

Case Report

Emergency Surgery for Embolisation of Amplatzer Device into the Left Atrium

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Occlusion of secundum atrial septal defects (ASD) by means of percutaneous transcatheter systems is increasingly used in clinical practice. A variety of different types and models of septal occluder devices are available nowadays, amongst which the Amplatzer device (Amplatzer Medical, Golden Valley, MN, USA), is regarded as one of increasing popularity. We report a case of attempted percutaneous transcatheter closure of a large ASD in an 11-year-old boy, complicated by device embolisation to the left atrium necessitating emergency surgery.

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The use of the Amplatzer device is gaining increasing popularity for the closure of secundum atrial septal defects. It is possible, however, that during its release from the introducing catheter it can be misplaced, or even embolise further, therefore requiring urgent surgical retrieval. We report a case of attempted percutaneous transcatheter closure of a large ASD in an 11-year-old boy, complicated by device embolisation to the left atrium necessitating emergency surgery.

Case presentation

An asymptomatic 11-year-old boy was found to have a large secundum ASD, measuring 2.5 × 2 cm on transthoracic echocardiography. Transoesophageal echocardiography was not performed. The patient and his parents were given the options of open heart surgery or umbrella implantation and were informed of the advantages and the possible complications of both. They opted for the transcatheter procedure and signed the appropriate informed parental consent.

Transcatheter closure was attempted under fluoroscopic control. A balloon was used to measure the stretched diameter of

the ASD and a 30 mm Amplatzer device was implanted. After the device was released, it slipped entirely into the left atrium, protruding into the mitral orifice. Retrieval efforts were fraught with the risk of mitral disruption or occlusion and were eventually unsuccessful. Although the patient was haemodynamically stable, urgent surgical intervention was recommended to retrieve the device and close the defect. On operation, a large secundum ASD was found with no tissue "shelf" at the inferior margin. The device was covered with recent red thrombus (Figure 1) and was found to be embolised entirely into the left atrium, lying on the anterior mitral valve leaflet, protruding into its orifice and orientated towards the left atrial appendage (Figure 2). Through the ASD, the device was retrieved without injury to the mitral valve and the defect was closed with an autologous pericardial patch. The patient had an uneventful recovery and was discharged a week later. He remains well at 4 months' follow up.

Discussion

Transcatheter occlusion techniques have become an increasingly used alternative to

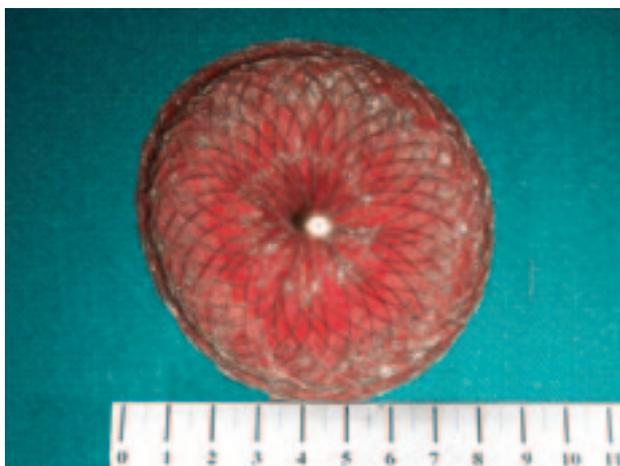


Figure 1. The Amplatzer device post retrieval.

surgical closure of the atrial septal defect. Various devices¹⁻⁴ for transcatheter closure are undergoing clinical trials, with each new device claiming advantages in terms of safety and efficacy over earlier ones. Amplatzer device closure of ASDs is preferable to surgical closure when the anatomy of the ASD is suitable. In patients experiencing unsatisfactory device position and significant residual defect, device retrieval is usually feasible at the time of implantation, followed by elective surgical closure. However, if embolisation (in which transcatheter snaring and retrieval is unsuccessful) occurs, urgent surgical therapy is necessary.⁵⁻⁸

There are several reasons for the acute failure of these devices. The most important is poor patient and/or device selection.^{5,6} Other suggested mechanisms of acute failure are device related failure, inadequate experience,^{6,7} poor defect rim to hold the device,^{5,7,8} and tearing of the interatrial septum as a result of catheter and device manipulations.^{6,7} A part or the entire device may embolise to the right or left atrium, main pulmonary artery or even to other parts of the vascular tree on both the right and left sides of the circulation. Once the atrial septal occluder is detached from its cable it becomes difficult to retrieve and depending on its location may even become lethal. The value of transoesophageal echocardiography (TOE) in patient selection, recognition of suitable anatomy and intracardiac detection of thrombi is well established.⁷ In our case the patient did not undergo TOE and umbrella implantation failed due to unsuitable anatomy.

Although devices are useful alternatives to surgi-

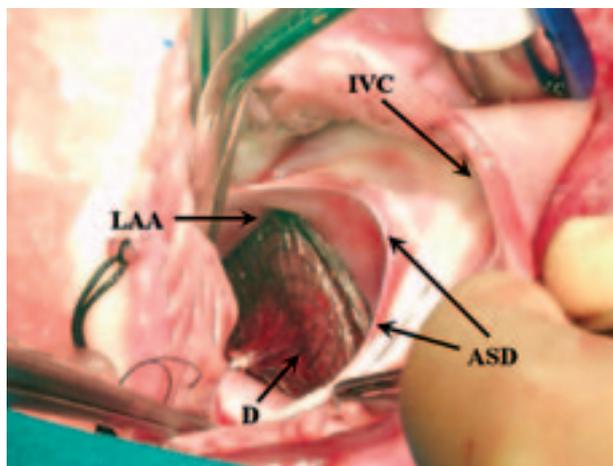


Figure 2. The Amplatzer device is depicted lying on the anterior leaflet of the mitral valve and lodged into the left atrial appendage. ASD – atrial septal defect; D – device; IVC – inferior vena cava; LAA – left atrial appendage.

cal closure in selected cases they can be associated with failures, and most importantly with potentially fatal complications. Thus, proper selection of patient and device is mandatory. Close monitoring and facilities for emergency surgery should be available for all patients.

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