



Journal Homepage: [-www.journalijar.com](http://www.journalijar.com)

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/24390
DOI URL: <http://dx.doi.org/10.21474/IJAR01/24390>



RESEARCH ARTICLE

A RARE PATTERN OF BREAST CANCER RECURRENCE ON 18F- FLUORODEOXYGLUCOSE-POSITRON EMISSION TOMOGRAPHY/COMPUTED TOMOGRAPHY: ISOLATED MICRONODULES IN DISTANT ADIPOSE TISSUES

Ayat Mouaden¹, Siham Mesmoudi², Imad Ghfir¹ and Hasnae Guerrouj¹

1. IbnSina University Hospital, Faculty of Medicine and Pharmacy of Rabat, Mohammed V University, Rabat.

2. Department of Pathology, Faculty of Medicine and Pharmacy of Rabat, Mohammed V University, Rabat, Morocco.

Manuscript Info

Manuscript History

Received: 12 August 2026

Final Accepted: 14 September 2026

Published: October 2026

Abstract

Recurrence of an initially early breast cancer (EBC) occurring exclusively in subcutaneous adipose tissues without skin or distant organ involvement is uncommon. Such recurrence is challenging to diagnose because of its non-specific clinical presentation and imaging characteristics, yet its identification is essential for optimal patient management. In this context, we report the case of an asymptomatic 41years old patient treated 10 years earlier for early left breast cancer, who presented during follow-up with a slight but continuous increase of CA 15-3 levels. Conventional imaging was negative and initial ¹⁸F-FDG PET/CT demonstrated three micronodules in the subcutaneous fat, located at a distance from the mastectomy scar, showing no metabolic activity and considered indeterminate. Four months later, a follow-up FDG PET/CT performed for persistent elevation of the tumor markers, revealed progression of the subcutaneous nodules, with the appearance of a moderate-to-high FDG uptake, without any other pathological foci. These findings were suggestive of isolated metastatic relapse in the adipose tissue, which was confirmed histologically. This case is reported from a pedagogical perspective to illustrate and raise awareness of a rare pattern of breast cancer relapse on FDG PET.

"© 2026 by the Author(s). Published by IJAR under CC BY 4.0. Unrestricted use allowed with credit to the author."

Introduction:-

Case report:

A 51-year-old woman had presented ten years earlier with a left-sided ductal carcinoma staged IIB (T2N1aM0) according to the World Health Organization classification and the Union for International Cancer Control (8th edition). The primary tumor was Hormone-Receptor positive, Human Epidermal Growth Factor type 2 negative (HR+/HER-). The patient was treated by neoadjuvant chemotherapy followed by mastectomy with axillary dissection, radiotherapy and long-term adjuvant hormone therapy, then declared in complete remission. Follow-up imaging and tumor markers remained normal. After 10years, CA 15-3 increased to 42U/ml (NV: 0-30U/ml). Both contrast enhanced computed tomography (CECT) of the three regions and bone scintigraphy were negative. A 18-

Corresponding Author: Ayat Mouaden

Address: IbnSina University Hospital, Faculty of Medicine and Pharmacy of Rabat, Mohammed V University, Rabat.

fluorine-fluorodeoxyglucose-positron emission tomography/computed tomography (^{18}F -FDG PET/CT) was subsequently performed. It showed low grade lymph nodes in the mediastinum likely related to a recent episode of bronchitis, and three 4 to 5mm micronodules of the adipose tissues, showing no FDG uptake, considered non-specific (Fig 1: A-B-C-D). Four months later, due to persistent tumor marker elevation to 56 U/ml, a second PET/CT was performed and showed structural and metabolic progression of the subcutaneous nodules of the inferior part of the left chest wall, (7 versus 4.5mm), in the neck base (9.1 vs 4.7mm) and the left gluteal fat (6.0 vs 4.0mm), highly uptaking FDG (Standardized uptake value, SUVmax=6.6) (Fig 2: A'-B'-C'-D'). No metastatic involvement was detected in the skin and other usual target organs including lymph nodes, bone, liver and lungs. Brain MRI was negative and excluded brain metastatic recurrence. Histopathology and immunohistochemistry of the chest nodule confirmed breast carcinoma (HR+/HER-) (Figure 3: A-B-C). The patient started targeted therapy with cycline-dependent kinase 4/6 inhibitor (CDK4/6) associated to endocrine therapy by Letrozole 2.5mg/day.

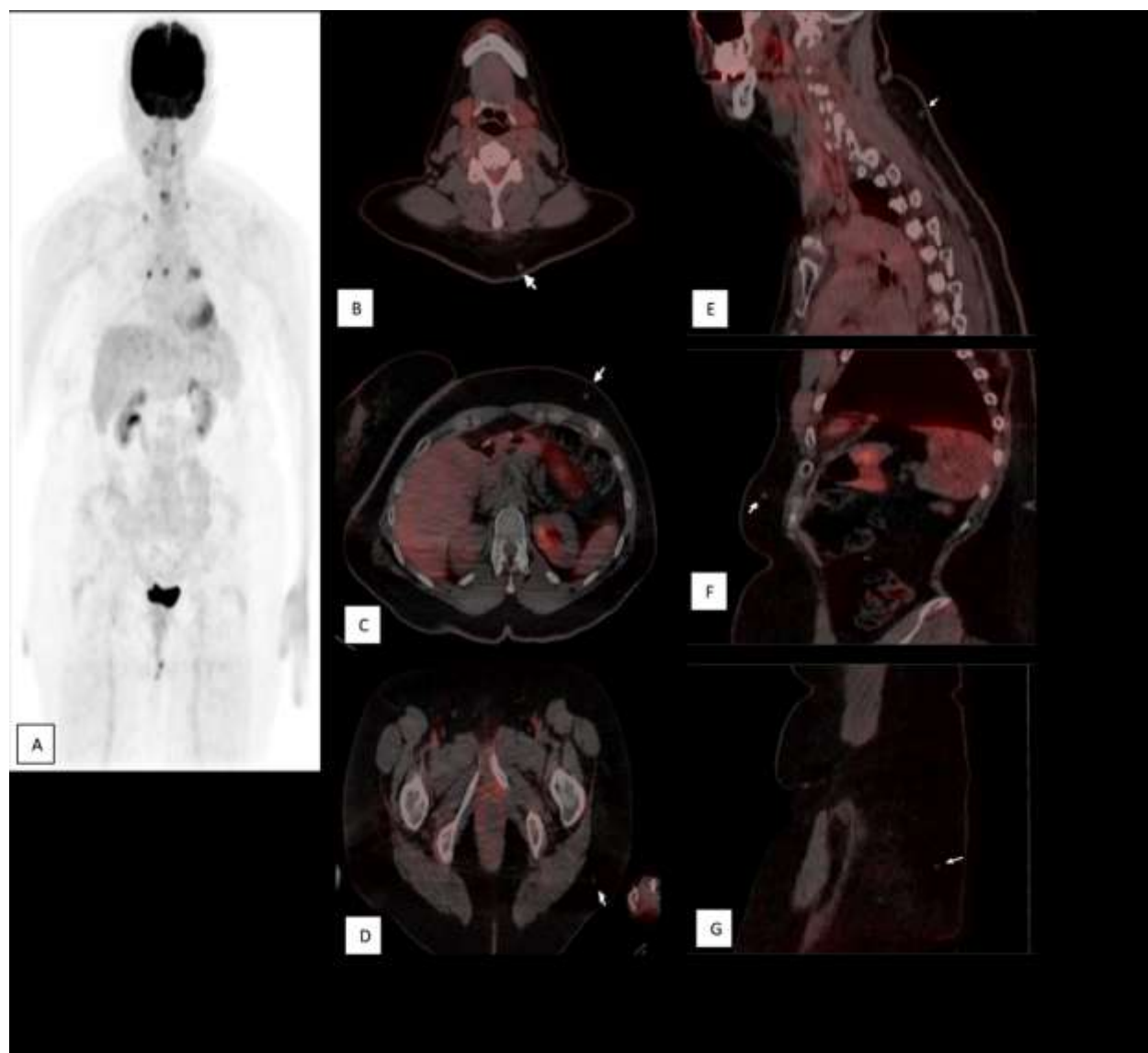


Figure 1: Whole-body FDG PET/CT imaging.

(A) Maximum intensity projection (MIP) demonstrates faint multifocal FDG uptake corresponding to nonspecific infection-related lymph nodes in the mediastinum.

(B-D) Axial fused images at the cervical (B), thoracic (C), and pelvic (D) levels, and corresponding sagittal fused images (E-G), reveal isolated subcutaneous micronodules showing no FDG uptake (White arrows).

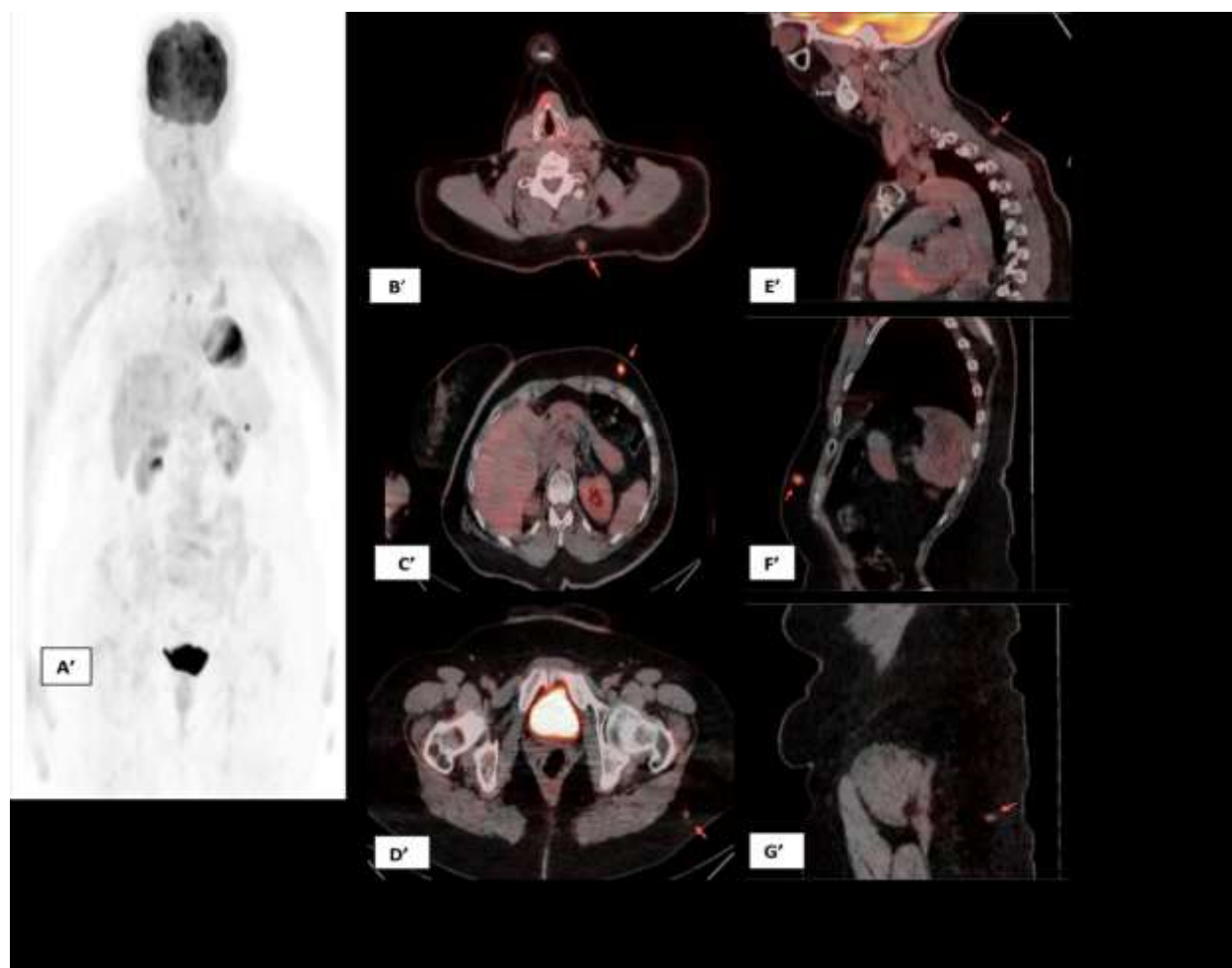


Figure2. Follow-up FDG PET/CT.

(A')MIP demonstrates the newly developed FDG avidity of the previously non-avid lesions.

(B'-D') Axial fused images (cervical, thoracic, pelvic) and corresponding sagittal images (E'-G') demonstrate morphological and metabolic progression of the subcutaneous micronodules, now showing FDG-avidity (red arrows), without skin, lymph node, visceral or bone involvement.

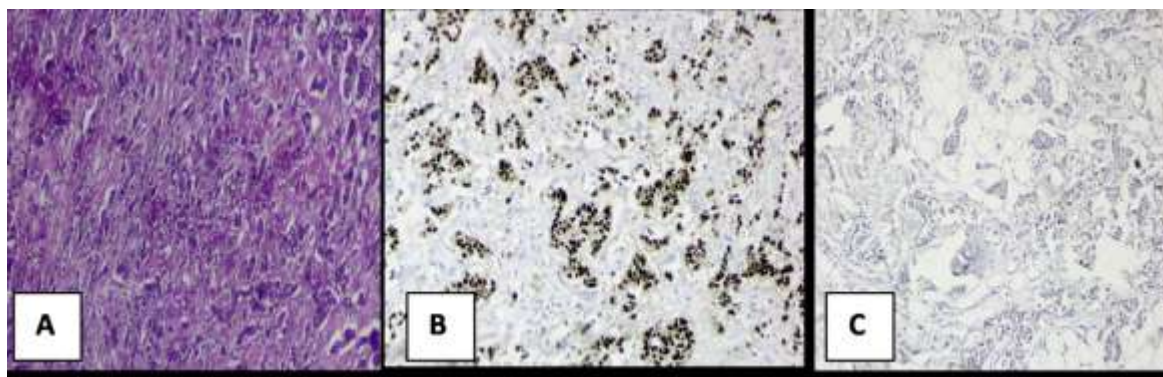


Figure 3. Histopathological and immunohistochemical features of the excised subcutaneous nodule examination demonstrates malignant epithelial cells arranged in nests and trabecular structures (A). Immunohistochemical staining shows strong and diffuse estrogen receptors (ER) (B) and absence of HER2 overexpression (C), consistent with a hormone receptor-positive/HER2-negative phenotype of the breast cancer metastasis.

Discussion:-

As in many countries worldwide, breast cancer remains the most frequently diagnosed malignancy among women in Morocco, with more than 12,000 new cases reported in 2022, and over 4,000 related deaths [1]. The prognosis is particularly unfavorable in patients with advanced-stages disease and/or aggressive histological subtypes, such as triple-negative BC, more prone to metastatic spread. Metastatic dissemination predominantly involves bones, lymph nodes, lungs, and brain, whereas soft-tissue involvement, including skin, fat and skeletal muscle is less frequent, with reported incidence ranging from 0.2 to 0.8% [2]. When present, soft-tissue metastases are typically associated with concurrent locoregional progression and/or dissemination to distant organs, thereby reflecting poor overall prognosis [3]. Isolated adipose metastases are exceptionally rare, possibly due the unfavorable microenvironment of adipose tissue for tumor proliferation, characterized by relatively poor vascularization and the secretion of anti-tumoral factors [4-5].

According to the European Society for Medical Oncology (ESMO) clinical guideline, ^{18}F -FDG PET/CT is recommended for BC survivals in cases of rising tumor markers when conventional imaging findings are inconclusive (6). In this context, reported sensitivity reaches 92.7% in patients with increased CA 15-3 levels (cut-off= 31.3U/ml) but the reported negative predictive value is below 60% [7]. A negative PET/CT may be falsely reassuring such in our patient. This limitation may be related to lesions smaller than 5mm being below the spatial resolution of the machine, resulting in a partial volume effect and underestimating FDG quantifications. We believe this explains the false-negative initial PET/CT in our case. In the absence of systematic recurrence in our patient, the early diagnosis of recurrence confined to the adipose tissues was particularly challenging, as the lesions were structurally nonspecific and FDG-negative, which mimicked benign dermatological origin. This pictorial report serves as a reminder of the need for vigilance in PET/CT interpretation when assessing for possible recurrence. Interpretation should be correlated to tumor marker values. Close monitoring and comparative examinations are recommended whenever findings are doubtful.

Informed Consent: The informed consent of the patient was obtained for the use of anonymized images.

Funding: None

Conflict of Interest: None

Use of artificial intelligence: The authors declare that no generative artificial intelligence was used in the elaboration of this paper.

References:-

1. Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, Jemal A. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2024;74(3):229-263. doi:10.3322/caac.21834, indexed in Pubmed: 38572751
2. Di Micco R, Santurro L, Gasparri ML, Zuber V, Fiacco E, Gazzetta G, et al. Rare sites of breast cancer metastasis: a review. *Transl Cancer Res.* 2019;8 (Suppl 5):S518–S555. <https://doi.org/10.21037/tcr.2019.07.24>, indexed in Pubmed: 35117130
3. Riggio AI, Varley KE, Welm AL. The lingering mysteries of metastatic recurrence in breast cancer. *Br J Cancer.* 2021 Jan;124(1):13-26. doi: 10.1038/s41416-020-01161-4. Epub 2020 Nov 26. PMID: 33239679; PMCID: PMC7782773, indexed in Pubmed: 33239679
4. Zhang S, Chen J, Zhang Y, Xu Z, Ren J, Huang S, Wu Z, Wu J. Axillary fat metastasis in breast cancer: A case report. *OncolLett.* 2025 Jun 26;30(3):412. doi: 10.3892/ol.2025.15158, indexed in Pubmed: 40630712.
5. Booth A, Magnuson A, Fouts J and Foster M: Adipose tissue, obesity and adipokines: Role in cancer promotion. *HormMolBiolClinInvestig* 21: 57-74, 2015, indexed in Pubmed: 25781552
6. Loibl S, André F, Bachelot T, et al. ESMO Guidelines Committee. Electronic address: clinicalguidelines@esmo.org. Early breast cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. *Ann Oncol.* 2024 Feb;35(2):159-182. doi: 10.1016/j.annonc.2023.11.016, indexed in Pubmed: 38101773.
7. Piva R, Ticconi F, Ceriani V, Scalorbi F, Fiz F, Capitanio S, Bauckneht M, Cittadini G, Sambuceti G, Morbelli S. Comparative diagnostic accuracy of ^{18}F -FDG PET/CT for breast cancer recurrence. *Breast Cancer (Dove Med Press).* 2017 Jul 4;9:461-471. doi: 10.2147/BCTT.S111098, indexed in Pubmed: 28740429.