A case of myositis ossificans traumatica

Clinical History:

A 6-year-old male patient with a history of trauma and left thigh pain.

Imaging Findings:

A 6-year-old child arrived at our department after a left thigh trauma (falling on stairs). Femur RX was performed, showing no fractures (Fig. 1). Pain did not cease and functional limitation persisted, so after 20 days the patient repeated left thigh radiography: Near femur diaphysis RX shows calcifications in the quadriceps muscle bellies (Fig. 2). US confirmed these finds. Then MR was performed showing a lesion at vastus intermedius of left quadriceps (11x3.5x1.5 cm). This lesion presented signal inhomogeneity with hypointense areas corresponding to calcifications and inhomogeneous enhancement after contrast injection (Fig. 3). Patient was treated with rest and US, two months later another MR was performed, showing reduction of the lesion and the perilesional oedema (Fig. 4). Currently the child has no pain and no functional impairment.

Discussion:

Myositis ossificans traumatica (MOT) is often defined as heterotopic, non-neoplastic proliferation of bone in an area previously exposed to trauma and haematoma. The most common areas that are affected by MOT are the quadriceps femoris, brachialis anticus, and the adductor muscles of the thigh although it may occur anywhere. It can happen at any age, but occurs most frequently in adolescents and young athletes, with over half of the cases occurring in the third decade. MOT is considered rare in children under 10 years of age and males are more often affected than females [1-2]. The pathogenesis of this injury remains unclear at this time. Some of the common theories include: transformation of muscle haematoma to bone; haematoma calcification; intramuscular bone formation from detached periosteal flaps; osteoblast proliferation from periosteal rupture; metaplasia of intramuscular connective tissue cells; individual predisposition.

It is believed that blunt trauma to the extremity creates a compression wave travelling through soft-tissue crushing...
the deepest muscle against the bone. The force is transmitted through the fluid compartment of all of the layers of muscles but the damage usually occurs in the layer that is next to the bone.

A typical patient presentation includes a history of trauma to the affected area with increased difficulty in moving and using the affected limb. The onset seems to be related to the severity of the injury. Pain, swelling and tenderness of the affected area usually do not respond to conservative management within the first 4–5 days.

Active, passive and resisted range of motion will be notably decreased in the affected limb with more severe injuries [2-3].

Three important criteria are to consider when diagnosing MOT. These include:
- a history of significant local injury;
- clinical and radiological evidence of ossification within 2 months of the initial injury;
- the location of the lesion in proximal limb areas more commonly associated with MOT including the brachialis anticus and quadriceps femoris [3].

MOT is generally considered to be a self-limiting condition and can have spontaneous resolution. Without treatment the radiological and clinical findings stabilise and/or resolve within 1.5 to 3 years following the onset of symptoms. Full reabsorption can take place especially in lesions occurring within the muscle belly. Lesions located near an origin or insertion of a muscle are less likely to reabsorb and may result in functional impairment.

**Differential Diagnosis List:** Myositis Ossificans Traumatica (MOT), Extraosseous osteosarcoma, Synovial osteosarcoma, Osteochondroma, Posttraumatic periostitis, Osteomyelitis, Tumoral calcinosis

**Final Diagnosis:** Myositis Ossificans Traumatica (MOT).

**References:**


**Description:** Femur RX shows no traumatic lesions. **Origin:** Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa
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Description: Femur RX shows calcifications in the quadriceps muscle bellies. Origin: Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa
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Description: Coronal FSE T1 image shows an inhomogeneous area with hypointense zones, corresponding to calcifications at vastus intermedius belly. Origin: Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa
Description: Sagittal T2 image shows the inhomogeneous lesion with hypointense areas corresponding to RX calcifications. Origin: Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa
**Description:** Coronal STIR image confirms the presence of oedema in the lesion. **Origin:** Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa

**Description:** Assial LAVA shows inhomogeneous enhancement after contrast agent injection. **Origin:** Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa
Description: Sagittal T2 shows reduction of the lesion and the perilesional oedema. Origin: Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa
**Description:** Axial STIR shows reduction of the lesion and the perilesional oedema. **Origin:** Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa