**INTRODUCTION**

This case study highlights a commonly overlooked complication of a common injury in a number of sports. *Myositis ossificans* (MO) is the term used to describe the ossification or the deposit of bone in muscle tissue, causing pain and swelling. Histologically, the lesion is characterized by calcium deposits rather than actual bone formation. The term is however a misnomer as it is not an inflammatory condition and it is not specific to muscle tissue. Muscle remains however

**ABSTRACT**

**Introduction:** This case report highlights the importance of recognising *Myositis Ossificans* as a complication of muscle contusion. The approach to diagnoses and treatment is discussed with reference to other similar cases involving ectopic traumatic calcification. This is particularly relevant to medical professionals involved in the management of contact sports athletes.

**Case:** This is a case of a 24 year old male footballer who sustained a blunt trauma to his left posterior thigh during a first division league football match. Ironically, the initial management possibly contributed to the severity of the diagnosis, that required a total of three months of treatment before the athlete could return to sports. The case report in fact is aimed at increasing the awareness of this complication and the risks of vigorous sports massage performed at such an early stage.

**Conclusion:** In reviewing the available literature, *Myositis Ossificans* is described as a chronic condition characterised by islands of calcification that can complicate up to 20% of muscle contusions. Despite being commonly described to affect muscle tissue, this condition, whose pathogenesis remains unclear, may develop in every tissue of the body. A description of available treatment modalities are included to aid the recognition of this condition and application of the optimal treatment.

**Keywords:** *Myositis ossificans*, contusion, massage, trauma

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the commonest tissue to be involved by MO, with the quadriceps femoris, brachialis anticus, and the adductor muscles of the thigh being frequently implicated. This condition may complicate up to 20% of large muscular haematomas that follow blunt trauma or strains.

MO is suspected clinically when an athlete being managed for a muscular strain or contusion injury, presents with sudden unexplained deterioration in his recovery. Apart from clinical suspicion, calcifications may be visualised as of three weeks from injury on plain radiography. MO can also complicate ligament sprains, hip surgery, burns and multiple injuries. Involvement of surrounding neural tissue by calcification may result in neuropathies.

CASE PRESENTATION

A 24 year old right footed male footballer, with no past medical history of note, presented with post-traumatic persistent pain located over his left posterior thigh. He recalled being injured in the first half of a Maltese first division football match. The mechanism of injury was characterised by blunt trauma to his left thigh after being pushed backwards onto the goalkeeper’s chin while defending his goal during a corner kick.

Despite this being a forceful and painful impact, characterised by difficulty in running and change in direction, the player managed to continue playing all ninety minutes of the game. He was reviewed by the team physiotherapist immediately after the game who diagnosed hamstring contusion and advised ice and bandaging with follow-up in the physiotherapy clinic in three days time. Although advised to use frequent applications of ice, the player was not compliant. He reported returning home after the game and taking a hot bath.

On being reviewed at the physiotherapy clinic the next day, severe bruising was noted over his left postero-medial thigh with limitation on running and moderate to severe pain on isometric contraction of his left hamstring and adductor muscles. Range of movement was full and unrestricted but characterised by pain at the end of left hip extension and minimal pain on hip adduction with his knees extended. The latter findings suggest involvement of both left hamstring and hip adductor muscle groups. Ultrasound was not performed and therefore identification of the individual muscles affected by the trauma was not ascertained. However, pain on resisted hip adduction with the knees extended, suggested involvement of the Adductor Magnus muscle. Hip and knee examinations were unremarkable and tendinous insertions and origins of the implicated muscle groups were not tender. The physiotherapist treated the player with soft tissue massage and prescribed an exercise programme for the next three weeks as summarised in Table 1 hereunder.

On returning to play at the end of the third week, he did complain of some discomfort on changing direction whilst running but otherwise felt much better. He was given the go ahead to play from the start. He recalled however one instance where he felt sudden left central posterior thigh pain, described as a pull, when he kicked a long ball. The pain was so severe that he couldn’t continue playing and had to be stretchered off the field. In view of the persistence and worsening of his symptoms beyond three weeks, the team doctor ordered a plain X-ray of the player’s left thigh (Figures 1-3).

<table>
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<tr>
<th>Week 1</th>
<th>Light jogging for 30 minutes per day</th>
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<tr>
<td>Week 2</td>
<td>Sport specific non-contact drills progressing later in the week to full training with the rest of the team</td>
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<tr>
<td>Week 3</td>
<td>As above including practice matches during training in preparation for the upcoming league match at the end of the third week</td>
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X-Rays, as depicted below showed characteristic calcifications suggesting the diagnosis of MO. In view of the diagnosis, the player was instructed to refrain from further training and an extensive two-month rehabilitation programme was commenced. This consisted of pool training in the first month characterised by underwater walking (frontwards, backward and sideways), hip abduction and adduction and progression to underwater running by the second week. After the first month a trial of running was attempted. Although the player managed to jog in a straight direction, running sideways was still very difficult. In the second month, pool training was again included alternating with quadriceps and hamstring strengthening using resistance bands and Swiss ball training to strengthen adductor muscles.

At the end of the two month rehabilitation programme, he was allowed to resume his football training, starting with non-contact drills progressing to contact drills and eventually a full football game. Once training was pain free and the coach was satisfied with his technique, he was again included in the squad for a league football match, which the player managed to play without any sequelae.

**FIGURE 1.** Anteroposterior view of left thigh showing calcified plaques.

**FIGURE 2.** Medial view of left thigh.

**FIGURE 3.** Sky view of left thigh
DISCUSSION

As presented in the literature and in the above case report, MO is suspected clinically when the recovery from a muscle contusion takes longer than expected, or there is a sudden deterioration in symptoms. In this particular case, vigorous massage, hot bathing, as well as lack of adherence to prescribed cryotherapy probably contributed to a worsening of the clinical picture through the expansion of the initial haematoma. The application of extracorporeal shock wave lithotripsy, surgical excision of mature lesions, acetic acid phonophoresis, as well as biphosphonate therapy have been discussed in the literature with varying degrees of success. Their application remains experimental and cannot therefore be prescribed routinely. The importance of adequate rest, ice application, compression and elevation (RICE) has been already documented in this condition and should always form part of the initial management of these athletes.

CONCLUSION

The discussed case report is aimed at increasing awareness of MO as well as question initial treatment modalities used. Injuries resulting in muscle contusions remain common in contact type sports, hence the need to raise awareness of this complication. Available literature discussing MO is limited to a few case reports and leaves room for more research in this field to explore possible pathogenesis as well as best preventive and treatment options. Having a high level of suspicion for the development of MO in an athlete whose recovery is taking longer than expected, cannot be overstated.

REFERENCES