



Figure 2. Histologic section (elastica van Gieson stain) through the area that shows abrupt laceration (arrow) of all the layers of media. The outer part of the defect contains only the adventitia. The luminal side of the defect is covered by fibrocellular proliferation (asterisk).

the aorta in 9 patients with Marfan syndrome, coactation of the aorta, or chronic aortic dissection by autopsy. Histologic section revealed almost the same findings as in the present case. The mechanism of the occurrence of intromedial tear could be associated with fragility of the aortic wall, such as cystic medial necrosis and Marfan syndrome. Svensson and colleagues^{3,4} also

reported this type of tear in 6.6% of patients with Marfan syndrome and suspected that it might propagate to become the classical type of aortic dissection.

In this case intromedial tear occurred in the aorta facing the pulmonary trunk and did not result in aortic rupture or pseudoaneurysm formation but in aortic regurgitation.

Intromedial tear of the aortic wall around the aortic commissure is a rare pathophysiologic cause of acute aortic regurgitation. The occurrence of intromedial tear might be associated with fragility of the aortic wall, such as cystic medial necrosis. If acute aortic regurgitation with aortic cusp prolapse and intact ascending aortic wall is present in the patients with connective tissue disease, intromedial tear of the aortic commissure should be taken into consideration.

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Novel left ventriculoplasty for nonischemic dilated cardiomyopathy with functional mitral regurgitation

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Functional mitral regurgitation (FMR) accompanying nonischemic dilated cardiomyopathy (DCM) has a poor prognosis, and its surgical management is still controversial. We report a novel surgical approach that consists of the repair of papillary muscle geometry and annuloplasty with

a semirigid ring and partial resection of the dilated left ventricle (LV). Mid-term postoperative results of our surgical approach included no recurrence of FMR, effective reduction of the LV volume and shape, and improvement of pulmonary artery pressure.

Clinical Summary

A 42-year-old man was admitted to our center for an easy fatigability on effort. On admission, echocardiogram demonstrated a dilated LV associated with severe mitral valve regurgitation. End-systolic volume index (ESVI) and end-diastolic volume index (EDVI) were 139.5 and 160.5 mL/m², respectively. Although severe regurgitation was present either at the mitral (3+) or tricuspid valve (3+), ejection fraction (EF) was decreased to 13 percentages, and pulmonary artery systolic pressure (PAP) was increased to 39 mm Hg. Preoperative gated single photon emission computed tomography quantification confirmed the diagnosis of DCM and showed the spherical shape of the dilated LV. Coronary angiography showed normal coronary findings.

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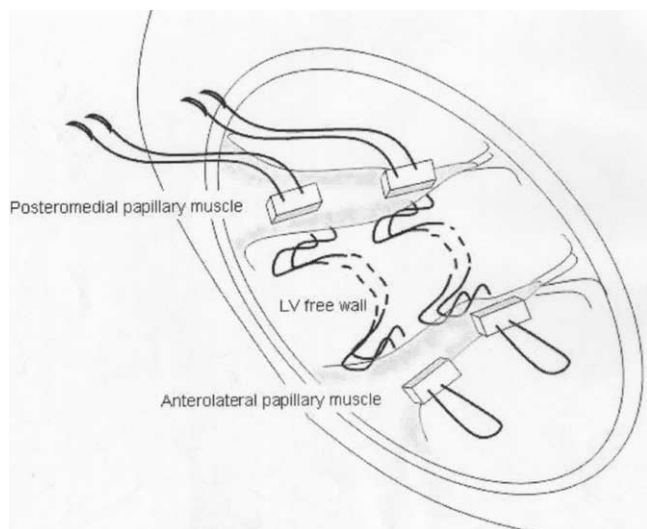


Figure 1. The scheme of papillary muscle positioning is shown. The left ventricle (LV) cavity was opened from the apex. Two mattress sutures were applied at both the base and the top of the papillary muscles. The mattress sutures were tied over the pledgets, and there was no gap between anterior and posterior papillary muscle.

The mitral valve was approached via right-side left atriotomy. The annulus was dilated, and severe central leakage was noticed. Mitral valve plasty was performed with a 28-mm Physio ring (Baxter Healthcare Corp, Irvine, Calif). The LV cavity was then opened from the apex to the middle part, with an incision parallel to the left anterior descending artery. The papillary muscles were

visualized. With the use of 0-0 Ti-Cron (Davis & Geck, Danbury, Conn), a mattress suture with pledgets was first placed on the base of anterior-lateral papillary muscle, hitched the LV free wall between both papillary muscles, and then ran through the base of the posterior-medial papillary muscles. The second mattress suture was placed in the same manner, 1 to 2 cm above the first one. The mattress sutures were tied over with second pledgets, and there was no gap between the bases of the anterior and posterior papillary muscles (Figure 1). Next, ventricular restoration was performed with an on-pump beating heart without aortic crossclamp. The LV muscle of the anterior-lateral wall was excised. A purse-string suture was applied in the transitional zone at the base of 2 papillary muscles. The LV cavity was then closed without a patch in 2 layers by using monofilament sutures. Tricuspid valve annuloplasty was performed with a 32-mm Carpentier-Edwards Classic ring (Edwards Lifesciences, Irvine, Calif).

After the operation, LV functions were improved at the 6-month period on the echocardiogram. EDVI decreased from 160.5 to 71.5 mL/m², and ESVI also decreased, from 139.5 to 41.5 mL/m². Whereas PAP dramatically decreased from 39 to 17 mm Hg, EF improved from 13% to 42%. The restoration of LV was also confirmed by gated single photon emission computed tomography quantification and showed a change of the LV shape from spherical to spindle at 6 months after the operation (Figure 2).

Discussion

In this article, we report the results of mitral valve repair combined with partial left ventriculotomy on a patient who had an end-stage DCM with severe FMR. The aim of this surgical approach is a synthetic repair for the pathology of DCM. We suggest that the integrity of the mitral component could be essential for a better prognosis after LV restoration surgery.^{1,2} Geometrically, FMR in DCM is composed of an annular factor (eg, annular dilatation) and a subvalvular factor (eg, sphericalization of the LV, leaflet tether-

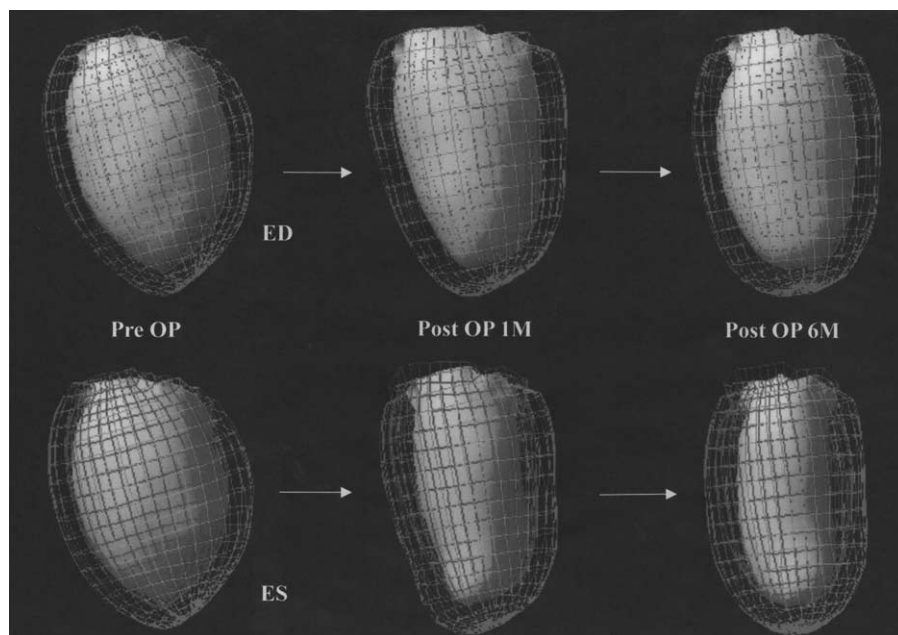


Figure 2. The change in left ventricle volume and shape is shown by gated single photon emission computed tomography quantification. The upper line of images shows the end-diastolic phase (ED), and the lower line of images shows the end-systolic phase (ES). The shape of the left ventricle changed from spherical to spindle at 6 months after operation. *Pre OP*, Before surgery; *Post OP*, after surgery.

ing geometry, and papillary muscle discoordination).³⁻⁵ From these points of view, we proposed that FMR in DCM could be treated by 2 different approaches: (1) reduction of the anterior and posterior annular distance to prevent the tethering effect of mitral leaflets and (2) plication of the interpapillary myocardium muscles during LV restoration to decrease the distance of both papillary muscles and to reserve the coaptation of mitral leaflets and additively restore the dilated LV, cooperating with partial volume reduction. In this surgical procedure, the first goal was achieved by using ring annuloplasty, and the second, by papillary muscle positioning with 2 mattress sutures and partial resection of the dilated LV.

ESVI and EDVI were successfully reduced after surgery. Both EF and PAP were markedly improved at 6 months, and the patient's New York Heart Association functional class improved from IV to I. Nevertheless, it is still difficult to clarify which factor (annular or subvalvular) has the stronger association with FMR, and 3-dimensional repair of FMR seems to be effective to boost ventricular restoration in LV surgery.

In conclusion, our combined surgical procedure aims to restore the LV and to improve the LV function in patients with DCM. To

determine the durability of this procedure, long-term follow-up is needed.

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Surgical treatment of an aneurysm involving ascending aorta, aortic arch, and a rupture of a descending aortic aneurysm 26 years following acute type A aortic dissection

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Supplemental material is available online.

A 60-year-old man with distal aortic ascending aneurysm, aortic arch aneurysm and subacute rupture of the descending aorta had undergone aortic valve repair and proximal ascending aorta replacement following acute type A aortic dissection 26 years ago. Surgical therapy included replacement of distal ascending, arch, and complete thoracoabdominal descending aorta using selective antegrade cerebral

and abdominal organ perfusion, reinsertion of the brachiocephalic trunk, left carotid artery, two intercostal arteries (Th-9/10), reimplantation of both renal arteries, the superior mesenteric artery and coeliac trunk through a left-sided thoracotomy and thoracoabdominal approach.

Clinical Summary

A patient underwent emergency aortic valve reconstruction combined with proximal ascending aorta replacement following traumatic type A aortic dissection after a ski-accident 26 years ago. The following years were uneventful and the patient was in good condition without signs of kidney dysfunction or abdominal malperfusion. An increasing aneurysm (diameter 4.5 cm) of the left common iliac artery was resected and a 10 mm Dacron tube graft inserted two years ago. A computed tomography scan one year later showed the known dissection of the aortic arch and descending aorta (Figure 1). However, diameter of the aortic arch and the descending aorta had increased to 6.5 cm and 7.5 cm, respectively just proximal to the diaphragm. In addition, a contained rupture was apparent.

Surgical Technique

In the right recumbent position, a skin incision was made from the lower angulus of the left scapula down to the belly button. The

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