Case Report of Breast Cancer Metastasis to Surgical Scar above the Pubis and Literature Review of rare Cases of Breast Cancer Metastasis

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Abstract:

Invasive ductal carcinoma of the breast is one of the most common malignancies in women, with metastasis frequently observed in specific organs such as bones, liver, lungs, and brain. However, metastasis to unusual sites, such as surgical scars, is rare.

This article presents a case report of a 55-year-old woman with locally advanced right breast cancer who developed metastasis to an old surgical scar in the pubic area after receiving neoadjuvant chemotherapy and breast-conserving surgery.

Several months after treatment, the patient presented to the clinic due to a non-healing wound in the old surgical scar. Histopathological analysis of the scar tissue revealed the presence of metastatic carcinoma of breast origin. Immunohistochemistry confirmed the diagnosis with positive markers GATA3, GCDFP15, CK7, and PAX-8.

This report underscores the importance of timely and accurate diagnosis of unusual breast cancer metastases. In this case, local surgical resection combined with radiotherapy was adopted as the therapeutic approach.

This study emphasizes the need to consider rare metastatic presentations and conduct thorough examinations of surgical scars in patients with a history of breast cancer. It highlights that even seemingly insignificant lesions may serve as potential metastatic sites.

Keywords: Breast Cancer, Metastasis, Surgical Scar

Background and Objective

Breast cancer is among the most frequently diagnosed malignancies in women worldwide, with projections indicating that approximately 25% of newly identified cancers in the female population will be breast cancer in the near future.[1] Invasive

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Received: 20/08/2024
Accepted: 17/04/2025
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Ductal Carcinoma (IDC) represents the most prevalent subtype of malignant breast cancer, accounting for 70-80% of invasive breast tumors.[2] IDC is characterized by the proliferation and invasion of epithelial cells within the ductal structures, leading to their infiltration into the surrounding stromal tissue. This process entails the breach of ductal walls by cancer cells, which disrupt the basement membrane and penetrate the layers of myoepithelial cells.[3] In numerous cases, IDC arises from the progression of precancerous lesions known as Ductal Carcinoma in Situ (DCIS), which results from the abnormal proliferation of epithelial cells within the mammary ducts.[4] A substantial body of research has highlighted that alterations in signaling pathways and the differential expression of various genes significantly contribute to the transition from DCIS to IDC. Notable changes include increased expression of HER-2 and C-MYC, alongside decreased expression of tumor suppressor genes such as BCL-2 and p53.[5-7]

Breast cancer remains a leading cause of mortality among women, with the majority of breast cancer-related deaths attributed to metastases that disseminate to other organs.[8] Patients diagnosed with metastatic breast cancer generally experience a poorer prognosis compared to those without metastasis, with a median survival time of approximately 2 to 3 years and a 5-year survival rate of merely 25%.[9] Research indicates that breast cancer exhibits a distinct propensity to metastasize to specific organs, including the bones, liver, lungs, and brain, which are recognized as the most common sites for metastasis.[10] Recent studies corroborate this observation, revealing that 60 to 75% of metastatic breast cancer cases involve bone metastasis, 32 to 37% involve lung metastasis, 32 to 35% involve liver metastasis, and 10% involve brain metastasis.[11,12]

On the other hand, advancements in treatment options for breast cancer patients, in conjunction with the development of innovative imaging techniques and enhanced early diagnostic capabilities, have led to an increase in the prevalence of metastasis, even in sites that have traditionally been considered rare for the dissemination of breast cancer.[1] Uncommon metastatic sites may include the eye,[13] skeletal muscles, subcutaneous tissue,[14] gastrointestinal tract,[15] spinal nerve root ganglia[16] and various other locations documented in numerous case studies.

In this case report, we present a 55-year-old female patient diagnosed with invasive ductal carcinoma in her right breast. Following neoadjuvant chemotherapy, she underwent breast-conserving surgery. A few months later, she developed metastasis of her breast cancer to an existing scar in the pubic area.

Case Report

The patient is a 55-year-old woman with no additional risk factors for breast cancer, apart from her age. In April 2022, she detected a lump at the 12 o'clock position of her right breast but delayed seeking medical attention for several months. Upon examination, the lump was identified as immobile, painless, and firm, with a palpable lymph node noted in the right axilla. The patient also reported experiencing shooting pain in her right arm. Diagnostic evaluations, including mammography, ultrasound, and fine-needle biopsy, confirmed the diagnosis of ductal carcinoma characterized as ER-positive, PR-positive, and HER2-negative, classified as locally advanced carcinoma. The patient subsequently underwent neoadjuvant chemotherapy, followed by breast-conserving surgery accompanied by the removal of the right axillary lymph nodes. She completed two additional rounds of chemotherapy post-surgery.

Several months after her surgery, the patient returned due to the deterioration of an old surgical scar above the pubis, which had not healed despite receiving recommended topical treatments from dermatologists. During subsequent visits, the surgeon noted the condition of the wound site, leading to an outpatient excision. The excised tissue was sent for pathological analysis, which confirmed the presence of metastatic carcinoma originating from the

breast. The patient declined systemic chemotherapy and opted for localized radiotherapy as an alternative treatment.

Currently, the patient's overall condition is stable. She has been receiving Aromasin at a dosage of 25 mg for the past ten months and commenced treatment with Palbociclib at 125 mg and Letrozole at 25 mg on August 4, 2024. She is under regular medical supervision.

In summary, this 55-year-old woman is a known case of breast cancer with involvement of the right axillary lymph nodes. Following chemotherapy, she underwent breast-conserving surgery, and during subsequent follow-up, metastasis to an old scar in the pubic area was identified, originating from her breast cancer.

Figure 1 - Scar above the pubis

Pathology Report

1-Breast

The patient has a documented history of advanced Invasive Ductal Carcinoma located at the 12 o'clock position of the right breast, with axillary lymph node involvement. She received neoadjuvant chemotherapy prior to surgery. The surgical procedure involved the excision of the tumor while preserving breast tissue and removing lymph nodes from the right axilla (see Images 2 and 3). A specimen measuring 2 × 6 × 9 centimeters was submitted for pathological examination on April 14, 2023. The findings are as follows:

- The largest diameter of the tumor measures 2 centimeters.

-Lymphovascular invasion is present.

-Ductal Carcinoma In Situ with a cribriform pattern and microcalcifications is observed in less than 25% of the tumor.

-The skin tissue is free of tumor involvement.

- Histological Grade (Nottingngham Histologic Score):

- Glandular (Acinar) / Tubular differentiation: Score 2
- Nuclear pleomorphism: Score 2
- Mitotic rate: score 2
- Overall histological grade: 2 / 3
- ER, PR Positive
- HER2 Negative
- Ki67 27%

-One out of ten excised lymph nodes is involved.

2-Scar Above the Pubis

A sample measuring 2.5 × 3 × 6 centimeters from the pubic area was sent for pathological analysis on December 22, 2024. The results indicate:

-Involvement of the skin tissue by metastatic carcinoma with a primary origin in the breast.

-The neoplastic cells express immunoreactivity as below:

<u>Positive</u>

- GATA3
- GCDFP15
- CK7
- PAX-8

<u>Negative</u>

- CK20
- CDX2

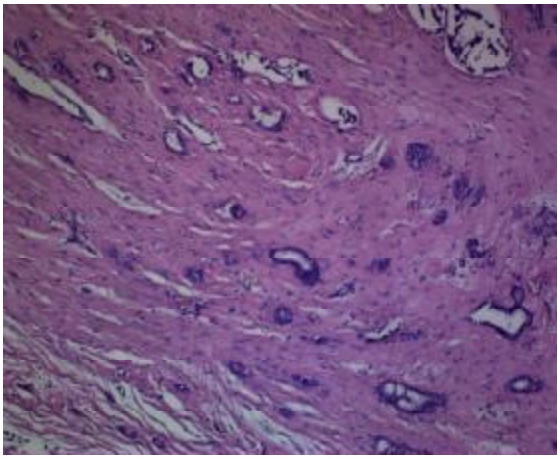

Figure 2-A

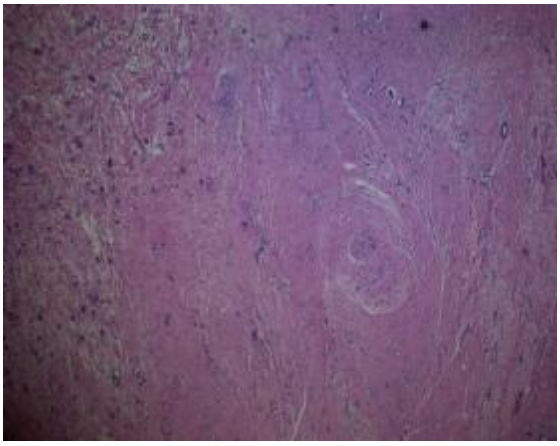

Figure 2-B

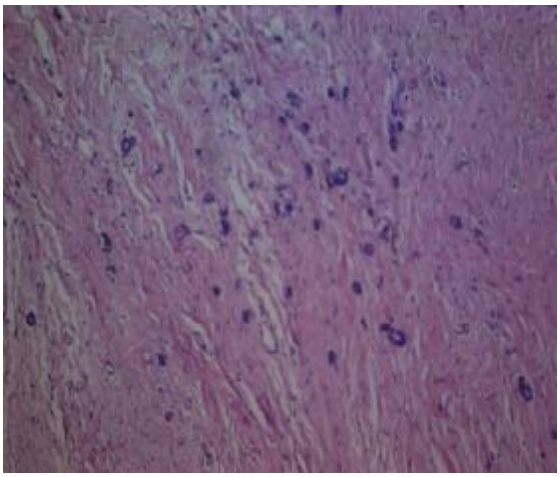

Figure 2-C. Pathological view of breast tumor

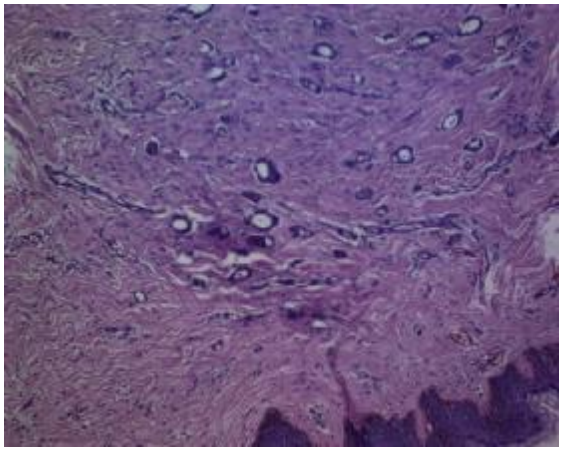

Figure 3-A

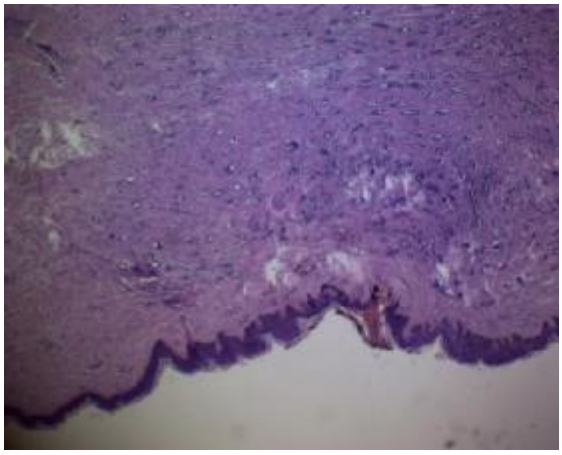

Figure 3-B. Pathological view of the pubic lesion

Discussion and Conclusion

Breast cancer represents a significant global health challenge and is the most commonly diagnosed malignancy among women, with approximately 2.3 million new cases and over 685,000 deaths attributed to this disease reported in 2020.[17] Although survival rates have markedly improved over the past two decades due to advancements in diagnostic techniques, such as mammographic screening, and the development of highly effective systemic therapies, the incidence of breast cancer continues to rise worldwide.[18] Early-stage breast cancer is manageable and treatable in 70 to 80 percent of cases, thanks to multimodal therapeutic approaches; however, advanced metastatic breast cancer remains an ongoing challenge.[19]

The patient described in this case report was diagnosed with invasive ductal carcinoma of the breast. It is pertinent to note that metastases originating from invasive ductal carcinoma typically localize to the liver, lungs, and brain.[20] Conversely, breast cancer is recognized as the leading tumor type associated with cutaneous metastasis,[21] with skin involvement accounting for approximately 24% of all breast cancer metastases.[22] Clinical manifestations often present as papules or nodules in about 80% of cases and may appear as telangiectatic carcinoma, erysipeloid carcinoma, neoplastic alopecia, or in a zosteriform pattern.[20] However, in this specific case, the patient exhibited metastasis to an existing scar in the pubic area, rendering this case particularly noteworthy. The metastatic involvement of invasive ductal carcinoma in an old cutaneous scar has not been previously documented in the literature.

Accurate clinical assessment and histopathological confirmation are essential for identifying and diagnosing soft tissue involvement in patients with a history of treated primary breast cancer. This process is crucial to prevent inappropriate treatments that may lead to adverse outcomes or increased mortality.[14] Although clinical diagnosis of metastatic lesions can present challenges, pathological evaluations of specimens obtained from the site of metastasis are invaluable. The pathology report for this case confirmed the presence of invasive ductal carcinoma cells at the metastatic site. Furthermore, immunohistochemical analyses can enhance diagnostic accuracy; the positivity of specific markers, such as estrogen receptors, progesterone receptors, and HER-2, can confirm the diagnosis and inform treatment decisions.[23]

The management of metastatic breast cancer generally employs a multifaceted approach tailored to each patient's functional status, comorbidities, type of primary malignancy, and the location and size of the metastatic lesions.[14] Radiation therapy and chemotherapy are commonly utilized as primary treatment modalities, either in isolation or in combination. Surgical intervention is typically reserved for patients who do not respond adequately to these therapies.[14] Surgical removal can markedly enhance the patient's quality of life.[24,25] In the case under discussion, the patient underwent superficial and subcutaneous resection of the metastatic area with negative margins, followed by radiation therapy to the pubic region to effectively eradicate the metastatic lesions.

Interpretation
Dr. Seyyed Abbas Mirmalek

Breast cancer most commonly metastasizes through hematogenous and lymphatic routes, often originating from tumors of considerable size, typically around 9 millimeters or larger (indicating subsequent cell divisions).[6] Lymphatic spread predominantly targets the axillary lymph nodes.[1-3] Numerous reports document the involvement of mediastinal lymph nodes, particularly when the tumor is located on the medial aspect of the breast. Additionally, superficial lymphatic pathways can facilitate the spread of the tumor to the contralateral breast or various dermal areas, with the abdominal skin often being a primary site of involvement.[2,4,6] Surgical scars may serve as conduits for metastatic cells disseminated via these superficial lymphatics. Furthermore, due to the relative ischemia associated with surgical scars, neoadjuvant treatment agents may reach the areas where metastatic cells are sequestered at diminished concentrations.[6] Such instances are classified as systemic diseases and are typically managed with chemotherapy.[1,3,5]

Interpretation sources

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