

Clinical Case Report

Ostium secundum atrial septal defect endocarditis caused by brucella infection

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ABSTRACT

The most common cardiovascular presentation of brucellosis (a zoonotic infection) in Iran is aortic valve endocarditis. Brucellosis is a systemic infection and may involve any congenital heart defect with various clinical signs and symptoms. We report brucella endocarditis in an atrial septal defect (ASD) in a 55-year-old man who presented with fever and hemiplegia. Echocardiography showed a secundum ASD with large vegetations of 0.5×1 cm arising from the rim of the ASD. Serological analysis was positive for *Brucella agglutinin*, thus confirming the diagnosis. The brain CT scan revealed a large ischaemic zone in the left hemisphere. At surgery, large vegetations were excised and the defect was closed with fresh pericardium. After surgery the patient was treated with a 4-week course of antibiotics. His recovery was uneventful except for the neurological deficit (hemiplegia); he was discharged on postoperative day 35.

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INTRODUCTION

Brucellosis is common in Iran and may present with life-threatening complications such as endocarditis in patients with congenital heart disease (CHD). Among CHDs, atrial septal defect (ASD) is frequently predisposed to endocarditis.¹ Complications of ASD include arrhythmias, pulmonary hypertension, thrombus formation and endocarditis which is the least common.² Only one case of brucella infection of an ASD has been reported.³ Bacteraemia and seeding can infect the ASD rim. In some patients with septic stroke, a small ASD or a pulmonary arteriovenous fistula have been found⁴ possibly allowing bacteria to bypass the pulmonary circulation through a shunt. Some patients with a patent foramen ovale (PFO) also have a residual eustachian valve (EV), an embryological remnant of the inferior vena cava valve, which prenatally directs oxygenated blood from the inferior vena cava across the PFO into the systemic circulation. This could lead to infective emboli reaching the brain and causing stroke. Even when the EV is prominent, it has generally been considered a benign finding in the absence of associated cardiac anomalies. Recently, it has been reported that EVs may predispose patients to a right-to-left shunt, which may increase the risk of endocarditis of the ASD rim.⁵ We describe a patient with brucella vegetation

of the ASD rim, whose left ventricular (LV) hypertrophy caused a spontaneous left-to-right shunt and subsequent brucella emboli. In late infective endocarditis involving the rim of the ASD, management with prolonged antibiotic therapy without surgical closure of the defect may not be effective.

THE CASE

A 55-year-old man with a history of chronic obstructive pulmonary disease (COPD) was referred to our hospital with fever, chills and hemiplegia. He had transthoracic echocardiographic (TTE) evidence of an ASD. He was found to have brucellosis with three blood cultures positive for *Brucella abortus*. Appropriate antibiotic therapy was started 3 weeks before referral to us. A fresh TTE examination showed a large ASD with thickened rim and vegetation on the EV (Fig. 1), with considerable left-to-right flow across the ASD. The large vegetation on the rim of the ASD (Fig. 2) seemed



FIG 1. Vegetation on the rim of the atrial septal defect on transoesophageal echocardiography

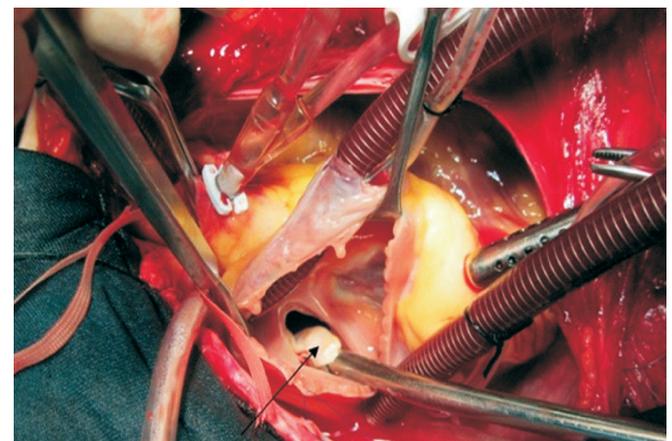


FIG 2. Intraoperative photograph of large vegetation on the rim of the atrial septal defect

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FIG 3. CT scan of the brain showing evidence of a left hemisphere stroke

like a PFO on TEE. A CT scan of the brain revealed a large ischaemic zone in the left hemisphere of the brain (Fig. 3). The patient had a closure of the ASD a week after admission to our centre. Follow-up TTE revealed no residual ASD. He received intravenous antibiotics for 6 weeks. His physiotherapy for hemiplegia continued throughout this period. The clinical course was uneventful and the patient was discharged but his hemiplegia persisted. A follow-up CT scan showed no change in the ischaemic area in the brain.

DISCUSSION

The rim of an ASD is rarely involved in infective endocarditis due to brucellosis. It usually occurs in areas endemic for brucellosis.⁶ The incidence of endocarditis is increased in patients with CHD especially those with a septal defect.⁶ The occurrence of infective endocarditis is increased in patients with defects such as EV and a left-to-right shunt. Most patients with brucella endocarditis have involvement of the aortic valve. Endocarditis of the rim of an ASD is rare, especially in normal heart valves. Additional risk factors of structural cardiac abnormalities such as pulmonary veins were not present in our patient.⁷ Another predisposing factor for brucella endocarditis in this patient was the presence of considerable left-to-right shunt through the ASD with long-

standing hypertension, and reduced LV compliance. Since LV hypertrophy increases the amount of blood shunted, it is expected to be a risk factor of infective endocarditis. The increasing afterload with impaired left compliance could explain the severity of the left-to-right shunt through the ASD that causes endocarditis by a Bernoulli effect.⁸ We believe that brucella endocarditis of the ASD associated with septic emboli to the brain is rare and has not been reported previously. However, there is a published report of brucella endocarditis of the ASD rim not associated with septic stroke.^{9,10} Twelve cases of septic stroke in adults have been reported, which have been associated with ASD endocarditis. Most of the patients were middle-aged with no relevant medical history except poor oral hygiene.⁹ In contrast to our patient, these patients mostly had pathogenic bacteria in the oral cavity and pharynx. Symptoms ranged from none to focal cranial nerve deficit to lethargy. Most authors hypothesized that the right-to-left shunt through the PFO was the primary contributory factor to the brain abscess by permitting the infected material to bypass the lungs and enter the systemic circulation.¹⁰⁻¹³

In conclusion, ASD should be assessed by TTE in all patients with a clinical suspicion of infective endocarditis, especially in the presence of prolonged fever associated with pulmonary infectious processes or other systemic signs and symptom such as focal neurological deficit.

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