Case report

A rare case of early infectious endocarditis after surgical patch closure of atrial septal defects revealed by acute limb ischemia

ABSTRACT

We report the case of a 47 years-old female who She presented to the emergency department with acute pain and coldness in the left lower limb 5 months after surgical closure of atrial septal defects. Initial examination was consistent with a clinical presentation of acute limb ischemia. Doppler ultrasonography and Computed Tomography angiography of the lower extremity arteries confirmed the presence of an occlusion on the left leg tripod. Echocardiography assessment revealed the presence of two echogenic friable formations on both sides of the surgical atrial septal defect closing patch suggestive of vegetation. Blood tests showed elevated inflammation and infection markors as well as positive blood culture for staphylococcus aureus. The patient was treated by antibiotics for 6 weeks and underwent a surgical patch closure replacement.

KEYWORDS

Early infectious endocarditis, antibiotic prophylaxis, atrial septal defects, Surgical patch closure

ABBREVIATIONS

ASD: Atrial septal defect
CHD: congenital heart disease
CT: Computed Tomography
CRP: C-reactive protein
ESC: European society of cardiology
PCT: Procalcitonin
TEE: Transesophageal echocardiography
TTE: Transthoracic echocardiography
WBC: Wight blood cell count

1. INTRODUCTION

Infective endocarditis after atrial septal defect (ASD) surgical patch closure is extremely rare, We report an extremely rare case of early infective endocarditis that occurred in an 47-year-old female patient, 5 months after cardiac surgery.

2. CASE PRESENTATION

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We report the case of a 47 years-old female who underwent a surgical closure of atrial septal defects with a patch on August 2012. She presented to the emergency department on January 2020 (5 months after cardiac surgery) with acute pain and coldness in her left lower limb. At initial physical examination, the patient had stable hemodynamic and respiratory state, her blood pressure was 100/60 mmHg, open air oxygen saturation was 98% and her temperature was 37.8°C. left lower limb physical examination was consistent with a clinical presentation of acute limb ischemia.
Doppler ultrasonography and Computed Tomography (CT) angiography of the lower extremity arteries confirmed the presence of an occlusion on the left arterial leg tripod.
The Electrocardiogram showed a regular sinus rhythm at 90 beats per minute, a fixed PR interval of 160 ms, with fine QRS, without repolarization disorders. Transthoracic echocardiography assessment revealed the presence of two echogenic friable formations with vibratory movement on both sides of the surgical atrial septal defect closing patch, measuring 13 x 9 mm on the right side and 14 x 13 mm on the left side, without patch dislocation nor interatrial shunts and without other valvular damages. Left ventricular systolic and diastolic function were normal and right ventricular systolic function was normal.
Blood tests showed elevated inflammation and infection markors including C-reactive protein (CRP) (up to 264 mg/L), Procalcitonin (PCT) (up to 3.2 ng/ml), high wight blood cell count (WBC) (up to 20310 /mm3) as well as two positive blood cultures for staphylococcus aureus penicillin susceptible. Tomographic assessment including brain CT and bodyscan did not reveal a deep infectious location or any other embolic location.
The patient was treated by intravenous antibiotics for 6 weeks with Gentamicin (2 weeks, 3 mg/kg/day) and Triaxon (6 weeks, 2 g/day) and underwent a surgical patch closure replacement after 2 weeks of intravenous antibiotics. Dental care was performed.

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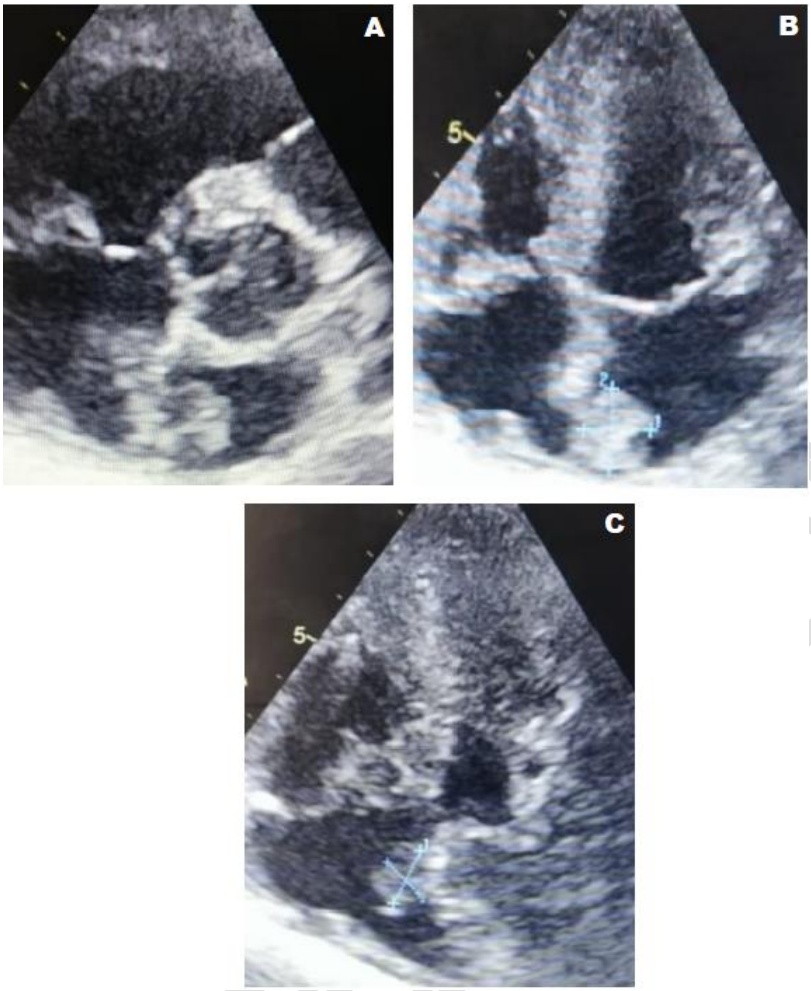

Figure 1: Transthoracic echocardiography (A) Basal parasternal short axis view (B) Apical 4 chamber view (C) Right ventricular apical view : showing two formations on both sides of the surgical atrial septal defect closing patch.

3. DISCUSSION

Infective endocarditis is commonly considered to be an exceptional event following percutaneous ASD device closure and it is very exceptional after surgical patch closure (2). Most reported cases in literature relates to endocarditis after percutaneous device closure of ASD. To our knowledge this is the second case of infective endocarditis of surgical patch of ASD and the first case reporting an early endocarditis on surgical patch of ASD.

Infective endocarditis after ASD correction can have various clinical presentations including persistent fever, impaired general condition, chest pain, systemic emboli, petechiae, and septic shock. Diagnosis is made by transesophageal echocardiography (TEE) and positive blood cultures in most cases, sometimes by transthoracic echocardiography (TTE). *Staphylococus aureus* is found in most cases. Other reported germs are streptococcus, *Bacillus pumilus*, and *Klebsiella pneumonia*. Negative blood cultures can be observed (3). Management of infective endocarditis after ASD device consists of intravenous antibiotics for at least 6 weeks. Surgical removal of the device is usually necessary after 2-3 weeks of antibiotics in cases with systemic embolization, big size or growing vegetation, non-

controlled infection, abscess, or in other case surgery must be performed urgently in complicated cases with cardiogenic shock or refractory heart failure. The search for an infectious entry point, in particular dental is essential.

Mechanisms of infection after ASD closure procedure are unclear (4). Screening for signs of infection before cardiac surgery is recommended and thus postponing ASD closure when the patient presents with any recent clinical symptoms of infection. In reported cases of infective endocarditis after ASD closure, some invasive procedures were performed shortly after ASD occlusion, suggesting bacteremia following the procedure. The risk for infective endocarditis might have therefore been underestimated (5). Some authors suggested that infection might have occurred before the end of neo-endothelialization, with seeding of microorganisms after the procedure, and development of thrombus and bacteremia (6),(7).
Reported cases of infective endocarditis might therefore challenge the duration of endocarditis prophylaxis after ASD closure. Recent guidelines on prevention, diagnosis, and treatment of infective endocarditis have restrained antibiotic prophylaxis and reinforced nonspecific hygiene measures, recommending good oral hygiene and regular dental care to reduce the risk of infection (3)(1) (8) . However, in a recent survey, more than half of the cardiologists do not follow the American Heart Association 2007 guidelines in their practice (9). The European society of cardiology (ESC) 2015 guidelines for the management of endocarditis kept the same antibiotic prophylaxis (10). Therefore, counseling for optimal oral health in patients at risk of infective endocarditis needs to be improved in current practice.

For congenital heart disease (CHD) patients, antibiotic prophylaxis before dental procedure is now recommended in five situations: prosthetic valve, previous infective endocarditis, unrepaired cyanotic CHD (including palliative shunts and conduits), completely repaired congenital heart defect with prosthetic material or device (whether placed using surgery or catheter intervention, during the first 6 months after the procedure), and repaired CHD with residual defects at the site or adjacent to the site of a prosthetic patch or prosthetic device (3),(1), (10).

4. CONCLUSION

Infective endocarditis is considered to be an exceptional event following percutaneous ASD device closure. Specific infectious mechanisms remain unclear. Therefore, screening to recent infection before ASD closure is necessary. According to recent guidelines antibiotic prophylaxis is recommended only for 6 months after ASD closure if no residual shunt. Prevention of infection and good oral health on a long-term, or even life-long, basis following ASD device closure is mandatory.

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