Case Report

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Unusual Abscess Caused by *Brucella Melitensis*

Nasim Eftekhari[1*], Amir Hossein Mohammad Bagheri[2]

1. Department of Microbiology, Kerman Branch, Islamic Azad University, Kerman, Iran.

2. The Office of Vice-President for International Affair, Department of Medical Education, Faculty of Medicine, Iran University of Medical Sciences(IUMS), Tehran, Iran.

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ABSTRACT

Brucellosis is a zoonotic infectious disease which any organ can be involved. Soft tissue lesions are rare manifestations of brucellosis. Brucella breast abscess in animal is not uncommon; involvement of the breast in human brucella is extremely rare. Breast abscess involvement was reported to 0.7% of the patient with brucellosis. We report the microbiological findings of breast abscess due to brucella. A 38-year-old woman living in the rural area of Kerman, Iran, presented with an abscess in the right breast. The sampling of the abscess aspiration and preparation of smears showed inflammatory fluid. Culture and PCR performed from the sample identified the presence of *Brucella melitensis*. The lesion had diminished in size after 8 weeks of treatment with combined doxycycline and rifampin. The possibility of breast abscess being caused by Brucella should be considered in countries, especially in endemic regions. Besides, isolated Brucella spp from microbiological cultures is important for a definitive diagnosis.

Introduction

Brucellosis is a systemic zoonotic infection transmitted from animals to humans by consumption of infected food products, direct contact with an infected animal, or inhalation of aerosols [1, 2]. Although the disease is prevalent worldwide, it is particularly endemic in many countries, mainly in the Middle East, India, central and southwest Asia, the Mediterranean basin, Mexico, Central and South America [2, 3, 4]. It may have some effect on different organ systems [1, 5]. Involvement of the soft tissue is an uncommon occurrence of the disease. Involvement of breast in animals is common, however, in humans it is an extremely rare manifestation [5, 6, 7]. Nonspecific manifestations and clinical diversity of the disease may result in misdiagnosis [5].

In this report, we present a case of *Brucella melitensis* isolated from an abscess of the right breast from a woman, which was successfully treated through abscess drainage and antibiotic therapy.

*** Corresponding Author:**
Nasim Eftekhari
Address: *Department of Microbiology, Kerman Branch, Islamic Azad University, Kerman, Iran.*
E-mail: *eftekhari180@gmail.com*

Case presentation

A 38-year-old woman was admitted to our department with pain, swelling, generalized malaise, erythema, and night sweats for 2 months. She was involved in stockbreeding on a farm in the rural area of Kerman Province, Iran. Physical examination revealed a 5×3 cm, indurated, erythematous and painful mass in the upper right breast.

Laboratory tests revealed the following results: mild leukopenia and neutropenia (4.49 x 103/µL leukocytes; 42.5% neutrophils, 43.9% lymphocytes, 10.7% monocytes, 2.7% eosinophil, 0.2% basophil), relatively elevated transaminases (ALT: 27 U/L and AST: 41 U/L). The erythrocyte sedimentation rate was 15 mm/hour and C-reactive protein level (0.5 mg/dL).

Mammography was done and reported to be negative. A fine- needle aspiration (FNA) of the breast abscess was performed. The aspirate was immediately sent to pathology and microbiological laboratories for analysis. The histological findings showed a necrotic tissue with abundant neutrophils.

The sample was intensively purulent. The microbiological analysis, including initial cell counting, showed inflamed material of abscess with 15×10^3 cells/per microliter of which 70% were neutrophils. In addition, we performed Gram and Ziehl- Neelen stains were performed. Both Gram and Ziehl- Neelen stains were negative for the detection of any bacteria and mycobacteria.

The sample was first inoculated in the biphasic Thioglycolate Fluid (CONDA, Spain) and the BACTEC medium (Becton & Dickinson, Ireland) for the enrichment process. After 2 days, the enriched sample was subculture on the sheep blood agar (Biolife, Italy). No colony appeared after 48 hours. 4-days later, the bacterium was isolated from the sample in the sheep blood agar at 35 °C and 5–10% CO_2 (Figure 1). The isolates were Gram - negative coccobacilli, positive for catalase, oxidase, and urease (CONDA Spain) tests. Soon after the result of the culture, serum was taken from the patient for a standard agglutination test (SAT). At a titer of 1/640 the SAT was positive.

The organism Brucella confirmed by the agglutination test against specific antiserum (Bahar Afshan, Iran). Polymerase chain reaction (PCR) was used to detect of type Brucella. PCR products run on electrophoresis gel showed sequences of PCR product had 731 bp nucleotides [8]. The results of genetic analysis confirmed the identifying of *Brucella melitensis* (Figure 2).

After incision and drainage, the patient was treated with rifampin (RA) 600 mg/day and doxycycline (D) 200 mg/day for 12 weeks. The abscess lesion and other systemic symptoms of the patient had clinically disappeared. SAT test titer was decreased to 1/160 and also on control ultrasound examination at the end of 8 weeks, there was no significant finding related to the abscess.

Written informed consent was obtained from the patient for the publication of this case report.

Fig. 1. *Brucella melitensis* colony appearance after 4 days.

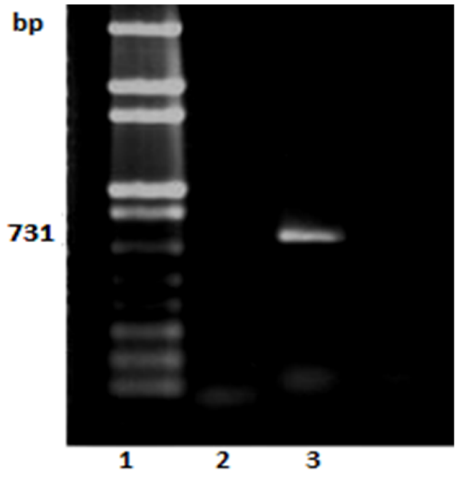

Fig. 2. Identification of DNA amplified fragments by agarose gel electrophoresis and ethidium bromide staining.

Discussion

Brucellosis is an infection caused by a non-encapsulated, aerobic and Gram-negative coccobacillus. It is a Zoonotic infection that frequently occurs as an occupational disease. Official statistics demonstrate that each year about half a million new cases of human brucellosis occur in the world [2].

This zoonotic disease is predominantly transmitted to humans through the ingestion of unpasteurized dairy products. It can also be transmitted by direct contact with carcasses of infected animals and fluids. Individuals engaged in livestock, farming, veterinary, butchery, and also laboratory workers are at high risk in developed countries [1].

The most common infectious agents causing abscess formation are pyogenic bacteria such as Staphylococci, Streptococcus species, atypical mycobacterial infection. Brucella spp remains an unusual pathogen for a breast abscess [5, 7].

Buzgan *et al.* studied 1028 brucellosis patient and reported that 42.3% of patients had a history of raising livestock, that 52% were female and 69.6% were between 13- 44 years old [6].

Brucellosis is a systematic disease that invades various tissues and organs [1, 2, 3]. Brucella infection of the human breast is extremely rare [5, 7]. Clinical symptoms of brucellosis are nonspecific and include fever, malaise, sweats, arthralgias, lower back pain, and headache. [1, 5,7].

Shahabi and Eftekhari in 2018 reported that cutaneous involvement is an unusual complication in brucellosis that reported to range between 0.4% and 17% [1]. Disseminated papulonodular eruptions have been the most common skin manifestation followed by erythema nodosum like lesions [7]. Based on the studies of Andriopoulos *et al.*, the prevalence of human brucellosis as a breast abscess is only 0.7% [4].

In our patient, the positive result of the cultivation of the aspirates in a specialist medical microbiology laboratory in a rather short time in conventional and BACTEC media was very helpful.

Ibrahim *et al*. in 2019 reported the case of a middle-aged Lebanese woman who presented with simultaneous breast abscesses and a pacemaker infection due to brucellosis [9]. Besli *et al.* in 2014 reported the case of a 51-year-old female with brucellosis manifests as breast involvement. He reported that in this case no systematic or local finding suggestive of brucellosis infection was noted [5]. In contrast, in our case, the infection was clearly localized to the abscess and the occurrence of hepatomegaly, splenomegaly or osteoarticular complications was not observed.

Abdoly et al. in 1996 described the case of female patient with a breast abscess caused by *B. melintensis,* which was successfully treated with trimethoprim-sulfamethoxazol (SXT) and doxycycline for 3 months [7].

Drainage might be as important as other pyogenic abscesses. Anti-microbial treatment with the combination of two antirubella drugs is recommended [2, 10]. The patient in our case was successfully treated with rifampin and doxycycline for 12 weeks.

Despite the breast abscess is a very rare complication

of systemic brucellosis, physicians should be aware of these uncommon manifestations of brucellosis in humans. In areas where brucellosis is endemic, it is important to take account of Brucella spp as a potential causative agent of breast abscesses when other more common etiologies have been discarded. In such cases, the contribution of the laboratory test in diagnosis is of great value. Despite the use of various serological tests as a diagnostic tool for brucellosis, sometimes these tests lack sensitivity and specificity.

Conclusion

We concluded that microbiological cultures from purulent material in a breast abscess is essential for a definitive diagnosis in the presence of serological evidence for brucellosis in the rare clinical presentations.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this article.

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Conflict of Interests

The authors declare that they have no conflict of interest.

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