

## A case of hot hips

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A 28 year old male was in a motor vehicle accident (unbelted) in the Middle East. Subsequently, he had steel rod fixation of a T6, 7, 8 fracture. While in hospital in the Middle East, he also developed a medication-induced hepatitis. On transfer to the Victoria General Hospital (VGH), he had an open wound over his right buttock.

His admission examination at the VGH revealed grossly normal motor function in his arms. However, there was no movement in his legs. Sensation was decreased from the T6 dermatome to the level of T10-12 below where there was no sensation. There was also no sensation at lower spinal levels. The rest of the physical examination was normal.

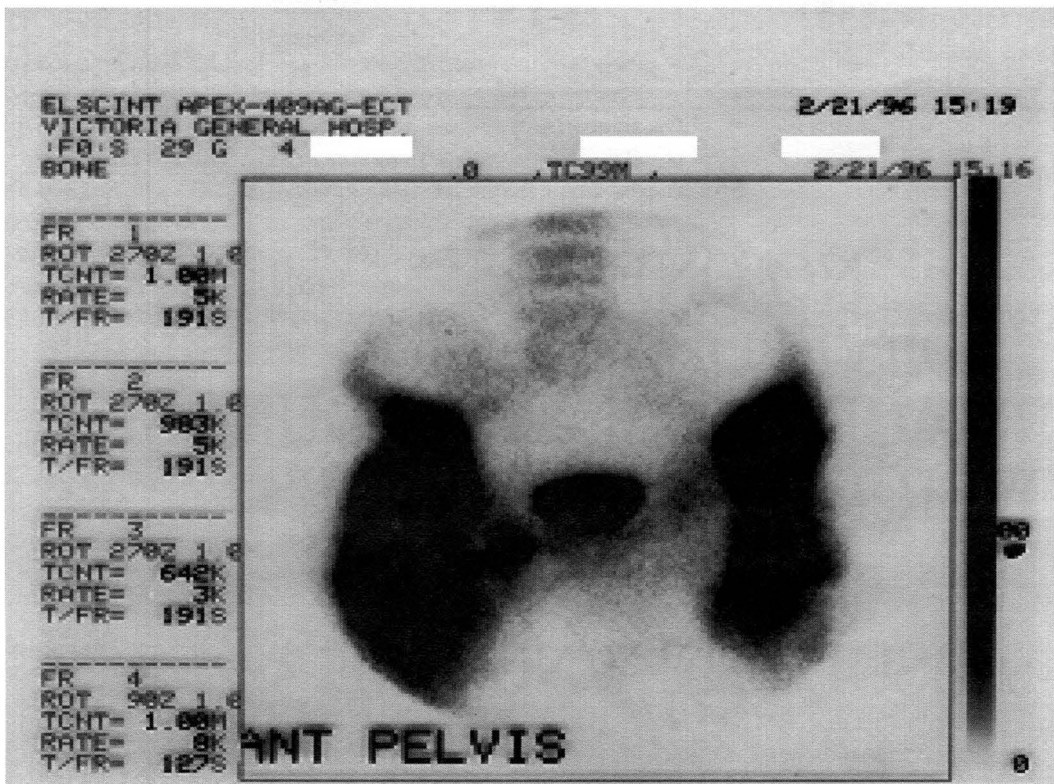
The buttock wound was debrided and closed by Plastic Surgery. Following this, the patient was transferred to the Nova Scotia Rehabilitation Centre.

While at the Nova Scotia Rehabilitation Centre, he received physiotherapy and his hip range of motion increased from R-58° L-74° to 90-95° flexion bilaterally.

Plain films of the hips the Nova Scotia Rehabilitation Centre were notable for dense calcifications in soft tissues but no sclerosis of the pelvis or femoral heads. A  $^{99m}\text{Tc}$ -MDP Bone Scan was done five months later as part of follow-up. This scan is shown below.

What is the diagnosis? Should surgery have been performed earlier? What is the appropriate management now?

(Answer on page 49)



**Diagnostic challenge:** A  $^{99m}\text{Tc}$ -MDP Bone Scan of a 28 year old male five months after a motor vehicle accident in the Middle East.

**Answer: Myositis Ossificans Traumatica**

Skeletal muscle ossification (SMO) is one of the most common sequelae of a traumatic event. Sports injuries and motor vehicle accidents are the most common causes of trauma. Other etiologies that can lead to SMO include post-operative coma, paralysis, hemophilia, severe burns and tetanus (1).

When the hip muscles are involved, 15% of individuals will develop myositis ossificans traumatica (MOT) (2). Other common sites of MOT include the elbow and the thigh muscles. In athletes, the frequency of MOT has been related to the severity of the injury (3).

The etiology of MOT is still unclear. Numerous explanations have been given, including localized formation of heterotropic non-neoplastic bone in muscles secondary to severe compression of muscle and soft tissue against bone which results in disruption of muscle fibers, capillaries, fibrous connective tissue, and probably periosteum (4). Damage to intramuscular connective tissue leading to sarcolemmal cell proliferation followed by fibroblast and osteoblast formation has also been postulated as an etiology of MOT (3).

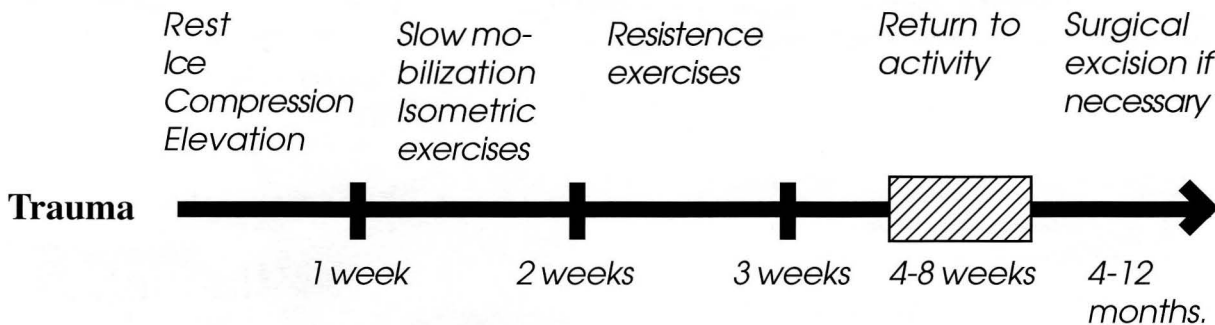
When an injury occurs, there is an acute inflammatory process and within a week reparative processes begin. In the early stages of ossification, MOT should be suspected if local pain, swelling, and tenderness do not respond to conservative management within a week of the trauma (3). There is usually a large, indurated tender mass within the muscle of the adjacent joints. With time, the mass does not resolve but becomes more discrete and firm, although it does become smaller (4). Changes consistent with calcification of the soft tissue that can be detected with plain films may be delayed as long as 6-8 weeks (3). However, a three-phase bone scan can detect MOT weeks before radiographic changes become evident. Therefore, it is useful in the early diagnosis of this condition (5).

With careful history taking, the diagnosis of myositis ossificans is a relatively easy one to make. Despite this, more serious conditions, such as a sarcoma,

must be included in the differential diagnosis, especially if the mass does not become less painful, more compact, or form discrete margins after the acute onset (3). A number of benign disorders must also be considered, including osteochondroma, post-traumatic periostitis and osteomyelitis (6). Osteochondroma is separate from normal bone (seen as a radiolucent zone) (3). Post-traumatic periostitis on plain film is difficult to distinguish from MOT with the exception of the continuity of the ossified mass with the normal bone (3). Osteomyelitis can easily be confused with immature MOT because of soft tissue swelling and periosteal reaction associated with inflammation of the affected bone (3). In this particular case, osteomyelitis would certainly have to be considered as the patient had an open wound over the right buttock. The diagnosis in this instance may have been complicated by the symptoms of four urinary tract infections that this patient had while in hospital.

The management of MOT has two parts: the acute phase and the long term. In the early stages, a combined conservative and aggressive approach must be used. This is accomplished through rest, elevation, ice and compression dressings, as well as isometric exercises within 7 to 14 days of injury as the pain and swelling subside (3). Passive stretching exercises should never be permitted (4). Daily examination of the hematoma should be carried out. If at any time the mass appears fluctuant, aspiration under sterile conditions is of greatest importance and will effect an early recovery (4). Figure 1 gives a time course of management for MOT.

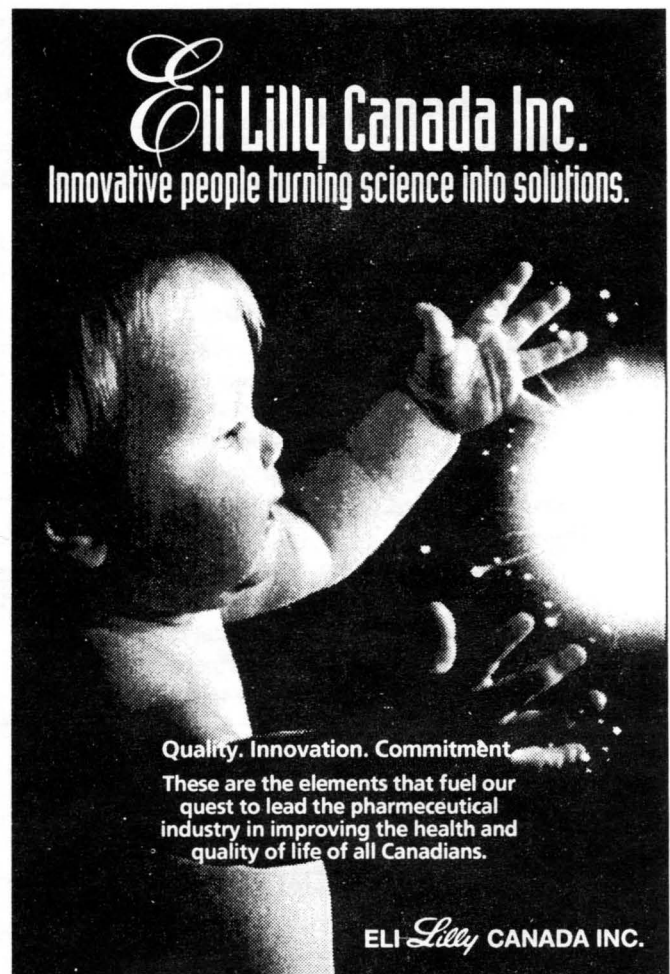
Early excision of the ectopic bone is contraindicated as it will invariably lead to locally extensive recurrent ossification (3). Surgical excision of mature MOT should be deferred for 6 to 12 months until the lesion is mature, as evidenced by a stable radiological appearance and decreasing isotope uptake on serial bone scans (2). Excision should be considered if there is persistent pain, muscle weakness or extreme loss of joint motion (4).



**Figure 1:** Management of myositis ossificans traumatica (adapted from 3).

## REFERENCES

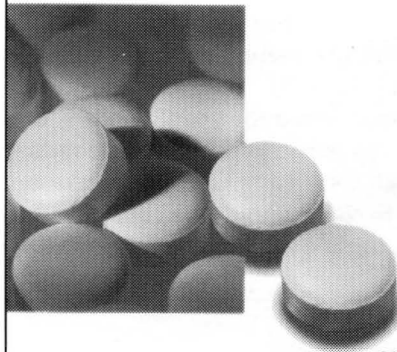
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