

Case Report

Polymyositis Ossificans: A Rare Location in the Foot

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Article History

Received: 09.09.2021

Accepted: 23.10.2021

Published: 30.10.2021

Journal homepage:

<https://www.easpublisher.com>

Quick Response Code



Abstract: We report a rare case of myositis ossificans of the foot. Myositis ossificans is a benign, tumor-like lesion characterized by heterotopic ossification of the soft tissues that usually affects the elbow and thigh. The presence of myositis ossificans in the foot is rare and only a few cases have been reported in the literature. At different stages of maturity, it has similar histological features with sarcomatous lesions. Misdiagnosis can lead to unnecessary radical treatment. The important clinical teaching of our case is that myositis ossificans can take various aspects. The knowledge of unusual sites of myositis ossificans is necessary to differentiate this lesion from malignant soft tissue tumors. This will avoid diagnostic pitfalls and unnecessary investigations, which can have complications for patients.

Keywords: myositis ossificans, soft tissues, foot, diagnostic.

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INTRODUCTION

Myositis ossificans (MO), otherwise known as heterotopic ossification, is a non-neoplastic, localized tumor-like lesion of new true bone formation that affects the muscles, ligaments, and fascia. There is usually a history of trauma resulting in tissue necrosis and hemorrhage, and thus the main demographics are adolescents and young adults [1, 2]. The anterior muscle groups of the thighs and arms are more frequently affected as these sites are subjected to high-risk injuries [1, 3, 4]. Despite its being a clinically and histologically distinct entity, diagnosis may be very difficult, especially when it is presented in an uncommon location. At varying stages of maturity, it shares similar characteristics with sarcomatous lesions or maturing bone. Misdiagnosis can result in unnecessary radical treatment. This lesion has rarely been reported in the foot. In this article, we present a rare case of a MO lesion located in the dorsal forefoot soft tissue.

Case

A 27-year-old man was referred to our orthopedic department with a 6-week history of a

painful, rapidly enlargement right heel. The patient had no medical or surgical history and he specifically denied any weight loss, malaise, anorexia, fever or chills. He described a minor trauma with hard object to the right heel.

The examination showed a discrete swelling of the heel without other associated inflammatory signs. The palpation found a hard mass at the heel. The patient had no skin lesions or muscle weakness. Neurovascular examination was normal.

His laboratory findings, including white blood cell count, erythrocyte sedimentation rate and C-reactive protein level, were normal.

The standard X-ray of the right foot showed multiple plantar calcifications (Figure 1a).

The CT scan showed multiple calcifications and micro-calcifications of the soft tissues of the ankle and foot, sitting mainly in the subcutaneous and muscular tissues (Figures 1b and 1c).



Figure 1: (a) Radiograph of the right foot showing multiple plantar calcifications, (b,c) Ct images demonstrating multiple calcifications and micro-calcifications of the soft tissues of the foot, sitting mainly in the subcutaneous and muscular tissues

In front of this aspect, we evoked either a scleroderma, a polymyositis, a hyperparathyroidism, a renal insufficiency, or a sarcoidosis. The phosphocalcic balance, renal function, thyroid status and the muscle enzymes were normal.

Surgical excision was performed through a plantar incision. A mature appearing was seen adjacent to the long flexor muscles. It was resected. Three zones were recognized on histological examination, including a peripheral region of mature trabecular bone, an intermediate region of osteoid and bone formation, and finally a central area with cyst formation and hemorrhage.

Four months after surgery, he had a painless normal gait without clinical or radiographic evidence of recurrence.

DISCUSSION

Myositis ossificans (MO) is a term used to describe a non-neoplastic proliferation of fibrous tissue and heterotopic ossification within soft tissue. It may occur at the surface of bone, but more commonly it affects collagenous supporting tissues, such as skeletal muscle, tendon, fascia, or ligament. It usually occur after trauma in 60% to 75% of all cases (as in our case) and therefore called in sometimes myositis ossificans traumatica (MOT) [5].

The most agreed etiologic mechanism includes an osteoblast stimulation as a consequence of a bone or soft tissue damage causing a formation of new bone, dystrophic calcifications or calcified chondroid matrix. However, in approximately 25% of cases, there is no apparent history of preceding trauma, and in some of these cases, an infectious process has been implicated to be a possible cause or the initiating factor. Other provocative causes include burns, neuromuscular disorders and hemophilia [5].

MOT usually appears in adolescents or young adults. The majority of the patients are male. The lesions are predominately involves the high-risk sites of injury in about 80% of cases, such as thigh, elbow and buttocks [6]. The most common sites myositis

ossificans are the quadriceps femoris, brachialis, and adductor muscles of the thigh. These sites are associated with blunt trauma as well as stretch and shear injuries. Other sites reported in either the traumatic or atraumatic forms include the masseter and pectoralis muscles, shoulder and gluteal regions, hand, ankle, and even the paravaginal tissues after childbirth [4, 7, 8]. However, involvement of the foot is rare, and only a few cases have been reported to current date.

Early in the disease, the lesion is soft and painful, and within a few weeks a firm and often painful mass develops in the affected muscles. This lesion matures over 6–12 months, and eventually ossifies and becomes painless [4]. The lesion may cause limitation in the range of movements according to its site and size.

The microscopic histological findings vary according to the age of the lesion and are mirrored by radiographic findings. Early in the disease course, the lesion is mostly cellular with fibroblastic tissue resembling a granulation tissue, and radiographs are often negative. As the area of ossification expands, radiographs demonstrate flocculent radiodensities or calcifications. As the lesion matures, it completely ossifies. The most pivotal diagnostic feature of MO is that the bone maturity occurs from the periphery in a zonal manner with a fibroblastic center, whereas the central part presents with loose spindle cells with no cytological atypia [9, 10]. However, in sometimes as in our case, the radiograph cannot detect the mineralization of MO. Magnetic resonance imaging (MRI) is not routinely used for the evaluation of MO. Typical MRI findings include a low-signal-intensity rim and a heterogeneous, high-signal-intensity and tumor-like enlargement of affected tissues [11]. CT is the preferred imaging modality to demonstrate the zonal pattern in posttraumatic MO [12]. It optimally identifies the typical patterns of this disease, including the separation of the mass from the adjacent cortex and the decreased attenuation of the center of the mass.

The term myositis ossificans is inconsistent because the inflammation is absent and, if present, it is usually minimal and the muscle may not be involved. Hence, the term heterotopic ossification is more agreeable [4].

Myositis ossificans must be differentiated from other nonneoplastic soft tissue processes with bone formation, as well as from infection, periosteal osteosarcoma, parosteal osteosarcoma, and periosteal chondroma. Non-neoplastic soft tissue processes with bone formation include myositis ossificans, pseudomalignant osseous tumor of soft tissues, florid reactive periostitis, and bizarre parosteal osteochondromatous proliferation, all are benign lesions that can mimic malignancy. These disorders have been reported under a variety of names, and because their clinical, radiographic, and histologic spectra overlap, a precise differential diagnosis may be difficult. Indeed, histologic and radiographic findings of pseudomalignant osseous tumor of soft tissues are virtually indistinguishable from those of myositis ossificans. A history of trauma, however, usually is absent, and pseudomalignant osseous tumor of soft tissues occurs in tissues other than muscle, including periosteum, fascia and connective tissue [4, 13].

Early in the disease course, rest, ice, compression, and elevation are universally recommended [1]. MO is a reactive self limiting condition, can spontaneously resolve and there is no compelling evidence that malignant degeneration ever occurs [2]. Surgery may be necessary in cases of considerable decreases in the range of motion, muscle atrophy, unremitting pain, and deterioration of function after 6–12 months of unsuccessful conservative care [14]. Excision is only indicated if the lesion is completely ossified because removal of immature bone may cause extensive local recurrence. Some studies suggest that using prophylactic indomethacin and etidronate can be beneficial in reducing postsurgical ectopic calcification [1].

CONCLUSION

Myositis ossificans is an infrequent but well-known benign entity that most often follows local trauma. Its occurrence in the foot has rarely been reported in the literature but must be included in the differential diagnosis when a patient presents with a painful mass, particularly in the plantar forefoot. A careful history and examination, coupled with radiographs and CT, should be diagnostic. Excision is reserved for a symptomatic lesion or uncertain diagnosis and should be delayed until the lesion has reached maturity.

Competing Interests: The authors declare no competing interests.

Authors' Contributions

All the authors have contributed to the management of the patient and the write up of the

manuscript. All the authors have read and approved the final version of the manuscript.

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Citation: Ameni Ammar *et al* (2021). Polymyositis Ossificans: A Rare Location in the Foot. *EAS J Orthop Physiother*, 3(5): 105-107.