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Case Report

Myositis Ossificans in Adductor Longus Muscle in a Recreational Football Player: A Case Report

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ABSTRACT

Myositis ossificans (MO) is a rare benign pathology characterized by heterotopic bone formation within skeletal muscle, typically following trauma. Although MO is uncommon in the adductor muscle group, it may occur in athletes after direct muscular injury. We present the case of a 21-year-old male amateur football player who developed persistent groin pain after sustaining a direct blow. Initial radiographs were normal, and conservative treatment was initiated. However, the symptoms persisted for eight months. Follow-up imaging revealed a full-thickness tear of the adductor longus and mature ossification consistent with MO. Despite the presence of a palpable ossified mass, the patient declined surgical intervention and continued with conservative management. This case illustrates the diagnostic challenges of MO in atypical locations and underscores the importance of follow-up imaging in athletes with unresolved symptoms. It also raises awareness of the potential risks associated with biologic agents, such as platelet-rich plasma (PRP), in the context of muscle injury.

Keywords: Adductor longus, conservative treatment, Myositis ossificans, Platelet-rich plasma (PRP), sports injury.

Level of Evidence: Level IV

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INTRODUCTION

Myositis ossificans (MO) is a benign condition characterized by the formation of heterotopic bone within skeletal muscle, typically following trauma.[1–3] Although it most commonly affects the quadriceps and brachialis muscles, involvement of the adductor muscle group, particularly the adductor longus, is rare but increasingly reported, especially among athletes engaged in kicking sports such as football and rugby.[3–5] Among these less common locations, the adductor longus muscle presents unique diagnostic and therapeutic challenges, particularly in athletes. The adductor longus is susceptible to strain and partial tearing due to its critical role in hip adduction and dynamic stabilization of the lower limb. Trauma-induced hematoma and subsequent inflammation may trigger abnormal osteogenic activity, ultimately leading to MO.[1]

Early diagnosis can be challenging, as initial radiographs are often unremarkable, and the clinical presentation may mimic other conditions such as muscle strain, hematoma, infection, or soft tissue tumors. Thus, advanced imaging modalities, including MRI and CT, are essential for identifying mature ossification and distinguishing MO from other pathologies.[2,6] As treatment options evolve, increasing attention has been directed toward the role of biological agents in muscle healing. While most MO cases respond well to conservative treatment, surgical excision may be warranted in patients with persistent symptoms or significant functional limitations. Treatment

decisions should consider symptom severity, lesion maturity, and patient preference. Recently, the use of biological agents such as platelet-rich plasma (PRP) and autologous conditioned plasma (ACP) has increased in the management of muscle injuries; however, their safety in the context of heterotopic ossification remains under debate.[7]

In this report, we present a rare case of adductor longus MO that developed following a kick sustained during amateur football and was diagnosed late. This case underscores the importance of clinical vigilance and timely imaging in patients with persistent groin pain, while also highlighting a scenario in which conservative management was effective despite radiographic evidence of mature ossification.

CASE REPORT

A 21-year-old male presented to the emergency department with sudden-onset groin pain after attempting a forceful kick while playing football. Although initial symptom relief was noted, the pain eventually recurred. He had no relevant medical history or prior injury. On physical examination, marked tenderness was observed along the adductor muscles from the symphysis pubis to the medial aspect of the left thigh. Pain was also elicited during resisted hip adduction. Initial pelvic radiographs revealed no abnormalities (Fig. 1). The patient was prescribed conservative treatment consisting of rest, ice, and nonsteroidal anti-inflammatory drugs (NSAIDs), and close follow-up was advised.

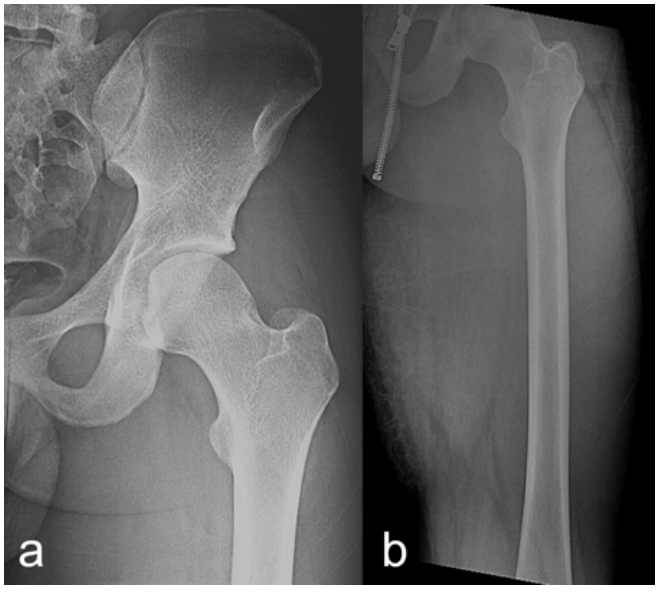

Figure 1. Anteroposterior radiographs of the pelvis **(a)** and left femur **(b)** were obtained at the initial presentation to the emergency department. No acute bony abnormalities or fractures were identified.

As the symptoms persisted, the patient presented to the orthopedic clinic at another facility. After six months of unresolved complaints, he received an ACP injection. Although the symptoms initially seemed to improve, the pain eventually recurred.

Eight months later, the patient re-presented with ongoing groin pain. On examination, a mobile, firm mass was palpable along the medial thigh, corresponding to the course of the adductor muscles. Repeat radiographs (Fig. 2) and MRI (Fig. 3) revealed a complete rupture of the adductor longus with

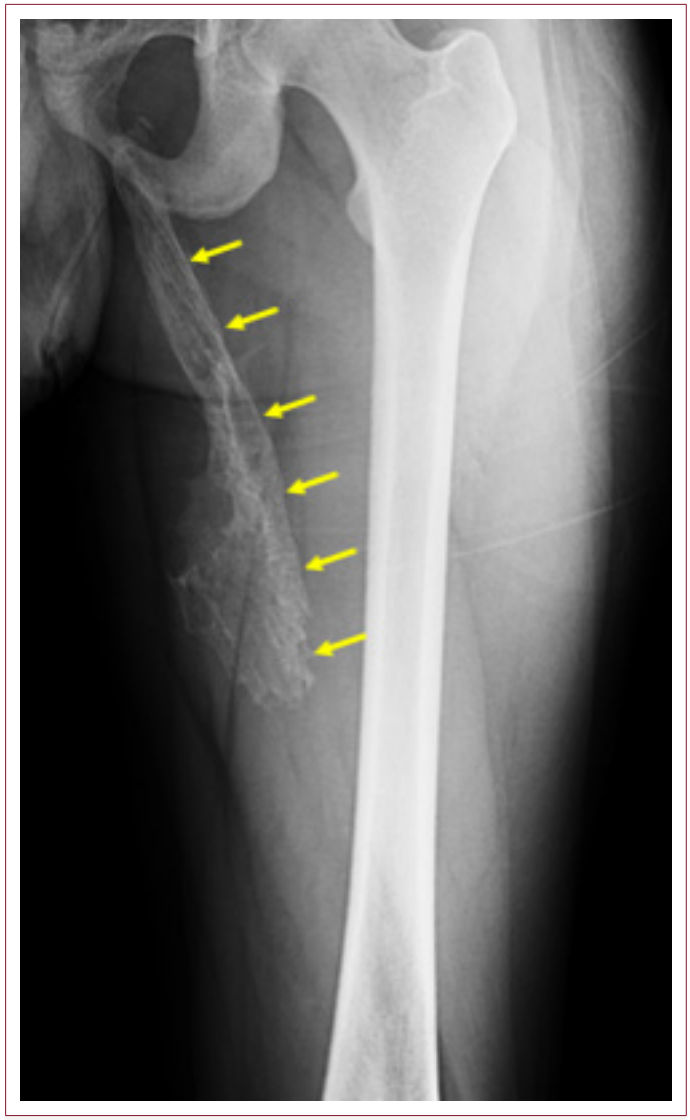

Figure 2. The follow-up anteroposterior radiograph of the left hip and proximal femur was obtained eight months after the initial injury. Mature, linear, and trabeculated ossification is visible along the course of the adductor longus muscle (yellow arrows), consistent with myositis ossificans.

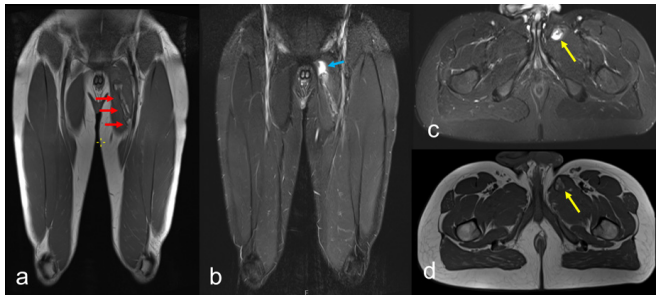

Figure 3. Magnetic resonance imaging (MRI) of the pelvis and proximal thighs showing findings consistent with complete adductor longus rupture and associated myositis ossificans. **(a)** Coronal T1-weighted image demonstrating discontinuity and retraction of the adductor longus muscle fibers (red arrows). **(b)** Coronal fat-suppressed T2-weighted image showing hyperintense edema and fluid at the proximal rupture site with a hypointense ossified lesion within the muscle belly (blue arrow). **(c)** Axial fat-suppressed T2-weighted image revealing a well-demarcated ossified mass within the adductor longus muscle (yellow arrow). **(d)** Axial T1-weighted image showing mature ossification with signal intensity similar to cortical bone (yellow arrow).

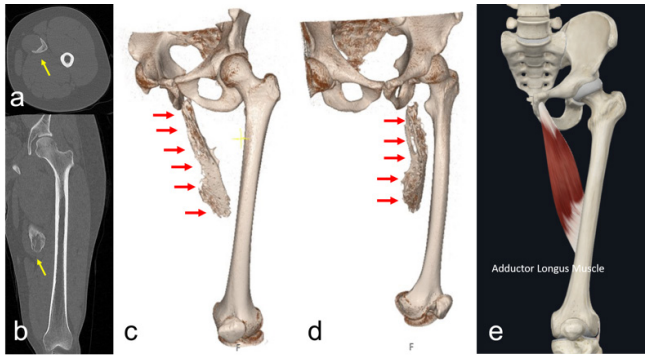

Figure 4. Computed tomography (CT) and three-dimensional (3D) volume-rendered reconstructions demonstrating mature heterotopic ossification within the adductor longus muscle. **(a)** Axial CT image showing a well-circumscribed, corticated, ossified mass within the adductor compartment (yellow arrow). **(b)** Coronal CT image confirming the linear configuration of the ossified lesion along the course of the adductor longus muscle (yellow arrow). **(c, d)** 3D volume-rendered CT reconstructions from anterolateral and anteromedial views, respectively, illustrating extensive mature ossification with a trabecular pattern along the typical trajectory of the adductor longus (red arrows). **(e)** Anatomical illustration showing the normal position and orientation of the adductor longus muscle for reference.

intramuscular myositis ossificans. To further delineate the lesion and assist with surgical planning, a CT scan (Fig. 4) was obtained, demonstrating mature, heterotopic ossification within the adductor longus. Although surgical excision was recommended, the patient declined surgery. Conservative treatment was continued, and his symptoms gradually regressed. He returned to low-energy sports activities, such as walking and cycling, and had no pain during daily activities, although he avoided running and competitive sports.

Written consent was obtained from the patient for the publication of the images and clinical information used in this case report.

DISCUSSION

MO is a benign post-traumatic condition characterized by heterotopic bone formation, typically resulting from direct trauma, strain, or avulsion injuries involving large muscle groups.[1,2,8] It most commonly affects the quadriceps and brachialis muscles. Involvement of the adductor muscle group, particularly the adductor longus, is uncommon.[5,9,10] However, cases involving these muscles are increasingly reported, particularly in athletes exposed to repetitive kicking trauma in sports such as football and rugby. The case presented by Çetin et al. is one of the earliest in the literature to report MO of the adductor brevis in an amateur football player.[11]

The increasing use of biological agents in muscle injury management has generated significant debate.[5,9,11] Similar clinical scenarios have been documented previously. In the present case, the patient sustained an acute injury after a direct kick and continued to experience groin pain thereafter. The diagnosis was delayed. Kanakaraddi et al. described a case in which MO of the adductor longus mimicked symptoms of hip pseudoankylosis.[12] Iorio et al. reported a case of bilateral MO in which symptoms appeared on only one side, emphasizing that diagnosis cannot rely on symptom presentation alone.[13]

Although initial radiographs revealed no abnormalities, advanced imaging techniques such as MRI and CT played a decisive role in recognizing and characterizing the lesion.[2] The critical importance of these modalities has been consistently highlighted in the literature. A limitation of this case is the absence of histopathological confirmation. However, the presence of a lesion displaying a radiological zonal maturation pattern and well-defined trabecular structure supported the diagnosis of MO and allowed differentiation from malignancy or focal myositis. This imaging-based approach enabled a definitive diagnosis and helped avoid unnecessary surgical intervention.[1]

Once the diagnosis is established, treatment planning should

take into account factors such as symptom severity, lesion maturity, the degree of functional limitation, and the patient's preferences. Conservative treatment, including NSAIDs, rest, and activity modification, is typically the first-line approach. However, in some cases, chronic symptoms may necessitate surgical intervention.[2,14,15] De Smet et al. [16] reported successful excision of an 8-cm MO lesion, resulting in full functional recovery and return to sport. Likewise, Talbot et al.[9] documented a rugby player who failed conservative therapy but achieved permanent recovery following surgical intervention. Conversely, Zarro et al. [5] demonstrated that nonoperative management could also result in pain reduction and functional improvement. In the present case, although mature MO was identified radiologically, the patient opted against surgery and showed progressive symptom improvement with conservative care alone. This outcome aligns with similar cases in which favorable results were achieved without operative treatment.

The increasing use of biological agents in the management of muscle injuries, particularly PRP, has generated significant debate.[7,17] While PRP has shown promising effects on tissue healing, there is growing concern about its potential to induce heterotopic ossification (HO).[7,14] In a large cohort study conducted by Poor et al.[14], the incidence of HO was significantly higher in athletes who received PRP for core muscle injuries. This finding highlights the osteogenic potential of growth factors introduced through PRP. Although PRP was not administered in our case, the patient received autologous conditioned plasma (ACP), a similar biologic agent that is rich in growth factors but has a lower leukocyte concentration.[7,14,18] Both therapies aim to promote tissue regeneration and reduce inflammation; however, their use in injured tissue must be approached with caution due to the possible risk of HO development.[7]

This case contributes to the growing literature on the diagnosis and management of adductor longus MO, a rare and often underrecognized condition. Advanced imaging modalities, awareness of the risks associated with biological treatments, and personalized treatment strategies are crucial for achieving optimal clinical outcomes. Further research is needed to clarify the relationship between biological agents and HO, as well as to define the appropriate timing and indications for surgical intervention in chronic cases of MO.

Although rare, MO of the adductor longus should be included in the differential diagnosis of athletes presenting with chronic groin pain, particularly when initial radiographs are unremarkable. Early clinical suspicion, prompt use of advanced imaging, and individualized treatment planning are key to minimizing morbidity. In today's clinical landscape, where biological agents are frequently used, careful consideration of their risks is essential. Surgical treatment should be reserved for patients with persistent and functionally limiting symptoms that are unresponsive to conservative measures. This case underscores the importance of clinical vigilance and supports the efficacy of conservative management in selected MO cases.

DECLARATIONS

Ethics Committee Approval: This is a case report; therefore, formal ethics committee approval was not required in accordance with institutional policies.

Informed Consent: Written informed consent was obtained from the patient.

Conflict of Interest: The authors declared no conflict of interest.

Financial Disclosure: The authors declared that they have no relevant or material financial interests that relate to the research described in this paper.

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ABBREVIATIONS

ACP: Autologous conditioned plasma

CT: Computed Tomography

HO: Heterotopic ossification

MO: Myositis Ossificans

MRI: Magnetic Resonance Imaging

NSAID: Nonsteroidal anti-inflammatory drugs

PRP: Platelet-rich plasma

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