CASE REPORT

Spontaneous complete hamstring avulsion causing posterior thigh compartment syndrome

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Br J Sports Med 2006;40:723–724. doi: 10.1136/bjsm.2005.022749

Complete avulsion of the hamstring muscle group from its ischial origin is an uncommon condition, and has been mostly reported in young athletes. A case is presented in which a middle aged man sustained this injury and developed a compartment syndrome of the thigh, which has not been previously reported. The surgical management of this patient is described.

Complete avulsion of the hamstring muscle group from its ischial origin is an uncommon entity. Most hamstring muscle injuries are strains occurring at the musculotendinous unit in athletes.^{1,2} Reported cases of hamstring avulsion in the English literature involve young patients who sustained sudden indirect injuries, while involved in sporting activities.^{3–6} We present a case of spontaneous complete hamstring avulsion in a middle aged man, who developed a compartment syndrome.

CASE REPORT

The patient was a sedentary 62 year old man who was walking normally, when he felt a sudden tearing sensation in his right buttock. He was unable to walk and sought attention from his primary care doctor, who diagnosed a simple hamstring sprain. There was no prior history of drug use or systemic disease. He presented to our institution 24 hours after injury, as his symptoms were steadily worsening. By that stage, there was considerable swelling and bruising of the right thigh, especially posteriorly. The pain and tense swelling made testing of the muscle groups very difficult, but there was no palpable defect in the thigh musculature.

Plain radiographs did not show any bony avulsions from the ischial tuberosity, but a magnetic resonance imaging (MRI) scan showed complete avulsion of the hamstring muscles from their ischial origin (fig 1). The presence of a large haematoma was confirmed on the coronal view. The sciatic nerve was in close proximity to the torn tendon and was considerably swollen.

Over the next few hours, the patient developed neurological symptoms in the right leg. On examination, sensation was present but decreased on the sole of the foot and on the lateral side of the calf, although motor power was preserved. Any attempt to move the thigh was met with excruciating pain. A diagnosis of posterior thigh compartment syndrome was made, and emergency surgical exploration was carried out.

The patient was placed prone and a longitudinal incision was made over the proximal aspect of the thigh. About 700 ml of haematoma exited the wound forcefully when the posterior compartment was entered. The muscles appeared dark red, but were viable, and the hamstrings were found to be avulsed from the lateral part of the ischium. The sciatic

nerve was easily identified lateral to the ischium and there was no entrapment. The hamstrings were repaired using two bone anchor sutures (G4 Super Anchor; Mitek Products, Norwood, Massachusetts, USA) drilled into the ischium. Easy mobilisation of the tendon stump allowed a tension-free repair. The wound could not be closed primarily because of tissue swelling, and a split skin graft was harvested from the opposite thigh and applied to the wound.

The patient's neurological symptoms resolved fully in the immediate postoperative period. After the skin graft had taken, physiotherapy was started, concentrating on gait training and hamstring strengthening. At our last review, two years after the injury, he was pain free on walking and climbing stairs, although there was subjective weakness of the hamstring muscles. He had a normal range of motion in his hip and knee, and the power of knee flexion was 4/5.

DISCUSSION

Previous cases of hamstring avulsion from the ischial origin have been described in young patients engaged in sporting activities.^{3–6} It is postulated that muscle weakness, imbalance, and inflexibility have a predisposing role,⁴ although this is likely to be more relevant to athletic injuries. There was no history of steroid use in this case, and it is known that fatigue or pathological changes in tendons or muscles can predispose to rupture.⁴ Biopsy specimens of the tendon were not taken, but the tissues appeared macroscopically normal.

Figure 1 The hamstring muscles have been avulsed as a group, and a large haematoma with swelling of the sciatic nerve can be seen on the coronal view. Written consent has been obtained from the patient for publication of these images.

What is already known on this topic

- Avulsion of the hamstring muscles from their ischial origin has previously been described in the young and active population, mainly as a result of sports injuries
- Neurological symptoms are rare in this type of injury

What this study adds

- Hamstring avulsion can also occur spontaneously in a middle aged patient
- A large amount of bleeding can occur, and the risks of a compartment syndrome should be borne in mind

Compartment syndromes are more common in the leg than in the thigh, and the large volume of the thigh may account for this. The anterior compartment is most commonly involved,⁷ but posterior compartment syndrome has also been described secondary to fractures, direct trauma, or compression.⁸ Oseto *et al*⁷ have described a case of posterior compartment syndrome of the thigh, secondary to hamstring avulsion and anticoagulation therapy. In this case, there was no history of use of aspirin, non-steroidal anti-inflammatory drugs, or anticoagulants. Monitoring of compartment pressure has been advocated in making the diagnosis of compartment syndrome,⁹ but we felt that a fasciotomy was justified on the strength of the physical findings.

The severity of this injury, compared with a simple hamstring strain, may not be appreciated, leading to late diagnosis and surgical repair. Physical examination can be unreliable because of the pain and swelling, and imaging techniques are often required to make a reliable diagnosis. Plain radiographs are useful in excluding an avulsion fracture from the ischial tuberosity,¹⁻¹⁰ and MRI has been found to be more useful than computed tomography in delineating the extent of the injury.¹⁰

Prompt diagnosis is also important for optimal surgical management. Klingele and Sallay⁵ studied the outcome of 12 patients with hamstring injuries at the ischial tuberosity, who were treated non-surgically, and found that those who had complete tears were left with persistent functional impairment. Early repair is easier than delayed repair, as the ruptured tendon can be brought up to the ischial tuberosity without any tension. Delayed repair requires a more extensile approach to expose the tendon,⁵ and the sciatic nerve is often found to be encased in scar tissue, needing neurolysis.⁵

In conclusion, we present a case of spontaneous rupture of the hamstring muscles from their ischial origin, which led to a compartment syndrome in a middle aged man. The diagnosis of hamstring avulsion is often delayed, and a high index of suspicion is required. The investigation of choice is MRI, and prompt repair with bone anchor sutures is to be recommended.

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Competing interests: none declared

Patient consent for publication of fig 1 has been obtained

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Accepted 22 November 2005

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COMMENTARY

Although spontaneous rupture of the hamstring is not a common occurrence in young athletes, it is important to keep it in mind in an elderly person who is keeping fit as part of active ageing. In such a population, there may be other factors, such as steroid use, that may play a part. It is important to establish the diagnosis clinically and by MRI and opt for early surgical intervention. This will reduce the morbidity of pressure on the sciatic nerve and allow easier repair of the hamstring rupture.

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