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A Case of Stage IV Breast Cancer Undergoing Surgery for Local Control after Developing a Breast Abscess during Chemotherapy

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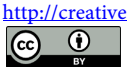

Abstract

We report a case of a 47-year-old woman who presented with a left breast mass and bloody nipple discharge. Work-up revealed triple-negative breast cancer with liver metastases, staged T3N1M1 (stage IV). Systemic chemotherapy with bevacizumab and paclitaxel was initiated approximately 1 month after the first presentation. After four cycles, the primary tumor regressed (42% reduction in target lesion size per RECIST 1.1) and metastatic lesions remained stable; however, a breast abscess developed ~6 months after treatment initiation. Pus culture grew *Staphylococcus aureus* (methicillin-susceptible). Empirical piperacillin-tazobactam was initiated and later changed to cefazolin according to sensitivity testing. Despite 3 weeks of therapy and repeated drainage, infection persisted, causing severe pain, continuous purulent discharge, and a marked decline in quality of life (QOL). Therefore, total mastectomy with level I - II axillary dissection was performed through an elliptical incision encompassing the ulcerated skin, achieving negative margins and adequate drainage. Postoperative radiotherapy was given at 3 months post-surgery, and systemic chemotherapy was resumed at 4 months. The patient maintained progression-free survival for ~16 months after surgery but ultimately died from brain metastasis ~18 months postoperatively. This case illustrates that, in stage IV disease complicated by uncontrolled local infection, palliative surgery for local control can restore systemic-therapy feasibility and improve QOL.

Keywords

Stage IV Breast Cancer, Triple-Negative, Breast Abscess, Palliative Mastectomy, Local Control

1. Introduction

The Japanese Breast Cancer Society Clinical Practice Guidelines 2022 do not recommend primary-tumor resection to improve survival in stage IV breast cancer; nevertheless, surgery may be considered for symptomatic relief or local control when bleeding, ulceration, infection, or malodor substantially impairs quality of life (QOL) [1]. We describe a patient with de novo stage IV triple-negative breast cancer who developed a refractory breast abscess during chemotherapy, in whom palliative mastectomy enabled infection control and resumption of systemic therapy.

2. Case Presentation

A 47-year-old woman presented with a palpable left breast mass and bloody nipple discharge. She had no significant comorbidities; family history was notable for pancreatic cancer (father) and Hodgkin's lymphoma (brother). Examination revealed an irregular, firm ~4 cm mass in the upper-outer quadrant of the left breast. The tumor in the inframammary fold had ulcerated and was exposed with necrotic tissue. Multiple cutaneous metastases were also observed in the surrounding skin (**Figure 1**). Serum tumor markers were CEA 119 ng/mL and CA15-3 23 U/mL. Core-needle biopsy confirmed triple-negative invasive carcinoma (**Figure 2**). Staging imaging showed multiple liver lesions, and the disease was classified T3N1M1 (stage IV). At that time (2019), bevacizumab plus paclitaxel was an accepted first-line regimen for metastatic TNBC in Japan. Checkpoint inhibitors such as atezolizumab were not yet approved or reimbursed domestically, and PD-L1 testing was unavailable; therefore, immunotherapy was not considered.

Figure 1. The tumor in the inframammary fold had ulcerated and was exposed with necrotic tissue. Multiple cutaneous metastases were also observed in the surrounding skin.

Figure 2. Contrast-enhanced chest CT revealed multiple intramammary metastases. The primary tumor showed almost regression.

Approximately 1 month after presentation, systemic chemotherapy with bevacizumab (q2w) and paclitaxel (weekly, 3 of 4 weeks) was initiated. Response was assessed every 2 months by contrast-enhanced CT and abdominal MRI according to RECIST 1.1. After four cycles, the sum of target-lesion diameters decreased by 42%, meeting partial response criteria, and liver metastases showed a 3% increase, consistent with stable disease (Figure 3).

Figure 3. The primary tumor showed almost regression.

Around 6 months after chemotherapy initiation, she developed high-grade fever, severe breast pain, erythema, and swelling. Laboratory data revealed leukocytosis (16,800/μL) and elevated CRP 22.9 mg/dL. Contrast-enhanced chest CT confirmed a breast abscess contiguous with the primary tumor (Figure 4). Chemotherapy was stopped. Despite broad-spectrum antibiotics and incision/drainage, infection persisted with continuous purulent discharge and increasing pain requiring daily tramadol and loxoprofen. Frequent wound dressing was necessary, and

QOL markedly deteriorated. Because persistent infection made systemic therapy impossible, a multidisciplinary team opted for local control surgery. Approximately 8 months after treatment initiation, left mastectomy with axillary lymph-node dissection was performed. The ulcerated skin and necrotic tissue were excised in bloc, and a closed suction drain was placed.

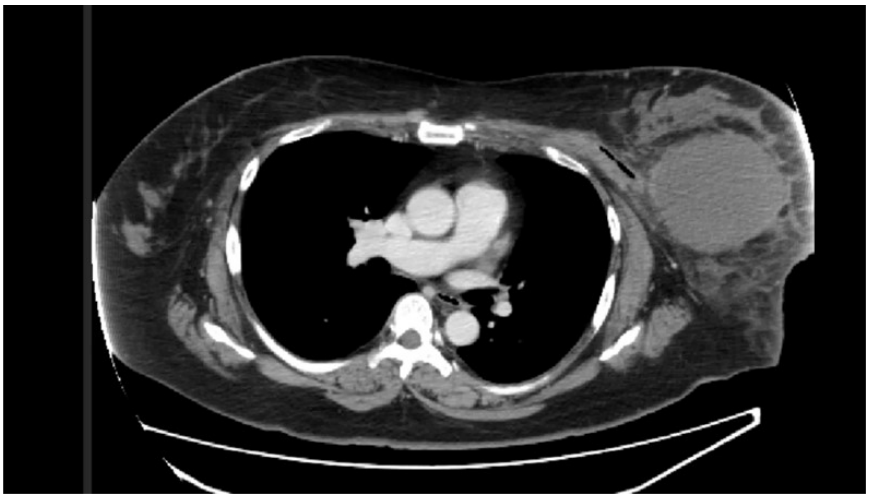

Figure 4. Contrast-enhanced chest CT confirmed a breast abscess contiguous with the primary tumor.

Postoperatively, the infection resolved, inflammatory markers normalized rapidly, and pain markedly decreased. Three months after surgery, radiotherapy was administered, and systemic chemotherapy was resumed 4 months postoperatively. The patient remained progression-free for ~16 months after surgery but developed brain metastasis 18 months after surgery and subsequently died of the disease.

3. Discussion

This case demonstrates the potential role of surgery in advanced breast cancer when systemic therapy is compromised by local complications such as infection. The Japanese Breast Cancer Society Guidelines 2022 emphasize that primary-tumor resection should not be performed for survival benefit in de novo metastatic disease [1]. This recommendation aligns with the Tata Memorial randomized trial, which showed no overall survival improvement with surgical resection after systemic therapy [2]. Conversely, the MF07-01 Turkish trial demonstrated a survival benefit in hormone receptor-positive and bone-dominant subgroups, implying that surgical value depends on biological and metastatic profiles [3]. A subsequent meta-analysis by Reinhorn *et al.* confirmed modest benefit in selected cases but underscored strong selection bias and heterogeneity among studies [4]. Earlier observational analyses suggested an apparent survival advantage with primary-tumor resection in metastatic breast cancer, although these studies were limited by selection bias and confounding [5] [6].

For triple-negative breast cancer (TNBC), characterized by aggressive biology and lack of targeted therapy, survival benefit from local resection is minimal. However, TNBC often produces rapid tumor necrosis and predisposes to secondary infection, as in the present case. Persistent abscess or ulceration can lead to chronic inflammation, systemic inflammatory response, and interruption of chemotherapy—factors that critically worsen prognosis.

The role of palliative or symptom-directed surgery has been well recognized. Morishita *et al.* reported that palliative mastectomy for infected or recurrent breast tumors effectively relieved pain, odor, and drainage, thereby improving QOL and enabling continuation of systemic treatment [7]. Similar findings were described in previous reports emphasizing that local disease control contributes significantly to maintaining the overall treatment plan [8] [9]. Recent studies further support this approach, showing durable symptom control and improved QOL after palliative surgery in metastatic settings, and prolonged chemotherapy continuation time among patients undergoing local resection, although no survival benefit was shown. The updated ABC 5 International Consensus (2023) likewise endorses local surgery for selected symptomatic patients [10]-[12].

4. Conclusions

In this case of stage IV triple-negative breast cancer complicated by refractory breast abscess during chemotherapy, palliative mastectomy successfully achieved infection control, pain relief, and resumption of systemic therapy, leading to a 16-month progression-free interval.

Even without curative intent, palliative surgery represents a valuable strategy to maintain QOL and therapeutic continuity in metastatic breast cancer.

Ethics Statement

This study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Daido Hospital. Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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