

Extended Aortic Grafting for Acute Ascending Dissection after Type B Dissection

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A 31-year-old man was diagnosed with acute ascending aortic dissection and massive aortic regurgitation following acute type B dissection during drug treatment. Although the aortic arch was not dissected, we performed aortic replacement from the aortic root to the proximal portion of the descending aorta. The aim of the operation was the prevention of aortic arch dissection, and closure of initial entry of type B dissection. (Ann Thorac Cardiovasc Surg 2001; 7: 384-6)

Key words: aortic dissection, modified Bentall operation, elephant trunk procedure

Introduction

Although replacement of an extended portion of the aorta remains a formidable task, various innovative approaches have made it easier recently.¹ We preferred an extended aortic replacement including the aortic arch for a patient who suffered from acute ascending aortic dissection following acute type B aortic dissection.

Case

A 31-year-old man complained of sudden back pain, lumbago and left leg pain, and was admitted to our hospital. A computed tomographic scan showed a Stanford type B (DeBakey IIIb) aortic dissection. The left common iliac artery was completely occluded by the false lumen and the right common iliac artery had a stenotic lesion as well. The aortic root was dilated without aortic dissection. A left axillo-bifemoral bypass was performed immediately. On the sixth postoperative day, he complained of severe anterior chest pain. A computed tomographic scan showed no signs of progression of the descending aortic dissection, and an echocardiography showed massive aortic regurgitation and an intimal flap of the as-

cending aorta. The patient was therefore diagnosed with acute dissection of the ascending aorta and massive aortic regurgitation.

Aortic root replacement and total arch grafting were performed immediately. The ascending aorta and aortic arch were exposed through a median sternotomy. It was revealed that the ascending aorta was dilated with acute aortic dissection extending from the aortic root to the middle portion (Fig 1a). A cardiopulmonary bypass was instituted between the proximal side of the aortic arch and the right atrium. The patient was cooled down to a rectal temperature of 20°C. Cardiac arrest was obtained with ascending aortic cross-clamping. After an ascending aortic incision was made, antegrade crystalloid cardioplegic solution was administered through both coronary orifices. It appeared that the dissection of the ascending aorta involved all of its circumferences, and reached both the coronary orifices. The aortic annulus was severely dilated. Aortic root replacement employing the Carrel patch technique was performed. A composite graft made by a 24-mm polyester vascular prosthesis (Intergard Woven Interwascular, La Ciotat, France) and a 21-mm Bicarbon mechanical valve (Bicarbon, Sorin Biomedica Cardio S.p.A, Italy) was used for the reconstruction of the aortic root. The proximal end of the conduit was sutured to the aortic annulus buttressed with a strip of Teflon felt. Under systemic circulatory arrest and selective cerebral perfusion from the left carotid artery and the right axillary artery, the aortic arch was transected. We found the entry of the type B dissection existed just distal to the left subclavian artery. The left vertebral ar-

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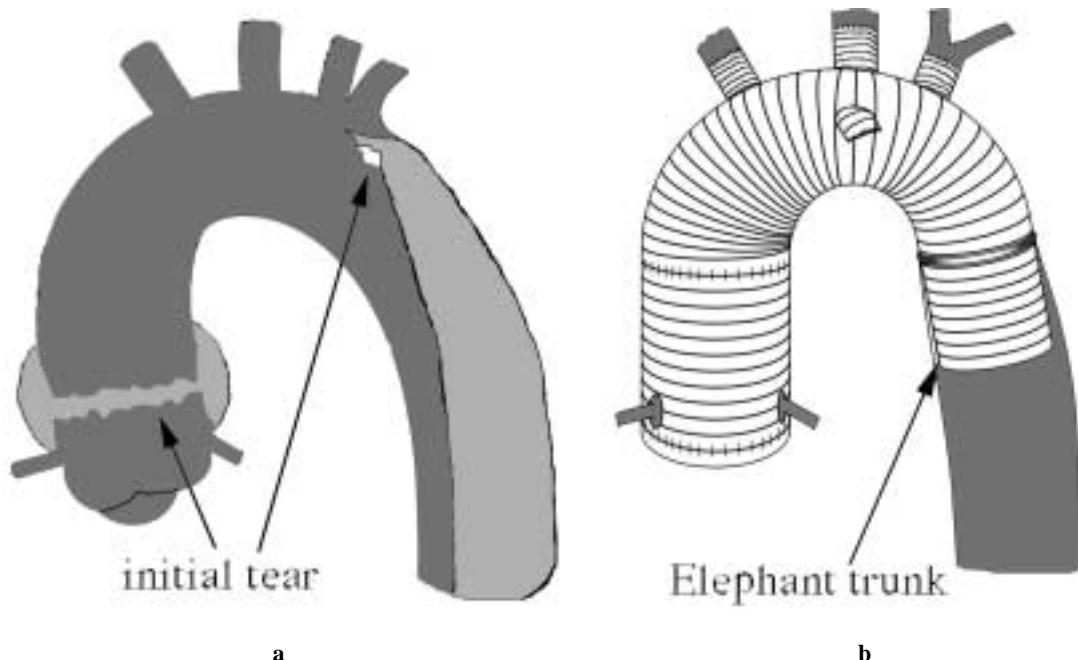


Fig. 1. Schematic drawing of the operation.

- a: Preoperative schema of the ascending aortic dissection and the descending aortic dissection. The shadows show the false lumen.
- b: Results of extended aortic replacement.

tery originated from the aorta independently. A polyester vascular prosthesis, which was 7 cm long and 2 cm in diameter, was inserted into the descending aorta as an “elephant trunk prosthesis.”²⁾ The false lumen of the aorta was glued together with the gelatin-resorcine-formaldehyde/glutaraldehyde (GRF) glue (Trigon AG, Monchengladbach, Germany)³⁾ and the four branched graft (24 mm) was connected to the elephant trunk buttressed with a Teflon felt strip, and the left subclavian artery and the left vertebral artery were anastomosed to one of the branch grafts. After systemic reperfusion and rewarming were started through the graft branch, the proximal side of the arch graft was anastomosed to the conduit of the aortic root, and the ascending aorta was declamped. Finally, the rest of the arch vessels were reconstructed by the other branches of the grafts, and the patient was weaned from bypass (Fig. 1b). ECC time was 227 min, selective cerebral perfusion time was 95 min, and circulatory arrest time was 52 min. The postoperative course was uneventful.

Pathological study of the aortic wall showed cystic medial degeneration. The computed tomographic scan undertaken two weeks after the operation showed that the dissection lumen near the distal aortic anastomosing point was occluded by the clot formation, and the dissecting lumen was patent in the distal side of the descend-

ing aorta and the abdominal aorta. The patient was doing well three months after the operation.

Discussion

Medical treatment is recommended to treat type B dissection, and surgical treatment is reserved for patients with complications, such as rupture of an aneurysm, or organ ischemia. However, medical treatment is associated with a high incidence of complications caused by expansion of the false lumen. Recently, several authors have begun to recommend the use of surgical treatment for type B dissection.⁴⁾ On the other hand, type A dissection should always be treated with surgical treatment consisting of ascending aortic grafting, with ascending aorta and total aortic arch grafting appropriate for patients whose initial tears exist in the aortic arch or distal aortic arch.⁵⁾

In this case, although the aortic arch was not dissected, we performed extensive aortic replacement from the aortic root to the proximal portion of the descending aorta. One of the aims of this procedure was the prevention of aortic arch dissection. If the aortic arch was not replaced at the operation the incidence of aortic arch dissection would have remained high because of his clinical history, age, and histological character. Although the pa-

tient had none of the usual characteristics of Marfan's syndrome, the histological diagnosis of cystic medial degeneration was suspected intraoperatively.

The second purpose of this procedure is the closure of the entry of the type B dissection. On the basis of the work of Borst and colleagues,²⁾ who introduced the elephant trunk technique, we tried this technique in this case. The procedure was performed to close the initial entry, to prevent enlargement of the residual aneurysm and to ease the proximal anastomosis in the aforementioned operation.

In conclusion, we believe that aortic replacement including the intact aortic arch is reasonable when the patient is young enough to easily withstand the operation and has a predisposition to suffer from the dissection again.

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