

Acute Exertional Compartment Syndrome Of The Superficial Posterior Compartment Without Direct Trauma Misdiagnosed As Deep Vein Thrombosis: A Case Report

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Citation

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Abstract

Acute exertional compartment syndrome secondary to minor soft tissue injury with involvement of the superficial posterior compartment is rare. The diagnosis is often overlooked and poses a diagnostic dilemma for clinicians when presented with a case of an acutely swollen painful calf with no history of obvious trauma. This report highlights two patients who presented to casualty with an acute swollen painful limb after minor unaccustomed exercise had been misdiagnosed as deep vein thrombosis and subsequently lead to delay in management. Clinician should not dismiss this possibility of acute exertional compartment syndrome as a differential diagnosis. The diagnosis of deep vein thrombosis should be positively excluded before indiscriminate treatment of anticoagulants. Early recognition and surgical intervention will prevent potentially catastrophic morbidity.

CASE REPORTS

CASE 1

A fit previously healthy 50-year-old solicitor developed a sudden swelling in the middle of the left calf whilst walking for a train. There was no history of direct contact or trauma. He had been on a holiday which involved heavy walking in South Africa two months prior to this admission.

CASE 2

A fit, healthy 27 year-old electrician, presented to the accident and emergency department with a sudden onset of swelling and pain in the left calf. His symptoms had developed after jogging and preceding this he had suffered a low grade discomfort in the calf for approximately a week. He recently started running exercises less than two months prior to this event.

On clinical examination, both patients demonstrated a visibly unilateral swollen calf. There was no pain on passive movements of the ankle. Neurovascular status was documented as normal. Routine blood test including clotting screen and X-rays were unremarkable. Given the history and findings thus far, a presumptive diagnosis of DVT was made. The patients were prescribed anticoagulant and was discharged the same day with clinical follow up.

Within twenty-four hours, both patients re-attended the department with increased severity of pain and swelling, this time with great difficulty in walking. Clinical examination revealed a substantial increased in the affected calf circumference, and there was pain on passive plantarflexion in all cases. Case 1 had parasthesia along the distribution of sural nerve of the affected leg. All patients had power grading of 4/5 (MRC grading) and distal pulses were intact.

In view of these new clinical findings, a Doppler ultrasound was performed and it revealed intramuscular haematoma deep to the gastrocnemius muscle but no real evidence of a DVT (see figure 1). Subsequent to that, a clinical diagnosis of compartment syndrome was confirmed in the superficial posterior compartment using a Stryker Compartment Pressure Monitor (Stryker Compartment Pressure monitoring instruments. Kalamazoo, Michigan). See Table 1.

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Figure 1

Figure 1: Doppler ultrasound scan of left calf depicting a 10 x 4cm of haematoma in the medial aspect of gastrocnemius.

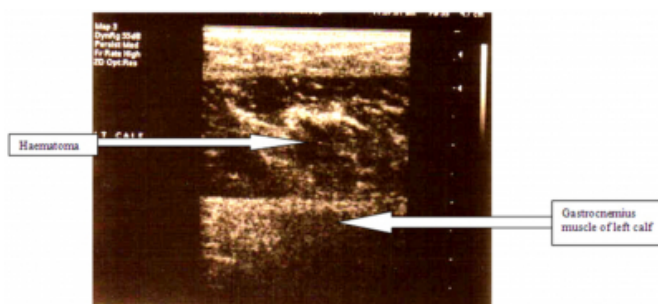


Figure 2

Case	Muscle Group	Compartment Pressure (mmHg)	Blood Pressure (mmHg)
1	Superficial posterior	80	125/60
	Deep posterior	10	
	Anterior	5	
	Lateral	5	
2	Superficial posterior	70	115/80
	Deep posterior	5	
	Anterior	8	
	Lateral	5	

At operation to perform emergency fasciotomy, a tear was apparent in the proximal part of the soleus muscle in case 1 and case 2; proximal aspect of gastrocnemius. All muscles affected above appeared dusky and oedematous. The wounds were left open and dressed and subsequently closed under general anaesthetic at seventy-two hours. At one year follow up, both patients regained full power of the leg but case 1 continued to complain of numbness in the back of the left foot.

DISCUSSION

Acute exertional compartment syndrome (ECS) of the superficial posterior compartment of the calf – gastrocnemius/soleus muscle complex - is rare after minor soft tissue injury. We postulated that the most likely aetiology involves exercise-induced muscle injury with subsequent haematoma exacerbated by the use of anticoagulant thus causing an increased intra-compartmental pressure.

The literature is replete with case reports describing exertional compartment syndromes in the lower leg.^[1,2,3,4] They have been classified in various debatable terms but the most commonly known to orthopaedic surgeon and sport physician is Acute and Chronic. The two entities differ in clinical presentation according to onset, severity and

acuteness of symptoms. Acute ECS with the involvement of the superficial posterior compartment of the calf is rare in the general population as compared to Chronic ECS.^[5] Our experience revealed a lack of awareness amongst first line casualty attendants. The vast majority of exertional compartment syndrome cases are treated conservatively in an outpatient setting, hence casualty officers rarely encounters such cases. Other possible reasons would be due to the confusion caused by various terms used in the literature to describe the same clinical entity. Furthermore, clinical diagnosis of acute ECS involving the superficial posterior compartment is less obvious than those of other muscle compartments in the lower limb because, being a larger compartment; it is able to withstand a greater increase in pressure before muscle ischaemia develops.

Acute ECS should remain in the clinician's differential diagnosis when evaluating patient with an acute painful swollen leg after unaccustomed or strenuous exercise. A thorough differential diagnosis includes the following: stress fracture, medial tibial stress syndrome, DVT, ruptured Baker's cyst and acute ischaemic limb. Often the patient's history, symptoms, and clinical signs alone may differentiate from the diagnoses. The diagnosis of exertional compartment syndrome can be confirmed by measuring compartment pressures of the suspected muscle group involved. DVT can be easily confused with acute exertional compartment syndrome as a cause of acute painful swollen limb, especially in the context of non-traumatic injury, or they may even coexist.

Collectively this report presents the consequences of a delay in diagnosis including muscle necrosis and neurological consequences. Fortunately, more sinister complications including rhabdomyolysis and acute renal failure did not occur. Despite the late presentation surgical decompression is essential.^[6]

In conclusion, a comprehensive differential diagnosis must be thoroughly investigated to properly diagnosed patient who presented with an acutely swollen painful limb after unaccustomed exercise so that prompt and effective treatment can be initiated. In addition, DVT should be positively excluded before indiscriminate treatment of anticoagulant.

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