

A Rare Case of Late Displacement of ASD Device in a 11 Year Old Child

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Abstract: Atrial septal defect (ASD) is a common congenital cardiac anomaly. Open heart surgery is the gold standard for the closure of atrial septal defects (ASDs). Percutaneous closure is gaining popularity in view of being less invasive, early post procedure recovery, cosmetic advantage, improved procedure techniques and relative safety. Procedure success, post procedure complications depend mainly on selection of appropriate device for the defect. A thorough evaluation including TTE and TEE are important to select size of device. We present a rare case of late displacement of ASD Device in a 6 year old child.

Keywords: ASD, Congenital, Device, TTE, TEE, displacement

1. Introduction

Atrial septal defect (ASD) is the most common congenital lesion in adults after bicuspid aortic valve. Trans-catheter closure of atrial septal defects is now widely performed using a variety of devices¹. It avoids sternotomy and cardiopulmonary bypass. The hospital stay and the morbidity are lower². Surgical closure is recommended for patients with secundum ASD requiring closure when percutaneous repair is not feasible or appropriate³. Observational studies comparing surgical and percutaneous transcatheter closure of secundum ASD suggest that mortality rates are similar, the rate of procedural success is comparable or slightly better with surgery, and the rate of early complications and length of hospital stay are reduced with the percutaneous approach⁴. The ideal lesion for percutaneous closure is a secundum defect ≤ 38 mm in diameter with a rim of tissue around the defect of at least 5 mm.

2. Case report

A 6yr old female child was brought to the OPD of Cardiology with complaints of occasional palpitations and Shortness of breath -NYHA class-2/since 10 days. Patient is a known case of ostium secundum-ASD, underwent device closure one year back was second intercostals space,s1 normal, fixed s2 split. ECG – incomplete RBBB (Figure-1). Chest x-ray- prominent pulmonary vascular markings (Figure-2). 2D-Echo- Dilated RA,RV, ASD device malaligned at inferior rim with left to right shunt (Figure-3). A diagnosis of ASD with late displacement of ASD device was made. In view of high risk of ASD device detachment and embolization, cardiothoracic surgeon opinion was taken. Patient immediately underwent surgical removal of the device and ASD surgical closure with pericardial patch. Intraoperatively, ASD device was observed to be firmly adhered at superior rim and inferior aspect of the device was floating in RA (Figure-4). The device was well epithelialised and was observed to be larger than the defect (Figure-5). Post operative course was uneventful.

3. Discussion

Transcatheter closure is a widespread technique used to treat secundum atrial septal defects (ASDs). The first case was performed in 1976 by King and Mills⁵. However, the percutaneous ASD closure fully entered the clinical arena with the introduction of Amplatzer septal occluder devices (ASO)⁶. Since then, many other devices have been developed and used, such as the Gore Cardioform septal occluder (GSO), the Figulla Flexible Occlutech device, the Cardioseal/Starflex and the bio absorbable devices Biostar or Biotrek^{7,8}. Measurement of the size and location of the ASD by TEE can help select the appropriate device. In addition, TEE and ICE can be used to guide the procedure in real time^{9,10,11}. In a study done by Earing MG, Cabalka AK et al, 94 patients underwent ICE during percutaneous closure of an ASD or patent foramen ovale (PFO) During the procedure, ICE identified a previously unrecognized anatomical diagnosis in 32 patients (an additional ASD or PFO, a redundant atrial septum, or an atrial septal aneurysm)¹². All devices were deployed successfully.

Complications associated with transcatheter closure of a secundum ASD include device embolization or malposition, access site complications, atrial arrhythmias, atrioventricular conduction block (often transient), erosion/perforation, and sudden death^{13,14}. Device embolization may occur in up to 1% of cases. The commonest reasons for occluder dislodgement are the use of an undersized ASD device, greater defect size, left atrium too small to accommodate the device, an inadequate or floppy rim, device mobility postimplantation, and operator-related technical issues¹⁵. The most of dislodgement occurs within 24 hours post implantation and takes place into left atrium (24.6%), aorta (18.4%), and right ventricle (16.7%)^{16,17}. Chessa M, Carminati M et al reported complication rate of 2.4 % for Device embolization or malposition requiring surgery.

In the present case the TEE before the patient undergoing device closure was unavailable as the procedure was done elsewhere. The cause of dislodgment in the present case was

thought to be due to choosing an over sized device and erosion of mitral rim. Our case gives an important emphasis of choosing a correct device size for ASD device closure and requirement of regular follow-up as the possibility of late embolization is also present though rare.

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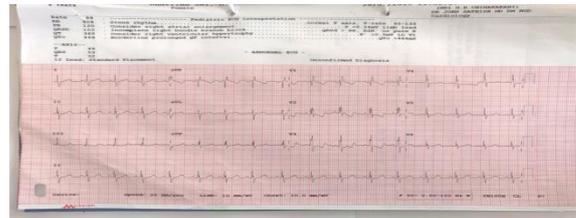


Figure 1: ECG- showing normal sinus rhythm with incomplete right bundle branch block

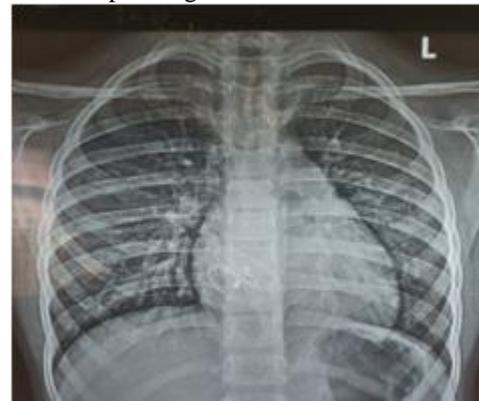


Figure 2: Chest x-ray- prominent bronchovascular markings suggestive of plethora with ASD device



Figure 3: Echo showing- malaligned inferior rim of device



Figure 4: Echo colour Doppler showing left to right shunting of blood



Figure 6: Intraoperative picture showing device firmly adhered at superior rim



Figure 7: Extracted device showing well epithelialisation

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