

Case Report

## Femoral artery necrosis due to parenteral intravascular drug misuse: A case report and literature review

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### ABSTRACT

Accidental intra-arterial injection as a consequence of drug misuse has been described in both the upper and lower limbs. We present a case in which a drug abuser injected heroin into his femoral artery. This resulted in necrosis of the femoral artery requiring an autologous graft. A life threatening haemorrhage necessitated ligation of the common femoral artery. His limb survived.

### CASE REPORT

A thirty eight year old male presented with pain and swelling of his left groin. He was an intravenous drug user. Six days prior to presentation he had injected his groin with heroin. He had a low-grade pyrexia with tachycardia. There was a swelling in his left inguinal region with overlying skin erythema. Femoral and popliteal pulses were palpable, foot pulses were not. There was no audible Doppler ultrasound signal in the foot.



Fig 1. MR Image through common femoral region showing an inhomogenous predominantly low T1 signal mass in the region of the common femoral artery.

A diagnosis of an infected inguinal haematoma was made. The patient was commenced on prophylactic low molecular weight Heparin subcutaneously and given Metronidazole, Ciprofloxacin, and Benzylpenicillin intravenously. A Magnetic Resonance Angiogram showed a large collection with gas formation in the anterior and medial compartments of the thigh causing bowstringing of the femoral vessels (Figure 1). Evacuation of a putrefied haematoma was undertaken.

On the first postoperative day, the patient developed clinical

signs of sepsis. There was mottling of his left flank and leg, and peritonism of his left lower abdomen. He returned to theatre where he was found to have extensive tissue necrosis distal to his inguinal ligament; this extended proximally into the left retroperitoneal space. The common femoral artery was necrotic. The area was debrided widely. As the long saphenous vein was occluded a vein graft was taken from the deep femoral vein in the left thigh. This was anastomosed from proximal common femoral artery to the superficial femoral artery. Good reperfusion occurred. The sartorius muscle was necrotic and completely debrided. The skin was approximated over the vessel and the patient transferred to the intensive care unit.

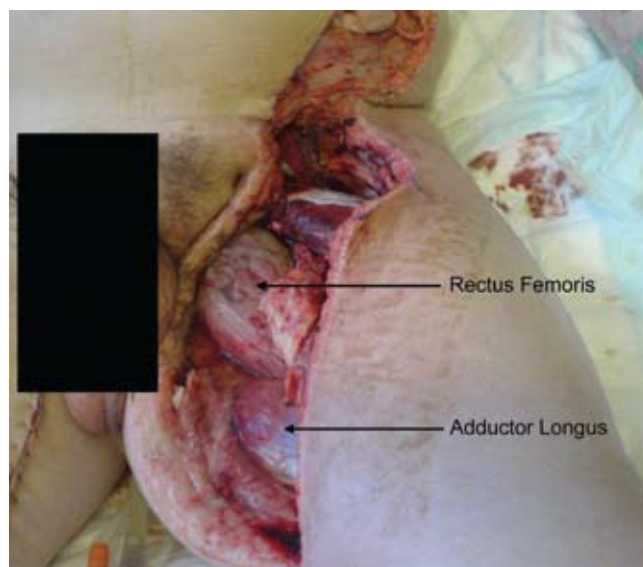


Fig 2. Image showing debrided groin wound with Rectus femoris flap placed over the graft.

In the next four days the patient required antero-lateral and postero-medial fasciotomies of the leg, further debridement of the groin wound, and a rectus femoris muscle flap mobilised and placed over the graft (Fig 2). Six days after the original procedure, torrential bleeding required ligation of the proximal common femoral artery. At seven weeks the limb

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remains viable (Fig 3) with rapid secondary healing of the groin wound and fasciotomies, using a closure (V.A.C.®) device.



Fig 3. Image of the healing groin wound showing survival of the limb.

## DISCUSSION

The femoral vein is frequently used to gain vascular access by habitual drug abusers. The most common complications of this form of drug abuse are cellulitis, abscess formation, acute on chronic deep venous thrombosis, infected thrombi in the vein and artery, arteriovenous fistulae, infective endocarditis, and pseudoaneurysm formation<sup>1,2</sup>. This patient injected the drug intra-arterially, extravasation of blood occurred, and secondary infection ensued from the use of a contaminated needle. This resulted in a large infected haematoma, causing bow stringing of the femoral artery. In turn this resulted in compression of the femoral artery, necrosis of the vessel wall, and subsequent ischemia of the lower limb.

Intra-arterial injection to the femoral artery with other drugs<sup>3</sup> has been described as presenting with an immediate burning pain distal to the site associated with a hyperaemic flush<sup>4</sup>. Often the pain is constant, and is exacerbated by movement<sup>4</sup>. The affected limb then becomes cold and mottled, distal pulses however are often palpable<sup>3,4</sup>. It can also cause swelling which results in a compartment syndrome<sup>4</sup>.

There are relatively few articles in the literature concerning lower limb accidental intra-arterial injection. Most cases have

favourable outcomes with limb amputation being avoided<sup>4</sup>. There is no accepted treatment protocol. Most patients respond to a combination of rest, elevation, analgesia and heparinisation<sup>3</sup>. Regional nerve blocks, stellate ganglion blocks, sympathectomies, intra-arterial and intravenous vasodilators, and thrombolytic agents have all been described<sup>3,4</sup>.

Our patient required revascularisation because there were signs of limb threatening ischemia, this ultimately failed, however his limb survived. In patients presenting with a pseudoaneurysm of the femoral artery due to parental drug abuse, some authors advocate excision without revascularisation as a viable option. In one series of 18 patients Padberg *et al*<sup>5</sup> undertook debridement and primary ligation in six patients, all had a Doppler ultrasound signal present at the ankle post ligation, none required amputation. Two patients did however return to theatre due to haemorrhage. In contrast, of the 12 other patients in the series who were treated with revascularisation, three ultimately required amputation and there were 13 returns to theatre to deal with haemorrhage and infection.

## CONCLUSION

We suggest in this case that an autologous vein graft in the presence of gross infection has a high risk of graft disintegration, and that proximal ligation of the femoral artery may offer the optimum primary surgical management.

The authors have no conflict of interest.

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