

A failed case of percutaneous septal closure of fenestrated atrial septal defect

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Abstract

A patient presenting with a history of palpitation and exertional dyspnea was initially diagnosed with two separate secundum-type atrial septal defects by transesophageal echocardiography. Subsequent transesophageal echocardiography, after failure of closure with two separate closure devices, showed another defect and an ongoing left to right shunt. During surgery, more defects were observed. The defects were successfully repaired using pericardial patch without incident. (Cardiol J 2011; 18, 1: 92–93)

Key words: percutaneous closure of fenestrated atrial septal defects

Introduction

Atrial septal defects (ASD) represent about 10% of all congenital cardiac anomalies [1]. Percutaneous closure of secundum-type atrial septal defects is a safe and effective alternative to surgical closure [2]. The use of a closure device in multiple and large defects is still controversial [3]. Studies concentrating on the better evaluation of septum have been conducted in order to increase the success of the procedure. In our case, after the closure of two separate defects detected by transesophageal echocardiography (TEE) with two devices, an ongoing left to right shunt was seen, and surgical treatment was decided. We present a case of percutaneous closure of fenestrated ASD.

Case report

A 31 year-old woman was admitted to our hospital with palpitations and exertional dyspnea. At presentation, her electrocardiogram showed incomplete right bundle branch block and sinus tachycardia. Transthoracic echocardiography revealed atrial septal defect and mild right ventricular enlarge-

ment with elevated pulmonary artery systolic pressure (45 mm Hg). For evaluation of rim sufficiency, TEE was performed. Transesophageal echocardiography revealed two separate defects at the septum (Fig. 1). In addition, aortic and posterior rims were 6 and 7 mm, respectively. Accordingly, we planned percutaneous septal closure, to be performed the next day. Firstly, a 10.5 mm occluder was applied after balloon sizing of the defect (Fig. 2A), and subsequently a second 12 mm occluder was placed (Fig. 2B). After this step, we detected another defect and an ongoing left to right shunt by TTE. Thus, we removed both devices without any complication and decided on surgical treatment. In the operating room, we detected four different defects at atrial septum (Fig. 3). The defects were then fully repaired using a pericardial patch. The post-operative course of the patient was uneventful, and she was discharged on the fourth post-operative day.

Discussion

Atrial septal defects represent about 10% of all congenital cardiac anomalies [1]. Percutaneous

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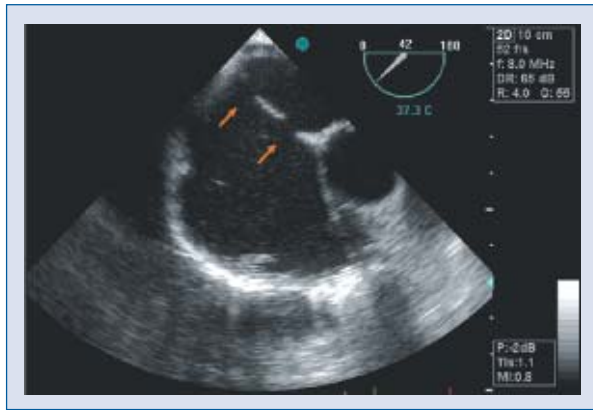


Figure 1. Transesophageal echocardiography revealed two different defects at the septum (arrows).

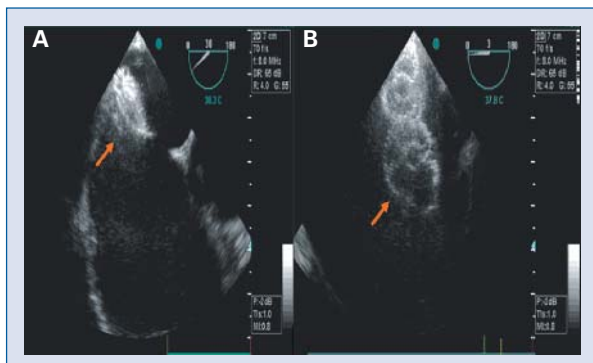


Figure 2. A: 10.5 mm occluder was performed (arrow); **B:** 12 mm occluder was performed (arrow).

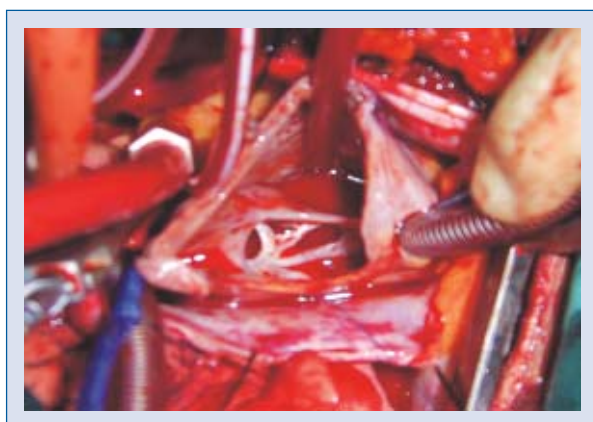


Figure 3. Four different defects at atrial septum.

closure using occluder devices has become a popular, effective, and safe method of treatment of secundum ASDs in spite of years of successful surgical experience [2].

The TEE is the cornerstone for evaluation of rim sufficiency and guidance of closure procedure. In the presence of more than one defect, measurement of the distance in between should be done, and a single device is suggested for a distance of less than 7 mm. When the distance is more than 7 mm, two separate devices should be applied [4]. Recent studies have made use of advanced echocardiography such as real-time 3D echocardiogram in order to evaluate interatrial septum better, thus increasing procedural success [5]. In our case, although TEE had detected two separate defects, a left to right shunt persisted after the closure, and the devices were subsequently removed.

This case, as well as current literature, suggests that the use of advanced imaging techniques for better evaluation of interatrial septum may increase the success of percutaneous closures.

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References

1. Hoffman JE, Christianson R. Congenital heart disease in a cohort of 19,502 births with long term follow up. *Am J Cardiol*, 1978; 42: 641–647.
2. Du ZD, Hijazi ZM, Kleinman CS, Silverman NH, Larntz K. Comparison between transcatheter and surgical closure of secundum atrial septal defect in children and adults. *J Am Coll Cardiol*, 2002; 39: 1836–1844.
3. McGarvey J, Ota T, Anderson W, Katz W, Zenati MA. Highly fenestrated septum primum leads to failure of Amplatzer septal defect closure. *Ann Thorac Surg*, 2008; 86: 998–1000.
4. Awad SM, Garay FF, Cao QL, Hijazi ZM. Multiple Amplatzer septal occluder devices for multiple atrial communications: Immediate and long-term follow-up results. *Catheter Cardiovasc Interv*, 2007; 70: 265–273.
5. Balzer J, van Hall S, Rassaf T et al. Feasibility, safety, and efficacy of real-time three-dimensional transesophageal echocardiography for guiding device closure of interatrial communications: Initial clinical experience and impact on radiation exposure. *Eur J Echocardiogr*, 2010; 11: 1–8.