SVOA Medical Research
e-ISSN 2977-3644

ScienceVolks Open Access

Case Report

Primary Breast Diffuse Large B-Cell Lymphoma in a Young Lactating Mother Initially Treated as Breast Abscess: A Case Report

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https://doi.org/10.58624/SVOAMR.2026.04.003

Received: December 20, 2025

Published: January 29, 2026

Citation: Roshan R, Shah B, Yadav M, Pandey S, Anuj KC, Mouni DS. Primary Breast Diffuse Large B-Cell Lymphoma in a Young Lactating Mother Initially Treated as Breast Abscess: A Case Report. *SVOA Medical Research* 2026, 4:1, 15-20. doi: 10.58624/SVOAMR.2026.04.003

Abstract

Background: Primary breast lymphoma (PBL) is a rare extranodal manifestation of non-Hodgkin's lymphoma, accounting for 0.4–0.5% of breast malignancies. It often mimics benign conditions like mastitis or abscess, a diagnostic pitfall heightened in lactating women due to physiological breast changes.

Case Presentation: We report the case of an 18-year-old lactating woman with a six-month history of a progressively enlarging left breast mass, initially treated as an abscess with incision and drainage without improvement. Examination revealed a large left breast mass (15x14 cm) with matted axillary and supraclavicular lymphadenopathy. Contrast-enhanced CT showed a 10x9x9 cm necrotic, infiltrative mass. Ultrasound-guided tru-cut biopsy and immunohistochemistry confirmed Diffuse Large B-Cell Lymphoma (DLBCL), Activated B-Cell (ABC) subtype with a double-expressor phenotype (C-MYC and BCL-2 positive). The patient received six cycles of R-CHOP chemotherapy followed by oncoplastic surgery (modified Benelli technique) for a residual lump, achieving a complete pathological response (ypT0).

Conclusion: This case underscores that a non-resolving breast abscess in a lactating woman warrants investigation for primary breast lymphoma. Early diagnosis via core biopsy and timely systemic chemotherapy are crucial for managing this aggressive malignancy, with surgery reserved for residual disease.

Keywords: *Primary breast lymphoma, Diffuse large B-cell lymphoma, Lactating mother, Breast abscess, R-CHOP, Oncoplastic surgery*

Introduction

Primary breast lymphoma (PBL) is an unusual breast tumor, representing an extranodal subtype of non-Hodgkin lymphoma and making up merely 0.4–0.5% of breast cancers.(1) Given its rarity, a clear understanding of PBL remains crucial for ensuring early identification and intervention. (2) PBL shows a female predominance but may develop in individuals of either sex.(3)

Classification of PBL includes primary and secondary variants. Primary breast lymphoma is confirmed when lymphoma is localized to the breast, with mammary tissue and lymphoid cells in direct association, and no prior or concurrent extramammary lymphoma.(4,5)

Approximately 50% of breast lymphomas are primary, and the majority belong to the B-cell non-Hodgkin category, with diffuse large B-cell lymphoma (DLBCL) being the most frequent variant.(4,6,7)

Case Presentation

Clinical History

An 18-year-old lactating mother presented to the Breast Oncosurgery clinic with persistent pain and a progressively enlarging mass in her left breast. Six months earlier, she had sought care at another facility with complaints of fever and breast engorgement, where she was diagnosed with a breast abscess and underwent incision and drainage. Despite this intervention, her symptoms failed to improve, prompting further evaluation.

At the time of presentation to our hospital, she reported no systemic *B symptoms* such as fever, night sweats, or unexplained weight loss. Her menstrual history was unremarkable, with menarche at 13 years, and she had delivered her first child at 18. Her total breastfeeding duration was less than six months. She had no known comorbidities and no family history of breast malignancy.

Clinical Examination

Physical examination revealed a large, firm mass occupying almost the entire upper quadrant of the left breast, measuring approximately 15 x 14 cm. The overlying skin showed scarring from the previous drainage procedure (Fig 1). Matted, fixed lymph nodes were palpable in the left axilla, and a noticeable, firm supraclavicular lymph node was also present (Fig 2). Based on these findings, an initial clinical diagnosis of locally advanced breast carcinoma was considered, staged as cT3N3cM0 (Stage IIIC).

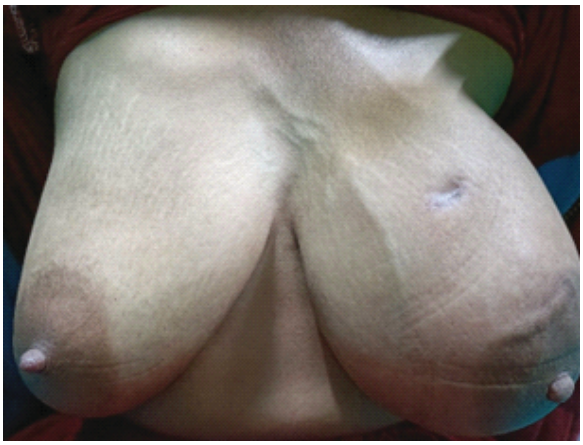

Figure 1. Left Breast increased in size with I&D mark.

Figure 2. Noticeable Supraclavicular Node.

Imaging Findings

A contrast-enhanced computed tomography (CECT) scan of the head, neck, chest, abdomen, and pelvis was performed as part of systemic staging. The thoracic images demonstrated a large, infiltrative, and heterogeneously enhancing left breast mass measuring approximately 10 × 9 × 9 cm, containing central necrotic areas.

Extensive regional lymphadenopathy was identified, including enlarged lymph nodes in the left axillary levels I and II, the largest measuring 4.9 × 4.3 cm. A significantly enlarged left internal mammary lymph node measuring 1.7 × 1.1 cm was also noted. In addition, the CECT revealed a prominent left supraclavicular lymph node measuring 1.2 x 0.8 cm, consistent with nodal involvement. No pathological lymphadenopathy or organ involvement was detected in the abdomen or pelvis, and no intracranial abnormalities were observed.

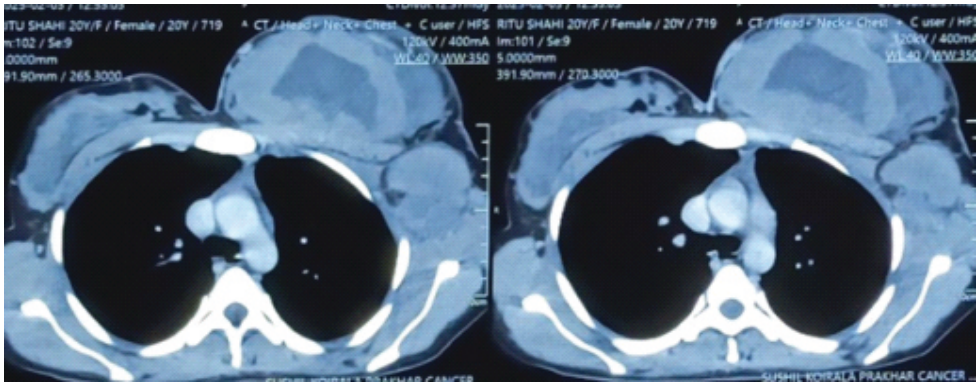

Figure 3. CECT

Histopathology (Tru-cut Biopsy):

Microscopic examination of multiple core biopsy fragments revealed diffuse infiltration by atypical lymphoid cells arranged in sheets. The neoplastic cells were predominantly medium to large in size—approximately two to three times larger than normal small lymphocytes—with round to oval nuclei, vesicular to coarse chromatin, and occasional irregular nuclear contours. Nucleoli ranged from pinpoint to prominent, appearing centrally or as multiple small nucleoli at the periphery. The cells exhibited scant to moderate cytoplasm and were admixed with scattered small mature lymphocytes.

Mitotic activity, including atypical forms, was evident at a rate of 2–3 mitosis per high-power field in the most active areas. Focal crush artifacts with distortion of atypical nuclei were present. No benign breast ducts or lobular structures were identified. These features were consistent with a malignant lymphoid neoplasm.

Immunohistochemistry:

Immunophenotyping demonstrated strong positivity for CD20, PAX5, and LCA, confirming B-cell lineage. C-MYC expression was observed in >40% of cells, and BCL-2 was positive in >50%, indicating a double-expressor phenotype. The proliferation index (Ki-67) was markedly elevated at approximately 90%.

The tumor cells expressed MUM-1 and BCL-6, supporting classification as an activated B-cell (ABC) subtype according to the Hans Algorithm. CD10 was negative, excluding Germinal center B-cell-like diffuse large B-cell lymphoma. Markers for T-cells (CD3), immature lymphoid cells (TdT, CD34), and mantle cell lymphoma (cyclin D1) were negative. Additional markers including CK, CD117, Desmin, and NKX2.2 were also negative.

The overall histopathological and immunohistochemical profile was diagnostic of diffuse large B-cell lymphoma (DLBCL), ABC subtype, with a double-expressor phenotype (C-MYC and BCL-2 co-expression).

The patient was treated with six cycles of R-CHOP chemotherapy consisting of rituximab 500 mg cyclophosphamide 600 mg, doxorubicin 60 mg, vincristine 1.8 mg, and Prednisone 100 mg administered every three weeks. Following completion of therapy, there was a marked clinical response, with only a residual lump measuring approximately 2×2 cm in the upper outer quadrant of the left breast. No palpable axillary or supraclavicular lymphadenopathy was noted.

A whole-body PET-CT scan was planned after completion of chemotherapy to assess systemic treatment response. Patient was unable to undergo the study due to financial constraints. Consequently, response evaluation was performed using targeted ultrasonography, which demonstrated a small residual lump measuring 1.8 × 1.5 cm and showed no evidence of axillary or supraclavicular lymphadenopathy.

A multidisciplinary team (MDT) meeting was held to evaluate the operability of the residual lump and the potential benefits of surgery. It was decided to proceed with excision of the residual lesion. Oncoplastic breast surgery using the modified Benelli technique was performed to remove the residual lump, employing volume displacement to achieve an optimal cosmetic outcome.

Routine follow-up surveillance was arranged at three-month intervals, with each visit centered on thorough clinical evaluation and early identification of any signs suggestive of recurrence or disease progression. At the one-year follow-up, contrast-enhanced MRI of both breasts demonstrated *no evidence of residual disease or tumor recurrence*, confirming sustained treatment response.

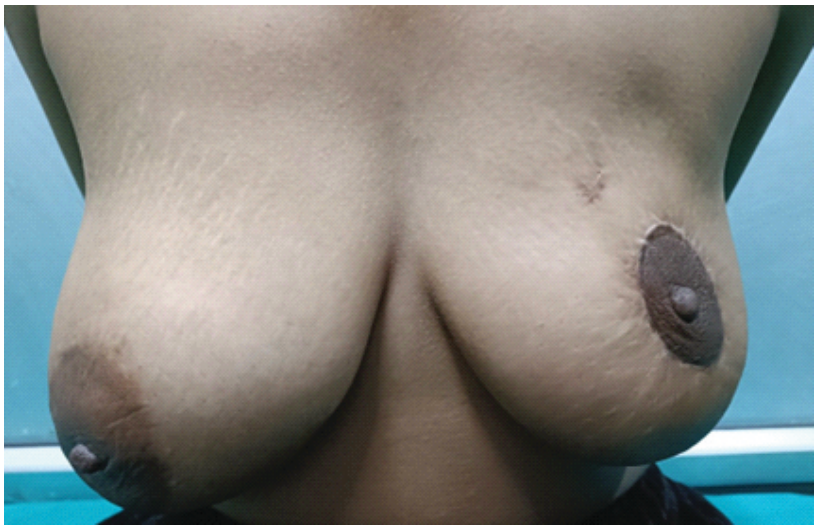

Figure 4. Aesthetic appearance at One year after completion of treatment.

Discussion

Primary breast lymphoma is a rare clinical entity with a significant potential for systemic dissemination.(4) The clinical presentation of primary breast lymphoma can closely resemble that of breast carcinoma. The most frequent manifestation is a solitary, palpable, and typically painless breast mass, reported in approximately 61% of cases, although multiple lesions may occasionally occur. Ipsilateral axillary lymphadenopathy is observed in about 13–50% of patients.(1,5)

Because many PBLs are of B-cell origin, some individuals may exhibit systemic “B symptoms,” including fever, unexplained weight loss, and night sweats. Overall, the disease most commonly presents as a painless but rapidly enlarging breast mass.(3)

However, as demonstrated in this case, primary breast lymphoma may easily be mistaken for mastitis or a breast abscess, particularly in lactating women, where inflammatory breast conditions are prevalent. This underscores an important clinical principle: any breast abscess that fails to resolve with standard treatment or presents atypically should prompt early consideration of a core needle biopsy to rule out underlying malignancy, including lymphoma.

Diffuse large B-cell lymphoma (DLBCL) is the most common histological subtype of primary breast lymphoma. The *double-expressor* phenotype (DE-DLBCL)—defined by co-expression of MYC and BCL2 proteins in the absence of corresponding gene rearrangements, as observed in our patient—is known to confer a less favorable prognosis.(7–9) Elevated Ki-67 proliferation index (90%) further supports an aggressive tumor biology. Primary breast lymphoma tends to demonstrate more aggressive behavior during pregnancy and lactation, often presenting bilaterally and progressing rapidly—changes likely influenced by the hormonal milieu of this period.(10)

The standard treatment for primary breast lymphoma is predominantly systemic, *with R-CHOP chemotherapy serving as the first-line therapeutic approach.*(1) Radiation therapy serves as an effective adjunct to systemic treatment in PBL, reducing the risk of local recurrence and potentially contributing to improved progression-free and overall survival.(11)

In our case patient received 6 cycles of R-CHOP. Surgery generally plays a limited role and is reserved for obtaining diagnostic tissue or, as demonstrated in this case, for excising residual disease following systemic therapy.

In select patients, oncoplastic surgical techniques—such as the modified Benelli approach—offer the advantage of achieving complete tumor removal while maintaining breast contour and cosmetic integrity, an important consideration for younger women.(12)

The complete pathological response observed in surgical specimen of this patient (ypT0) highlights the effectiveness of a comprehensive multimodal strategy, integrating systemic chemotherapy with individualized, aesthetics-preserving surgical management.

Conclusion

Primary breast lymphoma is an extremely rare (<0.5% of breast cancer) and diagnostically challenging malignancy, particularly in young lactating mother in whom benign inflammatory breast conditions are common. This case emphasizes the importance of maintaining a high index of suspicion when evaluating breast lesions that fail to improve with standard therapy for mastitis or abscess. Early use of core needle biopsy is crucial to avoid delays in diagnosis.

Our patient, initially misdiagnosed with a breast abscess, was ultimately found to have primary breast DLBCL—ABC subtype with a double-expressor phenotype—an aggressive variant requiring prompt systemic management. The excellent clinical and pathological response achieved with R-CHOP chemotherapy, followed by successful oncoplastic excision of residual disease, underscores the value of a multimodal, individualized treatment approach.

This case highlights an essential clinical message: timely recognition, accurate tissue diagnosis, and appropriate systemic therapy are key to optimizing outcomes in primary breast lymphoma, especially in young women where fertility, lactation, and cosmetic considerations play an important role.

Ethical Approval

Ethical approval was provided by authors' institution.

Funding

None

Conflict of Interest

The authors declare no conflict of interest.

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