A Potential Pitfall Associated with F-18 FDG Imaging in a Patient with Malignant Disease: Osteoid Osteoma: Original Image

Malign Hastalıklı Bir Olguda F-18 FDG Görüntüleme ile İlişkili Bir Tuzak: Osteoid Osteoma

İlknur AK, MD[a]

[a]Department of Nuclear Medicine, Eskişehir Osmangazi University Faculty of Medicine, Eskişehir

Geliş Tarihi/*Received:* 20.11.2008
Kabul Tarihi/*Accepted:* 10.02.2009

Yazışma Adresi/*Correspondence:*
İlknur AK, MD
Eskişehir Osmangazi University Faculty of Medicine,
Department of Nuclear Medicine,
Eskişehir,
TÜRKİYE/TURKEY
ilknur_ak@yahoo.com

ABSTRACT This case illustrates a pitfall associated with F-18 fluoro-deoxyglucose (FDG) imaging in a patient with malignant disease. We presented the F-18 FDG positron emission tomography (PET)/computed tomography (CT) images of a 42-year-old woman with non-Hodgkin's lymphoma that showed intense accumulation of F-18 FDG in the proximal metaphysis of the right femur that could simulate extranodal involvement. The fusion PET/CT images demonstrated that accumulation of F-18 FDG in the nidus was surrounded by a halo of reactive sclerotic bone. Combined PET/CT imaging has facilitated the descriptions of FDG uptake by allowing accurate anatomic localization of the FDG uptake.

Key Words: Osteoid osteoma; F-18 FDG; PET/CT

ÖZET Bu makale, malign hastalığı olan bir olguda F-18 fluorodeoksiglukoz (FDG) görüntüleme ile ilişkili bir tuzağı tanımlamaktadır. Sağ femurunun proksimalinde primer hastalığın ekstranodal tutulumunu taklit edebilecek yoğun F-18 FDG akümülasyonu gösteren, 42 yaşında non-Hodgkin lenfomalı bir kadın hastanın F-18 FDG pozitron emisyon tomografi (PET)/bilgisayarlı tomografi (BT) görüntülerini sunuyoruz. Füzyon PET/BT görüntülerinde, reaktif sklerotik bir halo ile çevrili nidusta F-18 FDG akümülasyonu izlendi Kombine PET/BT görüntüleme doğru anatomik lokalizasyonu belirleyerek FDG tutulumunun tanımlanmasını kolaylaştırmaktadır.

Anahtar Kelimeler: Osteoid osteoma; F-18 FDG; PET/BT

Turkiye Klinikleri J Med Sci 2009;29(4):1026-8

We present the F-18 FDG PET/CT images of a 42-year-old woman with non-Hodgkin's lymphoma that shows intense accumulation of F-18 FDG in the proximal metaphysis of right femur that could simulate extranodal involvement. The fusion PET/CT images demonstrated that accumulation of F-18 FDG in the nidus surrounded by a halo of reactive sclerotic bone (Figure 1).

Osteoid osteoma is a relatively frequent benign bone tumor, consisting of osteoid and woven bone, and surrounded by a halo of reactive sclerotic bone, with an average size of the nidus less than 1.5 cm. Pathologically, a nidus of highly vascularized stroma within cortical or cancellous bone or in a subperiosteal location incites exuberant bone sclerosis. The appearance consists of a lucent nidus that is sometimes calcified, associated with surrounding sclerosis. Often, clinical symptoms and radiographic findings are di-

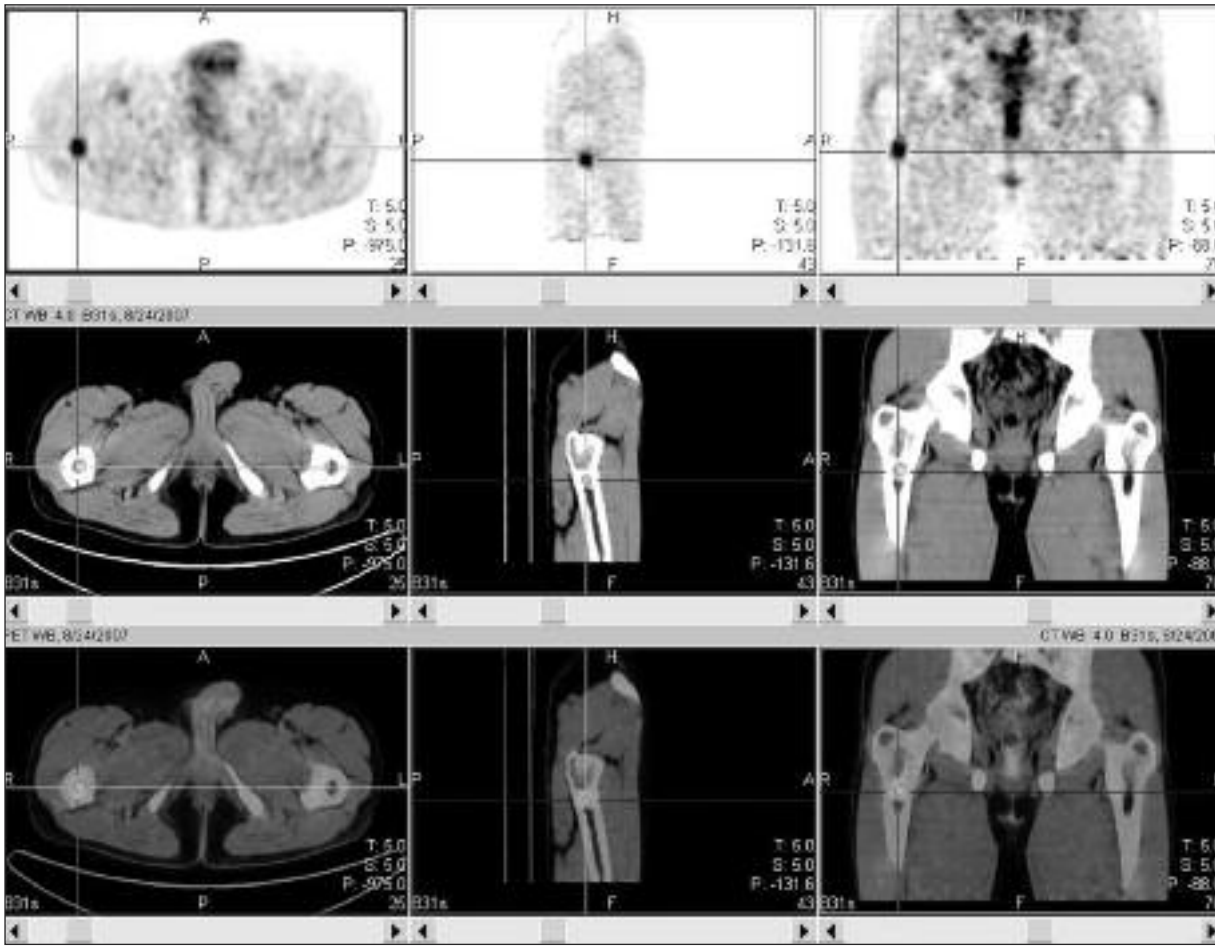

FIGURE 1: The patient was imaged using an integrated PET/CT camera (1 hour after the administration of 465 MBq FDG), which consists of a 6-slice CT gantry integrated on an LSO based full ring PET scanner (Siemens Biograph 6, IL, Chicago, USA). The CT portion of the study was performed just for defining anatomical landmarks and making attenuation correction on PET emission images. Three plane PET image shows an intense F-18 FDG uptake in the proximal metaphysis of the right femur with a maximum standard uptake value (SUVmax) of 6.75 (corrected by body weight) mimicking metastases. The fusion PET/CT images demonstrated the accumulation of F-18 FDG in the nidus surrounded by a halo of reactive sclerotic bone (2 x 2.5 cm in size).

agnostic. A lucent lesion, usually less than 1 cm in diameter, surrounded by a rim of sclerosis is seen in few other entities. The goal of treatment is removal or destruction of the nidus.[1,2]

The interpretation of F-18 FDG PET can be quite challenging, particularly on PET alone in a patient with malignant disease. Some reports have described F-18 FDG avid bone lesions mimicking metastatic disease including skeletal sarcoidosis, nonossifying fibroma, Paget's disease, osteoradionecrosis and osteoid osteoma.[3-7] Combined PET/CT imaging, which combines both functional and morphologic imaging in a single examination, has facilitated the descriptions of FDG uptake by allowing accurate anatomic localization and definition of the FDG uptake. The CT part significantly improved the performance of FDG-PET/CT in differentiation of benign and malignant bone lesions compared to PET alone. Combined PET/CT imaging can be helpful to identify benign bone lesions mimicking metastatic or residual disease in F-18 FDG PET as illustrated by this case.

REFERENCES

1. Kitsoulis P, Mantellos G, Vlychou M. Osteoid osteoma. Acta Orthop Belg 2006;72(2):119-25.
2. Lee EH, Shafi M, Hui JH. Osteoid osteoma: a current review. J Pediatr Orthop 2006;26(5): 695-700.
3. Ludwig V, Fordice S, Lamar R, Martin WH, Delbeke D. Unsuspected skeletal sarcoidosis mimicking metastatic disease on FDG positron emission tomography and bone scintigraphy. Clin Nucl Med 2003;28(3):176-9.
4. von Falck C, Rosenthal H, Gratz KF, Galanski M. Nonossifying fibroma can mimic residual lymphoma in FDG PET: additional value of combined PET/CT. Clin Nucl Med 2007;32(8):640-2.
5. Mahmood S, Martinez de Llano SR. Paget disease of the humerus mimicking metastatic disease in a patient with metastatic malignant mesothelioma on whole body F-18 FDG PET/CT. Clin Nucl Med 2008;33(7):510-2.
6. Lee JA, Huh SJ, Oh D, Bae DS. Osteoradionecrosis after three-dimensional conformal radiotherapy for recurrent cervical cancer presenting as a progressive osteolytic lesion. Ann Nucl Med 2008;22(2):139-41.
7. Lim CH, Park YH, Lee SY, Chung SK. F-18 FDG uptake in the nidus of an osteoid osteoma. Clin Nucl Med 2007;32(8):628-30.