Case Report

Septic Embolic Occlusion of the Superior Mesenteric Artery Induced by Mitral Valve Endocarditis

Shun-ichi Misawa, MD,¹ Yasuhito Sakano, MD,¹ Arata Muraoka, MD,¹ Yoshikazu Yasuda, PhD,² and Yoshio Misawa, PhD¹

A 75-year-old woman, who had been treated for rheumatic arthritis, was transferred to our hospital because of acute abdomen and continuous fever for several weeks. She had peritonitis, and abdominal computed tomography detected a thrombus occluding the proximal superior mesenteric artery and infarctions of the kidneys and spleen. Echocardiography showed a large vegetation on the anterior leaflet of the mitral valve. The necrotic small bowel and ascending colon were resected, and mitral valve replacement was performed 5 days later. She suffered from hyperbilirubinemia and pneumonia for several weeks after the operation but recovered successfully thereafter.

Key words: infectious endocarditis, mitral valve, superior mesenteric artery occlusion, septic embolism

Introduction

Superior mesenteric artery thrombosis is a rare disease and may occur as traumatic, atherosclerotic or cardiogenic episodes. The diagnosis and treatment of endocarditis and septic embolism are challenges for the attending physician. Surgical interventions without delay can be definite treatment strategies when long segment intestinal ischemia develops. We experienced a case of mitral valve endocarditis followed by septic embolic occlusion of the superior mesenteric artery causing intestinal necrosis.

Received: June 10, 2010; Accepted: August 16, 2010

Case Report

A 75-year-old woman, who had been treated for rheumatic arthritis by oral steroid therapy (6 mg/day) at another hospital, was transferred to our hospital because of acute abdominal pain after continuous fever for several weeks before admission. She had also been treated for decubitus of the lower back 2 months previously, but she had received no antibiotics.

Physical examination showed abdominal rebound tenderness without subcutaneous lesions such as Osler nodules. Abdominal computed tomography revealed complete occlusion of the proximal superior mesenteric artery and edematous changes of the small intestine and ascending colon with portal venous gas and pneumatosis cystoides intestinalis, suggesting intestinal necrosis (Fig. 1). In addition, there were infarctions of the bilateral kidneys and spleen. Brain computed tomography revealed no remarkable changes. The white blood cell count was 18500/µl and the platelet count was 16000 /µl. Blood gas analysis showed a pH of 7.407, base excess of -5.7 mmol/l and lactate of 3.4 mmol/l. Transthoracic echocardiography showed vegetation on the anterior leaflet of the mitral valve measuring 23×12 mm in diameter. Moderate mitral regurgitation was also recognized with normal

¹Division of Cardiovascular Surgery, Jichi Medical University, Shimotsuke, Tochigi, Japan

²Division of Gastroenterological Surgery, Jichi Medical University, Shimotsuke, Tochigi, Japan

Corresponding author: Yoshio Misawa MD. Division of Cardiovascular Surgery, Jichi Medical University, 3311-1 Yakushiji, Shimotsuke, Tochigi 329-0498, Japan

Email: tcvmisa@jichi.ac.jp

^{©2011} The Editorial Committee of *Annals of Thoracic and Cardiovascular Surgery*. All rights reserved.



Fig. 1 Preoperative abdominal computed tomography. Abdominal computed tomography reveals complete occlusion of the proximal superior mesenteric artery, portal venous gas, and pneumatosis cystoides intestinalis, suggesting intestinal necrosis. In addition, there are infarctions of the bilateral kidneys and spleen. SMA, superior mesenteric artery

left ventricular function. A blood culture yielded methicillin-sensitive *Staphylococcus aureus*. Ampicillin sodium and ciprofloxacin were administered as antibiotic therapy after an empiric administeration of vancomycin hydrochloride and gentamicin sulfate.

We thought that the necrotic intestine was more critical than the mitral valve lesion, and that it should be resected promptly, being followed by mitral valve surgery. An emergency operation was performed for the thrombosis of the superior mesenteric artery and the intestinal necrosis. Large parts of the distal small bowel and ascending colon were resected.

Before the second operation, the body temperature was 38.4 degree Celsius, the white blood cell count was 17700 / μ l, and C-reacting protein was 13.99 mg/ml, showing no interval change after the first operation. We performed mitral valve replacement at 5 days after the abdominal operation. Vegetations were observed on the anterior and posterior leaflet of the mitral valve (**Fig. 2**). The infected mitral valve was resected and replaced with a bioprosthetic valve. Pathological examination of the resected leaflets revealed that vegetations and bacterial colonies were recognized with a highly destructive change, and a degenerative change of the valve was slightly observed with a spotty calcification.

After the second operation, the patient needed inten-

sive care for respiratory distress for several days. Newly developed hyperbilirubinemia and pneumonia gradually subsided. Enteral nutrition with intravenous hyperalimentation was started, and the patient was transferred to another hospital for postoperative rehabilitation. There were no signs of recurrence of the infective endocarditis and systemic embolism at 6 months after the operation.

Discussion

Thrombi and/or vegetations in the cardiac cavity can be causes of mesenteric artery occlusion. Arterial fibrillation or myocardial infarction tends to lead to thrombi formation. Infective endocarditis not only destroys valvular structures but also produces vegetations. Infectious endocarditis is most common in patients with underlying valvular abnormalities, including congenital heart disease and acquired valvular lesions. Immunologically suppressed patients taking steroids and/or anticancer agents can be candidates for infective endocarditis.

Systemic complications occur in roughly 40% of patients, including septic embolism, congestive heart failure and perivalvular abscess.¹⁾ Embolic and metastatic events have high incidences during infective endocarditis but are rare in the mesentery.²⁾ Milliare et al. reported that 35 of 68 (51%) patients experienced embolic or metastatic





events, with the central nervous system being most commonly affected (n = 23), followed by the spleen (n = 7), kidney (n = 5), lung (n = 5), liver (n = 4), bone and joints (n = 4) and mesenteric artery (n = 1).³⁾ Dickman et al. described a state of acute arterial thrombosis that occurred as tissue infections adjacent to arteries (e.g. pyogenic abscesses and osteomyelitis), creating a prothrombotic environment and acute thrombotic occlusion.⁴⁾

Early initiation of adequate antibiotic therapy is mandatory to avoid complications associated with high levels of morbidity and mortality, especially in patients with valvular disease.⁵⁾ Valve replacement should be performed as soon as possible to eliminate the origin of septic emboli and prevent subsequent arterial occlusive events.¹⁾ In this case, small bowel resection and right hemicolectomy preceded mitral valve replacement because the patient's hemodynamic status was stable. No recurrence of endocarditis or embolism was observed at 6 months after the operation.

Conclusion

We experienced a case of mitral valve endocarditis followed by septic embolic occlusion of the superior mesenteric artery causing intestinal necrosis. The necrotic small bowel and ascending colon were resected, and mitral valve replacement was successfully performed 5 days later.

References

- Cassada DC, Stevens SL, Schuchmann GS, Freeman MB, Goldman MH. Mesenteric pseudoaneurysm resulting from septic embolism. Ann Vasc Surg 1998; 12: 597-600.
- 2) Eickhoff P, Fazekas T, Attarbaschi A, Binder T. Mitral valve endocarditis caused by ulcerative colitis followed by septic embolic occlusion of the superior mesenteric artery. Eur J Echocardiogr 2009; **10**: 806-7.
- 3) Millaire A, Leroy O, Gaday V, de Groote P, Beuscart C, et al. Incidence and prognosis of embolic events and metastatic infections in infective endocarditis. Eur Heart J 1997; **18**: 677-84.
- 4) Dickman FN, Moore IB. Mycotic aneurysms: a case report of a popliteal mycotic aneurysm. Ann Surg 1968; **167**: 590-4.
- 5) Liphaus BL, Goldenstein-Schainberg C, Kitamura LM, Silva CA. Abdominal mycotic aneurysm and cerebral embolic event associated with infective endocarditis in a patient with chronic rheumatic valvar disease. Arq Bras Cardiol 2007; **88**: e7-9.