

Late Bacterial Endocarditis Due to Haemophilus After Implantation of an Amplatzer Septal Occluder.

Alvarez-Navarro P^{1*}, Pradas Irun C¹, Romero Ferrer B², Leal Fernandez O³, Bustamante- Munguira J⁴, Azcarate Aguero P³ and Munoz Guijoza C²

¹Department of Cardiac Surgery, Josep Trueta University Hospital, Spain

²Department of Cardiac Surgery, Germans Trias i Pujol University Hospital, Barcelona, Spain

³Department of Cardiac Surgery, San Pedro University Hospital, Logroño, Spain

⁴Department of Cardiac Surgery, Valladolid University Clinical Hospital, Valladolid, Spain

*Corresponding author:

Pablo Alvarez Navarro,
Department of Cardiac Surgery,
Josep Trueta University Hospital, Spain,
E-mail: palvareznavarro@hotmail.com

Received: 17 Apr 2021

Accepted: 10 May 2021

Published: 15 May 2021

Copyright:

©2021 Alvarez-Navarro P et al., This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and build upon your work non-commercially.

Citation:

Alvarez-Navarro P et.al. Late Bacterial Endocarditis Due to Haemophilus After Implantation of an Amplatzer Septal Occluder. J Clin Med Img 2021; V5(9): 1-3.

1. Abstract

The treatment of choice in congenital structural cardiopathy, including atrial septal defects, is mostly carried out using a percutaneous approach. The main complications of this approach involve the puncture. Other complications include device migration, shunts, or endocarditis and they are extremely rare. Inhere we present a case of a patient with late Amplatzer-related endocarditis caused by a germ with negative blood cultures, related to incomplete endothelial occluder coverage. Identifying endothelial coverage defects is important for more adequate prophylaxis of infective endocarditis.

2. Introduction

Atrial Septal Defects (ASD) are the second most frequent Congenital Heart Disease (CHD) after ventricular septal defects, and the treatment of choice is the percutaneous approach. Complications associated with these treatments are infrequent and mainly related with the puncture. Other complications as embolism or endocarditis are uncommon and in most of the cases require surgical treatment.

A 17-year-old woman with a unique pathology consisting in an ostium secundum-type Atrial Septal Defect (ASD) was treated percutaneously with the implantation of a 24mm Amplatzer septal occluder. She came to our emergency unit 15 months later with headache and a 40°C fever. Physical examination results were correct, and no relevant alterations appeared in the chest x-ray, elec-

trocardiography, blood analysis and cranial CT-scan. She was discharged with antibiotic treatment (cefuroxime 500 mg/12 hours) and a follow-up by the general physician. One month earlier, she had undergone a tooth extraction and received amoxicillin 500 mg/8 hours for 10 days.

The patient returned 24 hours later with persistent fever, headache and atypical chest pain. She was admitted in the emergency area with fever of unknown origin diagnosis. Blood cultures, Coxiella Burnetii, cytomegalovirus, and Epstein Barr serology testing were carried out. Due to her history of ASD percutaneous closure, an initial transthoracic echocardiogram was performed. This was followed by a later Transesophageal Echocardiography (TEE) that revealed a well-positioned Amplatzer without periprosthetic leaks. It also discovered a multilobular endocarditic excrescence of 25mm maximum diameter, on the right side of the device, in the upper anterior interatrial septum (Figure1).

Late prosthetic Infective Endocarditis (IE) was diagnosed. After 10 days of antibiogram-guided antibiotic therapy she achieved a good response in the blood test markers and she also ran out of fever. She underwent surgery by median sternotomy approach and cardiopulmonary bypass (Figure 2). After the opening of the right atrium, the Amplatzer was visualized. It had only a partial endothelial coverage on the right atrial surface of the metallic mesh, with a 3 x 1.5 cm multilobular excrescence that continued through the septum towards the left atrium (there was infected material

on both surfaces and between the two discs). The device was extracted, the implantation borders were excised, and the defect was directly closed with interrupted monofilament polypropylene 4-0. Pathology testing revealed the presence of inflammatory infiltrate, histiocytic cell proliferation, fibrinoid degeneration, and necrotic

debris. Culture of the excrescence and the Amplatzer were negative. Polymerase Chain Reaction (PCR) was positive for *Haemophilusparainfluenzae*. She was discharged on the 7th day of hospitalization and continued as outpatient with parenteral antibiotic therapy. No complications were seen during 1-year follow-up.

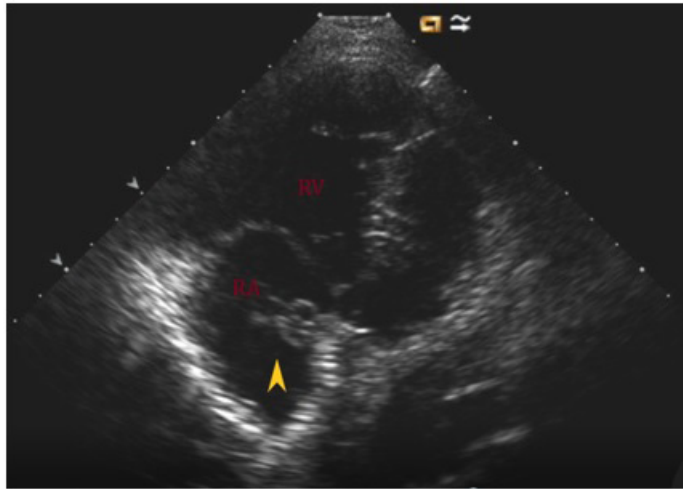


Figure 1: Echocardiographic image showing a large elongated hypermobile echogenic structure attached to the left atrial side of the device (arrows) compatible with vegetation. Right Atrium(RA), Right Ventricle (RV).

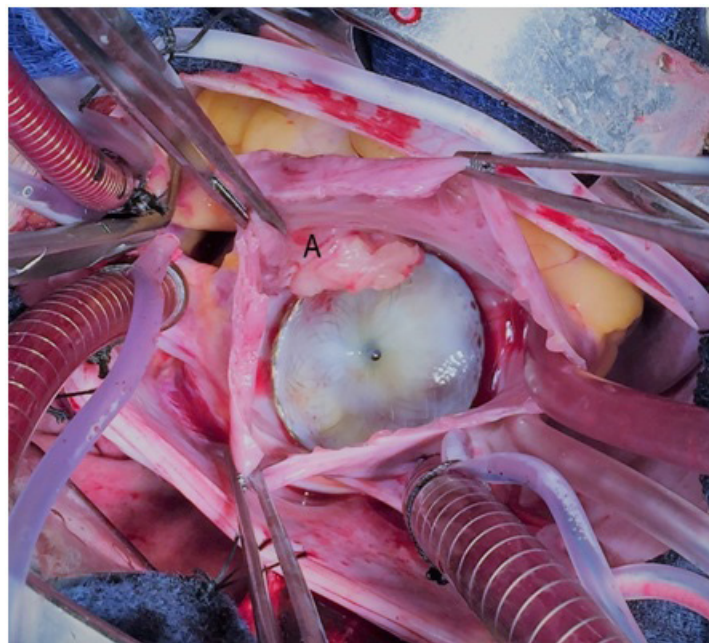


Figure 2: Surgical field after opening the right atrium. The amplatzer occupies most of the interatrial septum and presents a giant vegetation (A). Amplatzer revealing incomplete endothelial coverage of the part in the left atrium and the presence of infected material between the 2 device discs

3. Discussion

Percutaneous treatment of CHD has developed significantly over the last years. This development has made it the treatment of choice in many cases [1]. Percutaneous techniques are less aggressive than the classic surgical treatment and have lower morbidity and shorter hospital stay [2]. ASD represent the second most frequent CHD after ventricular septal defects and their treatment of choice is percutaneous, when the size and location of the defect permit the technique [3].

Percutaneous techniques can involve various complications, most related to vascular access such as infections or shunts, although they are extremely rare. In the case of Amplatzer for ASD closure, post-implant endothelialization occurs within 3 to 6 months [4]. During this period, the prosthetic material is more likely to form thrombi and emboli due to platelet aggregation. It is also more vulnerable to infectious processes that may cause bacteremia, which can result in an infection of the prosthesis and cause endocarditis. Thrombo-embolic and infective complications are rare after this

period. That is the reason why the European Society of Cardiology clinical practice guidelines recommend antibiotic prophylaxis only until 6months post-implantation.

Our case is relevant because of the late presentation of the IE linked to incomplete device endothelialization and also because it had been caused by an infrequent IE germ source with a negative blood culture. The use of other microbiological diagnostic tests like the PCR routinely in these situations has been widely disputed. Although they are extremely useful, performing them routinely is not universally accepted.

Only the 0.8%-1.3% of the cases of IE are caused by haemophilus, that belongs to the HACEK gram-negative bacilli group [5]. *H. parainfluenzae* forms part of the bacterial flora of the mouth and upper respiratory tract, and is the most common cause of haemophilus endocarditis [6]. Many haemophilus strains produce b-lactamase and are consequently resistant to ampicillin, amoxicillin, and derivatives. This is important to remember because this group of antimicrobials are usually prescribed as prophylactic treatment in dental procedures but may be ineffective.

In intravascular device-bearing patients suffering from infectious processes, the possibility of a device infection must always be considered. An incorrect antibiotic therapy can mask the clinical condition, hiding the diagnosis. A TEE is mandatory when there is persistent fever of unknown origin in these patients. This is a harmless procedure and can lead to the specific diagnostic.

This case is rare for its late appearance, after 6months post-implant, period in which endothelial coverage is considered to occur [7]. As we have indicated, despite the low prevalence of these complications, it is necessary to discard them through imaging tests such as TEE and/or CT-scan, as well as microbiological tests. In cases of IE with negative cultures, it is important the use of non-routine tests like the PCR. Appropriate length of bacterial endocarditis prophylaxis for patients with ASD closure is arbitrarily determined and usually extends from 6 months to 1 year after implantation of the device. The documented cases of prosthetic IE related to an incorrect endothelial coverage can lead to reassess the necessary length of prophylactic antibiotic coverage. Imaging techniques or biochemical markers are needed to identify patients with incomplete endothelial coverage who warrant long-term endocarditis prophylaxis.

References

1. Sharafuddin MJ, Gu X, Titus JL, Urness M, Cervera-Ceballos JJ, Amplatz K. Transvenous closure of secundum atrial septal defects: preliminary results with a new self expanding nitinol prosthesis in a swine model. *Circulation*. 1997; 95: 2162-8.
2. Du ZD, Hijazi ZM, Kleinman CS, Silverman NH, Larntz K. Comparison between transcatheter and surgical closure of secundum atrial septal defects in children and adults: results of a multicenter nonrandomized trial. *J Am Coll Cardiol*. 2002; 39: 1836-44.
3. 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: 2915-57.
4. Balasundaram RP, Anandaraja S, Juneja R, Choudhary SK. Infective endocarditis following implantation of Amplatzer atrial septal occluder. *Indian heart J*. 2005; 57: 167-9.
5. Scheld WM, Sande MA. Endocarditis and intravascular infections. In: Mandell GL, Bennett JE, Dolin R, eds. *Mandell, Douglas and Bennett's principles and practice of infectious diseases*. 4th ed. Vol 1. New York: Churchill Livingstone, 1995: 740-83.
6. Darras-Joly C, Lortholary O, Mainardi JL, Etienne J, Guillemin L, Acar J. Haemophilus Endocarditis: Report of 42 Cases in Adults and Review. *Clin Infect Dis*. 1997; 24: 1087-94.
7. Timothy C. Slesnick, Alan W. Nugent, Charles D. Fraser, Jr, Bryan C. Cannon. Incomplete Endothelialization and Late Development of Acute Bacterial Endocarditis After Implantation of an Amplatzer Septal Occluder Device. *Circulation* 2008; 117: e326-7.