

# Anterior Mitral Valve Leaflet Aneurysm Due to Infective Endocarditis Detected by Cardiac Magnetic Resonance Imaging

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*We report a case of mitral valve aneurysm in a 30-year-old man presenting with fatigue, malaise, and fever 10 weeks after emergent aortic valve replacement for endocarditis. The transthoracic echocardiogram demonstrated perivalvular aortic regurgitation, but no abscess cavity was defined. Cardiac magnetic resonance imaging (MRI) revealed a mitral valve leaflet aneurysm. Both aortic and mitral valves were replaced with mechanical prostheses. Pathology of the excised mitral valve showed a focally hemorrhagic aneurysm of the anterior leaflet with myxoid degeneration and focal calcification. Early diagnosis and intervention are important to treat this rare, potentially fatal complication of aortic valve endocarditis. Cardiac MRI provided an accurate and useful preoperative diagnostic evaluation.*

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**Key words:** Aortic regurgitation • Aortic valve endocarditis • Cardiac magnetic resonance imaging • Mitral valve repair/replacement • Mitral valve aneurysm

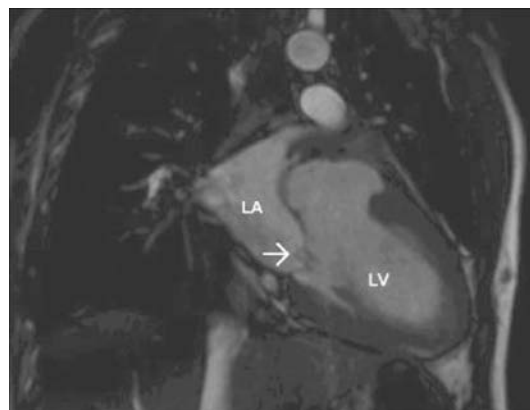
A 30-year-old white man with no prior cardiac history and with prior intravenous drug abuse presented with an acute febrile illness, substernal chest pain, and dyspnea. The patient subsequently developed cardiogenic shock and pulmonary edema and was diagnosed with *Streptococcus mitis* endocarditis involving a congenitally bicuspid aortic valve. Severe aortic valvular insufficiency and an aortic root abscess were demonstrated echocardiographically. Emergency surgery was performed with aortic valve replacement (23-mm Mosaic® bioprosthetic valve [Medtronic Heart Valves, Inc, Minneapolis, MN]), abscess debridement, and patch closure of the ascending aorta.

Postoperative recovery was complicated by acute renal insufficiency secondary to cardiogenic shock. A 4-week course of antibiotics was administered postoperatively. Transesophageal echocardiography postoperatively demonstrated normal mitral valve leaflets.

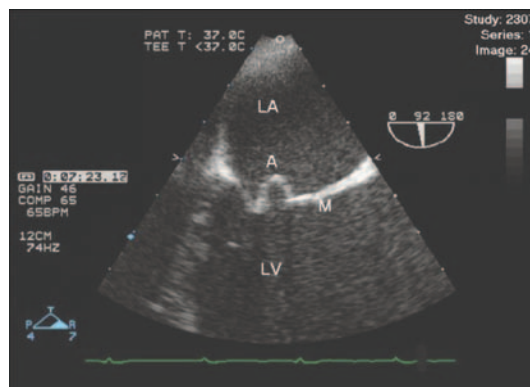
Approximately 10 weeks after surgery, the patient developed fatigue, malaise, and fevers up to 38.4°C (101°F). On physical examination, a harsh grade 3/6 pansystolic murmur was heard best at the left ventricular apex, and a grade 2/6 short diastolic murmur was heard across the precordium. The carotid upstroke was diminished, and neck veins were not distended. A transthoracic echocardiogram suggested the presence of a residual aortic perivalvular abscess and demonstrated significant perivalvular aortic regurgitation. The abscess cavity was not well defined by the transthoracic echocardiography, and the patient refused to undergo transesophageal echocardiography.<sup>1</sup> Cardiac magnetic resonance imaging (MRI) with a 1.5 Tesla Philips Intera scanner (Philips Medical Systems, Andover, MA) using a balanced fast field echo sequence was performed, which revealed perivalvular aortic regurgitation and a mitral valve leaflet aneurysm (Figure 1). The patient was returned to surgery, where a preoperative transesophageal echocardiogram demonstrated anterior mitral valve leaflet (A2) prolapse resulting in moderate eccentric mitral regurgitation. A focal aneurysm of the anterior leaflet of the mitral valve (A2) was observed (Figure 2).

Intraoperatively, the mitral valve chordae demonstrated areas of bacterial seeding from the aortic valve and an infectious diverticulum that had not yet perforated the valve. The valve was myxomatous with prolapse of the anterior leaflet, but no chordal rupture was observed. Surgical removal

**Figure 1.** Gradient echo cardiac magnetic resonance image of the coronal oblique view showing a mitral valve leaflet aneurysm. Arrow points to the aneurysm. LA, left atrium; LV, left ventricle.



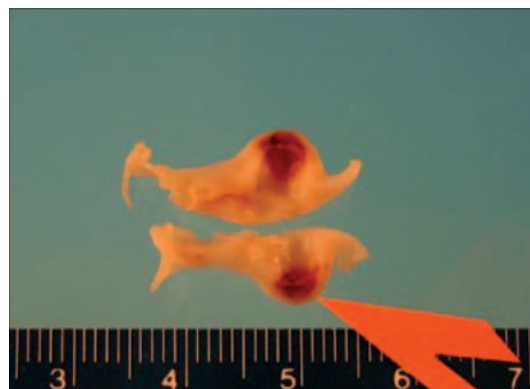
**Figure 2.** Transesophageal echocardiogram showing an aneurysm of the mitral valve leaflet. LA, left atrium; LV, left ventricle; A, aneurysm; M, mitral valve.



of the infected aortic bioprosthesis with translocation of the aortic valve to the ascending aorta in conjunction with saphenous vein bypass grafting to both the right and left anterior descending coronaries was performed, in addition to oversewing of the native left and right coronary

ostia. The mitral valve was replaced with a 31-mm St. Jude prosthesis with a noneverting mattress suture. On pathology, a 0.7-cm focally hemorrhagic aneurysm of the mitral valve leaflet with myxoid degeneration and focal calcification was observed (Figure 3).

**Figure 3.** Postoperative pathological specimen of the mitral valve leaflet showing focally hemorrhagic aneurysm of the valve leaflet with myxoid degeneration and focal calcification.



Postoperative recovery was uneventful, and following discharge the patient remained asymptomatic in follow-up.

## Discussion

Mitral valve aneurysm (MVA) is a rare but potentially fatal complication of aortic valve endocarditis. Mitral valve aneurysm is often not detected initially, but instead it typically presents later as mitral regurgitation.<sup>2,3</sup> MVA is usually seen as a localized prolapse or

the aortic valve or through seeding of the mitral valve leaflets from aortic regurgitation. Rare cases of MVA have also been reported with connective tissue disorders.<sup>9</sup>

In our patient, the most likely cause of MVA was bacterial seeding from the regurgitant jet striking the ventricular surface of the anterior mitral valve leaflet. This mechanism is supported by the initial absence of MVA on echocardiography and then its subsequent discovery in associa-

repair or replacement is usually indicated if the aneurysm ruptures or is associated with significant mitral regurgitation.<sup>10</sup> ■

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bulging of the mitral leaflet toward the left atrium during systolic contraction, with subsequent collapse during diastolic relaxation.<sup>4,5</sup> Although the mechanism of MVA in the present case was not clearly defined, it was most likely secondary to occult infection of the mitral valve leaflet in combination with mechanical stress due to the high velocity jet from aortic regurgitation.<sup>6-8</sup> Infection may occur by direct extension from

tion with the infected aortic valve prosthesis, as well as by the postoperative pathological analysis. Cardiac MRI is a new, noninvasive technique that proved extremely helpful in diagnosing and confirming the presence of MVA. Early detection of MVA and surgical intervention are important to avoid complications such as rupture, embolism, recurrent endocarditis, and worsening of mitral valve regurgitation. Mitral valve

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## Main Points

- Mitral valve aneurysm (MVA) is a rare, potentially fatal complication of aortic valve endocarditis.
- Cardiac magnetic resonance imaging proved extremely helpful in diagnosing and confirming the presence of MVA, which is important for avoiding complications such as rupture, embolism, recurrent endocarditis, and worsening mitral valve regurgitation.
- Mitral valve repair or replacement is usually indicated if the aneurysm ruptures or is associated with significant mitral regurgitation.