Endovascular Treatment of Perigraft Seroma after Open Abdominal Aortic Aneurysm Repair: Report of a Case

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Perigraft seroma is a rare complication after open abdominal aortic aneurysm (AAA) repair. We successfully treated large seroma after expanded polytetrafluoroethylene (ePTFE) aortobiiliac graft repair endovascularly. The patient was an 81-year-old lady with the history of five times laparotomy. She could not take any food because of vomiting. Contrast enhanced computed tomography (CT) revealed giant seroma compressing small intestine. Total relining of the graft with a Excluder™ endoprosthesis and open drainage of the seroma was performed. After the surgery, she became asymptomatic and seroma disappeared by CT 2 years later. This modality would be a good option for this rare complication.

Keywords: seroma, EVAR, aortobiiliac graft

INTRODUCTION

Perigraft seroma is a well-known postoperative complication of prosthetic vascular reconstruction especially after extra-anatomical bypass. The seroma after open abdominal aortic aneurysm (AAA) repair is relatively rare and has been reported as the frequency of 1.2%–1.3%,1–7 which would be underestimated.7) We report a case of giant perigraft seroma after open aortobiiliac graft repair with expanded polytetrafluoroethylene (ePTFE) graft. The patient was successfully treated by endovascular total relining with Excluder™ endoprosthesis and open drainage of the seroma.

CASE REPORT

An 81-year-old lady with the history of laparotomy for panperitonitis due to torsion of the sigmoid colon developed an inflammatory AAA. She was referred to our department and underwent open repair with ePTFE graft. During the surgery, small intestine was injured because of severe adhesion and small intestine repair was required. Postoperative course was complicated due to small intestine perforation and two laparotomies were required. Eight months after AAA repair, she could not take any meal because of vomiting. Her symptom was not improved by percutaneous endoscopic jejunostomy. Therefore, total parenteral nutrition was commenced. One year later, contrast enhanced computed tomography (CT) revealed a 7.7×10.7 cm low density mass around the graft (Fig. 1). Small intestine was compressed by this large mass and there was no contrast medium leakage into the mass and she was referred to our department. There was a pulseless mass on the right side of the abdomen without tenderness nor bruit. Blood chemical examinations were essentially normal without white blood cell count and C-reactive protein (CRP) elevation. Therefore, perigraft seroma was highly suspected. Because of the history of multiple abdominal surgeries, endovascular treatment was selected. Under general anesthesia, bilateral femoral arteries were exposed. An Excluder™ stent graft main body PXT231214 (W.L. Gore & Associates, Inc., Flagstaff, Arizona, USA) was deployed from right femoral artery. An iliac extender PXL161207 was
and 450 ml of yellow clear fluid were removed (Fig. 3). Bacterial culture of these specimens was all negative. The postoperative course was uneventful. She started to take a meal on the second day after surgery and was discharged on the 20th day after surgery. The seroma disappeared by CT 2 years after endovascular repair.

**DISCUSSION**

Seroma after open AAA repair is a rare entity with an estimated incidence of 1.2%–2.3% and this frequency would be underestimated because CT or duplex ultrasound is necessary for detecting small seroma. Many seromas are asymptomatic and careful follow-up would be enough. However, surgical intervention is required for the large seroma with the symptoms such as abdominal or back pain, abdominal fullness, vomiting, ileus, and rupture.

Most advocated treatment for seroma after aortobiiliac graft is resection and replacement of the graft with the other type of material. As the alternative methods for the graft preservation, resection of the seroma and tight closure of the sac around the graft, fenestration to the peritoneal cavity or omental transfer around the graft were reported. However, these graft preserving methods are effective only for 53%–72% of the patients. Also, these methods require laparotomy and are invasive for high risk patients. For our patient, these surgical methods with laparotomy would be difficult because of multiple laparotomy history.

As the less invasive and effective method, partial relining of the aortobiiliac graft using stent graft parts deployed from left femoral artery. There was no evident endoleak by completion angiography (Fig. 2). The seroma was removed from a 3 cm skin incision of the right side abdomen. Forty-two gram of gelatinous mass

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**Fig. 1** Contrast-enhanced computed tomography (CT) revealed a large low-density area around the aortobiiliac graft, which was measured 7.7 x 10.7 cm in the maximal diameter (arrows).

**Fig. 2** Angiography before (A) and after (B) endovascular total relining of the aortobiiliac graft. No endoleak was found after stent graft deployment.

**Fig. 3** Photograph of extracted gelatinous mass of the seroma.
was reported. If we could specify the graft segment of serous leakage, this partial relining could be selected. Unfortunately, specific area of serous leakage could not be identified for our patient. Therefore, we planned the total relining of the graft. As the stent graft, Excluder™ was selected because of two reasons. First, the distance between the lower renal artery and the graft bifurcation was 71 mm in our patient. At that time, Excluder™ and Zenith™ were available in Japan. The length of main part plus contra-lateral leg was 70 mm in Excluder™ and at least 74 mm in Zenith™. Therefore, only Excluder™ could be deployed as a bifurcated stent graft. Second, graft used in original Excluder™ had high serous permeability and aneurysm sac shrinkage rate was lower than Zenith™. Therefore, Excluder™ with low-permeability film on the graft was introduced. With this low-permeability Excluder™, sac shrinkage rate became equivalent with Zenith™. We thought this low-permeability film would prevent further serous leakage from the graft material itself. If the anatomy of the patient permits the choice of other Dacron devices, we would select Dacron because total relining with other type of material would be much better. Generally, the distance between the lower renal artery and the graft bifurcation is shorter than 70 mm. In such patients, total relining of the aorto-biiliac graft with bifurcated stent graft would be impossible. Fortunately, bifurcated stent graft could be deployed in our patients. However, if the distance between the lower renal artery and graft bifurcation was shorter than 70 mm, we would select the aorto-uniliac stent graft deployment, contra-lateral leg coil embolization, and femoro-femoral bypass. This method could be applied for many patients after open AAA repair and would be the good option for the perigraft seroma.

In this patient, seroma disappeared within 2 years. If the symptom due to seroma is not severe, resection of the seroma would not be necessary. However, giant seroma caused vomiting due to small intestine compression in our patient. We decided to remove the seroma to improve her symptoms. Fortunately, the access to the seroma was easy, because seroma cavity existed just beneath the abdominal wall. Also extent of the seroma could be identified as the junction of the stent graft with fluoroscopy. This made the removal of the seroma content easy. We did not perform simple puncture and aspiration because the seroma might contain gelatinous part.

**Conclusion**

When anatomically feasible, endovascular relining of the aortobiliac graft would be a good option for the treatment of perigraft seroma after open AAA repair, especially for high risk patients. Identification of the extent of the seroma by fluoroscopy might help the removal of the seroma.

**Disclosure Statement**

Kenji Sangawa and coauthor have no conflicts of interest to declare.

**References**