Stanford Type A Aortic Dissection which Ruptured into the Left Atrium: Report of a Case

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Abstract
A Stanford type A aortic dissection ruptures usually into the pericardial space or the mediastinal space. We herein report the rare surgical case of a Stanford type A aortic dissection which ruptured into the left atrium. The patient had a previous history of mitral valve replacement. The time and the cause of the aortic dissection was unclear. At operation, adhesions around the proximal aorta and between the aortic root and the left atrial roof were confirmed to be one of the causes for this rare form. A fistula to the cardiac cavity following an aortic dissection may occur in any patient, especially in those with a history of previous cardiac surgery.

Key words Aortic dissection · Left atrium · Fistula

Introduction
A ruptured aortic dissection into the cardiac cavity is an extremely rare type of congestive heart disease.1-3 We herein present a surgical case of a Stanford type A aortic dissection which ruptured into the left atrium but was thereafter successfully treated.

Case Report
A 71-year-old woman was admitted to Kyushu Cardiovascular Center for dyspnea without chest pain. She had a history of mitral valve replacement for mitral valve regurgitation 16 years previously. On admission, dyspnea progressed and respiratory management was immediately required. Her blood pressure was 75/35 mmHg with an irregular pulse of 84 beats/min. A chest roentgenogram showed a moderate cardiac enlargement and pleural effusion bilaterally. An ultracardiogram demonstrated moderate aortic regurgitation and another jet from the posterior aspect of the aortic root toward the posterior wall of the left atrium (LA). An aortogram showed a Stanford type A aortic dissection and an enhanced LA which was immediately enhanced from the aortic root (Fig. 2). An emergency operation was mandatory based on a diagnosis of a Stanford type A aortic dissection which had ruptured into the LA.

The operation was performed under cardiopulmonary bypass with hypothermic circulatory arrest and using the retrograde cerebral perfusion method. A tear was located on the posterior wall of the ascending aorta just proximal to the brachiocephalic artery. Adhesion was noted not only around the proximal aorta but also between the posterior wall of the aortic root and the LA roof; however, a pseudolumen having communication with the LA was also observed (Fig. 3). A patch closure of the fistula was made using a bovine pericardium and an ascending aortic graft was made using Hemashield (Meadox Medicals: Oakland, NJ, USA) (28 mm) with gelatin-resorcin-formalin glue. The patient had an uneventful postoperative course and her postoperative ultracardiogram demonstrated no communication between the aortic root and the LA.

Discussion
A ruptured aortic dissection into the left atrium constitutes an extremely rare type of heart disease. To our knowledge, only three cases have been previously reported in the literature. Two patients had successful
surgical repair,¹² and one patient died while awaiting surgery.³ Fistulization to the pulmonary artery, right atrium, and right ventricle in the setting of acute dissections have all been frequently reported.⁴–¹² Imaging plays an important role in the diagnosis and the early treatment of these complications.¹–¹⁰ Most previous reports have emphasized the usefulness of transesophageal echocardiography, which has been shown to be an excellent technique for visualizing these complications. In our patient, transesophageal echocardiography showed a normal aortic valve, ambiguous observations of the distal ascending aorta, and a space between the aortic root and the left atrium that had an opening to the left atrium. We thought the space was a ruptured aneurysm of the sinus of Valsalva into the left atrium. This was followed by aortography, which precisely confirmed the preoperative diagnosis. The time and the cause of the aortic dissection was unclear. This patient had no history of systemic arterial hypertension, no signs of Marfan’s syndrome, and no signs of any infection such as syphilis. In addition, no loss of elastic and muscle fibers of aorta, cystic medial necrosis, or aortitis was detected on a histologic examination. In some references,¹³–¹⁵ to dissections late after cardiac surgery, many of them were related to a degeneration or intrinsic weakness of the aortic wall, especially related to aortic valve disease. Dissections that occurred months to years postoperatively are not likely to be related to technical operative errors or clamp injury.¹³–¹⁸ In our patient, the tear was located on the position of a previous aortic cross-clamp, but we are unable to assume that the effects of the cross-clamp may be the cause of the dissection. In addition, aortic size is generally accepted as an important risk factor in an aortic dissection,⁹ but our patient’s former ascending aortic diameter was unknown.

Fig. 1. A transesophageal echocardiogram demonstrated a space between the aortic root and the left atrium. The space had an opening into the left atrium. LA, left atrium; Ao, aorta

Fig. 2. An aortogram showed a Stanford type A aortic dissection and an enhanced left atrium which was immediately enhanced from the aortic root. An opening was observed (gray arrow). LA, left atrium; Ao, aorta; white arrow, false lumen

Fig. 3. Intraoperative findings. Adhesion was noted between the posterior wall of the aortic root and the left atrium roof. In addition, the pseudolumen showed a communication with the left atrium (arrow). Ao, aorta; RA, right atrium; RV, right ventricle