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Vascular Surgery

Acute Lower Limb Ischemia Secondary to Iatrogenic External Iliac Artery Injury Following Femoral Fracture Reduction: Case Report

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Abstract | **Case Report**

***Introduction*:** Iatrogenic vascular injury after orthopedic manipulation is rare but potentially limb-threatening. External iliac artery injury following closed femoral reduction is exceptional and may lead to acute limb ischemia. ***Case Report*:** We report a young adult who developed acute left lower limb ischemia a few hours after closed femoral fracture reduction. Initially, distal pulses were normal, but the patient later presented with severe pain, pallor, coldness, and absent pulses. CT angiography showed an occlusion of the external iliac artery. Acute limb ischemia of iatrogenic origin was diagnosed. Urgent operative management was performed, involving resection of the external iliac artery and reconstruction with an autologous venous interposition bypass graft. ***Conclusion*:** External iliac artery injury after closed femoral reduction is rare but serious. Careful vascular monitoring after reduction and early imaging are essential to avoid delayed diagnosis and prevent limb loss.

Keywords: Limb Ischemia, Femur Fracture, Complication, Intimal Injury, Thrombosis, Irreducible.

INTRODUCTION

Iatrogenic vascular injuries following femoral reduction are rare but potentially severe complications. They may occur during forceful or repeated reduction maneuvers, particularly in high-energy femoral fractures or associated hip trauma. Due to its fixed course along the pelvic brim and its close anatomical relationship with the proximal femur, the external iliac artery is particularly at risk. Injury may range from intimal disruption to thrombosis or, more rarely, complete occlusion [1, 2].

Clinical presentation can be subtle at the beginning, making early recognition essential. Any postoperative suspicion of vascular compromise should prompt immediate vascular assessment with clinical examination and Doppler ultrasound, or CT angiography when needed. Rapid diagnosis is crucial to allow timely vascular intervention and prevent irreversible ischemic complications or limb loss.

CASE REPORT

We report the case of a 27-year-old active smoker with no known vascular history, who was admitted to the emergency department following a road traffic accident resulting in a closed double-level fracture of the left femur. On initial clinical examination, distal pulses were present and symmetrical in both lower limbs.

Four hours after fracture reduction, the patient developed pain in the left lower limb. Vascular examination revealed a mildly cold extremity compared with the contralateral side, with absence of peripheral pulses in the left lower limb, while motor and sensory functions remained intact. An urgent CT angiography of the lower limbs demonstrated a 4 cm segment of non-opacification of the external iliac artery, with distal reconstitution of the common femoral artery (Fig 1).

The patient was taken emergently to the operating room. Surgical exploration via a longitudinal inguinal approach to the left groin revealed a 4 cm contused segment of the external iliac artery (Fig 2-4). Resection of the injured arterial segment was performed, followed by arterial reconstruction using an autologous reversed saphenous vein graft (Fig 3).

The patient was started on systemic anticoagulation with heparin and underwent close

postoperative monitoring. The postoperative course was uneventful.

At the one-month follow-up, clinical examination demonstrated a favorable vascular outcome, with a warm and well-perfused limb and palpable distal pulses.

Fig 1: Lack of opacification of the external iliac artery (arrow) on CT angiography of the lower limbs.

Fig 2: Intraoperative view demonstrating the injured segment of the external iliac artery

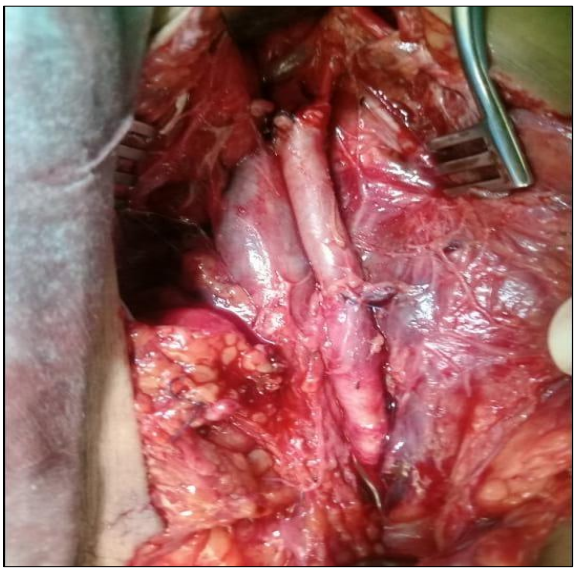

Fig 3: Reconstruction of external iliac artery using autologous reversed greater saphenous vein graft.

Fig 4: Segment of the external iliac artery contused

DISCUSSION

Intimal contusion of the external iliac artery is a rare iatrogenic complication following femoral reduction. The most likely mechanism involves compression or shearing of an arterial wall weakened by brutal traction and rotational maneuvers. Sudden vascular compression generates shear stress capable of disrupting the endothelial layer and inducing intimal injury [3, 4]. This type of lesion may remain clinically silent without careful monitoring and is often only revealed by signs of distal ischemia, the presence of a deep hematoma, or a secondary decrease in hemoglobin levels [5, 6].

The literature and current vascular trauma guidelines emphasize the critical importance of early diagnosis and prompt management to improve outcomes [7-9]. Systematic neurovascular assessment before and after reduction is strongly recommended, including peripheral pulse examination and ankle–brachial index measurement. An ABI ≥ 0.9 reliably excludes significant arterial injury, whereas abnormal findings should prompt further investigation [9]. Any asymmetry or abnormal clinical sign should lead to urgent CT angiography, which is currently considered the first-line imaging modality in suspected vascular trauma [7].

Most stable intimal injuries may be managed conservatively with close clinical monitoring and antithrombotic therapy [10]. However, progression to limb ischemia, occlusive thrombosis, or pseudoaneurysm requires intervention, either endovascular (covered or self-expanding stent placement) or open surgical repair [10]. Early recognition remains the key determinant of functional outcome. Prevention relies on careful reduction techniques and systematic vascular examination before and after the procedure [11, 12].

The reduction should be performed under adequate general anesthesia or effective order to minimize applied forces and prevent iatrogenic soft-tissue and vascular injury. Maneuvers must remain strictly progressive, based on controlled gentle axial traction, avoiding any hyperabduction or forceful rotational movements, which may generate significant shear stress along the iliofemoral axis and potentially lead to intimal injury or vascular complications [7, 8]. In cases of difficult or irreducible dislocation, fluoroscopic guidance is strongly recommended, and the use of adjunctive techniques (muscle relaxation optimization, staged traction, or alternative reduction methods) should be preferred over excessive force application [13].

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