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Case Report

Cutaneous Maculopapular Eruptions in Brucellosis: A Case Report in an Occupationally Exposed Adult

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ABSTRACT

Brucellosis is a zoonotic infection caused by Brucella species, most commonly *B. melitensis* and *B. abortus*. While systemic symptoms such as fever and arthralgia are well recognized, cutaneous manifestations are rare, occurring in only 0.4–17% of cases.

A 30-year-old male shepherd with a 10-week history of high-grade intermittent fever and severe back pain; two weeks later, he developed rash. Dermatologic examination revealed multiple hyperpigmented macules and scattered erythematous papules on the back. Laboratory findings showed mild anemia (Hb 10.2 g/dL) with otherwise normal hematologic and biochemical parameters. Serology demonstrated elevated titers for *Brucella abortus* (1:200) and *Brucella melitensis* (1:80), and two sets of aerobic blood cultures became positive after 5 days using the identified Brucella spp. (species not further resolved). The patient was treated with doxycycline (100 mg twice daily for 6 weeks) and streptomycin (1 g intramuscularly daily for 2 weeks). A follow-up after 3 months, the patient remained asymptomatic with no relapse; repeat serology showed declining titers.

In occupationally exposed individuals with prolonged fever, early consideration of brucellosis and proper serologic/culture confirmation can prevent diagnostic delays, even when presentations include uncommon features such as prominent cutaneous involvement.

1. Introduction

Brucellosis is a globally prevalent zoonotic infection caused by Brucella. Four species of Brucella infect humans, but the most common ones are *Brucella melitensis* and *Brucella abortus* [1]. It is generally spread to humans through direct contact with diseased animals or the consumption of raw milk and milk products. Individuals working in close contact with domestic animals, such as shepherds, farmers, and veterinarians, are at more risk due to occupational exposure [1].

The nonspecific clinical symptoms of brucellosis include fever, malaise, arthralgia, and back pain. It also frequently co-occurs with other febrile illnesses, which can make diagnosis challenging [2]. Dermatological signs are uncommon, occurring in approximately 0.4% to 17% of individuals, but musculoskeletal manifestations are frequent [3]. The lesions are typically nonspecific and may manifest as vasculitic changes, erythema nodosum-like rashes, papulonodular lesions, or maculopapular rashes [4, 3, 5].

Our case report describes an unusual presentation of brucellosis in a young male shepherd who developed persistent fever and pruritic rashes predominantly on the back. Cutaneous involvement has also been described for brucellosis, but it is uncommon and nonspecific [6].

Diagnosis was established by serology and culture-positive blood. The patient was successfully treated with combined doxycycline and streptomycin, the first-line treatment for brucellosis [7]. This case emphasizes the importance of having brucellosis as part of the differential diagnosis of chronic febrile illness with atypical skin presentations, especially in endemic regions and occupational high-risk groups.

2. Case Presentation

A 30-year-old male patient with no known comorbidities, a shepherd by profession, who reports close occupational contact with sheep and goats, including handling birthing products (placenta, fetal membranes, and fetuses). He consumed unpasteurized dairy products regularly and had no recent travel outside his rural region. He presented with complaints of fever and body ache for 10 weeks, and 2 weeks later, he developed rashes. The fever was high-grade (Peak temperature: 102.5°F), occurring daily, with sudden onset, intermittent, and associated with severe chills, shivering, and sweating, followed by body aches, mainly in the legs and back. The back pain was severe. Later, rashes appeared on the back, associated with itching 10/10 in intensity. On examination, he had

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Table 1: Vitals at presentation.

Vital Sign	Value
Blood Pressure	115/72 mmHg
Heart Rate	108 beats/min
Temperature	101.6 °F
Respiratory Rate	22 breaths/min

mmHg, millimeters of mercury; °F, degrees Fahrenheit; breaths/min, breaths per minute.

Table 2: Patient laboratory parameters at presentation

Laboratory Parameter	Result	Reference Range
Hemoglobin (Hb)	10.2 g/dL	13.5–17.5 g/dL (men)
White Blood Cell Count (WBC)	8.4 $\times 10^9$/L	4.0–11.0 $\times 10^9$/L
Platelet Count	335 $\times 10^9$/L	150–450 $\times 10^9$/L
Mean Corpuscular Volume (MCV)	88.1 fL	80–100 fL
Serum Creatinine	1.2 mg/dL	0.6–1.3 mg/dL
Alanine Aminotransferase (ALT)	32 U/L	7–56 U/L
Aspartate Aminotransferase (AST)	28 U/L	10–40 U/L
Alkaline Phosphatase (ALP)	90 U/L	44–147 U/L
Erythrocyte Sedimentation Rate (ESR)	48 mm/hr	<20 mm/hr
C-Reactive Protein (CRP)	22 mg/L	<5 mg/L

fL, femtoliter; mg/dL, milligrams per deciliter; U/L, units per liter.

rashes on the upper and mid back; several diffusely distributed hyperpigmented macules of various sizes and shapes were noted **(Figure 1)**, (pre-treatment). A few erythematous papules, some of which displayed signs of excoriation, were scattered among these **(Figures 1 & 2)**, (pre-treatment). The rest of the systemic examination was within normal limits. Vitals at presentation are summarized **(Table 1)**. Laboratory investigations at presentation are detailed **(Table 2)**.

2.1. Differential Diagnosis

Rickettsioses: Considered due to fever and rash; ruled out by negative serology.
EBV reactivation: Negative serology.
Drug exanthem: No recent medication history.
Secondary syphilis: Non-reactive serology.
COVID-related rash: No respiratory symptoms; PCR negative.

Brucellosis was favored due to occupational exposure, positive serology, and confirmatory blood culture.

Figure 1: Pretreatment examination shows numerous erythematous to hyperpigmented macules of varying sizes and shapes, along with numerous small, discrete follicular-based papules diffusely distributed across the upper and mid-back.

2.2. Brucellosis serology showed a positive result:

Brucella abortus 1:200- (Normal: Less than 1:80)
Brucella melitensis 1:80- (Normal: Less than 1:80)
ELISA confirmed IgM positivity.

Two sets of aerobic blood cultures became positive after 5 days using the identified Brucella spp. (species not further resolved). Urinalysis and Chest X-ray were performed as part of a fever workup and were unremarkable. This was a rare presentation of brucellosis manifesting as rashes, an uncommon feature and location. Initially, the patient received symptomatic treatment but did not improve. After a confirmed diagnosis, treatment was started with doxycycline 100mg PO ID for 6 weeks and streptomycin 1G IM daily for 2 weeks. After 2 weeks of treatment, the fever subsided, and the skin lesions began to fade. A follow-up after 3 months, the patient remained asymptomatic with no relapse; repeat serology showed declining titers. It is essential to think from different perspectives when a patient is not improving. This case highlights a rare presentation of brucellosis and may contribute to the medical literature for future reference.

3. Discussion

Brucellosis is a zoonotic systemic illness caused by Brucella species, primarily *B. melitensis* and *B. abortus*, and remains endemic in much of the globe with high livestock exposure [1]. The illness usually manifests as vague symptoms such as fever, malaise, arthralgia, and back pain, which can be mistaken for other inflammatory or infectious diseases, leading to a delay in diagnosis [2].

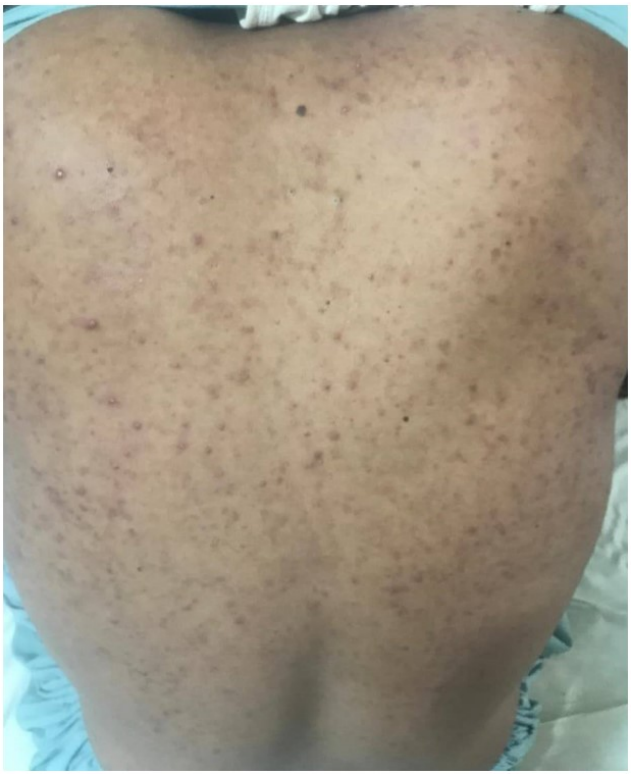

Figure 2: Pretreatment examination shows diffuse, bilateral, and symmetric involvement of the upper and mid-back with numerous monomorphic folliculocentric papules.

Cutaneous manifestations in brucellosis are uncommon, presenting in approximately 0.4% to 17% of cases [3]. Dermatologic manifestations are typically nonspecific and can include maculopapular rashes, papulonodular rashes, erythema nodosum-like lesions, petechiae, purpura, and vasculitis [8, 5].

In our case, a shepherd with prolonged febrile illness developed pruritic rashes predominantly on the back, an uncommon site for brucellosis-related skin lesions [9], as cutaneous involvement in brucellosis is rare overall and typically variable and non-specific [6], with reports not consistently highlighting the back as a distinct location.

The presence of hyperpigmented macules and erythematous papules added complexity to the clinical picture. After the initial symptomatic treatment failed, serological testing and positive blood cultures for *Brucella melitensis* and *Brucella abortus* confirmed the diagnosis. The patient was treated with doxycycline (100 mg PO twice daily for 6 weeks) and streptomycin (1 g intramuscularly daily for 2 weeks), a regimen supported by current guidelines and meta-analyses as highly effective for uncomplicated brucellosis [7, 10, 11]. The combination therapy is preferred due to intracellular efficacy and lower relapse rates compared to monotherapy or other double regimens (doxycycline plus rifampicin for 6 weeks) [7]. This case underscores the importance of including brucellosis in the differential diagnosis of chronic fever with unusual cutaneous lesions, especially in endemic areas and among at-risk occupational groups. Prompt diagnosis and appropriate antimicrobial therapy are crucial for preventing complications and curing [12].

4. Conclusions

In occupationally exposed individuals with prolonged fever, early consideration of brucellosis and proper serologic/culture confirmation can prevent diagnostic delays, even when presentations include uncommon features such as prominent cutaneous involvement.

Conflicts of Interest

The authors declare no competing interests that could have influenced the objectivity or outcome of this research.

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Informed consent

Written informed consent for publication of this case report and accompanying images was obtained from the patient's legally authorized representative. All identifying details have been removed; however, complete anonymity cannot be guaranteed.

Large Language Model

None.

Authors Contribution

FN contributed to conceptualization, data collection, writing the original draft, reviewing, editing, and supervision. FA contributed to literature review, writing – review and editing, and visualization. ZA provided supervision, editing, reviewing, and critical revision of the manuscript. B contributed to image collection, literature review, and data collection. SA contributed to writing the original draft, literature review, and reviewing. A contributed to data collection and writing.

Data Availability

The data supporting the findings of this case report are included within the article. Additional de-identified information may be made available upon reasonable request from the corresponding author.

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