



REVIEW ARTICLE

IMAGING FEATURES OF BREAST INFILTRATING DUCTAL CARCINOMA

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ABSTRACT

Triple-negative invasive ductal carcinoma (TNIDC) is a subtype of breast cancer that lacks expression of estrogen receptors (ER), progesterone receptors (PR), and human epidermal growth factor receptor 2 (HER2). This aggressive form of cancer accounts for approximately 10-20% of all breast cancers and is associated with a poor prognosis due to its high recurrence rate and limited treatment options. The present case report highlights a clinical presentation of a 46-year-old female diagnosed with TNIDC of the breast. She presented with a palpable mass in her right breast, and diagnostic imaging and biopsy confirmed the presence of invasive ductal carcinoma with triple-negative characteristics. The case plan of management was neoadjuvant chemotherapy. Pathologic examination confirmed the tumor's triple-negative status. The report emphasizes the importance of early diagnosis, genetic testing, and personalized therapeutic strategies, as well as the challenges in treating TNIDC due to its aggressive nature and resistance to hormonal therapies. This case underscores the need for continuous research into novel therapeutic agents, including immunotherapy and targeted treatments, to improve outcomes for patients with triple-negative breast cancer. Further investigation into biomarkers and potential targeted therapies could pave the way for more effective treatment regimens for this challenging disease.

INTRODUCTION

Triple-negative invasive ductal carcinoma (TNIDC) of the breast is a highly aggressive and challenging subtype of breast cancer. Characterized by the lack of expression of estrogen receptors (ER), progesterone receptors (PR), and HER2 (human epidermal growth factor receptor 2), this form of breast cancer accounts for approximately 10-20% of all breast cancer cases. The absence of these receptors makes TNIDC particularly difficult to treat, as it does not respond to commonly used therapies such as hormone therapy or HER2-targeted treatments. This case report focuses on the presentation, diagnosis, and treatment of a patient with triple-negative invasive ductal carcinoma. We aim to provide insights into the clinical challenges faced in managing this subtype, as well as the importance of early detection, accurate diagnosis, and the potential for novel therapeutic approaches. Given the aggressive nature of TNIDC, it is crucial to understand the histopathological features, potential genetic mutations, and available treatment options to improve patient outcomes. The following case describes a patient diagnosed with TNIDC, emphasizing the role of multidisciplinary management and highlighting the need for personalized treatment strategies for optimal care.

CASE PRESENTATION

Patient KH: A 46-year-old female presented with a complaint of a small swelling in the right breast for seven months. There was no history of breast pain, discharge, skin changes, or nipple retraction. The swelling was progressive and associated with heaviness in the right chest, with no aggravating or relieving factors. No swelling or pain was reported in the left breast.

Diagnostic Investigations

Breast Ultrasound

- Lobulated ovoid complex soft tissue mass measuring 30.17 × 18.71 cm located in the right upper outer quadrant between the 11 and 12 o'clock position.
- Predominantly hypoechoic with few cystic changes and microcalcifications.
- Wider than taller with minimal vascularity on color Doppler interrogation.
- Normal underlying muscles.
- Multiple enlarged right axillary lymph nodes, the largest measuring 2.2 × 1.7 cm.

- Left breast: Symmetrical parenchymal echopattern with mixed fat and glandular tissues. No mass or focal area of architectural distortion.

Diagnosis: Highly suspicious right breast malignant tumor (BI-RADS IV) associated with multiple right axillary lymphadenopathy.

Breast Biopsy Findings

- Core fragments composed of tumor-forming ducts lined by atypical cells with hyperchromasia, increased N:C ratio, pleomorphism, and abnormal mitoses.
- Stromal fibrosis and inflammatory reaction.
- Confirmed diagnosis: Right breast infiltrating ductal carcinoma.
- Immunohistochemistry (IHC): Negative for ER, PR, and HER-2 (Triple-negative).

Chest and Abdominal CT Scan

- Multiple pulmonary nodules of various sizes, the largest measuring 2 × 1.8 cm, with fibrous bands and ground-glass opacities in both lung fields.
- Normal-sized liver with ill-defined hypoattenuating non-enhancing lesions across all contrast phases.
- Multiple para-aortic lymph node enlargements.
- Findings consistent with pulmonary and hepatic metastases.

Laboratory Investigations

- FBP and RFT: Normal.
- SGT/GOT: Elevated.

Treatment and Outcome

- IV chemotherapy: Docetaxel 116 mg, doxorubicin 77 mg, and cyclophosphamide 770 mg (three cycles, dosage adjusted accordingly).
- Patient initially showed mild improvement but later developed worsening symptoms.
- After the third cycle, the patient developed severe right lower chest pain and difficulty in breathing.
- Chest X-ray: Moderate right pleural effusion.
- Underwater seal drainage was performed, but the patient developed sudden severe respiratory distress and passed away.

DISCUSSION

Clinical Presentation and Diagnosis: TNBC often presents at a later stage with high-grade tumors. It metastasizes early, commonly affecting the lungs, liver, bones, and brain. Diagnosis involves clinical examination, mammography, ultrasound, and histopathological analysis. The absence of ER, PR, and HER2 expression confirms the TNBC diagnosis.

Metastasis and Prognosis: TNBC has a high tendency for early metastasis, contributing to its poor prognosis. Liver and lung metastases, as seen in this case, significantly reduce survival rates. Studies show that metastatic TNBC has a median survival of less than two years.

Treatment Options

- **Chemotherapy:** The mainstay of treatment, though responses are often short-lived due to rapid resistance development.
- **Emerging Therapies:** Immunotherapy (e.g., pembrolizumab) and targeted therapies are being explored, showing promise in some patients.

Outcomes and Follow-Up: Despite aggressive treatment, TNBC patients often have a high recurrence risk. Early diagnosis and innovative treatment strategies are critical to improving outcomes.

CONCLUSION

Triple-negative invasive ductal carcinoma of the breast with metastasis represents one of the most challenging clinical scenarios in oncology. Due to the lack of specific molecular targets, treatment options remain limited, and prognosis is generally poor. However, ongoing research into immunotherapy and targeted treatments offers hope for improving survival outcomes. Close clinical monitoring and early intervention remain crucial for managing metastatic TNBC.

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