CASE REPORT

Multiple bone metastases detected 10 years after mastectomy with silicone reconstruction for DCIS and contralateral augmentation

Ryutaro Mori & Yasuko Nagao
Department of Breast Surgery, Gifu Prefectural General Medical Center, 4-6-1, Noishiki, Gifu, 500-8717, Japan

Correspondence
Ryutaro Mori, Department of Breast Surgery, Gifu Prefectural General Medical Center, 4-6-1, Noishiki, Gifu 500-8717, Japan. Tel: +81-58-246-1111; Fax: +81-58-248-3805; E-mail: r-mori@wj8.so-net.ne.jp

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Key Clinical Message

The patient developed multiple bone metastases following mastectomy with silicone reconstruction and contralateral augmentation for ductal carcinoma in situ (DCIS) of the breast. She was diagnosed with contralateral invasive cancer. Distant metastasis of DCIS is rare, and other metastatic origins must be screened. However, screening of augmented breasts is difficult.

Keywords
Bone metastases, breast augmentation, DCIS

Introduction

Distant metastasis of ductal carcinoma in situ (DCIS) of the breast is extremely rare. Other metastatic origins should be investigated in such situations. Meanwhile, contralateral invasive breast cancer is not rare compared with distant metastasis. However, in cases of contralateral augmentation, screening for contralateral breast cancer is difficult.

Case Report

The patient was a 54-year-old woman with a history of right mastectomy and axillary node dissection performed 10 years earlier at another hospital. She had also undergone ipsilateral reconstruction with a silicone implant and contralateral breast augmentation the following year. The pathological diagnosis of the surgical specimen was high-grade DCIS, presenting as negative for the estrogen receptor (ER) and positive for the progesterone receptor (PgR). Ten years after the first operation, the patient was presented with pantalgia and visited the internal medicine division of our hospital. An examination revealed a temperature of 40°C and tenderness in the patient’s chest, lumber area, and shoulders without neurologic symptoms. Her family and social history was unremarkable. A blood test revealed an elevated C-reactive protein (CRP) level of 18.07 mg/dL, increased white blood cell (WBC) count of 11,400, and elevated ferritin and procalcitonin levels; however, the physician was unable to find the focus of the inflammation. An autoimmune disease was suspected, and autoantibodies were investigated, although none was detected. The preliminary diagnosis was polymyalgia rheumatica, and 15 mg of prednisolone was administered.

In December of that year, an elevated alkaline phosphatase (ALP) level of 727 IU/L was detected, and bone scintigraphy was performed under suspicion of bone metastasis of cancer. The findings revealed multiple areas of abnormal uptake in the bilateral ribs, thoracic vertebrae, lumbar vertebrae, and right sacroiliac articulation (Fig. 1A). Based on these results, the physician consulted our division. The patient appeared to have multiple bone metastases of cancer. However, the diagnosis of the breast cancer resected 10 years earlier was DCIS, and distant metastasis of this type of cancer is extremely rare. Therefore, we performed breast magnetic resonance imaging (MRI) and positron emission tomography-computed...
Positron emission tomography-computed tomography (PET/CT) revealed abnormal accumulation of fluorodeoxyglucose (FDG) in the contralateral breast as well as multiple bone metastases (Fig. 2A). Breast MRI revealed a nondistinctive enhanced lesion in the left C portion that was not apparent to the radiologist (Fig. 2C). Repeat US of the breast revealed an obscure nonmass lesion in the same site (Fig. 2B).
A core needle biopsy targeting the contralateral lesion was performed, and the pathological diagnosis was invasive ductal carcinoma, which was positive for ER, negative for PgR, and negative for HER2 overexpression (Fig. 3 A–D).

Anastrozole and denosumab were administered based on the pathological diagnosis of the contralateral lesion. Four months later, the multiple areas of abnormal uptake on bone scintigraphy were considerably decreased (Fig. 1B).

The histology of the previous right breast cancer was reviewed, which revealed negative findings for both ER and PgR and no microinvasion, as evaluated according to anti-SMMS1 antibodies (Fig. 3B). Therefore, the previous right breast cancer appeared to differ from the newly developed left breast cancer.

Discussion

Ductal carcinoma in situ (DCIS) of the breast represents neoplastic lesions confined to the breast ducts and lobules. Its diagnosis has increased in association with the introduction of breast cancer screening mammography. Because patients with DCIS theoretically have no distant metastases, the primary treatment measure for DCIS is surgical resection, and such patients have an excellent prognosis. For example, the 8-year distant metastasis-free rate after mastectomy is 99.1% [1]. Meanwhile, the occurrence of contralateral breast cancer after initial therapy for DCIS is not rare compared with distant metastasis. According to the results of the NSABP-24 and UK/ANZ trials, the cumulative incidence of contralateral invasive cancer is 7.3% (15 years, based on the NSABP-24 trial) and 2.7% (10 years, based on the UK/ANZ trial)(without tamoxifen) [2,3].

Recently, breast enlargement surgery has become popular, and the incidence of breast cancer has increased worldwide. Therefore, the incidence of breast cancer in augmented females is increasing [4]. The risk of breast cancer, breast cancer mortality, and the size of the detected cancer in augmented females are similar to that observed in females without augmentation [5]. However, the characteristics of females who have undergone initial treatment for breast cancer are different from those of the general population. Females who have undergone initial treatment are examined at least annually for contralateral breast cancer, and detected breast cancer in these patients is expected to be smaller than that observed in the general population. Handel et al. [4] reported that the mean size of detected breast cancer is 23.3 mm in
augmented females and 23.3 mm in nonaugmented females. Meanwhile, Hofvind et al. [5] reported that the mean size of cancers detected during screening is approximately 14 mm. The size of contralateral breast cancers is similar to the size of cancers detected during screening. However, no studies have reported that breast cancers in the augmented contralateral breast are detected at a similar size to cancers detected during screening.

Whether the use of breast MRI in augmented females contributes to the early detection of breast cancer remains unclear. The U.S. Food and Drug Administration (FDA) recommends regular breast MRI examinations for augmented females. However, the purpose of such examinations is not to detect breast cancer, but to screen for silicone implant rupture [6]. In our case, breast MRI revealed a contralateral nonmass lesion; however, the radiologist was unable to identify this finding. We would not have detected the lesion on breast MRI if there were no findings of abnormal accumulation in the contralateral breast on PET/CT. Because siliconomas sometimes mimic cancer [7], the imaging findings may be interpreted to reflect nonmalignant lesions.

Recently, a report of a meta-analysis of observational studies of breast cancer detection and survival among females with cosmetic breast implants was published, which found that females with cosmetic breast implants who develop breast cancer develop nonlocalized breast tumors more frequently than females without implants. Moreover, cosmetic breast implants adversely affect breast cancer–specific survival following the diagnosis of the disease [8].

**Conclusion**

If distant metastases emerge following initial therapy for DCIS, screening for contralateral breast cancer and other metastatic origins should be performed. Moreover, detecting early breast cancer in augmented females is difficult. Therefore, contralateral augmentation should be performed cautiously.

**Conflict of Interest**

None declared.

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