

CASE REPORT

Isolated pulmonary valve endocarditis in a normal heart

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Received 11 November 2011; accepted 17 January 2012

Available online 31 July 2012

KEYWORDS

Infective endocarditis;
Pulmonary valve;
Three-dimensional echocardiography

PALAVRAS-CHAVE

Endocardite infecciosa;
Válvula pulmonar;
Ecocardiografia a tres-dimens

Abstract Isolated pulmonary valve endocarditis is a very rare entity, usually associated with intravenous drug abuse. We describe a case of isolated pulmonary valve endocarditis in a diabetic patient with no apparent precipitating factors besides a lesion on the right hallux. The clinical course was favorable and he was discharged home after a six-week course of antibiotic therapy.

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Endocardite isolada de válvula pulmonar em coração estruturalmente normal

Resumo A endocardite isolada da válvula pulmonar é uma patologia extremamente rara, estando mais comumente associada ao consumo de drogas por via intravenosa. Descrevemos um caso de endocardite isolada da válvula pulmonar num doente diabético cujo único factor de risco identificado era uma lesão no hálux direito. A evolução foi favorável e o doente teve alta clínica após seis semanas de antibioterapia.

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Introduction

Infective endocarditis (IE) involving the right heart valves accounts for 6% of patients with IE. The typical site of infection is the tricuspid valve (TV), either in isolation or accompanied by pulmonary valve (PV) involvement.¹

Isolated pulmonary valve endocarditis is very rare, affecting less than 1.5% of patients suffering from IE²; the literature includes 36 cases described from 1960 to 1999³ and 45 cases between 1960 and 2005.⁴ Risk factors include intravenous drug abuse, alcoholism, sepsis and central venous catheter or pacemaker interventions with subsequent lead infection; in 28% of cases no definite risk factor is found.^{3–6} When not associated with intravenous drug abuse – in which the most commonly involved agent is *Staphylococcus aureus* – *Streptococcus viridans* is the most prevalent pathogen (55–60%).⁴

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Figure 1 Skin lesion affecting right hallux.

Case report

A 68-year-old man, diabetic with peripheral neuropathy, was admitted to the Internal Medicine ward due to prolonged fever. He reported suffering from both asthenia and fever over the preceding three weeks. He had been given empirical amoxicillin plus clavulanic acid two weeks previously, a treatment that led to transient symptomatic improvement. During initial observation the patient was normotensive with an axillary temperature of 37.6°C. Both cardiac and pulmonary examinations were normal. His right hallux exhibited a lesion, which by his account had been present for the preceding twelve months (Figure 1). Blood tests revealed leukocytosis – $22.70 \times 10^9/l$ with 95.8% neutrophils – and elevated CRP (2.14 mg/dl). PA chest X-rays were normal. Blood cultures revealed methicillin-susceptible *Staphylococcus aureus* (MSSA). Transthoracic echocardiography (TTE), and later transesophageal echocardiography (TEE), both revealed a mobile, ovoid, 1-cm diameter mass adhering to the arterial face of the pulmonary valve, and another highly mobile filiform mass also adhering to the PV and protruding into the right ventricle (Figures 2 and 3) without causing any obstruction. Taking into account the antibiotic susceptibility test results, the prescribed antibiotic therapy consisted of flucloxacillin 1000 mg IV every 4 h and gentamicin 1 mg/kg every 8 h for six weeks. The fever began to subside on the eighth day. Control

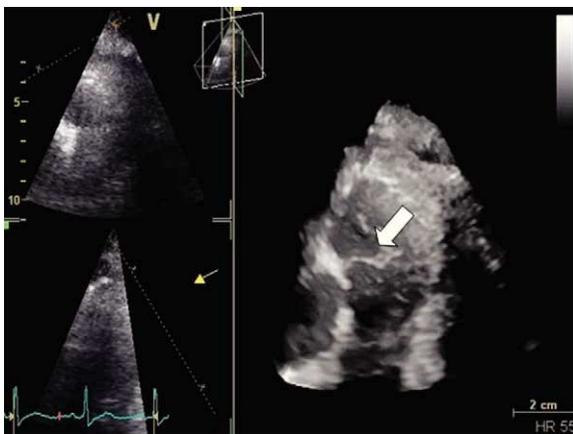


Figure 2 Three-dimensional view of pulmonary valve; vegetation is indicated by the white arrow.

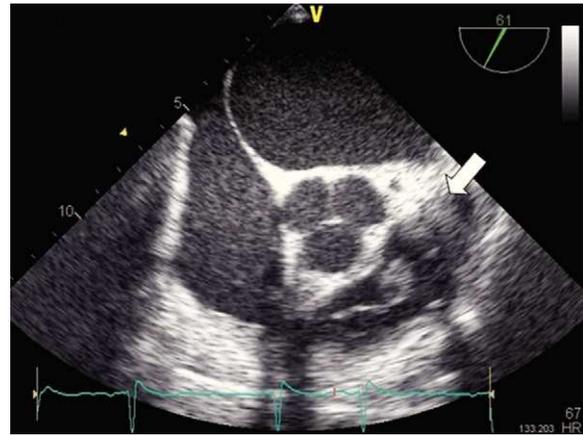


Figure 3 Transesophageal 61° view of aortic valve. Pulmonary valve vegetation is indicated by the white arrow.

echocardiography during hospitalization showed only mild to moderate pulmonary regurgitation. The patient had no other clinical manifestations or identifiable complications, including thromboembolism. Blood cultures were negative after the antibiotic course was completed. The patient was discharged home after six weeks. Nevertheless, the pre-discharge echocardiogram revealed persistence of the vegetations (Figure 4), which had developed a fibrotic appearance, and persistent mild to moderate pulmonary regurgitation.

Discussion

In association with TV endocarditis, pulmonary valve IE is a rare entity, but it is even less common when it arises in isolation. It is assumed that its rarity is due to the low pressure gradients within the right heart, the low prevalence of congenital malformations, the lower oxygen content of venous blood and the differences in the covering and vascularization of the right heart endothelium.³ Pulmonary valve IE is more frequent in males carrying the risk factors of intravenous drug abuse, alcoholism, sepsis or infection of central venous catheter or pacemaker leads.³



Figure 4 Short-axis view of vegetation on pulmonary valve after 6 weeks of antibiotic therapy, indicated by the white arrow.

In the present case, the absence of typical risk factors or structural heart problems increased the difficulty of reaching an accurate diagnosis. However, the patient is diabetic, which is a host risk factor for IE^{7,8} and *S. aureus* bacteremia.^{5,6,8} Diabetes is related to depressed leukocyte chemotaxis, adherence, phagocytosis, intracellular killing, and opsonization, factors that predispose to increased incidence and severity of infections.⁸ Several studies show that the incidence of *S. aureus* IE is rising^{5,6}; there is an increasing number of patients at risk for IE – due to ageing populations and increasing use of prosthetic cardiac devices – and of those at risk for *S. aureus* bacteremia, due to comorbidities such as diabetes, hemodialysis and immunosuppression.^{5,6} In this case the presence of a chronic diabetic ulcer on the right foot and the absence of other identifiable risk factors led us to believe that this might constitute the etiologic source of *S. aureus* bacteremia.⁹ The management and prognosis of this rare entity are determined by early diagnostic suspicion.² Due to the low sensitivity of TTE for evaluating the PV (vegetations are only identified by TTE in 70% of cases), TEE is the next step in diagnostic workup. Right-side *S. aureus* IE typically has a favorable prognosis with medical therapy alone; by contrast, left-side *S. aureus* IE has high morbidity and mortality.⁶ There is no difference between diabetic and non-diabetic patients with IE with respect to complications such as embolism, congestive heart failure, valvular vegetation, new valvular regurgitation, or intracardiac abscess, but the former are less likely to undergo surgery for the index IE episode. This may be explained by their worse clinical profile rather than by their having less indications for surgery.⁸ Indications for surgery are abscess formation, progressive valve destruction and incompetence, persistent bacteremia despite antimicrobial therapy and relapsing infection after completion of a full course of antibiotics.¹⁰ In this case the evolution was favorable, without complications. However, current evidence shows that diabetic patients have higher overall in-hospital mortality and diabetes is an independent predictor of IE mortality, especially in male patients.⁸

This case is notable not only due to the rarity of isolated PV endocarditis but also due to the absence of typical risk factors for IE, and highlights the need for meticulous skin care in diabetic patients.

Conflicts of interest

The authors have no conflicts of interest to declare.

References

1. Perez-Paredes M, Rincón JM, Varo AC, et al. [Isolated pulmonary endocarditis on native valve in elderly patient without predisposing factors]. *Rev Esp Cardiol*. 2001;54:402–4.
2. Gonzalez-Juanatey C, Testa-Fernandez A, Lopez-Alvarez M. Isolated pulmonary native valve infectious endocarditis due to *Enterococcus faecalis*. *Int J Cardiol*. 2006;113:E19–20.
3. Ramadan FB, Beanlands DS, Burwash IG. Isolated pulmonic valve endocarditis in healthy hearts: a case report and review of the literature. *Can J Cardiol*. 2000;16:1282–8.
4. Schroeder RA. Pulmonic valve endocarditis in a normal heart. *J Am Soc Echocardiogr*. 2005;18:197–8.
5. Fowler Jr VG, Miro JM, Hoen B, et al. *Staphylococcus aureus* endocarditis: a consequence of medical progress. *JAMA*. 2005;293:3012–21.
6. Miro JM, Anguera I, Cabell CH, et al. *Staphylococcus aureus* native valve infective endocarditis: report of 566 episodes from the International Collaboration on Endocarditis Merged Database. *Clin Infect Dis*. 2005;41:507–14.
7. Strom BL, Abrutyn E, Berlin JA, et al. Risk factors for infective endocarditis: oral hygiene and nondental exposures. *Circulation*. 2000;102:2842–8.
8. Kourany WM, Miro JM, Moreno A, et al. Influence of diabetes mellitus on the clinical manifestations and prognosis of infective endocarditis: a report from the International Collaboration on Endocarditis-Merged Database. *Scand J Infect Dis*. 2006;38:613–9.
9. Lipsky BA, Berendt AR, Deery HG, et al. Diagnosis and treatment of diabetic foot infections. *Plast Reconstr Surg*. 2006;117 7 Suppl:2125–38S.
10. Tariq M, Smego R Jr., Soofi A, et al. Pulmonic valve endocarditis. *South Med J*. 2003;96:621–3.