

Brucella Epididymo-Orchitis: A Rare Infection

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ABSTRACT

Brucellosis is one of the most common zoonotic diseases in the world. The study reports a middle-aged man who presented with fever and testicular pain for unknown reasons, and the blood culture for *Brucella* was positive. Ceftriaxone treatment was started, and amikacin was added two days after the poor effect. After no response, doxycycline and rifampicin were used instead. The clinical effect was poor and was accompanied by testicular abscess. As the conservative treatment was ineffective, surgery was used. Delayed diagnosis or improper treatment may lead to serious complications. An early diagnosis and effective treatment are imperative for favourable outcomes.

Key Words: *Brucella*, Zoonosis, *Brucella epididymo-orchitis*.

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INTRODUCTION

Brucellosis is a zoonotic infectious disease transmitted through direct or indirect contact with infected animals or by consuming raw meat and dairy products. Among the complications of brucellosis, involvement of the urogenital system is the second most common, primarily including epididymo-orchitis and testicular abscesses. Despite a global trend towards simplifying treatment and enhancing its efficacy, the varied clinical manifestations of brucellosis and the distinctiveness of each geographical region pose challenges to the contemporary treatment of the disease. Untreated brucellosis can lead to testicular abscesses and necrosis. We report the case of a middle-aged man who sought medical attention due to unexplained fever and testicular pain, and whose blood culture tested positive for *Brucella*.

CASE REPORT

A 54-year male presented with swelling of the right scrotum, accompanied by pain for five days. The pain was relieved in the left lateral and supine position. It was accompanied by fever. The highest body temperature was 37.6°C, so he went to the local Chinese medicine hospital for treatment. He was diagnosed with orchitis and was given anti-inflammatory and symptomatic treatment, but testicular pain became worse and worse. He denied frequent micturition, urgency, abdominal distension, abdominal pain, gross haematuria, and pyuria. A splenectomy was performed five years ago because of a spleen rupture, and the postoperative recovery was unremarkable.

The physical examination revealed swelling of the right scrotum, with tenderness and thickening and hardening of the spermatic cord. The pain was alleviated during the scrotum elevation test (Prehn sign). The transillumination test was negative. No obvious abnormalities were detected in the left testicle and epididymis.

The laboratory work-up indicated a haemoglobin (Hb) of 154 g/dL, white blood cells (WBCs) at $12.17 \times 10^9/L$, a platelet count of $98 \times 10^9/L$, and a procalcitonin (PCT) level of 0.27 ng/mL. Gamma glutamyl transferase (GGT) and alanine aminotransferase (ALT) levels were above normal limits. Further assessment of risk factors included a history of consuming non-pasteurised milk. Moreover, it was found that he had a history of close contact with animals such as cattle, sheep, and dogs. *Brucella* serology indicated a positive result. An ultrasound of the external genitalia (Figure 1) suggested an enlargement of the right testis and epididymis, there was a small hypoechoic area inside, considered to be a microabscess.

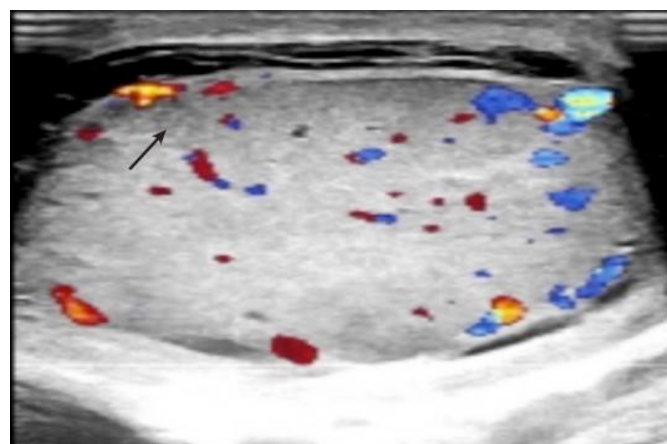


Figure 1: An ultrasound of the external genitalia suggests the enlargement of the right testis and epididymis, there is a small hypoechoic area inside, considered to be a microabscess (arrow).

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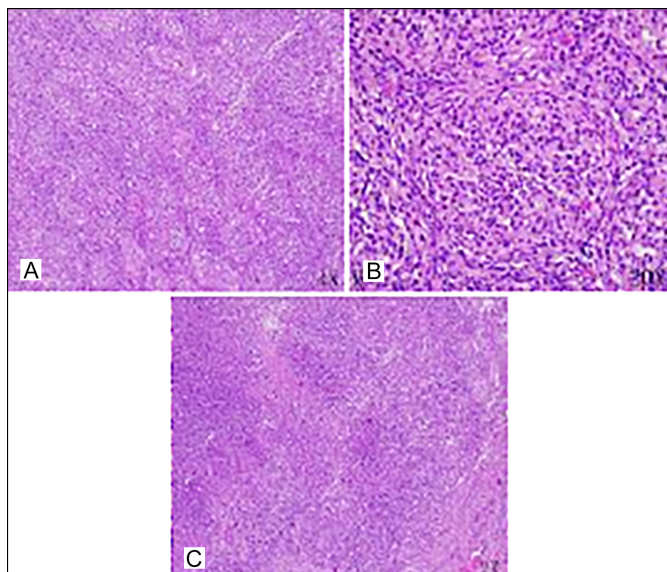


Figure 2: Histological examination of testis in patient with *Brucella* epididymo-orchitis after the operation. Testicular biopsy samples of (A, B) show the right testicular tissue, in which seminiferous tubules are seen, and a large number of acute inflammatory cells are seen infiltrating into the stroma, while testicular biopsy sample of (C) shows necrosis and abscess formation in the central area.

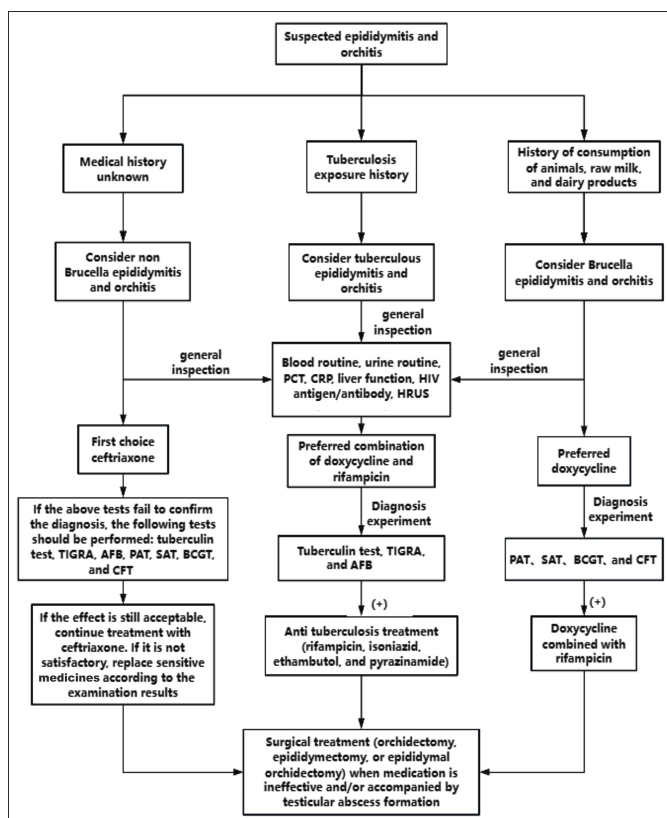


Figure 3: Diagnostic flowchart (TIGRA: T Cell-mediated IFN- γ release assays; AFB: Acid-fast bacilli; PAT: Plate agglutination test; SAT: Serum agglutination test; BCGT: Brucella Coombs gel test; CFT: Complement fixation test).

The initial consideration of acute orchitis was based on medical history. He was administered an intravenous injection of ceftriaxone upon admission. On the second day, the test results indicated an increase in WBCs and inflammatory factors, and testic-

ular pain worsened. Anti-infection treatment was continued and blood culture was sent. On the third day, the patient developed a fever, with the highest body temperature reaching 38.9°C, and was treated with cold sponging. It was also observed that the testicular mass in the right scrotum was gradually enlarging. Considering the poor antibacterial effect of ceftriaxone, Amikacin sulfate injection was added. However, the patient's right-sided testicular pain and swelling were not alleviated. On the fifth day, the blood culture tested positive for *Brucella*, and the antibiotics doxycycline and rifampicin, which were sensitive, were replaced for oral treatment. On the sixth day, the patient experienced frequent fevers, and the testicular pain was exacerbated. Considering the possibility of abscess formation as indicated by imaging reports, and realising that current medicine therapy alone cannot completely control symptoms, a right epididymo-orchidectomy was performed. Combining the postoperative pathological results (Figure 2) with the blood culture results, the diagnosis was ultimately determined to be *Brucella* epididymo-orchitis. Upon confirming that the epididymal and testicular inflammation and pain had been completely alleviated, the patient was discharged on the 10th day. Following discharge, the patient continued to take doxycycline and rifampicin orally for a minimum of three months. Three months later, the patient returned for a follow-up appointment. Based on the improvement in clinical results and the reduction of procalcitonin (PCT), it was obvious that his *Brucella* epididymo-orchitis had been cured. No repeat serological tests were conducted.

DISCUSSION

Brucellosis is one of the most common zoonotic diseases.¹ It is prevalent in southern Europe, Middle East, China, the Far East, Mexico, parts of Central and South America, and Sub-Saharan Africa.² In the progression of brucellosis, animal contact and drinking unpasteurised milk are obvious risk factors.³

In this case, considering the history and clinical data, the possibility of *Brucella* infection was initially contemplated, and a blood culture was sent accordingly. Although ceftriaxone was not the preferred treatment for *Brucella*, certain studies indicated that ceftriaxone exhibited 100% activity against *Brucella* blood isolates *in vitro*.⁴ It is also a potential medicine for the combined treatment of some *Brucella* complications. Following its administration, the clinical symptoms of the patients did not improve, and subsequently, aminoglycosides (Amikacin) were added to the regimen, yet the clinical symptoms persisted. A subsequent blood culture-confirmed *Brucella* infection, and the treatment was adjusted to a combination of doxycycline and rifampicin. However, the optimal treatment window had been missed. The patient experienced testicular pain on the right side, increased swelling, frequent fevers, and abscess formation, leading to the final decision to carry out surgical intervention.

The gold standard for identifying *Brucella* involves isolating and culturing the bacteria, with approximately 50% of patients with acute brucellosis testing positive in blood cultures after two to

three weeks.⁵ However, obtaining a medical history is also crucial. By inquiring whether patients have been in contact with infected animals or consumed unpasteurised dairy products, the risk of Brucella infection can be preliminarily assessed. Additionally, by considering the patient's place of residence, travel history, and occupation, it can be determined if they are in a high-risk area for brucellosis. In terms of treatment, the doxycycline-rifampicin regimen is predominantly used for treating Brucella infections, and it has shown acceptable efficacy in many cases.^{6,7}

Although the prognosis for Brucella epididymo-orchitis is generally favourable, inadequate treatment can result in serious complications, such as testicular abscesses, necessitating orchiectomy.⁸ Consequently, we have summarised a concise diagnostic and treatment process based on the aforementioned cases (Figure 3).

In summary, this case highlights the need to consider Brucella in cases of fever and testicular pain in endemic areas. An early diagnosis and effective treatment can prevent serious complications.

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PATIENT'S CONSENT:

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COMPETING INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

BL: Conception, drafting of work, and interpretation of data.

ZQ, TT, GC: Drafting of the work and key revision.

CR: Strict revision.

All authors approved the final version of the manuscript to be published.

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