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Persistent Lower Urinary Tract Symptoms After Prostatic Urethral Lift Successfully Treated with Water Jet Ablation of the Prostate: A Case Report and Review of the Literature

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Abstract

Background: We describe a patient who underwent waterjet ablation of the prostate after an unsuccessful prostatic urethral lift (PUL) procedure.
Case Presentation: After PUL, our patient had incomplete bladder emptying with a postvoid residual of 600 mL. Urodynamic study of the bladder suggested detrusor underactivity. Our patient was motivated to undergo a salvage bladder outlet surgery. At 3 months after Aquablation, he reported complete resolution of bothersome lower urinary tract symptoms (LUTS).
Conclusion: This case report illustrates return of volitional voiding and significant improvement in LUTS after salvage bladder outlet treatment with waterjet ablation of the prostate.

Keywords: Aquablation, benign prostatic hyperplasia, lower urinary tract symptoms, robotics

Introduction

BENIGN PROSTATIC HYPERTROPHY (BPH) with bothersome lower urinary tract symptoms (LUTS) is usually treated with medical therapy such as an α1-blocker and/or 5-α reductase inhibitor. When medication fails to manage symptoms, enucleative (e.g., robotic simple prostatectomy, holmium laser enucleation of the prostate [HoLEP]), endoluminal minimally invasive surgery (e.g., prostatic urethral lift [PUL], water vapor thermal therapy) and traditional resection or ablative procedures (e.g., transurethral resection of the prostate [TURP], laser photovaporization) may be offered.[1] When initial surgical treatment fails to alleviate a patient's LUTS, the next step in management can be challenging. In this case, PUL was the initial surgical treatment offered and was ineffective in managing our patient's symptoms. We describe additional diagnostic testing that was performed to evaluate the patient's bladder mechanics and 3-month follow-up results after salvage waterjet ablation was performed.

Presentation of Case

Initial presentation and treatment with PUL

Our patient is a 55-year-old man with LUTS secondary to BPH refractory to pharmacotherapy. His most bothersome LUTS were urinary frequency, urinary urgency, and incomplete emptying. He presented for care after hospitalization for acute urinary retention. Prostate size based on CT scan of the abdomen and pelvis was 45 cc. Office cystoscopy showed bilobar prostatic hypertrophy and multiple small bladder diverticula. He had a baseline international prostate symptom score of 33 and a postvoid residual (PVR) of 101 mL. He elected to undergo PUL for his symptoms. A total of four implants were placed during the procedure. At 1 month follow-up, he reported mild improvement in his LUTS and remained especially bothered by incomplete bladder emptying. PVR was 382 mL. Three months after PUL, he presented with a PVR of 600 mL, worsening urinary urgency and frequency, and newly developed urgency urinary incontinence. His International Prostate Symptom Score (IPSS) was 33 with a ''terrible (4)'' quality of life.

Diagnostic testing for persistent LUTS

On uninstrumented uroflowmetry, he voided 290 mL with maximum flow of 11 mL/second and a staccato voiding pattern. PVR by catheterization was 1500 mL. On filling cystometrogram, he had delayed first sensation (379 mL) and elevated maximum cystometric capacity (1359 mL) with filling continued after failure to void with maximal Valsalva effort at lower volumes. Compliance was mildly altered with

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FIG. 1. Planning treatment metrics during Aquablation. Markers adjusted for our treatment plan in the transverse plane (*left*) and sagittal plane (*right*).

end-fill pressure of 18 cmH_2O. He demonstrated detrusor overactivity (peak 44 cmH_2O) near end-fill without associated leak. He ultimately voided 159 mL with a maximum flow (Qmax) of 8 mL/second, and a PVR of 1200 mL. Assessment of detrusor pressure was obscured by artifact associated with maximal Valsalva effort. Office cystoscopy demonstrated persistent bilobar prostatic hypertrophy. He elected to undergo salvage waterjet ablation as the next step in management.

Salvage bladder outlet procedure and postoperative follow-up

Figure 1 shows the treatment plan in the transverse and sagittal planes. The total time of resection was 2 minutes and 32 seconds. Urolift implants were not identified during cystoscopy. Figure 2 shows the prostate in the sagittal plane before and after treatment. Cystoscopy performed after tissue ablation did not reveal any foreign body within the bladder and prostatic urethra. On POD #1, urine remained clear after continuous bladder irrigation was discontinued. The patient passed his void trial with a PVR of 13 mL. Hemoglobin was 12.1 g/dL postoperatively to 12.2 g/dL on postoperative day 1. At his 3-month follow-up appointment, our patient noted stronger urinary stream with resolution of all bothersome LUTS. IPSS improved to 0 from 33 with a ''delighted (0)'' quality of life. Uroflowmetry parameters were markedly improved, with Qmax 20 mL/second and PVR of 150 mL.

Discussion

The initial work-up for men with symptoms that persist after outlet procedures should include a basic history and physical examination, assessment of symptoms through a standardized questionnaire such as the IPSS, a urinalysis, and urine culture to rule out infection, and a PVR to rule out retention. LUTS in the immediate postoperative period are common, and proper counseling of the patient and patient's family can help with meeting their expectations after surgery. However, if symptoms do not improve over time, cystoscopy and urodynamics should be offered to identify persistent obstruction (from BPH, urethral stricture or prostatic urethral stenosis), detrusor overactivity, and/or detrusor underactivity.

Cystoscopy is critical in identifying, or ruling out, an anatomic obstruction. In this case, no stricture was identified, but persistent bilobar hypertrophy and a suboptimal result from PUL were identified. The AUA Guidelines recommend use of pressure-flow studies in this scenario as the diagnosis of functional obstruction was uncertain and repeat surgery was being considered.[1] In this case, urodynamics was suggestive of detrusor underactivity. Return of volitional voiding has been reported in 57%–100% of patients with catheter dependence before bladder outlet obstruction procedures,

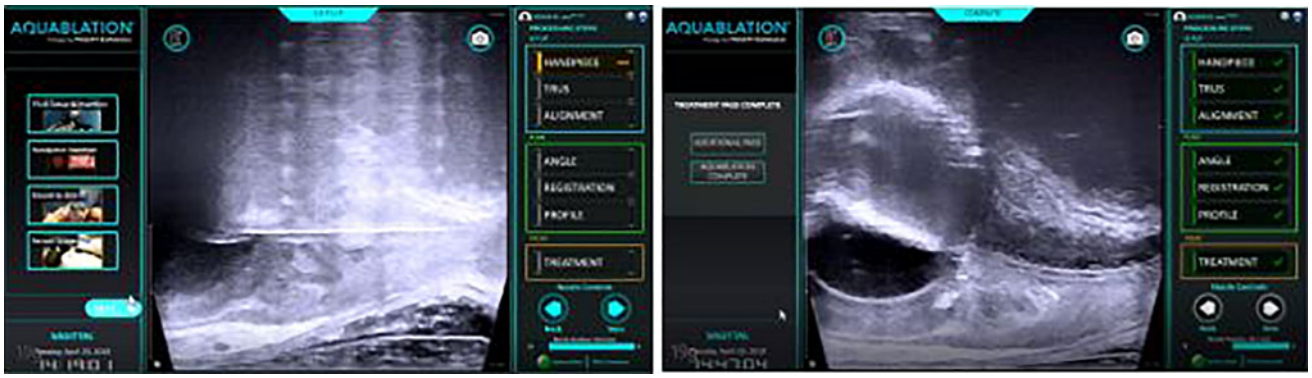

FIG. 2. Pretreatment (*left*) view of the prostate in sagittal plane. Post-treatment (*right*) view of the prostate with Foley balloon placed on traction with 50 mL of sterile water in the balloon.

even when detrusor underactivity or a contractility is demonstrated on urodynamics testing.[2] Nevertheless, treatment must be individualized based on surgical risk, patient botheration, and willingness to tolerate potential long-term side effects. Our patient was thoroughly counseled regarding his decreased likelihood of benefit relative to patients with demonstrable bladder outlet obstruction with detrusor underactivity before proceeding with a salvage bladder outlet procedure.

In the L.I.F.T. study, the retreatment rate of PUL was 13.6%.[3] Factors attributed to a decrease in treatment failure rate include surgeon experience and achieving a continuous anterior urethral channel from the bladder neck to the verumontanum upon implant placement.[3] In this case, a surgeon well experienced with PUL placed a total of four implants to achieve a continuous anterior urethral channel from the bladder neck to the verumontanum. Although uncommon, treatment failure after PUL presents a challenging scenario for urologists. If patients are interested in pursuing salvage surgical treatment, which is most appropriate? Furthermore, optimal management of the metallic implants placed at the time of PUL is unknown. Surgical considerations for the management of nonabsorbable implants have recently been described during HoLEP and include a combination of morcellation and grasping implants from the bladder.[4] Jamming of the morcellator blades during this technique can occur and requires replacement of the disposable morcellator blades.[4]

Our institution offered TURP, repeat PUL, and Aquablation. Similar to HoLEP, Aquablation is not restricted by prostate size or presence of a median lobe making it a useful tool in the armamentarium for the surgical management of BPH. However, the use of Aquablation for salvage treatment of bladder outlet obstruction has not been described. Therefore, management of the metallic implants placed at the time of PUL is unknown. Our team initially hoped to locate the metallic implants and remove them with a grasper at the time of cystoscopy before waterjet ablation. Since the metallic implants were not observed at the time of initial cystoscopy, we decided to proceed with waterjet ablation. Cystoscopy performed after waterjet ablation did not reveal any remnants of the metallic implants. Therefore, we assumed that the implants were irrigated out with the extensive irrigation that ensues after waterjet ablation. Alternatively, the implants could still be in place anteriorly since they were never observed or the waterjet may not have ablated the lateral tissue enough to destroy the suture holding the implant. The majority of the ablation was at the bladder neck and posterior tissue making either scenario possible. The overall improvement in our patient's symptoms and quality of life after Aquablation suggests its potential as salvage surgical therapy for BPH when PUL fails to improve symptoms.

Conclusion

This study details a patient who underwent a previous PUL procedure without resolution of LUTS. Waterjet ablation was performed with minimal hospital stay, minimal blood loss, and dramatically improved symptoms at 3-month follow-up. This case illustrates another indication for the use of Aquablation therapy.

Disclosure Statement

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Abbreviations Used

BPH = benign prostatic hypertrophy
HoLEP = holmium laser enucleation of the prostate
IPSS = International Prostate Symptom Index
LUTS = lower urinary tract symptoms
PUL = prostatic urethral lift
PVR = postvoid residual
TURP = transurethral resection of the prostate

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