Mitral Valve Thrombus Attached to the Intact Mitral Valve Associated With Distal Embolism

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A 61-year-old man was referred for cardiac investigation because embolism was suspected to be the cause of the sudden onset of severe pain in his right leg after a surgical procedure. The electrocardiogram revealed no atrial fibrillation. Transthoracic echocardiography demonstrated a tumor-like echo at the anterior mitral leaflet, and transesophageal echocardiography documented a mass 13×9 mm in size, attached by a stalk to the left atrial side of the anterior mitral leaflet. The other parts of the mitral valve appeared to be intact. At emergency surgery, the mass was located in the center of the left atrial side of the anterior mitral leaflet. It mimicked a myxoma and had a stalk arising from the anterior leaflet. After resection of the mitral valve mass, catheter thrombo-embolectomy was performed and several long pieces of fresh thrombus were removed. On histological examination, the mass consisted of fresh thrombus tissue. No cellular component or myxoma tissue was documented. The distal embolus also consisted of fresh thrombus tissue. This is the first case of a thrombus of the intact mitral valve without atrial fibrillation. (*Jpn Circ J* 1999; 63: 394–396)

Key Words: Echocardiography; Mitral valve; Thrombo-embolism

Left atrial thrombosis and left ventricular thrombosis are common types of heart thrombosis. The former is usually coexistent with mitral stenosis and/or chronic atrial fibrillation, and the latter is frequently concurrent with severe wall motion abnormalities in patients with myocardial infarction or dilated cardiomyopathy. Mitral valve prolapse is considered a rare source of thrombo-embolism.^{1,2} We report a case of a thrombus of the intact mitral valve without atrial fibrillation.

Case Report

A 61-year-old man was admitted to hospital for elective multiple colonic polypectomy. He had no history of heart disease or febrile illness. Polypectomy was performed after a blood transfusion because of severe iron deficiency anemia, probably due to undetected melena. He was referred to the Department of Cardiology because of a sudden onset of severe pain and coldness in his right leg after the procedure. On physical examination, blood pressure was 144/68 mmHg and his pulse rate was 80 beats/min with regular rhythm. No heart murmur was auscultated. Pulsation of the right dorsalis pedis artery was not palpable.

On laboratory examination, the white blood cell count was 6,600/mm³, red blood cell count was 393×10⁴/mm³, hemoglobin was 6.1 g/dl, and hematocrit was 24.5%. Although the platelet count was slightly elevated (47.7×10⁴/mm³), bleeding time, prothrombin time and activated partial thromboplastin time were all within normal limits. Serum creatine kinase was increased (835 IU/L) and serum

iron was decreased (12 µg/dl). C-reactive protein was 0.07 mg/dl. On pathological examination, the resected polyps consisted of adenoma with moderate dysplasia. No malignant cells were documented.

The chest roentgenogram showed no abnormalities in the cardiac silhouette or lung fields. A 12-lead electrocardiogram revealed regular sinus rhythm and negative T waves in V₄, V₅, and V₆. A transthoracic 2-dimensional echocardiogram demonstrated a tumor-like echo at the anterior mitral leaflet in the 4-chamber view. The dimensions of the left ventricle and the left atrium were normal and there was no evidence of mitral stenosis, mitral valve prolapse, mitral annular calcification, or wall motion abnormality. Mild mitral regurgitation was present in a color Doppler study. Transesophageal echocardiography (TEE) was performed using a Toshiba SSA 380A ultrasound imaging system and

Fig 1. A mitral valve mass (arrows) attached by a short stalk to the left atrial side of the anterior mitral leaflet was clearly demonstrated by transesophageal echocardiography. LA, left atrium; LV, left ventricle; MV, mitral valve.

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Fig 2. The mass was located at the center of the left atrial side of the anterior mitral leaflet at surgery (Top). The mass was completely resected (Bottom).

clearly documented a mobile mass 13×9 mm in size, attached by a short stalk to the left atrial side of the anterior mitral leaflet (Fig 1). The other parts of the mitral valve appeared to be intact. No other mass was present in the left atrium. We diagnosed mitral valve myxoma complicated with a distal embolism of the right leg.

Emergency open-heart surgery was done with cardiac arrest using cardiopulmonary bypass. The mass was located in the center of the left atrial side of the anterior mitral leaflet (Fig 2). It mimicked a myxoma with dark red coloration, and had a short stalk arising from the anterior leaflet. After complete resection of the mitral valve mass, thrombo-embolectomy was performed using a 4F-sized Fogarty balloon catheter. Several long pieces of fresh thrombus were removed.

On histological examination, the mass was 13×10×5 mm in size with a stalk 3 mm in length and 2 mm in diameter. The mass consisted entirely of relatively fresh thrombus tissue with fibrosis of the portion connected to the stalk and of the mitral leaflet (Fig 3). Neither cellular component nor myxoma tissue was documented. No organic change was found in the resected tissue of the mitral valve. The distal embolus also consisted of fresh thrombus tissue.

As regards the possibility of concomitant systemic thrombosis, blood examinations after the surgery revealed no abnormal values of antithrombin III, proteins C and S, lupus anticoagulant, and anticardiolipin antibodies.

Discussion

A left atrial thrombus usually accompanies mitral steno-

Fig 3. The mass consisted of fresh thrombus tissue (left) with fibrosis of the portion connected to the stalk and of the mitral leaflet (right).

sis or atrial fibrillation, but neither arrhythmia nor mitral stenosis was present in the present case. No other thrombi were found in the left atrium or the left atrial appendage at surgery, and mitral valve prolapse, which has been considered a possible cause of thrombo-embolism,^{1,2} was not present. Although most cardiac myxomas arise from the fossa ovalis of the left atrium, a few cases of the mitral valve myxoma have been reported.³⁻⁵ In the present case microscopic examination showed no evidence of myxoma tissue in the completely resected mass or the distal embolus. Egeblad and Hesse used 2-dimensional echocardiography to examine a patient with mitral valve prolapse and reported a mobile polypoid mass adhered to a recess between the mitral valve and the septum;⁶ however, no histological study was performed in that case. Although thrombosis associated with either calcium deposits of the endothelium or mitral annular calcification has been reported,⁷ in the present case no calcium deposits or mitral annular calcification were shown on echocardiography or histological examination. Neither systemic thrombogenic disease nor coagulation disorder, including disseminated intravascular coagulation, was clinically recognized, although mild thrombocytosis⁸ was present. A small ulceration or injury of the endothelial surface, which could not be confirmed histologically, might be a cause of the thrombus formation in what is an apparently rare and not previously seen case of a thrombus of the intact mitral valve without atrial fibrillation; however, the mechanism of thrombus formation remains unclear.

References

1. Zenker G, Erbel R, Krämer G, Mohr-Kahaly S, Drexler M, Harnoncourt K, et al: Transesophageal two-dimensional echocardiography in young patients with cerebral ischemic events. *Stroke* 1988; **19**: 345-348
2. Kelley R, Pina I, Lee S: Cerebral ischemia and mitral valve prolapse: case-control study of associated factors. *Stroke* 1988; **19**: 443-446
3. Sandrasagra FA, Oliver WA, English TAH: Myxoma of the mitral valve. *Br Heart J* 1979; **42**: 221-223
4. Barold SS, Hicks GL, Nanda NC, Ong LS, Falkoff MD, Heinle RA: Mitral valve myxoma diagnosed by two-dimensional echocardiography. *Am J Cardiol* 1987; **59**: 182-183
5. Meisner JS, Daboin NP, Keller PK, Sisto DA, Factor SM, Strom JA: Myxoma of the mitral valve detected by transesophageal echocardiography. *Am Heart J* 1993; **125**: 1449-1451
6. Egeblad H, Hesse B: Mitral valve prolapse with mobile polypoid cul-de-sac thrombus and embolism to brain and lower extremity. *Am Heart J* 1987; **114**: 648-650
7. Eicher J, Xavier F, DeNadai L, Ressencourt O, Falcon-Eicher S,

Giroud M, et al: Possible association of thrombotic, nonbacterial vegetations of the mitral ring-mitral annular calcium and stroke. *Am J Cardiol* 1997; **79**: 1712–1715

8. Martin F, Zuppiroli A, Gori A, Chiarantini E, Fedis S, Prisco D, et al: Platelet and blood clotting activation in patients with mitral valve prolapse. *Thromb Res* 1996; **83**: 299–306