SHORT REPORT

Endovascular Stent-graft Repair for Spontaneous Rupture of the Nonaneurysmal Thoracic Aorta in a Patient with Takayasu’s Arteritis

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Takayasu’s arteritis is a disease of unknown etiology with a constellation of clinical findings primarily resulting from stenotic lesions on the aorta and its branches. Although aneurysmal degeneration is observed frequently in patients with Takayasu’s arteritis, non-aneurysmal spontaneous aortic rupture is extremely rare. We report a case of endovascular stent grafting for spontaneous rupture of a non-aneurysmal thoracic aorta in Takayasu’s arteritis.

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Introduction

Spontaneous rupture of the thoracic aorta without aneurysm is a rare but catastrophic event. We report a case of spontaneous aortic rupture with Takayasu’s arteritis treated by stent-graft replacement.

Report

A 61-year-old woman with a long history of Takayasu’s arteritis underwent axillo-axillary bypass to the occlusion of the innominate artery 16 years previously. Since then the Takayasu’s arteritis has been stable and steroid therapy was discontinued several years ago. She presented with epigastric pain and was admitted to a local hospital. On admission, she underwent several examinations including upper gastrointestinal endoscopic examination and abdominal ultrasonography. However, the cause of epigastric pain was unclear. Three days later, she collapsed suddenly. Chest X-ray showed a left pleural effusion and drainage was performed with a chest tube. The effluent fluid was bloody. Contrast-enhanced computed tomography (CT) revealed left haemothorax and an extravasation of the contrast material through a break in the concentrically calcified aortic wall at the level of supra-celiac thoracic aorta. The aorta was of normal calibre adjacent to the site of rupture and there was suspicion of pseudoaneurysmal formation resulting from a penetrating atherosclerotic ulcer (Fig. 1A). Immediately she was transferred to our hospital with clinical diagnosis of aortic rupture. On arrival, she was haemodynamically stable. Direct open emergency surgical repair was considered extremely difficult because of a heavily calcified aorta with atheromatous degeneration. Therefore, we planned endovascular repair to minimize peri-operative complications. Urgent aortography was performed to obtain the information about the origin of the celiac axis and the access route. A thoracic aortogram showed narrowing of the descending thoracic aorta with free rupture (Fig. 1B). The celiac axis was about 3 cm below the rupture site. This anatomy was suitable for tube stent-grafting. An abdominal aortogram revealed occlusion of the left external iliac artery and narrowing of the right external iliac artery. Endovascular repair was performed immediately in an operating room under general anesthesia. The stent-graft was constructed using thin-walled (0.15 mm) woven polyester graft material measuring 8 cm in length by 18 mm in diameter (Ube Industries,
Co., Ube, Yamaguchi, Japan) attached to a self-expandable 30-mm-diameter Gianturco-Z stent (Cook, Copenhagen, Denmark) with interrupted 6-0 polypropylene sutures. The stent-graft was trimmed with tapered shape to fit the aortic configuration, delivered with a 20Fr straight catheter (Cook, Copenhagen, Denmark). As the delivery sheath insertion via common femoral and external iliac arteries was impossible due to narrowing of these arteries, the stent-graft was deployed in the distal descending thoracic aorta via a right common iliac artery exposed by midline laparotomy. The completion angiogram showed no endoleak. After stent-graft deployment, extirpation of the left pleural huge haematoma through the mini thoracotomy was performed to improve oxygenation. The postoperative course was uneventful. After 13 months of follow-up, the patient is doing well and has had no symptoms or complaints regarding the procedure. Multidetector

Fig. 1. (A) Contrast-enhanced computed tomography shows extravasation of contrast material and contained rupture of the supraceliac thoracic aorta. (B) Preoperative aortography shows narrowing of the descending thoracic aorta with free rupture (black arrows). Celiac axis (white arrow) arose about 3 cm below the rupture site.
row CT scans 13 months after operation demonstrated the complete resolution of the pseudoaneurysm (Fig. 2A, B).

Discussion

Spontaneous rupture of the thoracic aorta without aneurysm, dissection, infection, inflammation, neoplasm, aortic mural disease, or trauma is extremely rare. It is a life-threatening condition where emergency diagnostic and therapeutic measures are required.

Our patient had a long history of Takayasu’s arteritis. Aneurysmal degeneration often is reported in patients with Takayasu’s arteritis. Matsumura reported that Aneurysmal changes are seen in 32% of patients with Takayasu’s arteritis in Japan. In contrast, non-aneurysmal spontaneous aortic rupture is extremely rare. To our knowledge, only two cases of pseudoaneurysm formation of the ascending aorta and the descending aorta in the
chronic stage of Takayasu’s arteritis have been reported. In our patient the preoperative CT scan revealed severe calcified plaques around the area of rupture. Calcification of the aortic wall frequently is seen in the chronic stage of Takayasu’s arteritis. In the presence of atheromatous thinning in the calcified aortic wall, we speculated that a penetrating atherosclerotic aortic ulcer led to spontaneous aortic rupture.

Excellent outcomes can be achieved by prompt surgical intervention in the treatment of spontaneous rupture of the thoracic aorta. Endovascular repair may represent an additional treatment option. Endovascular repair to minimize the operative stress is a safe and effective alternative to open surgical repair in patients with a heavily calcified aorta.

References

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