

Functional medicine

Successful treatment of complicated benign prostatic hyperplasia in a diabetic patient with water vapor thermal therapy and urethral stenting

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ABSTRACT

Water Vapor Thermal Therapy is a novel, office-based procedure which has gained traction as first line therapy in specific therapeutic cases of benign prostatic hyperplasia. In this study, we present a case of a diabetic patient with complicated benign prostatic hyperplasia who presented with acute urinary retention along with bilateral hydronephrosis and acute kidney injury. He was treated with water vapor thermal therapy and subsequent urethral stenting, which alleviated his acute presentation and clinical symptoms. To the authors' knowledge, there are no reported cases which highlight the use of water vapor thermal therapy in complicated benign prostatic hyperplasia.

Introduction

Benign prostatic hyperplasia (BPH) is one of the most common urological conditions that affect men. Its pathogenesis is linked to aging along with the continued prostatic growth within limited space in the deep pelvis. Although BPH may be asymptomatic, clinical manifestation includes urgency, frequency, incontinence, nocturia, and terminal dribbling. Complications include lower urinary tract symptoms (LUTS), urinary tract infections (UTIs), hydronephrosis, urinary retention, and renal failure. The latter problems are especially problematic in diabetic patients, who are higher risk due to damage of the filtering function of the kidney. The traditional mainstay of BPH management includes pharmacotherapy and surgical intervention, however Water Vapor Thermal Therapy (WVTT) is a minimally-invasive procedure that is gaining traction in treating LUTS secondary to BPH. We report a case of a diabetic man with a presentation of BPH with urinary retention, bilateral hydronephrosis, and acute kidney injury who was treated with WVTT.

Case presentation

We present a 72-year-old Caucasian male with a history of diabetes mellitus who presented with urinary retention and frequency for some time. He endorsed urgency and frequency to the point where he urinates frequently with low volumes.

On questionnaire, the patient had an American Urological

Association Symptom Score (AUASS) of 32/35. He stated that his most recent hemoglobin A1c was 6.4% and glucose levels at home had been between 100 and 150mg/dL.

The patient's physical exam was significant for a prostate which was enlarged, non-tender, and smooth with no nodules. His abdomen was soft, non-distended, and non-tender upon palpation with a prominent bladder. Significant laboratory values included: glucose of 240mg/dL, blood urea nitrogen (BUN) of 35mg/dL, creatinine of 2.71mg/dL and estimated glomerular filtration rate (eGFR) of 22mL/min/1.73 m². Ultrasound of the bilateral kidneys demonstrated hydronephrosis [Fig. 1] and a large distended bladder with multiple diverticulum.

The presentation of acute urinary retention necessitated a prompt urethral catheterization, which decompressed the bladder and drained over 1500mL. The patient was then managed with Tamsulosin, a Spanner Prostatic Stent, and decided to undergo WVTT. The option of having a straight catheter prior to WVTT was given, however the patient refused and requested less-invasive means. The stent helped him empty his bladder better with lower post void residuals (PVR) between 150 and 315mL. This improvement indicated that his detrusor muscle was still functional, along with the absence of neurologic dysfunction. During the WVTT procedure, a transrectal ultrasound indicated a 138.58-g prostate. Ultimately, the patient underwent 15 nine-second treatments with WVTT. He did have a Foley catheter in place for 1 week prior to having a Spanner Prostatic Stent for another 4 weeks, given the size of his large prostate. Doing so allowed him to recover quicker while also taking patient preference of a more convenient means.

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<https://doi.org/10.1016/j.eucr.2019.100921>

Received 17 May 2019; Accepted 21 May 2019

Available online 22 May 2019

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Fig. 1. Ultrasound of right kidney pre-treatment demonstrating moderate hydronephrosis with some mild thinning of the renal parenchyma.



Fig. 2. Ultrasound of right kidney post-treatment demonstrating resolution of previous right hydronephrosis.

At the patient's 6-month follow-up, he presented a AUASS of 3/35 (32/35), a PVR of 155mL (1500mL), BUN of 21 mg/dL (35mg/dL), creatinine of 1.30mg/dL (2.71mg/dL), and eGFR of 55mL/min/1.73 m² (22mL/min/1.73 m²). Furthermore, he had follow-up ultrasounds of his kidneys which demonstrated resolution of his right hydronephrosis [Fig. 2] with a Mag-3 Renal Scan with Lasix demonstrating a mildly dilated, but non-obstructed left collecting system [Fig. 3].

Discussion

This case demonstrates a complicated presentation of BPH with urinary retention. Although, urinary catheterization solved the patient's

acute symptoms, the patient underwent a WVTT procedure, which improved his clinical symptoms. This procedure is gaining traction as a first-line therapeutic option, as current literature indicates it can significantly improve urinary symptoms, urinary flow rate, and LUTS.¹ A recent, 2-year clinical study demonstrated outcomes from baseline to 6, 12, and 24 months after WVTT treatment with mean International Prostate Symptom Score (I-PSS) reductions of 54%, 52%, and 51% respectively.¹ Additional studies indicate that the WVTT procedure provides rapid improvement in I-PSS in as little as 2 weeks.² This case study provides an example of immediate resolution of clinical symptoms even in the setting of advanced disease via WVTT.

The main-stay of BPH treatment is pharmacotherapy and surgical management. Newly updated American Urological Association guidelines now dictates that WVTT can be offered to patients with LUTS secondary to BPH with prostate volumes < 80g. Although this patient's prostate size of 138.55g was much higher than this indication, he preferred to avoid general anesthesia associated with other procedures.

An advantage in the WVTT procedure is the lack of adverse effects relative to first-line management of BPH. With pharmacotherapy, patients often commit to a lifetime of adherence, along with adverse effects such as retrograde ejaculation and orthostatic hypotension, along with less-than-optimal improvement. Studies indicate that Terazosin, a commonly prescribed alpha-antagonist for BPH, can improve one's AUASS by 6 points after 1 year with the uroselective Tamsulosin demonstrating a similar efficacy.³ This is in comparison to the immediate 29-point decrease observed in our patient treated with WVTT.

Surgical patients are at increased risk of post-operative complications that relate to general anesthesia and perioperative hospital stay, as well as the increased risk of sexual dysfunction due to extreme resections of tissue. WVTT can provide a solution to this, as it reduces inpatient hospitalization and has a lesser financial burden without sacrificing much clinical benefit.⁴ In the longest-term follow-up to date of a randomized trial for WVTT treated LUTS, adverse effects were short-lived and infrequent. The most common adverse effects included dysuria, hematuria, and frequency and urgency, with all being resolved within 3 weeks.⁴ There have also been no de-novo erectile dysfunction cases reported from WVTT therapy, which is a highly potential outcome from surgery and pharmacotherapy.⁴

Conclusion

Current literature is focusing on clinical outcomes of WVTT therapy, as it is a relatively novel procedure. However, there are no case reports regarding the efficacy of the procedure in complicated cases of BPH such as this one. This is a case report in which a diabetic patient presented with urinary retention due to BPH with bilateral hydronephrosis and acute kidney injury and was given immediate relief with WVTT. It provides an example of how WVTT can treat complicated BPH and provide a viable alternative to pharmacotherapy and surgery.

Consent: Written informed consent was obtained from the patient for this case report and subsequent images. A copy of the consent is available if necessary.

Conflicts of interest

None.

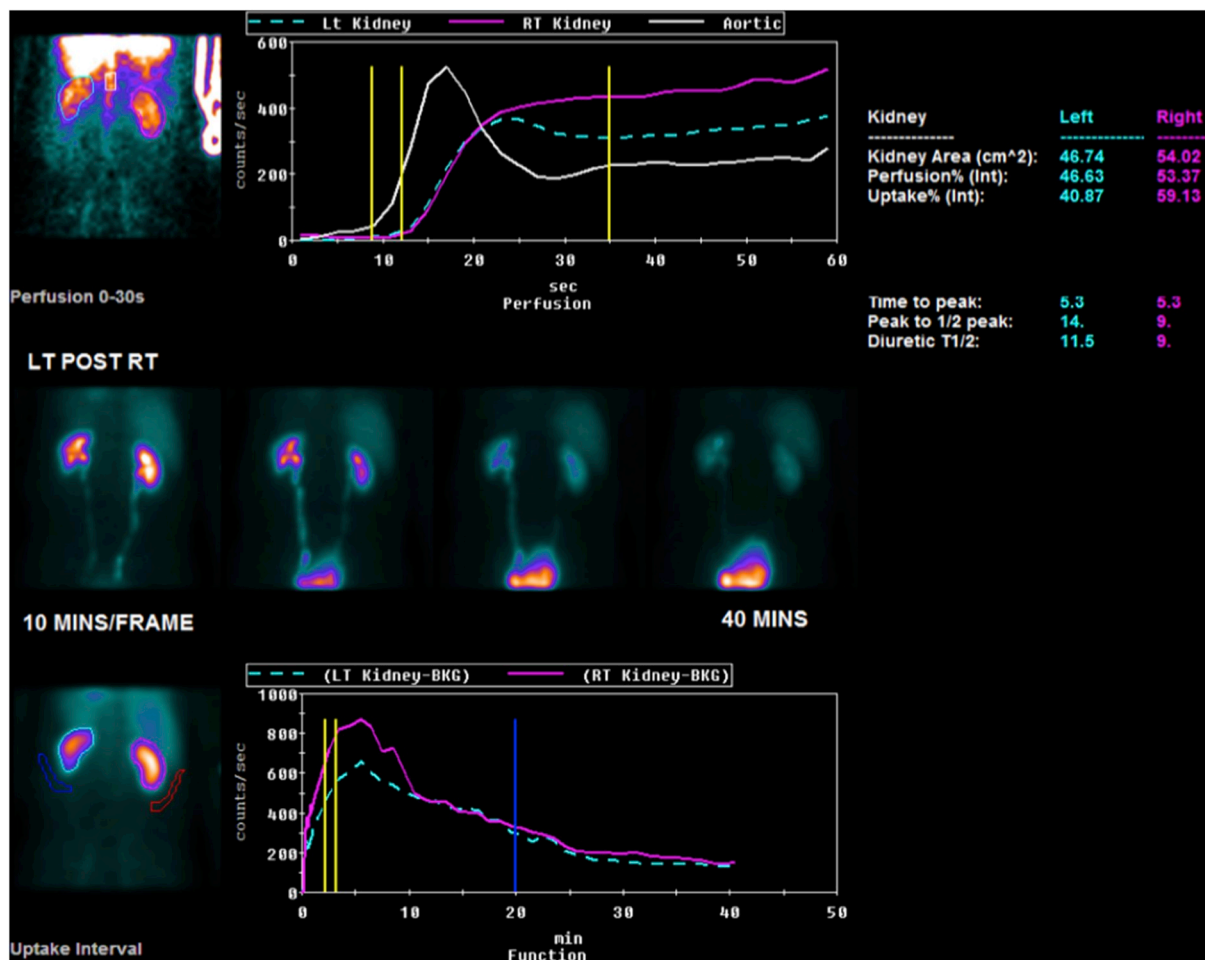


Fig. 3. Mag-3 renal scan with Lasix taken post-treatment demonstrating a mildly dilated, but non-obstructed left collecting system with bilateral drainage prior to Lasix administration.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of interest

None.

Acknowledgements

None to report.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://>

doi.org/10.1016/j.eucr.2019.100921.

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