SHORT REPORT

Massive Endoleak 5 Months after Endovascular Stent Grafting for Type B Aortic Dissection

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Introduction

Endovascular stent grafting for descending thoracic aneurysms is a less invasive technique than conventional surgical graft replacement, but it is not without complications of its own. These include stent graft misdeployment, paraplegia, arterial injury, stroke, distal thrombosis, migration, and endoleak. We report a rare case of massive endoleak 5 months after endovascular stent grafting for type B aortic dissection caused by further dilatation of the aorta.

Case Report

A 71-year-old man was transferred to our hospital with severe back pain. He had a history of hypertension and cerebral hemorrhage. Computed tomographic (CT) scans demonstrated aortic dissection extending from the distal aortic arch to the abdominal aorta above the celiac artery, and the false lumen was closed with a thrombus (Fig. 1a, b). He was treated with controlled hypertension. The CT scan 7 days after onset showed that the false lumen was almost closed, however a small ulcerlike projection was detected at the level of the diaphragm. Fifteen days after onset, he had sudden back pain again, and an urgent CT scan was performed. CT revealed dilatation of the ulcer-like projection (Fig. 1c, d). Angiography showed a false lumen extending from the level of the 11th thoracic vertebra to the 1st lumbar vertebra (Fig. 2a). Endovascular stent grafting to close the entry was performed to avoid rupture of the false lumen.

Under general anesthesia, a stent graft, which was composed of stainless-steel Z stents covered with a Dacron tube graft (30 mm in diameter), was delivered to the entry of the dissection through a 20 French sheath via the right femoral artery under fluoroscopic guidance (Fig. 2b). The stent graft deployment was successful: no endoleak was detected and no paraplegia occurred. The CT scan 7 days postoperatively showed that thrombosis of the false lumen was completely achieved and the patient was discharged with no symptoms (Fig. 3a, b).

A follow-up CT scan performed 5 months later, however, revealed a massive endoleak at the distal end of the stent graft at a site different from the previous false lumen (Fig. 3c, d). Angiography showed that the new aneurysm extended from the middle portion of the stent graft to just proximal of the coeliac artery and the maximum size was 65 mm in diameter (Fig. 2c). Because of the absence of a landing zone between the distal end of the stent graft and the bifurcation of the coeliac artery, we performed surgical graft replacement of the thoracoabdominal aorta with a 32 mm Dacron graft using femoro-femoro bypass.

The distal end of the stent graft was floating in the descending aorta and no entry was found. There was no organization around the stent graft and it was easily removed. This late endoleak was considered to be the cause of a new aneurysmal dilatation of the aorta. Histopathological findings in the excluded stent graft showed no organized thrombus, with fibrin and platelets around the stent graft (Fig. 4).

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Fig. 1. (a, b) Axial CT images on onset demonstrate aortic dissection extending from the distal aortic arch and the false lumen is closed with a thrombus. (c, d) CT images 15 days after onset reveal dilatation of the ulcer-like projection and a false lumen is detected on the lateral side of the descending aorta (arrows).

Fig. 2. (a) Angiogram shows the false lumen extending from the level of 11th thoracic vertebra to the 1st lumbar vertebra. (b) The stent graft deployment was successful and endoleak was not detected. (c) Angiogram shows that the new lumen extends from the middle portion of the stent graft to above the celiac artery.
Comment

Endovascular stent grafting for descending thoracic aneurysms is a less invasive technique than conventional surgical graft replacement. Complications, such as stent graft misdeployment, paraplegia, arterial injury, stroke, distal thrombosis, migration, and endoleak, however, may occur.1,2 There are some reports of endovascular stent grafting repair of thoracic aortic aneurysms.3-5 Mitchell et al. reported that complete aneurysm thrombosis of a thoracic aortic aneurysm was achieved in 83% of the cases and five patients (0.05%) required late operative therapy for endoleaks associated with aneurysm enlargement.3 Dake et al. reported that complete thrombosis of the aneurysm was ultimately achieved in 86 (83%)

Fig. 3. (a, b) Axial CT images 7 days after stent grafting repair show that thrombosis of the false lumen has been completely achieved. (c, d) A follow up CT images 5 months later reveal another lumen outside the stent graft. It is located on the medial side of the descending aorta (arrow).

Fig. 4. There was no organized thrombus, and fibrin and platelets were observed around the stent graft.
patients and an early endoleak was documented in 24 ± 4% of cases, and five stent grafts were surgically removed or excluded.4 Kawaguchi et al. reported an endoleak in 10 lesions (18%), and two of them were major leaks.5 In the present case, the initial closing of the false lumen was successful without endoleak and thrombosis of the false lumen was achieved. Five months later, however, a massive endoleak with a new dilatation of the aorta appeared at the distal site of the stent graft, which was at a site different from that of the previous false lumen. This complication is rare. Poor control of hypertension was considered as the cause of this aneurysmal change. The distal end of the stent graft was floating in the descending aorta and the stent graft was not organized and easily removed. This endovascular stent grafting technique is a quite different concept as compared with conventional surgical graft replacement. In conventional graft replacement, the prosthesis is firmly attached by sutures to the anastomotic end between the graft and native aorta. However the endovascular stent grafting technique depends only on the self-expanding force of the stainless steel Z stent to achieve a seal. Therefore, uncontrolled hypertension and patent intercostal arteries can cause endoleak and dilatation of the aorta. Endovascular stent grafting for a descending thoracic aneurysm is a less invasive technique and very useful, especially in high-risk patients, but careful long-term follow-up is necessary.

References