Advanced Medical Research

Global Science Publishing

Number 4 (2025), pp. 01–04

Case Report

Myositis Ossificans PET/CT Findings in a Patient Presenting with Suspected Sarcoma: Turbulance a Differantial Diagnosis

Osman Kesimoglu [1,*], Yılmaz Sahin [1], Ali Sahin [1], Bahar Yılmaz Cankaya [2] and Fuad Talıbov [1]

[1] Department of Nuclear Medicine, Faculty of Medicine, Ataturk University, Erzurum 25240, Turkey

[2] Department of Radiology, Faculty of Medicine, Ataturk University, Erzurum 25240, Turkey

* Corresponding author: kesimogluosman5@gmail.com

Received: July 27, 2025; Revised: August 4, 2025; Accepted: August 11, 2025; Published: August 27, 2025

Abstract: Myositis Ossificans (MO) is a benign lesion in which bone tissue forms within muscle or soft tissue after a traumatic injury. It most commonly occurs in the extremities, large muscle groups and demographically in young adults, with a higher incidence in women. 60–75% of cases are associated with trauma. To achieve an accurate diagnosis of suspected soft tissue lesions, different imaging methods need to be evaluated. In cases where imaging findings are insufficient, biopsy may be required for histopathological confirmation. This case report aims to emphasize the following: ^{18}F-Fluorodeoxyglucose (FDG) positron emission tomography-computed tomography (PET-CT) should be considered in the differential diagnosis of soft tissue tumors, the diagnostic importance of the CT component in ^{18}F–FDG PET-CT, and the crucial role of a detailed medical history in reaching a diagnosis.

Keywords: Myositis Ossificans; PET-CT; MRI

A 29-year-old woman with no history of trauma in her initial anamnesis presented to the clinic with complaints of pain and swelling in her left thigh. On physical examination, a mass was palpated, and Magnetic Resonance Imaging (MRI) was performed for differential diagnosis. Examination of the MRI sections revealed a space-occupying lesion measuring 45 mm × 40 mm within the semitendinosus muscle in the posterior of the left thigh, containing heterogeneously hypointense areas on fluid-weighted sequences, with signal intensity similar to muscle on T1-weighted images, and showing intense contrast enhancement on post-contrast T1-weighted images (Figure 1)

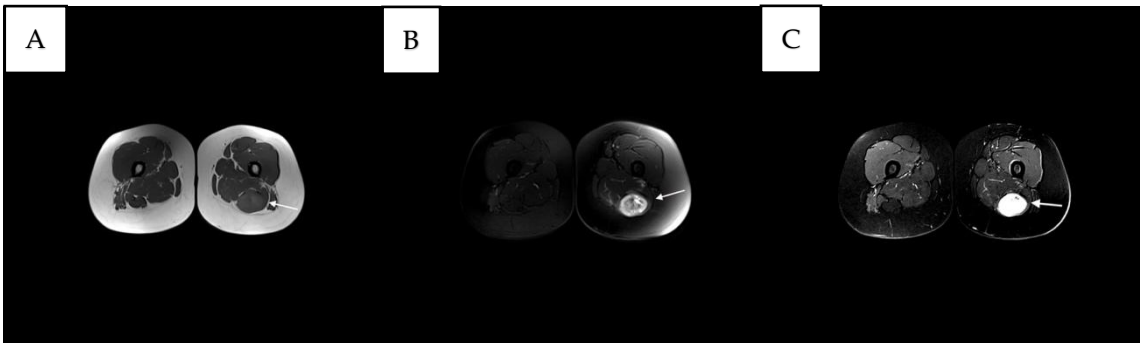

Figure 1. In the axial section of the MRI T1-weighted image, a lesion with an intensity similar to that of the muscle (**A**). The lesion showed areas of hypointensity on the MRI T2-weighted fat-suppressed image (**B**) and intense enhancement on the MRI T1-weighted fat-suppressed post-contrast image (**C**).

When the patient's radiology MRI report was evaluated, a soft tissue tumor was suspected, and the patient was referred to our clinic for advanced imaging with ^{18}F-FDG PET-CT for further investigation. On examination, a 45 mm × 40 mm lesion showing peripheral calcification and a Hounsfield unit (HU) value similar to that of muscle tissue was observed on the CT scans. In addition, increased ^{18}F-FDG metabolism was detected in the lesion (Figure 2).

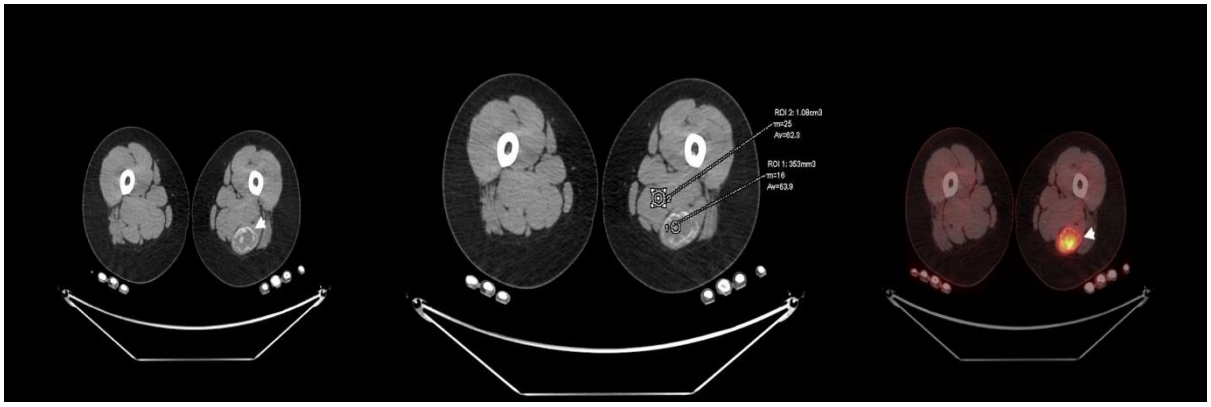

Figure 2. The lesion exhibited peripheral calcification, a Hounsfield unit value similar to that of muscle tissue, and increased ^{18}F-FDG uptake.

Upon examination of the obtained images, no dimensionally or metabolically pathological lymph nodes were observed. Upon re-questioning the patient's medical history, it was learned that the patient had a history of a fall while skiing three years ago, and the findings suggested MO. For differential diagnosis, histopathological correlation was recommended, and pathological examination of specimens obtained by core needle biopsy from the existing lesion confirmed the diagnosis of myositis ossificans. The graphical abstract describing all these processes is shown in Figure 3.

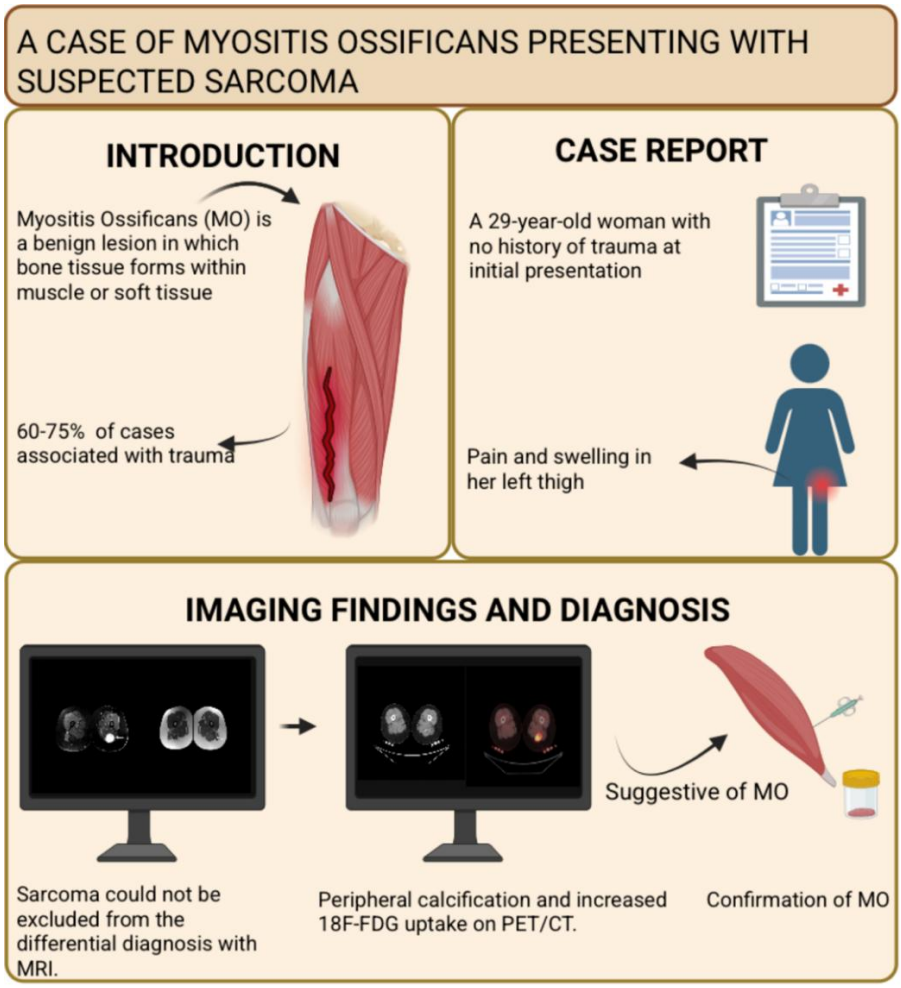

Figure 3. Diagnostic Process of Myositis Ossificans.

Discussion

Although the pathogenesis of MO is not completely understood, it is widely accepted that heterotopic ossification is stimulated by pluripotent mesenchymal stem cells. These cells originate from vascular endothelial cells through the endothelial-mesenchymal transition pathway and also have the ability to produce cartilage and bone [1]. The disease progresses through three stages: early, intermediate, and late. The first four weeks after trauma constitute the early or inflammatory stage. In MO, during the early period when ossification or calcification is not detected, differentiating it from malignancy or infection can be challenging. In the intermediate stage, which occurs 4–8 weeks after trauma, bone formation can be observed and is detectable on computed tomography (CT). In the late stage, which lasts several months, a mature peripheral zone of the lamellar bone is formed [2]. In the late phase, dense calcification is expected on CT; however, in the intermediate phase, a central area (zonal phenomenon) with attenuation similar to that of muscle tissue and/or peripheral calcifications of varying densities may be observed [3]

In this study, we report a case of MO detected in the semitendinosus muscle in the posterior thigh using ^{18}F-FDG PET-CT. The patient, who did not report a history of trauma during the initial examination, presented with pain and swelling, and a palpable mass was found on physical examination. Magnetic resonance imaging (MRI) was performed for differential diagnosis. The MRI report described the lesion as suspicious for malignancy; therefore, ^{18}F-FDG PET/CT was requested. On the CT component of PET-CT, peripheral calcification was observed, and in the center of the lesion, there was a soft tissue component with HU values similar to those of muscle tissue. Increased ^{18}F-FDG uptake was also observed in the lesion. Similar findings of ^{18}F-FDG uptake in MO lesions have been reported in several studies [4,5]

^{18}F-FDG accumulates in the MO region because of inflammation, mimicking malignant neoplasms. In general, when a lesion is suspected or diagnosed as malignant, ^{18}F-FDG PET-CT is performed to investigate other abnormalities. However, this imaging technique often fails to distinguish between benignity, malignancy, or inflammation, preventing a definitive diagnosis [6]. Nevertheless, when there is circular calcification

corresponding to ^{18}F-FDG uptake in muscle, MO should be considered; however, in the absence of a trauma history, it is not diagnostic [1].

Based on these findings, the patient was asked again about any history of trauma, and it was learned that they had suffered a skiing accident three years prior. Histopathological correlation was recommended and the diagnosis of MO was confirmed.

Funding

This research received no external funding.

Author Contributions

Conceptualization, O.K., Y.S., A.S., B.Y.C. and F.T.; writing—original draft preparation, O.K., Y.S., A.S., B.Y.C. and F.T. All of the authors read and agreed to the published the final manuscript.

Institutional Review Board Statement

For this case report, ethical committee approval is not required according to Turkish regulations and the criteria of TUBİTAK ULAKBİM TR Index. Only clinical data of the patient were used.

Informed Consent Statement

Informed consent was obtained from patient involved in study.

Data Availability Statement

Not applicable.

Conflicts of Interest

The authors declare no conflict of interest.

References

1. Sasaki M, Hotokezaka Y, Ideguchi R, *et al*. Traumatic Myositis Ossificans: Multifocal Lesions Suggesting Malignancy on FDG-PET/CT—A Case Report. *Skeletal Radiology* 2020; **50**: 249. https://doi.org/10.1007/S00256-020-03521-W.
2. Walczak BE, Johnson CN, Howe BM. Myositis Ossificans. *Journal of the American Academy of Orthopaedic Surgeons* 2015; **23**: 612–622. https://doi.org/10.5435/JAAOS-D-14-00269.
3. Łuczyńska E, Kasperkiewicz H, Domalik A, *et al.* Myositis Ossificans Mimicking Sarcoma, the Importance of Diagnostic Imaging—Case Report. *Polish Journal of Radiology* 2014; **79**: 228–232. https://doi.org/10.12659/PJR.890209.
4. Agrawal K, Bhattacharya A, Harisankar CNB, *et al.* [^{18}F]fluoride and [^{18}F]fluorodeoxyglucose PET/CT in Myositis Ossificans of the Forearm. *European Journal of Nuclear Medicine and Molecular Imaging* 2011; **38**: 1956. https://doi.org/10.1007/S00259-011-1794-0.
5. Koob M, Durckel J, Dosch JC, *et al*. Intercostal Myositis Ossificans Misdiagnosed as Osteosarcoma in a 10-Year-Old Child. *Pediatric Radiology* 2010; **40**: 34–37. https://doi.org/10.1007/S00247-010-1769-5.
6. Ozbayrak M, Guner AL, Unal VS, *et al.* ^{18}F-fluorodeoxyglucose-Positron Emission Tomography Avid Paraspinal Soft-Tissue Mass Mimicking a Malign Neoplasm: Non-Traumatic Myositis Ossificans. *Spine Journal* 2016; **16**: e705–e706. https://doi.org/10.1016/j.spinee.2016.03.036.