

[CASE REPORT]

Type III Endoleak of a Disconnected Stent-graft Limb

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Abstract:

A 70-year-old man, who had undergone the placement of an endovascular aneurysm repair graft for an abdominal aortic aneurysm 7 years previously, presented to our facility with the separation of a left iliac stent-graft limb from the main-body stent-graft, resulting in a type III endoleak. An attempt was made to repair the disconnected stent-graft limb with endovascular intervention. An extension stent-graft was successfully deployed using a pulled-through technique to connect the main-body stent-graft with the disconnected stent-graft limb. Endovascular intervention may be an acceptable treatment for type III endoleaks.

Key words: type III endoleak, stent-graft limb disconnection

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Introduction

Type III endoleaks can occur in the long-term follow-up after endovascular aneurysm repair graft (EVAR). An abdominal aortic aneurysm (AAA) with a type III endoleak is associated with a risk of rupture and thereby requires urgent repair. Endovascular intervention has become the treatment of choice for a type III endoleaks (1). An attempt was made to repair the disconnected stent-graft limb by endovascular intervention.

Case Report

A 70-year-old man presented with hypertension, diabetes mellitus and dyslipidemia. He had previously undergone coronary intervention, and EVAR-a Zenith stent-graft (COOK, Bloomington, USA) was deployed 7 years previously at another hospital. The main-body stent-graft was deployed from the right common femoral artery in conjunction with bilateral iliac limb extensions with one stent-graft overlap at their junctions. A compliant balloon was used to improve the apposition of the endo-graft to the aorta and the sites of their overlaps. AAA exclusion and the absence of endoleak were then confirmed on angiography.

However, the patient underwent endovascular embolization using lipiodol twice in the 7 years due to the diagnosis of a repetitive type II endoleak. This time, he was diagnosed

with a type III endoleak, due to the separation of a left iliac stent-graft limb from the main-body stent-graft at the AAA. It is possible that the repeated type II endoleak led to the enlargement of the AAA (to almost 100 mm), which separated the left iliac stent-graft limb from the main-body stent-graft. Computed tomography (CT) scans that were taken at the time of the current admission are shown in Fig. 1.

Because of the patient's refusal to undergo surgical repair in another facility, he was admitted to our hospital for a second opinion on how to treat the type III endoleak, which had resulted from a disconnected stent-graft. The patient then provided his consent for an attempt to repair the type III endoleak by endovascular intervention.

A 4.5 Fr 93 cm parent guiding catheter (MEDIKIT, Tokyo, Japan) was inserted into the left brachial artery and advanced to the main-body stent-graft. A 7 Fr sheath was inserted into the left femoral artery via bilateral common femoral artery cut down, and an 18 Fr sheath (GORE, Flagstaff, USA) was inserted into the right femoral artery in preparation to restrain bleeding with a compliant balloon in the event that the AAA ruptured during the procedure. We first attempted to advance a retrograde guide-wire from the left stent-graft limb to the main-body. However, it was difficult to cannulate due to the tortuosity and the distance from main-body stent-graft to the left limb stent-graft at the AAA. In our second attempt, a guide-wire was advanced through the parent guiding catheter, and then successfully caught using a goose-neck snare device (COVIDIEN, Minneapolis,

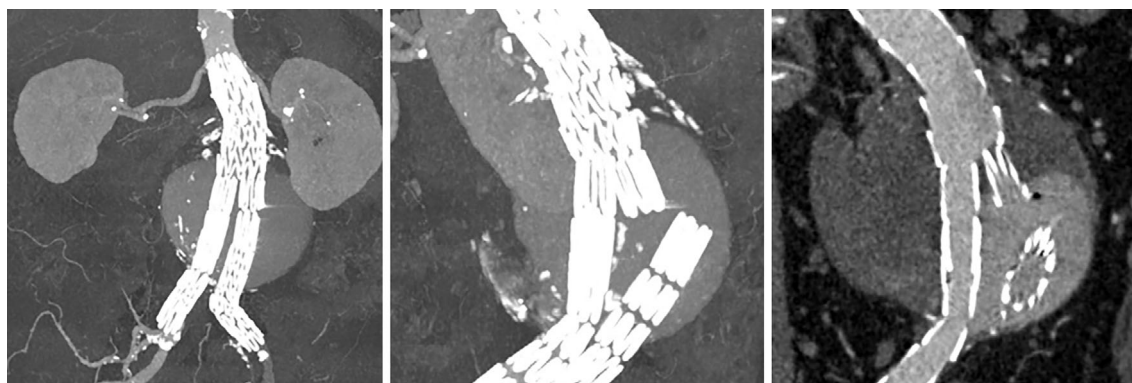


Figure 1. Computed tomography showing a type III endoleak resulting from the disconnection of the left iliac limb from the main-body stent-graft.

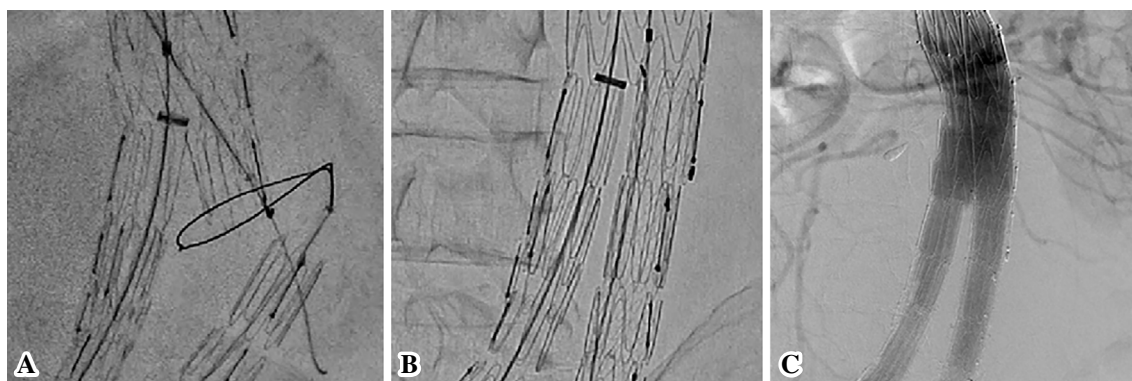


Figure 2. A: Angiography showed that the guide wire was successfully advanced through the main-body stent-graft using a goose-neck snare device that was advanced through the disconnected left iliac limb. B: The extension stent-graft was deployed along the pull-through guide wire. C: Completion angiography showed the successful restoration of blood flow in the iliac limb and no evidence of an endoleak.

USA) that had been advanced through the disconnected left stent-graft limb. The guide-wire was then pulled out through the 7 Fr sheath inserted into left common femoral artery and was changed to a stiffer guide-wire. The 7 Fr sheath was exchanged for a 12 Fr sheath (GORE). The EXCLUDER extension stent-graft (GORE) was successfully deployed along the stiff guide-wire connecting the main-body stent-graft with the left limb of the stent-graft (Fig. 2). A compliant balloon was used to improve the apposition of the sites of the proximal and distal overlaps. On completion, angiography showed the successful restoration of blood flow in the iliac limb and no evidence of an endoleak. The patient was able to tolerate the procedure and was discharged to return home without complications.

At six months after the procedure, follow-up CT showed that the AAA was not enlarged in comparison to before the procedure, and showed no evidence of an endoleak.

Discussion

In recent studies (2, 3), the incidence of type III endoleak with the Zenith stent-graft has been reported to range from 1.0% to 2.8%, with the majority of cases caused by compo-

nent separation (4, 5). These type III endoleaks occur due to the inadequate attachments of overlaps at the component junction, repetitive stress on the stent-graft, or a change of the morphology of the AAA. In this case, it was possible that the overlap of the main-body with the left iliac limb was disconnected due to an enlarged AAA resulting from repetitive type II endoleak and the corresponding embolization treatment. The CT and angiography findings at this time did not reveal any obvious type II endoleak. An AAA with a type III endoleak has a risk of rupture and thereby requires urgent repair. Kassavin et al. (6) described the use of *in situ* fenestration to facilitate the management of a disconnected iliac stent-graft limb that could not be repaired by conventional endovascular treatment.

In the present case, we attempted to repair a disconnected stent-graft limb with a transcatheter technique. The AAA had the potential to rupture during the procedure. Furthermore, the CT and angiography findings revealed that it was difficult to cannulate due to the tortuosity and the distance from the main-body stent-graft to the left stent-graft limb at the enlarged AAA.

A sheath was inserted into the right femoral artery in order to prepare to restrain bleeding with a compliant balloon.

With a goose-neck snare device, the guide-wire was successfully advanced through the main-body stent-graft to the left stent-graft limb. Finally, an extension stent-graft was safely deployed without complications along the pulled-through wire connecting the main-body stent-graft with the left stent-graft limb.

This report illustrates that a pull-through technique using a goose-neck snare device was useful for repairing a disconnected stent-graft limb.

Conclusion

This novel technique is a useful method for salvaging a disconnected stent-graft limb via endovascular intervention. Further experience and follow-up is needed to fully evaluate the safety of this procedure.

The authors state that they have no Conflict of Interest (COI).

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