SAS Journal of Surgery
Abbreviated Key Title: SAS J Surg
ISSN 2454-5104
Journal homepage: https://www.saspublishers.com

OPEN ACCESS

Post-traumatic Pain: Think of Circumscribed Myositis Ossificans

Youness Dahmani*, Monsef Boufettal, Reda Allah Bassir, Samir Khloufi, Ahmed El Bardouni, M.O. Lamrani, M. Kharmaz, Mohamed S. Berrada, Younes Bjijou

Faculty of Medecine of Rabat, Avenue Mohamed Belarbi El Alaoui B.P.6203 10000, Rabat, Morocco

DOI: 10.36347/sasjs.2021.v07i06.016 | **Received:** 11.05.2021 | **Accepted:** 16.06.2021 | **Published:** 20.06.2021

***Corresponding author:** Youness Dahmani

Abstract **Case Report**

Myositis ossificans is a benign condition, essential to know because the presence of ossifications of the soft tissues adjacent to the bone, always makes one fear a neoplastic localization in a young patient. We report in this study a rare case of traumatic circumscribed myositis ossificans of the thigh. Imaging plays an important role in the positive diagnosis, the differential diagnosis and the follow-up of the characteristic three-phase evolution of MOC. However, this pseudotumor may appear clinically and radiologically as a malignant tumor, a thorough knowledge of clinical and morphological study is necessary to differentiate this lesion from a soft tissue malignancy.

Keywords: myositis ossificans, thigh, traumatic, CT.

INTRODUCTION

Circumscribed myositis ossificans is a benign condition, limited in development to the outer surface of the bone or periphery within the soft tissues, resulting in a process of heterotopic ossification of soft tissues. It mainly affects active adolescents or young adults, with a male predominance. In 60 to 75% of cases, it occurs after a trauma, but it can also occur without previous trauma. Its location is ubiquitous, but it is mainly located in the most voluminous muscles exposed to impact (thigh, deltoid, calf, buttock, arm). MOC is an essential pathological entity to know, because the presence of ossifications of soft tissues adjacent to the bone always makes one fear a neoplastic localization of bone or soft parts in a young patient.

CASE REPORT

A 27-year-old patient with a fracture of the right femur following a traffic accident, who had undergone open-focus centromedullary nailing, consulted for a painful swelling of the right thigh, rapidly progressive over three weeks, located on the anterior face junction proximal and middle third of the thigh. The patient did not report any fever, chills or notion of weight loss. The clinical examination showed amyotrophy of the muscles of the anterior compartment of the right thigh, as well as a mass of 5 x 5 cm, relatively firm to palpation, with little sensitivity to pressure (Fig 1). There was no motor deficit or neurological symptoms. The pain was not severe enough to interfere with sleep or limit physical activities. There was no overlying or underlying joint stiffness and joint ranges were normal.

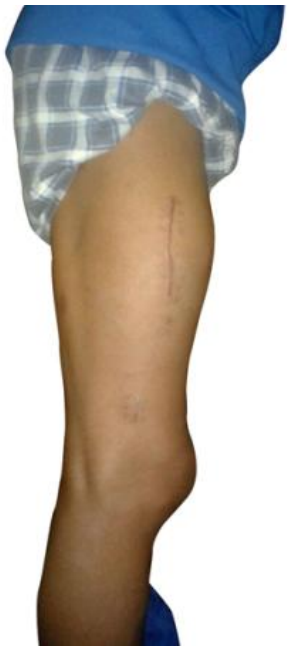

Fig-1: Tumefaction of the anterior aspect of the thigh

Biological workup revealed an accelerated sedimentation rate, Standard radiological workup showed peripheral intramuscular calcifications on the

anterolateral and medial aspect around the fracture site, with a "combed" appearance, a regular border and a clear border between them and the bony cortex (Fig 2).

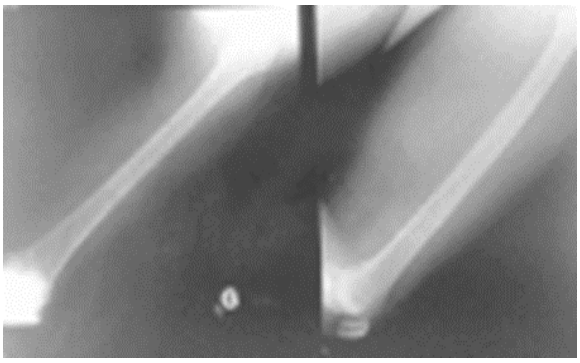

Fig-2a: Radiographs showed no calcifications opposite the mass (at 2 months).

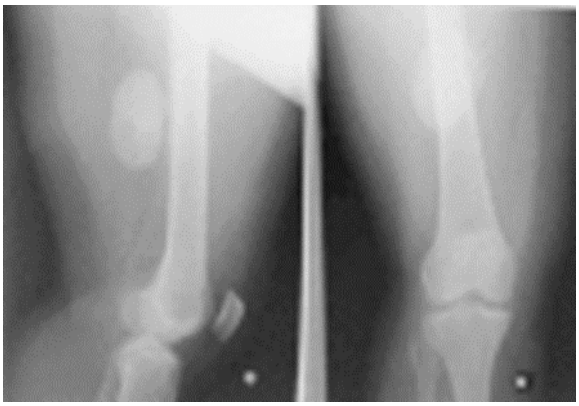

Fig-2b: Oval mass with regular border containing ossifications distant from adjacent bony structures (5 months)

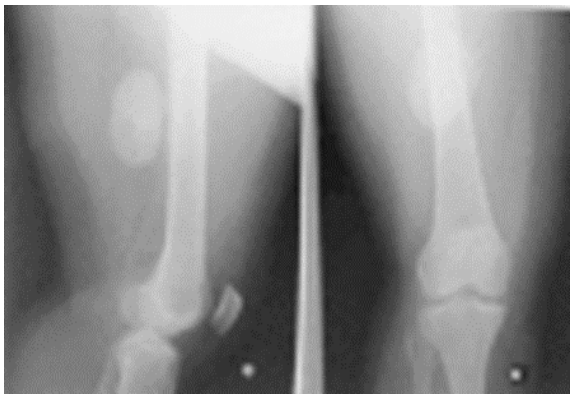

Fig-2b: Oval mass with regular border containing ossifications distant from adjacent bony structures (5 months)

The CT scan showed the particular distribution of juxta-cortical muscle calcifications, with a hypodense area with clear-centered crown calcifications separated from the bone. The diagnosis of circumscribed myositis ossificans was suspected (Fig 3).

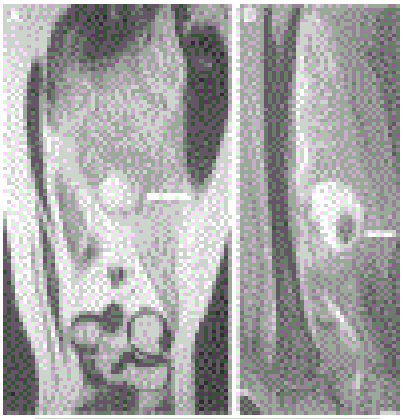

Fig-3A: tumor process in T1 hypersignal

Fig-3B: Tumor process with a T2 hypersignal center in the periphery and T2 hyposignal in the center

The patient was put on anti-inflammatory treatment, the clinical evolution was marked by a clear decrease in the size of the mass, then a total disappearance of the pain. A later radiological check-up showed focal cortical thickening related to integration of the calcifications with the diaphyseal cortex (Fig 4).

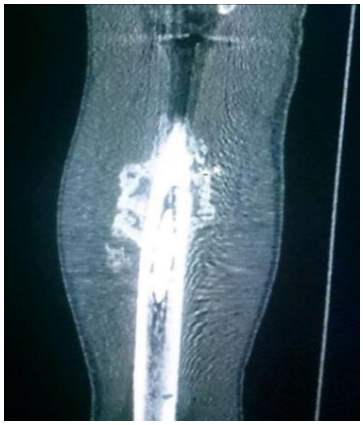

Fig-4a: CT scan (sagittal reconstruction) showing the distribution of calcifications in juxta-cortical

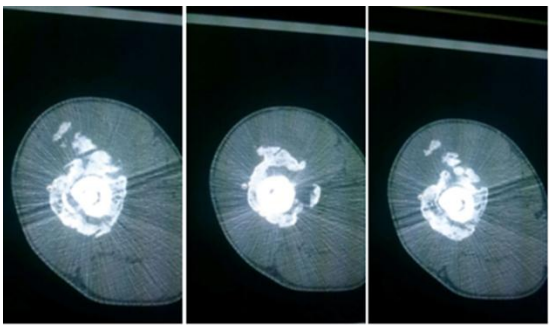

Fig-4b: CT scan (axial slices): hypodense area with crown-shaped calcifications with clear centers, separated from the bone

DISCUSSION

Circumscribed myositis ossificans is an inflammatory pseudotumor [1], which is rare and corresponds to a non-neoplastic heterotopic proliferation of bone and cartilage in soft tissue. The term myositis is inappropriate, however, because its reactive process is local and arises from interstitial connective tissue and not from skeletal striated muscle [2].

It can be confused clinically, radiologically, and histologically with a malignant soft tissue tumor. It encompasses two forms of disease with similar histological lesions but different clinical presentations: acquired and benign MOC [3-6] and generalized progressive myositis ossificans of genetic origin [7].

MOC affects adolescent and young adult athletes, and is often associated with trauma in 75% of cases ; it is more rarely spontaneous. The most frequent location is in the thigh, often in the anterior compartment. The pathogenic mechanism of these MOCs is still uncertain. Several hypotheses have been put forward: osteogenic potential of a possible post-fracture hematoma [9], tissue necrosis and invasion of the muscle by osteoblasts from the periosteum of the neighboring bone [10], and finally induction of intramuscular osteogenesis via activation of mesenchymal fibroblasts under the effect of muscular anoxia and the secretion of new "stress protein" substances [11].

The diagnosis of traumatic circumscribing myositis ossificans is clinical but mainly radiological. The clinical evolution is characteristic in 3 stages : at the beginning (<3 weeks) acute and brutal installation of a painful mass of inflammatory schedule, quickly increasing, one can note a reduction of balloting of the muscular compartment with functional impotence. At the mature stage, after about 2 months, the swelling reaches its maximum volume, but it gradually loses its inflammatory character with the beginning of functional recovery, except in rare cases of para-articular localization explaining some stiffness. Unlike malignant tumors, the regression phase is marked by the progressive and complete disappearance of the symptoms. But for the clinician, the diagnosis of MOC is a diagnosis of elimination. Indeed, the clinical signs described can perfectly correspond to clinical signs of bone or soft tissue sarcoma.

The biology shows an inflammatory syndrome with a slight increase in the sedimentation rate and hyperleukocytosis in the initial phase. These signs may point to an osteoarticular or soft tissue infection, especially since the patient may be febrile at the beginning of the evolution.

Standard imaging changes in parallel and is superimposed on the maturation of ossification. At the beginning the radiographs are normal. By the second week, soft tissue densification appears, with fine calcium opacities and sometimes a periosteal reaction. Between 3 and 8 weeks, the small calcifications become flaky, evolving into peripheral ossification away from the bone (crown), sometimes associated with a periosteal reaction. The center of the lesion is clearer. After 2 months, the peripheral ossification matures; it may sometimes come into contact with the bone [3-5]. Post-traumatic myositis (usually of the quadriceps) often has a slightly different appearance. It is oblong in shape with calcifications parallel to the axis of the shaft.

Ultrasound is often requested as soon as the painful swelling is perceived; it shows echogenicity abnormalities, which are not specific to the muscle. The mass appears oval, well limited, hypoechoic with an echogenic center, in relation to the histological zone phenomenon [1]. CT is the method of choice for visualizing heterotopic ossification by demonstrating the zone phenomenon.

At 3 weeks, the CT scan shows an iso or hyperdense soft tissue mass, enhancing after injection of contrast medium. There is no central or peripheral calcification. In the maturation phase, between 3 and 8 weeks, peripheral ring of calcifications. The ossification is separated from the bone by a radiolucent border.

CT scan after 2 months confirms the radiographic appearance and shows increased mass density, juxta-cortical muscle calcifications. The appearance of MO on MRI is variable depending on the maturity and variation of the histological appearance within the lesion. In the early stages, T2-weighted images may show an inhomogeneous focal mass with high central signal intensity. As the lesion grows and peripheral ossification becomes more dense, images show a hyperintense center surrounded by a hypointense rim corresponding to ossification [13].

Radiological diagnosis of OM remains difficult, biopsy is necessary, but if biopsy is done at the early stage of OM, it may lead to misdiagnosis of sarcoma, if biopsy is delayed, true sarcoma may be missed.

The histological appearance of OMC is typical, it is characterized by a "zonal" arrangement specific to OMC and accounts for the cross-sectional imaging observed with three distinct zones: a first heterogeneous central zone, consists of mesenchymal tissue, with fibroblasts that produce irregular trabeculae of osteoid substance, this zone also contains capillaries and necrosis; a second intermediate zone with osteoblasts bordered by immature bone deposits (osteoid tissue); a third external zone, with trabeculae of mature trabecular bone [3].

The differential diagnosis may be represented by non-neoplastic pathologies (fibromatosis entartrée, local infections) but especially malignant tumors (lymphoma, osteosarcoma, rhabdomyosarcoma) [1]. Indeed, in the initial phase, the main differential diagnosis is soft tissue sarcoma or synovialoscarcoma and other lesions that may be associated with peri-lesional edema such as abscess, rhabdomyolysis, or even hematoma.

When the mass is partially calcified, the questionable diagnoses are: parosteal sarcoma, rhabdomyosarcoma, malignant hystiocytoma and calcified hematoma. Then in case of a totally calcified mass, sarcoma and chondrosarcoma are to be evoked first.

The treatment of MOC is in most cases conservative, based on icing, anti-inflammatory drugs and rest. As a rule, the symptoms tend to decrease in the course of the disease. Spontaneous resorption or incomplete regression may occur. Radiation therapy can be used to reduce the size and accelerate the maturation of the lesion. Surgery is indicated in cases of significant pain due to neurological compression or joint stiffness [13].

ACKNOWLEDGEMENT

Consent

The patient has given their informed consent for the case to be published.

Competing interests

The authors declare no competing interest.

Authors' contributions

All authors have read and agreed to the final version of this manuscript and have equally contributed to its content and to the management of the manuscript.

CONCLUSION

MOC is a benign condition, of easy diagnosis in its typical form; in front of clinical and radiological arguments in favor, biopsy of the lesion is not necessary. However, osteosarcoma remains the diagnosis to eliminate, and histological evidence is required at the slightest doubt.

REFERENCES

1. S. Fnini et al. (2009). Chirurgie de la main, 28, 370–373.
2. Tamura S, Hasuo K, Kudo S, Uchino A, Yasumori K, Kawanami T, Masuda K. (1992). Atypical arteriographic features of myositis ossificans circumscripta (MOC). Radiat Med, 10(4):154-6.
3. Bernard M, Coumbaras M, Zeitoun F, Arrivé L, Tubiana JM, Le Hir P. (2003). Spectre radiologique évolutif de la myosite ossifiante circonscrite. JRadiol, 84(1):54–6.
4. Alouini-Mekki R, El Mhabrech H, Hasni I, Allani M, Jemni H, Gamaoun W, et al. (2007). La myosite ossifiante circonscrite : apport de l'imagerie. J Radiol, 88(5):663–8.
5. Benkada S, Jroundi L, Jaziri A, Elkettani NC, Chami I, Boujida N, et al. (2006). La myosite ossifiante circonscrite. À propos d'un cas. J Radiol, 87(3): 317–9.
6. Traoré O, Yilboudo J, Cissé R, Compaoré TM, Bandré E, Ouiminga RM. (1998). La myosite ossifiante circonscrite non traumatique. Rev Chir OrthopReparatrice Appar Mot, 84(1):79–83.
7. Penniello MJ, Chapon F, Olivier D, Leroy F, Guillois B, Lechevalier B. (1995). Myosite ossifiante progressive. Arch Pediatr, 2(1):34–8.
8. Wang XL, Malghem J, Parizel PM, Gielen JL, Vanoenacker F, De Schepper AMA. (2003). Myositis ossificans circumscripta. JBR-BTR;86:278–85. PostersLa Revue de médecine interne, 29S (2008) S337–S411
9. Mizuno K, Mineo K, Tachibana T. (1990). The ostogenitic potential of fracture haematoma: subperiosteal and intra muscular transplantation of the haematoma. J Bone Joint Surg, 72B:822–9.
10. Fauré C, Vialas M. (1975). Myosite ossifiante circonscrite. À propos d'un cas. Rev Chir Orthop;61:663–71.
11. Danis A. (2011) L'ossification dans les tissus mous : le mécanisme. Bull Mem Acad R Med Belg 1992,147:298–306. Lettres à la rédaction / Revue du rhumatisme, 78 292–299
12. Aneiros-Fernandez J., Caba-Molina M., Arias-Santiago S., O'Valle F., Hernandez-Cortes P., Aneiros-Cachaza J. (2010). Myositis ossificans circumscripta without history of trauma. J Clin Med Res., 2(3):142.
13. Sorin Claudiu M.A.N., Schnell C.N., Fufezan O., Mihut G. (2011). Myositis ossificans traumatica of the neck – a pediatric case. Mædica., 6(2):128.