

CASE REPORT

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A Case of Brucellosis Presenting with Papulopustular Rash and Septic Arthritis

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ABSTRACT Brucellosis is a zoonotic disease that is common all over the world. Although musculoskeletal involvement is common in the course of the disease, skin rash is very rare. Newly examined and observed papulopustular skin rash has not been reported before. In this study, a case of acute brucellosis is presented with fever, septic arthritis, and papulopustular rash. The diagnosis of brucellosis was made by serological tests. The patient was treated with doxycycline 100 mg twice a day, rifampicin 600 mg daily, and gentamicin 320 mg daily. Clinicians should be aware of brucellosis in the differential diagnosis of patients presenting with rash or septic arthritis in endemic areas.

Keywords: Brucellosis; papulopustular rash; septic arthritis; skin involvement; synovial; fluid

Brucellosis is a zoonotic disease worldwide world and is endemic in some countries.¹ Bacteria can be transmitted by the consumption of unpasteurized milk or dairy products of from infected animals, direct contact of with secretions to and impaired skin, inhalation of infected aerosols, and inoculation to the conjunctiva.^{2,3}

Brucellosis is a systemic infection that may affect musculoskeletal system, reticuloendothelial system, gastrointestinal system, central nervous system, cardiovascular system, genitourinary system and the skin.⁴

Despite the fact that brucellosis can affect a number of systems, skin involvement is very rare.^{4,5} While the musculoskeletal system is the most commonly affected system, septic arthritis is also rare.⁶ In this study, a case of acute brucellosis related with papulopustular skin rash and septic arthritis is presented.

CASE REPORT

A 45-year-old female patient was admitted to the hospital with fever and rash, with pain, and swelling in

the left knee. Three days prior to her admission, she had fever and rash. She had developed pain, swelling, and increased heat and mild redness on her left knee. In the physical examination, her general condition was good-moderate and she was conscious. Fever was 38.9°C, arterial blood pressure was 110/70 mmHg, and pulse rate was 90 bpm. A systematic examination revealed swelling, limitation of motion, and an increase in temperature and diameter of the left knee. She had rashes on the trunk and arms that were red, itch-free, painless, filled with white fluids, and fluffy from the skin (Figure 1). The number of white blood cells (WBCs) was 12.880/L (the normal range is 4.490-12.000/L), hemoglobin was 9.6 g/dL (the normal range is 11.9-14.6 g/dL), platelet count was 171.000/L (the normal range is 173.000-390.000/L), C-reactive protein (CRP) was 10.34 mg/dL (the normal range is 0-0.5 mg/dL), and sedimentation rate (ESR) was 73 mm/h (the normal range is 0-20 mm/h). Synovial fluid aspiration was applied for the diagnosis of septic arthritis with a total of 56,000/mm³ leukocytes counted at 100 X magnification in the leukocyte counting chamber. Arthroscopic

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FIGURE 1: Rashes that were red, itching-free, painless, filled with white fluids and fluffy from the skin, on the trunk **a**) and arms **b**).

debridement was performed for the treatment of septic arthritis. Synovial fluid was worked for gram stain and culture to determine the microorganism causing the infection. The gram stain was negative for bacteria, but there were 10-15 leukocytes in all areas. Synovial fluid was inoculated into 5% sheep blood agar, eosin methylene blue agar, and chocolate agar and was incubated at 37°C for a period of up to five days. Two blood cultures were taken simultaneously and were incubated for a period of up to 21 days in an automated culture system. The patient was considered to have brucellosis because she lives in a rural area and consumes raw milk cheese. Rose bengal and Brucella immunocapture (1/320) were positive. Brucella-IgM antibody was detected by ELISA. Blood and synovial fluid cultures were negative.

The patient was accepted as having acute brucellosis and was administered doxycycline 100 mg twice a day, rifampicin 600 mg daily, and gentamicin 320 mg daily. On the third day of her follow-up, her fever had decreased, and the rashes had regressed. Her knee pain had decreased at the end of the first week. The patient was hospitalized for seven days and followed up as an outpatient for continued brucellosis treatment. Gentamicin treatment was stopped at 7 days. In the second week, it was observed that the rash continued in a regressed form and macular type. Values of WBC, CRP, and ESR had regressed (**Figure 2**). The number of WBCs was 10.710/L, the

value of CRP was 4 mg/dL, and ESR was 68 mm/h. The treatment of the patient was still performed, and in the combination of rifampicin plus doxycycline was planned to be completed in three months. Informed written consent was obtained from the patient in this case.

DISCUSSION

Brucellosis is the most common zoonosis, and over 500,000 people worldwide are diagnosed with brucellosis every year.³ Turkey is among the countries where brucellosis is endemic. The incidence of the disease is 9.6 per 100,000 according to 2017 data from the Public Health Directorate in the city of Tokat.⁷

Skin involvement is very rare in the course of brucellosis, and its incidence is between 0.4% and 17%. Rash formation is caused by direct inoculation of the bacteria, hypersensitivity phenomenon, accumulation of immune complexes in the skin, and direct invasion of the skin during hematogenous spread of the bacteria. Skin involvement is not common, and, furthermore, the type of rash is not specific for brucellosis. The most common types of skin rashes of brucellosis are papulonodular, maculopapular, erythema nodosum, petechia-purpura, and contact urticaria. The rare types of rashes are reported in the literature: vasculitic lesions, subcutaneous abscesses, chronic ulcers, recurrent epidermal cysts, palmar erythema, livedo reticularis, and lichefactive panniculitis.³⁻⁵ In the presented case, maculopapular and papulopustular rashes were observed. Papulopustu-

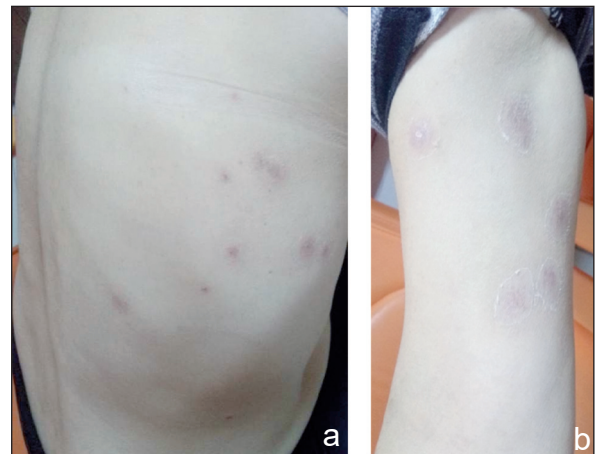


FIGURE 2: The rashes were continued in a regressed form and macular type on trunk **a**) and arms **b**) in the second week of follow up.

lar rashes related to brucellosis have never been found in the literature.

The most commonly affected system in brucellosis is the musculoskeletal system. A variety of disorders have been reported including spondylitis, sacroiliitis, peripheral arthritis, osteomyelitis, bursitis, and tenosynovitis.⁶ While arthralgia is observed in 65% of the patients, arthritis is present in 26%.⁸ Most peripheral arthritis occurs in the large joints of the lower extremities. The knee joint is the most commonly involved joint.⁹ Peripheral arthritis can be in the form of septic or reactive arthritis. Reactive arthritis is sterile, mobile and involves multiple joints, however septic arthritis is less common, usually involves single joint and is more severe.¹⁰

In cases presenting with arthritis, the macroscopic appearance of synovial fluid is blurry and yellowish, and leukocyte monitoring of over 50.000 / mm³ in microscopic finding is in favor of septic arthritis.¹¹ In this case, the patient was diagnosed as septic arthritis due to the blurred macroscopic appearance and 56.000 / mm³ leukocytes on microscopic count. Bacteria isolation from the blood culture of patients with brucella septic arthritis varies between 20-70%. Bacterial isolation from synovial fluid is quite difficult.⁶ In this case, bacteria could not be isolated in blood or synovial fluid cultures.

The use of rifampicin and doxycycline for the treatment of brucellosis in adults is recommended for 6 weeks if uncomplicated. In complicated cases, it is recommended to plus an aminoglycoside (streptomycin or gentamicin) to the treatment for 7-14 days and to extend the duration of oral treatment.² In the presented case, triple combined antibiotherapy was

used that she had septic arthritis. Gentamicin treatment was given for 7 days, and the dual treatment was planned to be completed for 3 months.

Our case is the first case of brucellosis characterized by papulopustular rash and septic arthritis in the literature. Brucellosis is a systemic infection that may present with very different clinical manifestations. Brucellosis should be kept in mind in the differential diagnosis, especially in the presence of rash and/or septic arthritis with fever in regions where infection is endemic, such as Turkey.

Source of Finance

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Emine Türkoğlu, Muhammed Köroğlu; **Design:** Emine Türkoğlu, Sedef Z. Özen; **Control/Supervision:** Emine Türkoğlu, Muhammed Köroğlu; **Data Collection and/or Processing:** Emine Türkoğlu, Sedef Z. Özen; **Analysis and/or Interpretation:** Emine Türkoğlu, Muhammed Köroğlu; **Literature Review:** Sedef Z. Özen; **Writing the Article:** Emine Türkoğlu; **Critical Review:** Emine Türkoğlu, Muhammed Köroğlu; **References and Findings:** Muhammed Köroğlu, Sedef Z. Özen; **Materials:** Muhammed Köroğlu, Sedef Z. Özen.

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