On-line Case Report

How a footballer got hurt without getting hit: isolated peroneal compartment syndrome of a non-traumatic cause

KYLE KOWALEWSKI, ANDREW MAYO, SIMON JOURNEAUX

Department of Orthopaedic Surgery, Mater Misericordiae Health Services, Brisbane, Queensland, Australia

ABSTRACT

Compartment syndrome can present atypically both on history and examination, so any sudden isolated muscle pain of a compartmental distribution should be regarded with a high index of suspicion to optimise the outcome for the patient.

Keywords: Peroneal compartment syndrome

A 29-year-old male police officer was playing touch football in the evening when he started noticing an ache in his right calf. The only traumatic episode he could recall was an insignificant twisting of his knee while warming up but he was able to start the game. The pain increased as the match progressed, causing him to have to stop playing. He took paracetamol at home and went to bed for the night. At 03:00 h the pain awoke him as it had become more severe. More analgesics were taken with no effect. By morning, the pain was so severe that he went to his GP who administered subcutaneous morphine with little effect. A calf ultrasound was done to exclude deep vein thrombosis and was found to be negative. He was referred for an emergency department consultation.

On presentation, he was in extreme pain and was only mildly responsive to narcotic analgesia. Examination revealed paresthesia and decreased sensation in the second web space. The right calf was not evidently swollen and there was no palpable tension in the anterior compartment; however, there was extreme tenderness over the proximal lateral compartment. He had normal

pulses, capillary refill and power with decreased sensation in his second web space. Passive stretch of the right foot in flexion and extension did not illicit pain, although inversion and eversion were not specifically tested. Although the presentation seemed atypical, he was taken to theatre for measurement of compartment pressures with or without fasciotomy.

Compartmental pressures were measured intra-operatively under general anaesthesia. The diastolic blood pressure recorded at 60 mmHg. The anterior compartment pressure was 20 mmHg, and the peroneal compartment pressure was 55 mmHg. As there was no clinical basis to suggest compartment syndrome of the other two compartments, their pressures were not measured. A lateral fasciotomy incision was made exposing the anterior and peroneal compartments. The fascia of the anterior compartment was incised resulting in minimal bulging of viable muscle through the fascia. The fascia of the peroneal compartment was then incised resulting in considerable bulging of ischaemic muscle through the fascial defect. The colour returned to normal

Correspondence to: Andrew Mayo, Department of Orthopaedic Surgery, Mater Misericordiae Health Services, Brisbane, Queensland, Australia
E: andrewemayo@hotmail.com

within 2–3 min of the fasciotomy. There was a small bleeding vessel seen in the mid part of muscle bulk, a possible cause of the compartment syndrome in this patient. Diathermy was applied to the bleeding vessel to obtain haemostasis. The wound was then boot laced for partial closure, dressed and the leg was put in a short leg backslab. Postoperatively, the pain and tenderness had much improved. Two days later, he was taken back to theatre and the wound was closed easily. At discharge, the pain and paresthesia had completely resolved.

Discussion

The musculature of the lower limb is enclosed within four osseofascial bound compartments namely the anterior, peroneal, posterior superficial and deep compartments. Fryberg¹ states that a compartmental pressure within 30 mmHg of the diastolic pressure is diagnostic of compartment syndrome. This increased intramuscular interstitial fluid pressure compromises the capillary filling pressure required to maintain capillary blood flow, resulting in ischaemia. If left untreated, the resultant ischaemia can lead to minor functional and histological damage after 4 h and even muscle necrosis after 8 h.² Pain, however, is detected much sooner, as ischaemia has been demonstrated to affect neurons clinically in only 33 min.³

Trauma-related compartment syndromes such as from fractures, crush injuries or pressure areas in comatose patients are numerous, but very few cases of non-traumatic origin have been reported.

The usual clinical findings of lower limb compartment syndrome include pain, tenderness over the affected site

with a tense and swollen compartment and pain on passive stretch and active movements. Peripheral pulses are usually present. Given the rapid progression of ischaemic muscle tissue to necrosis, it is important to recognise and treat compartment syndrome early.

What makes this case unique is both its history and findings on clinical examination. First the history of non-traumatic origin causing compartment syndrome is uncharacteristic, as there are so few cases reported. Second, the usual physical examination did not demonstrate pain on passive stretch, which is normally a typical sign elicited in compartment syndrome. This was probably because we were testing the 'wrong' compartment. Forced inversion would more likely than not have caused significant pain. It should be noted by orthopaedic surgeons and emergency doctors alike, that compartment syndrome can present atypically both on history and examination, so any sudden isolated muscle pain of a compartmental distribution should be regarded with a high index of suspicion to optimise the outcome for the patient.

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