

Native Valve Infective Endocarditis Associated with Ruptured Right Sinus of Valsalva: A Case Report

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ABSTRACT

Endocarditis is defined as an infection of the cardiac endothelium. The incidence occurs from 2 to 10 cases per 100,000 people/year. Cardiovascular complications, including cardiac arrest, cardiogenic shock, myocardial infarction, acute heart failure, and heart block. The case of a 51-year-old male patient with fever, asthenia, adynamia, and chills is presented, evolving to shock data to determine the origin, requiring management with vasopressor, a diagnostic protocol with transthoracic echocardiogram is performed where calcified aortic valve and mass attached to the valve ring and image suggestive of abscess at the level of the sinuses of Valsalva are observed. Transesophageal echocardiogram, in addition to the vegetation previously described and the abscess in the mitro-aortic continuity, tricuspid valve lesion with rupture of the sinus of Valsalva. Consultation was requested for cardiothoracic surgery with aortic valve replacement due to a N23 mechanical valve, with closure of the right sinus of Valsalva ruptured to the right ventricle infective endocarditis of the aortic and tricuspid valve with clinical improvement if any eventualities occurred. Rupture of the sinus of Valsalva with fistulization towards lower-pressure cavities (generally the right atrium and ventricle) is probably the most frequent form of presentation. Accurate diagnosis of complicated infective endocarditis means the difference between a good evolution and a poor prognosis.

KEYS WORDS: endocarditis, sinus of valsalva, aortic valve disease, echocardiography

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INTRODUCTION

Endocarditis is defined as an infection of the cardiac endothelium¹. The incidence of infective endocarditis occurs from 2 to 10 cases per 100,000 person-years. The risk populations to be diagnosed by this pathology are usually people who live in developing countries, men over 67 years of age, however, young people can also present it. Other associated risk factors are degenerative valve disease, placement of valve prostheses, catheters or cardiac devices, chronic diseases such as diabetes, immunosuppression, congenital heart disease and rheumatological diseases^{1,2}.

The criteria for infective endocarditis were originally

published in 1994, being constituted by major and minor criteria, integrating a definitive diagnosis with two major criteria or 5 minor criteria, and considering a possible diagnosis with 3 minor criteria²; In 2021, the International Society for Cardiovascular Infectious Diseases (ISCVID) convened a Working Group to prepare an update of the diagnostic criteria, publishing the Duke-ISCVID criteria in May 2023, consisting of three major criteria, 1-Microbiological: identification of typical microorganism with two or more sets of blood cultures separated from atypical with three sets, or PCR/positive nucleic acid test for *Coxiella burnetii*, *Bartonella* or *Thopfermyxa whipplei* in blood, or detection of IgM and IgG for *Bartonella* by indirect

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immunofluorescent assay; 2- Imaging: echocardiography or cardiac tomography with findings such as vegetation, valve/leaflet perforation, valve/leaflet aneurysm, abscess, pseudoaneurysm, intracardiac fistula, worsening of insufficiency or previous regurgitation or partial dehiscence of the prosthetic valve and/or with PET/CT with abnormal metabolic activity; 3- Surgical: direct inspection during cardiac procedure; and 5 minor criteria 1- Predisposition: prosthetic valve, previous valve repair, congenital heart disease, valvular stenosis or regurgitation, implantable electronic cardiac device, obstructive hypertrophic cardiomyopathy, intravenous drug use, 2-fever, 3- vascular phenomena: arterial embolus, septic pulmonary infarcts, cerebral or splenic abscess, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhages, Janeway lesions, purulent purpura, 4- immunological phenomena: positive rheumatoid factor, Osler nodules, Roth spots or immune complex-mediated glomerulonephritis, 5- microbiological evidence without meeting major criteria, 6- abnormal metabolic activity identified by PET/CT, 7-clinical criteria of valve disease such as murmur or worsening of previous murmur^{3,4}.

Intravenous antibiotics should generally be used to treat endocarditis, and optimal antimicrobial therapy involves prolonged use (>4 weeks) of bactericidal agents to eradicate infection. Vancomycin plus ceftriaxone is a reasonable option for empirical treatment in patients with native valve infective endocarditis. Cefazolin is a reasonable alternative for patients with MSSA who cannot receive penicillin without adverse effects⁵.

Cardiovascular complications, including cardiac arrest, cardiogenic shock, acute myocardial infarction, acute heart failure, and heart block were reported in nearly a quarter of patients with infective endocarditis⁶. A case of a patient with complicated infective endocarditis at the second level of care is presented.

CLINICAL PICTURE

A 51-year-old man with a history of severe aortic stenosis and chronic smoking. He began his condition with fever, asthenia, adynamia, and chills, for which he went to the medical service without presenting clinical improvement. After 5 days, he presented data of shock to determine the origin, requiring management with a vasopressor, a diagnostic protocol was carried out with a transthoracic echocardiogram where a calcified aortic valve and a mass attached to the valve ring and an image suggestive of an abscess at the level of the sinuses of Valsalva were observed. Transesophageal echocardiogram, in addition to the vegetation previously described and the abscess in the mitro-aortic continuity, tricuspid valve lesion with rupture of the sinus of Valsalva. Starting with a double empirical antibiotic scheme with vancomycin and gentamicin, later the infectious disease was assessed for who confirmed the diagnosis of endocarditis of the native valve and requested consultation with

cardiothoracic surgery. Aortic valve replacement was performed through a mechanical N23 valve, with closure of the right sinus of Valsalva ruptured to the right ventricle. Infectious endocarditis of the aortic and tricuspid valve, the cultures of the vegetations show growth of gram - and gram +, so the antibiotic therapy of vancomycin with ceftriaxone is changed to vancomycin and meropenem with clinical improvement without eventualities.

DISCUSSION

Heart failure caused by valvular regurgitation is a major complication of infective endocarditis and manifests as refractory pulmonary edema with or without shock. Aortic root abscess can occur in patients with aortic valve endocarditis, causing damage to the atrioventricular node with resultant heart block. Perivalvular (aortic and mitral) abscesses are more common with prosthetic valve endocarditis than with the native valve, however they can occur⁶.

Rupture of the sinus of Valsalva with fistulization towards lower-pressure cavities (generally the right atrium and ventricle) is probably the most frequent form of presentation. It usually appears in the form of progressive heart failure and rapid evolution, being possible the auscultation of a continuous murmur in machinery, of high intensity and mesocardial predominance⁷.

The three main indications for surgery in patients with native valve infective endocarditis are heart failure due to valve dysfunction or perforation, uncontrolled endocardial infection, and prevention of systemic embolization, especially cerebral, with the aim of debridement of infected material and repair or replacement of damaged cardiac structures⁸. The AATS guidelines suggest that patients who have undergone surgery receive antibiotic prophylaxis, as they constitute a high-risk group for recurrent endocarditis⁸.

More specifically, urgent surgery is indicated when there are (I) >10 mm vegetations after one or more embolic events, (II) >10 mm vegetations with severe valvular dysfunction, and (III) isolated large (>15 mm) or very large (>30 mm) vegetations⁸.

In relation to management, admission to the intensive care unit (ICU) is usually part of the normal management of the patient after surgery for infective endocarditis. In addition, the admission of patients with IE to the ICU may be due to hemodynamic instability associated with severe sepsis, frank HF or severe valve disease or organ failure due to complications related to infective endocarditis. Estimating the number of patients that must be admitted to the ICU is complicated. In a retrospective and multicenter observational study with 4106 patients, the reasons for admission to the ICU were congestive HF (64%), septic shock (21%), neurological deterioration (15%), and cardiopulmonary resuscitation 9%. Critical care morbidity is high, with up to 79% of patients requiring mechanical ventilation, 73% requiring inotropic support, and 39% suffering from renal failure⁹.

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CONCLUSION

The accurate diagnosis of infective endocarditis complicated by echocardiography means the difference between a good evolution and a poor prognosis.

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