

Community Associated Methicillin-Resistant *Staphylococcus Aureus* Causing Acute Urinary Tract Infection and Epididymo-Orchitis: A Case Report

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Abstract:

Acute epididymitis is most commonly infectious in etiology, usually secondary to a urinary tract infection (UTI) or a sexually transmitted infections (like gonorrhea and chlamydia). Enteric gram-negative bacteria (like *Escherichia coli*) and coagulase-negative *Staphylococcus saprophyticus* are the most frequently encountered organisms associated with UTIs. *Staphylococcus aureus*, especially methicillin-resistant *Staphylococcus aureus* (MRSA), is an uncommon pathogen when considering community associated acute UTI and acute epididymitis. We present an unusual case of a 28-years-old immunocompetent male, who presented with a left scrotal swelling and was found to have acute epididymo-orchitis due to an acute MRSA UTI.

Keywords: MRSA; UTI; epididymitis; orchitis; genito-urinary infection.

Abbreviations:

MRSA= Methicillin resistant *Staphylococcus aureus*

SA= *Staphylococcus aureus*

UTI= Urinary tract infection

STI= Sexually transmitted infections

IV= intravenous

ID= infectious diseases

CFU= Colony Forming Units

Introduction:

Acute epididymitis is the most common cause of scrotal pain in adults in the outpatient setting, accounting for 600,000 cases per year in the United States (Tracy et al., 2008). Acute cases most commonly arise from infections like urinary tract infections (UTIs) or a sexually transmitted infections (such as gonorrhea and chlamydia). Noninfectious causes of epididymitis generally present as subacute or chronic, and the etiology can range from trauma to autoimmune diseases. *Staphylococcus aureus* (SA) is an uncommon pathogen when considering epididymitis. We present an unusual case of acute epididymo-orchitis and UTI secondary to community associated methicillin-resistant SA (MRSA) in a young immunocompetent male.

Methods: Data was obtained from the electronic medical record The patient gave verbal informed consent for the case report. The diagnosis of epididymo-orchitis was confirmed through ultrasound findings, which

correlated with clinical findings. MRSA UTI was diagnosed by urine cultures.

Results:

A 28-years-old Caucasian male with a past medical history of intravenous drug use, MRSA bacteremia, and hepatitis C (not on active treatment) was admitted with complaints of left scrotal swelling, increased urinary frequency, dysuria, and hematuria for 5 days. He denied any fevers or chills. No history of kidney stones, sexually transmitted infections (STIs), UTIs, or exposure to tuberculosis was reported. His personal history included a monogamous long-term relationship with a female partner, active use of intravenous drugs (heroin), 10 pack- years of cigarette smoking, and occasional marijuana smoking.

On physical examination, the patient had significant erythema, tenderness, induration, and swelling of the left hemi-scrotum. No fluctuance, crepitus, or active drainage was noticed. Cord structures were thickened and tender on the left-sided scrotum. Cremasteric reflex was present on both sides. On rectal examination, the prostate was smooth, non-tender, nonindurated, and without any boggy areas.

His labs were significant for leukocytosis (WBC count of 29,800/uL) with neutrophilic predominance, and an elevated CRP of 305 mg/L. All other labs, including tumor markers, were normal. Urine analysis was suggestive of a urinary tract infection and the urine cultures grew

>100,000 CFU/ml of MRSA. Amplified urine testing for Neisseria and Chlamydia was negative. Blood cultures were drawn.

Ultrasound of the scrotum showed an enlarged hyperemic left testicle and epididymis, consistent with epididymo-orchitis. Multiple focal hypoechoic lesions were seen within the left testis suggestive of micro-abscesses. There was also an associated thickening and edema of the left scrotal wall with a small complex hydrocele. Transthoracic echo, obtained as part of workup to locate for the source of MRSA infection, did not show any obvious cardiac vegetations.

Urology and Infectious diseases (ID) were consulted. Urology recommended conservative management and ID recommended intravenous (IV) vancomycin. The patient's scrotal swelling and dysuria improved with a couple of days of IV vancomycin, and the patient decided to leave the hospital against medical advice. Upon discharge, the patient was prescribed Bactrim (Double Strength) twice a day for 21 days and Doxycycline 100 mg twice daily for 14 days as per ID recommendations. Outpatient follow-ups were scheduled with Urology and ID. His blood cultures did not show any growth over the next 5 days.

Discussion:

Acute epididymitis is a clinical syndrome consisting of pain, swelling, and inflammation of the epididymis lasting <6 weeks (Trojian et al., 2009). Among sexually active men aged <35 years, it is most frequently caused by *C. trachomatis* or *N. gonorrhoeae*. In men aged ≥35 years, epididymis usually becomes infected in the setting of bacteriuria secondary to bladder outlet obstruction (e.g., benign prostatic hyperplasia) (Tracy & Costabile, 2009). In older men, non-sexually transmitted acute epididymitis is also associated with prostate biopsy, urinary tract instrumentation or surgery, systemic diseases, and/or immunosuppression.

The most frequently encountered organisms associated with bacteriuria and UTI are the enteric gram-negative bacteria (*Escherichia coli* being the most predominant) and coagulase-negative *Staphylococcus saprophyticus*. Repeated unprotected anal intercourse can predisposes men to UTIs from enteric flora (like *E. coli*); (Ashby & Smith, 2010). *Proteus mirabilis*, and *Enterococcus*, account for less than 5% cases of UTIs (Orenstein & Wong, 1999; Khan & Ahmed, 2001).

The frequency of *Staphylococcus aureus* (SA) UTI, mostly MRSA, has been gradually growing and it is an important etiology for hospital-acquired infections worldwide (Klevens et al., 2006; Lescure et al., 2006). Bacteriuria with SA is hypothesized to occur through several mechanisms that include catheterization, urologic procedures, or seeding of the genitourinary tract (bacteria excreted through kidneys in overt bacteremia). Bacteremia itself is associated with bacteriuria in patients infected with SA, which suggests that bacteremia is an important precursor for bacteriuria in some patient groups (Chihara et al., 2010; Lee et al., 1978).

Our patient was a young male who developed epididymo-orchitis secondary to a UTI from MRSA. He had no risk factors of developing MRSA in urine. He was immunocompetent, with no history of recent hospitalization, urinary instrumentation, or catheterization. He had a remote history of MRSA bacteremia but his blood cultures at this admission were sterile, ruling out bacteremia as the source of bacteriuria.

Conclusions:

Community-associated SA predominantly causes skin and soft tissue infections, and other fatal infections such as necrotizing pneumonia and

necrotizing fasciitis. Community-associated MRSA is an uncommon pathogen for urogenital infections, and a little is published on MRSA-positive urine cultures. Recent studies have reported an increasing prevalence of SA in UTIs (E & O, 2008). This case report points out that there may be an increasing incidence of community-associated MRSA as a causative agent of genitourinary infections, like UTIs and acute epididymo-orchitis. This case also points out the importance of obtaining urine cultures in these cases. More case reports and case series are required to ascertain the true incidence and prevalence of MRSA as a cause of community acquired infections, including UTIs and genitourinary infections.

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References:

1. Ashby, J., & Smith, A. (2010). A case of sexual transmission of *Escherichia coli* leading to urine infections in a male homosexual couple? International Journal of STD & AIDS, 21(9), 660–661.
2. Chihara, S., Popovich, K. J., Weinstein, R. A., & Hota, B. (2010). *Staphylococcus aureus* bacteriuria as a prognosticator for outcome of *Staphylococcus aureus* bacteremia: A case-control study. BMC Infectious Diseases, 10, 225.
3. E, E. A., & O, K. I. (2008). Incidence and antibiotic susceptibility pattern of *Staphylococcus aureus* amongst patients with urinary tract infection (UTI) in UBTH Benin City, Nigeria. African Journal of Biotechnology, 7(11), 1637–1640.
4. Khan, S. W., & Ahmed, A. (2001). Uropathogens and their susceptibility pattern: A retrospective analysis. JPMA. The Journal of the Pakistan Medical Association, 51(2), 98–100.
5. Klevens, R. M., Edwards, J. R., Tenover, F. C., McDonald, L. C., Horan, T., Gaynes, R., & National Nosocomial Infections Surveillance System. (2006). Changes in the epidemiology of methicillin-resistant *Staphylococcus aureus* in intensive care units in US hospitals, 1992–2003. Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America, 42(3), 389–391.
6. Lee, B. K., Crossley, K., & Gerding, D. N. (1978). The association between *Staphylococcus aureus* bacteremia and bacteriuria. The American Journal of Medicine, 65(2), 303–306.
7. Lescure, F. X., Biendo, M., Douadi, Y., Schmit, J. L., & Eveillard, M. (2006). Changing epidemiology of methicillin-resistant *Staphylococcus aureus* and effects on cross-transmission in a teaching hospital. European Journal of Clinical Microbiology & Infectious Diseases: Official Publication of the European Society of Clinical Microbiology, 25(3), 205–207.
8. Orenstein, R., & Wong, E. S. (1999). Urinary tract infections in adults. American Family Physician, 59(5), 1225–1234, 1237.
9. Tracy, C. R., & Costabile, R. A. (2009). The evaluation and treatment of acute epididymitis in a large university-based population: Are CDC guidelines being followed? World Journal of Urology, 27(2), 259–263.
10. Tracy, C. R., Steers, W. D., & Costabile, R. (2008). Diagnosis and management of epididymitis. The Urologic Clinics of North America, 35(1), 101–108; vii.
11. Trojian, T. H., Lishnak, T. S., & Heiman, D. (2009). Epididymitis and orchitis: An overview. American Family Physician, 79(7), 583–587.