Seminal vesicle abscess following prostate biopsy requiring transgluteal percutaneous drainage

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Transrectal ultrasound guided biopsy (TRUSB) of the prostate directly contaminates the prostate with rectal flora. Patients commonly receive fluoroquinolone (FQ) antibiotics to prevent infection. Infectious complications following TRUSB are increasing. The most common offending organism is Escherichia coli (E. coli), with isolates of this bacteria showing growing resistance to FQs. We present to our knowledge the first reported case of seminal vesicle abscess formation after TRUSB. The abscess was initially not seen on computed tomography and eventually treated with percutaneous drainage by a transgluteal approach. We review literature on infectious complications following TRUSB with implications for future antibiotic prophylaxis.

Key Words: prostate, biopsy, seminal vesicles, abscess, postoperative complications

Introduction

Transrectal ultrasound guided biopsy (TRUSB) of the prostate is the standard method of diagnosing prostate adenocarcinoma. Patients are commonly given antibiotics as prophylaxis against infection. Hospital admissions for infectious complications following TRUSB are increasing.[1,2] The most common pathogen isolated from culture specimens following prostate biopsy is *Escherichia coli* (E. coli).[3] These trends come at a time when E. coli bloodstream isolates are showing increasing resistance to fluoroquinolone (FQ) antibiotics.[4] We present a case of seminal vesicle (SV) abscess formation following TRUSB successfully treated with transgluteal percutaneous drainage.

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Case report

A 67-year-old male underwent his first TRUSB of the prostate for a prostate-specific antigen (PSA) elevation. He self-administered a bisacodyl enema the morning of biopsy and received 3 days of oral levofloxacin 500 mg daily beginning the day before biopsy. Biopsy pathology revealed atypical small acinar proliferation in one of 12 biopsy cores. None of the cores contained SV tissue.

The day after biopsy, the patient presented to the emergency department complaining of myalgias and chills. The patient was febrile (T_{max} 102.3° Fahrenheit) with otherwise normal vital signs. Blood work revealed a white blood cell (WBC) count of 13,000/µL. He was started on intravenous (IV) ceftriaxone. The urine culture grew E. coli resistant to FQs but sensitive to all other tested antibiotics. Blood cultures showed no bacterial growth after 5 days. The patient was discharged home with 6 weeks of nitrofurantoin therapy. No fevers or other problems were encountered while the patient was on nitrofurantoin.

The patient returned to the emergency department 7 weeks later with a temperature of 102° F, abdominal pain, and dysuria. He was not in urinary retention and denied pelvic pain. Laboratory data showed a WBC count of 19,000/μL. Computed tomography (CT) of the abdomen and pelvis with oral and IV contrast showed mild enlargement of the left SV compared to right, but no discrete SV, prostatic, or pelvic fluid collection, Figure 1. The patient was initially treated with IV vancomycin and meropenem.

The patient defervesced and his leukocytosis resolved. Urine culture again grew FQ-resistant E. coli with identical sensitivities to the previous culture. Blood cultures were negative. The patient's antibiotic regimen was tailored to IV cefepime for home infusion.

The morning of anticipated discharge, the patient demonstrated signs of sepsis with a fever of 102° F, tachycardia, increased work of breathing, oxygen-saturation of 85 percent by pulse oximetry, and confusion. Immediate CT angiography of the chest was negative for pulmonary embolism. Antibiotics were changed to IV meropenem and gentamicin, and the patient was transferred to the intensive care unit. A new infectious work up was initiated, including magnetic resonance imaging (MRI) of the pelvis. MRI revealed a complex left SV abscess, Figure 2. Subsequently the patient went to interventional radiology for placement of a transgluteal percutaneous drain, Figure 3, which initially yielded 18 mL of purulent fluid. The abscess fluid and one-of-two new blood cultures grew E. coli resistant to only FQs.

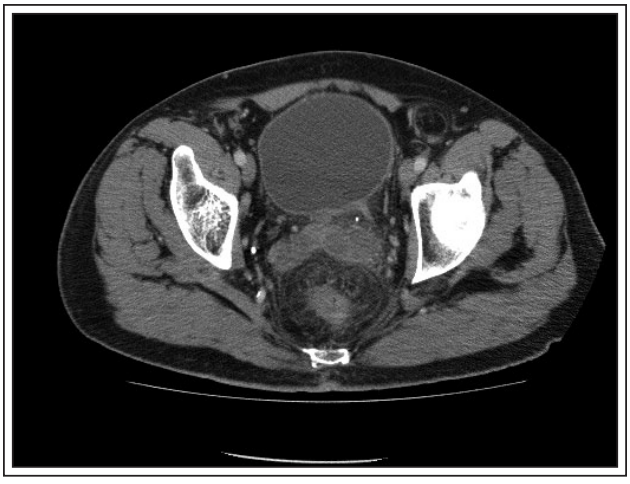

Figure 1. Axial computed tomography of abdomen and pelvis with oral and intravenous contrast. Mild left seminal vesicle (SV) enlargement compared to right with soft tissue stranding around prostate and SVs. No discrete fluid collection identified.

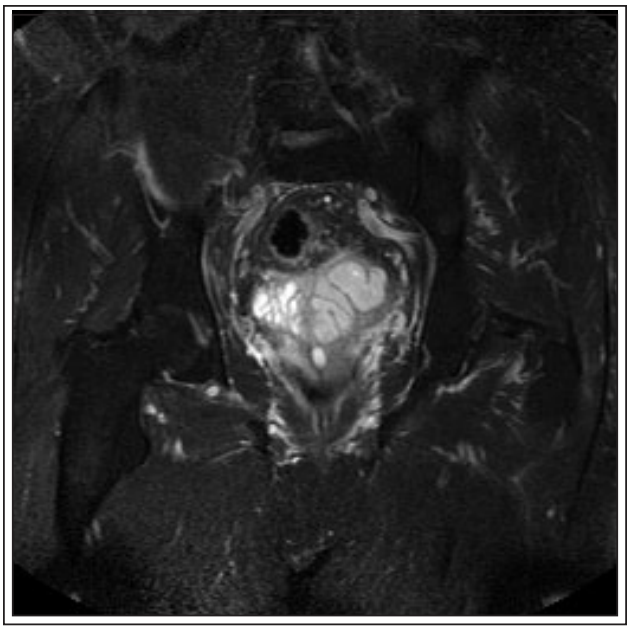

Figure 2. Coronal magnetic resonance imaging of the pelvis, T2 phase. Enlarged left seminal vesicle with multiseptated 5.1 cm x 3.3 cm x 4.6 cm fluid collection.

The patient stabilized in the ICU. The percutaneous drain was removed 72 hours later after CT showed resolution of the abscess. After an additional 48 hours, the patient was discharged on 2 weeks of home infusion IV meropenem. At 1 month follow up, the patient is doing well.

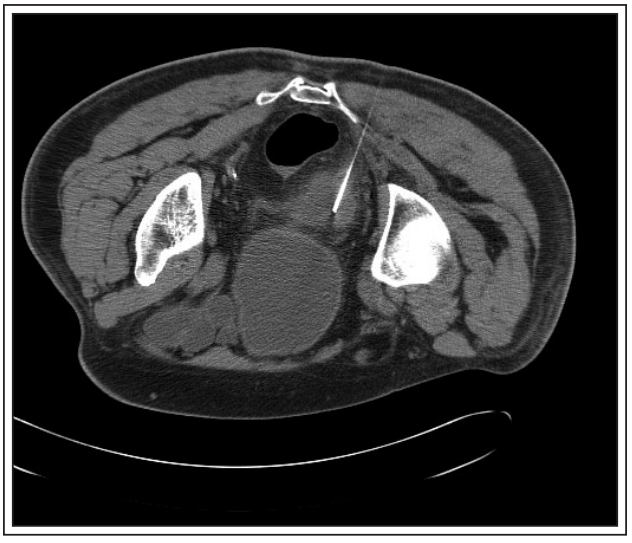

Figure 3. Axial computed tomography (CT) of the pelvis without contrast. CT-guided transgluteal percutaneous placement of 19-gauge trocar needle into left seminal vesicle abscess cavity. The needle was exchanged for an 8.5 French locking pigtail drain.

Discussion

To our knowledge, this is the first reported case of SV abscess following TRUSB of the prostate. As SV tissue was not present in the original biopsy, it is unlikely the abscess resulted from direct inoculation. The abscess developed over 2 months despite antibiotic therapy from essentially the time of biopsy. The diagnosis required a high index of clinical suspicion. All fluid cultures grew FQ-resistant E. coli with identical sensitivity profiles.

Hospitalization for infectious complications following TRUSB has increased over time. Nam et al reviewed over 75,000 Ontario men who underwent TRUSB and found hospitalizations for infectious complications within 30 days of biopsy increased from 0.6% in 1996 to 3.6% in 2005.[1] Similar chronological increases in rates of hospitalization for infectious complications following TRUSB have been reported.[2]

FQs are commonly used for infection prophylaxis due to broad-spectrum activity against Gram-negative bacteria and favorable bioavailability in the prostate. A retrospective study of Veteran males found FQ-resistant E. coli urinary tract infections following TRUSB increased more than three-fold between 2004 and 2006.[5] Furthermore, FQ-resistant E. coli bloodstream isolates in the US increased from 0% in 1998 to 12% in 2007.[4] Not surprisingly, studies where men are administered FQ prophylaxis for TRUSB show similar increases in not just infectious complications but FQ-resistant E. coli infections. Recent prospective study by Kehinde et al gave 300 men ciprofloxacin prophylaxis prior to prostate biopsy. Rates of septicemia significantly increased from 2.1% in 2001 to 13% in 2005, with FQ-resistant E. coli accounting for over 87% of the infections.[6] A sentinel study by an Australian group isolated a significantly higher percentage of type 131 E. coli, an internationally-emerging isolate with high rates of FQ resistance, among bacteremic patients after TRUSB (41%) versus controls (13%).[7]

Several factors likely contribute to increased risk of infectious complications following prostate biopsy, including diabetes, chronic renal failure, benign prostatic hyperplasia (BPH), and previous prostate biopsy.[2,3,6] Previous TRUSB and antibiotic exposure within 5 years are associated with significantly higher rates of FQ-resistant E. coli infections.[7,8] Our patient's past medical history is significant for BPH and previous antibiotic exposure.

In an age of increasing FQ resistance among E. coli and more frequent hospitalizations for infectious complications following TRUSB, urologists must rethink prophylaxis against infection. Examining rectal flora prior to TRUSB has proven a reliable method for identifying FQ resistance and predicting postoperative complications.[8,9] Adding a one-time dose of IV amikacin prior to biopsy to routine periprocedural use of oral ciprofloxacin decreased the rate of septicemia from 8% to 1.7%. The septicemia rate in patients receiving combination IV amikacin and oral ciprofloxacin prophylaxis remained essentially stable at approximately 1.5% between 2001 and 2005.[6]

For patients with infectious complications following TRUSB, effective empiric antibiotic therapy is critical to reducing morbidity until culture growth enables targeted therapy. After TRUSB, urine and blood cultures that grow FQ-resistant E. coli also show high resistance to gentamicin, trimethoprim-sulfamethoxazole, and penicillins but high-to-near 100% sensitivity to amikacin, carbapenems, and IV cephalosporins.[5,6,8,9]

Our technique of transgluteal percutaneous drainage also makes this case unique. Transperineal and transrectal drainage techniques have been successful in managing SV abscesses in conjunction with IV antibiotic therapy.[10] However, as we planned to utilize the drain for at least 72 hours, we felt a transperineal approach would be highly irritative and a transrectal approach would result in persistent rectal flora contamination. Additionally, given the risk of fistulization, we felt a transgluteal approach offered the lowest probability of future complications. □

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