Case Report

Proximal Femoral Erosion: A Sequelae of Psuedoaneursym Formation Following Operative Fixation of an Intertrochanteric Neck of Femur Fracture

Abstract

A 72-year-old male sustained a left intertrochanteric neck of femur fracture following a fall. He underwent operative fixation with a dynamic hip screw and was discharged home. Fifteen months later, the patient presented again with ongoing left thigh pain and swelling. A pelvic radiograph showed scalloping of the medial proximal femoral cortex. Further investigation revealed a left profunda femoris artery pseudoaneurysm. Vascular injury during operative fixation of intratrochanteric fractures is a rare complication, which may be missed due to a delayed presentation. Treating physicians should be mindful of late presentations of vascular injury following the surgical fixation of proximal femoral fractures.

Keywords: *Complication, neck of femur, operative fixation, pseudoaneurysm, vascular injury*

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Introduction

Internal fixation of proximal femur fractures is one of the most common orthopedic procedures performed around the world. Vascular complications following these surgeries are rare with an incidence of 0.2%.[1] A recent review found the majority of vascular complications to be iatrogenic, and pseudoaneurysms accounted for 68% of vascular complications.[2] Nearly 94% of total vascular complications required procedural intervention; 56% needing an open procedure (mostly direct vessel repair or neck aneurysm ligation) and 35% managed with angiographic embolization. Almost 70% of total vascular injuries had an uneventful recovery following management.[2] As such, vascular complications need to be recognized and effectively managed to reduce morbidity.

These vascular complications typically present with localized pain (68%) and swelling (92%) over the affected area; these signs are even more common with pseudoaneurysms.[2] This case report examines the development of a profunda femoris artery pseudoaneurysm following internal fixation of an intertrochanteric neck of femur fracture. To the authors' knowledge, this is the first reported case of femoral scalloping present on a postoperative radiograph as a radiological sign of a profunda femoris artery pseudoaneurysm.

Case Report

In January 2014, a 72-year-old gentleman with a history of chronic obstructive pulmonary disease attended an emergency department following a fall while intoxicated. He presented with left hip pain and decreased mobility. Radiographs demonstrated a left intertrochanteric neck of femur fracture. He underwent operative fixation with a dynamic hip screw (DHS) [Figure 1]. There were no immediate complications; however, postoperatively, he reported pain in his medial thigh. Further radiographs were reported as unremarkable and the patient was discharged home without significant delay.

In April 2015, due to a persistent pain and swelling in his left thigh, the patient represented to the emergency department and was referred to fracture clinic. Since his initial surgery, the thigh swelling had been gradually increasing in size and he frequently took dihydrocodeine to manage the pain. Further questioning revealed that the patient presented to the emergency

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department 2 weeks following surgery; however, a pelvic radiograph was reported as normal and he was discharged without followup. On examination, there was a large, fixed mass in the left anteromedial aspect of his thigh. Distal pulses were palpable and distal sensation was intact. A pelvic radiograph showed arthrosis of the left hip and union of the proximal femur fracture, with a DHS present in a satisfactory position. There was scalloping of the medial femoral cortex and extrusion of the screws past the medial femoral cortex [Figure 2]. Ultrasound was inconclusive. A magnetic resonance image was performed to exclude sarcoma, which demonstrated an asymmetric expansion of the left proximal thigh and an 11 cm × 11 cm × 12 cm heterogeneous lesion that was likely to be impinging upon the neurovascular bundle. Differential diagnosis at this stage included vascular aneurysm formation, osteomyelitis with abscess formation, or a neoplastic process.

A computed tomographic angiogram of the lower limb confirmed a large hematoma and pseudoaneurysm measuring 24.2 mm from a branch of the left profunda femoris artery. The patient underwent coil embolization of the pseudoaneurysm with an uneventful recovery [Figure 3a and b]. At 3-month followup, the patient's symptoms had completely resolved. At 2½-year telephonic followup, the patient continues to report no further symptoms.

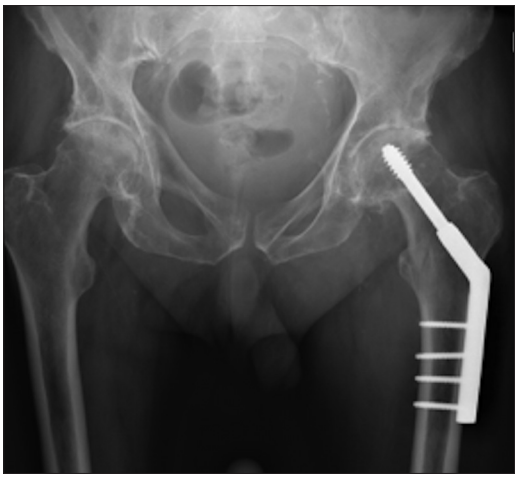

Figure 1: Postoperative anteroposterior pelvis radiograph showing a left dynamic hip screw *in situ*

Figure 2: Anteroposterior pelvis radiograph showing left dynamic hip screw *in situ* with medial scalloping of the femur, with screws penetrating beyond the medial cortex at 15-month followup

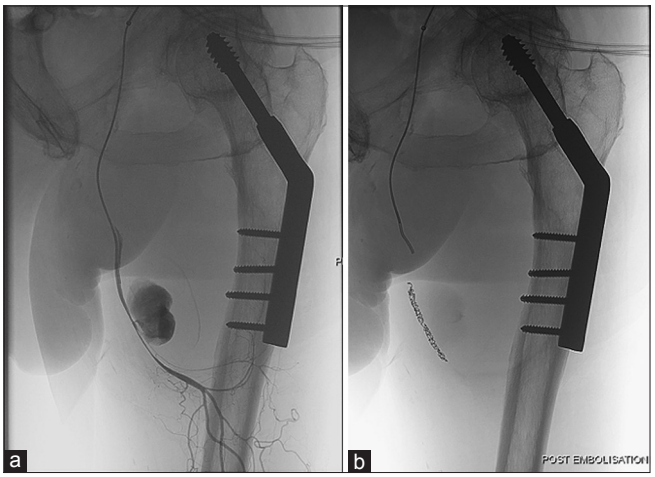

Figure 3: Left proximal femur with left dynamic hip screw *in situ* and digital subtraction angiography of the left common femoral artery demonstrating a profunda branch aneurysm (a) and following coil embolization (b)

Discussion

Iatrogenic injury to the profunda femoris artery following operative fixation of intertrochanteric neck of femur fracture is rare and possibly underreported.[3] Several case reports show variations of a profunda femoris artery injury in both acute and chronic presentations.[4-6] Neuburer *et al*. found that vascular lesions affected the deep femoral artery significantly more than the superficial femoral artery.[2] Pseudoaneurysm formation was more frequent and there was significant diagnostic delay (36 days vs. 2 days) than identifying other vascular lesions. In this case report, injury is hypothesized to have occurred during initial overdrilling of the proximal femoral cortex from a lateral-to-medial direction prior to screw placement in the DHS plate. The patient's postoperative pain and swelling in the groin was caused by the pseudoaneurysm and, in this case, possibly a re-bleed within the pseudoaneurysm, prompting the patient to seek further medical attention. What is unique about this particular case is the scalloping of the medial femoral cortex caused by the mass effect of the expanding hematoma and subsequent remodeling of the medial femoral cortex. Although the screws are proud of the medial cortex, a decision was made not to remove the metalwork due to the risk of subsequent femoral fracture. A full workup was also performed to exclude other benign and malignant causes of femoral scalloping.

Iatrogenic injury to the profunda femoris artery during operative fixation of proximal femur fractures is potentially a preventable occurrence. This is likely best achieved by avoiding overdrilling of the medial femoral cortex prior to

positioning of shaft screw fixation in the DHS plate. This case report serves as a reminder to all surgeons on the potential dangers of overdrilling and the need to be mindful during this process.

While uncommon, vascular complications do occur following operative fixation of proximal femur fractures. The key learning messages from this case report are to avoid overdrilling of the medial femoral cortex prior to shaft screw fixation in the DHS plate and to be mindful of vascular complications in any postoperative patient presenting with localized pain and swelling over the proximal thigh. Evidence of vascular complication should be looked for on both clinical examination and subsequent imaging in symptomatic patients. Evidence of remodeling cortical bone not keeping with postfracture healing may be a radiological sign of hematoma and profunda femoris artery pseudoaneurysm and should prompt further investigation and management to ensure satisfactory patient outcomes.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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