Clinical note

Fat necrosis may mimic local recurrence of breast cancer in FDG PET/CT

Burcu E. Akkas *, G. Ucmak Vural

Department of Nuclear Medicine, Ankara Oncology Research and Training Hospital, Ankara, Turkey

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A B S T R A C T

Fat necrosis of the breast is a benign condition that most commonly occurs as the result of trauma. The radiographic and clinical significance of fat necrosis of the breast is that it may mimic malignancy. We present a case of false positive FDG PET/CT scan caused by fat necrosis and mimics local recurrence of breast carcinoma 3 years after radical mastectomy. Physicians must be aware of fat necrosis as a potential pitfall for PET/CT. Fat necrosis must be considered in the differential diagnosis of hypermetabolic breast masses in patients who previously had mastectomy or mammoplasty.

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La necrosis grasa puede asemejarse a una recurrencia local del cáncer de mama en la PET/TC con FDG

R E S U M E N

La necrosis grasa de mama constituye una situación benigna que se produce de forma común como resultado de un trauma. El significado radiográfico y clínico de la necrosis grasa puede asemejarse a una neoplasia. Presentamos el caso de un resultado falso positivo de la PET/TC con FDG debido a una necrosis grasa, y su semejanza con una recurrencia local de carcinoma de mama a los 3 años de una mastectomía radical. Los facultativos deben ser conscientes de que la necrosis grasa puede constituir una limitación para el estudio PET/TC. La necrosis grasa debe considerarse en el diagnóstico diferencial de las masas hipermetabólicas de mama en pacientes sometidas previamente a mastectomía o mamoplastia.

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Introduction

Fat necrosis is the result of adipose tissue death mainly due to surgery and radiation therapy but may also result from incidental trauma.1 It is a common entity that may pose a challenge to clinicians and radiologist imaging breast.1-5 Because of increasing tendency to nipple sparing surgeries followed by post operative radiation therapy, and, in addition with the high popularity of reduction mamoplasties, breast imagers should become familiar with different manifestations of fat necrosis in order to prevent unnecessary biopsies. Although many potential pitfalls are well known to complicate PET/CT reporting, in clinical practice, there is still limited data on FDG uptake of fat necrosis in breast tissue. Here, we present false positive FDG PET/CT findings in a patient with fat necrosis mimicking local recurrence of breast carcinoma 3 years after radical mastectomy.

Case presentation

A 70-year-old female patient referred to PET/CT imaging for the suspicion of recurrent breast carcinoma 3 years after the radical mastectomy and 6 cycles of chemotherapy with cyclophosphamide and adriamycin. She was complaining of a palpable mass of 1 cm in size in the operation region. On ultrasound, an indistinctly bordered mass of mixed echogenicity was reported. Corresponding to the findings of physical examination and ultrasound, PET/CT scan demonstrated a hyper metabolic mass lesion 1 cm in size with maximum standardized uptake value (SUVmax) of 3.7 on the left outside of the thoracic wall (Fig. 1). The findings of the FDG PET/CT scan were considered as suspicious for local recurrence. Further investigation was needed for diagnosis and the suspicious mass was resected. On pathological analysis of the resected tissue, there was no evidence of malignant cells. The result of the excisional biopsy was, unexpectedly, fat necrosis.

Discussion

Fat necrosis has a multitude of appearances on mammography, ultrasound and Magnetic Resonance Imaging (MRI). The sonographic and mammographic features are variable and reflect the amount of fibrosis of fat necrosis. Such that fat necrosis may present as lipid cysts, coarse calcifications, microcalcifications, and focal asymmetries or even spiculated masses on mammography.2 In a retrospective study of 126 cases with fat necrosis, authors found
Fig. 1. The axial (upper row), coronal (middle row) and sagittal (lower row) slices of CT (left column), PET (middle column) and fused PET/CT (right column) images of the PET/CT scan demonstrated a hyper metabolic mass lesion (arrow) 1 cm in size with maximum standardized uptake value of (SUVmax) 3.7 located on the left outside of the thoracic wall, corresponding to the operation region.

a wide spectrum of sonographic presentations. Likewise, MRI appearances of fat necrosis may be indistinguishable from that of malignancy and can mimic tumor recurrence after breast sparing therapies.

Physicians imaging breast are familiar with fat necrosis as a potential cause of false positive interpretation on ultrasound, mammography and MRI. However, there are not yet enough experiences on FDG uptake in necrotic fat as well as fat necrosis appearances in PET/CT images. Although many nonmalignant conditions and potential pitfalls are reported to confound the interpretation of PET/CT, to our knowledge, in the literature there is limited data demonstrating increased FDG uptake in fat necrosis. Seo et al. previously reported fat necrosis following transverse rectus abdominis myocutaneous (TRAM) flap reconstructed breasts in 3 cases.

Fat necrosis is a significant phenomenon to consider in the differential diagnosis for breast masses especially on the follow up of patients with breast carcinoma. The clinical significance of our study was the presentation of fat necrosis as a palpable mass which mimics local recurrence of breast carcinoma on ultrasound and PET/CT 3 years after radical mastectomy without breast reconstruction.

Conclusion

The wide clinical and radiological manifestations of fat necrosis are still difficult to diagnose even with the new diagnostic modalities and a great proportion of these lesions need a biopsy to diagnose. To our knowledge, this is the first case report demonstrating fat necrosis mimicking local recurrence of breast carcinoma on PET/CT imaging on the follow-up of a patient who underwent radical mastectomy without breast reconstruction.

References