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Case Report

Primary Infected Distal Superficial Femoral Artery Aneurysm Treated with Endovascular Stent Graft : A Case Report

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Abstract

Treatments for peripheral artery aneurysms include surgical repair and endovascular treatment. Endovascular treatment using covered stent-grafts has recently become common for peripheral artery pseudoaneurysms due to traumatic or iatrogenic vascular injury. However, the usefulness of endovascular treatment for infected peripheral artery aneurysms is not clear. We herein present a case involving an 84-year-old man who developed a giant primary infected aneurysm of the distal superficial femoral artery (SFA) and was treated by placement of Viabahn stent-grafts. On two years follow-up, the stent-grafts have been still patent and there has been no sign of infection. In this case, placement of Viabahn stent-grafts was a viable and successful treatment option for an infected SFA aneurysm.

Key words : infected aneurysm, superficial femoral artery, stent-graft

Introduction

Primary infected aneurysm is an uncommon but potentially lethal disease. With medical treatment only, the reported hospital mortality ranges from 36% to 82% because of persistent infection and subsequent aneurysm rupture¹⁾. Early diagnosis, appropriate surgical intervention, and potent antibiotic therapy are essential for survival²⁾.

Long-term acceptable outcome of endovascular treatment for infected aortic aneurysm have been reported^{3)~5)}. However, the usefulness and long-term outcomes of endovascular treatment for infected peripheral artery aneurysms are not clear. Actually, there are few reports about infected infrainguinal aneurysm treated with endovascular treatment⁶⁾.

We herein present a case involving an 84-year-old man who developed a giant infected aneurysm of the distal superficial femoral artery (SFA) and was treated by placement of Viabahn stent-grafts.

The GORE Viabahn Endoprosthesis with Heparin Bioactive Surface (W. L. Gore & Associates, Flagstaff, AZ, USA) is a flexible, self-expanding, endoluminal stent-graft consisting of two components : a tubular section of expanded polytetrafluoroethylene (ePTFE) with a heparin bioactive surface and an external nitinol structure extending along the device length⁷⁾.

Viabahn stent-grafts are used for revascularization in symptomatic peripheral arterial disease with lesion length of 10 cm or more for targets lesions in SFA. Also, indications for using Viabahn stent-graft is emergency treatment for patients

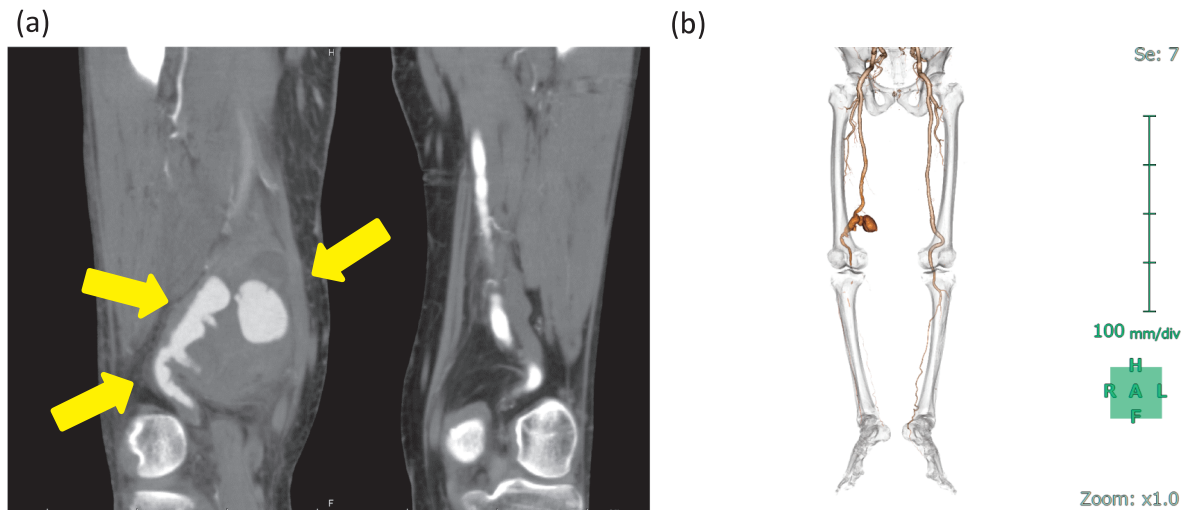


Fig. 1 Computed tomography angiogram showing a right distal SFA aneurysm.

(a) Sagittal view indicating three necks of the aneurysm with arrows.

(b) Three-dimensional computed tomography.

with blood leaks that are difficult to stop bleeding due to traumatic or iatrogenic vascular injury in the arteries in the chest, abdomen, and pelvis. Endovascular treatment with placing Viabahn stent-graft for above-knee peripheral artery disease is safe and has excellent short-term efficacy outcomes⁸⁾.

Case Presentation

An 84-year-old man with a history of current tobacco use, hypertension, chronic kidney disease, diabetes mellitus, alcoholic cirrhosis was referred to our unit for evaluation of a right femoral pulsatile mass. The patient's vital signs at the time of presentation were as follows : blood pressure, 179/117 mmHg ; heart rate, 80 beats/min ; oxygen saturation, 98% (room air) ; and body temperature, 36.8°C.

Computed tomography demonstrated an irregular shaped 81×61 mm distal SFA aneurysm with no mural thrombus (Fig. 1a, b). The patient's inflammatory marker levels were high (C-reactive protein, 26.7 mg/dL ; white blood cell count, 11,700 cells/ μ L). *Staphylococcus epidermidis* was detected in one of the two blood culture bottles. The patient was diagnosed as the primary

infected aneurysm.

Considering of the invasiveness of the surgical treatment for this large infected aneurysm, we utilized an urgent interventional approach taking account of the future bridge surgery. Under local anesthesia, the right common femoral artery was punctured in an antegrade fashion, and an 8-French sheath was deployed. Digital subtraction angiography showed the large aneurysm in the distal SFA (Fig. 2a). After administration of 5000 IU of heparin, a 0.014-inch guidewire was passed across the aneurysm and popliteal artery. At the end of the procedure, 8 × 100 mm + 8 × 50 mm self-expandable Viabahn endoprosthesis were delivered into the distal SFA. A leakage from stent-graft joint was found, then a Viabahn VBX 8 × 39 mm endoprosthesis was placed at the stent-graft joint (Fig. 2b). The final angiogram showed complete exclusion of the aneurysm with no leakage (Fig. 2c).

The patient recovered well from the procedure and had no immediate complications. After the operation, daptomycin was administered by intravenous drip, and aspirin and clopidogrel were orally administered. The inflammatory marker levels (C-reactive protein and white blood cell

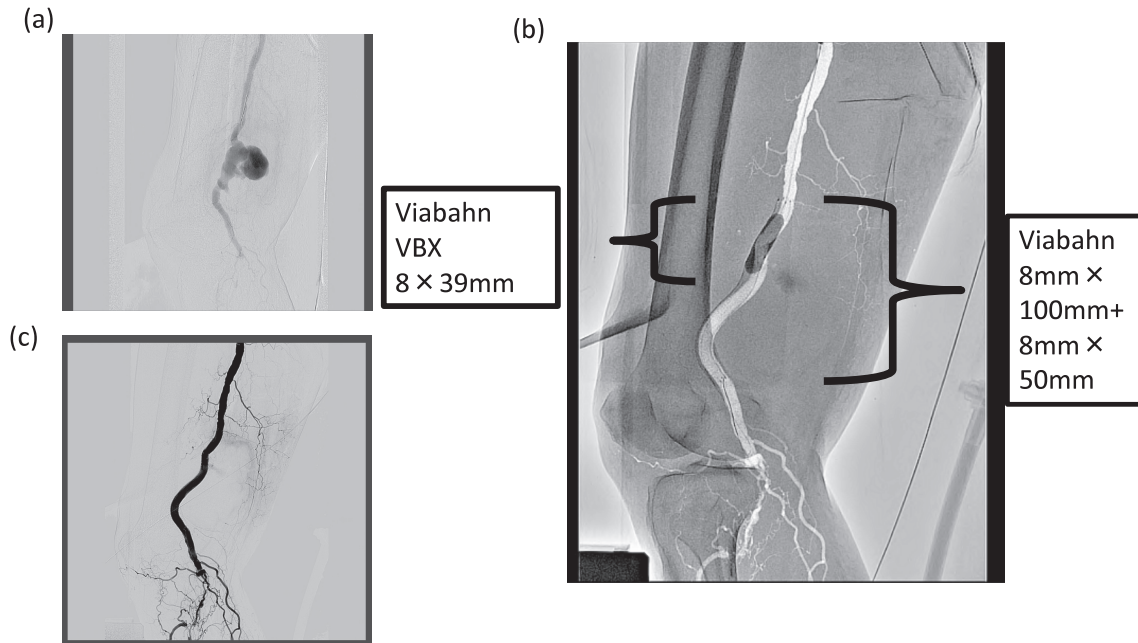


Fig. 2 (a) Percutaneous angiogram showing the right distal superficial femoral artery aneurysm.
 (b) Viabahn endoprosthesis and Viabahn VBX endoprosthesis were delivered after percutaneous intervention.
 (c) Completion digital subtraction angiogram.

count) were improving. The patient recovered well and was discharged on foot ten days after the treatment. Two weeks after the operation, computed tomography revealed that the aneurysm sac had decreased in size to 72 × 54 mm.

He continued oral antibiotics (Sulfamethoxazole/Trimethoprim) after discharge, but he was forced to discontinue oral administration after five months because of an exacerbation of renal function. Two years since the endovascular treatment, the stent-grafts have been still patent and there has been no sign of infection and walking function have been maintained.

Discussion

Primary infected aneurysms are rare and management remains challenging. Open surgical repair has been the widely accepted gold standard treatment. If the emergency surgical treatment was chosen, infected distal SFA aneurysm must be removed, then extensive local debridement

and revascularization must be performed. To avoid routing in an infected area, extra-anatomic routing from left superficial artery to the left popliteal artery below the knee with a saphenous vein graft may be mandatory.

Endovascular treatment for infected aneurysms is considered as a minimally invasive treatment, considering for unnecessary of general anesthesia, debridement and bypass detouring the infected site. Di et al. reported that elective endovascular aortic repair is a viable strategy for treatment of primary infected abdominal aortic aneurysm⁹.

The aneurysm in this case was very large and the evaluation of general condition had not been done yet ; thus, the emergency surgical resection of the aneurysm and revascularization was hesitated for its high invasiveness. The one-stage treatment with emergency endovascular treatment and the bridge surgical revascularization was considered as a treatment strategy. Consequently, the patient did not need to be underwent

surgical revascularization because of good postoperative course.

However, there has always been a concern about persistent infection by putting a stent graft in an infected field. It is always necessary to classify an open surgery into mind as bridge surgery when treating with endovascular stent graft for infected aneurysms¹⁰⁾. Kondo et al. reported a case that two years after EVAR for infected rupture AAA, recurrent graft infection occurred¹¹⁾. Treatment and prevention of post-operative infection in mycotic aortic aneurysms, regardless of the intervention being open or endovascular, includes broad-spectrum antibiotics without consensus on duration or preferred agents⁵⁾¹²⁾¹³⁾. Recommendations have included starting antibiotics early and prolonged duration of post-operative antibiotics (e. g., > six months postoperatively or lifelong)⁵⁾¹²⁾¹³⁾. Most investigators report that non-Salmonella infection is a significant risk factor for operative mortality, however Luo et al. indicate the necessity for lifelong oral antibiotics in patients with positive blood cultures regardless of non-Salmonella infection or Salmonella infection⁴⁾.

This case had to stop taking oral antibiotics after five months due to decreased renal function, but the patient was actually planning to take it for lifelong. Fortunately, this case was no sign of recurrence of the infection for two years. Careful short and long-term follow-up is required for possibility of recurrence of infection after endovascular treatments for infected aneurysms.

Although randomized controlled trials may be the ultimate answer to the role of endovascular stent-graft replacement in infected SFA aneurysms, a proper number for a trial may be impossible given with the rarity of this entity. Case series such as this with longer term follow-up data may be useful in defining the role of endovascular treatment in this difficult clinical situation.

Conclusion

A case of primary infected SFA aneurysm was successfully treated by endovascular treatment with Viabahn stent-grafts and appropriate antibiotic therapy post procedure for five months and have kept being no recurrence at two years follow-up.

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感染性遠位浅大腿動脈瘤に対して Viabahn ステントグラフト 内挿術を施行した一例

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末梢動脈瘤に対するステントグラフトによる血管内治療は有効であるが、感染を伴った鼠経靱帯以下領域の末梢動脈瘤に対する治療報告は散見されるものの長期成績を含めた有効性は確定していない。患者は84歳男性。主訴は右大腿部腫脹と疼痛でありCT検査で不整な形状をした右遠位浅大腿動脈瘤を認めた。血液検査では高炎症反応を認め感染性動脈瘤を強く疑った。感染が制御できない場合はbridge surgeryも視野に入れて、緊急でViabahnステントグラフト内挿術を施行した。術後経過良好で救肢となり、独歩で自宅退院。2年経過してもステントグラフトは開存を維持して感染の再燃もなく、歩行機能も維持している。

キーワード：感染性末梢動脈瘤，浅大腿動脈，ステントグラフト