

# **RESEARCH ARTICLE**

# RESIDUAL ATRIAL SEPTAL DEFECT AFTER PERCUTANEOUS CLOSURE: WHAT THERAPEUTIC ATTITUDE FOR THIS RARE COMPLICATION

#### Mbida Biwole Aloys Cyrille, Meriem Boumaaz, Yousra Aboucherif, Najat Mouine, Iliyasse Asfalou and Aatif Benyass

Department (Cardiology), University (Mohammed V University of Rabat), Faculty (Faculty of Medicine and Pharmacy), Hospital (Mohamed V Military Hospital of Rabat), City (Rabat), Country (Morocco).

	• • • • • • • • • • • • • • • • • • • •
Manuscript Info	Abstract

*Manuscript History* Received: 18 December 2021 Final Accepted: 20 January 2022 Published: February 2022

Key words:-Interauricular Communication, Amplatzeroccluder Prosthesis, Malposition Residual atrial septal defect (ASD) is a rare complication after percutaneous closure of an ostium secundum atrial defect in eligible patients. Cardiac imaging, mainly transthoracic and transesophageal echocardiography is essential to establish the diagnosis. Surgical closure is the therapeutic strategy of choice. We present the case of a 54-year-old woman who presented with a residual left-to-right atrial shunt four years after percutaneous closure of an ASD ostium secundum.

.....

Copy Right, IJAR, 2022,. All rights reserved.

#### **Introduction:-**

Percutaneous closure is the gold standard approach for ostium secundum atrial septal defect (ASD) in eligible patients. The "AmplatzerOccluder" has become the prosthesis of choice given its simplicity, safety and high success rate of 85 to 100% [1]. However, this technique is not free from complications.

Late onset of residual interatrial communication is a rare complication though little is known about it.

## **Patient And Observation:-**

Mrs. A.H is 54 years old, postmenopausal, consults for chronic dyspnea on moderate exertion and palpitations.

There is a past history of percutaneous closure of an ASD ostium secundum. The 19 mm AMPLATZER Duct Occluder was the prosthesis used. We note an improvement after 4 years following the therapy.

The transthoracic echocardiography performed on admission (figures 1 and 2) shows dilation of the right cavities and a significant left-right atrial shunt with a Qp/Qs ratio = 2.6. Transesophageal echocardiography (figure 3) shows a fixed prosthesis, disinserted and not anchored on the lower edge with a left-right auricular shunt.

Management was discussed during the "heart team" and the therapeutic decision was in favor of surgical closure with tricuspid annuloplasty (figures 4 and 5).

The postoperative course was simple and the evolution after 02 months until today is marked by regression of symptoms.

**Corresponding Author:- Mbida Biwole Aloys Cyrille** Address:- Department (Cardiology), University (Mohammed V University of Rabat), Faculty (Faculty of Medicine and Pharmacy), Hospital (Mohamed V Military Hospital of Rabat), City (Rabat), Country (Morocco).

#### **Discussion:-**

ASD ostium secundum is the most commonly diagnosed heart defect in adulthood. It is twice as common in women as in men [2].

The occurrence of ASD in adults are generally different from children. It is most often revealed by exertional dyspnea which progressively worsens with age. There is a physiological alteration of the diastolic function with age, which will lead to an increase in pressure within the left atrium and therefore a left-right atrial shunt. It can also be discovered during the etiological assessment of heart rhythm disorders (atrial fibrillation, flutter, etc.) and right ventricular insufficiency showing significant dilation of the right cavities. Cases of cerebrovascular accidents and paradoxical embolisms have been reported, revealing a wide ASD [3].

Transthoracic echocardiography alone is sufficient to make the diagnosis of ASD ostium secundum. Transesophageal echocardiography on the other hand, makes it possible to better define the anatomy of the lesion, the structure of the edges and to eliminate congenital anomalies that may be associated [4].

Percutaneous closure is increasingly offered to all patients with ostium secundum ASD. Absolute contraindications such as pulmonary arterial hypertension and Eisenmenger syndrome have become rare [5,6]. The 2020 European and American class I recommendations specifyvarious criteria for selection of patients. This include; an orifice diameter <38mm, edges of more than 5mm except in the retro-aortic, a hemodynamically significant shunt and pulmonary resistance bass. Some authors propose percutaneous closures on larger ASD above 40 mm. Petit J et al reported successful percutaneous closure of largerASD in 16 out of 17 patients with no residual shunt in the postoperative course. The only failure was the total absence of posterior margin. They concluded that very large atrial septal defects with diameters greater than 40 mm can be closed percutaneously with the Amplatzer device [7]. The early complications of percutaneous closure include; migration of the prosthesis into the left cavities, thrombosis on the prosthesis with the risk of embolization and infections. However, late complications are rarely seen. L ABID et al have shown that the residual shunt rate at 3 months and 1 year remains low at 1 and 8% respectively [1]. Some interventional series show a high success rate of percutaneous closure on single defects with an absence of residual shunt in more than 95% of cases in the months following implantation [8]. G. Butera et al report a percutaneous closure success rate of 99% of cases on multiple defects without long-term complications [9].

Percutaneous closure is not superior to surgery. Several studies show that the rate of complications is not significantly different in the two cases, although some may be more serious in the surgical group. The long hospital stay and complications related to extracorporeal circulation justify the primary choice of percutaneous closure. Recourse to surgery is indicated when faced with complicated percutaneous closure, poor anatomy of the edges and in the presence of other types of ASD (ostium primum, sinus veinsosus) [10].

There is no data related to risk factors of occurrence of residual shunt after percutaneous closure. We believe that it could be linked to poor anatomy of the edges, closure of large defects not suitable for prosthesis and erroneous analysis on cardiac imaging. Prevention would be based on a rigorous selection of eligible patients.

In addition, our patient underwent extracorporeal surgery with placement of an interauricular patch. Intraoperative images were not taken and the postoperative course was without complications.

## **Conclusion:-**

Residual ASD after percutaneous closure with an Amplatzer prosthesis is a rare complication and there is limited data about it. Transesophageal echocardiographique analysis of the lesions is essential. Though this technique has a very high success rate, it does not replace surgery in terms of effectiveness and survival rate.

Figures:-



**Figure 1:-**Transthoracic echocardiography in 2D mode (apical section 4 chambers) showing a defect of the interatrial septum (blue arrow) and a dilation of the right ventricle (red arrow).



Figure 2:- Pulsed Doppler mode transthoracic echocardiography showing a ratio of systemic and pulmonary flow of 2.6 in favor of a significant Left-Right shunt.



Figure 3:- Transesophageal echocardiography in bicaval section showing a defect between an Amplatzer prosthesis and the lower edge of the interatrial septum measuring 12 mm (red arrows) and a Left-Right flow in color mode (green arrow).

## **Références:-**

- 1. L. Abid, D. Abid, R. Hammami, S. Charfeddine, F. Triki, S. Kammoun. Percutaneous closure of ostium secundum atrial septal defect: immediate and long-term results. J.I. M. Sfax, N°28; Février18; 45 54
- Losay J, Lambert V. Fermeture percutanée des communications inter-auriculaires, des indications bien définies [Percutaneousclosure of the inter-auricular communications, welldefined indications]. Presse Med. 2004 Aug 28 ;33(14 Pt 1):966-73. French. doi: 10.1016/s0755-4982(04)98808-2.
- Boudiche S, Chatti S, Amroussia R, Mghaieth F, Ziadi J, Farhati A, Ben Hammamia M, Tekaya MA, Ouali S, Guedira F, Denguir R, Mourali MS. Atrial septal defect closure in adults: A ten-year experience. Tunis Med. 2019 Dec;97(12):1362-1369.
- 4. Akagi T. Current concept of transcatheter closure of atrial septal defect in adults. J Cardiol. 2015 Jan ;65(1):17-25. doi: 10.1016/j.jjcc.2014.09.002.
- 5. Sahin M, Ozkutlu S, Yıldırım I, Karagöz T, Celiker A. Transcatheter closure of atrial septal defects with transthoracic echocardiography. Cardiol Young. 2011 Apr ;21(2):204-8. doi: 10.1017/S1047951110001782.
- 6. Baumgartner H, Bonhoeffer P, De Groot NM et al. Task Force on the Management of Grown-up Congenital Heart Disease of the European Society of Cardiology (ESC); Association for European Paediatric Cardiology (AEPC); ESC Committee for Practice Guidelines (CPG). ESC Guidelines for the management of grown-up congenital heart disease (new version 2010). Eur Heart J, 2010;31:2915-2957.
- 7. Petit J, Losay J, Lambert V, Piot JD, Bertaux X. Large atrial septal defects in adults: results of attempted systematic percutaneous closure. Arch Mal Coeur Vaiss. 2006 May;99(5):429-32.
- Abid D, Rekik N, Mallek S, Abid L, Akrout M, Smaoui M, Abdennadher M, Kolsi K, Frikha I, Kammoun S. Percutaneous closure of Ostium secundum atrial septal defect using amplatzer occlusion device. Tunis Med. 2013 Jul;91(7):453-7.
- 9. Butera G, Romagnoli E, Saliba Z, Chessa M, Sangiorgi G, Giamberti A, Cappato R, Bussadori C, Abella R, Pelissero G, Frigiola A, Carminati M. Percutaneous closure of multiple defects of the atrial septum: procedural results and long-term follow-up. CatheterCardiovascInterv. 2010 Jul 1 ;76(1):121-8. doi: 10.1002/ccd.22435.
- 10. Suchon E, Pieculewicz M, Tracz W, Przewlocki T, Sadowski J, Podolec P. Transcatheter closure as an alternative and equivalent method to the surgical treatment of atrial septal defect in adults: comparison of early and late results. Med Sci Monit. 2009 Dec;15(12):CR612-7.