Amplatzer™ Prosthesis Embolization After Percutaneous Atrial Septal Defect Closure: A Case Report

Embolização de Prótese de Amplatzer™ após Fechamento Percutâneo de Comunicação Interatrial: Relato de Caso

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Introduction

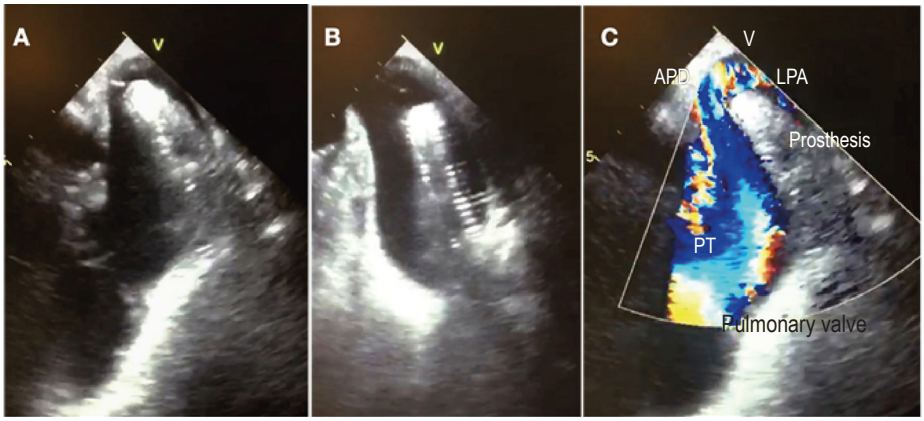
Atrial septal defect (ASD) is the most common congenital heart disease in adults; in specific cases, it has indications for treatment. The percutaneous approach has been highlighted as a less invasive method to close this defect, specifically in cases of ostium secundum ASD; however, it can have complications as described in the following report.

Clinical case

A 44-year-old man with a history of undergoing percutaneous ASD closure using an Amplatzer™ prosthesis 2 years prior underwent transesophageal echocardiography (TEE). He remained symptomatic after the procedure but did not undergo complementary imaging tests during this period.

TEE revealed right chamber dilation, a large ostium secundum ASD measuring 26 mm, and transseptal flow from the left to the right atria. The Amplatzer™ prosthesis moved to the pulmonary artery trunk just after the pulmonary valve close to the bifurcation, where it was firmly adhered by one of the edges to the lateral wall of the vessel. Color Doppler showed turbulent flow in the pulmonary trunk (Figure 1, Video 1).

The patient underwent computed tomography angiography, which confirmed the presence of an ASD measuring 44 mm × 28 mm, right chamber dilation, and the pulmonary artery trunk showing an image compatible with the Amplatzer™ prosthesis in the pulmonary artery near the bifurcation of right and left branches with no signs of filling failure in the pulmonary branches (Figure 2). The patient underwent conventional surgical correction consisting of a median sternotomy, ASD closure, and prosthesis removal from the pulmonary trunk (Figure 3). The patient's condition progressed with decreased pulmonary pressure, decreased sizes of the right chambers, and significant symptom improvement.



LPA, left pulmonary artery; PT, pulmonary trunk.

Figure 1 – *Transesophageal echocardiography images showing an Amplatzer™ prosthesis displaced to the pulmonary artery trunk (A and B). Color Doppler image showing turbulent flow in the pulmonary artery trunk (C).*

Keywords

Heart septal defects, atrial; Septal occluder device.

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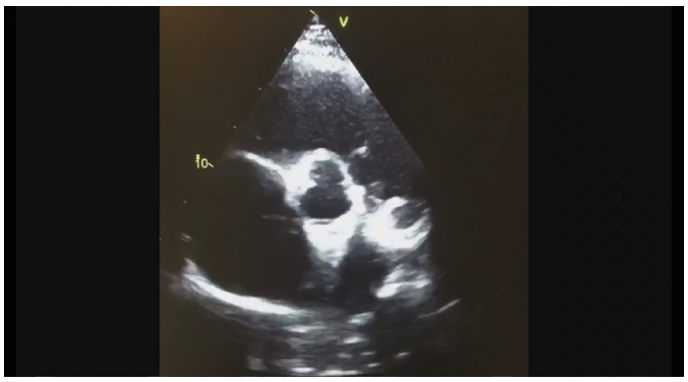

Video 1 – *Echocardiography showing occluder prosthesis displacement.*

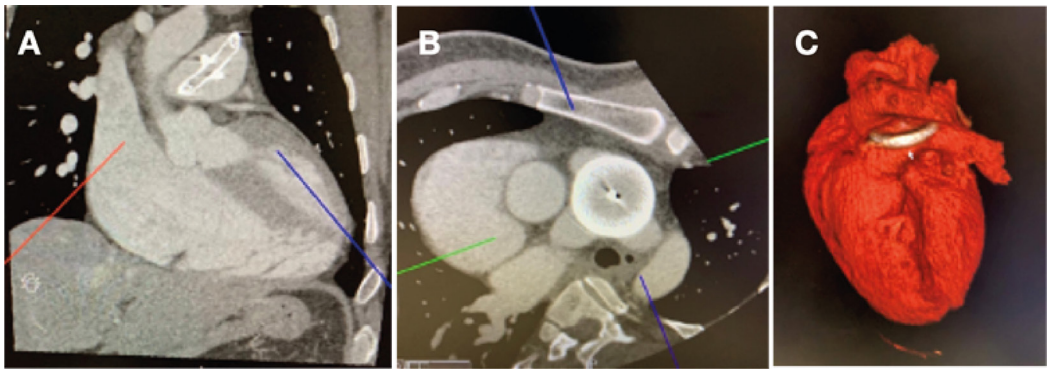

Figure 2 – *Tomography images of planar (A and B) and three-dimensional (C) reconstruction showing an Amplatzer™ prosthesis in the pulmonary artery trunk.*

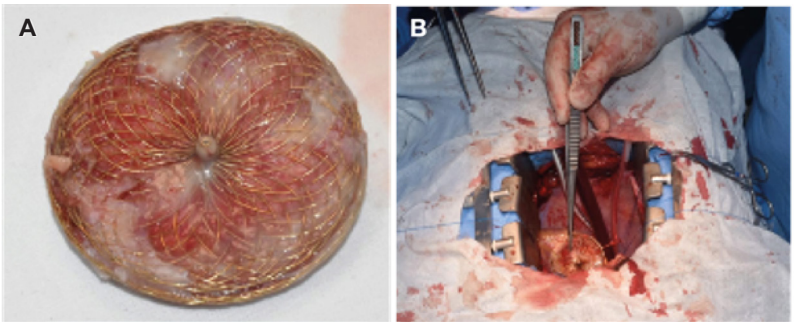

Figure 3 – *Image of the Amplatzer™ prosthesis after open surgical extraction (A); and the Amplatzer™ prosthesis being removed from the pulmonary artery trunk (B).*

Discussion

The incidence of ASD in the literature is 3.78 per 10,000 births, corresponding to 5–9% of all cases of congenital heart malformation[1,2].However, ASD is the most prevalent congenital heart disease in adults (reportedly involving up to 25% of cases), predominant in women, and classified into four types (ostium secundum [50–70%], ostium primum [30%], venous sinus [5–10%], and coronary sinus [3% – extremely rare]). Only ostium secundum ASD is considered an atrial defect itself[2,3].

The percutaneous closure of ASD using the Amplatzer™ device is currently a therapeutic option fully established in the treatment of ostium secundum ASD in patients who meet the anatomical criteria[2,3]. The increased number of percutaneous prosthesis implants has increased possible complications. The main complication is device embolism during implantation with the risk of displacement, embolization, and incorrect placement of 0.5–1%[1,2,4,5]. Almost all cases of prosthesis embolization require surgical intervention[3,5]. It was not

possible to identify when the device migrated in the reported case, but there are reports of migration immediately after and up to 10 years after the implantation. The great adherence of the prosthesis to the pulmonary trunk and the absence of signs on the ASD edges indicate migration soon after the implantation in addition to the patient's report that his symptoms never resolved.

Percutaneous ASD treatment with the Amplatzer™ prosthesis may be the best option for most adult ASD cases requiring treatment (with signs of hemodynamic repercussion) since it presents a low rate of complications. However, prosthesis embolization is a severe complication with a high mortality rate that often requires surgical intervention. The cause of prosthesis displacement is ambiguous, but insufficient edges for device fixation can be a factor; thus, it is important to correctly select appropriate candidates for the procedure. Since the authors did not know this patient prior to the procedure, it was impossible to specify the cause of the embolization in this case. Fortunately, this severe complication was successfully resolved after surgery.

Authors' contributions

Research creation and design: Valerio, RS; Peixoto LB; Uellendahl, MM. Manuscript writing: Valerio, RS; Peixoto LB; Uellendahl, MM; Critical revision of the manuscript for important intellectual content: Rodrigues, AAE; Peixoto LB; Uellendahl, MM; Silva, CES; Raoul, AJS.

Conflict of interest

The authors have declared that they have no conflict of interest.

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