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CASE REPORT

Severe muscle injury and extensive intramuscular haematoma of the vastus intermedius in a rugby player

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Introduction

Muscle injury includes a range of pathology, from simple muscle strains to more severe and extensive muscle tears and disruption. Most low-grade injuries are successfully treated non-operatively (Fernandes et al, 2011). High-grade injuries can be more challenging to treat, particularly in athletes with high functional demands. This article describes a severe quadriceps injury in a high-demand athlete, identified late and treated with a good outcome.

Discussion

This case demonstrates how extensive muscle injuries can be masked. Where recovery is delayed or patients are more symptomatic than expected, it is important to maintain clinical suspicion. Even in an athlete with good muscle bulk, the signs of increased thigh circumference, pain or restricted knee movement can suggest a clinically important muscle or tendon injury, swelling and localised bleeding. In this case, the extent of muscle injury and localised haematoma puts the patient at risk of developing subsequent myositis ossificans (Torrance and deGraauw, 2011).

Case report

A 23-year-old man experienced a direct blow to the right anterior thigh during a rugby match. He described immediate pain in the thigh, had difficulty weight-bearing and was unable to continue to play. He managed the injury over the first few days with relative rest and non-steroidal anti-inflammatory medication. He attempted to return to rugby over the next 2 weeks but was unable to do so because of persistent pain localised to the right quadriceps and knee.

Three weeks after the initial injury he continued to show no improvement and reported persistent pain localised to the right anterior thigh and knee. His gait was obviously antalgic, he was focally tender in the quadriceps, and he was unable to return to rugby, running or training.

The patient underwent magnetic resonance imaging of the whole thigh. This showed marked disruption to the vastus intermedius muscle in the right thigh, in keeping with a grade 3b muscle body tear (Pollock et al, 2014). A large 12x7x3 cm layered haematoma was identified in the quadriceps musculature (Figure 1). The distal vastus intermedius muscle had retracted with a 3 cm gap evident on imaging.

The patient was reviewed in the orthopaedic clinic following his imaging and 4 weeks after the original injury. He remained symptomatic but was subjectively improved, reporting less pain. The circumference of the right thigh was 5 cm greater than that of the left thigh, measured 15 cm from the superior pole of the patella. There was no bruising or redness, and he was demonstrably tender along the middle-to-upper aspect of the quadriceps in the midline.

Straight leg raise was maintained but painful for him and knee range of movement was restricted with knee flexion only between 10 and 60° and limited by pain. There was no paraesthesia along the leg, no change in temperature nor any neurovascular compromise.

After discussion, non-operative treatment was agreed. A programme of rest, ice treatment, non-steroidal anti-inflammatory medications and physiotherapy was prescribed and the patient was reviewed in the orthopaedic trauma clinic. Eight weeks after injury he remained symptomatic and while his recovery was not complete, he continued to improve and was able to return to rugby training and skiing.

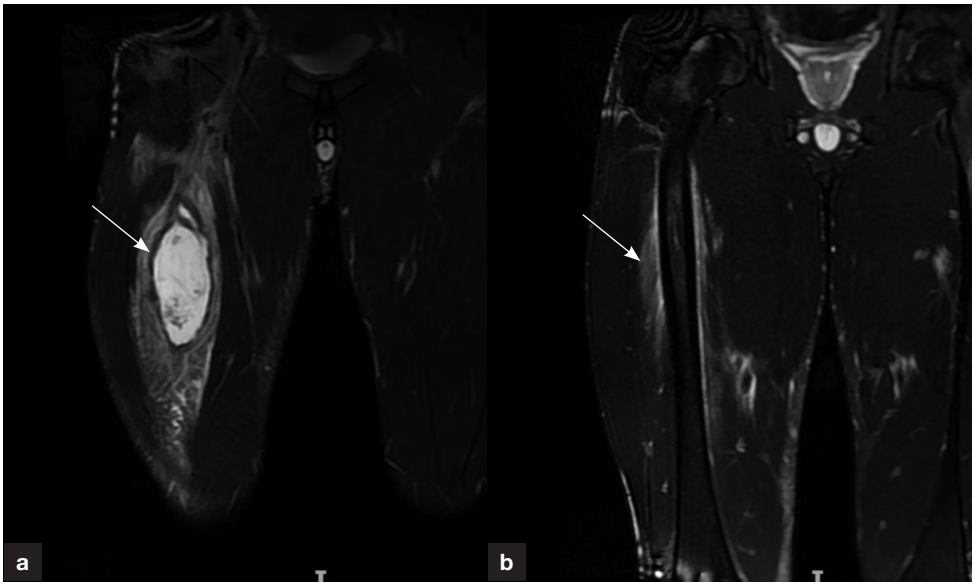

Figure 1. T2-weighted magnetic resonance imaging (a) anterior and (b) posterior view. A 12x7x3cm haematoma can be seen in the right thigh (arrows).

Surgical repair in muscle is technically challenging (Giai Via et al, 2020). Fixation techniques are not as biomechanically secure as those used to repair bone or tendon. Moreover, muscle fibres run parallel to the force applied by the suture, meaning this part in particular is weak under more minor stress (Kragh et al, 2005). Haematomas that are large and symptomatic can be surgically drained (Liu et al, 2023). Early movement is important to minimise scar formation but where surgical fixation is tenuous and perhaps insecure, this may not be possible. The role and benefits of surgery for muscle injuries are not well established or evidenced. There is very limited evidence that for patients in whom surgery is considered outcomes may be better when this is undertaken early and within 4 weeks (Äärimaa et al, 2004).

Where recovery is delayed, or symptoms are severe, careful clinical examination can point to a more serious injury than expected. Magnetic resonance imaging offers an objective assessment by which the injury can be graded and the prognosis for recovery informed, which is helpful to the patient and clinician (Crema et al, 2015).

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Learning points

- Most injuries to the muscle belly will respond well to good non-operative treatment.
- For high-energy injuries and where symptoms are more severe or recovery is slower than would be expected, it is important to maintain a high level of clinical suspicion for a more severe injury.
- Careful clinical examination identifying localised swelling, bleeding or extensive bruising and loss of function can point to a more a severe injury.
- Magnetic resonance imaging is a helpful diagnostic tool providing objective assessment of the extent of injury.
- The evidence base for surgical treatment of muscle injuries is limited. Severe injuries are not common and an individual assessment is advised, taking account of the extent of injury and the functional baseline and needs of the patient.

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