

Case Report

Neglected fracture shaft femur presenting with pseudoaneurysm: a case report

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ABSTRACT

A pseudoaneurysm is a collection of blood leaking from a damaged arterial wall. Development of the false aneurysm is due to either initial injury of the vessel or is a complication of internal fixation of the femoral fracture. Femoral artery pseudoaneurysms (FAPs) may close spontaneously if the tear is small enough to allow for clotting and sealing. On the other hand, rupture of the aneurysm can trigger thrombosis, distal embolization and compression of adjacent structures. We present a case of left superficial femoral arterial pseudoaneurysm in a 36-year-old male with fracture of left femoral shaft. A 36-year-old male with history of road traffic accident presented to our institute with pain and swelling in left thigh. Patient was investigated and diagnosed with fracture left femoral shaft with a pseudoaneurysm of the left superficial femoral artery (SFA). Stenting was done for SFA followed by open reduction and internal fixation of the femoral shaft fracture. Such cases require multidisciplinary approach and a proper planning with involvement of different medical specialities to achieve optimal results and to minimise any intraoperative and post operative complications.

Keywords: Femur fracture, Pseudoaneurysm, FAPs

INTRODUCTION

A pseudoaneurysm is a collection of blood leaking from a damaged arterial wall. Pseudoaneurysms (PSAs) of superficial and deep femoral artery are rare injuries and have been reported following penetrating and blunt trauma to the thigh and orthopaedic procedures of the proximal femur.¹⁻² It is a serious complication following fractures of the femoral shaft. Development of the false aneurysm is due to either initial injury of the vessel or is a complication of internal fixation of the femoral fracture.

The resultant arterial injuries such as laceration or disruption of the lumen, thrombosis, pseudoaneurysm formation or an arteriovenous fistula can cause life-threatening bleeding, distal ischemia and hematoma. It is likely that many injuries are sub-clinical and may remain undetected.³ Local effects of pseudoaneurysm are secondary to mass effect on adjacent structures causing

compromise of function.⁴ This condition may promote formation of pulsating mechanism injury in the area and erosion of the neighbouring vein's wall.^{5,6} FAPs may close spontaneously if the tear is small enough to allow for clotting and sealing. On the other hand, rupture of the aneurysm can trigger thrombosis, distal embolization and compression of adjacent structures. Compartment syndrome of the thigh has also been observed after formation of a pseudoaneurysm of the femoral artery or of its branches.⁷ We present a case of left superficial femoral arterial pseudoaneurysm in a 36-year-old male with fracture of left femoral shaft.

CASE REPORT

A 36-year-old male presented to us with history of road traffic accident 6 weeks ago with pain and swelling in left thigh. The swelling was of around 20x15 cm over the medial aspect of left thigh (Figure 1) which was tense on

palpation. There was tenderness and crepitus over the thigh. Local temperature was normal and overlying skin was shiny with no dilated veins. Distal neurovascular examination was normal. The patient appeared to be pale. He was investigated and X rays showed a spiral oblique midshaft femur fracture (Figure 2). USG AV Doppler using 5MHz multi frequency convex transducer was done that revealed an anechoic cystic lesion of 3.1x2.2 cm arising from junction of proximal 2/3rd and distal 1/3rd of left SFA showing yin yang pattern with neck measuring 0.5cm suggestive of post traumatic pseudoaneurysm in left SFA. Left popliteal vein was also not taking colour flow and was non-compressible. There was a collection of 13.5x13x27cm in the thigh suggestive of chronic haematoma. 128 slice computed tomography (CT) Angiography was done to confirm the diagnosis which revealed post traumatic SFA pseudoaneurysm with haematoma formation and intermittent bleeding.



Figure 1: Pre operative clinical photo showing massive swelling over the medial aspect of left thigh.



Figure 2: Pre operative images with a spiral oblique fracture of shaft femur with a medial spike.

Management of pseudoaneurysm was planned prior to surgical management of femoral fracture. Stenting for left SFA was done (Figure 3) to bypass the pseudoaneurysm rent by interventional radiologist. Post stenting MRI (3 Tesla) was done that revealed thrombosis of pseudoaneurysm and no active bleeding. Patient was then planned for open reduction and internal fixation of femoral fracture. Cardio Vascular and Thoracic surgeons were present intraoperatively to deal with any vascular

complication. Patient was operated in right lateral position using lateral approach. A large amount of haematoma from lateral aspect was drained from the thigh (Figure 4) and the remaining was left untouched to avoid any complication as it was present in multiple planes. Fracture was reduced and fixed using femoral interlock nail and circlage wire. Post operative X-rays were acceptable (Figure 5) and post operative period was uneventful. There was no episode of any bleeding post operatively and fracture showed signs of healing on radiographs at 6 week follow up.

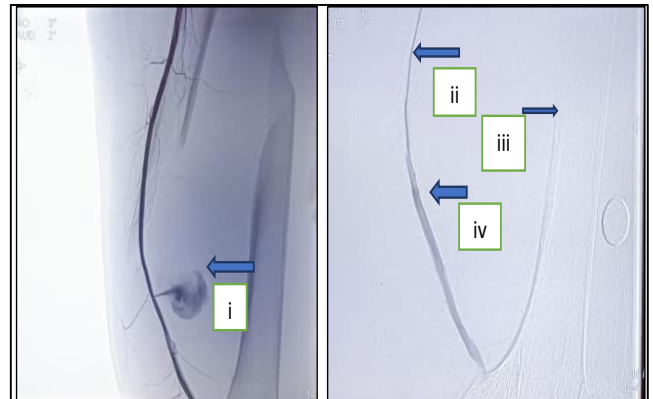


Figure 3: Stenting done for pseudoaneurysm. i- Pseudoaneurysm, ii- Left SFA, iii- Shaft of femur and iv- Stent in situ.

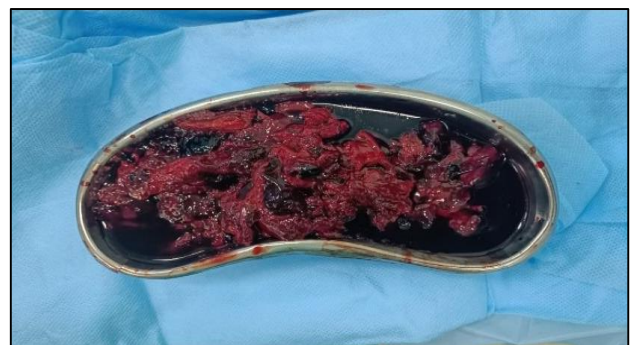


Figure 4: Haematoma drained intra operatively.

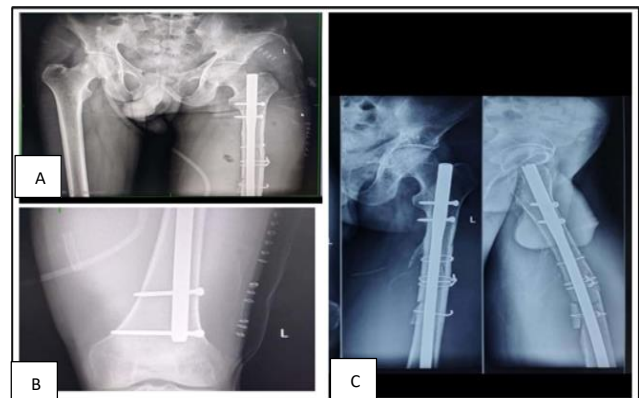


Figure 5 (A-C): Immediate post operative X-rays, showing follow up X-rays and arrow showing stent in situ.

DISCUSSION

Pseudoaneurysms arise from a disruption in arterial wall continuity. They may result from inflammation, trauma, or iatrogenic complications.⁸ Traumatic pseudoaneurysms are secondary to incomplete disruption of an artery and result in leakage of blood into the surrounding tissues.⁹ Under the influence of sustained arterial pressure, blood dissects into the tissues around the damaged artery and forms a perfused sac that communicates with arterial lumen.^{8,10} The perfused sac is contained by the media or adventitia or simply by soft-tissue structures surrounding the injured vessel.⁴ Pseudoaneurysms may present at any time from hours to months after penetrating vascular injury.⁹ In our case there was a spiral oblique fracture of femoral shaft with a medial spike that may have injured the SFA leading to pseudoaneurysm formation. Pseudoaneurysms typically present late and signs such as persistent hip pain, thigh swelling, and the presence of a pulsatile mass and unexplained anaemia may suggest the diagnosis, unless hemodynamic instability and high clinical suspicion of active bleeding prompts a diagnosis of the rupture of the artery or pseudoaneurysm.^{3,11} Distal pulsations are usually present. Without a clear history of trauma, the lesion may mimic some soft tissue conditions like abscesses or neoplasms.¹²

They may undergo spontaneous thrombosis or develop complications such as infection, local compression on neurovascular structures or rupture. A high clinical index of suspicion and radiological imaging [particularly computed tomography (CT), angiography, and duplex ultrasonography] plays a major role in obtaining a diagnosis.¹² Multidetector CT angiography enables 3-dimensional reformatting of the lower limb vasculature. It is a quick and non-invasive method, with high sensitivity (90-95%) and specificity (98-100%) for detecting arterial injury after trauma.¹³ Experience in treatment of PFA pseudoaneurysms is limited. Symptomatic PSAs (intermittent or continuous bleeding) should be treated. However, the decision to treat asymptomatic pseudoaneurysms is controversial. The majority of small PSAs (less than 2-3 cm in diameter) is prone to thrombose spontaneously within 4 weeks [14-15]. False aneurysm can obliterate spontaneously, especially when smaller than one inch and with a small neck (<10 mm).¹⁶ However, active intervention is indicated in larger (> 3 cm) symptomatic lesions such as active or intermittent bleeding. In our case pseudoaneurysm was of size 3.1×2.2 cm and it did not thrombose even after 6 weeks. Patient showed a decreasing trend of haemoglobin. So, we planned stenting to bypass the pseudoaneurysm prior to fixation of femur fracture. The patient did not show any episode of post operative bleeding. Current therapeutic approaches include ultrasound-guided compression, ultrasound-guided thrombin injection, endovascular repair using coil embolization and stent graft insertion. Such cases require multidisciplinary approach and a proper planning with involvement of different medical specialities to achieve

optimal results and to minimise any intraoperative and post operative complications.

CONCLUSION

Arterial injury due to fragments of a femur fracture has been reported on a few occasions. However, most of them presented late at 4-6 weeks after fixation of the fracture with a swelling over the anteromedial aspect of the thigh. The present case is unique in that the pseudoaneurysm manifested and was diagnosed after 6 weeks of the initial injury prior to fixation of the fracture. This gave us an opportunity to plan and manage the pseudoaneurysm before managing the fracture and helped to minimise the risk of any intraoperative vascular complications. Percutaneous endovascular treatment with a covered stent as used in this patient has been shown to be an effective treatment for pseudoaneurysms arising from larger indispensable vessels even in acute situations. The advantages of percutaneous stent grafting include minimally invasive nature without the need for general anaesthesia, minimal blood loss and reduced morbidity.

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