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Case Study

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LATE INFECTIVE ENDOCARDITIS AFTER TRANSCATHETER CLOSURE OF A PATENT FORAMEN OVALE

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ABSTRACT

Infective endocarditis (IE) is a serious and potentially fatal complication of implanted heart devices and requires the highest caution. Concerning devices for percutaneous transcatheter closure of a patent foramen oval (PFO), this complication is extremely rare and occurs typically early during the first six months after device implantation. We report a case of a 64-year-old male who presented late *Staphylococcal* infective endocarditis of an Amplatzer patent foramen oval occluder device thirteen years after implantation with a brief review of the literature on the subject.

KEYWORDS: Infective endocarditis, Amplatzer occluder, patent foramen oval, *Staphylococcus aureus*.

INTRODUCTION

There is a strong association between cryptogenic stroke and the presence of anomalies of the interatrial septum. Patients with a patent foramen ovale (PFO) and cerebrovascular accidents are at increased risk for recurrent events.[1]

Percutaneous closure of PFO is very attractive compared to medical therapy or surgical closure to prevent this risk. Although the overall serious complication rate is approximately 15% to 20%, with atrial fibrillation and bleeding being the most common,[2-3-4] infectious complications are exceedingly rare.[5-6-7] In order to prevent infective endocarditis, antibiotic prophylaxis is recommended for 6 months after device implantation because complete endothelialization is considered to occur at 3 to 6 months.[8] However, its confirmation is impossible. This case illustrates that infection remains possible a long time after patent foramen ovale occlusion despite theoretical device endothelialization.

CASE REPORT

A 64-year-old male patient was admitted into the Emergency Department for a severe sepsis with multiple organ failure. In his medical past-history, he had an ischemic stroke and he underwent transcatheter patent foramen oval closure with an Amplatzer device 13 years before.

Laboratory investigations revealed an elevated leukocyte count at 15.4 × 10^9/L with an elevated neutrophil count at 11.7×10^9/L, a normal platelet count at 221 × 10^9/L, an elevated C reactive protein rate at 210 mg/L and elevated Procalcitonin at 2.1 ng/mL. The urine cytobacteriological examination was negative.

He subsequently became febrile with blood culture positive for Methicillin-Susceptible Staphylococcus aureus (MSSA). Given this septicemia, the absence of an obvious site of infection and the history of transcatheter closure of a PFO, the presumptive diagnosis was endocarditis.

The initial transthoracic echocardiography revealed no abnormality. A transesophageal echocardiography was performed and showed two large and mobile vegetations on the left atrial side of his PFO closure device measuring 7×10 mm and 5×4 mm in diameters.

(Figure 1). The right side of the device showed also irregularities, highly suspected to be infectious vegetations.

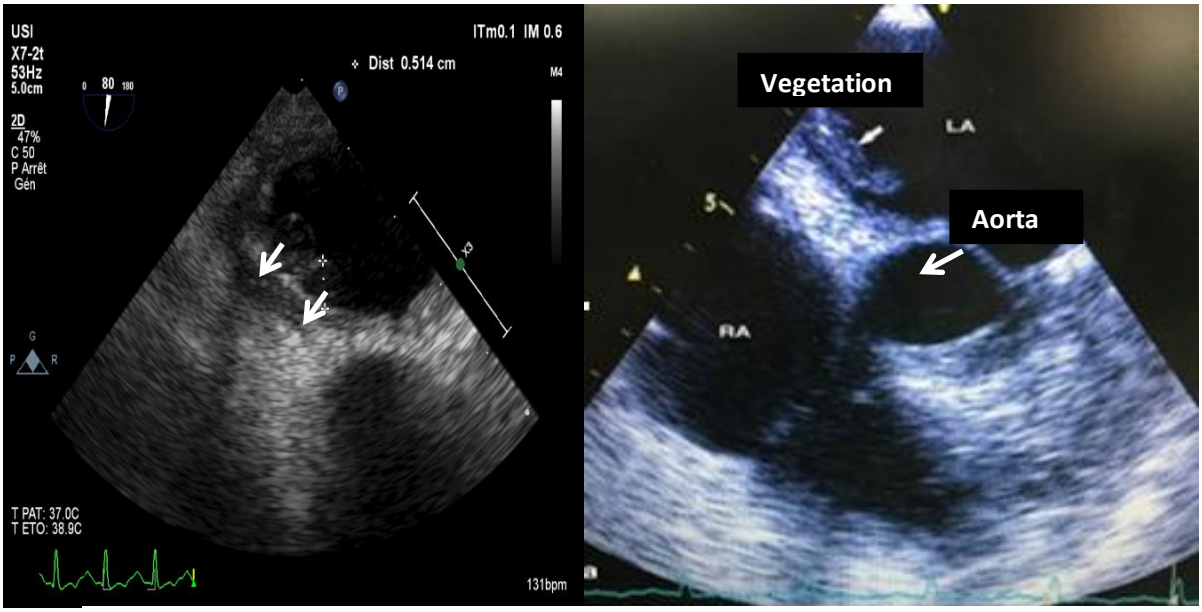

Figure 1: Transesophageal echocardiography demonstrating vegetations on the left side of Amplatzer patent foramen ovale occluder device.

The patient was treated with an appropriate intravenous antibiotherapy including Oxacillin 150mg/kg/day divided every 6 hours and Gentamicin 3mg/kg/day once daily.

After ten days of treatment, blood cultures continued to be positive for MSSA, although hemodynamic parameters have stabilized.

For this reason, we decided to surgically remove the device. During the intervention, large vegetations were found on both sides of the device *(figure 2)*. The septum was closed with bovine pericardial tissue. Bacteriologic analysis of the vegetations and the device confirmed the presence of Staphylococcus aureus. After 42 days of antibiotic therapy by Oxacillin, the patient was discharged in good clinical condition.

Figure 2: Vegetations (marked by arrows) on the epithelialized surface of the excised device.

DISCUSSION

The first transcatheter closure of a PFO was in 1992.[9] Since that time, transcatheter closure of PFOs in adults has considerably increased and has become the treatment of choice for young patients with cryptogenic stroke due to paradoxical embolism.[2] The procedure is considered safe because of its low incidence of complications. Infection rate is extremely low and occurs typically early after device implantation either before endothelialization occurs or in poorly endothelialized devices.[6] Half a year is the time necessary for neo-endothelization of the implanted devices.[8] For this reason, most authors recommended antibiotic prophylaxis of six months duration after implantation.

Our case illustrates that infection remains possible a long time after PFO occlusion despite theoretical device endothelialization, and thus represents a lifetime potential risk for these patients. Other cases of late infective endocarditis of Amplatzer sepal occluder device have been reported in the literature. Bialkowski et al. presented endocarditis of the Amplatzer occluder 24 months after device implantation.[10] Another article presented a 1.5 × 1.5 cm mobile mass of endocarditis on the left atrial side of the Amplatzer 30 months after

occluder implantation.[9] Jha et al. presented the case report of a 10-year-old patient with IE of an Amplatzer device six years after device implantation.[11]

As follows, the risk of IE in the field of implanted medical devices is presented not only in a short post-implantation period, but also during the lifetime of the patient. Therefore, in patients with PFO occluder device, the diagnosis of infective endocarditis should be suspected especially in the case of Staphylococcus aureus septicemia. The diagnosis of endocarditis of occluder device can be difficult and frequently requires transesophageal echocardiography.[12-13-14] In the presented case, infective endocarditis was suspected, but the transthoracic echocardiography was negative. Transesophageal echocardiography is likely the test of choice and should be performed promptly if IE is suspected. In analogy with prosthetic valve endocarditis, it seems reasonable to try antibiotic treatment first, but surgical intervention should be considered early in case of septic, embolic or hemodynamic complications.[11-13]

CONCLUSION

Infective endocarditis of a PFO closure device is extremely rare and requires the highest caution. Published papers indicate, in correlation with presented case report, infective endocarditis should be suspected even at the late phase after Amplatzer implantation. Therefore, it seems reasonable to prescribe antibiotic prophylaxis at any time to prevent the infection of device and not only during the first 6 months after device implantation. According to published case reports, most patients with this complication require surgery and extraction of infected material. Prospective studies on infective endocarditis of PFO occluder devices are needed to clarify their incidence, prevention and long-term prognosis.

CONFLICT OF INTEREST AND SOURCE OF FUNDING

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