CASE REPORT
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Successful Resection of a Giant Left Ventricular Pseudoaneurysm Developed Later after Mitral Valve Replacement

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We present a case of successful surgical resection of a giant left ventricular (LV) pseudoaneurysm that developed 5 yr after mitral valve replacement (MVR). A 59-yr-old female was admitted with exertional chest pain radiating to left arm and back. 64-slice multidetector computed tomography (MDCT) revealed significant stenosis on the ostium of the first diagonal branch of the left anterior descending coronary artery and also a huge pseudoaneurysm compressing the right atrium and the inferior vena cava. She underwent resection of the pseudoaneurysm, and the pseudoaneurysm tunnel was repaired from the inside of LV cavity by removing the previously inserted prosthetic valve, followed by redo MVR together with coronary arterial bypass grafting (CABG) for a single-vessel disease. At the 6-month follow-up, the patient continued to do well without any complications.

Key Words: Aneurysm, False; Postoperative Complications; Mitral Valve

INTRODUCTION

LV pseudoaneurysm is very rare as well as difficult to diagnose clinically (1). It has been defined as a rupture of the myocardium involved in pericardial adhesions or the epicardial wall of LV (2, 3). The myocardial infarction is known as the most common cause of it (4). Inferior infarcts are almost twice as common as anterior infarcts (5). One-third of them results from a surgical procedure, mostly MVR (3). We report a successful resection of a giant LV pseudoaneurysm developed as a delayed complication after MVR.

CASE REPORT

A 57-yr-old woman had undergone a mitral valve replacement (MVR) with mechanical prosthesis 5 yr ago. At 3 yr after the operation, an echocardiogram at a regular follow-up did not show any specific abnormalities. The patient was admitted with exertional chest pain radiating to the left arm and back, which developed in the past 6 month. Physical examination revealed normal prosthetic valve heart sounds and systolic murmur at left parasternal area. Echocardiography revealed good mitral valve function, mild to moderate tricuspid regurgitation, and a huge LV pseudoaneurysm (Fig. 1). Transthoracic and transesophageal echocardiogram demonstrated a defect of LV wall and a systolic turbulent flow from LV into the pseudoaneurysm. 64-slice MDCT (Toshiba, Aquillion, Tokyo Japan) revealed a giant pseudoaneurysm with partially calcified wall, 11×7×6 cm in dimension, compressing the right atrium and inferior vena cava (Figs. 2, 3). Cardiac magnetic resonance imaging (MRI) (ACHIEVA 1.5T, Phillips) confirmed a huge LV pseudoaneurysm (size, approximately 10×12 cm) located on the inferior side of the heart. Coronary angiography revealed significant proximal stenosis of the diagonal artery. In light of the patient's conditions, we opted for surgical resection of this LV pseudoaneurysm.

The patient underwent single-vessel CABG by anastomosis of left internal mammary artery to the diagonal artery, followed by repair of the LV pseudoaneurysm through the re-sternotomy and under the cardiopulmonary bypass (CPB). The large LV pseudoaneurysm leaked through a tunnel-like structure below the mitral valve (Fig. 3). Therefore, repair and removal of the pseudoaneurysm sac was performed after removal of the mechanical prosthesis that had been replaced previously. MVR was redone using a Sorin Bicarbon valve (27 mm), and tricuspid valve annuloplasty was performed using an Edward Cosgrove ring (26 mm). Weaning from the CPB was uneventful. Aortic cross time was 193 min. and total CPB time, 284 min. The postoperative course was in normal. Postoperative echocardiography revealed a good functioning of the mitral mechanical valve and no tricuspid regurgitation with well-preserved LV function. Tissue biopsy results showed that the pseudoaneurysmal sac was composed of degenerated fibromyxoid tissue and multifocal dystrophic calcifications.

At the 6-month follow-up, the patient was doing well without any complications.

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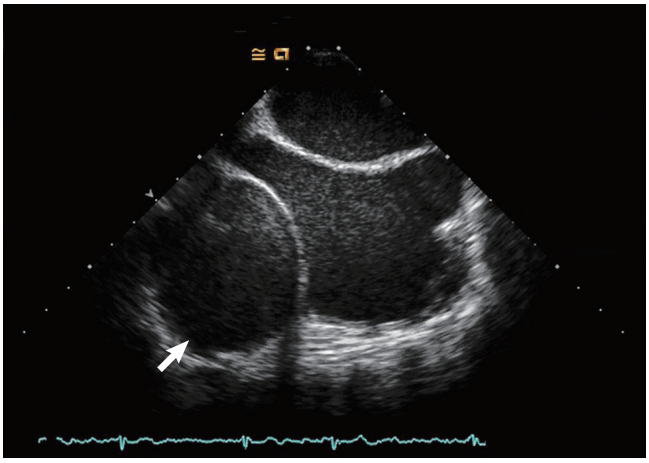

Fig. 1. Two-dimensional transesophageal echocardiographic view of the left ventricular pseudoaneurysm (arrow).

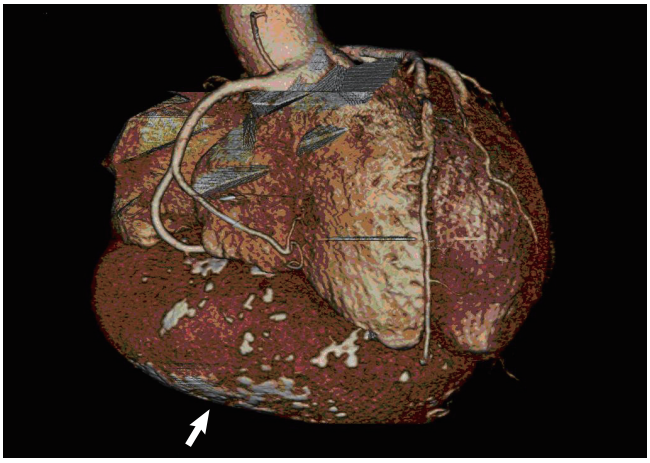

Fig. 2. Reconstructed 3D-computed tomography. The left ventricular pseudoaneurysm is indicated by an arrow.

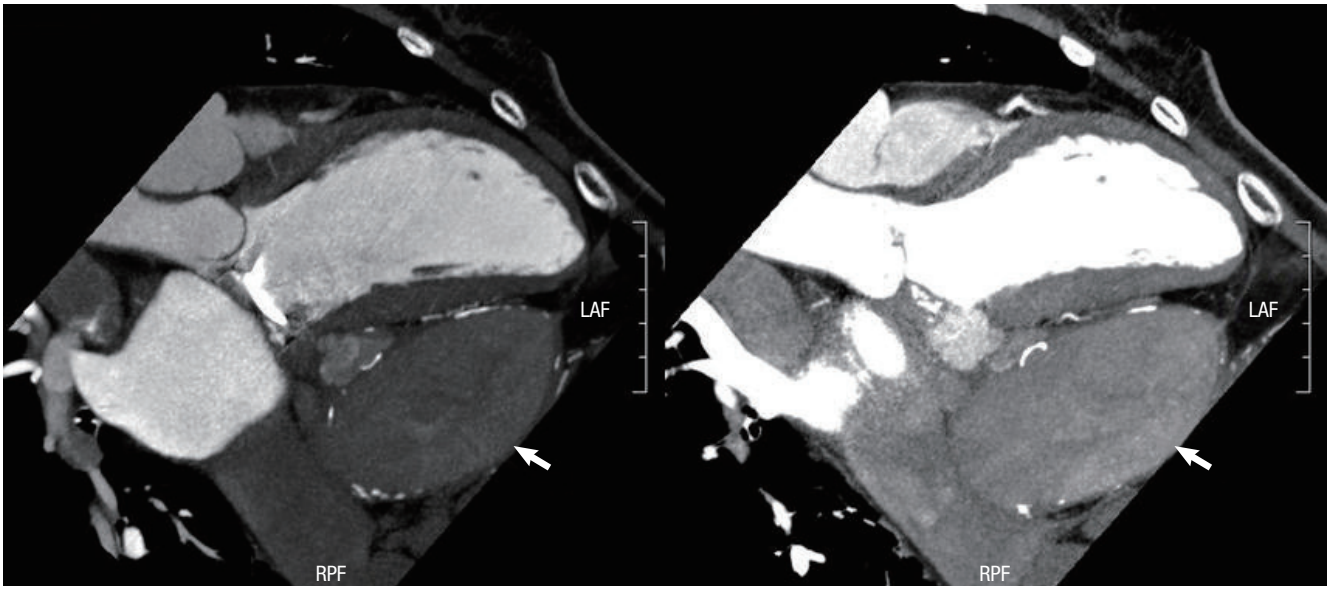

Fig. 3. Left ventricular pseudoaneurysm (arrow) from medial aspect of MVR site through tortuous tract.

DISCUSSION

LV pseudoaneurysm is a clinically rare condition that is difficult to diagnose (1). It is defined as rupture of the myocardium involved in pericardial adhesions or the epicardial wall (2, 3). The most common etiology of LV pseudoaneurysm is myocardial infarction (4). Inferior infarcts are approximately twice as common as anterior infarcts (5). One-third of pseudoaneurysms result from a surgical procedure, most often MVR (3).

In this case, the pseudoaneurysm is not considered to be caused by only a single-vessel lesion with proximal diagonal artery stenosis but also by myocardial infarcts. The ischemic lesion was located far from the LV pseudoaneurysm and patient had no evidence of myocardial infarcts. Therefore, this LV pseudoaneurysm was thought to have resulted from the previous MVR. Further, pseudoaneurysm was not detected on echocardiographic examination that was performed 2 yr ago, and chest pain and dyspnea developed in the past 6 months. Therefore, we presumed that this LV pseudoaneurysm had developed recently and enlarged rapidly. Surgical treatment is usually recommended for LV pseudoaneurysm because of the possibility of its rapid expansion and rupture (3).

The neck of LV pseudoaneurysmal sac in this case was located inferior to the prosthetic mitral valve and connected to the LV cavity with a tunnel-shaped structure. Repair of the LV pseudoaneurysm was possible only after removal of the previously placed mechanical valve. Therefore, we had to replace mitral valve although the previous valve had good function.

Coronary angiography is usually necessary before surgery. In fact, angiography of the LV is the best available test for diagnos-

ing LV pseudoaneurysm (3). However, because of its cost and invasiveness, a reasonable alternative for the first evaluation is transthoracic echocardiography (2, 3, 6).

Further, more information about the location and the relationship between LV pseudoaneurysm and other organs can be obtained by reconstructed computed tomography and cardiac MRI. This data could be very helpful to the surgeon in order to plan the surgical procedure (2, 7-9).

In conclusion, we successfully resected a giant LV pseudoaneurysm developed 5 yr after MVR together with CABG, redo MVR, and tricuspid annuloplasty through the median re-sternotomy.

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