

Breast cancer local recurrence after mastectomy with immediate latissimus dorsi myocutaneous flap reconstruction: A case report

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Wataru Shinzaki¹, Hironobu Manabe¹, Michiyo Kubota¹, Hiroki Inui¹, Toshiya Hojo¹, Toshikazu Ito¹, Yoshihito Itani² and Yoshifumi Komoike¹

Abstract

Even though most local recurrences after autologous breast reconstruction occur in superficial tissue, they also occur in deep tissue in the reconstructed breast. A 49-year-old woman presented with a bloody discharge from the right nipple. Ultrasonography revealed a hypoechoic area in her right breast, which was diagnosed as ductal carcinoma in situ on histopathology. We performed nipple-sparing mastectomy and immediate reconstruction of the breast with a latissimus dorsi myocutaneous flap. At 6 years postoperatively, the patient presented with a palpable mass. Ultrasonography revealed a solid mass lesion subcutaneously in the right breast. Computed tomography revealed multiple enhanced solid mass lesions in the subcutaneous and deep tissues of the reconstructed breast. The mass in the deep tissue of the reconstructed breast was diagnosed as an invasive micropapillary carcinoma by biopsy. For local recurrence, we performed wide excision of the reconstructed breast. The masses in the subcutaneous and deep tissues of the reconstructed breast were diagnosed as invasive micropapillary carcinoma. Superficial recurrence was first detected by physical examination, and deep recurrence was later detected with further imaging. We present a case of local recurrences that occurred in the deep tissue, in addition to superficial tissue of the reconstructed breast.

Keywords

Surgery, breast cancer, local recurrence

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Introduction

As the breast cancer rate has risen nationally, the rate of breast reconstruction has also increased.^{1,2} Approximately 63% of patients undergoing mastectomy undergo some form of reconstruction, with an estimated rate of 25%–50% in choosing the autologous type.³ Studies have shown that most local recurrences occur in the superficial tissue of the reconstructed breast and are clinically detected by physical examination.⁴ Rarely, local recurrences occur in the deep tissue of the reconstructed breast.⁵ We present the case of a patient with multiple local recurrences localized within the superficial and deep tissues of the breast reconstructed with a latissimus dorsi myocutaneous flap.

Case

A 49-year-old woman visited our hospital with a bloody discharge from the right nipple. The patient had a history of

topical treatment for atopic dermatitis, but did not have a history of surgery or family history of breast cancer. Ultrasonography (US) revealed a hypoechoic area in the lateral region of the right breast, which was diagnosed as ductal carcinoma in situ (DCIS) using vacuum-assisted biopsy (Figure 1(a)). Magnetic resonance imaging (MRI) revealed wide enhanced lesions in the lateral region of the right breast, with a maximum diameter of 76 mm (Figure 1(b)).

¹Division of Breast and Endocrine Surgery, Department of Surgery, Faculty of Medicine, Kindai University, Osakasayama City, Japan

²Department of Plastic and Reconstructive Surgery, Faculty of Medicine, Kindai University, Osakasayama City, Japan

Corresponding Author:

Wataru Shinzaki, Division of Breast and Endocrine Surgery, Department of Surgery, Faculty of Medicine, Kindai University, 377-2, Ohnohigashi, Osakasayama City 589-8511, Osaka, Japan.

Email: shinzaki@med.kindai.ac.jp



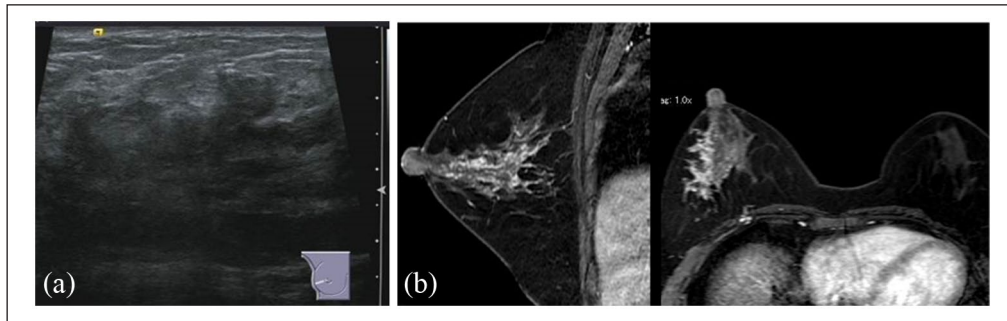


Figure 1. (a) Ultrasonography shows a hypoechoic area in the lateral region of the right. (b) Magnetic resonance imaging shows enhanced lesions in the lateral region of the right breast.

The tumor-to-nipple distance (TND) was 1.5 cm, but there were no signs of peri-areolar skin thickening enhancement of the nipple on MRI. Distant metastases were not observed on contrast-enhanced computed tomography (CT). We performed surgery for DCIS of the right breast. Nipple-sparing mastectomy and immediate reconstruction of the right breast with a latissimus dorsi myocutaneous flap were performed. We performed mastectomy because the lesion was observed very extensively lateral of the right breast, and we preserved the right nipple with mastectomy because there were no signs of malignancy in the nipple on preoperative physical examination and MRI findings. A retroareolar imprint cytology was intraoperatively examined and confirmed to be negative. Sentinel lymph node biopsy with one-step nucleic acid amplification was performed intraoperatively, and there was no lymph node metastasis. Postoperatively, the patient was hospitalized for 21 days without complications. Histopathological examination revealed DCIS with comedo necrosis, with no involvement of the margins. A retroareolar tissue was negative for malignancy at the final examination. Immunohistochemical scoring for estrogen receptor (ER) and progesterone receptor (PgR) was performed according to the Allred score.⁶ ER and PgR staining intensity was recorded in a four-step scale (0–3) and the proportion of stained cells was divided into six categories (0–5 points). The intensity and proportion scores were added, which yielded the Allred score (0–8 points). The sample with a score ≥ 3 points was regarded as having a positive hormone receptor. In this case, immunohistochemical staining showed strong positivity for ER and PgR (both Allred scores were of 8 points) and was negative for HER2 with a score of 0 points. Tumor, node, and metastasis (TNM) classification was of Stage 0 (TisN0M0). Adjuvant endocrine therapy after mastectomy for hormone receptor-positive DCIS is not performed at our institution because it does not affect prognosis. Therefore, the patient did not receive adjuvant therapy. As a postoperative follow-up examination, physical examination was performed every 3 months during the first year and every 6 months after the second year. In addition, US and contralateral mammography were performed once a year.

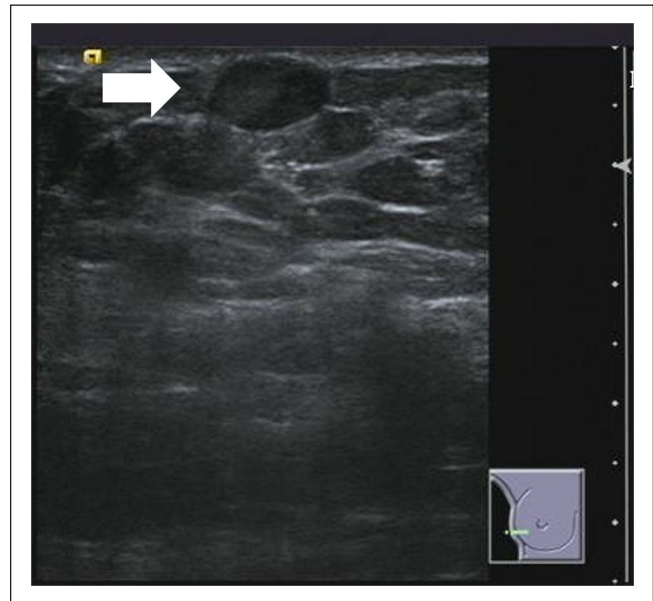


Figure 2. Ultrasonography shows a solid mass lesion subcutaneously in the lateral region of the right breast.

However, 6 years after the primary surgery, the patient visited our hospital with a palpable mass in the skin of the right breast. Physical examination of the breast revealed a palpable mass, 1.0 cm in diameter, in the lateral site of the right breast. US revealed a solid subcutaneous mass lesion in the lateral region of the right breast. The largest diameter of the mass was 1.0 cm, and it had a smooth surface (Figure 2). The mass was diagnosed as positive by fine-needle aspiration cytology. CT revealed multiple enhanced solid mass lesions in the subcutaneous and deep tissues of the reconstructed breast (Figure 3(a)). On second-look US, the mass in the deep tissue of the reconstructed breast was 1.2 cm in diameter (Figure 3(b)). The mass in the deep tissue of the reconstructed breast was diagnosed as an invasive micropapillary carcinoma (IMPC) by core-needle biopsy. Although CT showed mild swelling of the right axillary lymph node, fine-needle aspiration cytology was not performed. Distant metastases were not observed on CT or bone scintigraphy.

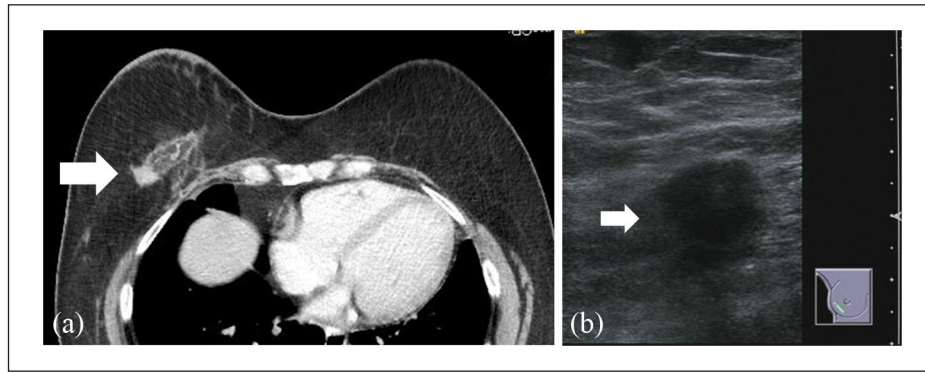


Figure 3. (a) Contrast-enhanced computed tomography shows enhanced solid mass lesions in the deep tissue in addition to the superficial tissue of the reconstructed breast. (b) Second-look ultrasonography shows the mass in deep adipose tissue of the reconstructed breast.

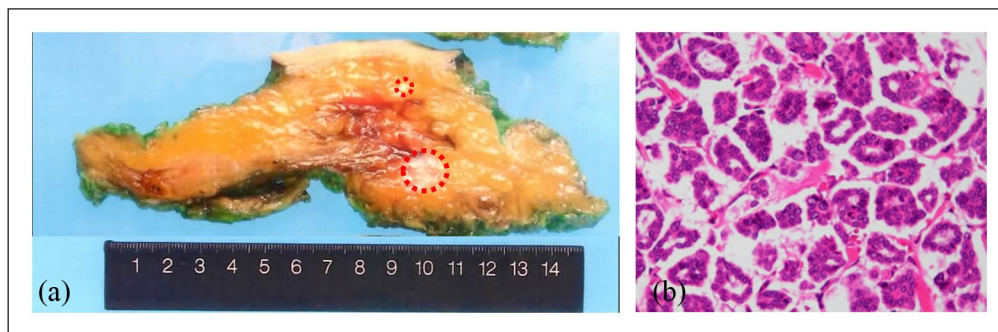


Figure 4. (a) Histopathological findings. The macroscopic image shows multiple tumors localized within the superficial and deep adipose tissues of the reconstructed breast (red dotted circle). (b) The microscopic image of the deep tumor shows tumor cells exhibiting typical features of IMPC separated by a mesh-like stroma (H&E staining, $\times 40$).

Salvage surgery was performed for local recurrence in the reconstructed breast. Wide excision of the reconstructed breast was performed and the latissimus dorsi myocutaneous flap was removed. Right axillary lymph node sampling was performed to evaluate ipsilateral axillary lymph node metastasis. No lymph node metastasis was observed.

Macroscopically, the tumor was localized within the superficial and deep adipose tissues of the reconstructed breast (Figure 4(a)). Histopathology of a deep tumor identified IMPC with a tumor diameter of 1.5 cm (Figure 4(b)). The histological grade score was 2 (tubular forming score, 3; nuclear atypia score was 2, and mitotic score, 1) points, with lymphatic invasion, but no vascular invasion. The superficial tumors had similar histopathology. In this case, immunohistochemical staining showed strong positivity for ER and PgR (both Allred score, 8 points). Furthermore, negative results were observed for HER2 with a score of 0 points, and 18.4% of cells showed positive Ki-67 staining. The TNM classification at the time of recurrence was T1N0M0 Stage 1. Since biological profiling classified the tumor as luminal B type, tri-weekly docetaxel, cyclophosphamide, and endocrine therapy were administered as adjuvant therapies. No local recurrence was observed at 6 months after secondary surgery.

Discussion

The indications for nipple-sparing mastectomy in our institution are significant extension of cancer compared with breast volume, multicentric disease, and patient preference. Patients with a clinically normal nipple and no skin involvement are considered for nipple-sparing mastectomy. A retroareolar margin is microscopically examined by imprint cytology intraoperatively. The nipple-areola complex (NAC) is preserved if the shape, color, and palpated features of the nipple are normal and if the retroareolar ducts are confirmed to be tumor-free in the imprint cytology. TND as a risk factor for NAC involvement and recurrence in nipple-sparing mastectomy has been debated. Frey et al.⁷ reported that a short TND is a significant predictor for nipple involvement, and they recommended TND cutoffs of 1 or 2 cm for the selection of appropriate nipple-sparing mastectomy candidates. Conversely, Wu et al.⁸ suggested that nipple-sparing mastectomy can be a feasible surgical option even for DCIS with a TND of ≤ 1 cm, if the retroareolar resection margin is negative for malignancy. In this case, although nipple discharge was observed at first visit and the TND was approximately 1.5 cm, we decided to preserve the nipple because there were no signs of malignancy in the nipple on

preoperative physical examination and MRI findings. The retroareolar ducts were confirmed to be negative in the intraoperative imprint cytology, and the retroareolar tissue was negative for malignancy at the final pathology. Moreover, histopathological diagnosis at the time of recurrence also showed no recurrence in the nipple and peri-nipple tissue. Heinzen et al.⁹ reported that the intraoperative evaluation of the retroareolar margin imparts high accuracy in the prediction of retroareolar margin involvement, and frozen section examination was more accurate than cytology. Intraoperative examination of frozen sections may offer an alternative to cytology for evaluating the retroareolar margin while performing nipple-sparing mastectomy at our institution.

Local recurrence rates after autologous breast reconstruction range from 2% to 7%, which are similar to those of mastectomy alone.^{4,10,11} Previous studies investigating pure DCIS have reported low local recurrence rates of 4.0%–5.3% after nipple-sparing mastectomy and immediate reconstruction.^{8,12} Most previous reports have focused on transverse rectus abdominis myocutaneous (TRAM) flap reconstruction because of its wide acceptance as a standard method for autologous breast reconstruction. In this case, a latissimus dorsi myocutaneous flap was used for autologous breast reconstruction.

Most local recurrences of breast cancer in reconstructed breasts occur at the level of the skin.^{4,5} In the present case, local recurrence occurred in the deep tissue of the reconstructed breast, in addition to the superficial tissue of the reconstructed breast. There are few reports of multiple local recurrences in reconstructed breast tissue. Patterson et al.⁵ reported that 2 (11.1%) of the 28 locoregional recurrences had multiple recurrences in TRAM reconstruction.

Many local recurrences after autologous reconstruction following mastectomy were detected by physical examination since most of them occur in the skin and superficial tissues. Wu et al.¹⁰ reported that all local recurrences ($n=11$) were detected by physical examination. Local recurrences in this case occurred 6 years after index reconstruction, which is consistent with previously published studies describing a range of a few months to 8 years.^{4,10,11} Superficial recurrence of the reconstructed breast in this case was detected by physical examination.

MRI revealed a wide range of malignant lesions in the lateral region of the reconstructed breast. Wu et al.¹¹ reported that the multifocal tumor type was associated with a high rate of local recurrence. There is often more widespread multifocal disease with separate DCIS foci away from the primary lesion than in invasive ductal carcinoma (IDC).¹³ This observation emphasizes the importance of removing all breast tissue during mastectomy since the residual parenchyma may contain another focus of DCIS. Recurrences after mastectomy for pure DCIS have been reported, all of which were IDC.¹⁴ DCIS had been left behind or within residual tissue after mastectomy, further DCIS had developed, and the absence of radiological follow-up allowed

invasive foci to supervene. The local recurrence in our case report was IMPC. These may have coexisted pathologically with DCIS at the first surgery and may have been left behind after mastectomy.

There is still no agreement regarding the surveillance of patients who have undergone mastectomy followed by autologous reconstruction because there is currently no accepted standard of care for routine post-reconstruction imaging.¹⁵ The majority of studies have reported local recurrence in autologous breast reconstruction by clinical examination, chiefly as palpable masses or nodularity along the scar or skin flap.^{5,10} However, recurrence in the deep tissue of the reconstructed breast may be difficult to detect using palpation alone. Noroozian et al.¹⁶ examined surveillance after mastectomy and autologous breast reconstruction, and suggested that screening mammography may be a useful adjunct surveillance tool. They showed that the overall cancer detection rate in women who underwent autologous breast reconstruction after cancer (1.5%) was similar to that of age-matched women in the screened population (1.1%). Local recurrence is initially detected by surveillance mammography, which illustrates that mammography can detect a nonpalpable lesion after TRAM reconstruction.⁵ In this case, local recurrence in the deep tissue may also have been initially detected if mammography screening was performed on the reconstructed breast. US is a widely available and relatively inexpensive imaging method that has no radiation hazards and enables biopsy under image guidance. Although there are no evidence-based guidelines for US screening in postoperative patients, several studies have demonstrated the additional benefits of US.¹⁷ US plays a crucial role in the detection of recurrent lesions after breast cancer surgery, especially in patients who present with a nonpalpable chest wall.¹⁸ Based on these results, screening mammography or US may be useful adjunct surveillance tools after mastectomy and autologous breast reconstruction for cancer. CT does not have a role in screening for locoregional recurrence, as it is expensive and involves significant radiation exposure. MRI is more sensitive and better in detecting cancer recurrences in the early stages, but no evidence is available that proves the superiority of MRI versus mammography in routine follow-up for all patients.

Local recurrence after mastectomy rarely occurs in deep tissues of the reconstructed breast. Here, superficial recurrence was first detected by physical examination, and deep recurrence was later detected with further imaging examinations. The detection time of a deep recurrence was almost double that of the time to detect superficial recurrence.⁵ Moreover, deep/chest wall recurrence is strongly associated with metastasis, and generally results in poorer survival.¹⁹ The early detection of local recurrence in the deep tissue of the reconstructed breast may enable the long-term survival of patients. Patients at a high risk of local recurrence after mastectomy and autologous breast reconstruction may benefit from surveillance imaging of the chest wall with mammography or US.

Conclusion

In this case, local recurrences occurred in the deep tissue, in addition to the superficial tissue of the reconstructed breast. Although physical examination is important for detecting local recurrences, the routine addition of surveillance imaging may provide better imaging of the deep chest wall for patients after mastectomy and autologous breast reconstruction, especially for patients at high risk of local recurrence.

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Author contributions

W.S. wrote the manuscript and performed all breast cancer surgery in this case, in which Y.K. assisted and instructed. Y.I. performed plastic surgery operation which was mentioned in this report and supervised this manuscript from the point of plastic surgery. H.M., M.K., H.I., T.H., and T.I. supervised this manuscript from the point of oncology and breast surgery. All authors read and approved the final manuscript.

Declaration of conflicting interests

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Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

Informed consent

Written informed consent was obtained from the patient for publishing anonymized information to this article.

ORCID iD

Wataru Shinzaki  <https://orcid.org/0000-0002-3914-9799>

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