CASE REPORT

Brucella endocarditis complicated with mycotic aneurysm of anterior tibial artery: A rare dual combination

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Abstract

Brucellosis has a typical presentation of prolonged fever, malaise, night sweats and arthralgia. Brucella Endocarditis (BE) is the leading cause of mortality and is one of the unusual complications of brucellosis. A high index of suspicion is required for timely diagnosis. Diagnosis is often missed or delayed, due to non-specific and varied presentation. Early initiation of appropriate antibiotic regimens, often combined with surgical intervention can improve survival rates in BE. This case highlights the rare occurrence of concomitant BE of native aortic valve and pseudoaneurysm of the anterior tibial artery. There is a paucity of case reports in literature, describing mycotic aneurysms of the anterior tibial artery secondary to brucellosis.

Keywords: aneurysm, aortic valve insufficiency, brucellosis

Introduction

Human brucellosis is a zoonotic disease which is caused by gram negative intracellular bacillus of the genus Brucella. Brucellosis is transmitted through ingestion of un-pasteurized milk, or by direct contact with infected animal parts and inhaled aerosols [1]. Globally there's a regional variation in the reported cases of brucellosis, with highest incidence reported from Central Asia and Mediterranean region [2]. The condition is endemic in regions with high animal husbandry, particularly in rural settings. Infective endocarditis is the most frequent cardiac complication and is the primary cause of death in brucellosis. High mortality can be explained in view of delayed diagnosis, due to the protean nature of clinical presentations and various brucella endocarditis mimics. Brucella pseudo aneurysm is extremely rare and commonly involves the aorta, femoral, iliac and splenic artery. The occurrence of mycotic aneurysm in the anterior tibial artery is extremely rare, with a limited number of case reports.

Case Report

A 30-year-old male, farmer by occupation was admitted to the Department of General Medicine, at tertiary care hospital in North Karnataka, with 3 months history of prolonged fever, fatigue, and exertional dyspnea. Fever was moderate to high grade type, intermittent in nature, also associated with chills and night sweats. In addition to fever, the patient reported progressive breathlessness, which was initially exertional and later progressed limiting his routine work. It progressed from NYHA grade II to grade III, over the course of 3 months. Just two days prior to admission, patient developed a painful swelling in his left lower limb below the knee joint. There was neither history of arthralgia nor other significant systemic symptoms. There was no history of consumption of unpasteurized milk. Past medical and family history was unremarkable.

On examination, patient was febrile with a temperature of 102°F, pulse rate of 104 bpm, high

volume and collapsing pulse was noted. Blood pressure measured in the right upper limb in supine position was 140/60 mm Hg and 160/50 mmHg in the lower limb, indicating a wide pulse pressure. Respiratory rate was 18 breaths/minute. A general physical examination revealed mild pallor, grade 2 clubbing and no signs of icterus, lymphadenopathy or pedal edema. A pulsatile swelling in the left lower extremity was noted, measuring 3 × 4 mm, tender, showing no discoloration or signs of inflammation. Examination of peripheral pulses was normal. Cardiovascular examination revealed an early diastolic murmur in the newer aortic area and there were no signs of congestive cardiac failure. Other systemic examination was normal. Routine blood investigations revealed anemia with hemoglobin of 10 g/dl and mild thrombocytopenia with platelet 1 lakh/mm^3. Both renal and liver function tests showed values within normal limits. Inflammatory markers like erythrocyte sedimentation rate, C-reactive protein, and procalcitonin were elevated. The conventional tube agglutination test revealed titers greater than 1:640. Positive serology test supported the diagnosis of brucellosis. Using automated bact/alert culture media and the VITEK 2 equipment, three sets of blood cultures were sent from three distinct locations. The blood cultures tested positive for brucella melitensis after a prolonged incubation period of seven-days.

2D echocardiogram and Transesophageal Echocardiography (TEE) revealed a large mobile echogenic vegetation measuring 1.77 × 1.37 cm, attached to noncoronary-cusp of the aortic valve with severe aortic regurgitation (Figure 1). There was no evidence of perivalvular abscess or calcification, mitral valve showed no vegetation or regurgitation. The left ventricle showed mild dilatation with ejection fraction of 60% and there was no regional wall abnormality. The aortic root and ascending aorta showed no abscess or pseudoaneurysm. Left lower limb Color Doppler assessment confirmed a pseudoaneurysm of the anterior tibial artery, measuring 2cm x 1.8 cm with no evidence of surrounding hematoma, abscess or soft tissue oedema (Figure 2). Computed tomography angiogram revealed a pseudoaneurysm of the anterior tibial artery measuring 2 × 1.8 cm without signs of active bleeding.

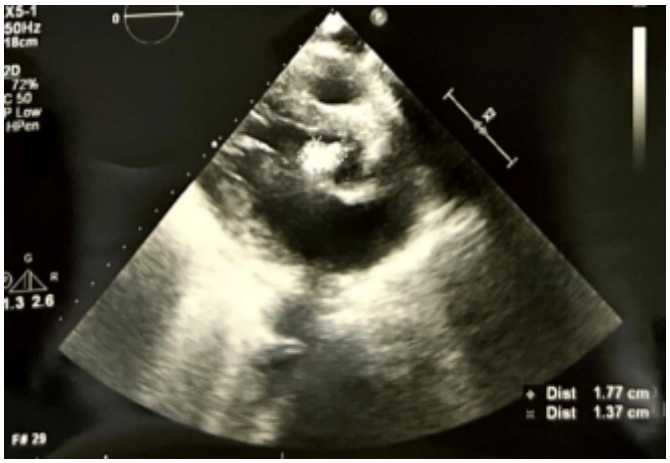

Figure 1: Presence of vegetation over the aortic valve of size 1.77 × 1.37 cm.

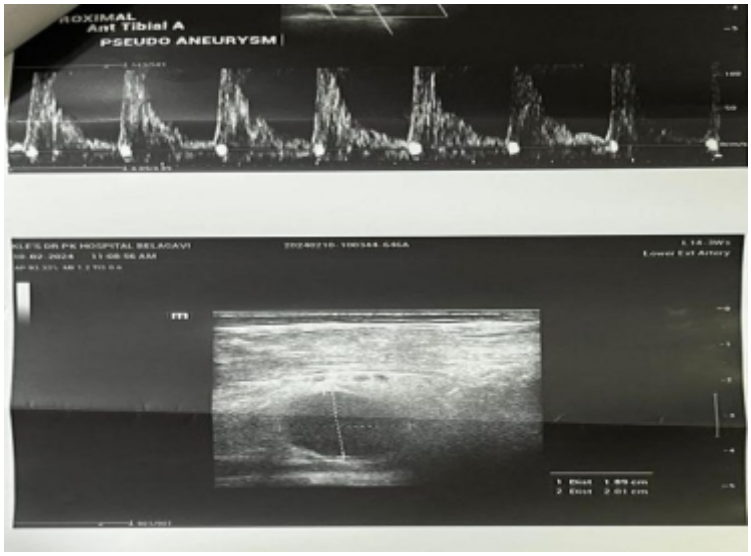

Figure 2: Color Doppler study showing the pseudoaneurysm of the proximal anterior tibial artery measuring 2.0 × 1.8 cm in size.

Empirical therapy with intravenous ceftriaxone injection (2 g daily) was initiated. The treatment regimen was subsequently modified after serology tested positive for brucella. Patient was then started on a combination therapy of oral doxycycline (200 mg/day) and rifampicin (600 mg/day), which were continued for a total duration of 4 months. Intravenous gentamicin was added during the initial four weeks of hospital stay (160 mg/day).

Cardiothoracic opinion was taken in view of large sized vegetation and acute aortic regurgitation. Aortic valve replacement was recommended, once the patient had become afebrile and had completed 2-4 weeks of antibiotic treatment. An interventional radiologist's opinion was also sought in view of the pseudoaneurysm. Surgical intervention for the mycotic aneurysm was deferred. A close follow-up with serial Color Doppler studies to monitor the size of pseudoaneurysm was recommended. After starting antibiotic therapy, patient was afebrile on the 10th day of admission, however dyspnea persisted. A repeat echocardiogram on the 14th day of admission was done, no significant change was noted in vegetation's size and severe aortic regurgitation persisted. Surgical intervention was planned to manage aortic regurgitation and prevent the risk of potential embolic complications. After 3weeks of admission, patient underwent aortic valve replacement using a mechanical valve (23mm TTK Chitra valve). Patient tolerated the surgery well and the post-operative period was uneventful. Following surgery, anticoagulation was initiated with warfarin, with close monitoring of International Normalized Ratio (INR). Post operatively patient was monitored for 10 days, during which the pulsatile swelling in the left lower extremity gradually subsided. Follow-up Color Doppler showed a reduction in the size of the pseudoaneurysm. The patient was discharged on prolonged oral antibiotic therapy for 4 months and was advised to continue lifelong warfarin therapy. He was instructed to monitor INR regularly and maintain a target range of 2-2.5.The patient was followed up regularly over the subsequent 6

months. All his cardiac symptoms had resolved and a repeat echocardiography revealed normal function of the mechanical valve and absence of vegetation. INR was monitored during follow-up and was maintained within the target range of 2-2.5. The pulsatile swelling in the left lower limb had also completely resolved.

Discussion

Brucella endocarditis is a rare but serious complication of brucellosis [3]. It is often seen in individuals with direct exposure to infected animals, such as veterinarians and livestock handlers. Early diagnosis can be challenging due to the nonspecific clinical presentation and the chronic, indolent nature of the disease. Thus this case highlights the importance of including brucellosis as one of the important differentials for infective endocarditis, particularly in patients presenting with pyrexia of unknown origin, those residing in endemic regions, or individuals with occupational exposure to livestock. Brucellosis presents with a wide range of clinical manifestations ranging from fever, arthralgia and multisystem involvement.

Osteoarticular and genitourinary involvement are the most common forms of presentation. Cardiovascular manifestations include endocarditis, myocarditis and pericarditis. Endocarditis is a rare but serious complication of brucellosis, seen in 1.3-1.7% of cases [4]. Despite its low incidence, it is associated with high mortality, accounting for up to 80% of deaths among those affected. Data from India is limited and is largely confined to case reports and case series. It can affect normal, damaged as well as prosthetic heart valves. According to case reports, the aortic valve is most commonly affected in (52-70% of cases) followed by the mitral valve [5]. Brucella endocarditis is complicated by the development of myocardial abscess, valve destruction, heart failure, and embolic phenomenon. Mycotic aneurysms are due to direct arterial wall infection via bacteremia, septic emboli or due to contagious spread from adjacent infected tissues. In the event of septic embolization, emboli enter the adventitia via the vasa vasorum. The inflammatory reaction damages both the muscularis and the adventitia, resulting in blood vessel wall weakening and the development of pseudoaneurysm. Mycotic aneurysms involving the aorta or major arteries owing to brucella infection are rare and are often underdiagnosed or under-reported. According to case reports, the ascending thoracic aorta and abdominal aorta are more commonly affected. The other sites reported are iliac artery, superior mesenteric artery, subclavian and axillary artery [6]. Pseudoaneurysms are best managed by endovascular aneurysm repair or surgical repair along with prolonged antibiotic therapy. Surgical intervention for pseudoaneurysm is indicated in the presence of rapid expansion of aneurysm, risk of rupture, active bleeding, distal ischemia, or compression of adjacent structures [7].

Brucellosis can be diagnosed using blood cultures, serological assays and nucleic acid amplification tests. Blood culture remains the gold standard for the diagnosis of brucellosis. Moreover, a positive blood culture fulfills a major criterion of the modified Duke criteria for diagnosis of infective endocarditis. Brucella is a slow-growing, fastidious intracellular organism, isolating the organism from the blood requires prolonged incubation. Owing to time restraints and low sensitivity of blood culture, the diagnosis of brucella poses a diagnostic challenge. Hence, most physicians rely on serolo-

gical tests which detect antibodies. The diagnostic cut-off values using the standard tube agglutination test, are a titer of > 1:160 in non-endemic areas and > 1:320 in endemic areas [8].

2D echocardiography and TEE are not only essential for diagnosing infective endocarditis, but also for identifying complications such as valve damage, annular abscesses and large-sized vegetations. The management of Brucella endocarditis comprises of both medical and surgical treatment, depending on the extent of valve involvement and complications. First line regimen for uncomplicated adult brucellosis is oral doxycycline (200 mg/day) and rifampicin (600-900 mg/day) for duration of 6 weeks. For Brucella endocarditis, a triple-drug regimen is recommended. A combination of intravenous aminoglycoside for 2-4 weeks, gentamicin (5-6 mg/kg/day) along with oral rifampicin and doxycycline for 4-6 months is recommended [9]. Monotherapy regimens and durations shorter than 6 weeks are considered inadequate, as it is associated with higher relapse rates and complications. Mortality and relapse rates are lowest in patients with Brucella endocarditis, who receive intravenous aminoglycosides in addition to an oral regimen. Surgical intervention is indicated in the presence of severe valvular destruction and large vegetation exceeding 10mm, which have a high risk of embolization [10].

Conclusion

Brucella endocarditis, though rare, is a potentially life threatening complication of brucellosis and is associated with considerable diagnostic challenges, especially in culture negative presentation. A high index of suspicion is required particularly in patients having occupational exposure to livestock.

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