Interesting Image

Mol Imaging Radionucl Ther 2026;35(2):120-122 **DOI:***10.4274/mirt.galenos.2025.98475*

^{68}Ga-PSMA PET/CT Detects a Rare Case of Breast Metastasis from Prostate Cancer

^{68}Ga-PSMA PET/BT ile Prostat Kanserinden Kaynaklanan Nadir Bir Meme Metastazının Tespiti

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Abstract

Positron emission tomography/computed tomography (PET/CT) with Galium-68 prostate-specific membrane antigen (^{68}Ga-PSMA) PET/CT) is a valuable tool for initial staging, recurrence detection, and assessment of treatment response in men with prostate cancer. Metastatic spread to regional and distant lymph nodes, bone, lung and liver is well known and expected in patients with castration-resistant disease. However, the application of a highly sensitive whole-body imaging modality such as ^{68}Ga-PSMA PET/CT can reveal metastatic foci in rare or unusual locations. We present the case of an 82-year-old patient with prostate adenocarcinoma who underwent long-term androgen deprivation therapy. A ^{68}Ga-PSMA PET/CT scan was performed in June 2021 due to significant prostate-specific antigen elevation and revealed disease progression with widespread regional and distant metastases, including a soft-tissue mass in the right breast that demonstrated intense radiotracer uptake; this mass was subsequently resected and histologically confirmed. This case underscores the excellent diagnostic performance of ^{68}Ga-PSMA PET/CT for atypical metastatic sites.

Keywords: Prostate cancer, breast metastasis, ^{68}Ga-PSMA PET/CT

Öz

Gallium-68 prostat spesifik membran antijeni pozitron emisyon tomografisi/bilgisayarlı tomografi (^{68}Ga-PSMA PET/BT), prostat kanseri olan erkeklerde başlangıç evrelemesi, nüks tespiti ve tedavi yanıtının değerlendirilmesi için değerli bir araçtır. Bölgesel ve uzak lenf düğümlerine, kemiğe, akciğere ve karaciğere metastatik yayılım, kastrasyona dirençli hastalığı olan hastalarda iyi bilinen ve beklenen bir durumdur. Bununla birlikte, ^{68}Ga-PSMA PET/BT gibi yüksek hassasiyetli bir tüm vücut görüntüleme yönteminin uygulanması, nadir ve alışılmadık lokalizasyona sahip metastatik odakları ortaya çıkarabilir. Uzun süreli androjen deprivasyon tedavisi gören 82 yaşında bir prostat adenokarsinomlu hastayı sunuyoruz. Haziran 2021'de, prostat spesifik antijen düzeyinde belirgin yükselme nedeniyle ^{68}Ga-PSMA PET/BT taraması yapıldı ve bu tarama, yaygın bölgesel ve uzak metastazlarla birlikte hastalığın ilerlediğini ortaya koydu. Sağ memede yoğun radyoaktif madde tutulumu gösteren bir yumuşak doku kitlesi tespit edildi ve bu kitle daha sonra rezeke edilerek histolojik olarak doğrulandı. Bu olgu, atipik metastaz bölgelerinde bile ^{68}Ga-PSMA PET/BT'nin mükemmel tanısal performansını vurgulamaktadır.

Anahtar Kelimeler: Prostat kanseri, meme metastazı, ^{68}Ga-PSMA PET/BT

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Received: 29.06.2025 **Accepted:** 11.11.2025 **Epub:** 08.01.2026 **Publication Date:** 04.06.2026

Cite this article as: Gaydarov G, Nikolova P, Ilcheva M, Halachev N, Hadzhiyska V. ^{68}Ga-PSMA PET/CT detects a rare case of breast metastasis from prostate cancer. Mol Imaging Radionucl Ther. 2026;35(2):120-122.

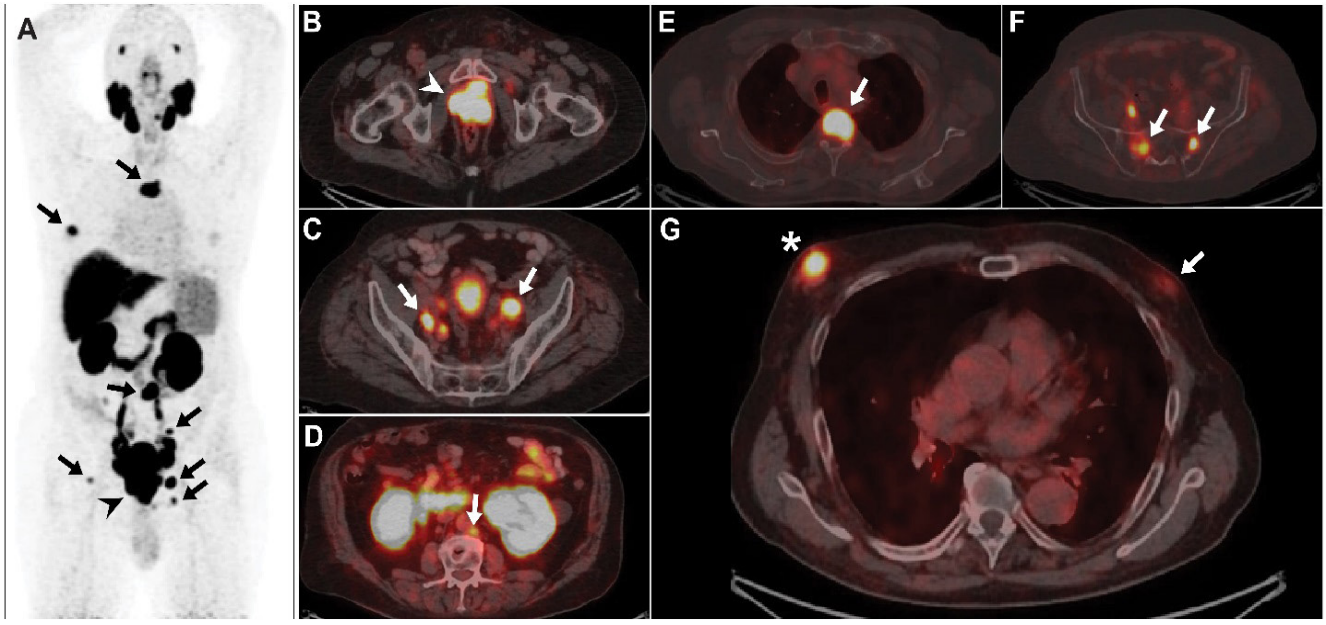

Figure 1. An 82-year-old patient, who had been diagnosed with high-grade prostate adenocarcinoma in November 2014 (then aged 75) with a Gleason score of 8 (4+4) and a pre-biopsy serum prostate-specific antigen (PSA) concentration of 135 µg/L, was admitted to our department for further evaluation. Initial staging with bone scintigraphy and abdominopelvic computed tomography (CT) revealed locally advanced disease, without evidence of regional or distant dissemination. The patient underwent long-term androgen deprivation therapy until June 2021, when he was referred for restaging with Galium-68 prostate-specific membrane antigen (^{68}Ga-PSMA) positron emission tomography (PET)/CT because of a significant PSA elevation (182 µg/L). Prior to the scan, the patient reported a painful right breast lump that he had noticed one month earlier. The scan was performed after obtaining a written consent and in accordance with the standard protocol, 60 min after intravenous administration of 4.5 mCi ^{68}Ga-PSMA-11 (1). Maximum-intensity projection images demonstrated intense PSMA uptake in the prostate gland (A, arrowhead) and in multiple metastatic sites (A, arrows). Fused images revealed an enlarged prostate with lobulated margins and intense PSMA uptake throughout the gland (B, arrowhead). Multiple PSMA-avid parailiac and paraaortic lymph nodes (C and D; arrows) and several bone lesions (E and F; arrows) were identified. Remarkably, there was evidence of a focal soft-tissue lesion in the right breast with intense uptake, measuring 23 × 20 mm in axial diameter (G, asterisk). Increased subareolar glandular tissue with faint activity was also noted in the contralateral left breast (G; arrow). Following the PET/CT, the patient was referred for further evaluation with mammography, which demonstrated benign gynecomastia in the left breast and a lesion with malignant characteristics in the right breast. To definitively exclude a primary breast tumor, the patient was referred for surgical excision of the lesion. Histopathological examination and immunohistochemistry confirmed the presence of breast metastasis from prostate carcinoma. Breast metastases from prostate cancer are uncommon, with only a few cases reported in the literature (2). Long-term hormonal treatment is considered a predisposing factor, often causing gynecomastia and increased breast vascularity, which facilitate hematogenous metastatic spread (3). Kumar Chauhan et al. (4) report a similar case of a patient with metastatic castration-resistant prostate cancer (after surgical castration and anti-androgen therapy) who had a metastasis in the left breast that was also PSMA-positive, considerably larger, and even infiltrated the adjacent chest wall. Previous studies have shown that increased PSMA expression can also occur in benign changes associated with gynecomastia, which may be unilateral or asymmetric (5,6). Synchronous breast cancer should also be considered, given the increased expression of PSMA in the tumor-associated neovasculature of various non-prostatic malignancies. Polverari et al. (7) described a PSMA-avid breast lesion detected on restaging PET/CT that was confirmed histologically as primary male breast cancer. In contrast, their patient presented with an isolated locoregional recurrence after radical prostatectomy (a PSMA-positive para-iliac lymph node) rather than widespread metastatic prostate cancer and had no prior anti-androgen therapy. Our report underscores the excellent diagnostic performance of ^{68}Ga-PSMA PET/CT for the detection of unusual metastatic sites and emphasizes potential pitfalls in the interpretation of such findings.

Ethics

Informed Consent: Informed consent was obtained from the patient for the publication of his anonymized images and relevant clinical information.

Footnotes

Authorship Contributions

Concept: G.G., Design: N.H., V.H., Data Collection or Processing: M.I., N.H., Analysis or Interpretation: P.N., M.I., V.H., Literature Search: P.N., M.I., Writing: G.G.

Conflict of Interest: No conflicts of interest were declared by the authors.

Financial Disclosure: The authors declare that this study has received no financial support.

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