

A rare case of isolated streptococcal pulmonary valve endocarditis diagnosed with repeated echocardiography

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A 49-year-old man was transferred from an internal department to the intensive care unit due to septic shock resulting in multiple organ dysfunction. On admission, he presented with high fever and bilateral lower limb paresis. His medical history was unremarkable. Laboratory test results revealed high levels of inflammatory markers (C-reactive protein, 29 mg/dl [reference range <0.5 mg/dl]; procalcitonin, 18 ng/ml [>2.0 denoting high risk for severe sepsis]), and thrombocytopenia. Magnetic resonance imaging showed multiple spine abscesses. A chest computed tomography scan revealed extensive pneumonia and pulmonary embolism. The patient received therapy with imipenem (4 × 0.5 g IV) and vancomycin (2 × 1.0 g IV). The initial blood cultures were positive for *Streptococcus pneumoniae*. Repeated transthoracic echocardiography (TTE) revealed right ventricular (RV) overload and no signs of intracardiac infection.

In the intensive care unit, the patient required an inotropic support, mechanical ventilation, and

continuous renal replacement therapy. Ongoing infection with no clinical improvement and newly onset diastolic murmur raised a suspicion of infective endocarditis (IE). The third TTE, performed 1 month after admission, showed an enlarged and hypokinetic RV, permanent flattening of the interventricular septum suggesting pressure and volume RV overload (FIGURE 1A), turbulent flow in the pulmonary artery, and an additional mobile structure in the RV outflow tract (RVOT) detectable in the subcostal view (FIGURE 1B).

Importantly, in transesophageal echocardiography (TEE), the left heart valves and tricuspid valve presented no signs of IE (FIGURE 1C). TEE revealed a dilated pulmonary artery (36 mm), the 26-mm long mobile echo attached to the pulmonary valve (PV) prolapsing into the RVOT during diastole, which is typical for bacterial vegetation (FIGURE 1D), and PV damage with severe pulmonary regurgitation (FIGURE 1E). The patient underwent cardiac surgery with bioprosthetic pulmonary valve

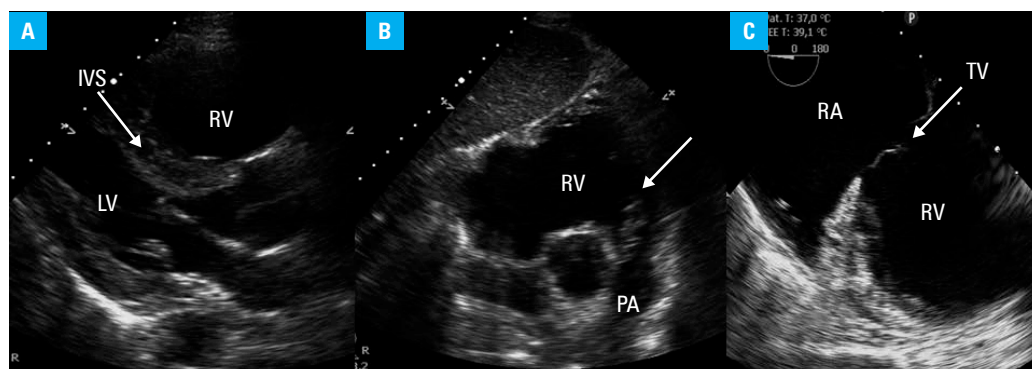


FIGURE 1 Echocardiographic imaging of pulmonary valve endocarditis; **A** – an enlarged right ventricle and flattening of the interventricular septum (arrow); transthoracic echocardiography (TTE), long-axis view; **B** – additional echo in the distal right ventricular outflow tract (RVOT) (arrow); TTE, short-axis subcostal view; **C** – normal tricuspid valve (arrow); transesophageal echocardiography [TEE], 4-chamber view
Abbreviations: see the next page

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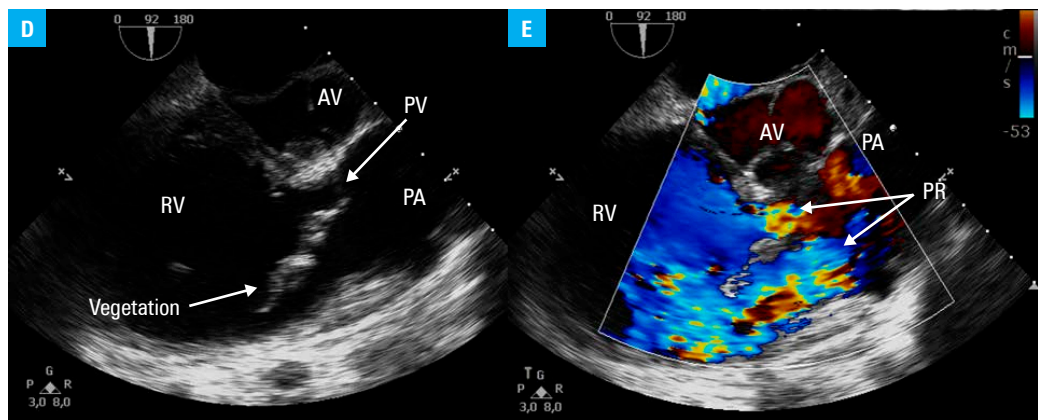


FIGURE 1 Echocardiographic imaging of pulmonary valve endocarditis; **D** – long vegetation attached to the pulmonary valve (arrows); TEE, RVOT view; **E** – 2 jets of severe pulmonary regurgitation (arrows); TEE, color Doppler, RVOT view
Abbreviations: AV, aortic valve; IVS, inter-ventricular septum; LV, left ventricle; PA, pulmonary artery; PR, pulmonary regurgitation; PV, pulmonary valve; RA, right atrium; RV, right ventricle; TV, tricuspid valve

replacement. His recovery was uneventful, and he was discharged after 3.5 months of therapy.

Right-sided IE accounts for 5% to 10% of cases and occurs in intravenous drug abusers and in patients with an implantable device, congenital heart disease, or HIV infection.¹ It usually involves the tricuspid valve.^{1,2} Isolated PV endocarditis is very rare, accounting for less than 2.0% of hospitalizations for IE, and is extremely rare in patients with structurally normal hearts.^{2,4} It mostly affects men,⁵ and its main risk factors include intravenous drug abuse, alcohol abuse, sepsis, catheter-related infection, immunosuppression, dental extraction, and bowel surgery.^{1,3,4} The most common cause of PV endocarditis is *Staphylococcus aureus*.⁵ Streptococcal IE is rare (about 13% of cases).^{2,5} The clinical presentation of PV endocarditis is similar to that of tricuspid valve infection. However, the symptoms may suggest other pulmonary diseases; therefore, an accurate diagnosis may be delayed. PV may be not well visualized on TTE, making the diagnosis of IE more difficult. Thus, repeated TTE and TEE are recommended.^{1,3} PV surgery is indicated in cases of valve damage with severe insufficiency, long vegetation, or cardiovascular instability.^{1,2,4}

Our case shows that PV endocarditis may occur in patients without heart disease, with no history of intravenous drug use, or impaired immunity. In patients with risk factors and unexplained respiratory symptoms, PV endocarditis should always be considered in a differential diagnosis.

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