

Simultaneous Mitral Valve Replacement and Bypass Grafting for Mycotic Aneurysm of the Femoral Artery during the Active Phase of Infective Endocarditis: A Case Report

Mayumi Shinonaga, MD, Kazuo Yamamoto, MD, Hirotomo Matsubara, MD,
Fumihiro Takeda, MD, Satoshi Tanaka, MD, Fumiaki Oguma, MD,
and Shigetaka Kasuya, MD

A 52-year-old woman with a 3-week history of fever and cough was diagnosed as having bacterial endocarditis with vegetation and severe mitral valve insufficiency by echocardiography. Blood culture revealed *Streptococcus mitis*. After antibiotic treatment for 3 weeks, the patient noticed swelling with pain in her left groin. Computed tomography revealed an occluded aneurysm in the left common femoral artery. Simultaneous surgical treatments of mitral valve replacement and bypass grafting using a saphenous vein following resection of the mycotic femoral arterial aneurysm were performed. Pathohistological examination of surgical specimens revealed acute inflammatory findings, but no microorganisms were found, probably because of the preoperative antibiotic therapy. Her postoperative course was uneventful, and there was no recurrence of mycotic aneurysms in a period of 10 months after the operation. Prompt recognition and urgent simultaneous surgical treatments for mycotic aneurysms complicated with infective endocarditis were effective. (Ann Thorac Cardiovasc Surg 2001; 7: 381–3)

Key words: peripheral mycotic aneurysm, infective endocarditis, mitral valve replacement, vascular reconstruction

Introduction

Patients with infective endocarditis (IE) often require cardiac valve surgery even during the active phase of IE if the infection is not responsive to antibiotic treatment. Septic embolism and mycotic aneurysm (MA) complicate the course of IE. We experienced a case that required simultaneous mitral valve replacement and bypass grafting following aneurysmectomy for an MA of the femoral artery (FA) during the active phase of IE.

Case Report

A 52-year-old woman was admitted to a local hospital

From the Department of Thoracic and Cardiovascular Surgery, Tachikawa General Hospital, Nagaoka, Japan

Received April 16, 2001; accepted for publication June 4, 2001. Address reprint requests to Mayumi Shinonaga, MD: Department of Thoracic and Cardiovascular Surgery, Tachikawa General Hospital, 3-2-11 Kanda, Nagaoka 940-8621, Japan.

because of a 3-week history of fever, cough and poor appetite. Her blood level readings were a white cell count of $23400/\mu\text{l}$ and a C-reactive protein level of 15.3 mg/dl. An echocardiogram showed severe mitral valve insufficiency with a large (15 by 10 mm) vegetation and moderate tricuspid valve insufficiency. *Streptococcus (S.) mitis* was isolated from blood culture, and bacterial endocarditis was confirmed. The patient had received imipenem and clindamycin that were sensitive for *S. mitis*. After three weeks of antibiotic therapy, she complained of pain in her left groin and a feeling of coldness in her left foot. Computed tomography (CT) revealed the presence of a left femoral arterial aneurysm. She was transferred to our hospital due to persistent infection and cardiac failure.

A systolic ejection murmur over the precordium and a pulsatile mass with tenderness in her left groin were noticed. Her left ankle-brachial pressure index was 0.45 with absence of popliteal artery pulsation. A chest X-ray showed marked cardiomegaly, pleural effusion, and pul-

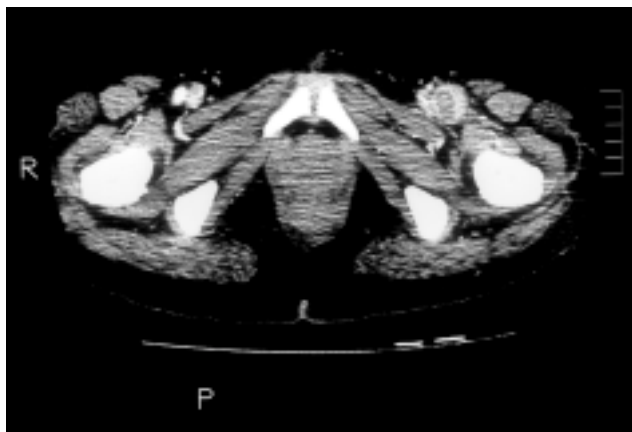


Fig. 1. A computed tomography revealed the presence of a left common femoral arterial aneurysm, 3 cm in diameter with a thrombus.

monary congestion. A three-dimensional CT scan revealed the presence of a left common femoral arterial aneurysm, 3 cm in diameter with a thrombus and obstruction of the artery (Fig. 1). Superficial femoral arterial flow was detected at the distal lesion. CT or magnetic resonance imaging showed no embolic lesions or aneurysms in other organs or arteries.

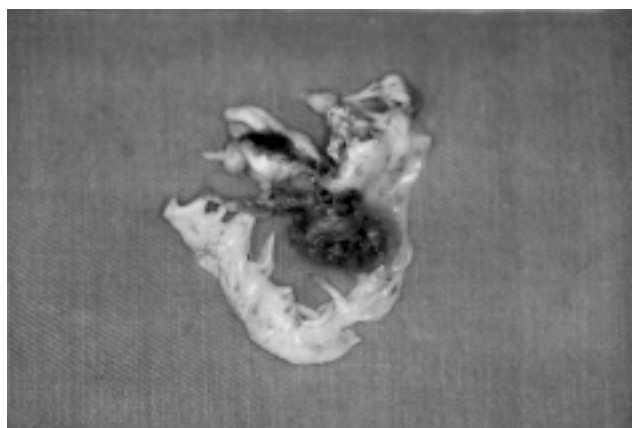
The patient underwent surgical treatment 2 weeks after detection of the aneurysm. The mitral valve had a large vegetation extending to the chordae and a perforation of the anterior leaflet (Fig. 2a). Following mitral valve replacement using a 27-mm Carbomedics valve prosthesis and tricuspid annuloplasty, the femoral arterial aneurysm was completely excised (Fig. 2b). The margins of the arterial segment were normal, and an interposition grafting from the common FA to the superficial FA us-

ing a saphenous vein graft was performed. The deep FA was also reconstructed using an autovein graft. These vein grafts were seven millimeters in diameter and big enough to use for anastomoses to the FA. Histopathological examination of surgical specimens, including the mitral valve and the aneurysm, revealed acute inflammation, but no microorganisms were found and the culture of microorganisms was negative. The patient's postoperative course was uneventful, and she had no recurrence of mycotic embolism or aneurysm during a ten-month follow-up period.

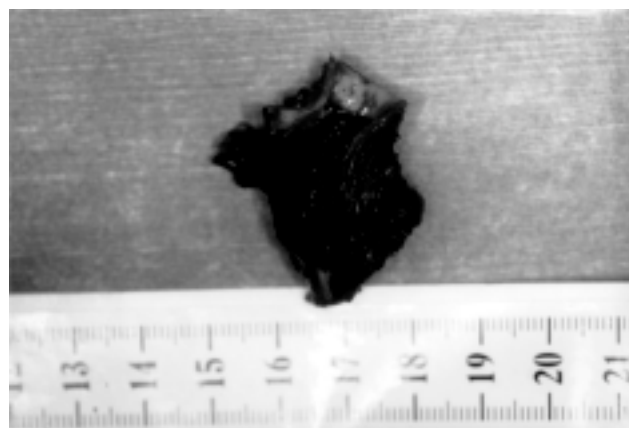
Discussion

Mycotic aneurysms of the femoral arteries are mostly caused by arterial trauma, including self-induced vascular manipulation, accident or iatrogenic causes such as catheter intervention and bypass grafting. Although IE had been the most common etiology for MAs in the preantibiotic era, an MA caused by a septic embolus is now rare due to the widespread use of antibiotics.^{1,2)} Mansur et al.³⁾ reported that nine of 217 patients with IE during 5.4 years had extracranial MAs and that one of those cases involved the FA. Dean et al.⁴⁾ reported 9 cases of MAs or embolism with IE during 10 years, two of which involved the FA.

S. mitis belongs to the viridans group, and some cases of *S. mitis* IE required valve replacements due to failure of antibiotic treatment.^{5,6)} If vegetation has been seen on an echocardiogram, patients with *S. viridans* infection have a significant higher risk for embolic events compared to those with other microorganism infections.⁷⁾



a



b

Fig. 2. a: Excised mitral valve with large vegetation extending to the chordae.

b: Excised mycotic aneurysm of the femoral artery that was occluded with a thrombus.

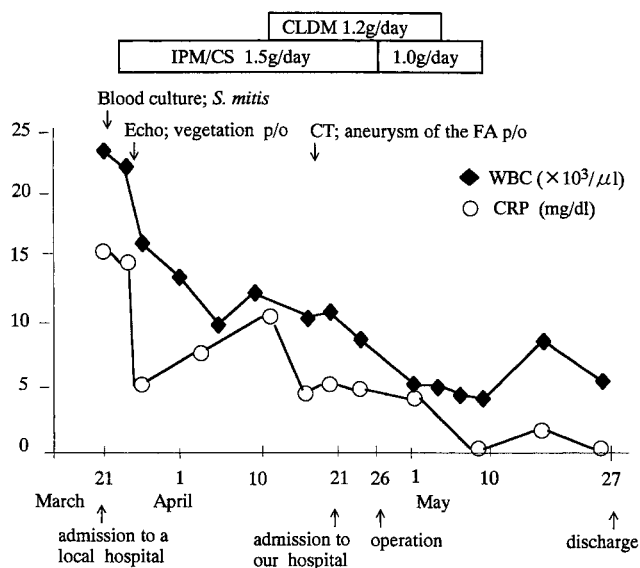


Fig. 3. The clinical course of the patient.

IPM/CS: imipenem/cilastatin sodium, CLDM: clindamycin, *S.*: *Streptococcus*, Echo: echocardiogram, CT: computed tomography, FA: femoral artery, WBC: white blood cell, CRP: C-reactive protein.

Excluding congestive heart failure, embolism of infected debris and its sequelae are the most common complications of IE. These events occur in approximately 30% of patients requiring valve replacements due to IE, and one third of these cases involve the peripheral arteries.⁷⁻⁹ Embolomycotic aneurysms are formed when endoarteritis destroys the integrity of the arterial wall, following septic emboli from cardiac vegetation that lodge in the lumen or in the vasa vasorum of vessels.^{2,4} Embolectomy at a peripheral vessel may be successful before vascular inflammation destroys the arterial wall.^{9,10} In the present case, an MA had already formed when the patient complained of pain in her groin.

In a case of peripheral true aneurysm, unlike pseudoaneurysm or aortic aneurysm, there is a low risk of acute aneurysmal rupture. Therefore, the timing of surgery is determined with consideration of the cardiac status and severity of limb ischemia.³ Our patient required urgent valvular surgery and simultaneous vascular reconstruction because of cardiac deterioration and ischemic change in her foot. A patient might only require the latter procedure if the cardiac state is sufficiently stable.^{9,11} Conventional treatments for MAs include aortic ligation, aneurysmal excision and extra-anatomic bypass grafting.^{1,12} If the vessels are in a healthy and uninfected state without substantial purulence, bypass procedures in situ are performed and autogenous vein grafts are preferred

over Dacron.^{2,3,12}

The widespread use of antimicrobial treatment has reduced the incidence of septic embolism and MA associated with IE. In this case an MA might not have formed if the patient had received valvular surgery at an earlier phase after failure of more than two weeks of antibiotic therapy. However, once an MA occurs in a peripheral artery in a patient suffering from persistent infection and cardiac failure, simultaneous cardiac valve surgery and vascular reconstruction to reverse limb ischemia are the best treatment methods even during the active phase of IE.

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