Epididymoorchitis due to Brucella melitensis

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Abstract

Brucellosis is the most common worldwide zoonotic infection and is characterized by febrile illness often affecting the muscular and skeletal systems. While infection with Brucella species often presents with non-localizing systemic symptoms, genitourinary manifestations are uncommonly diagnosed. Urologic involvement presenting as epididymitis or orchitis is often misdiagnosed and may demonstrate prolonged symptomatology. Global travel and the ubiquitous importation of livestock and animal products should prompt clinicians to consider the diagnosis of brucella outside of traditional endemic regions.

INTRODUCTION

Brucellosis is a worldwide zoonotic infection caused by gram-negative coccobacilli. Primarily an endemic infection spread by livestock, brucellosis typically presents with generalized fatigue and flu-like symptoms. Genitourinary involvement such as epididymoorchitis is not uncommon. We present a case of epididymoorchitis refractory to traditional antibiotic treatment in a patient with exposure to unpasteurized goat cheese.

CASE PRESENTATION AND MANAGEMENT

A 62 year-old male presented to the urgent care clinic with fevers and right testicular pain of approximately one week duration. History revealed dull intermittent lower back pain for several months prior to presentation and he denied voiding complaints. On examination, the patient was noted to have a temperature of 99ºF and a tender, enlarged right testicle. Although the patient demonstrated a serum leukocytosis of 12,800/mL, urinalysis was normal. Doppler ultrasonography demonstrated diffuse hypoechogenicity of the right testicle and increased blood flow of the right epididymis in addition to small bilateral hydroceles. A two-week course of fluoroquinolone therapy was recommended by urology; however, due to concern for prolonged Q-T syndrome with ciprofloxacin treatment, the patient was discharged home on doxycycline 100mg twice daily and clindamycin 600mg three times daily by the emergency department physician. The patient returned to the urgent care clinic two days later with increasing right testicular pain. He remained afebrile with a stable testicular examination but had a further increase in serum leukocytes to 19,200/mL. Repeat ultrasonography confirmed epididymoorchitis with some improvement in the hypoechogenicity of the right testicle. He was discharged home to continue his previous antibiotic regimen with follow-up scheduled in the urology clinic. Ultrasonography one month later revealed persistent right epididymoorchitis, a small hypoechoic area in the right testicle, and left hydrocele though the patient was improved clinically. In light of the patient's subjective improvement, he was maintained on the dual antibiotic regimen. During this time, the patient's wife was diagnosed with osteomyelitis secondary to Brucella species. After receiving an information packet regarding his wife's diagnosis, the patient presented to the emergency room for evaluation of similar symptoms. Further history revealed ingestion of unpasteurized goat cheese while the patient was traveling in Mexico. MRI of the lumbosacral spine confirmed L3-L5 osteomyelitis and a concomitant psoas abscess. Agglutination test for Brucella was positive at 1:2560 and Brucella IgG and IgM tests were also positive. The patient was treated for brucellosis with a two-week course of intravenous gentamicin at 5mg/kg/day and a new six-week course of doxycycline at 100mg oral twice daily. The patient reported resolution of testicular pain and enlargement two months later and scrotal ultrasound confirmed near-resolution of epididymoorchitis. Brucella antibodies were negative seven months after diagnosis and scrotal ultrasonography at that time revealed complete resolution of testicular hypoechogenicity.

DISCUSSION

Brucellosis is a worldwide zoonotic infection caused by gram-negative coccobacilli. Four species, Brucella

melitensis, Brucella abortus, Brucella canis, and Brucella suis, are known to cause infection in humans. Primarily an endemic infection spread by sheep, cattle, goats, dogs, and swine as the species names suggest, brucellosis was previously seen most commonly in occupational workers with livestock exposure [2]. However clinically apparent disease in the United States now occurs predominantly in California and Texas (which account for more than half of U.S. cases) likely from the importation of unpasteurized goat cheese from Mexico where the disease is endemic [3]. Brucellosis, like tuberculosis, is a chronic granulomatous infection affecting most organ systems [4]. Genitourinary involvement remains an oft overlooked aspect of the protean manifestations of this disease and previous reports have described epididymoorchitis as a focal manifestation of brucella in 2%-20% of cases with serious complications such as necrotizing orchitis observed in untreated cases. Some series deem the reproductive system the second most common site of focal brucellosis [5].

Patients with Brucella epididymoorchitis (BEO) have a variable time course to the onset of their symptoms with 78% of patients having acute symptoms (<30 days), and 22% with chronic pain (>30 days). Fortunately, nearly half of affected patients are diagnosed with both brucellosis and orchitis within two weeks of each other. Concurrent signs and symptoms seen in a case-series of BEO included fever in 52%, rigors in 43%, arthralgias in 33%, hepatosplenomegaly in 18%, weight loss and cough in 15%, with generalized lymphadenopathy, rash, and lower urinary tract symptoms occurring in less than 5% of affected patients [5].

Laboratory abnormalities seen in cases of brucella include elevation of the erythrocyte sedimentation rate (ESR), C-reactive protein levels (CRP), leukocytosis or leukopenia, anemia, thrombocytopenia, and/or mild elevation of the hepatic transaminases. Urinalysis is normal in the vast majority of patients with BEO and less than 15% of patients have any combination of hematuria, proteinuria, or pyuria. Definitive diagnosis requires positive serologic markers, PCR, or recovery of the organism from culture data. The sensitivity of blood culture varies from 15-70% largely due to the slow growth of the organism, and blood culture positivity is often delayed by 2-3 weeks. For this reason PCR and enzyme-linked immunosorbent assays (ELISA) have gained popularity for their improved sensitivity and specificity.

Radiographic evaluation of scrotal disease is commonplace in urologic practice and the sonographic characteristics of BEO bear mentioning given its propensity to form granulomatous lesions. Echographic findings include enlarged and heterogenous epididymitis with diffusely hypoechogenic testis [1]. Because testicular brucellosis typically occurs from direct contiguous spread of primary epididymitis, the development of granulomatous inflammation of the testes is common. These granulomatous lesions may form focal necrotic areas resembling those seen in neoplastic disease. Bayram et al attempted to make this differentiation with scrotal ultrasound evaluation of 246 consecutive serologically confirmed brucellosis patients, however significant overlap of the sonographic characteristics of the inflammatory reaction to testicular brucellosis and neoplasms was noted [6]. Kocak et al report a patient with a history of brucellosis three years prior to evaluation for epididymoorchitis found to have a hypoechoic, heterogenous 63x42x38mm intratesticular mass which was not hyperemic on color flow Doppler imaging. Orchiectomy revealed a brucellar abscess in the absence of malignancy [7]. Orchiectomy for benign disease is not uncommon and may be avoided with a high degree of clinical suspicion for brucellosis, particularly in endemic areas.

Although epididymoorchitis remains the most common form of involvement of the genitourinary system by brucella, renal abscess [8], prostatitis/prostatic abscess [9,10], and testicular abscesses [7] have been reported.

Treatment of Brucellosis should involve an infectious disease subspecialist as relapse of infection occurs in up to 10% of cases within the first year [11]. Guidelines for the treatment of brucellosis exist and two regimens are accepted for use. Both require doxycycline for six weeks in combination with either: streptomycin or gentamicin for two to three weeks, or rifampin for six weeks [12].

In conclusion, epididymoorchitis due to Brucella species may be relatively common in endemic regions and in the global market in which we now reside, and clinicians outside of the traditional endemic regions for brucellosis are likely to encounter this protean infection. Due to the risk of prolonged illness and morbidity associated with mistreatment, brucellosis should be considered in patients with exposure to animal products and clinical manifestations consistent with this disease. Persistent symptoms of epididymoorchitis despite conventional therapy should prompt further diagnostic testing and a high degree of

suspicion for brucellosis in patients with livestock exposure.

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