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ENDOVASCULAR AND SURGICAL TECHNIQUES

Endovascular Repair of Iliac Aneurysms Following Aortoiliac Surgery

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Introduction

Iliac aneurysms following aortoiliac surgery are often misdiagnosed and may be difficult to treat surgically. Rupture, distal embolisation and occlusion of the prosthesis are possible complications.

Some of these iliac aneurysms can be treated by endovascular techniques.

We report two cases of iliac aneurysms treated by two different endovascular techniques: one with coils embolisation and one with an endovascular graft interposition.

Case 1

A 73-year-old man presented with lumbar discomfort. Physical examination revealed a pulsatile mass in the abdominal left lower quadrant. Two years prior to this presentation an aortoiliac aneurysm had been treated as an emergency by an aortobifemoral bypass. At that time distal anastomoses were performed end-to-side to the common femoral arteries. Both common iliac arteries were aneurysmal and were opened to exclude the aneurysms. To allow retrograde perfusion of the hypogastric arteries by external iliac arteries, a short stump (<1 cm) of common iliac artery was preserved.

Duplex and computed tomography demonstrated



Fig. 1. Selective angiography of the left external iliac artery shows a saccular false aneurysm of the left common iliac artery stump and patency of both hypogastric and external iliac arteries.

two iliac aneurysms. The diameter on the left was 5 cm and on the right 3 cm. Angiography confirmed their presence at the level of the common iliac stump (Fig. 1). The inferior mesenteric artery was occluded and the two hypogastric arteries were still patent.

The left aneurysm was treated by endovascular coil embolisation (MReye Embolization Coils, 5 cm length and 5 mm wide, Cook) of the hypogastric and external

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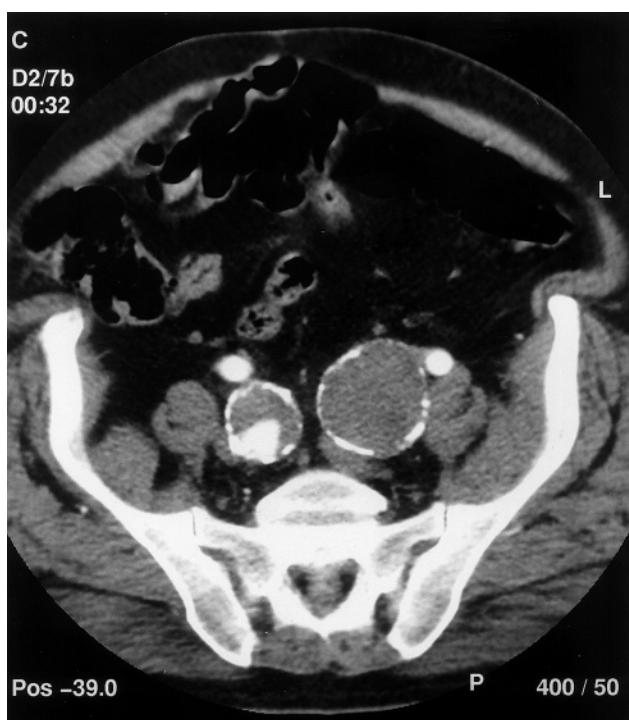


Fig. 2. A one-year postoperative scanner with contrast enhancement shows the complete exclusion of the left aneurysm.

iliac arteries. The coils were inserted via the left common femoral artery with a 5F introducer.

Following embolisation, the false aneurysm thrombosed and the pulsatility of the mass disappeared. The patient suffered no abdominal distress and he was discharged two days later.

The right false aneurysm was not treated because it was smaller and to prevent colonic ischaemia by simultaneous embolisation of both hypogastric arteries.

At one year, an enhanced CT scan confirmed the complete exclusion of the left aneurysm with a decrease in size (46 mm in diameter). The right one remained stable with a diameter of 30 mm (Fig. 2).

Case 2

A 58-year-old man presented with diffuse pain in the lower abdomen and physical examination revealed a tender pulsatile mass in the left lower quadrant of the abdomen. Femoral and distal pulses were present. The past history revealed surgical treatment of an aortic aneurysm by an aortobi-iliac bypass ten years previously. He also suffered from severe chronic obstructive pulmonary disease.

Ultrasonography and computed tomography demonstrated two false iliac aneurysms. The left one had

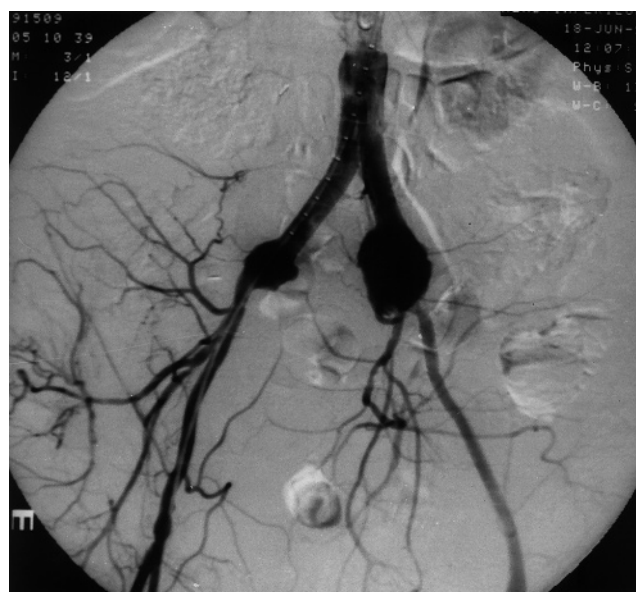


Fig. 3. Arteriogram demonstrates the presence of two iliac anastomotic aneurysms developed at the level of the distal anastomosis. The two hypogastric arteries are still patent.

a diameter of 4 cm and the right one of 2 cm. Angiography confirmed the presence of two iliac false aneurysms at the level of the iliac end-to-side anastomoses (Fig. 3). The inferior mesenteric artery had been sacrificed and the two hypogastric arteries were still patent.

Infection was considered unlikely, because the patient had no history of fever or sign of localised or systemic infectious disease, the leukocyte count was normal and the CT scan with contrast enhancement showed no periprosthetic fluid or gas collection, or inflammation suggestive of graft infection.

The first step was embolisation of the left hypogastric artery before implantation of an endovascular graft in order to avoid retrograde flow into the false aneurysm. This was performed by introducing coils (MReye Embolization Coils, 5 cm length and 5 mm wide, Cook) via a contralateral approach (5F introducer and 5F sidewinder catheter). An endovascular graft (Corvita, 8 cm length and 10 mm wide, Schneider)¹ was then placed via a 10F introducer placed in the left common femoral artery. Postprocedure angiography confirmed complete exclusion of the false aneurysm, and patency of the left hypogastric artery reperfused via pelvic collaterals (Fig. 4).

Following the procedure the false aneurysm was clinically thrombosed. The postoperative course was uneventful and the patient was discharged two days later.

At one year, the patient is asymptomatic and has no signs of claudication. A duplex-scan confirms the



Fig. 4. Postprocedure angiography confirms complete exclusion of the left anastomotic aneurysm.

patency of the stent graft without stenosis, and thrombosis of the left aneurysm. A CT scan with contrast enhancement confirms the complete exclusion of the false aneurysm, which is reduced in size (30 mm diameter and 30 mm length) and the right one is stable with a diameter of 23 mm and a length of 30 mm.

Discussion

False iliac aneurysms following surgical aortoiliac reconstruction are late complications. The reported incidence varies from 1% to 15%,¹ but the true incidence is higher because many are not clinically apparent. With the advent of ultrasonography and computed tomography they should be more frequently diagnosed.¹

They are thought to be caused by mechanical stress, degenerative progression of the native artery or sub-clinical prosthetic infection. They develop more often in end-to-side anastomosis.² In the first case, the false aneurysm developed from the common iliac artery

stump and in this case the mechanism might be progressive aneurysmal disease of the common iliac artery remnant.

Rupture, distal embolisation, prosthetic occlusion and pressure on or erosion into adjacent structures may complicate the aneurysm. Rupture may occur in 20% of the patients³ and emergency surgery has a mortality ranging from 67% to 100%.⁴ Elective re-intervention may be difficult and risky because the patients are often elderly with serious co-morbidities. The most frequent local complication is ureter injury.² The mortality of elective surgical repair ranges from 8% to 21%⁴ and the morbidity varies from 36% to 73%.^{4,5}

With the development of covered stents the endovascular treatment of iliac aneurysms or false aneurysms may become more frequent.⁶ This kind of treatment offers a less-invasive approach with lower morbidity and mortality. Yuan *et al.*⁴ reported nine patients with iliac anastomotic aneurysms treated by endovascular grafts (thin-walled PTFE grafts with Palmaz balloon-expandable stent for anchorage) introduced through an open femoral arteriotomy access site. There was no operative mortality, one postprocedural wound haematoma and one myocardial infarction. Recently, Jausseran *et al.*⁷ reported two false iliac aneurysms treated by endovascular grafts (EndoproSystem; Boston Scientific-Meadox) with no post-procedure complication and no operative mortality.

The mid-term results are encouraging. The mean graft patency reported by Yuan *et al.*⁴ is 16.1 months with no evidence of perigraft leakage or aneurysmal enlargement. In the report of Jausseran *et al.*,⁷ the two grafts are still patent more than two years after the procedure without complication or perigraft leakage. In our report, the two aneurysms are excluded without complication or perigraft leak one year after the procedure and a decrease in size is confirmed by contrast-enhanced CT scan.

An important rule in the endovascular management of false iliac aneurysm is to exclude the potential retrograde flow, especially from the hypogastric artery, before the placement of the endovascular graft. This may be done by coil embolisation.^{3,4,7} When the inferior mesenteric artery is chronically occluded, efforts should be directed to keep patent at least one of the hypogastric vessels to avoid colonic ischaemia.⁸ In our report, we remain uncertain as to how we should manage the controlateral aneurysm.

Another precaution is to exclude a prosthetic infection which requires conventional operative intervention.^{3,4} Infection may be excluded by clinical history, biological tests and CT scan with contrast

enhancement.^{4,7} In some cases, scintigraphy with labelled leukocytes may be useful.⁷ If there is doubt, conventional surgery is required.⁷

When the main symptom is local compression by the aneurysm, conventional surgery should be preferred to achieve effective decompression.⁹

In conclusion, endovascular techniques may provide an elegant and minimally invasive alternative in the treatment of iliac aneurysms following aortoiliac surgery. The low mortality and morbidity and good mid-term results are encouraging but long-term results are still not known. The efficacy of this kind of endovascular treatment remains to be assessed by larger series.

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