

# MRSA: An Emerging Cause of Prostate Abscess

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**Abstract** Gram negative bacteria are the most common cause of acute prostatitis and prostate abscess. Increased empiric use of antibiotics and immunocompromised states, predispose patients to develop invasive prostate infections due to uncommon organisms like Community acquired methicillin resistant staphylococcus aureus (CA-MRSA). Prostatitis and prostate abscess, classically, result in significant constitutional symptoms including dysuria, fevers and irritative urinary symptoms along with pelvic pain. We present a rare case of acute prostatitis secondary to MRSA, with minimal constitutional symptoms, complicated with formation of prostate abscess and sepsis requiring surgical intervention.

**Keywords:** MRSA, prostate abscess, acute prostatitis, LUTS

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## 1. Introduction

Acute prostatitis secondary to bacterial infection is most commonly caused by gram negative bacteria. It is of an abrupt onset with significant constitutional symptoms, if inappropriately treated, progresses into life threatening clinical sequelae including bacteremia, prostatic abscess and chronic bacterial prostatitis. CA-MRSA is a rare cause of acute prostatitis with inclination towards immunocompromised patients. As in our patient, early use of diagnostic imaging and culture based antibiotic therapy was pivotal in accurate diagnosis and treatment of a rare MRSA prostate abscess.

## 2. Case

Our patient is a 61 year old Caucasian gentleman, with a past medical history significant for diabetes mellitus type II and hypertension, who presented to our hospital complaining of poor urinary stream, difficulty urinating and emptying his bladder. He denied any fever, chills or dysuria. He was residing in Philippines when his symptoms started, was seen there by his urologist who diagnosed him with benign prostatic hyperplasia (BPH), and started him on tamsulosin and a short course on antibiotics for a possible urinary tract infection (UTI). Patient continued to have symptoms when he came back to United States.

Physical examination was significant for mild suprapubic tenderness. Urogenital exam showed normal genitalia and digital rectal exam revealed slight tenderness of prostate with mild enlargement of prostate.

His work up revealed mild leukocytosis of  $11.4/\text{mm}^3$ . Urinalysis showed pyuria as 11-20 WBC/HPF (Normal: 0-5), bacteria 4+ and microscopic hematuria. Given the duration of his symptoms and limited response to

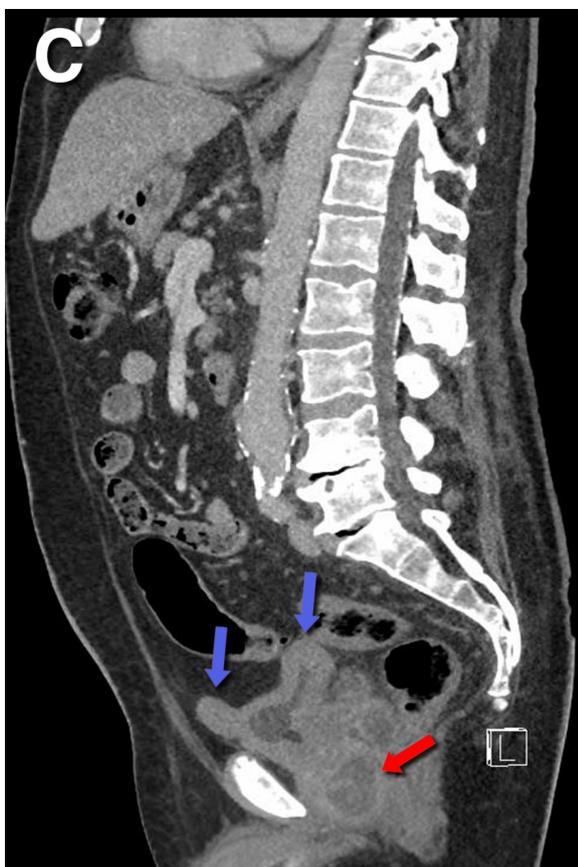
empirical therapy, and suprapubic tenderness and fullness, a Foley's catheter was placed, producing 1000 cc of retained urine. CT scan of abdomen/pelvis was obtained which showed marked prostatic enlargement with multiple rim enhancing structures within the prostate suggestive of prostate abscess in acute setting (Red arrows, Panel A, Panel B and Panel C).



**Panel A.** Coronal View CT scan of abdomen and pelvis showing multiple ring enhancing lesions with in prostate (red arrows)



**Panel B.** A Cross-sectional view CT scan abdomen and pelvis showing prostate abscess (red arrow)



**Panel C.** CT scan of abdomen and pelvis, in sagittal view, showing thickening of urinary bladder wall representing inflammation (Blue arrow) and prostate abscess (red arrow)

Patient was started empirically on ceftriaxone IV to cover gram negative rods after blood and urine cultures were obtained. Patient was given a dose of azithromycin to cover chlamydia, although nucleic acid amplification testing for gonorrhea and chlamydia came back negative. Urine culture grew MRSA but blood cultures remained aseptic. A urology consult was obtained, and due to lack of constitutional symptoms, a normal PSA of 2.2 and unimpressive rectal exam, it was considered to be BPH and positive urine culture was considered as contaminants. During next 2 days, patient became septic as he became tachycardic, hypotensive and febrile, so antibiotics were changed to vancomycin IV and urine cultures were repeated. Meanwhile Foley's catheter was removed and intermittent straight catheterization was tried which was of significant discomfort to patient so Foley's catheter was reinserted. A repeat CT scan of abdomen and pelvis showed progression of prostatic infection as compared to previous CT scan with now showing new air locules with in the prostate gland. Urine cultures regrew MRSA but blood cultures remained aseptic. Patient underwent transurethral resection of prostate (TURP) with drainage of pelvic structures and tissue samples were obtained. His clinical condition improved significantly and he was discharged on oral Bactrim in a stable condition. Tissue pathology report showed mixed acute and chronic prostatitis.

### 3. Discussion

Prostatic abscess is a rare disease due to the widespread use of broad-spectrum antibiotics in patients with lower urinary tract symptoms (LUTS) [1]. It is mainly identified in patients with predisposing factors, including chronic indwelling catheters, invasion of the lower urinary tract, diabetes mellitus, human immunodeficiency virus infection and other causes of compromised immunity [2]. Prostatic abscess formation which was primarily caused by *Neisseria gonorrhoeae* (75% of cases) in the pre-antibiotic era is now predominantly caused by *E. coli* (antibiotic era 60% to 80% of cases) [3]. Other significant pathogens include *Pseudomonas* species, *Staphylococcus* species, and occasionally obligate anaerobic bacteria [4]. In the last decade, epidemiologic studies have illustrated that MRSA-induced infections have changed from being primarily acquired in hospitals to also being acquired in the community [5]. CA-MRSA as a cause of prostatic abscess is quite unusual with 7 reported cases in the medical literature. Nevertheless, accurate diagnosis and treatment remain of great importance due to the possibility of progression to sepsis and mortality [6]. The majority of CA-MRSA prostatic abscess patients in the literature presented with hesitancy, weakened stream, dysuria, fever, perianal discomfort, tender prostate, and leukocytosis [7]. Our patient had poorly controlled diabetes mellitus II, presented with lower urinary tract symptoms (LUTS) such as difficulty urinating, difficulty emptying bladder, poor urinary stream as well as constipation. He was diagnosed with benign prostatic hyperplasia (BPH) and treated accordingly along with a short antibiotic course for a possible UTI. However, his symptoms failed to resolve. His urinalysis was showed pyuria along with bacteruria

and he was started on empiric antibiotics to treat gram negative bacteria. Due to lack of response to the initial outpatient antibiotic therapy, CT scan of the abdomen/pelvis was obtained which showed marked prostatic enlargement with multiple rim enhancing structures within the prostate suggestive of prostatic abscess. Subsequently, urine cultures came out positive for MRSA. The diagnosis of a prostatic abscess remains a challenge for physicians due to its rarity along with the lack of a gold diagnostic standard [8]. Prostatic abscess is challenging to diagnose due to its non-specific signs, symptoms and physical examination findings, including fever, chills, urinary frequency, dysuria, acute urinary retention (AUR) or lower back pain, which is easily misdiagnosed as acute bacterial prostatitis [9]. Imaging examination such as transrectal ultrasonography (TRUS), CT and MRI is critical for accurate diagnosis [10]. Due to lack of constitutional symptoms and normal prostate exam, diagnosis of prostatic abscess secondary to MRSA was excluded. Our patient developed fever and his antibiotics were changed to IV Vancomycin and a repeat urinary culture and CT scan abdomen/pelvis were obtained, which revealed increase in the size of the prostate lesion and urine culture remained positive for MRSA. Treatments of prostatic abscess have changed greatly in recent years [10]. Surgeries such as perineal incision or transurethral resection were traditionally recommended as the first-line therapy [11]. By contrast, minimally invasive treatments such as TRUS-guided needle aspiration transrectally or transperineally under local anesthesia are more popular at present [10]. Our patient underwent TURP with significant improvement and was safely discharged home to complete 3 weeks course of oral Bactrim.

#### 4. Conclusion

Prostatic abscess is an underdiagnosed pathology and one due to MRSA is exceedingly rare. Due to increasing use of empiric antibiotics, resistant organisms like MRSA

are emerging as significant cause of morbidity and lack of gold standard diagnostic testing hinders the clinicians to make a timely diagnosis especially in the absence of significant signs and symptoms of infection. Our case represents such dilemma and thus sheds light on the need of further research to identify the type and timing of imaging as a possible early diagnostic aid. In our case, prompt imaging with a CT scan, culture guided antibiotic therapy and prompt surgical intervention (TURP) resulted in improved outcome.

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