

A rare presentation of repair of aortic coarctation-related complication and its hybrid repair

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ABSTRACT

A 50-year-old male patient who had coarctation surgery history was admitted to our hospital with complaints of hematemesis and melena. Computed tomography showed extravasation of the distal anastomosis of the descending aorta and periesophageal and left thoracic hematoma. A hybrid surgery with new graft interposition between supraceliac abdominal aorta and the distal part of the prior graft was performed in combination with thoracic endovascular aortic repair. Aorta coarctation surgery may have high complication risk. Hybrid treatment of such complications reduces the mortality and morbidity risk.

Keywords: Aortic coarctation; aortic rupture; hybrid repair.

Aorta coarctation surgery accounts for 10% aneurysm formation arising from the suture lines during follow-up.^[1] In this study, we present a rare case of pseudoaneurysm after early postoperative period and its hybrid repair.

CASE REPORT

A 50-year-old male patient was admitted to our hospital with complaints of hematemesis and melena. The patient was hospitalized by the internal medicine specialist with the diagnosis of gastrointestinal bleeding. The patient's history revealed coarctation of aorta. Subclavian flap aortoplasty was performed 10 years ago and 10 mm polytetrafluoroethylene (PTFE) graft interposition from the ascending aorta to the descending aorta passing the posterior pericardia was performed four months ago. The patient was referred to our clinic with the history of aortic coarctation surgery which might be a suspicious cause of the gastrointestinal bleeding. Computed tomography showed that there was extravasation of the distal anastomosis of the descending aorta and hematoma which extended around esophagus and left thorax (Figure 1).

A written informed consent was obtained from the patient and he was operated in the hybrid operating room. Redo sternotomy and supraumbilical midline laparotomy were performed. Mediastinum and abdominal aorta were explored. The patient was heparinized and 10 mm PTFE graft which was

anastomosed between the ascending to the descending aorta was explored from the mediastinum. A hole was created into the diaphragm and a new 10 mm PTFE



Figure 1. Preoperative computed tomography image showing the polytetrafluoroethylene graft anastomosed to the descending aorta (white arrow), pseudoaneurysm, mediastinal and left thoracic hematoma (black arrow), periesophageal hematoma and nasogastric catheter (arrowhead).

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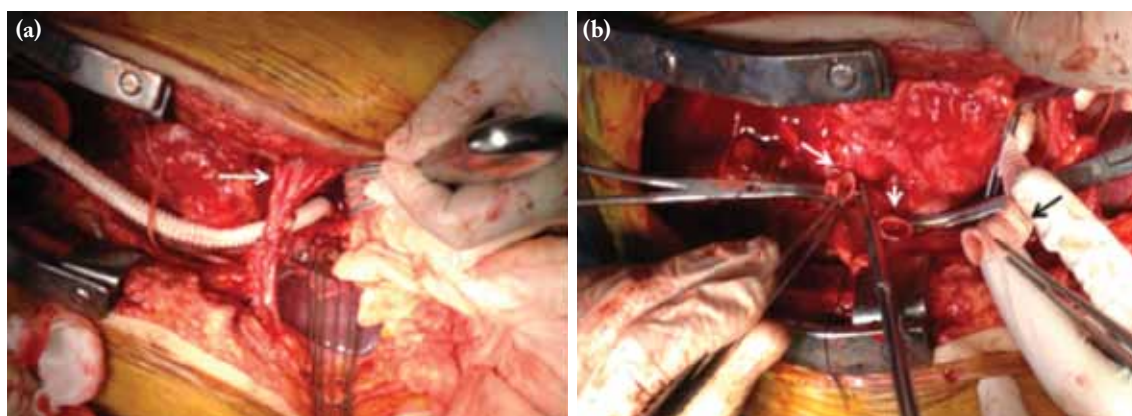


Figure 2. (a) A new polytetrafluoroethylene graft anastomosed to the supraceliac abdominal aorta, diaphragm (arrow). (b) Anastomosis of the new graft's proximal side (black arrow) to the old graft's distal side (white arrow), old graft's clamped distal side (arrowhead).

graft was passed through the hole. Side clamp applied to the abdominal aorta and distal anastomosis was performed to the abdominal aorta from the superior of the celiac artery level. We preferred abdominal aorta anastomosis to minimize high complication risks due to hematoma on thoracic level and, therefore, we used redo sternotomy instead of thoracotomy which is associated with a lower complication risk compared to the redo sternotomy in uncomplicated

patients. Old graft was clamped and divided from the proximal of the descending aortic anastomosis. The proximal end of the new graft was anastomosed to the distal end of the old graft (Figure 2). The distal end of the old graft was ligated. The right common femoral artery was explored and aortography was performed with the right common femoral arterial cannulation. There was extravasation of the thoracic aorta anastomosis. Thoracic endovascular aortic repair



Figure 3. (a) An angiographic image of the descending aorta and pseudoaneurysm (arrow). (b) An angiographic image of the descending aorta after thoracic endovascular aortic repair.

(TEVAR) was performed through the right femoral arterial intervention using 10 mm/70 cm endovascular graft (Vascutek/Terumo, Inchinnan, Scotland, UK.) (Figure 3). The patient was taken to the intensive care unit after the operation was completed. In the pre- and early postoperative period, we inserted nasogastric catheter to monitor hematemesis. There was no bloody drainage. In the postoperative first week, no new melena formation was seen. The patient was discharged 10 days after the operation.

DISCUSSION

Aorta coarctation is a congenital vascular anomaly which is mostly seen on aortic isthmus.^[2] Its prevalence is 0.4% of live births.^[2] There are many techniques for repairing this anomaly such as subclavian flap aortoplasty, Dacron-patch aortoplasty, tube graft interposition, and ascending to descending aorta end-to-end graft anastomosis, although most are associated with complications.^[3] Pseudoaneurysm formation which is seen 17% after subclavian flap aortoplasty, 5% to 28% after Dacron-patch aortoplasty, 6% after tube graft repair, and 3% after end-to-end anastomosis is a high mortality complication and mostly develops on the descending aortic anastomosis due to the weak thoracic aortic structure. This complication has high rupture capacity and has to be treated regardless of its size.^[3]

In this case, the patient underwent subclavian flap aortoplasty 10 years ago and the ascending to descending aorta end-to-end graft anastomosis four months ago. Subclavian flap aortoplasty did not cause any pseudoaneurysm for 10 years; however, end-to-end graft anastomosis caused spontaneous pseudoaneurysm formation and left thoracic hematoma in four months. Pseudoaneurysm formation should be checked with routine imaging controls. Due to potential late complications, patients who are treated surgically should be regularly followed in an imaging study, regardless of the fact that young or old and new or a long time passed from the initial surgery.^[3] In this case, our patient was admitted with gastrointestinal bleeding due to periaortic and thoracic hematoma. Although pseudoaneurysm and hematoma rarely cause esophageal fistula and gastrointestinal bleeding,^[4] we should keep in mind that history of aortic coarctation surgery may complicate with gastrointestinal bleeding.

Emergent open surgically repair of the descending aorta has the highest mortality risk compared to endovascular treatment.^[5] Today, thoracic endovascular

aortic repair is a safe and easy method for all types of diseases of the thoracic aorta, such as aortic aneurysms, hematomas, blunt aortic ruptures, and aortic surgery complications, whether in emergency or elective setting.^[5] Thoracic endovascular aortic repair has lower mortality (9%) and paraplegia rates (3%) compared to open surgery and it is suggested that TEVAR should be the standard therapy for thoracic aortic diseases.^[5] The patients who are treated with TEVAR should be also followed with imaging techniques due to the recurrence risk of TEVAR and first disease. In our patient, we preferred TEVAR for pseudoaneurysm treatment and this method provided us a safe and rapid repair of the aorta in a patient who had third operation of the descending aorta.

In conclusion, aortic coarctation surgery may have a high mortality complication risk in early and late postoperative period. The patients have to be followed through imaging studies on a regular basis. Thoracic endovascular aortic repair is a low mortality, morbidity, and first choose method for descending aortic pathologies, such as aortic coarctation patients operated more than one.

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REFERENCES

1. Hörmann M1, Pavlidis D, Brunkwall J, Gawenda M. Long-term results of endovascular aortic repair for thoracic pseudoaneurysms after previous surgical coarctation repair. *Interact Cardiovasc Thorac Surg* 2011;13:401-4.
2. Dzsinič C, Vaszily M, Vallus G, Dzsinič M, Berek P, Barta L, et al. Late complications and treatment options of aortic coarctation operated in childhood. *Orv Hetil* 2014;155:1189-95. [Abstract]
3. Midulla M, Dehaene A, Godart F, Lions C, Decoene C, Serge W, et al. TEVAR in patients with late complications of aortic coarctation repair. *J Endovasc Ther* 2008;15:552-7.
4. Kahlberg A, Tshomba Y, Marone EM, Castellano R, Melissano G, Chiesa R. Current results of a combined endovascular and open approach for the treatment of aortoesophageal and aortobronchial fistulae. *Ann Vasc Surg* 2014;28:1782-8.
5. Mitchell ME, Rushton FW Jr, Boland AB, Byrd TC, Baldwin ZK. Emergency procedures on the descending thoracic aorta in the endovascular era. *J Vasc Surg* 2011;54:1298-302.