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Correspondence to:

Ki Seok Choo, M.D.
Department of Radiology, Pusan National University Yangsan Hospital, Pusan National University School of Medicine, 20, Geumo-ro, Mulgeum-eup, Yangsan-si, Gyeongnam 50612, Korea.
Tel. +82-55-360-1840
Fax. +82-55-360-1848
E-mail: kschoo0618@naver.com

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Contralateral Internal Mammary Lymphadenopathy Mimicking Metastasis in a Patient with a History of Breast Cancer and Prior Interstitial Mammoplasty by Paraffin Injection: MRI, PET-CT, and Pathological Findings

Kyung Jin Nam¹, Ki Seok Choo¹, Jee Yeon Kim²

¹Department of Radiology, Pusan National University Yangsan Hospital, Pusan National University School of Medicine, Gyeongnam, Korea

²Department of Pathology, Pusan National University Yangsan Hospital, Pusan National University School of Medicine, Gyeongnam, Korea

Foreign body injections into breasts may produce foreign body reactions, fibrosis, and local swelling of involved lymph nodes, which can be misdiagnosed as metastasis or malignancy. Here, the authors report MR imaging, PET-CT imaging, and pathologic findings of contralateral internal mammary lymphadenopathy suspicious of breast cancer metastasis in a 58-year-old woman with history of left breast cancer, and previous interstitial mammoplasty by paraffin injection in both breasts.

Keywords: Paraffin; Lymphadenopathy; Internal mammary lymph nodes; Breast cancer metastasis; Magnetic resonance imaging (MRI); Positron emission tomography-computed tomography (PET-CT)

INTRODUCTION

Foreign body injections into breasts may produce local swelling of involved lymph nodes, which may be misdiagnosed as metastasis or malignancy (1). Contralateral internal mammary paraffin lymphadenopathy, mimicking breast cancer metastasis has not been described. Here, we report the case of a 58-year-old woman with history of interstitial mammoplasty via paraffin injection in both breasts, that presented with contralateral internal mammary lymphadenopathy, suspicious of breast cancer metastasis by magnetic resonance imaging (MRI) and positron emission tomography-computed tomography (PET-CT).

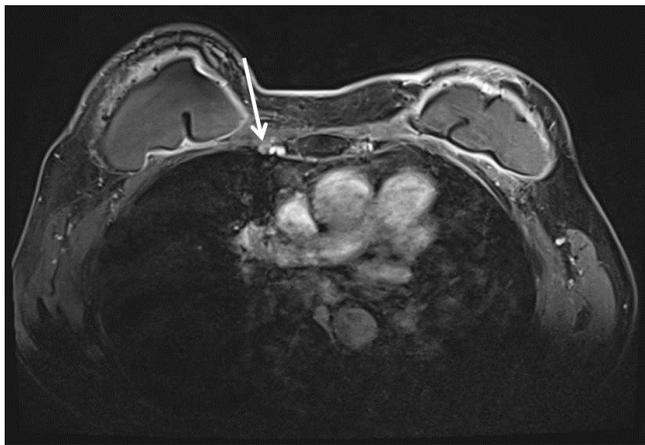
CASE REPORT

The 58-year-old woman concerned had history of liquid paraffin injection in both

breasts 10 years previously, and had been diagnosed 2 years previously with left breast cancer and undergone left skin-sparing mastectomy, and left axillary lymph node dissection. Following complete tumor removal, bilateral breast reconstruction with submuscular silicone implants was performed. During surgery, most paraffinoma in both breasts was removed. Histopathological report of the left breast was invasive ductal carcinoma, not otherwise specified, of Bloom-Richardson grade 3, and 17 of 25 lymph nodes showed macrometastasis with extracapsular extension. TNM staging was pT₂N₃M_x, and after surgery, she received adjuvant chemotherapy.

She was followed routinely by her oncologist for 2 years, with no evidence of breast cancer local recurrence or metastasis. However, she underwent breast MRI during

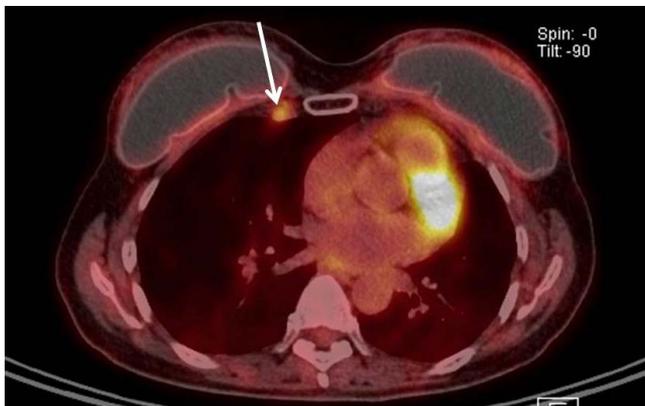
routine follow-up a month prior to this presentation. Axial contrast-enhanced T1-weighted breast MR images showed two abnormally enlarged lymph nodes (0.8-cm and 1.0-cm) at the right first and third intercostal spaces (Fig. 1a, b). PET-CT was performed for further evaluation, and axial images showed increased ¹⁸F-fluorodeoxyglucose (FDG) uptake, confined to the same right internal mammary lymph nodes not observed in pre-operative PET-CT scan (Fig. 1c, d). SUV max values of two enlarged nodes were 1.6 and 3.2, respectively, and both were suspicious for breast cancer metastasis based on MRI and PET-CT findings. Nodes were not accessible by imaging guided percutaneous techniques, and thus, biopsy was performed by single-port video-assisted thoracoscopy. Biopsy specimen showed drained lipid droplets into the lymph node. Multiple empty spaces



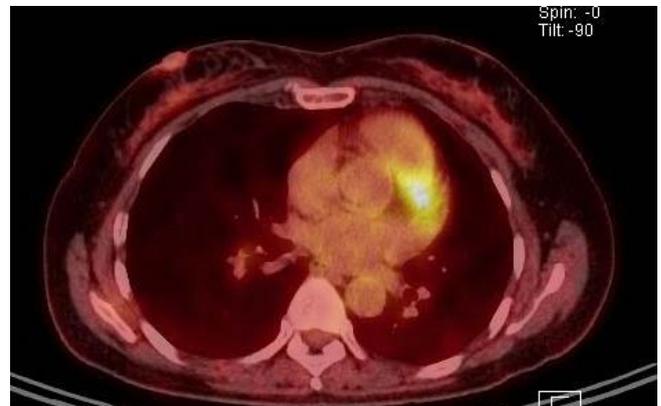
a



b



c



d

Fig. 1. A 58-year-old woman with history of left breast cancer, and previous interstitial mammoplasty via paraffin injection in both breasts. (a, b) Axial contrast-enhanced T1-weighted breast MR images showing two enlarged lymph nodes (0.8-cm and 1.0-cm) at the right first, and third intercostal spaces (arrows). (c) Axial PET-CT image showing increased FDG uptake, confined to the same right internal mammary lymph nodes (arrow). (d) Pre-operative axial PET-CT image at the same anatomical level as in (c) showing no FDG uptake.

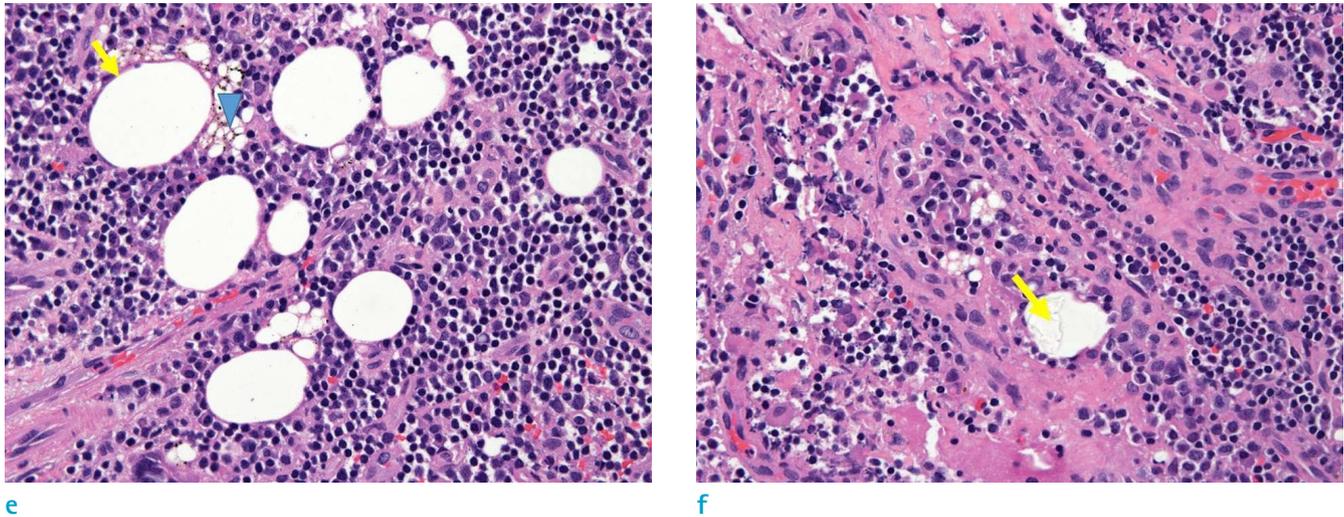


Fig. 1. (e) Photomicrograph of histopathological specimen showing drained lipoid droplets, into the lymph node. Multiple empty spaces show a relatively thick and fibrotic wall (arrow). Macrophages with microvesicles, are also dispersed in the lymph node (arrowhead) (Hematoxylin & Eosin staining, $\times 400$). (f) Photomicrograph of histopathological specimen, showing refractile material in empty cystic spaces (arrow) (Hematoxylin & Eosin staining, $\times 400$).

containing fragments of refractile unstained material, showed a relatively thick and fibrotic wall. Macrophages with microvesicles were also dispersed in the lymph node (Fig. 1e, f). The picture was consistent with pathology of paraffin lymphadenopathy.

DISCUSSION

Interstitial mammoplasty by liquid paraffin injection, was used in the early 1900s until silicone was introduced (2). However, this method had serious complications, including local granulomatous reactions, material-induced mastitis, foreign body reactions, fibrosis, material migration, and autoimmune reactions (3). In addition, liquid paraffin was reported to interfere with physical examinations, mammography, and ultrasonography (4, 5). Dynamic contrast enhanced MR imaging is a reliable imaging modality, in patients with foreign body injection (6).

Contralateral internal mammary silicone lymphadenopathy, as a complication of breast prosthesis implantation, has been described twice in literature (7, 8).

This case demonstrates that in a patient with disrupted lymph drainage due to prior mastectomy and axillary node dissection for breast cancer, paraffin particles in breast parenchyma can migrate to internal mammary lymph nodes that imitate cancer metastasis. Although FDG positive lesions have high likelihood of harboring

malignancy, false-positive uptake is not uncommon, and differential diagnosis of such lesions includes infection, inflammation, and granulomatous, including foreign body, related changes (9). Lymphadenopathy in patients with history of breast cancer raises concern of recurrence, and warrants prompt evaluation to prevent delays in diagnosis and treatment. Enlarged internal mammary nodes present a diagnostic challenge, due to interference by foreign body granuloma induced by paraffin injection on ultrasound, inaccessibility, and sample errors associated with imaging guided percutaneous needle biopsy (1). Video-assisted thoracoscopy provides reliable means of achieving accurate diagnosis.

In conclusion, we report a rare case of contralateral internal mammary paraffin lymphadenopathy suspicious of breast cancer metastasis, in a patient with history of breast cancer and previous interstitial mammoplasty by paraffin injection in both breasts.

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