

CASE REPORTS

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# Brucella orchitis presenting as a testicular mass mimicking a testicular tumor: a rare case report

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## Abstract

**Introduction** Brucella epididymo-orchitis is a complication that occurs in 5.7% of patients with brucellosis and can rarely mimic a testicular tumor. We here report a case of a 25-year-old man with a testicular brucellosis that presented as a testicular mass that responded to conservative treatment using antibiotic therapy.

**Case report** A 25-year-old patient presented with left testicular pain, abdominal pain, easy fatiguability, and feeling unwell. Physical examinations were normal. A testicular tumor was suggested by a scrotal color Doppler US scan and testicular MRI. However, tumor markers were all within the normal range. A serum Brucella agglutination test (Rose Bengal test) was done, and it was positive. The patient received anti-brucella antibiotics. An ultrasound scan 3 months later revealed complete recovery after completing antibiotic treatments.

**Discussion** Brucella orchitis can be determined based on the triad of serology, ultrasonography, and the presence of the common symptoms like fever, testicular pain, redness, and enlargement. The early diagnosis of this phenomenon is crucial due to the morbidity and complications that may be encountered. Moreover, it has several differential diagnoses, such as testicular tumor, epididymitis, trauma, torsion of the testis, and hematocele. Failure to obtain an adequate diagnosis, particularly if a testicular tumor is suspected, may result in unnecessary intervention like orchiectomy.

**Conclusion** Brucella orchitis is a complication of brucella infection that may mimic a testicular tumor. Several techniques of diagnosis are required for an accurate assessment.

**Keywords** Brucellosis, Orchitis, Testicular mass, Testicular tumor

## 1 Introduction

Brucellosis is a zoonotic multiorgan infectious disease caused by Brucella species which are gram-negative coccobacilli [1]. Dogs, cattle, swine, sheep, goats, reindeer, and camels are the sources of infection. The transmission can occur through the skin by contact, inhalation of the organism, and ingestion of contaminated meat or unpasteurized milk and its products. The highest incidence of the disease appears in veterinarians, livestock farmers, and sheepherders, especially in countryside communities [2, 3]. Brucella epididymo-orchitis is a rare complication that occurs in 5.7% of patients with brucellosis, and the most prevalent symptoms are scrotal swelling,

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pain, and fever [4, 5]. Testicular epididymitis caused by brucella can occasionally progress to necrotizing orchitis, testicular abscess, or a testicular mass misdiagnosed as a testicular tumor, resulting in unnecessary orchiectomy [6]. We here report a case of a 25-year-old man with a testicular brucellosis that presented as a testicular mass and responded to conservative treatment using antibiotic therapy.

## 2 Case presentation

### 2.1 Patient information

A 25-year-old married male patient presented with left testicular pain, abdominal pain, easy fatiguability, and feeling unwell for a duration of three weeks without a history of fever and sweats. He was a butcher and has close contact with sheep.

### 2.2 Clinical findings

Physical examination showed normal vital signs; the abdomen was soft; and both testes were normal apart from mild tenderness of the left testis without feeling a mass.

### 2.3 Diagnostic approach

An abdominal ultrasound (US) scan showed mild enlargement of the spleen (13 cm), but a scrotal color Doppler US scan revealed a hypervascular left testis with a 15 × 10 mm hypoechoic lower pole lesion (Fig. 1), suggesting a testicular tumor. Magnetic

resonance imaging (MRI) of the testis also showed a diffuse abnormal signal intensity of the left testis with a 17-mm lower pole thick-walled enhancing lesion with a few cystic loculi in the center in favor of a testicular tumor (Fig. 2a, b). However, tumor markers including beta-HCG, alpha-fetoprotein, and lactate dehydrogenase were all within normal limits. A serum Brucella agglutination test (Rose Bengal, LINEAR CHEMICALS, S.L.U, Spain) was positive with a high titer (1/640).

### 2.4 Therapeutic intervention

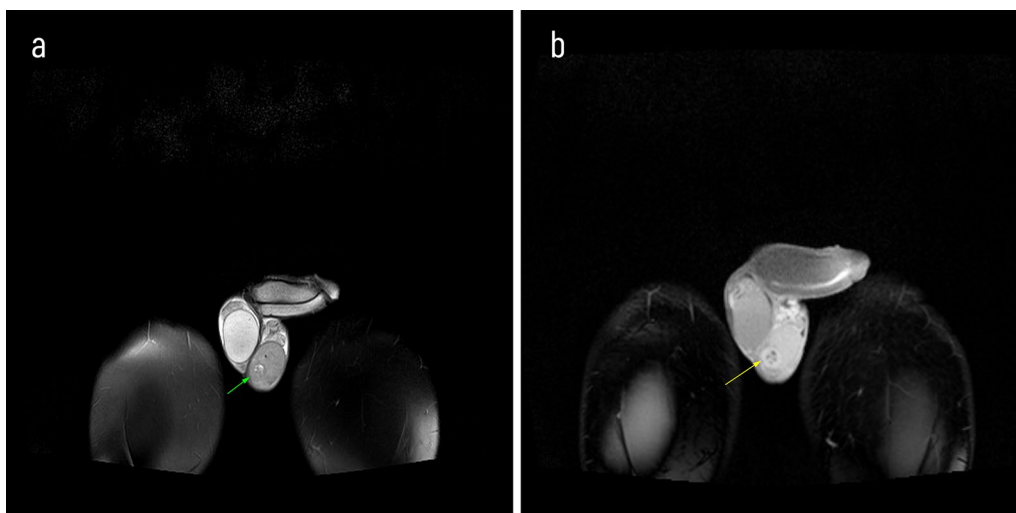
The situation of the case was discussed with the multi-disciplinary team, and counseling with the patient was done to start anti-brucella antibiotics with close observation. He received gentamicin 5 mg/kg/day for 1 week, with doxycycline 100 mg and rifampicin 300 mg twice daily for 10 weeks.

### 2.5 Follow-up and outcome

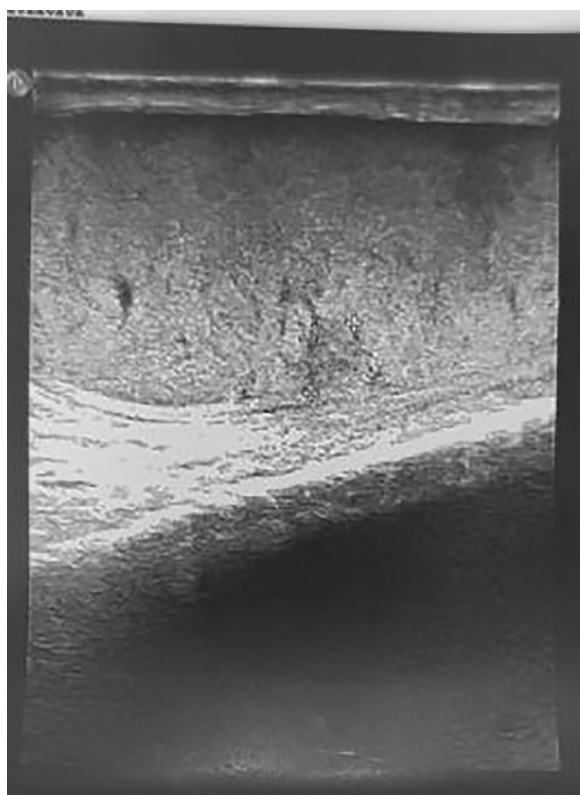
A follow-up scrotal US scan after 4 weeks of treatment showed regression of the mass to 8 × 6 mm together with clinical improvement of his symptoms (Fig. 3). He completed 10 weeks of antibiotic treatment. An US scan after 3 months revealed complete resolution of the mass, leaving a dot of calcification in the area (Fig. 4), and he was completely free of symptoms.



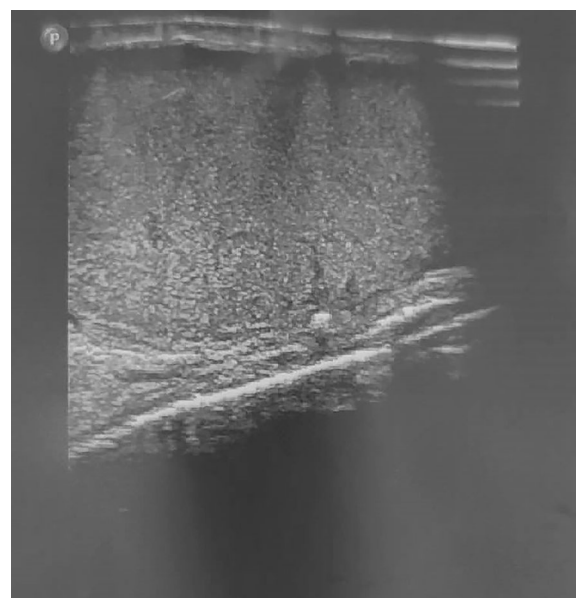
**Fig. 1** Ultrasound scan shows ill-defined, hypoechoic lesion with internal vascularity



**Fig. 2** MRI shows testicular brucellosis. **a** T2 fat suppression axial section, left testis shows diffuse low signal and 1.2-cm cystic locules in lower part “green arrow.” **b** Contrast-enhanced T1 fat suppression coronal section, left testis shows diffuse enhancement, lower part contains thick wall-enhanced lesion “yellow arrow”



**Fig. 3** Ultrasound shows regression of the mass after 4 weeks of treatment



**Fig. 4** An US scan after 3 months showing complete resolution of the mass, spot of calcification seen at its site

### 3 Discussion

Brucellosis is an endemic infection in some geographical regions like the Middle East, the Mediterranean region,

the Arabian Peninsula, and India. It is much more common in rural areas than in urban areas [1, 2, 7]. This disease is regarded as a multisystemic infection which may lead to suppurative complications, especially in the joints and bones [4]. In brucellosis, infection of the male genitourinary system is mostly known as *Brucella* epididymo-orchitis or *Brucella* orchitis. It is infrequent, comprising about 2–20% of all cases. Orchitis seems to be the most common genitourinary involvement, but testicular

abscesses and prostatitis might also be detected as consequences of primary infection [2, 3]. Brucellar abscess is usually due to necrosis in the area of granulomatous infection caused by bacterial persistence in macrophages. Testicular abscess caused by brucellosis during involvement of the genitourinary system is uncommon [4].

The most common general presentations of brucellosis include fever, sweating, osteoarticular involvement, arthritis, chills, nausea, vomiting, and myalgia. However, some other specific symptoms like scrotal pain and scrotal swelling may be associated with brucella orchitis [1, 3]. It has been revealed that young males are at higher risk for infection, and Savasci et al. retrospectively reviewed 28 cases of Brucellar epididymo-orchitis, and their findings showed that most of the cases were in their twentieth and thirtieth years of life, with a mean age of 31 years old [1]. In 20–40% of cases, brucella orchitis is thought to be directly involved from epididymitis. Furthermore, in the study of Baykan et al. the incidence of both epididymis and testes involvement was about 67% among 24 male cases [3]. Bilateral involvement of the testis has been reported to be less than 10% by Celen et al., while Baykan et al. found a higher rate of 21% [3, 8]. In line with the literature, the present case was a young male aged 25 years. It is worthwhile to mention that among all of the symptoms that are associated with brucellosis, none of them presented in the current case, and he only had mild testicular and abdominal pain. In addition, the infection in this case was unilateral focal orchitis without involvement of the epididymis or any other organs.

Regarding the diagnosis, Brucella orchitis can be determined based on the triad of serology, ultrasonography, and the presence of the common symptoms like fever, testicular pain, redness, and enlargement [2]. The early diagnosis of this phenomenon is crucial due to the morbidity and complications that may be encountered. Anemia or leukopenia has been reported to occur in nearly 55% and 21% of cases with brucellosis, respectively [3, 4]. Moreover, it has several differential diagnoses, such as testis tumor, epididymitis, trauma, torsion of the testis, and hematocele [2]. Failure to obtain an adequate diagnosis, particularly if a testicular tumor is suspected, may result in unnecessary intervention like orchiectomy [9]. Special laboratory tests and radiological evaluation are crucial in diagnosing Brucella orchitis [1]. The serum Brucella agglutination tests are the major diagnostic approaches for brucellosis, and a titer ratio greater than 1:160 is marked as a positive result whenever accompanied by specific clinical symptoms [3]. Despite its accuracy, agglutination test titers in chronic brucellosis can be absent or less than 1:160 [2]. Ultrasonography is a required imaging tool more commonly to exclude the possibility of a tumor or abscess other than to establish

the primary diagnosis, and it is difficult to rule out malignancy without proper laboratory and clinical examinations [6]. The ultrasonography findings usually include testicular enlargement, heterogeneous or hypoechoic echogenicity, inhomogeneous echotexture, and testicular hypervascularity. These findings commonly depend on inflammation; they are not specific to Brucella orchitis and can be seen in all etiologies of orchitis. Thus, these features can be used to investigate the differential diagnosis and complications of Brucella orchitis rather than its exact diagnosis [1]. In the present case, both findings of scrotal color Doppler US and MRI of the testis were in favor of a testicular tumor in which a hypervascularity of the left testis with a hypoechoic lower pole lesion was seen on US and a thick-walled enhancing lesion was also found on MRI. Because the case was almost asymptomatic, both the clinical presentations and radiological findings supported the occurrence of a testicular tumor. To exclude this suspicion, tumor markers like beta-HCG, alpha-fetoprotein, and lactate dehydrogenase were done, and they were normal. Furthermore, the serum Brucella agglutination test (Rose Bengal test) was also conducted and it was positive with a titer of 1:640. Since the geographical area of the case is endemic for brucellosis, the incidence was determined to be a bacterial infection rather than a carcinoma.

It has been reported that medical treatment with drugs like rifampicin, tetracycline, streptomycin, doxycycline, ciprofloxacin, cotrimoxazole for at least six weeks played a significant role in the management of brucellosis with only 10% of relapses [6]. A combination of doxycycline (200 mg) and rifampicin (600 mg) daily for approximately six weeks has also been recommended [2]. The chance of treatment failure in monotherapy has been reported to be higher than in combined treatment, so the medical treatment should include dual or triple regimens of antibiotics [1, 10]. In addition, some scholars mentioned orchiectomy as the standard option for the treatment of Brucella orchitis, followed by oral tetracycline for about six weeks with intramuscular streptomycin for two weeks to decrease the relapses [2, 11]. In a study by Kaya et al., the findings of nine cases with brucellar orchi-epididymitis have been summarized, and the primary management in six cases was orchiectomy [4]. Another study recommended orchidectomy for the treatment of observed focal hypoechoic lesions in the testis by ultrasonography [1]. Despite that the current case was suspected as a testicular tumor and a hypoechoic lesion was seen in the scrotal US, we were supposed to do orchiectomy according to the literature. But depending on the results of laboratorial tests like the tumor markers and serum agglutination tests, the clinicians desired to prevent unnecessary intervention. After consultation with the

patient, he was treated with a combination of gentamicin (5 mg/kg/day) for 1 week, with doxycycline (100 mg/twice daily) and rifampicin (300 mg twice/daily) for 10 weeks. After the fourth week of treatment, an US scan showed regression of the mass and symptoms' resolution. The mass was completely resolved after the completion of the treatment.

#### 4 Conclusion

*Brucella orchitis* is a complication of brucella infection that can be misdiagnosed as a testicular tumor. In endemic areas, physicians must be aware of testicular abscess during the diagnosis. Several ways of diagnosis are required for an accurate assessment.

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#### Author contributions

RB was a major contributor to the conception of the study, as well as in the literature search for related studies. GA and SS were involved in the literature review and writing of the manuscript. FK has drafted the work and substantively revised it. SFA was the clinician that managed the case and gave the final approval of the manuscript. ST and SMA have confirmed the authenticity of the data. AS and RA have critically revised the manuscript. All authors have read and approved the final manuscript.

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#### Consent for publication

Written informed consent for publication has been acquired from the patient.

#### Competing interests

The authors declare that they have no competing interests.

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