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Isolated Pulmonic Valve Endocarditis

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Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
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Conflict of interest: None declared

Patient: Male, 47
Final Diagnosis: Pulmonic valve endocarditis
Symptoms: Fever • myalgia
Medication: —
Clinical Procedure: —
Specialty: Cardiology

Objective: Rare disease

Background: Infective endocarditis (IE) has a high mortality rate, even when treated with appropriate antibiotic therapy and surgical intervention. Right-sided endocarditis is in itself rare, with some studies reporting an incidence of 5–10%. The majority of these cases involve the tricuspid valve, and isolated pulmonary valve endocarditis (PVE) is an extremely rare entity affecting less than 2% of patients with infective endocarditis. Identification and early management are crucial to prevent long-term complications and reduce mortality.

Case Report: We present a patient with a history of essential hypertension and no underlying valvular disease, who underwent dental cleaning and subsequently developed low-grade fever, myalgia, and malaise. This occurred during the flu season, and was initially diagnosed and treated as flu, without any improvement. The patient was later found to be bacteremic with *S. mitis*, with no identifiable source, and a normal transthoracic echocardiogram (TTE). He was later hospitalized, had a transesophageal echocardiogram, and was found to have a large pulmonic valve vegetation.

Conclusions: This case presents an interesting and rare finding of endocarditis, isolated to the pulmonic valve, in an otherwise healthy individual with no predisposing risk factors. The lack of peripheral stigmata, as well as an unremarkable initial outpatient TTE, made the diagnosis more difficult. It should also be noted that current guidelines do not specifically address right-sided endocarditis, and do not specify the role of surgical intervention.

MeSH Keywords: Endocarditis • Endocarditis, Bacterial • Pulmonary Valve

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/913041v

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Background

Infective endocarditis (IE), although rare, has a high mortality rate, even with appropriate antibiotic therapy and surgical intervention. Isolated pulmonic valve endocarditis (PVE) is extremely rare, affecting less than 2% of patients with IE [1]. Early symptoms of IE can be initially misdiagnosed as a viral illness, particularly during the flu season, which can result in delayed intervention and an increased rate of complications. This case is an example of the importance of avoiding the cognitive bias of anchoring when a clinical history suggests an alternate, potentially fatal, diagnosis. It also adds to the short list of isolated PVE cases with no predisposing risk factors.

Case report

A 47-year-old man presented to the emergency department (ED) at another hospital, in the winter, with complaints of fevers, malaise, chills, and joint and neck pain of 3-week duration. His medical history included hypertension. The patient had professional dental cleaning performed 2 weeks prior to the onset of symptoms. These symptoms were initially attributed to flu and he was subsequently discharged with a course of oseltamivir, but his symptoms failed to resolve. Blood cultures obtained during that ED visit yielded *Streptococcus mitis*. Given his symptoms and positive blood cultures, his primary care physician ordered a transthoracic echocardiogram (TTE), which was unremarkable. He was then referred to our hospital due to suspicion of endocarditis.

The patient was afebrile with stable vital signs on presentation to our hospital. Physical examination was unremarkable for stigmata of endocarditis. Lab data revealed ESR 48 mm/hr (normal 0–22 mm/hr) and CRP 10.796 (normal <3 mg/L). Complete blood count and metabolic panel were normal. Initial chest radiograph and urinalysis were negative. Vancomycin and ceftriaxone were initiated in the emergency department. *S. mitis* was again isolated from blood cultures. Transesophageal echocardiography (TEE) was performed because of persistent bacteremia. Repeat TTE and TEE revealed a large highly mobile pulmonic valve vegetation (17×6 mm), with mild pulmonic regurgitation, without involvement of any other heart valve (Figure 1). The cardiothoracic surgery service did not recommend surgical intervention.

The blood culture isolate was sensitive to ceftriaxone; thus, vancomycin was discontinued. The infectious disease consultant recommended a 6-week course of ceftriaxone. The patient had persistent fevers and the acute onset of left-sided chest pain 1 week after admission. A repeat TTE revealed a decrease in the size of the vegetation. Because of persistent fever in the setting of negative blood cultures, and the decrease

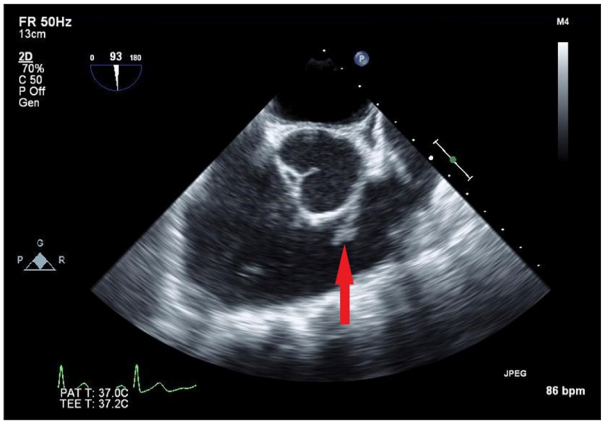

Figure 1. Echocardiogram with arrow (red) demonstrating bulky mobile pulmonic valve vegetation.

in the size of the vegetation, partial embolization of the vegetation was considered. ^{67}A gallium scan was performed, which demonstrated increased uptake in the posterior left lower lobe of the lung. Persistent fever was attributed to septic microembolization to the lung. The antibiotic regimen was expanded to include gentamicin 100 mg every 8 h, and thereafter fevers subsided and the patient remained hemodynamically stable. Antibiotics were continued on an outpatient basis with medications administered via a peripherally-inserted central catheter. The regimen included gentamicin 100 mg every 8 h for 2 weeks and ceftriaxone 2 g every 12 h for 6 weeks. A repeat TEE 1 month later showed continued resolution of vegetations.

Discussion

Infective endocarditis (IE) has a high mortality rate, despite treatment with appropriate antibiotic therapy and surgical intervention. IE has an in-hospital mortality rate of 15–20%, and a 1–year mortality rate approaching 40%. The overall incidence of IE is 3–10 per 100 000 patient-years, with a higher prevalence in older patients. Right-sided endocarditis is less common than left-sided involvement, and accounts for 5–10% of IE cases, most of these cases involve the tricuspid valve. Isolated pulmonic valve endocarditis (PVE) affects less than 2% of patients with IE [1]. The literature review published by Chowdhury et al. estimated that 70 cases of isolated PVE were reported between 1979 and 2013 [2]. Predisposing factors for PVE include intravenous drug abuse, alcoholism, sepsis [3], immunosuppression, and catheter-related infections [4]. Up to 28% of cases of PVE have no identified predisposing factors [5].

Modified Duke criteria are applied as the standard diagnostic tool for all patients with suspected IE. Echocardiography is complementary for diagnosis. Transthoracic echocardiogram is usually the initial test in most patients, but a TEE is recommended when the initial transthoracic imaging is negative in

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the setting of high clinical suspicion. A review of the literature by Gonzàlez-Alujas et al. reported TTE sensitivity ranges between 40% and 63% and that of TEE is 90–100%. In addition to establishing the diagnosis of endocarditis, echocardiography may also reveal complications such as valvular regurgitation or rupture, as well as the presence of an abscess or fistula formation.

Blood cultures should be obtained before the initiation of empiric antibiotic therapy. The duration and dosage depend on the underlying pathogen. Two weeks of treatment with penicillin or ceftriaxone combined with an aminoglycoside is effective in viridans group Streptococcal endocarditis in selected patients with uncomplicated infection [7]. The development of septic emboli in our patient led to the decision to prolong antibiotic treatment. Blood cultures are repeated until negative to demonstrate the adequacy of treatment. Repeat echocardiography is also utilized to track change in vegetations and to assess whether complications have developed. Current guidelines identify the specific indications for surgical intervention. These include valvular regurgitation resulting in acute heart failure, the presence of multi-drug resistant organisms or fungi, IE complicated by heart block or abscess formation, persistent bacteremia or recurrent emboli despite appropriate antibiotic therapy, and severe regurgitation with mobile vegetations >10 mm [8]. It should be noted that these indications are based on studies in patients with left-sided native valve and prosthetic valve IE.

Except for recent dental prophylaxis, this patient had none of the other predisposing risk factors. A high degree of clinical suspicion was maintained because of the paucity of clinical history, the absence of intravenous drug abuse, and the initial negative outpatient transthoracic echocardiogram. According to the modified Duke criteria, this patient would have fallen into the category of possible IE, with positive blood cultures for *S. mitis* drawn >12 h apart but without evidence of vegetations detected on TTE, without other minor criteria at the time of presentation. The decision was made to proceed with TEE because there was no obvious source for bacteremia. At the recent dental procedure, our patient did not meet the criteria for prophylactic antibiotics.

Conclusions

This case presents the interesting and rare finding of endocarditis isolated to the pulmonic valve in an otherwise healthy individual with no predisposing risk factors. Although the patient had symptoms that may overlap with those of the flu, the duration of symptoms (3 weeks) should have been taken into account on the initial diagnosis. However, this case occurred during the winter of 2017–2018, a particularly bad flu season, in which an already overwhelmed ED may have suffered an availability bias. The lack of peripheral stigmata, as well as an unremarkable initial outpatient TTE, also made the diagnosis more difficult in this case. It should be noted that current guidelines do not specifically address right-sided endocarditis, and do not specify the role of surgical intervention.

Conflicts of interest

None.

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