

Marked FDG Uptake on PET/CT Corresponding to Low-Grade Ductal Carcinoma In Situ of the Breast: A Case Report

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Swiss Journal of Radiology and Nuclear Medicine - www.sjoranm.com - Rosenweg 3 in CH-6340 Baar, Switzerland

Abstract

During PET-CT performed for an unrelated condition, an incidental, well-circumscribed focus of increased FDG uptake was identified in the left breast. Despite initial difficulty in localization, subsequent multimodality imaging confirmed the lesion.

Keywords: Breast cancer, FDG PET-CT

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Discussion

PET-CT findings in breast tissue may be but are not necessarily indicative of the presence of cancer cells.

The usual isotope used is the radiolabelled glucose analogue F-18 Fluorodeoxyglucose (FDG) which binds to cells with increased glucose metabolism. The focally increased metabolism isn't restricted to breast cancer and can be found in both malignant and benign findings and hence result in potential pitfalls in interpretation [1, 2, 3].

Therefore, FDG PET-CT is not indicated for the initial diagnosis but is primarily used for staging and re-staging in breast cancer. During the staging with PET-CT for either breast cancer or other cancer types, any additional foci with increased FDG uptake require further investigation [1].

Breast cancer can be classified by histological type and further divided into four major biological subtypes, each showing different levels of FDG uptake.

Moreover, ductal carcinoma in situ (DCIS) is generally associated with low glucose meta-

bolism and hence limited detection with FDG PET-CT [1].

In the present case, PET-CT demonstrated a conspicuous, focal area of increased FDG uptake in the left breast. A corresponding lesion was expected on ultrasound, but none was identified. Consequently, breast MRI with and without intravenous contrast was performed, revealing a small enhancing focus in the left breast at approximately 3 o'clock, corresponding to the PET-CT finding.

Dynamic analysis of contrast enhancement on CE MRI showed benign type 1 enhancement curves with a single type 2 curve pointing in the direction of a suspicious finding.

For further evaluation, contrast-enhanced mammography (CEM) combined with second-look ultrasound was performed. CEM showed subtle contrast enhancement at the ROI. An ultrasound-guided 16G core needle biopsy of this area revealed simple fibrosis.

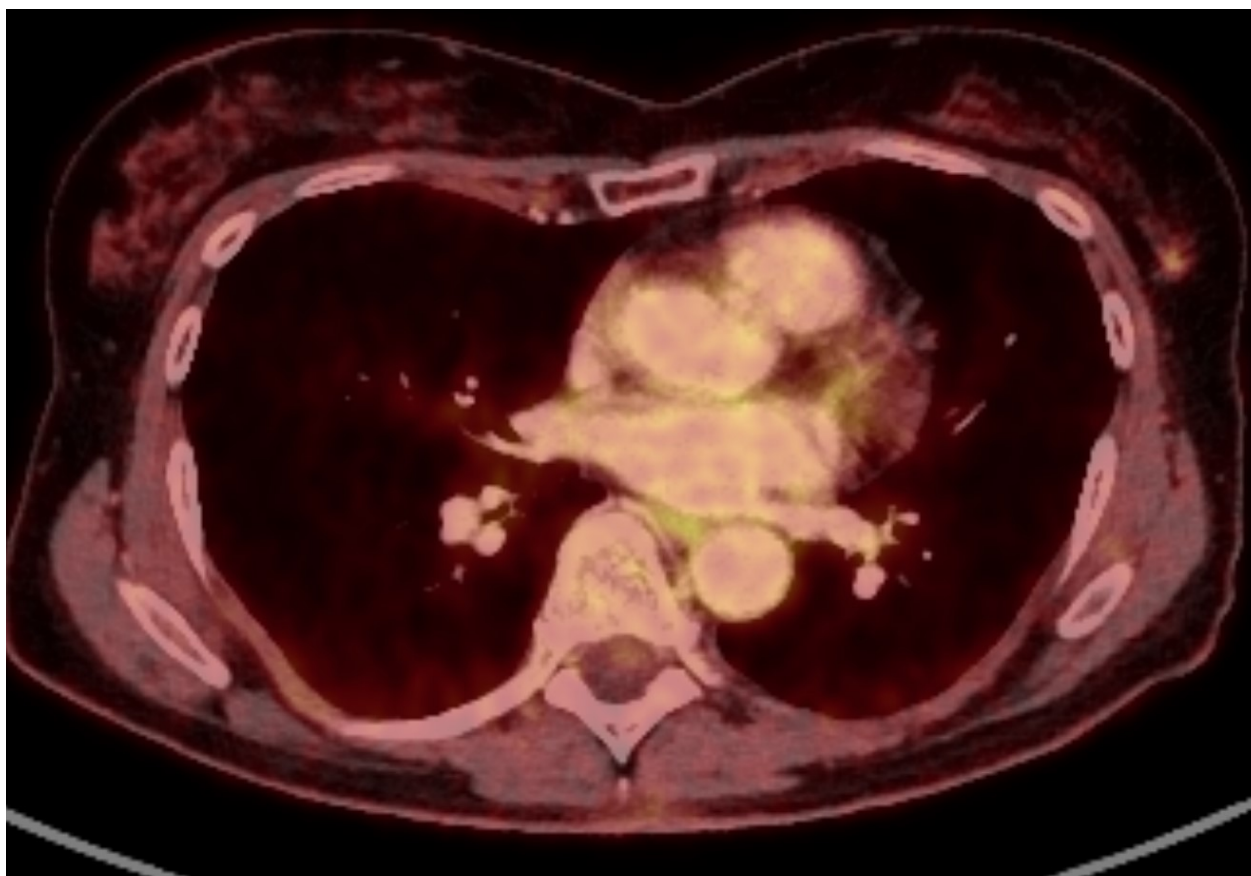


Figure 1: PET-CT scan revealed a well-defined, round focus of FDG uptake in the left breast.

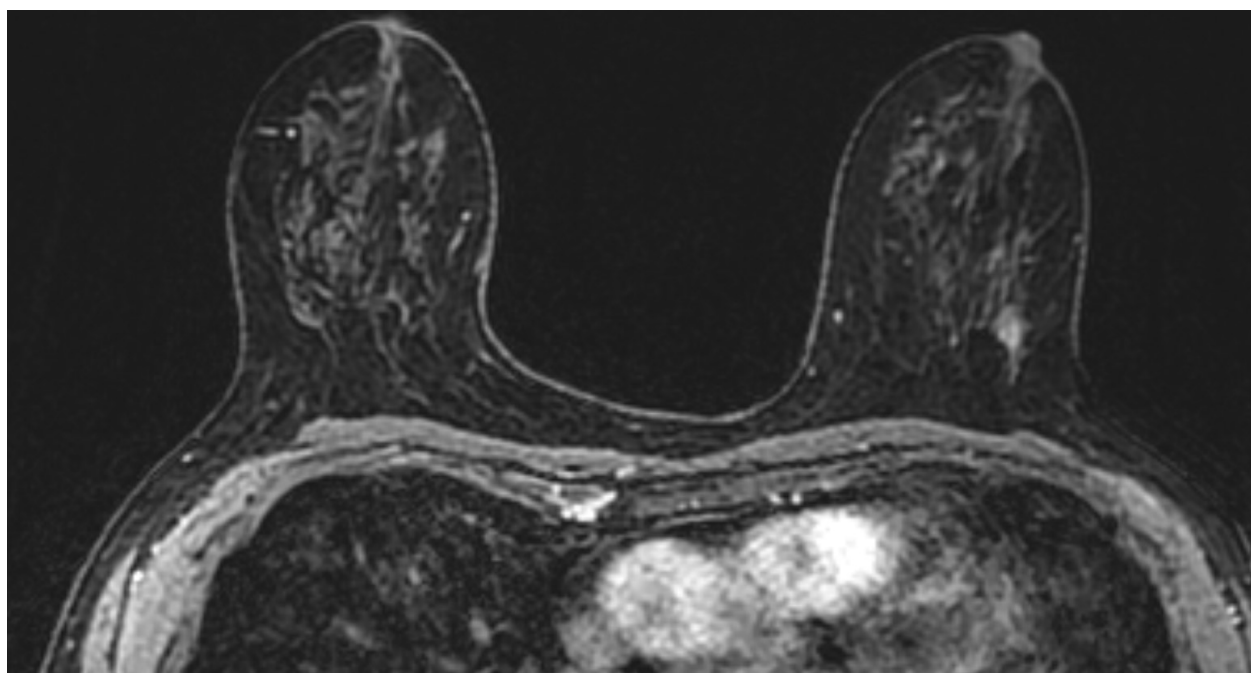


Figure 2: MRI with intravenous contrast was performed, as no lesions had been detected on the initial ultrasound. The MRI showed a focus with contrast enhancement and non-specific dynamic curves, corresponding to the same location as the PET-CT finding in the left breast at 3 o'clock.

As a last resort, a stereotactic vacuum-assisted breast biopsy was performed in the area of interest in the left breast. Histology result showed to be ductal carcinoma in situ with Van Nuys Group 1/ DCIS VNG 1.

This case was discussed at our multiple disciplinary conference, where the decision was made to proceed with breast-conserving surgery using preoperative radioactive iodine seed marking.

Postoperative histopathology confirmed DCIS VNG1 without any invasive component.

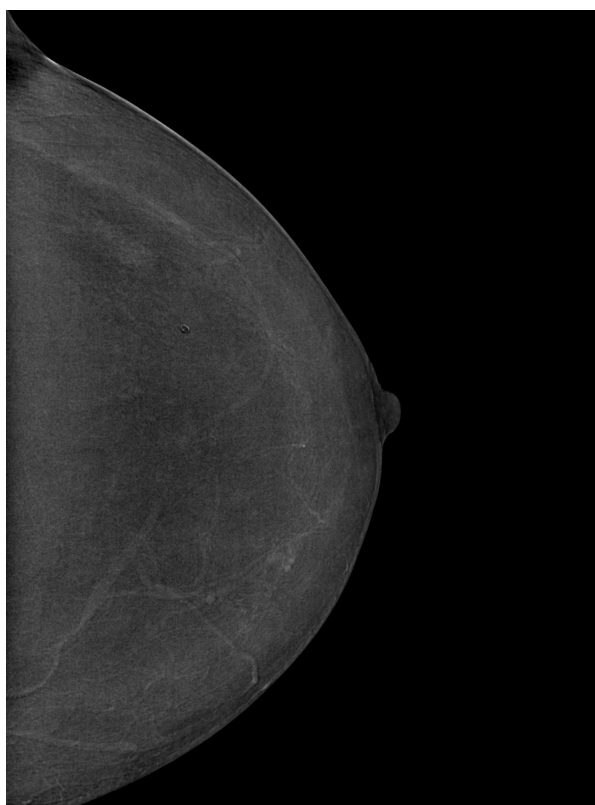


Figure 3: Contrast-enhanced dual-energy mammography (CEM) with a second-look ultrasound was performed. CEM demonstrated a subtle area of contrast enhancement at the same site as the MRI finding, with no correlating abnormalities on ultrasound.

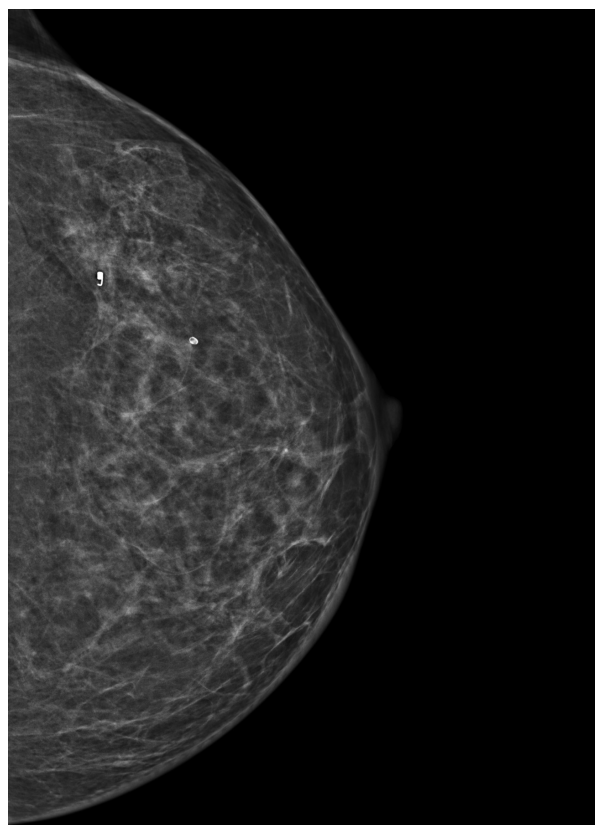


Figure 4: A vacuum-assisted breast biopsy (VAB) was carried out in the region of interest in the left breast, and the site was marked with a coil.

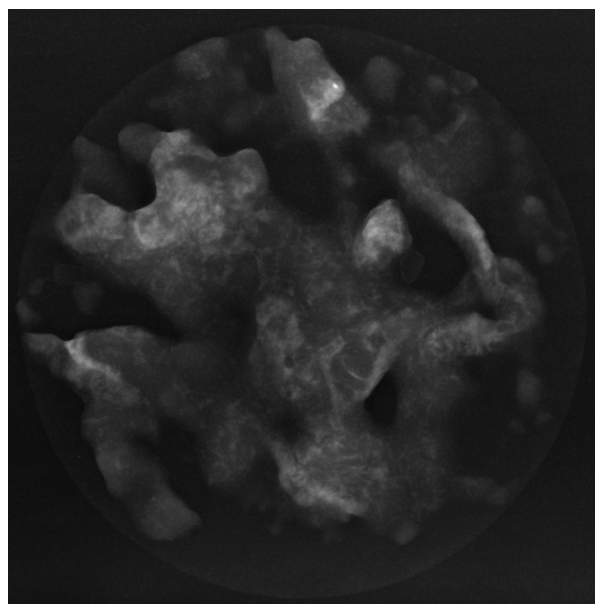


Figure 5: The biopsied tissue showed only a single microcalcification.



Conclusion

This case demonstrates that a focal isolated area of increased FDG uptake on PET-CT should not be disregarded, even if no corresponding lesion is identified on second-look ultrasound.

Low-grade DCIS (Van Nuys Grade 1) may show FDG activity on PET-CT despite its subtle nature.

Final Diagnosis

Ductal Carcinoma in Situ Van Nuys Group 1/ DCIS VNG 1

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Declarations

Consent for publication: The author clarifies that written informed consent was obtained and the anonymity of the patient was ensured. This study submitted to Swiss J. Rad. Nucl. Med. has been conducted in accordance with the Declaration of Helsinki and according to requirements of all applicable local and international standards. Competing interests: No competing interests. Funding: No funding resources.

Conflict of interest:

The authors declare that there were no conflicts of interest within the meaning of the recommendations of the International Committee of Medical Journal Editors when the article was written.

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