Dislodged Amplatzer septal occluder in right ventricle, interesting echocardiographic and surgical images

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Abstract

There are surgical and percutaneous interventional strategies to treat ASD, each with its own advantages and inevitable drawbacks too. Here, we described a case of large size secundum type ASD (30 mm x 31 mm) that first underwent percutaneous closure with ASD Amplatzer device number 33. The day after the procedure, although the patient was asymptomatic, on follow-up echocardiography, it was found that the device was embolized into the right ventricle within Moderator Bands. Hence, the cardiac surgery was performed.

Keywords

Secudum atrial septal defect, Atrial septal defect, percutaneous intervention

Text

A 40 years old woman with no history of previous underlying disease referred to our center with complaints of dyspnea and palpitation on exertions. Her physical examination revealed systolic murmur grade II on the left border of sternum and wide splitting in second heart sound with no evidence of cyanosis. Her ECG demonstrated sinus rhythm with RBBB morphology. According to all these data from history to physical examination, echocardiography was performed that showed a large size ASD with left to right shunt (secundum type, 30 mm x 31 mm on 3D echocardiography), severe right ventricular enlargement and high pulmonary arterial pressure (systolic PAP:60mmHg) [Figure 1]. Considering non-invasively estimated high PAP the patient underwent right heart catheterization on which PAP was measured as 45/15 mmHg, approximately. Although ASD rims seemed suitable, it was not an ideal choice to operate with percutaneous device closure due to the large size of ASD. However, a trial of percutaneous closure was considered and the ASD Amplatzer device number 33 was deployed successfully with neither residual defect nor compressive effect on adjacent cardiac structures. The day after the procedure, the patient referred for follow-up echocardiography. While the patient was stable and asymptomatic, her cardiologist became astonished by detecting the device entrapped within Moderator Bands, fortunately with neither imposing obstruction nor destructive effect on cardiac structures. Basically, we expected that device embolization occur almost in the first hours after procedure with some symptomatic manifestations, but in our patient happened with a delay with no symptoms. As was predictable, regarding to the large size of ASD, percutaneous retrieval wasn't an ideal choice. Hence, the patient underwent cardiac surgery during which ASD closure was performed by using pericardial patch with no confirmation of residual shunt by contrast studies on echocardiography [Figure 2]. Although percutaneous ASD closure is a safe approach which could decrease the risk of surgery and its scar formation[1], it has some inevitable drawbacks such as malposition of device, residual defect, caval thrombosis, systemic or pulmonary embolization, thromboembolism, erosion and perforation of the cardiac structures, and atrial arrhythmia[2]. According to related articles, the most common complication is embolization or malposition of device, frequently during the initial hours to the first 24 hours[3]. In addi-

tion, the cardiac perforation is a rare complication of percutaneous ASD device closure, which present with hemopericardium or tamponade, mostly 3 days after procedure[4]. Moreover, cardiac erosions are serious complication after percutaneous closure of ASDs, mostly located near aortic root[5]. Important predictors of ASD device embolization are large defects, bigger devices, insufficient rims, undersized device, or insufficient left atrial size to hold a device[6], among which ASDs measured $>$ 20 mm and device size $>$ 24 mm are the most paramount issues[7].The most site of embolization is within main pulmonary arteries[8]. Although it frequently happens in the first hours after the procedure, rarely it's reported to occur with delays and without symptoms[3,9]. While inappropriate position of the device and under sizing predict immediate embolization, redundant rims and aortic erosion result in delayed embolization[10]. The patient's symptoms depend on the site of embolization. The patient may develop dyspnea and heart failure as device causes obstruction in the left ventricular outflow or inflow[11] or may present with sign of right side heart failure in the case of RV inflow or outflow obstruction[12]. Finally, in the case of embolization, if trans catheter snaring and retrieval could not be achieved, urgent surgery is considered[1]. Briefly, the algorithmic approach of device embolization management during trans catheterization is showed below[13]: [Figure 3]

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Figure Legends

Figure 1: **A)** Atrial septal defect (ASD) on color view.**B)** ASD size on 3D view. **C)** Device position in cathlab.**D)** Device embolized in right ventricle [LA: left atrium. RA: right atrium. LV: left ventricle. RV: right ventricle]

Figure 2: Cardiac surgery