of certain conditions was considered indicative of abnormal renal function, including creatinine greater than 1.1 mg/dl, GFR less than 60 ml/minute/1.73 m², abnormal RUS (hydronephrosis, renal scars or nephrolithiasis), hydronephrosis or urinary stones on CT, asymmetrical renal function (differential less than 40%) on NM renal scan or decreased estimated renal plasma flow for age and gender on NM renal scan.⁷

As deemed appropriate, we used the chi-square, Fisher exact or Wilcoxon test to compare the TV and RP groups with respect to demographic, clinical and outcome measures using SAS®, version 9.3. Two-sided $p = 0.05$ was considered statistically significant.

Retropubic BNC was performed through a midline suprapubic incision with the patient supine. The bladder was opened anteriorly down to the bladder neck, which was transected (fig. 2).⁸ The bladder neck and anterior cystotomy were closed in 2 layers with 3-zero chromic running suture followed by 2-zero chromic figure-of-8 sutures. A SPC was placed through a separate cystotomy and a Jackson-Pratt drain was left in the pelvis until discharge home.

Transvaginal BNC was performed with the patient in the low lithotomy position. A 20Fr SPC was placed cystoscopically using a Lowsley retractor. A 24Fr urethral catheter was placed until the bladder neck was divided. An elliptical incision was made around the urethra (fig. 3). The urethra was dissected away from its circumferential attachments up to the level of the pubic symphysis and then transected immediately proximal to the external sphincter (fig. 4, A). The bladder neck was closed in 2 layers followed by the vaginal mucosa (fig. 4, B). A vaginal pack was placed for approximately 24 hours.

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