CASE REPORT

Unmasking an Incidental Tenosynovial Giant Cell Tumor on Fluorodeoxyglucose Positron Emission Tomography / Computed Tomography in a Melanoma Patient

Amera Sadija[1], **Sejla Ceric**[1,2], **Timur Ceric**[2,3]

[1] Clinic for Nuclear Medicine, Clinical Center of the University of Sarajevo, Sarajevo, Bosnia and Herzegovina
[2] Faculty of Medicine, University of Sarajevo, Sarajevo, Bosnia and Herzegovina
[3] Clinic for Oncology, Clinical Center of the University of Sarajevo, Sarajevo, Bosnia and Herzegovina

Corresponding Author: Amera Sadija MD. Clinic for Nuclear Medicine, Clinical Center of the University of Sarajevo. E-mail: amera0206@yahoo.com; Phone: +387 33 298 485; ORCID ID 0000-0002-5424-4671.

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Abstract

Introduction: Tenosynovial giant cell tumor (TGCT) is a benign, yet metabolically active tumor affecting the synovium, bursa, or tendon sheath.

Aim: The purpose of the current case report is to evaluate the importance of fluorodeoxyglucose positron emission tomography / computed tomography in diagnosis of extra osseous soft tissue lesion.

Case report: We present a 48-year-old male with malignant melanoma undergoing fluorodeoxyglucose positron emission tomography / computed tomography surveillance. A highly fluorodeoxyglucose-avid mass in the right foot raised concern for melanoma metastasis. However, biopsy revealed an unexpected diagnosis of TGCT.

Conclusion: This case highlights the importance of fluorodeoxyglucose positron emission tomography / computed tomography in diagnosis of extra osseous lesions, particularly in cancer patients. In such scenarios, considering alternative diagnosis and pathohistological diagnosis confirmation become crucial to avoid misdiagnosis of metastases.

Keywords: positron emission tomography / computed tomography, giant cell tumor, melanoma.

Learning objectives

- Highlight the difficulties in diagnosing Tenosynovial giant cell tumor particularly in cancer patients.
- Underline a very high level of metabolic activity in Tenosynovial giant cell tumor mimicking metastases.
- Realize the importance of fluorodeoxyglucose positron emission tomography / computed tomography in diagnosis of extra osseous soft tissue lesion.

INTRODUCTION

The diagnosis of Tenosynovial giant cell tumor (TGCT) presents a significant challenge due to its lack of specific clinical and imaging features. This often leads to confusion with other benign and malignant processes affecting the synovial lining, particularly in cancer patients. Especially, TGCT can mimic bone metastasis, further complicating its identification. While typically involving the appendicular skeleton, it can also be found incidentally in imaging studies without obvious symptoms. This case report highli-

ghts the difficulties in diagnosing TGCT and underlines the importance of considering it in the differential diagnosis, especially for metabolically active soft tissue lesions detected on fluorodeoxyglucose positron emission tomography / computed tomography (FDG PET/CT) in cancer patients. The aim of article was to evaluate the importance of FDG PET/CT in diagnosis of extra osseous soft tissue lesion and to underline very high level of metabolic activity in TGCT mimicking metastases.

CASE PRESENTATION

We present a case of a 48-year-old man with a history of malignant melanoma of temporal region. The patient underwent a PET/CT examination for surveillance, which demonstrated no suspicious abnormality except for very high-level metabolic activity localized to the mass of the right foot. Maximum standardized uptake value (SUV) in this area was 28.8 (Figure 1).

On the corresponding CT, soft tissue mass was seen in tarsal sinus, affecting talocrural joint and talar corpus, correlating with this abnormal focal metabolic activity (Figure 2).

This lesion was considered suspicious for metastatic disease, due to the history of operated melanoma.

A contrast-enhanced MRI of the joint was performed to better assess the anatomy of the underlying lesion, and it revealed a tumoral mass measuring 65x57mm intraarticular in tarsal sinus and in subtalar joint, destroying talus bone subcortically.

Given the suspicion for metastatic melanoma, this mass was biopsied. Histopathology revealed a giant cell tumor of tendon sheath, most probably localized type. The described cells were Melan A negative, CD 163 CD 68 positive and osteoclast-like cells TRAP positive.

On orthopedic surgery evaluation, the decision was made to provide surgical management.

In a patient with cancer, the discovery of a metabolically active lesion within or adjacent to skeletal muscle, but not clearly involving bone, should raise suspicion of a coexistent process. It should not be conclusively diagnosed as a metastatic lesion solely by PET imaging. Distant metastatic lesions to skeletal muscle as the sole suspicious abnormality would be unusual in melanoma. The differential diagnosis must include soft tissue sarcoma or malignant nerve sheath tumor, among other entities. Additional imaging and tissue diagnosis should be pursued in such a situation, as they were in our case. If equivocal, excisional biopsy of the lesion should be considered.

If this lesion had been misdiagnosed on PET/CT as metastatic malignant melanoma, the patient could have received unindicated therapy.

Discussion

TGCT was originally described as an inflammatory lesion involving the tendon sheath rather than as a malignant lesion. According to the 2013 World Health Organization Classification of Soft tissue Tumors, TGCT can be subdivided into localized (L-TGCT) and diffuse forms (D-TGCT). L-TGCT is primarily located in the digits of the hand and feet, while D-TGCT is more involved in the large joints, especially the knee. TGCT-D is often associated with bone erosions, cartilage loss and osteophyte formation and typically involves the appendicular skeleton, rarely the axial skeleton. No clear histological distinction can be made between the two main subtypes, so L-TGCT and D-TGCT are mainly differentiated by a radiological distribution of tumor within the joint.

The common symptoms of patients with TGCT include pain, limitation of motion, and minimal to mild joint swelling, heat, and tenderness, but TGCT can also be found incidentally in imaging studies of patients without any of these symptoms and manifests as a nonspecific well-defined soft-tissue mass.

This case study highlights the occurrence of PET/CT incidental discovery of TGCTs, in

particular, and metabolically active soft tissue lesions, in general. Although our lesion was conspicuous and suspicious, the foamy macrophages on biopsy were suggestive of inflammation and consistent with TGCT pathology. It has been suggested that the increased presence of monocytes and macrophages, due to TGCT tumor cell t(1:2)(p13;q37) translocation and resulting in increased colony stimulating factor 1 (CSF1) expression, is directly responsible for the increased FDG uptake. The increased expression of GLUT-1 and hexokinase II within macrophage-containing lesions has been reported in literature to correlate with SUV max and is thought to explain the mechanism of the increased FDG uptake. There are no known case reports of non–PET-avid TGCT in literature.

Conclusion

This case highlights the importance of FDG PET/CT in diagnosis of extraosseous lesions, particularly in cancer patients. In such scenarios, considering alternative diagnosis and pathohistological diagnosis confirmation become crucial to avoid misdiagnosis of metastases.

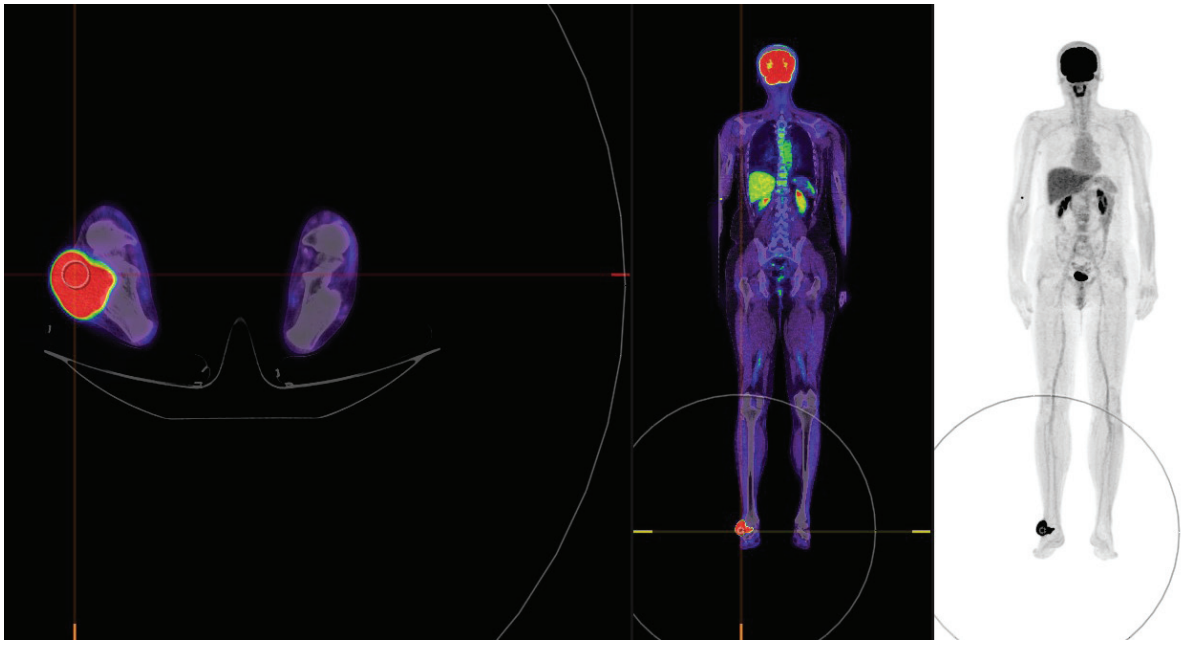

Figure 1. High-level metabolic activity localized to the mass of the right foot

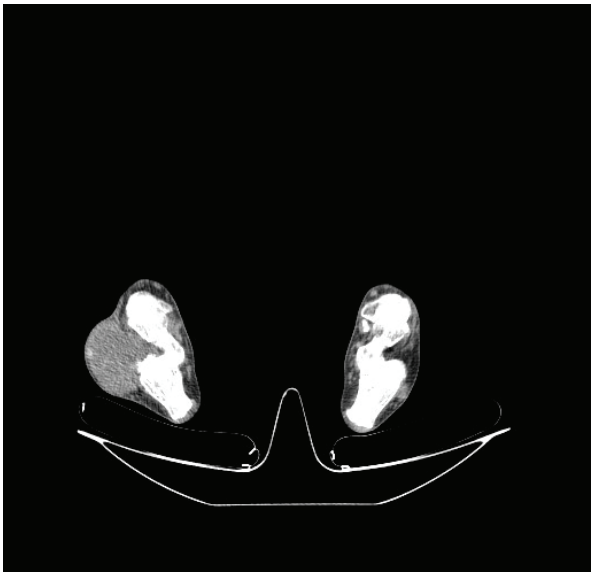

Figure 2. Soft tissue mass was seen in tarsal sinus

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