



CASE REPORT

False femoral aneurysm complicated by ilio-femoral venous thrombosis secondary to primary hip arthroplasty

M.E. O'Donnell*, D. McCaul, C.D. Weir

Department of Surgery, Craigavon Area Hospital, 68 Lurgan Road, Portadown, BT63 5QQ Northern Ireland, UK

Accepted 29 December 2004

Introduction

Vascular injuries after total hip arthroplasty are rare. Despite the close proximity of the neurovascular structures to the operating field, the reported incidence is 0.25%. We report a false femoral artery aneurysm caused by a sharp fragment of bone cement from a primary hip arthroplasty, which was found to be impinging on the artery. Aneurysmal enlargement subsequently impeded venous return resulting in massive ilio-femoral venous thrombosis. Surgical management required pre-operative insertion of a caval filter, as a prophylactic measure, followed by prosthetic arterial bypass. Although false femoral aneurysms are a recognised complication of many open or percutaneous interventional procedures, to our knowledge, there have been no previous reports of this complication at this site. Mechanism of vascular injury and management of this type of complication will be discussed.

* Corresponding author at: 42 Woodrow Gardens, Saintfield, County Down, BT24 7WG Northern Ireland, UK.
Tel.: +44 2897 519511; Mobile: +44 7793 585686.
E-mail address: modonnell904@hotmail.com
(M.E. O'Donnell).

Case report

A 69-year-old lady was referred with a two-week history of increased swelling in her left leg associated with left groin pain. She had previous primary left and right hip arthroplasty, 2 and 10 years prior to admission, respectively, with revision of the right side one year prior to admission. However, her mobility still remained poor due to a polyarthropathy secondary to severe osteoarthritis. She was obese (BMI 37.5), hypertensive, with a history of previous deep venous thrombosis (DVT) of the right lower limb following her primary right hip arthroplasty. This was confirmed by venous duplex and treated with oral anticoagulation. There were no other risk factors for DVT or peripheral vascular disease (PVD).

She presented with moderate swelling of her left lower limb with pitting oedema and erythema. Peripheral pulses were normal. Blood investigations were normal. Venography demonstrated ectatic veins with poor flow but no definite thrombus was identified. Abdominal and pelvic ultrasounds were normal. She was discharged, but readmitted two weeks later with increased swelling, and subsequently referred to the vascular team. Examination demonstrated a pulsatile mass in the

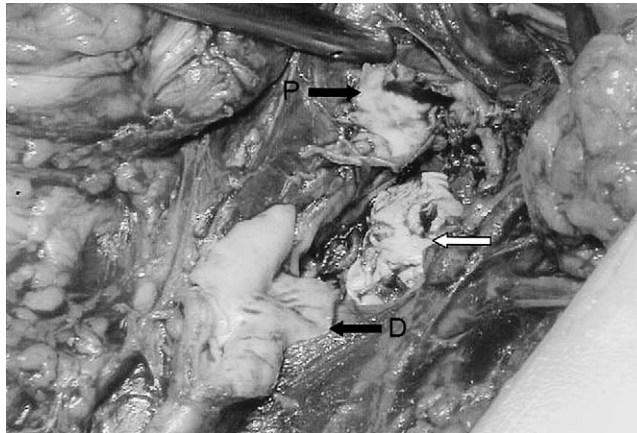


Figure 1 Exposure of the left groin with proximal [P] and distal [D] segments of the left CFA (→) divided by underlying bone cement (⇔).

left groin with significant left lower limb oedema. The patient was commenced on therapeutic enoxaparin. Investigations, including duplex doppler and computerised tomography (CT) scans confirmed a 3.5 cm false aneurysm in the left common femoral artery (CFA), and fresh venous thrombosis on pre-existing, extensive, old thrombosis within the ilio-femoral venous system. Antero-posterior plain X-ray of the left hip confirmed the prosthetic hip joint with no evidence of fracture.

A permanent inferior vena caval filter (B. Braun Medical Ltd., U.K.) was placed below the level of the renal veins. Six days later the left CFA was explored, finding a large false aneurysm. A fragment of bone cement with a sharp spike was found to be impinging on the deep aspect of the CFA (Fig. 1). This was removed (Fig. 1). A knitted Dacron interposition graft (Hemashield™, Boston Scientific, U.K.) was used to repair the CFA. She is currently well and remained on anti-coagulation for six months.

Discussion

This case demonstrates the formation of a left false femoral aneurysm secondary to a breach in the arterial wall from a portion of bone cement. The predominant presenting feature was gross left lower limb swelling secondary to massive ilio-femoral venous thrombosis. To our knowledge, there have been no previous reports of this complication at this site. The only other report of a similar complication is a false aneurysm of the popliteal artery, presenting with deep venous thrombosis, as a result of trauma from an avulsion fracture of the distal femur.³

Mechanisms of vascular injury as a consequence of total hip arthroplasty include; direct arterial perforation, arterial thrombosis secondary to polymerisation heat, excessive cement, excessive extension during forced intra-operative dislocation of hip, and chronic lesions secondary to foreign body irritation.⁶ Primary hip arthroplasty has a greater

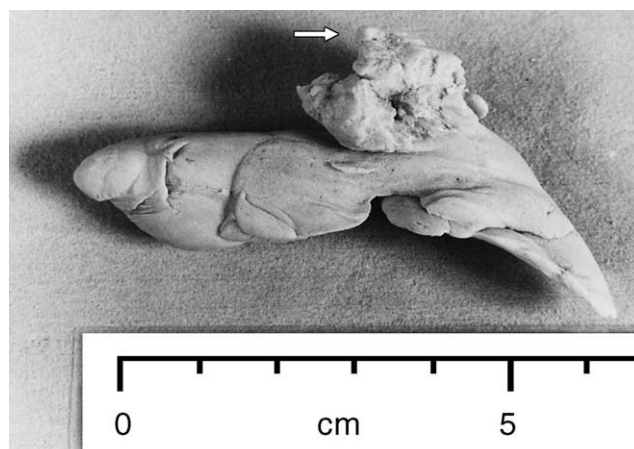


Figure 2 Extracted bone cement—(⇔) demonstrates the sharper area that was impinging on the femoral artery.

risk of these complications during the removal of the acetabular component. In this case, intra-operative injury was presumed unlikely given the two-year time-lag between surgery and clinical presentation. It was thought that the gradual erosion of the femoral artery was caused by extrinsic pressure from a segment of bone cement (Fig. 1) that had migrated from the site of the primary hip arthroplasty. The commonest locations of vascular injury following hip arthroplasty are the external iliac artery and the common femoral artery.^{1,2} Most of these vascular complications occur on the left side despite equal distribution of hip arthroplasties. This may be due to the left lateral position of the aortic bifurcation and the left iliac artery.²

Arterial injuries after hip arthroplasty may present with: (i) hip pain due to pressure, ischaemic changes, or microembolism, (ii) a pulsatile mass, or (iii) severe haemorrhage due to direct arterial injury from malpositioned retractors. Bach et al reports that the mean time-lag of nine months between hip surgery and the initial manifestation of the false aneurysm.¹

In this case, although there appeared to be no clinical evidence of a pulmonary embolus, it was thought prophylactic caval filter insertion was appropriate, given the patient's age, poor mobility, history of previous thromboembolic disease, presence of fresh venous thrombus, combined with major upcoming vascular reconstruction.⁴ Venous thrombectomy was not considered, as the venous thrombosis was a secondary phenomenon due to external pressure.

Morgan and Belli⁵ describes various treatment modalities for post-catheterisation false aneurysms,

using the seldinger technique, such as ultrasound (USS) guided compression, direct thrombin injection, coil embolisation or stent graft occlusion. None of these procedures would have been suitable, as bone cement impingement was the dominant factor, and indeed, all would probably have been relatively contraindicated. In this case, we felt open exploration was mandatory.

This case reveals a previously unreported vascular complication after hip arthroplasty. We stress the importance of a systematic approach with: (1) emphasis on the venous thromboembolic process and prophylaxis, (2) adequate pre-operative imaging, and (3) decisive surgical management.

References

1. Bach CM, Steingruber I, Wimmer C, Ogon M, Frischhut B. False aneurysm 14 years after total hip arthroplasty. *J Arthroplasty* 2000;15:535–8.
2. Bergqvist D, Carlsson AS, Ericsson BF. Vascular complications after total hip arthroplasty. *Acta Orthop Scand* 1983;54:157–63.
3. Dresner SM, Banerjee B, Owen R, Lees TA. A popliteal false aneurysm caused by an avulsion fracture of the femur: A case presenting with deep venous thrombosis. *Eur J Vasc Endovasc Surg* 1999;17:180–2.
4. Kinney TB. Update on inferior vena cava filters. *J Vasc Interv Radiol* 2003;14:425–40.
5. Morgan R, Belli AM. Current treatments for postcatheterization pseudoaneurysms. *J Vasc Interv Radiol* 2003;14:697–710.
6. Nachbur B, Meyer RP, Verkkala K, Zurcher R. The mechanisms of severe arterial injury in the surgery of the hip joint. *Clin Orthop* 1979;141:122–33.