



Case Report

Left ventricular pseudoaneurysm as a complication of prosthetic mitral valve infective endocarditis

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ABSTRACT

We report a case of infective endocarditis complicated with left ventricular pseudoaneurysm originating from the posterior annulus of the prosthetic mitral valve in a 56-year-old woman. Despite prolonged antibiotic treatment, transesophageal echocardiography (TEE) showed partial detachment of the prosthesis from the posterior mitral annulus. Three-dimensional rotational computed tomography clearly demonstrated a pseudoaneurysm toward the posterolateral portion of the mitral prosthetic valve, which was not evident by TEE. Valve replacement and repair of the pseudoaneurysm were performed 83 days after initiation of antibiotic therapy. Left ventricular pseudoaneurysm is a rare but serious complication of mitral prosthetic valve endocarditis. It requires prompt diagnosis and early surgical intervention.

<Learning objective: We present a case of infective endocarditis (IE) complicated with left ventricular pseudoaneurysm originating from the prosthetic mitral valve. Repeated transesophageal echocardiography is recommended for all IE patients when perivalvular extension is suspected. Electrocardiography-gated three-dimensional-computed tomography is useful for detection and evaluation of pseudoaneurysm, especially in planning surgical procedures.>

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Introduction

Pseudoaneurysm of the left ventricle is a rare complication of mitral valve infective endocarditis (IE), although perivalvular cavities or pseudoaneurysm complicating aortic valve IE have been frequently reported [1]. In this report, we describe a case of pseudoaneurysm of the left ventricular posterior wall, which developed as a complication of mitral prosthetic IE. This complication of endocarditis is associated with high rates of morbidity and mortality, especially for those in whom surgery is not performed.

Case report

A 56-year-old woman was admitted to our hospital for evaluation of persistent low-grade fever lasting for 10 days. Past history included rheumatic mitral valvular disease requiring mitral valve replacement (Hall–Kaster single tilting-disc prosthesis) 26 years previously and chronic renal failure requiring hemodialysis

for 13 years. A recent echocardiogram revealed progression of aortic stenosis, regurgitation, and decreased left ventricular function (ejection fraction: 30%), but the prosthetic mitral valve functioned well. After admission, blood tests revealed *Streptococcus salivarius* in culture, and transesophageal echocardiography (TEE) revealed 11-mm diameter vegetation attached to the mitral prosthesis (E-component 1A). No evidence of prosthetic valve detachment or paravalvular leakage was found initially. The detected *S. salivarius* was ampicillin-sensitive (minimal inhibitory concentration = 0.064 µg/mL), and we started intravenous ampicillin 2 g twice a day.

On the 12th day after admission, contrast-enhanced computed tomography (CT) revealed a perivalvular cavity located in the posterior atrioventricular groove (Fig. 1A), previously there had been no cavity formation with CT scanned about 1 year previously. The cavity was poorly enhanced with contrast dye and was considered to be an abscess cavity. Coronary angiography was performed to rule out the possibility of aneurysm originating from the left circumflex artery or coronary sinus vein, but no communication between the cavity and the coronary arteries or veins was detected. Early surgical intervention was recommended, but the patient refused. On the 47th hospital day, she developed low-grade fever and dysarthria, and contrast-enhanced head CT revealed mycotic aneurysm and

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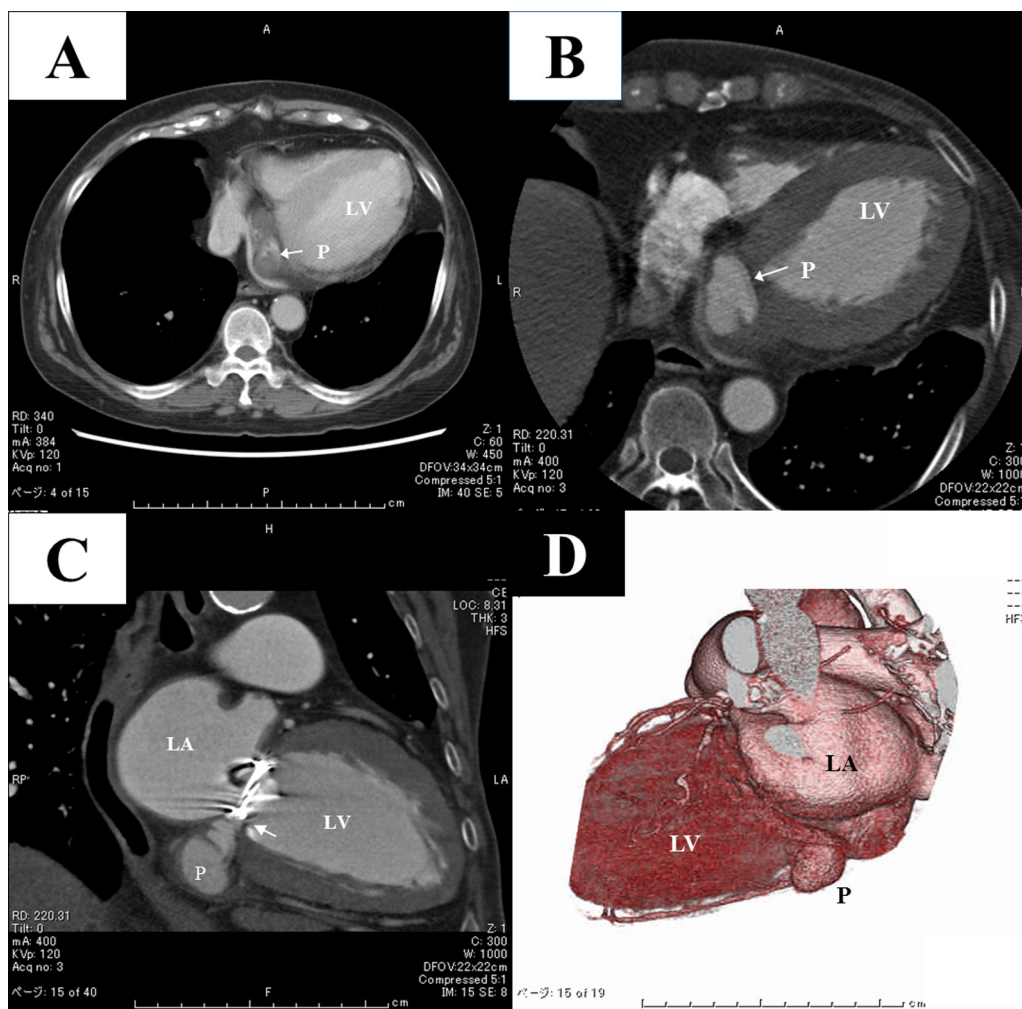


Fig. 1. (A) Non-electrocardiography (ECG)-gated contrast-enhanced computed tomography (CT) on day 12 showing a mass adjacent to the posterior mitral annulus. The cavity was poorly enhanced at this time. (B–D) An ECG-gated CT performed with a 64-slice CT scanner on day 48 clearly showing that the cavity was the pseudoaneurysm originating from the posterior annulus of the mitral prosthesis. Clear communication of the pseudoaneurysm and left ventricle was identified (white arrow in C). Ao, aorta; LA, left atrium; LV, left ventricle; P, pseudoaneurysm.

brain abscesses (Fig. 2A and D). Electrocardiography (ECG)-gated three-dimensional (3D) CT with a 64-slice CT scan, which was performed on the 48th day, revealed that the cavity had developed as a pseudoaneurysm originating from the posterior annulus of the mitral prosthesis (Fig. 1B–D). As the pseudoaneurysm had grown rapidly, surgical intervention was once again strongly recommended. However, the patient refused after being informed of possible complications resulting from surgery. On the 70th day, she developed low-grade fever again and C-reactive protein had increased to 30 mg/dl, having been under 2.0 mg/dl after 4 weeks of antibiotic treatment, and repeated TEE, on the 76th day, showed that the mitral prosthesis was partly detached from the posterior annulus, causing perivalvular leakage (E-component 1B). At this point, the patient accepted all the possible risks and agreed to undergo surgical intervention.

During surgery, a detachment of mitral prosthesis and a defect of myocardium were observed along the posterior part of the mitral prosthesis, communicating with the pseudoaneurysm. The defect was closed with a Gore-Tex patch from inside the left ventricle. The mitral prosthesis was replaced by a 27-mm St. Jude bi-leaflet mitral prosthesis, and the degenerated and stenotic aortic valve was replaced with a 17-mm St. Jude Regent aortic prosthesis. The antibiotics were continued for 4 weeks postoperatively, and the patient was discharged after 18 weeks of hospitalization. CT

evaluation of the brain prior to discharge revealed that the aneurysm had decreased in size and the brain abscesses had improved (Fig. 2B, C, E, F). At 4-year follow-up, the patient was classified as New York Heart Association functional class I with no evidence of any neurological deficit.

Discussion

Left ventricular pseudoaneurysm is commonly caused by myocardial infarction. A review of 290 cases of left ventricular pseudoaneurysm showed that myocardial infarction was present in more than half of the cases; infection was responsible for this condition in only 13% of cases [2]. Left ventricular pseudoaneurysm is commonly located in the posterolateral wall, in contrast to true left ventricular aneurysm which typically forms in the anterior or apical wall. In the present case, the pseudoaneurysm originated from the posterior annulus of the prosthetic mitral valve as a complication of IE in the prosthetic mitral valve.

Periannular extension of IE has been reported to occur in 19–40% of cases of native valve endocarditis and in 55–94% of cases of prosthetic valve endocarditis (PVE). A strong association between aortic valve infection and perivalvular complications has been reported [3]. Periannular extension of PVE sometimes results in periannular ring abscesses or pseudoaneurysm formation and cause dehiscence

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