

## Continence Outcomes After Treatment of Recalcitrant Postprostatectomy Bladder Neck Contracture and Review of the Literature

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<b>OBJECTIVE</b>	To present our experience with 2-stage management for recalcitrant refractory bladder neck contracture (BNC) after radical prostatectomy.
<b>METHODS</b>	A 15-year retrospective medical record review was performed for patients referred for BNC using current procedural terminology code or by International Classification of Diseases - Ninth Revision code for bladder neck incision (BNI). Treatment consisted of deep cold-knife BNI, followed by cystoscopy at 3-4 months. If stable and healed, an artificial urethral sphincter (AUS) or male sling was placed depending on continence level. Recurrent BNC at 3 months was treated with a second BNI.
<b>RESULTS</b>	Sixty-three patients were referred with median (range) age of 66 (41-82) years, body mass index 30.1 (21.9-64.8) kg/m <sup>2</sup> , and follow-up of 11 (1-144) months. Seventeen (27%) underwent adjuvant radiation therapy. Of the 46 who had successful management of the BNC, 91.3% were satisfied with level of continence after BNI alone or with a single additional operation. Of the 33 who underwent AUS or sling, only 2 failures occurred: 1 ultimately required cystectomy after multiple urethral erosions, and 1 with mild incontinence was satisfied with a secondary sling procedure. Four patients progressed to permanent urinary diversion. Together, either BNI (n = 4) or the secondary incontinence procedure (n = 1) was not successful in a total of 5 patients and required permanent urinary diversion. Nine had concurrent severe membranous strictures with no coaptation of the external urethral sphincter and were treated with direct vision internal urethrotomy and AUS and were continent.
<b>CONCLUSION</b>	This represents the largest known experience with BNC after radical prostatectomy. Patients can be managed with cold-knife incision, followed by AUS or sling, with 66% achieving continence. UROLOGY 83: 648–652, 2014. © 2014 Elsevier Inc.

Long-term complications after radical prostatectomy (RP) include erectile dysfunction, stress urinary incontinence, and bladder neck contracture (BNC). The morbidity associated with BNC includes infection, urinary retention, need for subsequent surgery, and future incontinence, as well as decreased quality of life. The incidence of BNC from the Cancer of the Prostate Strategic Urologic Research Endeavor database is 8.4%, and the Prostate Cancer Outcome Study reported that 16% of patients were treated for BNC after RP.<sup>1,2</sup>

Most strictures are believed to occur within the first 6 months after RP and are rare after 24 months.<sup>3</sup>

Although most cases of BNC are managed by the treating urologist with simple office dilation or a single urethrotomy, often times repeat dilations or bladder neck incision (BNI) lead to advanced and densely scarred vesicourethral anastomosis (VUA) and urethral lumen obliteration. In these recalcitrant situations, a more complex management scheme is necessary for the reconstructive urologist, where the primary goal is salvaging urethral voiding and quality of life maintenance. This can be accomplished with surgical procedures aimed to eliminate the VUA contracture and then often a secondary procedure to re-establish urethral continence either using an artificial urethral sphincter (AUS) or a male sling.

We review our experience with treatment of BNCs at a tertiary referral center and hypothesize that with aggressive BNI as the initial management followed by

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implantation of an AUS or male sling, most patients can be salvaged for urethral voiding with satisfactory continence.

## MATERIALS AND METHODS

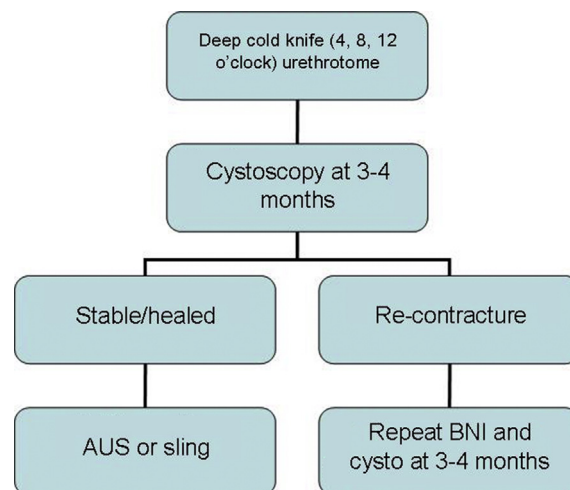
The study was approved by the Institutional Review Board. A 15-year retrospective medical record review was performed. Patients were identified as those referred to 2 surgeons in the Center for Genitourinary Reconstruction (K.A., H.W.) for BNC by current procedural terminology code or those who underwent BNI by International Classification of Diseases-Ninth Revision code. BNC was defined by the inability to pass a 15F flexible cystoscope. All patients presented in urinary retention after RP. Urodynamics evaluation is not part of our standard workup for this patient population, although it is used for selected patients depending on irritative voiding symptoms and medical comorbidities that might influence sling vs AUS placement.

A 2-stage treatment course (Fig. 1) was used consisting of deep cold-knife incision of the BNC down to perivesicle fat (typically at the 4-, 8-, and 12-o'clock positions) using a 22F urethrotome and catheter drainage for 1 week. Cystoscopy was then performed at 3-4 months. If stable and healed, an AMS-800 AUS (American Medical Systems) was placed in the standard fashion and then activated 6 weeks postoperatively. Alternatively, patients were offered a male urethral sling if incontinence was mild (1-3 pads per day [PPD]). Recurrent BNC was treated with a second BNI if the BNC recurred at the 3-month surveillance cystoscopy. Follow-up cystoscopy was again performed after an additional 3 months. Satisfaction was defined as no desire for further procedures and 0-1 PPD continence. For those patients who could not undergo further BNI because of obliteration of the urethra, urinary diversion was performed. Postoperatively, patients were followed up symptomatically for continence by pad count. Cystoscopy was not routinely performed.

## RESULTS

The patient characteristics at the time of presentation to the Center for Reconstruction are listed in Table 1. A total of 63 patients were referred after RP who had recalcitrant BNC. Median (range) age was 66 (41-82) years, and body mass index was 30.1 (21.9-64.8) kg/m<sup>2</sup>. Median follow-up was 11 (range, 1-144) months after AUS placement or after last BNI or surgical procedure. Distribution of previous bladder neck procedures is shown in Figure 2. Seventeen (27%) patients underwent adjuvant radiation therapy (XRT). Median number of BNIs before referral was 1 (range, 1-12).

Of the 46 patients who had successful management of the BNC, 13 were satisfied with the level of continence after BNI alone. The remainder of the patients (33) underwent AUS or sling. There were only 2 failures in this group. One patient, who had previous adjuvant XRT and AUS that eroded into his urethra, underwent urethral reconstruction before attempting AUS placement again. He ultimately required permanent urinary diversion after a second urethral erosion. The other patient had 1 PPD stress incontinence after AUS was placed and was not



**Figure 1.** Treatment pathway for recalcitrant bladder neck contractures (BNCs). (Color version available online.)

satisfied. He underwent a secondary sling procedure and was dry. There were 4 patients for whom the bladder neck could not be stabilized using BNI and who progressed to permanent urinary diversion (cystectomy with ileal conduit). In total, of the 46 patients who underwent successful stabilization of the bladder neck, 91.3% achieved a successful outcome with BNI alone, AUS or sling. Thirteen patients are unresolved, awaiting further treatment, lost to follow-up, or deceased (Fig. 3).

Table 1 compares the successfully treated patients and the patients in whom the BNI was not successful. The age ( $P = .68$ ) and the body mass index ( $P = .31$ ) were not significantly different between the 2 groups. Prior XRT was more common among patients in whom incision failed (75%) compared with those who had successful endoscopic management (26%).

Patients with prior XRT were analyzed as well. Of the 17 patients in this cohort who received XRT, 10 patients were treated with AUS. Urinary diversion was performed in 4 of the 17 patients. One patient who received an XRT and an AUS eventually had urethral erosion and required suprapubic diversion.

Taken together, either BNI ( $n = 4$ ) or secondary incontinence procedure ( $n = 1$ ) was not successful in a total of 5 (8%) patients and required permanent urinary diversion. Nine patients had concurrent severe membranous strictures with no coaptation of the external urethral sphincter along with BNC and were treated with BNI and AUS, and were continent. No patient in this series had a transurethral resection of the prostate before RP. Table 1 quantifies the end result of the reconstructive effort for BNC after RP.

## COMMENT

The development of postprostatectomy BNC has been attributed to a number of modifiable surgical techniques at RP and patient characteristics, with some

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