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Case Report

Scalp Metastasis from Triple-Negative Breast Cancer in a BRCA1-Positive Young Female: A Case Report

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Abstract

Background: Scalp metastasis from breast cancer is an exceedingly rare event and typically reflects advanced disease. It is especially uncommon as an isolated early manifestation of recurrence in triple-negative breast cancer (TNBC), a subtype known for aggressive behavior and poor treatment response.

Case Presentation: We report the case of a 37-year-old BRCA1-positive female with TNBC who presented with a right breast mass. Following neoadjuvant chemotherapy, she underwent nipple-sparing mastectomy and axillary clearance. Histopathology revealed residual disease and poor response to chemotherapy, with 4 out of 17 lymph nodes involved (ypT2N2a). Three months postoperatively, she developed a tender scalp mass with imaging findings suggestive of metastasis. Surgical excision with flap closure was performed;histopathological analysis confirmed a metastatic deposit of adenocarcinoma infiltrating the fascia and underlying bone marrow, consistent with breast origin based on weak mammaglobin positivity.

Conclusion: This case highlights the importance of clinical vigilance for atypical sites of metastasis in TNBC patients, especially in the setting of known genetic susceptibility and residual disease post-neoadjuvant treatment.

Keywords:Triple-negative breast cancer, BRCA1,Scalp metastasis,Cutaneous metastasis, Breast cancer recurrence, Surgical excision

Introduction

Triple-negative breast cancer (TNBC), defined by the absence of estrogen, progesterone, and HER2 receptors, accounts for 15–20% of all breast cancers and is characterized by rapid progression, high recurrence rates, and limited treatment options (Dent et al., 2008). TNBC exhibits distinct metastatic behavior, with a predisposition for visceral and central nervous system sites over bone (Bozkurt et al., 2024).

Cutaneous metastases occur in up to 23.9% of patients with breast cancer, but scalp involvement is exceptionally rare, and often underdiagnosed due to its subtle presentation (Yuet al., 2024; Liu et al., 2020). In patients with BRCA1 mutations, the risk of early, aggressive recurrence is amplified. Here, we describe a rare case of isolated scalp metastasis in a young BRCA1-positive woman with TNBC and poor pathological response to neoadjuvant therapy.

Case Presentation

A 37-year-old unmarried, nulligravid woman (weight: 77.8 kg) with no sexual history presented in December 2023 with a tender lump in the right breast. She denied systemic symptoms, nipple discharge, or visible skin changes. Her past medical history included bronchial asthma and confirmed allergies to betadine, amoxicillin, and chemotherapy. Family history was significant: her mother had breast cancer at age 53 (currently alive), and three maternal aunts died in their 40s from ovarian cancer.

Clinical examination revealed a T3N0 lesion. Ultrasound imaging showed an irregular, invasive lesion highly suspicious for malignancy. MRI revealed a BI-RADS VI mass with multiple satellite lesions and suspicious right axillary lymph nodes. Core biopsy confirmed triple-negative invasive breast carcinoma. BRCA1 mutation was detected; BRCA2 was negative. Staging investigations in February 2024, including a whole-body bone scan and CECT thorax- abdomen-pelvis, showed no evidence of metastasis. The patient received eight cycles of neoadjuvant chemotherapy.

In October 2024, she underwent right nipple-sparing mastectomy with axillary clearance, extended latissimus dorsi flap reconstruction, and breast implant placement. Postoperatively, 500mL of seroma was aspirated under ultrasound guidance. Histopathological analysis revealed no response to chemotherapy, with moderate residual tumor cellularity. Resection margins were free of malignancy. Four out of seventeen axillary lymph nodes were positive. The pathological stage was reported as ypT2(2)N2a.

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In January 2025, she developed a new, tender lump on her scalp with associated headache. The lesion was firm, non-discharging, and unchanged in size over time. CECT brain imaging (March 2025) revealed a 2.6 × 0.9 × 1.9 cm subaponeurotic enhancing soft tissue lesion involving the bilateral posterior parietal regions, abutting the outer table of the calvaria with subtle erosion, but no intracranial extension. Tc99m whole-body bone scintigraphy in April 2025 did not show additional metastatic lesions.

Given the imaging findings suggestive of metastasis, surgical excision of the scalp mass with bone was performed.Defect size was 6* 6 cm. Bone defect was filled with titanium mesh . The soft tissue defect was closed with a rotational flap. The excised tissue has been sent for histopathological analysis; results are awaited.The patient was followed up the clinic and surgical sites healed well.

Discussion

Scalp metastasis is a rare form of cutaneous spread in breast cancer. Most cases occur in patients with advanced disease and often accompany other systemic metastases (Costa et al., 2017; Liu et al., 2020). However, isolated scalp metastasis, as in this case, has been reported infrequently and may represent an early sign of recurrence.

TNBC is known for aggressive behavior and early visceral spread. Dent et al. (2008) demonstrated that TNBC patients are four times more likely to experience visceral metastasis in the first five years post-diagnosis compared to other breast cancer subtypes. BRCA1 mutations, often associated with basal-like TNBC, confer further risk of early metastasis and poor response to chemotherapy (Kennedy et al., 2020).

Residual tumor post-neoadjuvant chemotherapy, as seen in this patient, is a strong predictor of poor prognosis (Alizadeh et al., 2018). Scalp lesions may mimic benign dermatologic conditions, leading to diagnostic delays. In this case, prompt imaging revealed characteristic features of a subaponeurotic metastatic lesion with subtle bone involvement but no intracranial extension—typical of cutaneous breast cancer metastases (Wu et al., 2024).

While histopathology is pending, the imaging findings and the patient's high-risk profile support the clinical suspicion of metastatic disease. PET/CT may offer further utility for assessing residual disease or other occult metastases (Liu et al., 2020).

Conclusion

This case underscores the need for high clinical suspicion when evaluating new scalp masses in breast cancer patients, particularly in those with TNBC, BRCA1 mutations, and residual disease post-neoadjuvant therapy.surgical excision and reconstruction can be done in single stage . Surgical excision provided tissue for histological confirmation and symptom relief. Final diagnosis awaits histopathology, but this rare presentation highlights the importance of comprehensive metastatic surveillance in high-risk subgroups.

Consent for publication

Informed written consent for publication and accompanying images was obtained from the patients prior to collecting information.

Availability of data and material

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

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