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BRUCELLA ENDOCARDITIS IN CHILDREN: A RARE CASE REPORT

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ABSTRACT
Brucella endocarditis, which affects less than 2% of the population, is the leading cause of mortality in patients with brucellosis. This case report describes the admission of a seven-year-old girl to the pediatric department of the Queen Alia Center for Heart Disease as a case of brucella endocarditis. Her medical treatment was initiated, and she subsequently underwent surgical intervention in an effort to achieve improvement. The patient continued to exhibit no recurrence following a six-month follow-up period. Long-term monitoring and follow-up care are crucial to safeguarding the health and well-being of patients with this condition.

KEYWORDS: This case report describes the admission of a seven-year-old girl to the pediatric department of the Queen Alia Center for Heart Disease as a case of brucella endocarditis.

INTRODUCTION
Prominent globally, brucellolosis is a zoonotic disease characterized by its challenging diagnostic criteria. With over 500,000 reported cases annually, brucellosis ranks as one of the most widespread zoonotic diseases worldwide. An animal factor predominates in the etiology of the disease.[1] The primary modes of transmission for the intracellular gram-negative pathogen are direct contact with the bodily fluids of infected animals and, more commonly, the consumption of unpasteurized milk.[2] Brucellosis outbreaks pose a significant community health concern in the Mediterranean region, the Middle East, South Asia, Central America, and the Middle Americas.[3] Symptoms of brucellosis include fever, chills, sweats, weakness, joint and muscle pain, and fatigue, among others. Although endocarditis is an uncommon complication, it is the most prevalent type of cardiac involvement observed in patients with brucellosis, which causes damaging valve lesions. The aortic valve is the most commonly affected valve.[4] We report the case of a 7-year-old female patient. She lives in Al-Karak with a rare case of Brucella endocarditis with aortic root thrombosis and was admitted to the pediatric department of the Queen Alia Center for Heart Disease. Diagnosing Brucella endocarditis is extremely challenging and requires a high level of clinical suspicion, especially considering the regional epidemiological pattern.

CASE PRESENTATION
A seven-year-old female living in Al-Karak was referred from Prince Hamza Hospital with a two-month history of fever and joint pain, which started two weeks before the referral. Three months before this visit, the patient was examined due to fever, body pain, and arthralgia, and she was diagnosed with brucellosis. She was treated with trimethoprim, sulfamethoxazole, and rifampin for eight weeks. The disease symptoms diminished after the completion of treatment; however, two weeks after the cessation of medications, the patient's previous symptoms returned, and additionally, erythematous rashes appeared in her legs. The patient also had a history Gradually, their level of consciousness began to change, progressing to a state of disorientation without evidence of dizziness, vertigo, double vision, seizures, or vomiting. Then the patient was referred to our hospital for continuity of care.

During this admission, the patient's fever was 38.5 ºC. At presentation, the patient appeared well, conscious, and oriented. He had a blood pressure of 90/65 mmHg, a heart rate of 90 beats /minute, a respiratory rate of 24 breaths /minute, and an oxygen saturation of 98%.

A mild-to-moderate systolic murmur was found on the left side of the sternal border. Rashes were observed as palpable erythematous papules and purpura on the heels of two legs. The laboratory findings included a hemoglobin level of 11,7 g/dl; a leukocyte count of $18x10^3$/UL; a differential of 62% neutrophils, 27%

lymphocytes, 6% monocytes, and 3% eosinophils; a platelet count of $291x10^3$/uL; a C-reactive protein level of 237 mg/L (normal <5 mg/L); and an erythrocyte sedimentation rate of 80 mg/h (normal <20 mg/h). Transaminases, serum electrolytes, creatinine, coagulation markers, and immunoglobulins were normal. A chest X-ray revealed cardiomegaly. Brucella titer is equal to 1:1280. Echocardiography revealed large vegetation (2x2 cm) at the subaortic valve with moderate to severe aortic stenosis.

Based on Duke's criteria for a diagnosis of endocarditis and Brucella infection, Brucella endocarditis with aortic root thrombosis was recognized.[5] Five blood cultures were performed. Therapy with vancomycin, gentamicin, rifambicin, and doxycycline. Patient planned for aortic valve replacement (Konno procedure). The operation was successful. The patient started on warfarin and enoxaparin while INR was monitored. Vancomycin and gentamicin were withdrawn when blood cultures were negative. The patient was discharged on hospital day 26, at which time he was being treated with oral rifambicin and doxycycline. He had been afebrile since day 13. Then enoxaparin was discontinued, and the patient was maintained on warfarin therapy. Follow-up appointments were scheduled to monitor the patient's progress, ensure continued treatment compliance, and evaluate recovery. The patient was strongly advised to avoid potential sources of Brucella infection in the future to prevent recurrence. Additionally, medical treatment was continued for one year post-operation to ensure comprehensive care. The patient's compliance with medication and follow-up appointments was excellent, and she showed no signs of recurrence during the six-month follow-up period.

DISCUSSION

Brucellosis is a zoonotic infection primarily found in the Mediterranean and Middle Eastern regions, with the highest prevalence reported in the Mediterranean region.[6] Brucella species associated with human brucellosis include *Brucella melitensis, Brucella abortus,* and *Brucella suis.*

Brucellosis can affect all organs, leading to symptoms such as fever, fatigue, joint pain, and muscle aches. Compared to adults, children are disproportionately affected by brucellosis with approximately one-third of children presenting with focal complications.[7] Brucella endocarditis is a rare disease affecting native, congenital, or prosthetic valves and is associated with high mortality rates. Although overall mortality due to brucellosis is low (<1%), endocarditis is responsible for the majority of deaths (80%) related to this disease.[8] Heart failure is the leading cause of death, and the best outcome is associated with a combined medical and surgical approach.[9]

Our patient suffered from endocarditis at the age of eight, with symptoms of fever, body pain, and arthralgia for three months before the disease. After receiving standard treatment, previous symptoms returned, and new complaints appeared. Due to nonspecific symptoms, such as fever and lethargy, there is often a delay in seeking medical care. This is why the disease can progress, and develop otherwise preventable complications, despite having low mortality if treated early on. Although Brucella endocarditis affects both the mitral and aortic valves, mitral valve endocarditis due to brucellosis tends to occur in predamaged valves, whereas aortic endocarditis is seen especially in previously healthy valves.[10] Our patient had aortic involvement. Brucella endocarditis leads to destructive lesions on the valve and represents the majority of deaths related to brucella infection.[11]

The diagnosis is supported by a positive echocardiogram showing valvular vegetation with positive blood cultures or the identification of Brucella antibodies via ELISA.[12] In our case, antibody testing was successful (Brucella titer 1:1280), as was the finding of ECHO. All five blood cultures were negative.

The treatment of brucella endocarditis depends on antimicrobials combined with surgical intervention.[13] Brucella endocarditis tends to cause tissue ulceration, severe valve injury, and large vegetation, making medical therapy alone insufficient.[14]

The patient underwent surgical intervention, specifically an aortic valve replacement procedure to address Brucella endocarditis. The surgical technique involved the removal of apparently infected material and the affected valve and the replacement of a mechanical prosthesis.

The surgical indications for Brucella endocarditis are based on the guidelines outlined by the American Heart Association for the management of infective endocarditis. The primary goal of surgery is to completely remove the infected materials and affected valves through a thorough excision.[15]

The patient was initially treated with triple antibiotic therapy consisting of gentamicin, doxycycline, and rifampin. Vancomycin and gentamicin were discontinued once blood cultures returned negative results. The timing of surgical intervention and the duration of medical therapy after surgical intervention in Brucella endocarditis patients are subjects of ongoing controversy and debate. Although there are no definitive guidelines in published reports, our patient was treated with antibiotics for one year post-operation, which is considered sufficient in this case. No signs of recurrence were observed in our patients within the follow-up period of six months.

In conclusion, The successful management of this case underscores the critical role of early detection, immediate antibiotic therapy, and timely surgical

intervention in not only treating endocarditis but also preventing potential complications.

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