INTRODUCTION
Pseudoaneurysm of the mitral-aortic intervalvular fibrosa
Following Infective Endocarditis in a Patient With Acute Heart Failure:
A Case Report

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A 22-year-old male presented with infective endocarditis and aortic regurgitation with congenital bicuspid aortic valve. Echocardiography revealed vegetation on the aortic valve and a pseudoaneurysm in the region of the mitral-aortic intervalvular fibrosa (MAIVF) with severe aortic and mitral regurgitation. His clinical condition, acute heart failure due to severe aortic and mitral regurgitation, became worse. Since the MAIVF complication indicates advanced disruption of tissue at the MAIVF, urgent cardiac surgery was indicated because of the evidence of pseudoaneurysm. He received successful aortic valve replacement and restoration of normal mitral-aortic continuity. Pseudoaneurysm of the MAIVF is a relatively rare complication of infective endocarditis, but should be considered in patients who are suspected to have vegetation because echocardiography can easily establish the correct diagnosis.

Key Words
- Aneurysm (mitral-aortic intervalvular fibrosa)
- Endocarditis (infective)
- Heart failure (acute)

Pseudoaneurysm of the mitral-aortic intervalvular fibrosa (MAIVF) is a rare complication of infectious endocarditis. The accurate detection of pseudoaneurysm of the MAIVF is crucial in overall patient management and in surgical guidance because the pseudoaneurysm may not be readily identified during surgery. In addition, cardiac surgical intervention is increasingly important in the treatment of patients with infective endocarditis. Mortality is unacceptably high when patients with complications are treated with only antibiotics, but mortality is reduced when antibiotics are combined with surgical intervention. Accordingly, complications have become indications for cardiac surgery.

We report a case of infective endocarditis with congenital bicuspid aortic valve complicated by the development of a pseudoaneurysm of MAIVF with acute heart failure. The diagnosis was confirmed at surgery and appropriate treatment was instituted. The postoperative course was uncomplicated.
CASE REPORT

A 22-year-old male was admitted with high fever and abnormal echocardiography findings suggesting infective endocarditis. The diagnosis was aortic regurgitation with congenital bicuspid aortic valve 4 months earlier and surgery was scheduled for aortic valve replacement. About 2 weeks prior to admission, his physician had treated him with antibiotics for cellulitis. He was subsequently admitted for intravenous antibiotic treatment because of severe infection.

Physical examination revealed his blood pressure was 152/52 mmHg, and his pulse was 89/min and regular. Auscultation of the heart revealed grade 4/6 to and fro murmur and grade 3/6 diastolic murmur. Lung examination revealed no abnormalities. The extremities did not show any peripheral edema. Blood chemistry values were within normal limits except for C-reactive protein and brain natriuretic peptide, which were 4.5 and 912 pg/ml, respectively. All blood cultures remained negative. Chest radiography showed cardiomegaly (cardiothoracic ratio 62%) and severe pulmonary vascular congestion, although the cardiac silhouette was normal (cardiothoracic ratio 50%) and no evidence of congestion at 4 months before admission (Fig. 1).

Echocardiography was important in the diagnosis of this case (Fig. 2). The two-dimensional view revealed vegetation on the aortic valve and a 10-mm pseudoaneurysm in the region of the MAIVF. The size did not change in systole and diastole. Color Doppler echocardiography demonstrated slight forward flow from the left ventricle into the pseudoaneurysm. Color flow imaging showed aortic regurgitation (degree △) and mitral regurgitation (degree △ - △). Tricuspid regurgitation was also observed and the pressure gradient was 33 mmHg. In addition, the left ventricular internal diameter was extremely enlarged in diastole (82 mm) and systole (60 mm).

The clinical course of the patient is shown in Fig. 3. Although he was given gentamicin and cefuroxime after admission, his clinical condition, acute heart failure due to severe aortic and mitral regurgi-
tion, became worse. He underwent an urgent operation and received successful aortic valve replacement and excision of the pseudoaneurysm (Fig. 4). Perforation was implicated in the entry of pseudoaneurysm. He also underwent reconstruction of the intervalvular fibrous body and restoration of normal mitral-aortic continuity.

DISCUSSION

Echocardiography is important in the visualization of valvular vegetations, abscesses and other complications in patients with infective endocarditis. One such complication is the development of MAIVF. Aneurysms are prone to rupture, embolize or even cause further destruction of the aortic or mitral valve apparatus.\(^7,8\) Therefore, it is important to recognize the complication early, and to institute appropriate surgical treatment in a timely fashion to decrease morbidity and mortality. This case report describes a patient with a protracted course of infective endocarditis who presented with MAIVF complication.

MAIVF is the junction between the left half of the non-coronary cusp and the adjacent third of the left coronary cusp of the aortic valve and the anterior mitral leaflet. Among 55 consecutive patients with aortic valve endocarditis, 24 showed involvement of the subaortic structures.\(^1\) Thus, MAIVF is an important complication of infective endocarditis.

The reduction of mortality in infective endocarditis over the past three decades (from 25 - 30% to 10 - 20%) may be due mainly to more aggressive surgical intervention based on increased experience. The indications for surgery\(^3\) are now defined more pre-

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**Fig. 3** Clinical course of the patient

*Solid, gray and dotted lines* indicate body temperature, cardiothoracic ratio and C-reactive protein, respectively.

CRP = C-reactive protein; BT = body temperature; CTR = cardiothoracic ratio.

**Fig. 4** Mitral valve and pseudoaneurysm of the mitral-aortic intervalvular fibrosa

MAIVF = mitral-aortic intervalvular fibrosa.
cisely than in the past. Since MAIVF complication indicates advanced disruption of tissue at the MAIVF, there is an indication for urgent cardiac surgery because of evidence of pseudoaneurysm. The present patient had pseudoaneurysm of the MAIVF, so underwent an urgent operation. Therefore, although pseudoaneurysm of the MAIVF is a relatively rare complication of infective endocarditis, it may affect mortality in patients with infective endocarditis. This point should be kept in mind in patients with suspected vegetation when echocardiography is performed.

References