

Infective Endocarditis with Fistulized Mitral Aortic Pseudoaneurysm for Left Ventricle

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Introduction

Infective endocarditis (IE) is an important cause of mortality and morbidity¹. Its incidence ranges from 3 to 9 cases per 100,000 people. Risk factors include valvular diseases, valve prosthesis, rheumatic disease, diabetes mellitus, immunosuppression and intravenous drugs¹.

Cardiac complications stand out among the leading causes of death, especially upon postoperative acute evolution. Ventricular pseudoaneurysm, abscess, fistula formation, systemic embolism and heart failure are described in the literature¹. Early detection and evaluation of these changes is crucial for a better prognosis.

Mitral-aortic intervalvular fibrosa (MAIF) pseudoaneurysm is a serious and potentially fatal complication that requires, as a rule, surgical management. Previous endocarditis and aortic valve replacement are recognized as predisposing factors for this complication. The diagnosis can be confirmed by echocardiography, cardiac catheterization or computed tomography².

We report the case of MAIF diagnosed after four months of mitral aortic valve replacement surgery. Diagnosis was suspected by transthoracic echocardiography (TTE) confirmed by transesophageal echocardiography (TEE) and computed tomography angiography of the chest.

Case Report

Male patient, 32, white ethnicity, underwent double mitral aortic valve replacement by metallic prostheses four months ago. History of rheumatic fever in childhood. The patient was admitted with complaints of intermittent fever accompanied by chills and asthenia for fifteen days. Initial presumptive diagnosis was of pharyngitis. The

patient was treated in the outpatient unit with amoxicillin and clavulanate with no improvement after 48 hours. The patient maintained night fever peaks higher than 38 °C associated with sweating and muscle weakness.

On physical examination, the patient presented blood pressure = 90 x 56 mmHg; heart rate = 91 bpm; respiratory rate = 18 bpm and axillary temperature = 36.6 °C. On cardiovascular examination: apical impulse visible in the 6th left propulsive intercostal space. Presence of bilateral arterial supraclavicular pulse. Rhythmic heart sounds in two stages. Holosystolic rude murmur in mitral focus (3+ / 6+) irradiating to all foci and metallic click of the prosthesis after the second heart sound. There was no change in murmur intensity with handgrip maneuver. No abnormalities in the abdomen, respiratory tract and lower limbs. Roth spots in the fundus were found as well.

Initial laboratory tests revealed normocytic and normochromic anemia. Samples were collected for blood culture and antimicrobial therapy with amikacin and ceftriaxone were administered for ten days.

TEE showed double-disk mechanical prostheses in mitral and aortic positions with mild mitral prosthetic regurgitation. Cavity image newly formed at the mitral aortic fibrous level. On color Doppler, aortic wall inflow through pseudoaneurysm draining in the left ventricle (Figures 1 and 2).

Chest angiography held five days after TEE revealed image suggestive of post-valve implantation, mitral-aortic fibrous pseudoaneurysm with communication to the ascending aorta (Figure 3). It was not possible to define its origin in the left ventricular outflow tract due to fistula. Besides this, ascending aorta aneurysm was found.

The first blood culture was positive for *Kocuria rosea*. Later, in two new blood cultures after four and seven days, *Corynebacterium amycolatum* was found.

Since the admission, the patient evolves with atrioventricular dissociation (Figure 4). The general condition, initially toxemic, had a good response following change from antibiotic therapy to vancomycin (32 days) and gentamycin (15 days). However, despite optimal treatment, the patient persisted with hemolysis, splenomegaly, hemoglobin drop, besides the persistence of conduction disturbance. Surgical approach after 46 days of conservative medical treatment was then decided.

During the surgery, metallic mitral prosthesis with laceration of points in the “mitral aortic curtain” was observed, with abscess extending to the aortic prosthesis

Keywords

Endocarditis/complications; Aneurysm, false/complications; Heart valve diseases; Aortic valve/abnormalities; Mitral valve/abnormalities.

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Manuscript received January 12, 2015; revised manuscript January 15, 2015; accepted June 1, 2015.

DOI: 10.5935/2318-8219.20150030

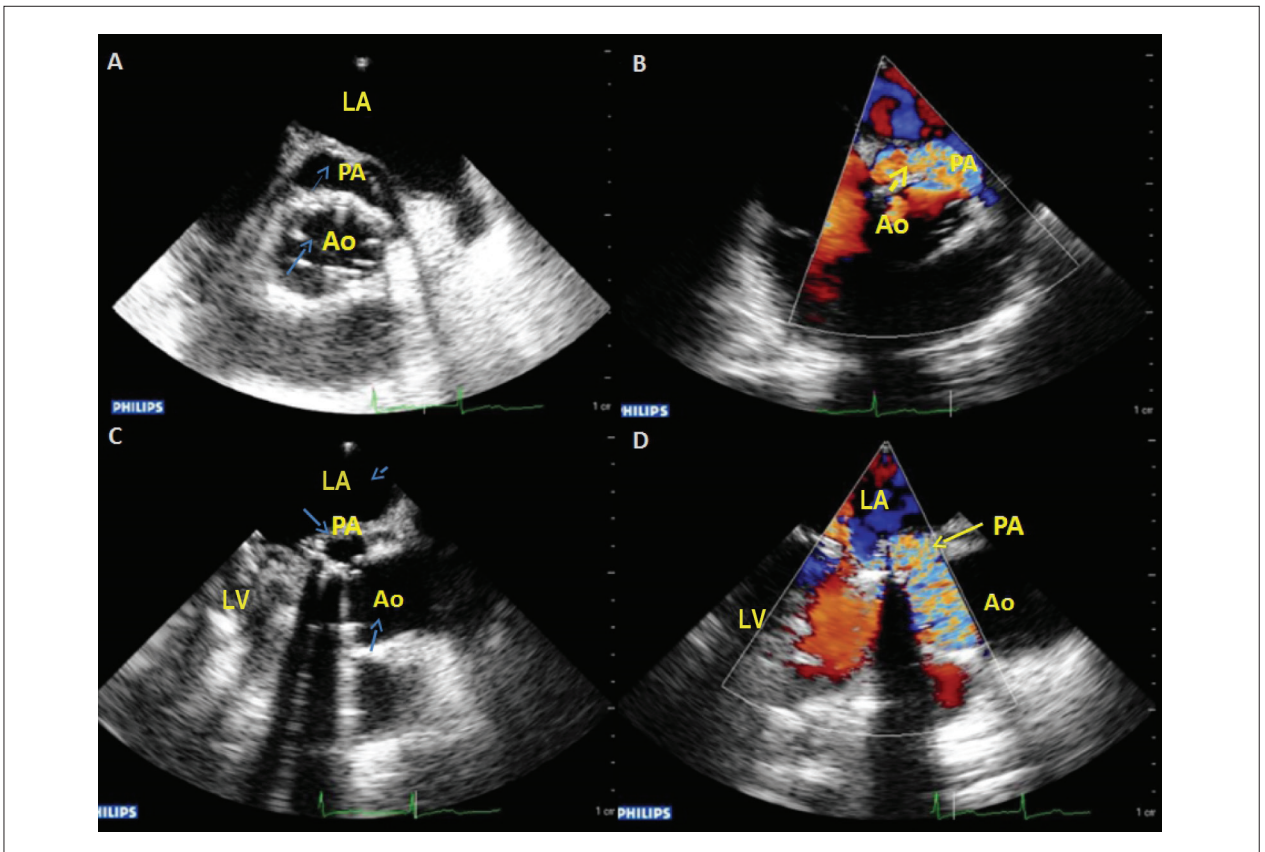


Figure 1 – Echocardiogram images A, B, C and D. A and B: aorta longitudinal cross-section of the pseudoaneurysm (PA). C and D: Transesophageal echocardiogram at 130 degrees showing PA communication hole with the ascending aorta. PA: pseudoaneurysm; Ao: aortic valve; LA: left atrium.

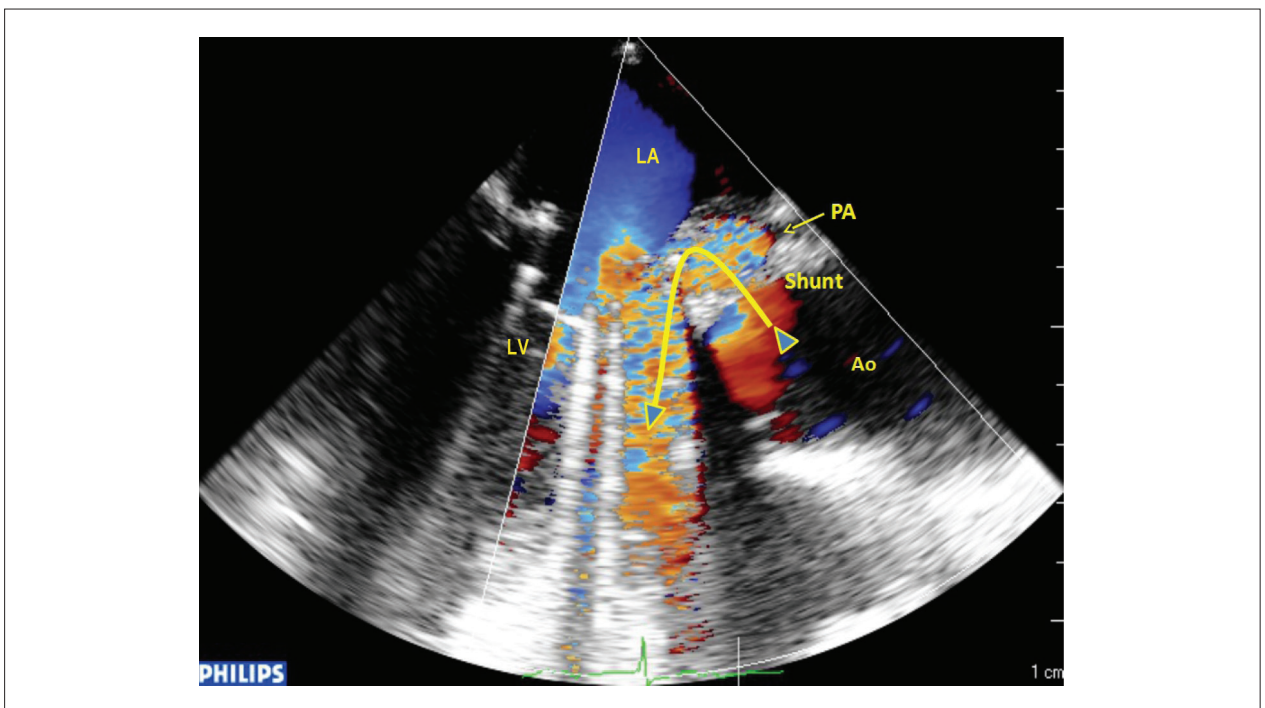


Figure 2 – Transesophageal echocardiogram shows shunt flow, originating from the aorta (Ao), passing through the pseudoaneurysm and flowing into the left ventricle (LV); LA: left atrium.

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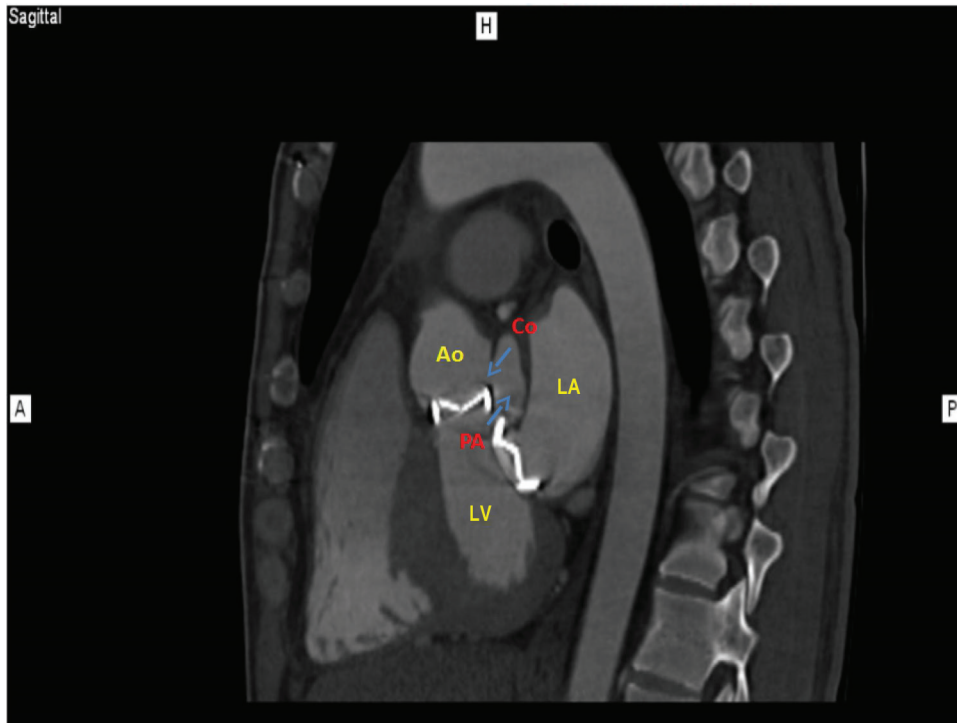


Figure 3 – Pseudoaneurysm (PA) in the mitral aortic fibrous area with fistula formation to the ascending aorta. Co: communication; Ao: aorta; LA: left atrium; PA: pseudoaneurysm; LV: left ventricle.

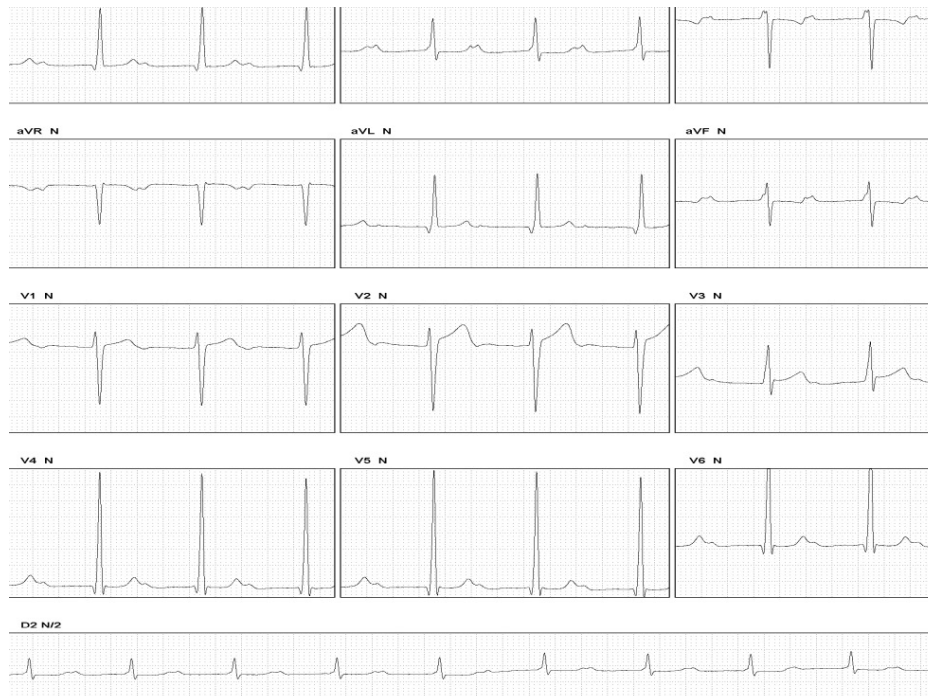


Figure 4 – Basal electrocardiogram with atrioventricular dissociation and left ventricular overload.

which also presented periprosthetic leak. Fistula described on TEE was confirmed. New metallic prostheses were implanted in the mitral and aortic positions. Prolonged cardiopulmonary bypass and dependence on circulatory support (ECMO) postoperatively.

Discussion

IE can affect both the valve endocardium and adjacent structures. It is caused by a variety of bacteria and fungi. The most incident ones include *Streptococcus viridans*, *Enterococcus sp.* and *Staphylococcus aureus*, accounting for about 80% of cases³. Other less common microorganisms such as HACEK bacteria (*Haemophilus aphrophilus*, *Actinobacillus actinomycetemcomitans*, *Cardiobacterium hominis*, *Eikenella corrodens* e *Kingella kingae*) and fungi affect the other patients.

Diagnosis of IE is based both on medical history and detailed physical examination and laboratory tests and imaging tests. Clinical, pathological, echocardiographic and microbiological parameters are considered for definitive diagnosis. The Duke criteria modified for defining the cases, divided into major and minor⁴, are used. The presence of two major criteria, a major one associated with three smaller ones or five smaller ones taken separately, is sufficient for diagnosis. The patient met Duke diagnostic criteria for IE, since he presented, respectively, two major and two minor criteria, namely: (1) two positive blood cultures for *Corynebacterium amycolatum*; (2) Echocardiogram with pseudoaneurysm possibly caused by valvular suture dehiscence and/or fistulized perivalvular abscess; and moderate aortic valve regurgitation; (3) fever associated with intracardiac prostheses; and (4) immunological phenomena in the fundus — Roth spots — as well as splenomegaly.

IE is still a disease with high morbidity and mortality despite advances in therapy and diagnosis⁵. In-hospital mortality can reach 20%⁵. According to Hasbun et al⁶, the occurrence of some specific points — comorbidities, general status, heart failure, causing organism and surgery — increases mortality.

In our case, there is a rare condition of high morbidity and mortality: IE on prosthetic valve complicated with fistulized MAIF to the left ventricle. The peculiarity of this case involves the fact that IE is active on MAIF diagnosis, and the latter is associated with an unusual organism — *Corynebacterium amycolatum*.

The intervalvular mitral aortic fibrous zone comprises a thin fibrous structure that connects the posterior portion of the aortic root to the base of the anterior leaflet of the mitral valve. Pseudoaneurysm is more often secondary to surgical trauma or infective endocarditis of the aortic valve, particularly in prosthetic valves⁷. There is also a description

of cases related to the partial dehiscence of the aortic prosthesis⁷. The patient presented two risk factors: aortic valve replacement and recent endocarditis.

The probable etiology in the case was a valve abscess resulting from infective endocarditis: a life-threatening condition little reported in literature. It also presents a high postoperative mortality rate.

From a clinical point of view, the patient may be asymptomatic in the absence of complications. Other forms of presentation involve heart failure, signs of infection, cerebrovascular events or anginal chest pain⁸. The latter is due to systolic compression of the left coronary artery². In 20% of cases, there is fistula formation⁷. Just like more serious complications, cardiac tamponade or hemopericardium due to the MAIF rupture⁹ rarely occurs.

Diagnosis can be confirmed by echocardiography, computed tomography and cardiac catheterization². In this case, the entity was strongly suspected during the course of the first echocardiogram. Subsequently, chest computed tomography angiography confirmed the diagnosis of fistulized MAIF to the left ventricle.

Although surgery is chosen in most reported cases, treatment is still controversial in the literature. Surgery may be used both to treat complications at the time of diagnosis and to prevent the occurrence of these complications. However, there are reports with conservative medical treatment¹⁰. More recently, percutaneous approach was reported⁸.

Authors' contributions

Research creation and design: Villacorta Jr. H, Martins WA; Data collection: Alban NRA, Almeida MM, Costa WLB, Ribeiro ML; Data analysis and interpretation: Alban NRA, Almeida MM, Villacorta Jr. H, Martins WA; Manuscript drafting: Alban NRA, Almeida MM, Costa WLB, Martins WA; Critical revision of the manuscript for important intellectual content: Ribeiro ML, Villacorta Jr. H, Martins WA.

Potential Conflicts of Interest

There are no relevant potential conflicts of interest.

Sources of Funding

This study was partially funded by Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro (Faperj)

Academic Association

This study is not associated with any graduate program.

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