# ELEPHANT TRUNK PROCEDURE FOR POSTPARTUM RETROGRADE TYPE B DISSECTION

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***Dissection of the descending aorta with the intimal tear close to the left subclavian artery and retrograde extension into the aortic arch and ascending aorta is an unusual finding and appropriate surgical manegement is controversial. We described a case of an ascending aorta aneurysm due to postpartum chronic Stanford Type B dissection in which the thrombosed false lumen was extending to the aortic root retrogradely. Elephant trunk procedure combined with the ascending aorta and arch replacement were successfully performed and the patient has recovered rapidly.***

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Dissection of the descending aorta usually presents with a tear near the origin of the left subclavian artery and in the presence of only antegrade extension, prognosis is much better with the medical treatment in the absence of enlargement of the aorta to form an aneurysm and inadequate perfusion. However, the surgical intervention for an type B dissection with retrograde extension toward the ascending aorta is controversial for choosing of type of arch replacement. We describe a case of Type B dissection which was detected in the postpartum period extending toward the ascending aorta.

## CASE REPORT

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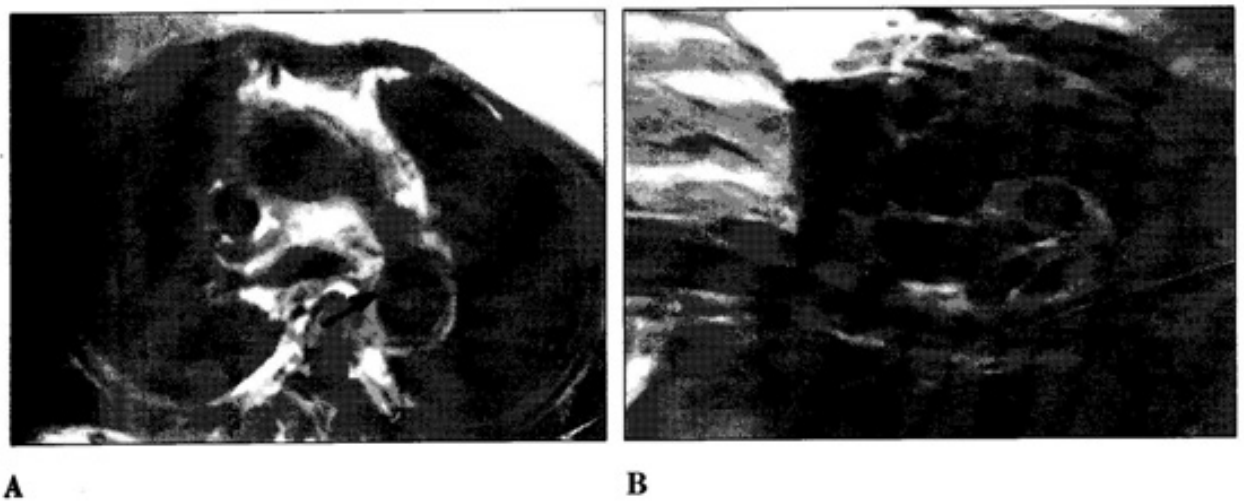
A 36-year-old woman with a history of hypertension was admitted to our clinic with a diagnosis of aortic dissection. The diagnosis was made at the third month of the postpartum period at another hospital when she has suffered an ausle onset of severe back pain and weakness of both legs. Computed tomographic scan demonstrated the location of the intimal tear in the proximal descending aorta which was extending toward the abdominal aorta (Fig 1-a-b). The aortic arch and the ascending aorta was also found intact by transesophageal echocardiogram (TEE). We decided to follow the case with medical therapy since the of patient did not accept the operation and she was discharged with antihypertensive treatment after two weeks of hospitalization. Eight months later she came to our clinic with



A B

**Figure 1.** Magnetic resonance imaging showing in (A) and (B) the intimal flep in the descending aorta and intact ascendan aorta (arrows).

symptoms of dyspnea, chest pain, palpitation and fatique. On physical examination a mild diastolic murmur was heard at the left sternal border. Chest radiography showed marked cardiomegaly and a dilated ascending aorta. TEE revealed aneurysmatic dissection of the ascending aorta and aortic arch with moderate aortic valve regurgitation and left ventricular hypertrophy. Thorax magnetic resonance imaging demonstrated the thrombosed false lumen extending proximally to the aortic root (Fig 2). The patient was undertaken to the surgery electively. After sternotomy, cardiopulmonary bypass (CPB) was established via the right femoral artery and bicaval venous cannulation of the right atrium. Left heart venting was carried out through the right superior pulmonary vein and continuous retrograde blood cardioplegia was used for myocardial protection. When the ascending aorta was opened, the true lumen without the intimal tear which was compressed by the thrombosed false lumen from the beginning of the aortic arch to the sinuses of valsalva in a retrograde fashion were seen. After the patient was cooled to a rectal temperature of 18°C, CPB was discontinued and retrograde cerebral perfusion (400 mL/min) were used for brain protection. The intimal tear was detected in the proximal descending aorta. We decided to perform an elephant trunk procedure for the second stage operation and the possibility of another intimal tear in the descending aorta. The descending aorta just below the subclavian artery was transected and 26mm woven Dacron graft (Intervascular Inc., FL, USA) was inserted in to the true lumen. The length of the graft for the elephant trunk was 8

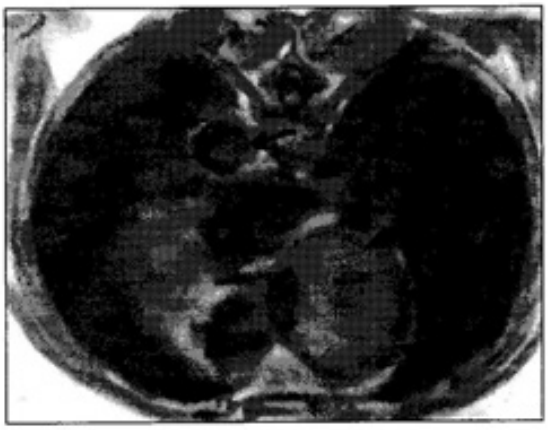


**Figure 2.** Same patient's MRI eight months later, showing the aneurysmatic enlargement of the ascendan aorta with thrombosed false lumen that compressed to the true lumen. The intimal tear is also seen in the descending aorta.

cm. After the anastomosis of the descending aorta and arch vessels to the graft as a whole, the retrograde cerebral perfusion was stopped, arterial systemic perfusion cannula was inserted to the graft and CPB was begun. During re-warming the competence of the aortic valve was found normal and the proximal anastomosis was accomplished at the level of sinotubuler junction. The patient was weaned from CPB without difficulty. Total circulatory arrest with retrograde cerebral perfusion (RCP) and CPB time were 37min and 225 min, respectively. There was no neurologic deficits and she was extubated at the sixteenth hour of the postoperative period. The patient did well postoperatively and has been under follow-up for one year.

## DISCUSSION

Pregnancy is a predisposing factor for aortic dissection and in women under the age of 40 years, 50% of all dissections occur during pregnancy [1]. The highest incidence is in the third trimester and is probably related to the hormonal and hemodynamic alterations.

Patients with a descending aortic dissection which is the intimal disruption near to the origin left subclavian artery and extension of the dissection to the ascending aorta require an individual evaluation for the selection of the surgical strategy. The optimal approach for the Type B dissection is lateral thoracotomy but in the presence of an ascending aorta enlargement, the priority should be given to the ascending and aortic arch replacement via a sternotomy. The therapeutic difficulties encountered as a result of the wrong surgical approach, as well as without repair of the primary lesion or unnecessary repair of the minimally affected aortic segment. In our case, we did not need a surgical evaluation for the descending aorta dissection in the acute phase because no complication except paraparesis related to dissection or no aneurysmatic enlargement was seen. But eight months later we faced with this unusual complication of the chronic descending aorta dissection. Lui et all described the case of type A aortic dissection without an entrance tear in the ascending aorta or the aortic arch which finally evolved as a type B dissection [2]. As it is difficult to resect the intimal tear in the descending aorta through median sternotomy, the surgical treatment of this stiuation is controversial. Although Miller et al [3] demonstrated that resection of the intimal tear was not necessary for patients with acute type A dissection due to lack of statistical difference between patients with and without intimal tear resection, we believe that if the initimal tear is not resected, development of a progresively enlarging aneurysm and rupture seem more likely to occur due to residual false lumen. Kazui and colleagues [4] reported that extended aortic reconstruction by resection of the intimal tear in the descending aorta and total arch replacement was a resonable surgical technique for retrograde dissection complicated by dilation of the ascending aorta. In our opinion, arch replacement with an elephant trunk procedure through median sternotomy for retrograde aortic dissection is feasible technique and provide excellent result. Von Segesser reported that 9 (10%) of 89 consecutive patients with type A dissection who received surgical treatment had a tear in the descending aorta [5]. Hanafusa et all also reported 12 (8%) total arch replacement with an elephant trunk procedure due to retrograde dissection of 139 consecutive patients with type A dissection [6]. Whenever the intimal tear localized in the lesser curvature of the arch, Ohtsubo and coworkers[7] recommend to using hemiarch replacement because of its easier feasibility and better result than total arch replacement. They also reported that hemiarch replacement demonstrated a lower mortality, shorter CPB, circulatory arrest and less bleeding. Although some reports suggest that supplemental retrograde cerebral perfusion during hypothermic circulatory arrest did not decrease neurologic complications and some recent reports suggest the advantages of unilateral selective low flow antegrade cerebral perfusion for aortic arch repair[8], we have used the retrograde cerebral perfusion in this case with no neurologic deficit.

Whenever the intimal tear is located in the proximal portion of descending thoracic aorta, the surgeon should keep in mind the possibility of the retrograde aneurysmatic enlargement of the arch and ascending aorta as a chronic complication of type B dissections in patients who are treated medically.

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