

## Transurethral Vaporization of Bladder Neck Using Holmium Laser: First Experience in Manado

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**Abstract:** Bladder neck contracture (BNC) is a potential complication after radical prostatectomy (RP). This may be a result of inadequate approximation at the time of surgery, urinary extravasation, or distraction of the bladder neck from a hematoma. Patients commonly complain of a poor urinary stream or prolonged unexplained incontinence. Treatment of BNC requires a tailored approach and can range from simple, office-based procedures to complex surgical reconstruction. We reported a case of 81-year-old male complaining urine retention for one month. The patient had previous open prostate procedure a year prior. On examination, neurogenic causes were excluded. Retrograde ureterocystography revealed bladder neck contracture. Patient was diagnosed as bladder neck contracture post open prostatectomy surgery. Transurethral holmium laser vaporization with 800 micrometre, 20 Hz frequency and 4,5 Joule of power through a ureteroscope was performed. Two-way Foley catheter 18Fr was inserted without irrigation. Patient was discharged post-surgery two days after catheter removal and spontaneous micturition. Endoscopic balloon dilatation with incision appears to offer promising results in the management of BNC. The consideration of using transurethral vaporization with holmium laser modality was the first procedure ever done in Manado. In conclusion, TUVP is one of the alternatives, minimally invasive procedures to treat BNC. The use of holmium laser for the incision of bladder neck is another alternative to treat BNC with great outcome proven by the length of stay (LOS) of two days after the procedure was done.

**Keywords:** bladder neck contracture; transurethral vaporization; holmium laser; post prostatectomy

## INTRODUCTION

Bladder neck contracture (BNC), also referred to as postprostatectomy vesicourethral, is a well-described complication that may occur following the surgical treatment of benign and malignant prostate conditions.<sup>1</sup> It is thought that BNC arises from excess anastomotic narrowing, lack of mucosal apposition, or even fibrotic narrowing. Nevertheless, etiologies of BNC development are highly dependent on the primary treatment modality undertaken with BNC also occurring after pelvic radiation. BNC can range in complexity from simple, short, annular contractures to obliterative stenoses refractory to repeated treatments. BNC was commonly observed after open retropubic prostatectomy. Most BNCs have occurred after resection of glands weighing less than 20 g.<sup>2</sup> The reported incidence of BNC has varied from 0.14% to 20%.<sup>2</sup> BNC occurs in 0,48-17,5% of men after open RP (ORP) and 0-3% after lapRP or RALP. Conventional transurethral resection of prostate (TURP) has resulted in BNC rates as high as 12.3%.<sup>3</sup> To date, BNC is relatively uncommon (3-5%) with recently developed BPH treatments, such as plasma vaporization of the prostate.<sup>1</sup>

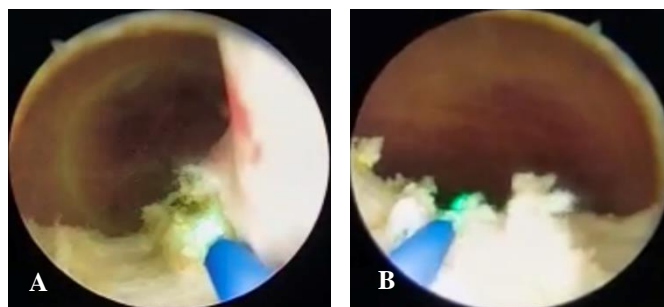
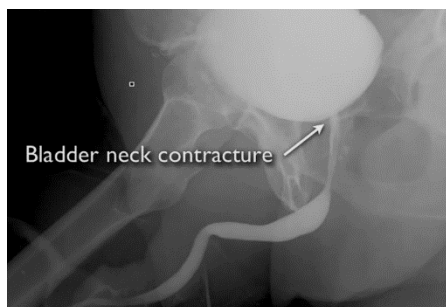
Most BNC cases develop within one year after surgery, and usually in less than six months.<sup>4</sup> Patients tend to present with obstructive voiding symptoms. Recurrent urinary tract infections or urinary retention within six months from surgery, history of radiation therapy (RT) (associated with recalcitrant stenosis) before BNC treatment, and baseline urinary incontinence (UI) are strongly suggestive of BNC. The workup should include urinalysis with culture and PSA measurement to rule out other etiologies that may mimic BNC. Cystoscopy and/or uroflowmetry and postvoid residual volume can be considered.<sup>5</sup>

Choosing an appropriate treatment for BNC is tricky and should be selected with patient-identified goals of care. Treatment of BNC requires a tailored approach and can range from simple, office-based procedures to complex surgical reconstruction. Bladder neck incision (BNI) is one of choice, in which the outcome is not dissimilar in terms of maximum flow rate, postvoid residual volume, and continence status to those for a control group of patients treated with RP but who did not develop BNC.<sup>6</sup>

## CASE REPORT

An 81-year-old male complained urine retention for one month. The patient had a previous open prostate procedure a year prior. Patient also had ischemic stroke and received blood thinning therapy for three months. In genitourinary examination we found full bladder and abdominal pain in suprapubic quadrant. On examination, neurogenic causes were excluded. The patient's blood investigations and all other lab results were normal. Retrograde ureterocystography was done which showed bladder neck contracture (Fig. 1, 2A).

Patient was diagnosed as BNC post open prostatectomy surgery. Diagnosis and management were discussed with the patient. Transurethral holmium laser vaporization through a ureteroscope was performed under anesthesia for BNC management using holmium laser fiber with 800 micrometre, 20 Hz Frequency and 4,5 Joule of power.



**Figure 1.** Bladder neck contracture showed in retrograde ureterocystography

**Figure 2.** Bladder neck contracture (A) before and (B) after transurethral vaporization of bladder neck using holmium laser

Two-way Folley Catheter 18Fr was inserted without irrigation (Fig 2B). Patient was discharged post operative two days after catheter removal and spontaneous micturition.

## DISCUSSION

Bladder neck contractures historically occur in 0.5% to 10% of patients after radical prostatectomy, and the rate has diminished dramatically over the past decade. BNC is not an uncommon complication after open prostate surgery, but reported rates have significantly declined since the advent of robotic surgery, arguably thanks to better-quality urethrovesical anastomosis and lower blood loss.<sup>4</sup> However, robotic surgery has led to a significant decrease in the incidence of BNC, most likely due to improved visualization and exposure at the time of vesicourethral anastomosis.<sup>1</sup> Impressively, recent series from large volume robotic centers report BNC rates approaching zero. Both surgical techniques and patient-related factors have been evaluated in contributing to development of BNC.<sup>7</sup> They arise from inadequate coaptation of the mucosal surfaces. This may be a result of inadequate approximation at the time of surgery, urinary extravasation, or distraction of the bladder neck from a hematoma. Associated morbidity of BNC may include urinary retention, urinary incontinence, urinary tract infection and need for further surgical interventions.

Independent predictors of vesicourethral anastomotic stenosis (VUAS) include open surgery, prostate-specific antigen (PSA) recurrence, and postoperative hematuria, urinary leak and urinary retention. In some cases, patient complained a poor urinary or developed sign and symptom of urinary bladder outlet. The diagnosis should be considered in any patient who complains of a poor urinary stream or in patients who have prolonged unexplained incontinence. Most BNC cases develop within one year of surgery. Patients tend to present with obstructive voiding symptoms. Recurrent urinary tract infections or urinary retention within six months from surgery, history of radiotherapy (associated with recalcitrant stenosis) before BNC treatment, and baseline urinary incontinence are strongly suggestive of BNC. In our case, the patient had a urinary retention with developed sign and symptom of bladder outlet obstruction who had an open prostate procedure one year prior. According to anamnesis, a suspicion of bladder neck contracture was made. Uretrocystography needed for obstruction case investigation. Theoretically, BNC was diagnosed by flexible cystoscopy in patients who developed signs and symptoms of bladder outlet obstruction.<sup>8</sup>

There is lack of a standardized protocol for managing patients with BNC. BNC incision can be performed with a variety of techniques, including cold-knife, electrocautery, laser, hot-knife, and loop resection. There are many modality options for endoscopic incision of BNC; however, in many cases more than one endoscopic treatment will be required. Yurkanin et al<sup>6</sup> found that results for men with BNC after RP who underwent cold knife bladder neck incision (BNI) were not dissimilar in terms of maximum flow rate, postvoid residual volume, and continence status to those for a control group of patients treated with RP but who did not develop BNC. Data are promising for the use of cold-knife incision as a primary means of treating BNC.<sup>6</sup>

There is no consensus on the optimal modality for BNI. In one study that compared holmium laser incision with other treatment modalities, cold-knife incision, transurethral incision, and dilation were associated with treatment failure when compared to laser. Endoscopic balloon dilatation with incision appears to offers promising result in the management of BNC. If treatment with simple cystoscopic dilation fails, direct cold-knife incision of the bladder neck at 6 o'clock followed by intermittent self-catheterization for a limited time usually corrects the problem. In this case, we took the consideration of using holmium laser modality which is the first procedure ever done in Manado.

The goal of bladder neck reconstruction is to create a nonischemic, water-tight vesico-urethral anastomosis. The re-treatment is sometimes needed just in case patient shows developed signs and symptoms of urinary incontinence or bladder outlet obstruction.

Postoperative hematuria with associated hematoma or urine leak may suggest disruption of the vesicourethral anastomosis. Among those treated initially with transurethral dilation or incision, 58% of patients only required one treatment with comparable rates of success with single dilation (balloon, filiform and followers, or urethral sounds) or incision (58% vs 57%); no difference in recurrence rates for these modalities.<sup>9</sup> According to Elmanzy et al,<sup>10</sup> the re-treatment rate of using holmium laser is 15.8%.

## CONCLUSION

Transurethral electrovaporization of the prostate (TUVP) is one of the alternatives, minimally invasive procedures to treat bladder neck contracture (BNC). The use of holmium laser for the incision of bladder neck is another alternative to treat BNC with great outcome proven by the length of stay (LOS) of two days in this patient after the procedure was done.

## Conflict of Interest

The authors affirm no conflict of interest in this study.

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