

Anticipated treatment defect versus prostatic abscess: radiographic findings following transurethral convective radiofrequency-induced water vapor thermal ablation

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With the increasing use of minimally invasive technologies for the treatment of benign prostatic enlargement/lower urinary tract symptoms, clinicians must become familiar with the various treatment effects and complications. Here we present a case of treatment defect after transurethral

convective radiofrequency-induced water vapor thermal ablation (REZUM) radiographically identified as a prostatic abscess without consideration that the finding may have represented an anticipated treatment defect. This likely led to an unnecessary surgical procedure. This entity should be recognized by urologists and radiologists alike to avoid such interventions in the future.

Key Words: thermal ablation, REZUM, TURP, BPH/LUTs

Introduction

Lower urinary tract symptoms (LUTS) comprise a complex presentation of both voiding (incomplete

emptying, intermittency, weak stream, and straining to void) and storage (frequency, urgency and nocturia) symptoms that can greatly impact patient quality of life. Bothersome LUTS are particularly common among aging men and in many cases are exacerbated by benign prostatic enlargement (BPE). The clinical constellation is often categorized as BPE/LUTS. The impact on quality life is demonstrated by the resultant healthcare costs, with treatment of BPE/LUTS within the top 10 diseases for men older than 50 within the

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United States. As such, there is an expanding armament of treatment modalities, including medical therapy with alpha-adrenergic antagonists or 5-alpha reductase inhibitors (5-ARIs), minimally invasive office-based and operative techniques, as well as open surgical extirpation. Transurethral convective radiofrequency water vapor thermal ablation (REZUM) represents one novel minimally invasive method for treatment of BPH/LUTS.¹

Case report

Clinical history

A 71-year-old male with a history of hypertension and BPE/LUTS presented to the emergency department with fevers, gross hematuria, and suprapubic pain 3 weeks following REZUM treatment. One week prior he had been diagnosed with a urinary tract infection for similar symptoms and was prescribed a cephalosporin. He was poorly compliant with this treatment and had no clinical improvement. He was evaluated in the emergency department by the urology service and diagnosed with a urinary tract infection with acceptable PVR of 120 mL. Additional evaluation revealed Cr 1.17, serum WBC 9.5, and nitrite negative urine with 20 WBC. Imaging was deferred as the patient symptomatically improved during his period of observation in the ED and he was discharged to complete a course of Bactrim. He returned 2 days later with worsening pain, fevers and irritative voiding symptoms despite adherence to oral antibiotics.

Physical examination

On examination, the patient was febrile but well-appearing and hemodynamically stable. Physical examination was only notable for suprapubic tenderness. DRE was not performed.

Diagnosis

Evaluation in the ED revealed significant leukocytosis (22K) and mild acute kidney injury (cr 1.41); prior urine cultures remained no growth and a repeat UA was obtained which was nitrite negative with 120 WBC. Repeat blood and urine cultures were obtained. A contrast CT scan revealed a 3.8 cm x 2.3 cm x 1.5 cm ill-defined, rim-enhancing hypodense prostatic fluid collection suspicious for abscess formation, Figure 1. An additional hypodense lesion in the interpolar region of the right kidney was concerning for focal pyelonephritis. He was admitted and started on piperacillin/tazobactam with plan for subsequent operative prostatic abscess unroofing.

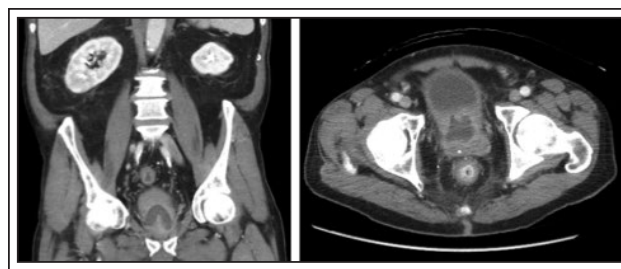


Figure 1. Radiographic appearance of prostate after radiofrequency thermal therapy.

Intervention

On hospital day #2, the patient was taken to the operating room. Intraoperative cystoscopic findings revealed a large cavity in the prostatic urethra just distal to the bladder neck with extensive fibrinous exudate. A small amount of residual prostatic adenoma was resected. A 20F urethral catheter was left in place for drainage at the conclusion of the case.

Follow up

Postoperatively, he experienced mild hematuria managed conservatively with hand irrigations alone. On POD#1, the patient's hematuria resolved. He remained afebrile and on POD#2 and his leukocytosis resolved. Urine and blood cultures remained no growth. He was transitioned to a course of Augmentin and was ultimately discharged on POD#3 after a successful trial of void.

Outcomes

Final pathology revealed prostate tissue with evidence of extensive infarct and acute inflammation, Figure 2.

Discussion

LUTS represent a complex clinical entity, common among aging men. The high prevalence of bothersome LUTS has led to the development of a variety of medical and surgical treatments. Transurethral convective radiofrequency water vapor thermal ablation (REZUM) is a novel minimally invasive method for treatment of BPH/LUTS using convective thermal therapy.¹

Radiofrequency is used to create water vapor thermal energy which is then delivered via transurethral injection into the transition zone of the prostate. The water vapor infiltrates the interstitial tissues and upon contact with cellular structures instantly denatures cell membranes and results in cell death. Gross and histological evaluation post-treatment have confirmed ablation localized to the transitional zone without any thermal damage to non-target tissue.²

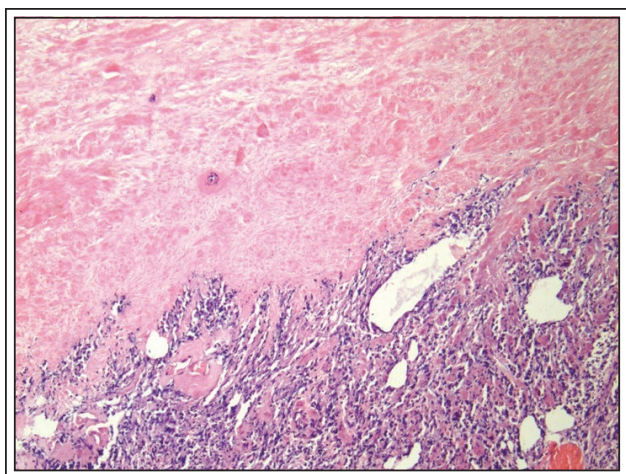


Figure 2. Prostatic tissue pathology; necrosis (left side) and aggregate of inflammatory cells (right side).

Subsequent studies evaluated the radiographic appearance of the ablative lesion over time using MRI, demonstrating reduction in prostatic volume as well as subsequent resolution of the ablative lesion at 3 and 6 month intervals.³ While clinical trials are ongoing, preliminary short term and 2 year follow up, as well as safety and adverse effect profiles, appear promising.⁴ Little has been written on the complications following this procedure, and to our knowledge there has been no report of the radiographic appearance of the treatment defect in clinical practice. While we cannot definitively prove this patient did not have a prostatic abscess, we believe it is much more likely that his imaging and final pathology were consistent with a post-treatment response. Presuming that the lesion did not represent a prostatic abscess, the patient may have been clinically managed with a trial of intravenous antibiotics alone, possibly avoiding a surgical procedure. Recognition of the radiographic appearance of the prostatic defect created by this treatment may allow clinicians to avoid unnecessary surgical intervention on patients presenting with infectious physiology after prostatic radiofrequency thermal ablation therapy. □

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