

'Silent' atraumatic compartment syndrome following heroin use – a diagnostic challenge

Ross Jack¹; Alison Howd²; Rajendra Raman¹; Ben Slater³ Julie Thomson¹

1 Emergency department, NHS Fife 2 Vascular surgery, NHS Fife 3 Anaesthesia & Critical care, NHS Fife

History

A 24 year old male presented with leg swelling and collapse. He reported waking 6 hours after smoking heroin with swelling and reduced power in the right leg, severe back pain, breathlessness and dizziness. On initial evaluation in the emergency department (ED) he reported no pain in the leg; however his back pain was refractory to high doses of opioids.

Examination

On examination he was alert when supine but lost consciousness on sitting. Blood pressure was unrecordable with only carotid pulses palpable. All four limbs were pale and cold. The whole right leg was markedly swollen compared to the left. Power was preserved in the arms and left leg but reduced in the right leg.

Table 1

Blood test	Result
Creatine kinase	158,200 IU/L
Creatinine	191 µmol/L
Amylase	3,021 U/L
Lactate	11.3 mmol/L
White cell count	49.9 x10 ⁹ /L

Initial management

Fluid resuscitation and a peripheral adrenaline infusion were commenced. Computed tomography excluded pulmonary embolism and aortic dissection. The patient was transferred to the intensive care unit where severe hyperkalaemia persisted despite continuous high exchange veno-venous haemodialysis.

Definitive management

A vascular opinion was requested. The right leg was extremely swollen with a very tense, insensate calf and loss of foot dorsiflexion. The thigh was extremely tense and very tender to palpation. Emergency open fasciotomy of the calf and thigh showed severely damaged calf muscles with recovery unlikely, and swollen but potentially viable thigh muscles. After resolution of multi-organ failure, above knee amputation was performed with good recovery.

Factors that delayed diagnosis

In this case, ED recognition of compartment syndrome was delayed by the short reported period of unconsciousness, lack of typical disproportionate leg pain, distracting severe back pain, and severe shock with widespread peripheral shutdown. In retrospect the diagnosis was suggested by the combination of swelling and neurological deficit in one leg only.

Discussion

Where drug use is involved, the history may be unreliable or unobtainable, particularly with regard to any period of unconsciousness; in this case it is likely that the patient was unconscious with an occluded right femoral artery for significantly longer than the reported 6 hours, resulting in necrosis of the calf muscles to the point of analgesia. The distracting severe back pain (possibly due to retroperitoneal ischaemia) resolved with resuscitation, unmasking significant pain in the still viable right thigh. As blood pressure improved the pulses returned in the arms and left leg, focusing attention on the persistently ischaemic right leg.

Literature search

6 cases¹ were identified of 'painless' compartment syndrome, traumatic and atraumatic, with pain varying from absent to relieved using simple analgesia. All were identified due to increased swelling or neurological dysfunction. Reports on drug-related compartment syndrome² often involved loss of consciousness and pain varied from absent to severe in the affected limb. Times to presentation ranged from 4 to 48 hours.

Summary

This case complements current literature by illustrating that the presence of limb swelling with any degree of pain or neurological dysfunction, particularly in the context of an uncertain period of unconsciousness, should raise suspicion of compartment syndrome. Urgent compartment pressure monitoring and vascular review should occur alongside resuscitation and organ support.

References

- Blanchard S, Griffin GD, Simon EL. Atraumatic painless compartment syndrome. American Journal of Emergency Medicine. 2013; 31: 1723.e3-1723.e4
- Oh LS, Lewis PB, Prasarn ML, Lorich DG, Helfet DL. Painless, atraumatic, isolated lateral compartment syndrome of the leg: an unusual triad of atypical findings. The American Journal of Orthopedics. 2010; 39(1):35-39
- Badhe S, Baiju D, Elliot R, Rowles J, Calthorpe D. The 'silent' compartment syndrome. International Journal of the Care of the Injured. 2009; 40: 220-222
- Bera A, Kramer B. A case of rhabdomyolysis and compartment syndrome associated with acute heroin overdose. Critical Care Medicine. 2016; 44: number 12 (supplement)
- Panagiotopoulos AC, Vrachnis I, Kraniotis P, Tyllianakis M. Gluteal compartment syndrome following drug-induced immobilisation: a case report. BMC Research Notes. 2015; 8: 35