

# Atrial Septal Abscess in Early-Onset Prosthetic Mitral Band Endocarditis: A Case for Multimodality Imaging



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## INTRODUCTION

Non-nosocomial health care-associated infections are increasingly associated with early-onset prosthetic material-related endocarditis. Microorganisms can infect the prosthetic material either intraoperatively by direct contamination or postoperatively via hematogenous spread during the initial days or weeks after surgery because of transient bacteremia. We present the case of an elderly woman who developed a large interatrial septal abscess as a sequela to prosthetic mitral band-related endocarditis.

## CASE PRESENTATION

A 72-year-old woman with diabetes had undergone coronary artery bypass grafting and mitral valve repair with a 40-mm band via the transeptal approach. The interatrial septum was closed using Prolene sutures. The patient's postoperative hospital stay was uneventful. Three weeks after surgery, she contacted the operating surgeon reporting discharge from the sternal wound. She was prescribed empiric antibiotics for 2 weeks with antiseptic dressings. Because of unresolved symptoms and clinical deterioration, the patient returned and was admitted to the hospital.

Upon examination, she was febrile (99.5°F), with a regular pulse of 118 beats/min and blood pressure of 100/70 mm Hg, and had a serosanguinous discharge oozing from her sternal wound. She had no petechiae, pallor, or pedal edema and had normal heart and breath sounds. Her abdomen was soft and nontender, with no organomegaly. Central nervous system examination and chest x-ray results were also normal. Laboratory tests revealed hemoglobin of 10 mg/dL, a total leukocyte count of 18,500/mm<sup>3</sup> with predominantly neutrophilia with mild thrombocytosis, and normal renal and liver function test results. Three sets of cultures from both blood and the sternal wound were negative for microbial growth.

Transthoracic echocardiography showed a mildly thickened, irregular interatrial septum and increased echodensity along the prosthetic mitral band (Figure 1). There were multiple mobile vegetations on the mitral valve leaflets, trivial mitral regurgitation, and mild tricuspid regurgitation. There was moderate left ventricular systolic dysfunction, with akinesia of the mid, apical lateral, and inferior

wall segments. Transesophageal echocardiography revealed a thick atrial septum of 1.4 × 2 cm, with areas of echolucency suggestive of liquefactive necrosis or abscess. There was a mobile pedunculated echogenic mass protruding into left atrial atrium from the mitral annulus and also extruding from the interatrial abscess seen in multiple views (Figure 2, Videos 1-3). Three-dimensional transesophageal echocardiography confirmed mobile vegetations from the mitral valve to the atrial surface of the prosthetic mitral band along the posterior mitral annulus (Video 4). The en face left atrial view revealed central liquefaction of the interatrial septum abscess cavity in the region of the fossa ovalis extruding into the left atrium, suggesting a posterior basal abscess of the left ventricular wall (Figure 3, Video 5).

High-resolution computed tomography of the chest and abdomen demonstrated a central hypoattenuated region of the thickened interatrial septum, vegetations on the prosthetic mitral band with a posterior basal left ventricular wall abscess (Figure 4), and a large splenic infarct (Figure 5).

After establishing the diagnosis of prosthesis endocarditis and interatrial septal and posterobasal left ventricular wall abscess, the patient was scheduled for surgery. Unfortunately, 3 days later, she developed an intracerebral bleed and died 2 weeks later.

## DISCUSSION

In one series, the incidence of early-onset prosthetic valve endocarditis for annuloplasty rings was 0.2% (four of 1,992 cases). In that particular series, the patients were significantly older, less likely to use injection drugs, and more likely to have health care-associated infections and intracardiac abscess.<sup>1,2</sup> The incidence of atrial septal endocarditis following percutaneous or surgical closure of atrial septal defects has been reported in only a few case reports. Abscess formation (defined as a thickened area or mass with a heterogeneous or echolucent appearance) on the interatrial septum is even more rare.<sup>3-5</sup> Usual sites for abscess formation in cases of prosthetic mitral valve endocarditis are the periannular region, aortic root, and left ventricular wall by direct extension. Pathogens have direct access to the prosthesis-annulus interface and also to perivalvular tissue along suture pathways. Because the valve sewing ring, mitral annulus, and anchoring sutures are not endothelialized early after valve implantation, there is increased risk for prosthetic valve endocarditis.<sup>6-8</sup> We hypothesize that in our case, the abscess on the interatrial septum could have formed either by seeding of the interatrial septum from mobile suppurative vegetations or de novo during the postoperative period, when the interatrial septum was exposed to bacteremia from the sternal wound infection. Transesophageal echocardiography using three-dimensional imaging provided excellent anatomic details in this case by confirming the size and location of the abscess. High-resolution

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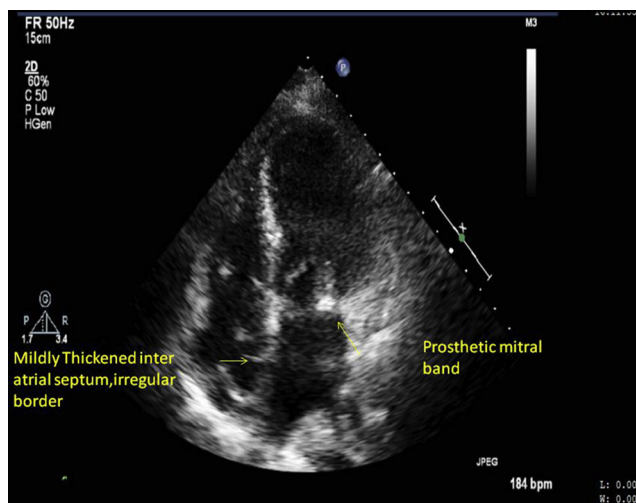
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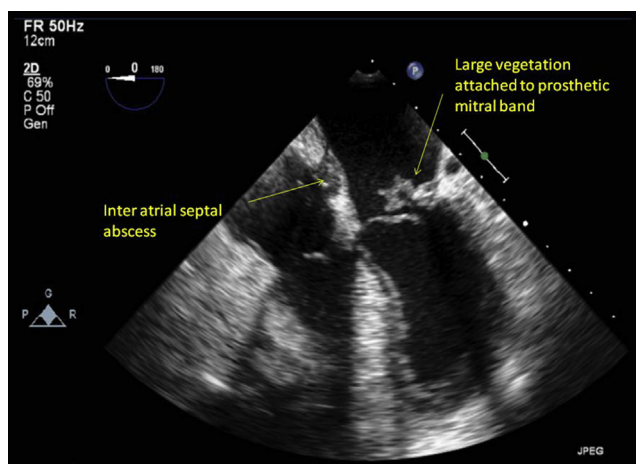
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**Figure 1** Two-dimensional transthoracic echocardiographic apical four-chamber view with yellow arrows showing the thickened interatrial septum and mitral vegetations.

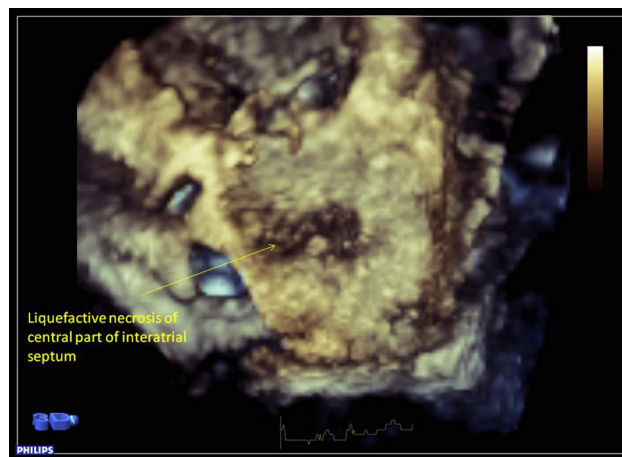


**Figure 2** Two-dimensional transesophageal echocardiographic four-chamber view with arrows pointing at multiple vegetations attached to the mitral valve repair band with pedunculated, small, irregular echogenic mass protruding into the left atrium and an echolucent thickened interatrial septum.

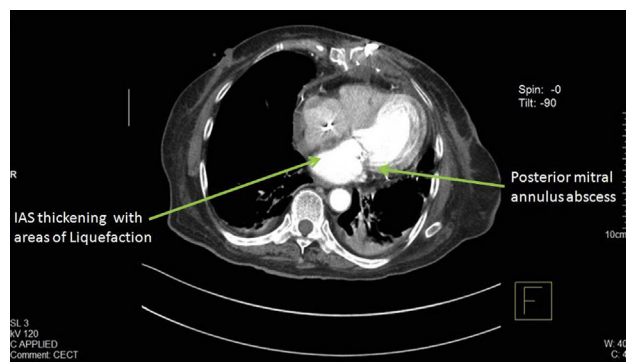
computed tomography also confirmed and complemented the echocardiographic findings while supplying additional information on the extracardiac lesions.

## CONCLUSIONS

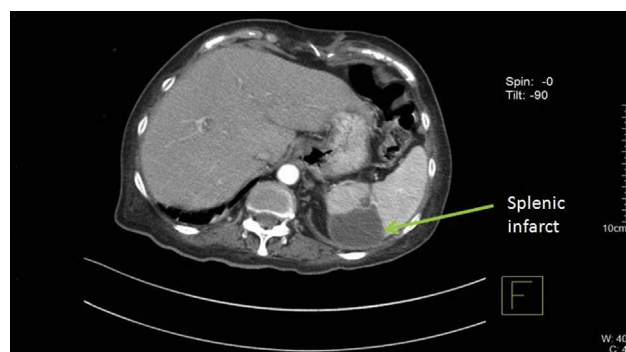
In patients presenting with early-onset prosthetic mitral band infective endocarditis, the interatrial septum must be considered a locus for abscess formation. Multimodality imaging is essential for making this diagnosis and should be used in patients presenting with these potential complications. Echocardiography is useful for detecting complications of infective endocarditis including alterations of the interatrial septum. Three-dimensional echocardiography may provide additional information in complex lesions.



**Figure 3** Three-dimensional transesophageal echocardiographic en face view of the liquefactive necrosis of the interatrial septum viewed from left atrium (arrow).



**Figure 4** High-resolution computed tomographic scan at cardiac level showing increased atrial septal thickness with variable intensities and posterior mitral leaflet vegetation (arrows). Thickness in this posterior mitral annular region depicts a basal posterior left ventricular wall abscess.



**Figure 5** High-resolution computed tomographic scan at the abdominal level shows large splenic infarct (arrow).

## SUPPLEMENTARY DATA

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.case.2017.02.003>.

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