Infected Endocarditis With Perivalvular Pseudoaneurysm

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A 16-year-old Japanese woman with infective endocarditis was admitted to hospital. An echocardiography exhibited a perivalvular pseudoaneurysm just under the mitral valve. Left ventriculography demonstrated that the aneurysm had a small neck and dyskinetic motion with oppression to the coronary sinus and right coronary artery. 

Key Words: Echocardiography; Infective endocarditis; Left ventriculography; Perivalvular pseudoaneurysm; Staphylococcus aureus

Bacterial endocarditis usually affects the valve leaflets, but erosion into the valve annulus and adjacent myocardium may form a myocardial abscess. Annular abscesses are most frequent in aortic annular abscess. Alternatively, fistulas or pseudoaneurysms are more frequent in mitral annular abscess. Perivalvular abscesses can drain into the ventricles or aorta, and they can form a life-threatening pseudoaneurysm. Although the patient in the present report had a perivalvular pseudoaneurysm, medical treatment was sufficiently effective to control the infection and, therefore, a cardiac catheterization could be performed to detect the pseudoaneurysm. The present study describes a patient with perivalvular pseudoaneurysm diagnosed by left ventriculography.

Case Report

A 16-year-old Japanese woman without a significant previous cardiac history was transferred to hospital because of a 1-week history of tiredness, shortness of breath, and high fever. On physical examination, her body temperature was 40°C, pulse rate was 108 beats/min, respiratory rate was 26 breaths/min with dyspnea, and blood pressure was 104/52 mmHg. A holosystolic murmur could be heard at the apex since the previous day, although she had never been told that she had an abnormal heart murmur. Coarse crackle was heard at the lower lung field. Osler’s nodes, Janeway lesions, and Roth spots were also found on admission. Muscle weakness of the left leg and pathological reflex of the left leg were detected on neurological examination. Transient hematuria and liver dysfunction were seen on admission. The patient’s C-reactive protein level was 16.0 mg/dl and white blood cell count was 12,540/µl. A chest radiograph revealed cardiac enlargement and mild pulmonary congestion and an electrocardiogram showed sinus tachycardia and low voltage.

A transthoracic and transesophageal echocardiography showed mitral valve prolapse without vegetation and massive mitral regurgitation. Magnetic resonance imaging and magnetic resonance angiography revealed multiple infarction of the brain and no mycotic aneurysm. There was a possibility that the vegetation attached to the mitral valve had already embolized to the brain, kidney, liver, hands, and feet. Staphylococcus aureus (S aureus) sensitive to ampicillin was identified by the blood culture, and the patient improved after taking ampicillin for 3 weeks; however, echocardiograms exhibited perivalvular pseudoaneurysm (15±25 mm) just under the mitral valve (Fig 1). Left ventriculography demonstrated that the aneurysm (Fig 2) had a small neck and dyskinetic wall motion with oppression to the coronary sinus and right coronary artery, and that mitral regurgitation was moderate. The aneurysm, which had an entrance measuring 8 mm, was identified just under the posterior commissure of the mitral valve of the left ventricular site during surgery. Furthermore, there were ruptured chords. There were no abscesses present or vegetation on the mitral valve. Patch closure of the perivalvular pseudoaneurysm and a mitral valve plasty were performed. Neither an aneurysm nor mitral regurgitation were detected by echocardiography and left ventriculography after the operation (Fig 3). No reinfection occurred in the patient after discharge and she is currently well.

Discussion

Endocarditis is usually isolated to the valve leaflets, but aggressive bacteria such as S aureus have a tendency to invade the valve annuli, forming a perivalvular abscess. The presence of an annular abscess is a very poor prognostic factor, carrying a high surgical mortality rate and a poor long-term survival rate. Iemura et al have reported that for patients with native valve endocarditis caused by S aureus, surgical treatment should be performed as soon as possible. Yoshida et al recommend urgent surgical intervention for patients with significant valve lesions and who are unresponsive to medical treatment in order to prevent embolization and deterioration of the heart. However, the patient in the present report already presented with embolization to the brain on admission. As there was no vegeta-
tation to her valves, medical treatment was prescribed, and the patient’s clinical course was very good after admission. We consider that this was a result of administering ampicillin on admission, which proved effective in treating S aureus. Alternatively, there was a possibility that the patient might have had a diverticulum, and subsequently suffered from infective endocarditis; that is, the cavity may not have been a pseudoaneurysm but a diverticulum. The wall of a diverticulum includes a muscle layer and the wall motion is dyskinetic, whereas the wall of a pseudoaneurysm does not include a muscle layer and the wall motion is dyskinetic. In the present report, left ventriculography demonstrated that the cavity had dyskinetic wall motion. Aoyagi et al have reported the effect of patch closure of the perivalvular pseudoaneurysm. We also performed patch closure of the perivalvular pseudoaneurysm to prevent the pseudoaneurysm from rupturing. But, because we did not resect the pseudoaneurysm, we were unable to investigate it pathologically and, therefore, this is a limitation of the study.

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References