



Prostate Abscess: Prompt Definitive Treatment by Transurethral Unroofing

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Abstract

A 50-year-old man undergoing repeat induction chemotherapy for refractory AML had his course complicated by febrile neutropenia. He was diagnosed with a disseminated pseudomonas infection involving the lung and skin. Due to persistent fevers despite antibiotic treatment, computed tomography (CT) imaging was performed which demonstrated a 2cm prostate abscess. This was managed by transurethral unroofing of the abscess in order to eradicate his infection in the most timely manner. The patient recovered well and resumed his chemotherapy regimen two weeks following treatment.

Case Presentation

A 50-year-old man with a history of alcoholism, asthma, was diagnosed with Acute Myeloid Leukemia (AML) in October 2015. He underwent induction chemotherapy with cytarabine and daunorubicin, however post-treatment bone biopsy in November 2015 showed refractory disease. He underwent re-induction with high dose cytarabine and received 7 of 12 planned doses. He also received dexamethasone at that time and was being evaluated for a stem-cell transplant. He subsequently developed a high fever (105 °F) with associated hypotension requiring vasopressors. Labs demonstrated severe neutropenia (WBC 0.02 K/ μ L). He was immediately started on broad spectrum antimicrobial coverage.

Upon initial workup of his high fever, he was found to have pulmonary lesions concerning for organizing pneumonia as well as skin nodules. Induced sputum cultures grew pseudomonas and mycobacterial alveolar complex. Blood cultures showed pseudomonas bacteremia and biopsies of cutaneous lesions confirmed disseminated pseudomonas infection. Despite broad antimicrobial coverage, the patient continued to have high fevers. A CT of the chest, abdomen, and pelvis was performed to assess the extent of systemic involvement, which revealed a 2cm right sided prostatic abscess (Figure 1).

At baseline, the patient denied any urinary symptoms, but reported increased frequency, urgency, and a sensation of incomplete voiding over the past few weeks.

Urology was consulted for definitive management of the prostatic abscess as soon as possible because the patient could not complete his chemotherapy course or be considered for stem cell transplant until the systemic infection was eradicated.

The patient was taken to the OR by urology two days later for a transurethral resection of the prostatic abscess. Digital rectal exam was notable for a smooth, indurated prostate with no boggy tenderness but tender to palpation. An intra-operative trans-rectal ultrasound (TRUS) was simultaneously

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Figure 1: Axial and coronal images of a non-contrast CT scan of the pelvis highlighting the hypoechoic prostatic abscess.



Figure 2: Images from the transurethral resection of the prostatic abscess using bipolar electro-cautery loop. A) After cutting several strips from the prostate, the abscess tissue can be appreciated bulging into the view. B) Initial unroofing shows release of a large amount of purulent fluid. C) After evacuating the fluid and debris, the residual empty abscess cavity can be seen.

performed to assist in localizing the abscess and assessing our depth of resection to prevent perforation of the prostatic capsule. During the procedure, thin tissue sweeps were performed using the bipolar electrocautery resection loop in order to shave down the prostatic tissue to the level of the abscess (Figure 2A). Once the pseudo capsule of the abscess was perforated, pressure was applied with the cystoscope to drain all the purulent fluid from within (Figure 2B). Once drained, the empty abscess cavity was inspected and the periphery of the prostate (outer edge of the abscess capsule) was intact (Figure 2C).

The bladder was drained immediately following unroofing of the abscess in order to collect a specimen to send for bacterial, fungal, and mycobacterial cultures. An 18Fr 3-way catheter was left in place with continuous bladder irrigation for 24 hours. Upon catheter removal, the patient was able to void without difficulty. The prostate abscess cultures ultimately grew abundant pseudomonas, and the patient was treated with a 6-week course of oral ciprofloxacin.

Further workup of the pulmonary lesions ruled out an invasive mycobacterial infection. Two weeks after his TURP, the disseminated infection improved and the patient was then able to resume chemotherapy for his AML. He was seen in the urology clinic five weeks post-operatively, at which time he showed no signs of residual infection and denied any urinary symptoms. He had a normal digital rectal exam at that time.

Discussion

Prostate abscess formation has become a rare condition with the widespread use of antibiotics; only a handful of case reports or case series exist over the past several decades [1-7]. Because of the lack of reliable pathognomonic symptoms, diagnosis of a prostate abscess can often be delayed. However, it represents a serious infection with a high mortality rate unless treated properly [1-2]. Therefore, a high index of suspicion should be held in patients with persistent high fevers or confirmed systemic infection and any lower urinary tract symptoms (LUTS), including dysuria, urgency, and urinary frequency. Risk factors for prostatic abscess include indwelling catheters, recent urinary tract instrumentation, bladder outlet obstruction, history of acute or chronic bacterial prostatitis, and an immunocompromised state. Diagnosis can be confirmed with TRUS, CT, and/or magnetic resonance imaging (MRI) [1].

The primary treatment for all patients diagnosed with a prostate abscess is parenteral antibiotics primarily targeting gram-negative bacteria. *E. coli* is the most commonly identified bacteria in prostate infections, representing 65-80% of prostatitis cases. Other

gram-negative bacteria such as *Pseudomonas aeruginosa*, *Serratia*, *Klebsiella*, and *Enterobacter* combine for 10-15% of cases. Gram-positive bacteria such as *Staphylococcus* and *Enterococcus* account for 5-10% of prostate infections; therefore, broad-spectrum antibiotics should be considered in patients with persistent fevers or severe infections [2-3].

Our case presents a severely immunocompromised patient with a known systemic pseudomonas infection and persistent fevers despite treatment with broad-spectrum antibiotics. He did have urinary symptoms as well, but this was not elucidated until after the prostate abscess was discovered on CT imaging.

The decision whether to drain the abscess has traditionally been based upon the size of the abscess, with abscesses >2 cm often being drained [4]. The efficacy of drainage via transurethral unroofing or a TRUS-guided needle aspiration is controversial in the literature and is often based upon abscess location, multifocality, prostate size, and clinician preference [3,5]. One study of these various management strategies demonstrated significantly shortened hospital stays (10 days) with transurethral unroofing when compared with conservative management (19 days) or needle aspiration (23 days) [5]. A review of the literature is consistent with this pattern of longer treatment duration in patients managed conservatively or with needle aspiration [3-7]. The risks of TURP are perforation of the prostatic capsule at the time of procedure or delayed complications such as urethral diverticulum, stricture, or incontinence. Transrectal needle aspiration carries a higher risk of recurrence in some series, as well as a risk of rectovesical or rectourethral fistula formation.

Our patient presented with a 2 cm prostatic abscess that was relatively deep, extending to the prostatic capsule. In addition, he presented under unique circumstances in that he was undergoing repeat induction chemotherapy for his refractory AML and being considered for a stem cell transplant. All treatment had been halted in the setting of his infection. As such, clearing him of his pseudomonas infection in the timeliest manner was paramount so that he could resume his chemotherapy. Therefore, the decision was made to perform a transurethral unroofing of the abscess. The use of intra-operative TRUS added significant value in localizing the abscess and preventing perforation of the prostatic capsule given the depth of resection that was required. As a result of surgical intervention, the abscess was maximally drained and the patient's pseudomonas infection was cleared in a timely manner, enabling him to resume chemotherapy within two weeks of his surgery.

Conclusion

This case demonstrates the challenges in diagnosing a prostate abscess as well as the variables that must be considered in choosing how to properly manage the infection such as size, location, and clinical scenario. Here, the patient's prostate abscess was delaying vital treatment for his refractory AML, and surgical drainage enabled prompt eradication of his infection. Based on our review of the literature, transurethral unroofing of the abscess is highly effective at accomplishing this goal.

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