

Endovascular aneurysm repair-related embolism treated by distal bypass: A challenging case report

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ABSTRACT

Endovascular aneurysm repair (EVAR) has become an effective and reliable therapy. Although EVAR is less invasive than open surgery, it possesses various disadvantages. Graft limb occlusion is an important complication of EVAR and the third most common reason for readmission after EVAR. In this report, we present a late complication of EVAR due to graft migration resulting in severe stenosis of the external iliac artery and recurrent distal arterial thrombosis. A 60-year-old male patient was admitted with acute-onset left leg pain. His medical history revealed EVAR treatment two years previously. During the last two months, he developed symptoms of claudication. Imaging studies revealed that the left superficial femoral artery was obstructed by thrombi, and the left leg of EVAR graft was positioned close to the internal iliac artery causing severe ostial stenosis in the external iliac artery. Also, a Type Ib endoleak was detected. Due to critical lower extremity ischemia, emergency embolectomy was performed. Three days later, a saphenous femorotibial bypass was performed for claudication and the leg of the EVAR graft was extended simultaneously. In conclusion, EVAR has advantages over open repair. Nevertheless, it is associated with a high rate of complications requiring reintervention. Therefore, open surgery should be the first choice in challenging cases.

Keywords: Endovascular procedure, limb salvage, saphenous vein, vascular grafting.

A permanent increase of at least 50% in diameter of an artery compared with the expected normal diameter of the artery has been defined as an arterial aneurysm.^[1] Endovascular repair of aortoiliac aneurysms has become an effective and reliable therapy over the last two decades,^[2,3] due to its advantages compared to conventional open surgery such as lower blood loss, reduced pain, shorter hospitalization, faster recovery, and lower morbidity and mortality.

Limb graft occlusion is an important complication of EVAR and the third most common reason for readmission after EVAR.^[3] In this report, we present a late complication of EVAR due to graft migration which resulted in severe stenosis on the external iliac artery and recurrent distal arterial thrombosis.

CASE REPORT

A 60-year-old male patient was admitted to the emergency department complaining of severe left leg pain for the last few hours. His medical history revealed that he underwent EVAR for an abdominal and iliac aneurysm two years previously. Also, claudication developed in the last two months with a claudication distance of 200 m. He had presented to the hospital with the same severe leg pain 10 days previously. At the time of his admission, acute arterial embolism was detected on Doppler ultrasound and emergent femoral embolectomy was performed. After the operation, his complaints were regressed.

On physical examination, the patient had palpable bilateral femoral artery pulses; however, the popliteal, and pedal arteries were not palpable on the left

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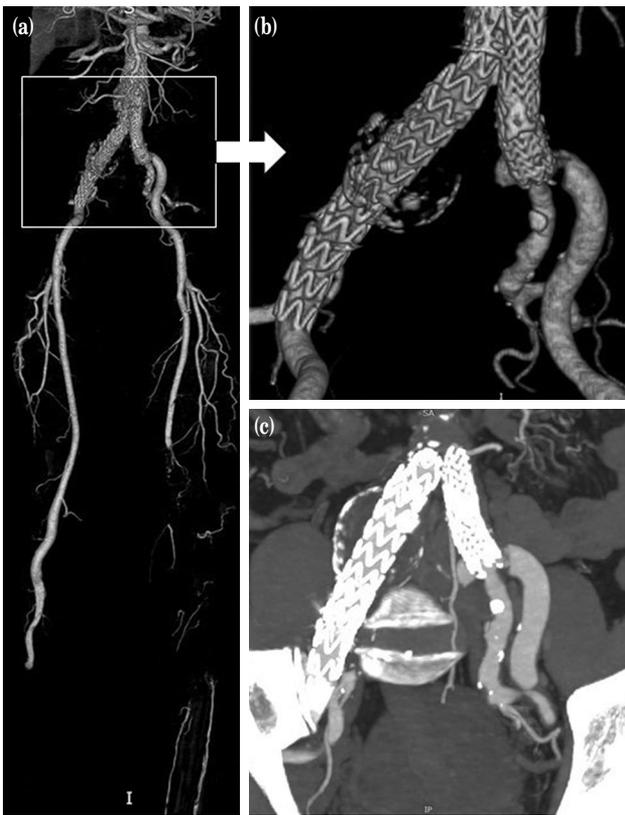


Figure 1. Preoperative computed tomographic angiography. (a) A full view including distal vascular bed. (b) A three-dimensional view of displaced EVARs graft limb. (c) A computed tomographic angiography view of displaced EVAR graft limb.

EVAR: Endovascular aneurysm repair.

lower extremity. Also, coldness and paleness were observed below the left knee. Doppler ultrasound revealed the presence of an acute thrombus in the

left superficial femoral artery (SFA). Computed tomographic angiography (CTA) was performed for further investigation and revealed that the left SFA was full of thrombi, the left limb of the EVAR graft was positioned close to the internal iliac artery causing an angulation and severe ostial stenosis of the external iliac artery. Type Ib endoleak was also detected. At the same time, bilateral distal SFA and popliteal arteries were ectatic and the distal vascular flow reserve was poor (Figure 1).

Due to the presence of critical lower limb ischemia, emergency embolectomy was performed after a written informed consent was obtained from the patient. Postoperatively, the patient's pain subsided, but his claudication continued. Three days later, a femoro-tibial bypass was performed using a saphenous vein graft and the left limb of the EVAR graft was extended simultaneously (Figure 2). The patient was discharged uneventfully on postoperative Day 3. Stenosis caused by the EVAR graft completely resolved on follow-up CTA at three months postoperatively and the femorotibial bypass graft was patent (Figure 3).

DISCUSSION

Although open surgery is more invasive, early and late complication rates and the need for re-intervention are lower than EVAR.^[2,4] More than half of patients reportedly suffer complications of EVAR within the first 10 years of treatment.^[2]

Limb graft occlusion is the third common and serious complication following EVAR.^[3] The etiology

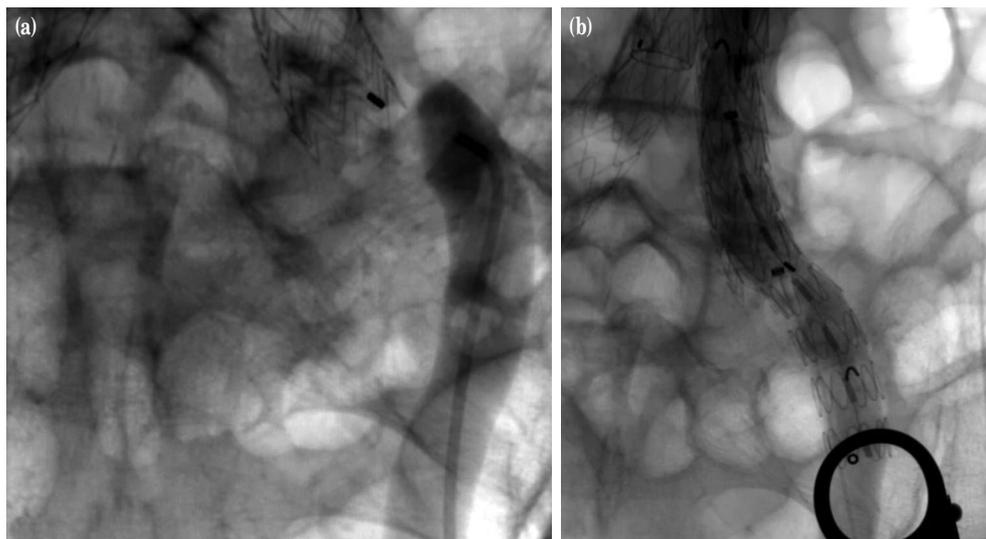


Figure 2. An angiographic view of displaced left EVAR graft limb. (a) Preoperative view. (b) Postoperative view.

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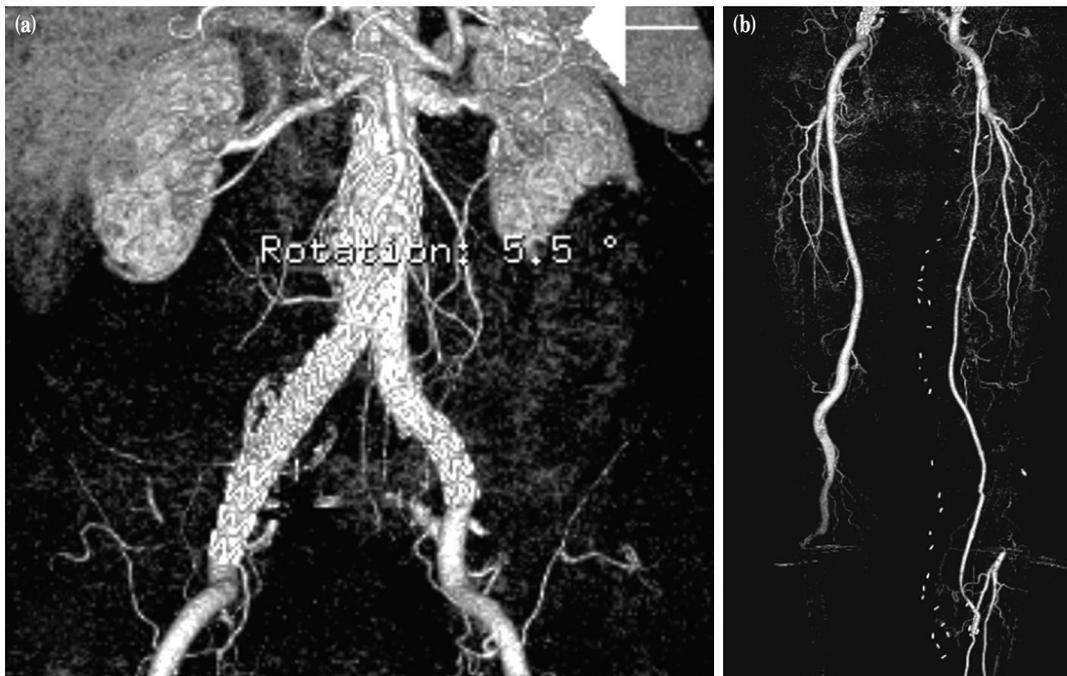


Figure 3. Postoperative computed tomographic angiography. (a) Iliac extension. (b) Femorotibial bypass with saphenous graft.

of endograft limb occlusion are multifactorial. Mantas et al.^[5] investigated 439 patients treated by EVAR and found that graft limb occlusion was associated with iliac artery angulation $\geq 60^\circ$, perimeter calcification $\geq 50\%$, and $\geq 15\%$ endograft oversizing of the common iliac artery. Woody et al.^[6] studied the possible reasons for occlusion in two major categories: anatomic factors such as stenosis, angulation and tortuosity of the iliac artery, and graft related factors such as twisting, kinking and infolding of fabric of the graft. The patient presented here had severe angulation at the level of the internal-external iliac artery bifurcation.

Culverwell et al.^[7] presented a phenomenon called the “oxbow lake” which causes kinking and occurs, when a long segment of tortuous artery was straightened by an endograft. However, in this phenomenon, the occlusion occurred at the time of the intervention. There were neither signs nor symptoms of stenosis or occlusion during the first two years in our patient. We believe that the migration of the graft through the internal iliac artery due to angulation caused a subtotal occlusion of the external iliac artery which eventually resulted in acute thrombosis of the femoral artery.

In conclusion, due to the high rates of complication and re-intervention in EVAR, open surgery should

be the first choice in challenging cases with fewer comorbidities and lower risk.

Declaration of conflicting interests

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