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Unusual presentation of more common disease/injury

Huge anastomotic femoral pseudoaneurysm following aorto-bifemoral bypass

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Summary

There has been recent concern that the number of patients at risk of femoral artery false aneurysms may be increasing, due to an increase in the number of cardiac and vascular radiological interventional procedures performed each year. Rarely, such pseudoaneurysms can develop around the anastomotic site of a femoral bypass graft.

The present report describes the unusual presentation of a huge femoral pseudoaneurysm in a 70-year-old male patient who had an aorto-bifemoral bypass in the past. A surveillance CT angiogram of a previously diagnosed right femoral pseudoaneurysm revealed that it had reached a size of 10×7×cm – a considerable growth when compared to his previous scan. An urgent referral was then made to the vascular surgery team. He subsequently underwent a successful surgical repair of his right femoral pseudoaneurysm. Postoperatively, he had an uneventful recovery except for a mild wound infection, which was treated with intravenous antibiotics.

BACKGROUND

Femoral artery pseudoaneurysm is an uncommon complication of femoral artery puncture and can infrequently occur around the anastomotic site of a femoral artery bypass graft.[1]

The management of pseudoaneurysms demands close multidisciplinary team co-operation, namely between radiologists, vascular surgeons and plastic surgeons.

Ideally, each patient should be reviewed employing a team approach. Many pseudoaneurysms require only observation; those with a volume greater than 6 cm will require treatment as spontaneous thrombosis is uncommon.[2]

Complications of pseudoaneurysms include rupture, distal embolisation, local pain, neuropathy and local skin ischaemia.[3]

This case demonstrated the fact that pseudoaneurysm can progress rapidly in size and regular follow-up is mandatory in order to prevent subsequent expansion or rupture which requires major surgery.

CASE PRESENTATION

A 70-year-old male was referred to the vascular team in March 2010 following a CT angiogram of the aorta, which had disclosed a large (13 cm) false aneurysm in the right femoral artery. This was a considerable increase in size when compared to his previous scan in August 2009, which showed that the aneurysm was 5 cm in diameter.

His colourful history, as a vasculopath, included over 50 years of smoking 30–40 cigarettes per day. He was a poorly controlled, non-insulin dependent diabetic of 7 years with hypertension, suffering a stroke 15 years ago.

With regard to his vascular surgical history, he had an aorto-bifemoral bypass graft 3 years ago with the subsequent development of bilateral femoral aneurysms; the right remained patent, while the left became thrombosed. As a result he suffered from a necrotic left fifth toe. He was then given the option of either major vascular reconstruction, with a high risk of failure, or a below knee amputation. He opted for a left below knee amputation, which took place in June 2009.

He was referred to the vascular team after a surveillance CT angiogram showed that his asymptomatic aneurysm increased in size to 13 cm. However, on direct questioning, the patient commented on pain in his right leg and gave a rough estimate of 3–4 weeks since he first noticed a swelling in the right groin (figure 1). On examination he had stable observations and a large, hard, pulsatile swelling in his right groin. However, the leg was warm, appeared well perfused and all peripheral pulses were present.

INVESTIGATIONS

The CT angiogram demonstrated atherosclerotic disease within the infra-renal abdominal aorta, with resultant occlusion of the distal abdominal aorta and both the internal and external iliac arteries bilaterally. The aorto-bifemoral graft was occluded on the left with a false aneurysm at the anastamosis measuring 5.8 cm at maximum diameter. The right limb remained patent, however there was a large 10×7×13 cm false aneurysm at the anastamosis within the right groin.

DIFFERENTIAL DIAGNOSIS

Relevant vascular differential diagnoses include:

- Sapheno varix and lymphadenopathy.

Other differentials may be classified according to:

- Malformations – inguinal and femoral hernias, hydrocele, undescended testes.
- Inflammatory lesions – cellulitis, adenitits, arthritis, psoas abscess.
- Neoplasms – lipoma, dermatological and lymph node tumours.
- Trauma.

Figure 1 The aneurysm on initial inspection.

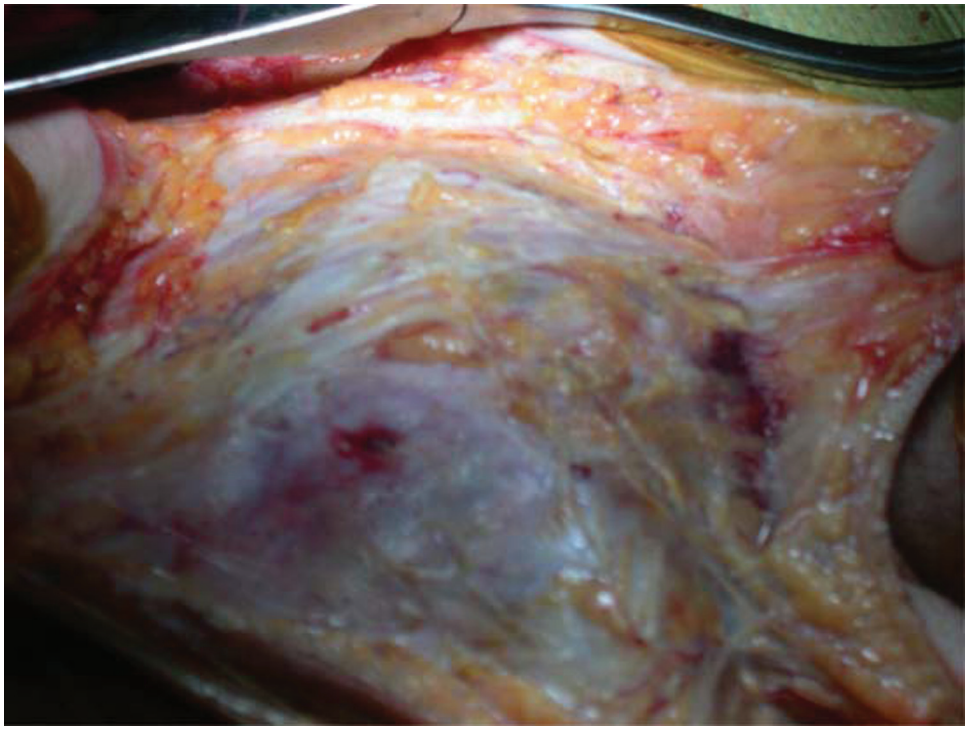

Figure 2 The aneurysm covered by fascia.

TREATMENT

After admission the patient was cross-matched, symptomatically controlled and underwent a femoral pseudoaneurysm repair next day.

The operation involved an anterior vertical incision at the right iliac artery. The extraperitoneal space was entered and the right graft limb was controlled (figure 2). The incision was then lengthened down the leg.

Hunter's canal was opened posteriorly and the superficial femoral artery was controlled (figures 3 and 4). The aneurysm sac was then dissected anteriorly and opened (figure 5). Back bleeding from the common femoral artery

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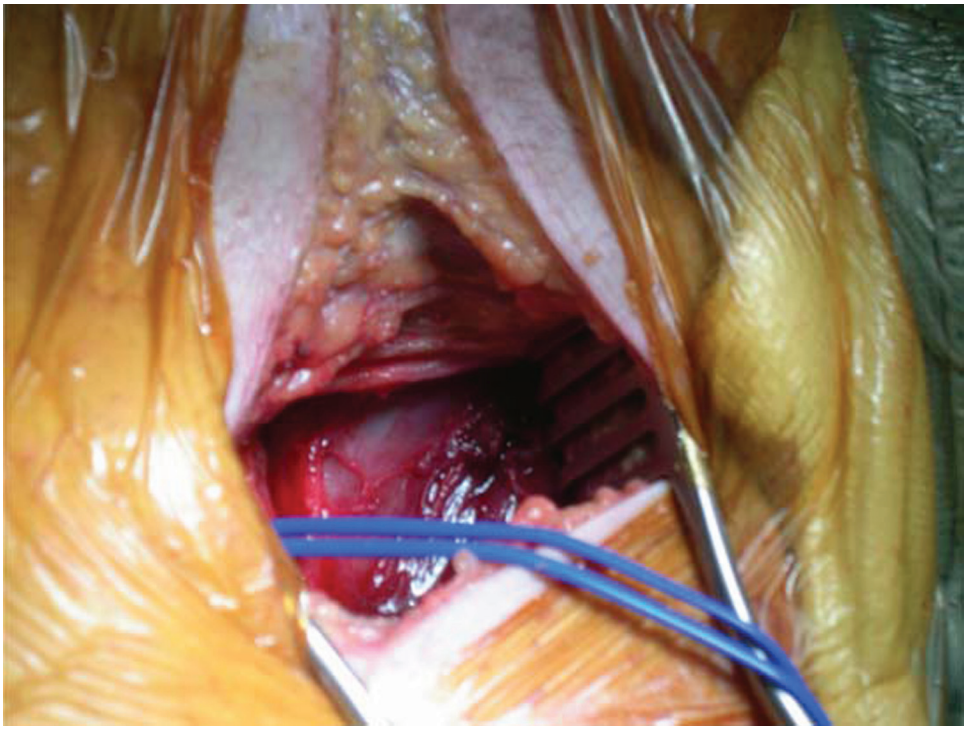

Figure 3 Exposure of Hunter's canal.

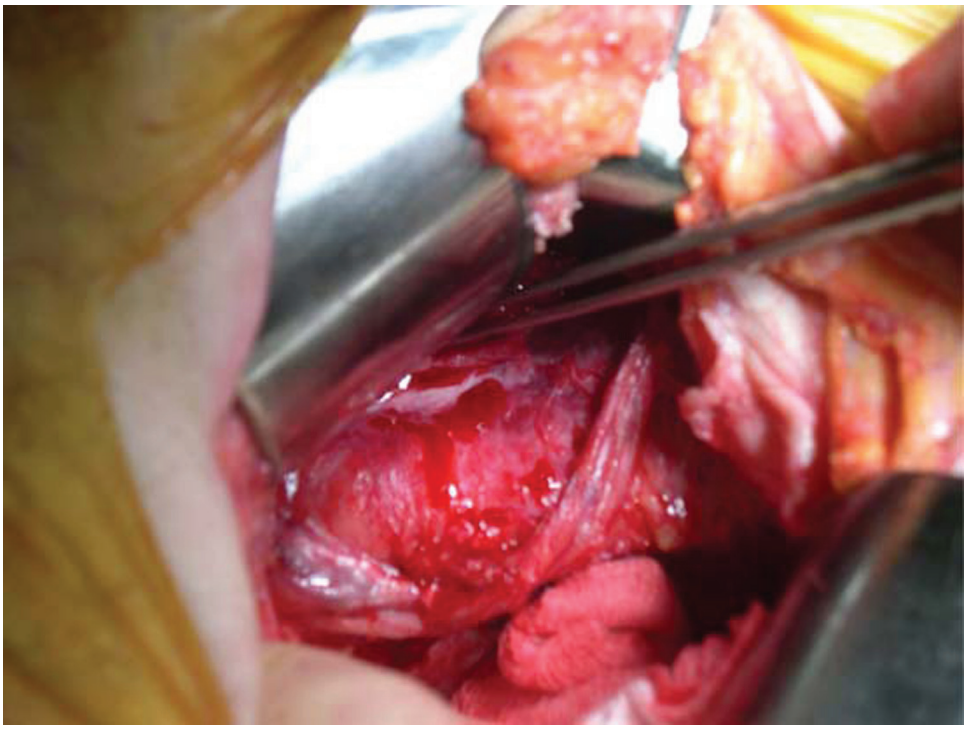

Figure 4 Initial dissection of the aneurysm.

was noticed at the distal anastomotic site of the bypass graft.

The pseudoaneurysm sac was excised (figure 6) and the distal end of the graft was detached and refashioned, cutting the affected edges. The graft was then re-anastamosed to the original arteriotomy site in the common femoral artery (figures 7 and 8).

Due to a tissue deficit, the tensor fascia lata and the sartorius muscles were mobilised to cover the graft and anastamosis.

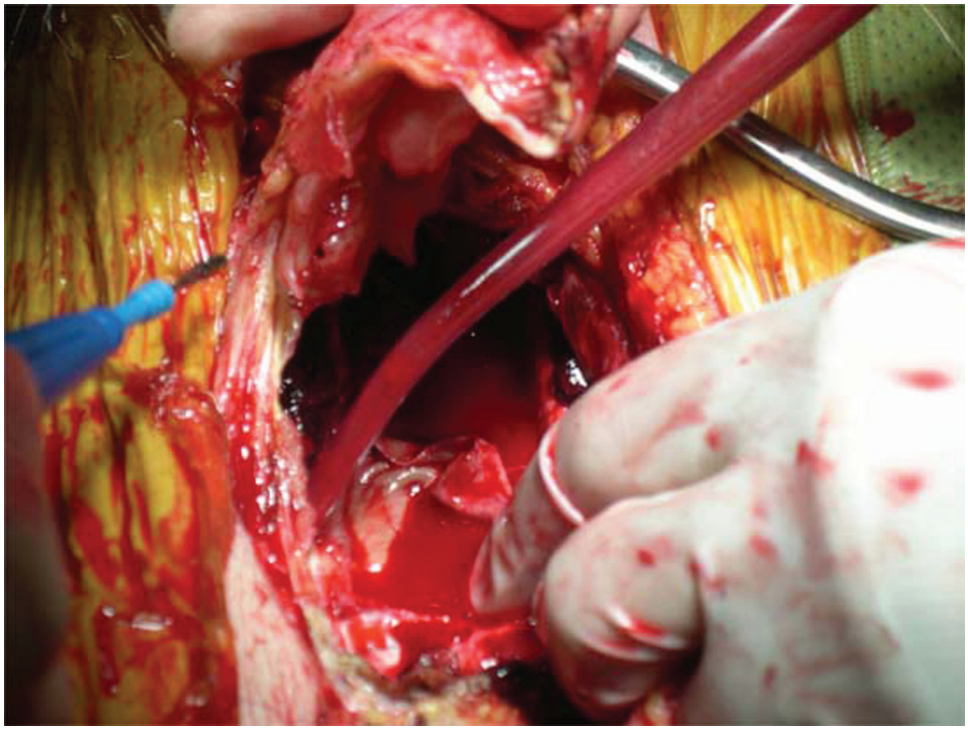

Figure 5 Further dissection of the aneurysm.

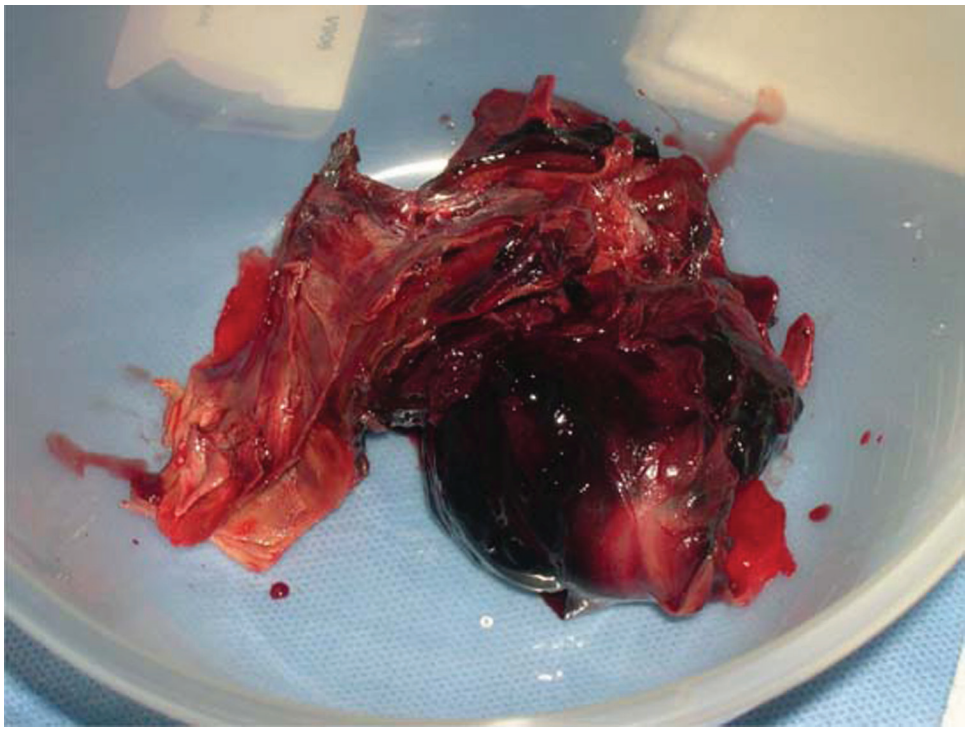

Figure 6 The false aneurysm is excised.

OUTCOME AND FOLLOW-UP

The patient recovered well postoperatively, although his discharge was delayed by the development of superficial wound infection, which was treated with intravenous antibiotics. The patient was eventually discharged home 2 weeks after admission.

DISCUSSION

A femoral artery pseudoaneurysm is a pulsatile haematoma that results from leakage of blood into the soft tissues anterior to the femoral artery, with subsequent fibrous encapsulation and failure of the defect in the vessel wall to heal.[4]

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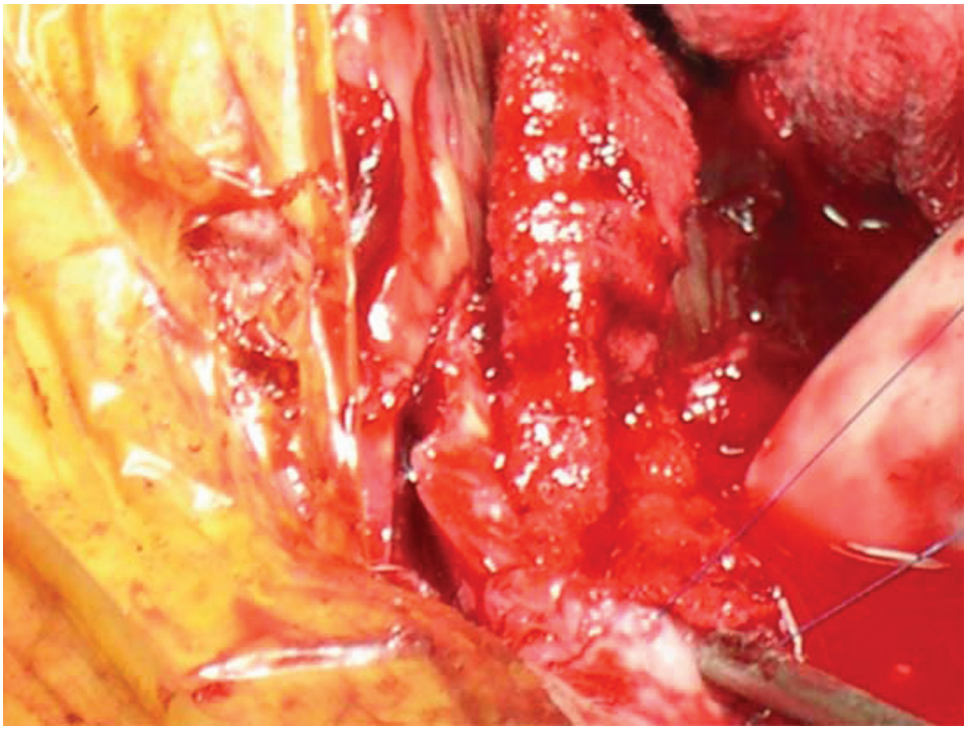

Figure 7 Anastamosis of the graft to the common femoral artery.

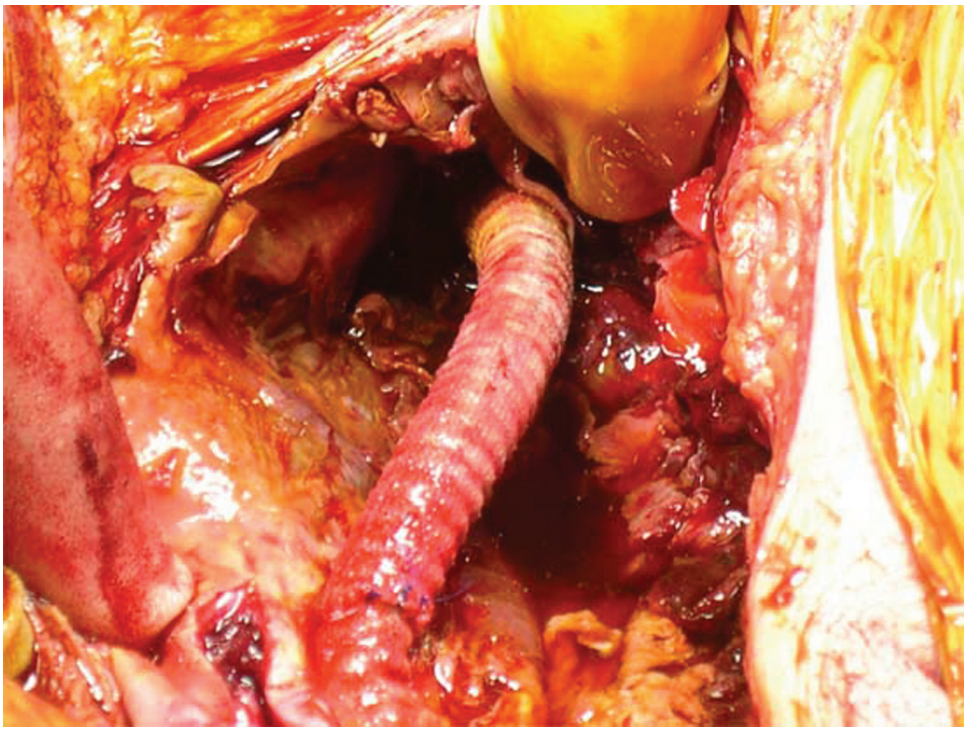

Figure 8 Completion of the anastamosis.

It is an uncommon complication of femoral artery puncture and it can occur infrequently around the anastomotic site of a femoral bypass graft. It occurs in 0.8–2.2% after interventional procedures. This problem has become more significant due to the exponential growth of interventional cardiology and vascular procedures.[5]

Several therapeutic strategies have been developed to treat this complication. They include ultrasound-guided compression repair (UGCR), surgical repair and minimally invasive percutaneous treatments (thrombin injection, coil embolisation and insertion of covered stents).[6]

Chiu *et al*[7] reported a case of a huge femoral artery pseudoaneurysm (22×18×14 cm) in a 94-year-old woman who presented with progressive swelling of the right thigh over the past 10 years. It was excised under proximal control of the common femoral artery. The femoral artery was then reconstructed with the ipsilateral greater saphenous vein.

O'Sullivan *et al*[5] reviewed the various alternative approaches in the management of iatrogenic femoral pseudoaneurysms and concluded that a size of 6 cm would require treatment as spontaneous thrombosis is uncommon. The review found that most pseudoaneurysms would respond well to UGCR. If this fails, vascular surgeons should attempt percutaneous endovascular exclusion. If this is unsuccessful, or should there be any signs of infection or rapid expansion, surgery is preferable. If skin or soft tissue cover is at risk, advice from the plastic surgeons should be sought.

Norwood *et al*[8] performed a review of femoral pseudoaneurysms in a single centre reported the breakdown of previous graft anastomosis as the second commonest cause (29.1%).

In our case the patient was found to have 5 cm right femoral artery pseudoaneurysm. Six months later, a surveillance CT angiogram revealed a marked increase in the size of the pseudoaneurysm to 10×7×13 cm, which also became symptomatic. Urgent surgical intervention was required to prevent further expansion and rupture.

In conclusion, this case demonstrates that femoral pseudoaneurysms demand close monitoring, as it can rapidly increase in size and earlier intervention is required to avoid major surgery. Early detection facilitates the less invasive treatment with ultrasound- guided thrombin injection.[9] Each patient should be reviewed employing a team approach with close co-operation between a radiologist and a vascular surgeon.

Learning points

- The differential diagnosis of femoral pseudoaneurysm should be considered in the diagnosis of any groin swelling, especially in a patient with known vascular history or intravenous drug use.
- In terms of optimum management, the patient should have been referred for thrombin injection when the aneurysm was smaller in size.
- Femoral pseudoaneurysm requires regular frequent follow-up with arterial imaging if a decision is made to monitor its size.
- Patient education regarding the nature of femoral pseudoaneurysms is necessary, in order to flag up any new symptoms as soon as they occur and thus help avoiding major surgery.

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Competing interests None.

Patient consent Obtained.

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