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Case Report

Atypical Manifestation of Myositis Ossificans, Symptomatic 30 Years after Vascular Injury of Lower Limb

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Abstract

Myositis ossificans (MO) is an inflammatory pseudotumor characterized by bone formation in skeletal muscles. In 80% of the cases trauma has been implied. Sometimes it can become clinically manifest with pain and motion limitation, but usually in the first year after the injury. Differential diagnosis is often made with bone forming tumors, soft tissue inflammatory pathologies and limb infections. This makes positive diagnostic of MO to be a long and expensive process, which puts the patient and family in great stress. Treatment is most often conservative, with surgical treatment being reserved for complicated and unresponsive cases.

Keywords: *Myositis Ossificans (MO); Bone Tumors (TO); Soft Tissue Tumors (STT)*

Introduction

Myositis ossificans is a pathologic condition characterized by bone forming mass inside long muscles, often after severs injuries. Most affected population is young active males, usually following sports traumatism or MVA. There are also cases reported of MO without injuries in paraplegic persons.

Although the exact mechanism that leads to MO is still unclear, it has been suggested that inappropriate differentiation of fibroblast into osteogenic cells is the cause. Often the starting event is believed to be a major trauma which leads to hematoma formation and local inflammatory response. Inflammatory cytokines released at the zone of damage stimulate the endothelial cells of the blood vessels to transform into mesenchymal stem cells. At this point these mesenchymal stem cells differentiate into chondrocytes and osteoblasts, which translates in bone formation inside skeletal muscle [2-5].

Form the pathophysiological point of view there are three stages. First stage is the early onset during initial four weeks characterized by inflammatory response at the injured site. Second or intermediate stage happens in the following four to eight weeks, in which calcic deposits starts to form. Last stage is called maturation, at this phase consolidation and bone regression occurs.

Case Presentation and Discussion

A 63 years old male presented himself in the outpatients' clinic with one month old right calf pain. The pain was not permanent, but related to prolonged effort and also appeared during night. The patient also had an unintentional slight loss of weight of 4 kilos in the previous 3 months.

He is known with the following associated pathologies: a benign prostatic hyperplasia for which he follows no treatment, type II diabetes with normal glycemic levels under diet and exercises. During mid-80's he suffered a right knee dislocation on the football field, associated with popliteal vascular disruption for which he was immediately operated and an autologous saphenous vein graft was performed.

Physical examination revealed an atrophic right calf with the diameter of 29 cm, compared to the other side of 37 cm (Figure 1). This finding was known to the patient, his leg being like this since the injury back in the 80s. A hard palpable mass was felt along lateral side of the tibia, adherent to the profound structures. No pain on light touch, but discomfort at more profound palpation. Also no signs of infection noted.

Figure 1: *Clinical aspect of the legs, atrophic right calf 29 cm in diameter vs. normal left calf 37 cm.*

An MSK ultrasound was performed at the moment of initial consultation in the office. A well delimitated hyperechoic lesion was noted on the lateral border of the tibia, with fluid collection at the proximal end, the surrounding muscle was with normal echographic aspect. The patient was referred for an x-ray the following day. The x-ray of the calf demonstrated the presence of a heterotopic bone formation 21/2 cm in the anterior compartment, with no bony contact and no other pathologic aspects (Figure 2).

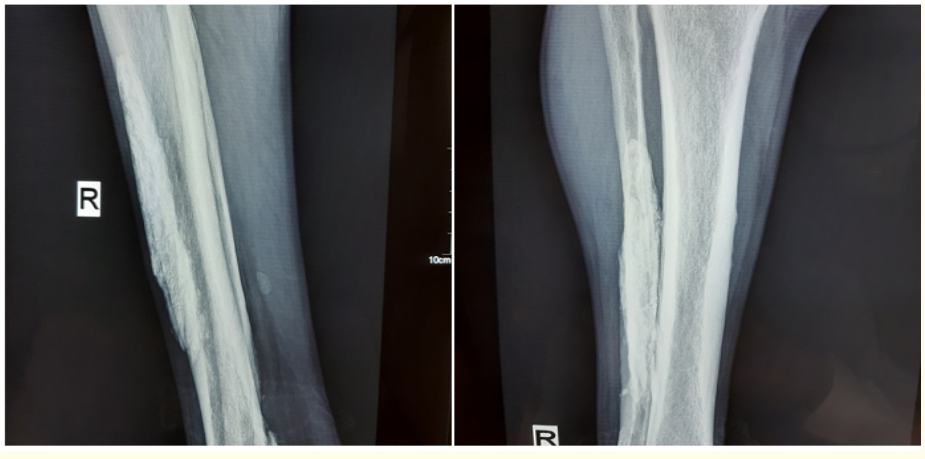

Figure 2: *AP and lateral x-ray of the right calf, note the ossifying process in the anterior compartment.*

At this point the initial diagnosis of MO was formulated, but because the atypical manifestation of the disease, 30 years after the vascular injury, further investigations was considered necessary. The differential diagnosis at this point was made with bone forming tumors and with infection. The patient was further referred for CT, MRI and bone scan.

The following laboratory testing were ordered: CBC, ESR, CRP, PV, calcium, alkaline phosphatase, sodium, potassium, magnesium, uric acid, albumin, bilirubin, cholesterol, urea, creatinine, AST/ALT, triglycerides, iron, gamma-gt, inorganic phosphate, all of them being in normal range. Just the glycemic level was slightly elevated of 127 mg/dL.

CT scan is considered to be the best modality for delineating the zonal pattern of calcification and can be diagnostic before the characteristic calcification pattern becomes radiographically detectable [1,2,4]. It can be seen that a calcification mass is occupying almost the entire tibialis anterior muscle, with no breach outside the muscle's body and no contact with bone whatsoever (Figure 3 and 4).

MRI is the single best imagistic investigation for evaluation of soft tissues and it is used to rule sarcomas, abscess and so on. The MRI aspect is different for each histologic stage of MO, but usually is a determinate lesion, which supports the diagnostic. MO typically is heterogeneous signal intensity on T1-weighted areas of high signal intensity. T2-weighted hyperintensity suggests regions of granulation tissue, blood and edema. Although intralesional enhancement has been reported in MO, heterogeneous or solid enhancement should raise the suspicion of sarcoma [1,4].

Bone scintigraphy with ^{99m}Tc HDP was obtained with no abnormal uptake (Figure 6). This is to be expected in MO diagnosed so late, however it is a valuable investigation in the early stages of the condition [1]. The rationale in this case was for the exclusion of other inflammatory conditions, such as cellulitis, osteomyelitis and of neoplastic pathology.

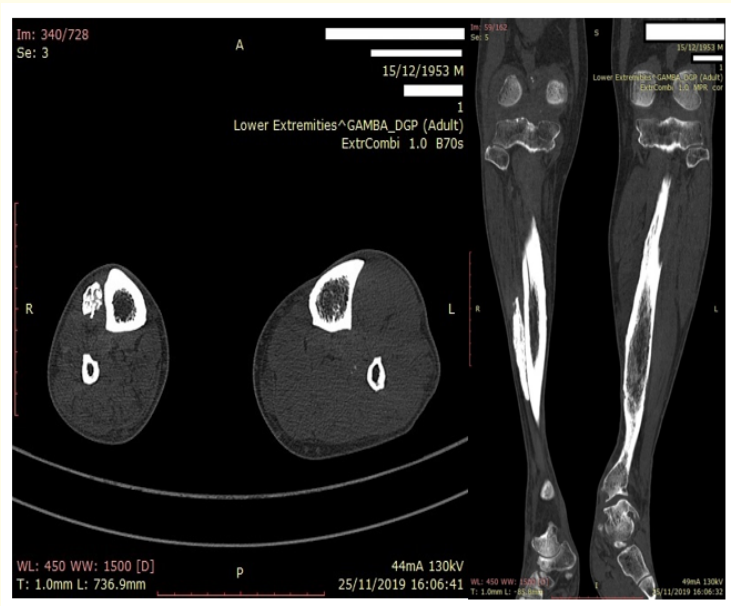

Figure 3: *CT axial and coronal view; bone mass inside tibialis anterior muscle.*

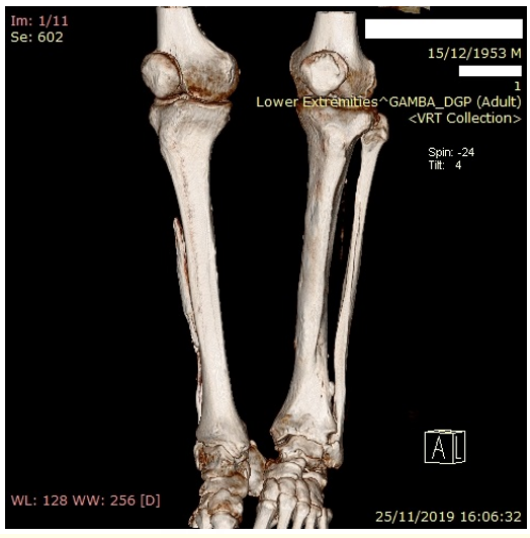

Figure 4: *CT 3D reconstruction shows the bony mass next to the lateral border of the right tibia.*

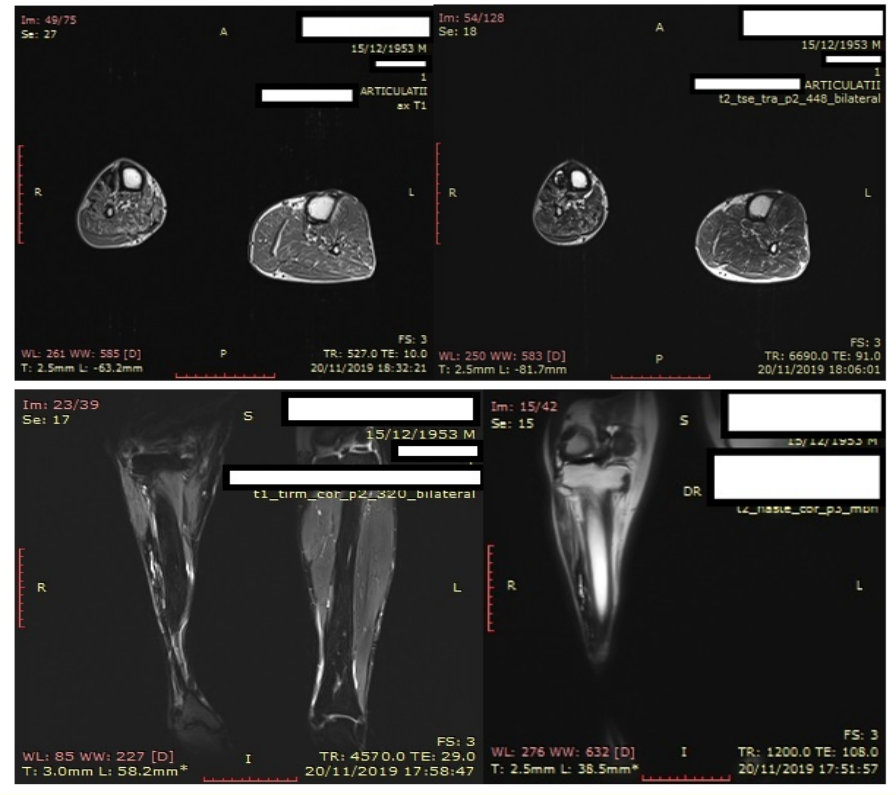

Figure 5: *Right calf MRI axial and coronal view, T1 and T2; calcic deposits inside tibialis anterior muscle.*

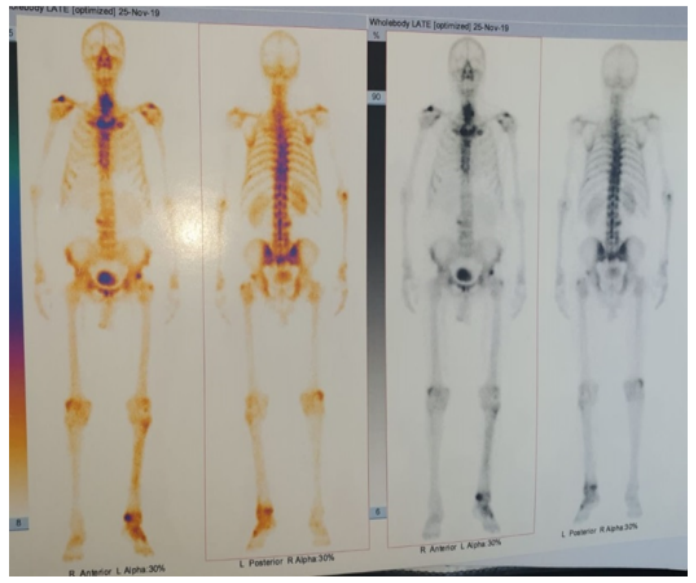

Figure 5: *^{99m}Tc bone scintigraphy showing no sign of anormal uptake.*

Treatment

The goal is a pain free limb with good function. Because is a self-limiting process in the earliest phases of set-up it can sometimes heal or even resorb itself spontaneously. That is why in such cases immobilization, rest, ice, compression and elevation is the key. The rationale is that large hematomas formed after injury, which are the precursors of MO, should be controlled and limited as much as it can be done.

The initial approach in this particular case being an old lesion was to prescribe NSAIDs treatment, Pentoxifylline 1 tablet per day and physiotherapy. In the first month of treatment the leg became pain free. Further options were discussed with the patient as follows: MO is considered to be a "no touch lesion" if the pathology is asymptomatic, regular x-ray should be obtained and compared to the previous. If pain or other discomfort reappears the lesion should be excised and fragment biopsy should be sent for histopathology exam.

Surgery should be reserved only for those situations in which conservative treatment is no longer an option: persistent pain, compression of neuro-vascular bundle, irritation of nearby structures. We should always keep in mind that excision of such large MO fragments could lead to limb function impairment [4].

Conclusion

Myositis ossificans is a benign pseudo-tumor characterized by bone deposit in the soft tissues, the actual incidence is unknown because it rarely symptomatic and usually rather soon after a traumatic event, than later during lifetime. When it is symptomatic it becomes a source of fear and stress for the patient especially because it's differential diagnostic with tumors like osteosarcoma.

It should be considered as a "no touch" lesion until proven unresponsive to conservative measures. The treatment is most frequent medication, physiotherapy and regular follow-up, surgery being reserved only for those cases in which symptoms don't settle.

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