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CASE REPORTS

Iatrogenous superficial femoral artery pseudoaneurysm: treatment with a PFNA nail

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KEYWORDS
Pseudoaneurysm;
Osteosynthesis;
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Abstract
Introduction: Iatrogenic lesions of the superficial femoral artery are a severe but infrequent complication. The internal rotation and adduction of the affected limb during fracture reduction may cause the overdrilling of the locking mechanism of the intramedullary nail to damage the arterial endothelium.
Clinical case: We present the case of a patient with a pertrochanteric fracture operated with a PFNA nail. The postoperative period was uneventful. Six days after discharge she returned whit pain and swelling in the thigh. An echo-Doppler was conducted, which revealed a pseudoaneurysm of the superficial femoral artery that was treated through stent exclusion.
Conclusions: We recommend avoiding adduction and internal rotation when locking the intramedurally nail. Diagnosis of pseudoaneurysm can be made through echo-doppler and its exclusion with a coated stent can afford good results.

PALABRAS CLAVE
Pseudoaneurisma;
Osteosíntesis;
Fractura de cadera

Pseudoaneurisma iatrogénico de la arteria femoral superficial con clavo PFNA

Resumen
Introducción: la lesión iatrogénica de la arteria femoral superficial es una complicación grave aunque infrecuente. La rotación interna y la aducción del miembro afecto durante la reducción de la fractura hacen posible que el sobrefresado del cerrojo del clavo intramedular pueda lesionar la íntima vascular.

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Caso clínico: presentamos el caso de un paciente con fractura pertrocantérea intervenido con clavo PFNA. El postoperatorio cursó sin incidencias. A los 6 días del alta acudió por dolor y tumefacción en el muslo. La eco-Doppler diagnosticó un seudoaneurisma de la arteria femoral superficial que fue tratado mediante exclusión con stent.
Conclusiones: aconsejamos evitar la aducción y rotación interna máxima durante el cerrojado de los clavos intramedulares. El diagnóstico del seudoaneurisma puede realizarse mediante eco-Doppler, y para excluirlo, el stent recubierto proporciona generalmente buenos resultados.

Introduction

Iatrogenic lesions to the superficial femoral artery are a rare complication that has been reported following treatment of pertrochanteric hip fractures with intramedullary nails[1]. One of the factors that predispose patients to these lesions is placement of the affected limb in a traction table with adduction and internal rotation[2]. In this position, the superficial femoral artery becomes vulnerable and could be injured in the event of overreaming of the distal lock.

Clinical case

We present the case of a 78-year-old patient referred to us by the Emergency Department of our hospital after sustaining a fall at home. Clinically, he presented with external rotation and shortening of the right lower limb; movement of the affected limb was extremely painful with absolute functional impotence. The radiological study showed an unstable pertrochanteric fracture in the right hip. The patient's medical history included an episode of chronic venous insufficiency, operated 5 years before.

Surgery was performed with spinal anesthesia; the patient was placed in the supine position on the traction table. To achieve reduction, the affected limb was placed in internal rotation and forceful adduction: this position permits more accurate introduction of the nail into the medullary canal. The contralateral limb was placed in 70° abduction to achieve efficient radioscopic control of the fracture both on the frontal and the axial planes. Fixation was carried out with a 240 cm PFNA nail, 95 mm femoral head blade and dynamic distal block (fig. 1). Postoperative evolution was satisfactory, with no relevant clinical changes; the patient was discharged at 5 days from surgery and was able to walk with a walker.

Figure 1 Fixation of a pertrochanteric fracture with a 240 cm PFNA nail.

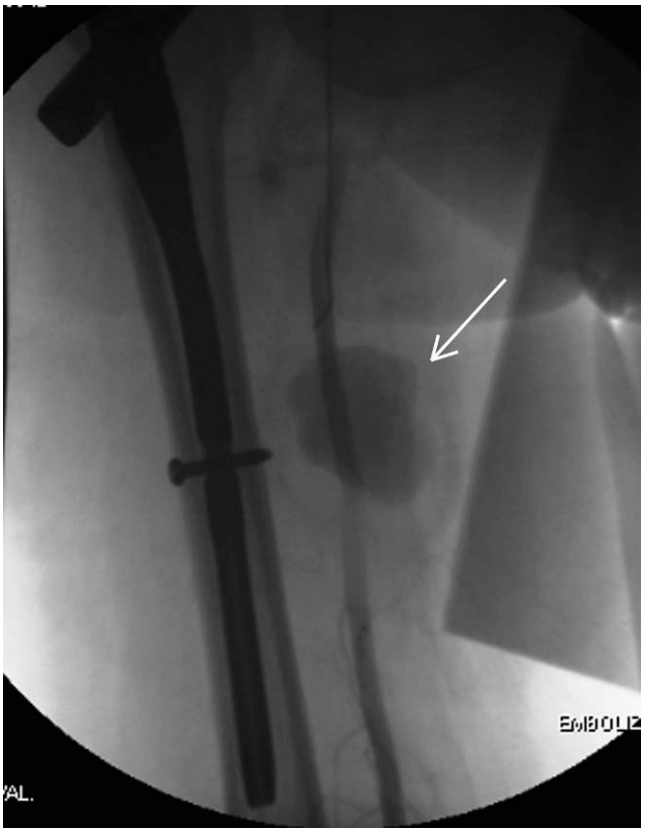

Figure 2 View of the superficial femoral artery pseudoaneurysm (arrow).

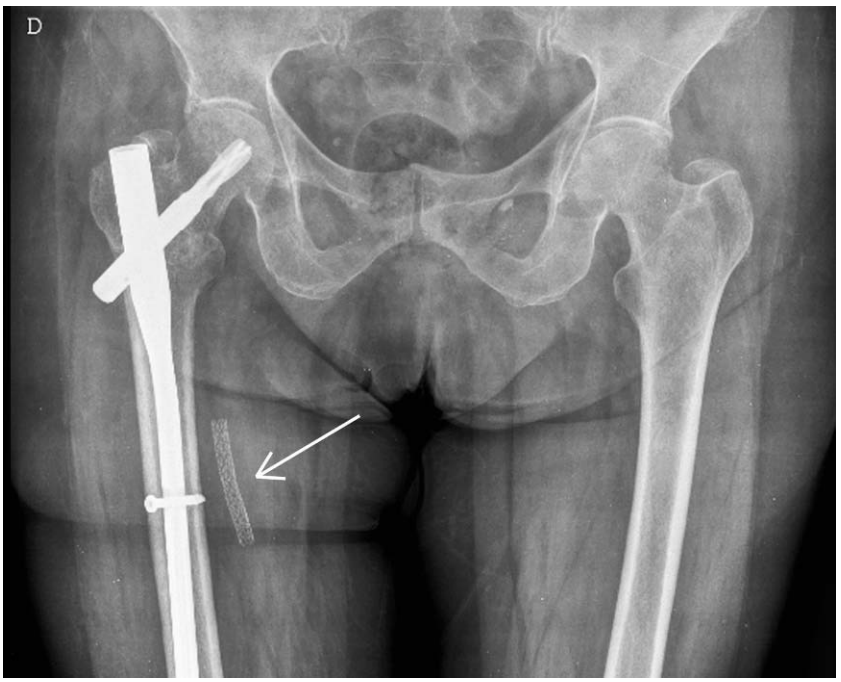

Figure 3 Result following implantation of a coated stent (arrow).

At 7 days from discharge the patient presented at the emergency department with pain, fever and diffuse numbness on the internal side of the operated thigh. Follow-up radiographs were performed that did not show any noteworthy finding. An echo-Doppler showed signs of deep venous thrombosis, while the presence of an artery pseudoaneurysm of 33 × 39 mm was observed in the upper medial third of the thigh.

While the patient was in hospital, a selective angioradiology study confirmed a diagnosis of right superficial femoral artery pseudoaneurysm (fig. 2). A percutaneous transluminal angioplasty was performed through the femoral artery in order to close the neck of the pseudoaneurysm, which was excluded by implantation of a 7?59mm coated stent. A follow-up echo-Doppler showed a good result with effective occlusion of the pseudoaneurysm. The patient improved clinically and was discharged after 2 days.

An examination 6 months further to stent implantation did not show vascular symptoms; the patient was able to walk with a cane. Radiographic follow-up was satisfactory and the fracture had healed (fig. 3).

Discussion

Deep femoral artery pseudoaneurysms following internal fixation of a pertrochanteric hip fracture have been reported in several studies in the literature[3-8]. Superficial femoral artery pseudoaneurysms following intramedullary nailing is far less frequent, with less than 10 cases reported to date[1,9].

Fixation of pertrochanteric hip fractures by intramedullary nailing entails less aggression to soft tissues, but femoral reaming and implant insertion into the medullary canal require greater adduction of the affected limb than with the use of plates and nails or lag screws.

When the fractured limb is reduced on the traction table prior to intramedullary nail implantation, the femoral vessels remain fixed between the posterior region of the perineum and the fémur. This means that internally rotating and forcefully adducting the limb in order to reduce the fracture approximates these vascular structures to the femur, especially in the area where the nail is locked, so that the former may become injured when reaming the hole for the nail's locking screws[1,2].

For these reasons, it is worth considering the need to rectify the adduction and internal rotation of the fractured limb once the implant has been inserted. This may permit safer placement of the nail's locking screw and thereby prevent a potential iatrogenic vascular lesion. Reaming the locking screw holes using a drill bit with a stop could be useful to prevent these complications.

The existence of these injuries is often diagnosed initially on the basis of symptoms and subsequently confirmed by an echo-Doppler.

At present elective treatment of superficial femoral artery pseudoaneurysms is based on the use of minimally invasive techniques developed through angioradiology[10,11]. This permits the exclusion, by means of a coated stent, of small-necked vascular pseudoaneurysms.

Conflict of interests

The authors have declared that they have no conflict of interests.

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