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Rare Primary Diffuse Large B-Cell Lymphoma of a Male Breast

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Abstract

Background: Breast lymphomas are typical extranodal types of lymphoma, also known as Extranodal-lymphoma (ENL), which occur extremely infrequently, aggregating into a very small proportion of malignant breast tumors. The rarity of breast lymphomas is attributed to the scant lymphoid tissue content of the chest wall. **Aims of Study:** This case report is aimed at providing an up-to-date review of the literature on breast lymphomas for clinicians to, therefore, consider the possibility of this disease entity while treating a breast mass. **Case Presentation:** A case was reported of a 52-year man with chief mammary non-Hodgkin breast ENL when fine-needle aspiration cytology (FNAC) was not leading to a firm conclusion or result. Following an incisional biopsy, he was found to have a primary breast lymphoma. Later, the patient was diagnosed with the diffuse large B-cell type of lymphoma also known as non-Hodgkin's Lymphoma (NHL). He had a complete reduction and disappearances of all the signs and symptoms of the disease after a course of neoadjuvant chemotherapy: Cyclophosphamide, Doxorubicin, Vincristine and Prednisolone (CHOP). **CONCLUSION**: Based on the above case presentation, it is vital for health care professionals and oncologists to recognize the disease by assessing the breast mass accurately with more entities so that proper diagnosis via core biopsy (incisional biopsy) can eliminate the PBL before further treatment is required.

Keywords

Non-Hodgkin's Lymphoma, PBL, B-Cell Lymphoma,

Breast Cancer, CHOP, ENL

1. Introduction

Primary breast lymphoma (PBL) is both a typical yet rare clinical entity: a very well-defined subcategory of non-Hodgkin's Lymphoma (NHL). Several reports suggest that PBL represents 0.6% of all malignant breast tumors, 1.2% of all the NHL, and 2.1% of Extranodal-lymphomas (ENL) [1] [2] [3] [4] [5]. Most breast lymphomas are of the non-Hodgkin's type, representing approximately 70% - 90% of all PBL, while diffuse large B- cell lymphomas (DLBCL) constitute 46% - 71% of all PBL [6]. However, (P-NHL) Primary-NHL is one of the most frequent and hematopoietic tumors of the breast [7]

Aims of Study: This case report is aimed at providing an up-to-date review of the literature on breast lymphomas for clinicians to, therefore, consider the possibility of this disease entity while treating a breast mass.

2. The Case Presentation

A 52-year-old male industrial chemist was admitted to the surgical outpatients' department at a tertiary hospital with a painless left breast lump that had been evident for 8 months and had increased in size progressively. There was a darkening of the overlying skin and no nipple discharge. The patient reported remarkable weight loss and intermittent fevers over the period, but also reported no cancer history in his family. He had self-treated with herbal medications for some months prior to arriving at the tertiary hospital. Physical examination revealed a middle-aged man, who appeared chronically ill and cachectic. The left breast was diffusely enlarged with a ~4 cm × 3 cm mass located in the center portion with a darkening of the overlying skin. He also had discrete tiny ulcers in the nipple-areolar complex oozing a small amount of serosanguinous fluids with a few other lymph nodes such as Axillary lymph nodes. FNAC revealed potential malignancy, but results were inconclusive. He subsequently had an incisional biopsy with a histopathology report, which confirmed PBL distinguished as a large B-cell type of non-Hodgkin's lymphoma. The observational photograph of the index patient is as displayed in **Figure 1(a)**. **Figure 1(b)** shows the characteristic diffuse lesion as seen in the mammographic study. **Figure 2** and **Figure 3** show the Hematoxylin and eosin (H&E) staining of the breast tissue and DLBCL with activated B-cell type respectively. Here, the tumor-cells are revealed as CD3, CD5, CD15, CD30, and CK negative but came out positive for CD45, CD20, CD10, BCL6 (see **Figures 4(a)-(d)**). The breast scan showed multiple heterochronic tiny masses of variable sizes in the middle portion of the right breast. A cranial and abdominal CT scan was essentially normal while the chest CT scan showed left pulmonary infiltrates with hilar lymphadenopathy but no pleural effusion. The biochemical profile and complete blood count were also

typical. Subsequently, he had a total of six doses of medication of neoadjuvant chemotherapy: (CHOP)-Cyclophosphamide, Doxorubicin, Vincristine and Prednisolone, and thereafter experienced complete disease remission. He was examined at two-month intervals for approximately 18 months in the surgical outpatient clinic with a satisfactory clinical outcome, following which he requested an end to follow-up examinations.

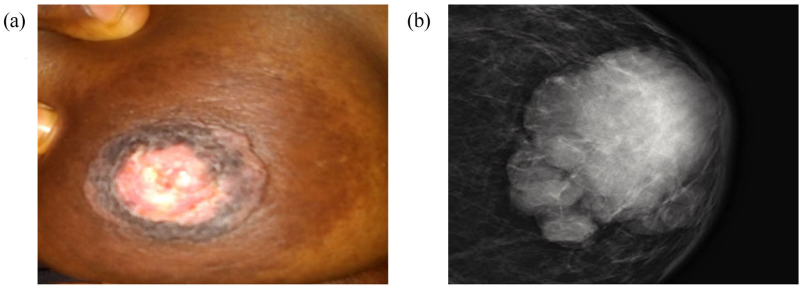

Figure 1. Clinical image of breast of the index patient displaying (a) large B-cell type; Non-Hodgkin's lymphoma (b) diffuse right breast lesion shown from mammographic study of index patient.

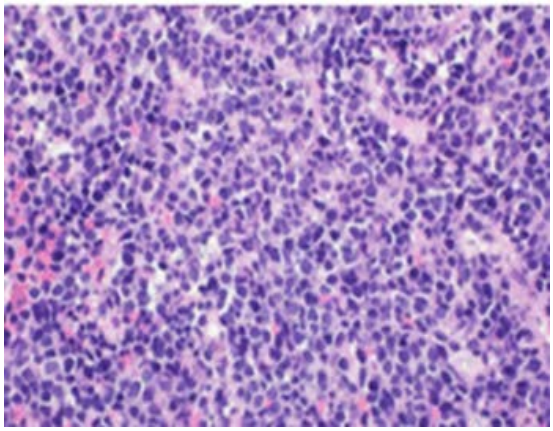

Figure 2. H&E stain showing the histology of breast tissue from index patient at 400× magnification.

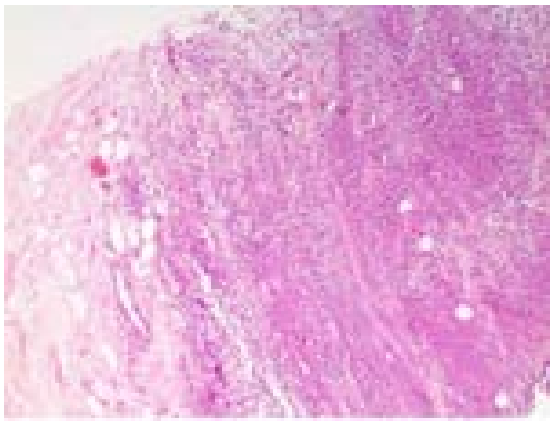

Figure 3. Diffuse large B-cell lymphomas (DLBCL) with activated B-cell type.

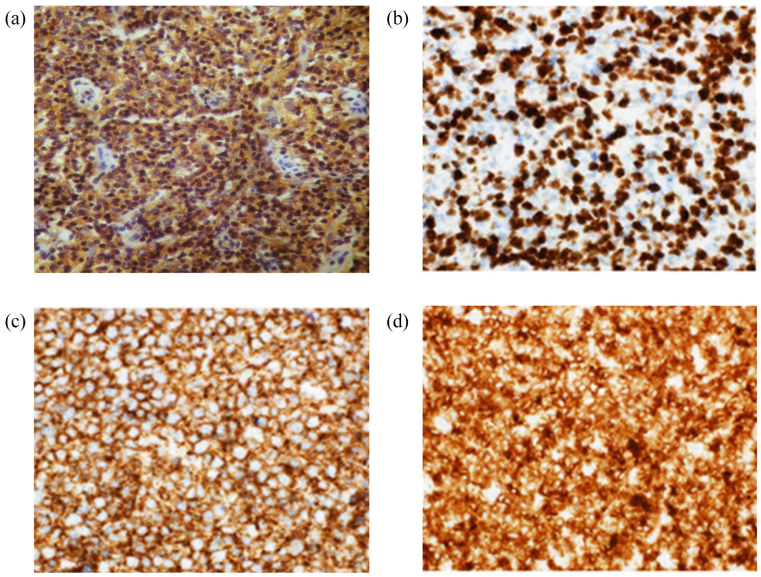

Figure 4. Antibody staining of the breast tissue to detect: (a) CD 45 (b) CD 20 (c) CD 10 (d) BCL6 (uncommon).

3. Discussion

The index patient is male with a lesion located on the left breast. This finding concurred with previous reports indicating that both Nodal-Lymphomas (NL) and Extranodal-Lymphomas (ENL) occur more frequently in males, with the involvement of the breast being mainly associated with females [8]. However, this finding contradicts those of other studies which reported that breast PNHL involved only the right side of the breast, and was almost entirely found in female patients. It is unclear why the right side of the breast is the most common site for these [7]. Primary-Lymphomas (PL) of the breast is generally regarded as rare, yet they remain the most frequently occurring hematopoietic breast tumor [7] [9] [10]. Physicians or oncologists treating and dealing with the carcinoma in the breast should endeavor to be fully up-to-date with knowledge regarding this entity to distinguish the signs and symptoms associated with prompt management of the condition. Indeed, the early prognosis of breast carcinoma is important for satisfactory clinical outcomes [10] [11] [12] [13]. In addition, single-breast involvement is more common, particularly in the upper-right portion of the breast [14] [15] [16] [17]. Only approximately 1% - 14% of reported primary breast lymphoma affects both sides of the breast (bilateral) disease [18].

There have been many diagnostic criteria of primary-breast lymphoma [15]. In 1972, Wiseman and Liao defined the existence of adequate pathologic specimens as diagnostic criteria for P-NHL. There is also a very close association of the mammary tissue and lymphomatous infiltration, with no previous diagnosis of an extramammary-lymphoma, with possible ipsilateral axillary lymph node involvement [7] [15] [19]. Our patient fulfilled these criteria, and this further supports our conclusion that this was an instance of a primary breast lymphoma (PBL), and those breast-cancers, in general, are not diseases associated with the

younger age group. Finally, PBL is most commonly seen as a palpable mass, as shown in our index patient [20] [21].

An open biopsy supported with immunophenotyping proved to be a very reliable confirmatory diagnostic tool. Tru-cut biopsies have equally distinguished the diagnosis of breast-malignancies with a good accuracy rate [22] [23]. Many radiographic detection methods, such as CT, sonography and mammography, are generally nonspecific for PBL [24] [25] [26] [27]. It should be noted that immuno-phenotyping in the diagnosis of PNH-Lymphoma of the breast is crucial, with several reports from the literature confirming that immuno-phenotyping plays a key role in evaluating and diagnosing the disease [28] [29] [30] [31] [32]. In our index patient, the histopathological diagnosis was PBL of the large B-cell type (non-Hodgkin's type). The tumor cells typing were negative for CD3, CD5, CD15, CD30, CK but were positive for CD45, CD20, CD10, and BCL6 (see **Figures 4(a)-(d)**) with clinical evidence of distant metastasis to the lung parenchyma (T2 N0 M1).

Several treatment options are available for primary breast lymphoma, such as chemotherapy as the first preference of treatment of primary-BL, and radiation as a second preference, followed by surgery. The above-mentioned preferences can be used alone or in combination [32] [33] [34] [35]. The impact of surgeries as a treatment option for PBL is limited due to surgery requiring adequate tissue for proper diagnostic criteria and classification of the disease [31] [33]. Finally, mastectomy offers no guarantee of preventing recurrence [36]. In patients with PBL, the survival rates are comparable with other types of lymphomas: relatively high. The likely course of the diseased condition of PBL depends mainly on the description of the abnormality of the tumor (histological-grade) [31] [37]. The International Prognostic Index (IPI) suggests predictors of survival that include 1) LDH levels, 2) performance status, 3) age, 4) the presence of extranodal tumors, and v) Ann Arbor staging in the prediction of 5-year survival [32] [33]. For Stage I disease, the 5-year survival rate is 89% [35]. Finally, the central nervous system [CNS] is regarded as the most typical site of relapse due to its high level of incidence and involvement based on available reports [38] [39].

4. Conclusion

Based on the above case presentation, it is obligatory for health care professionals and oncologists to recognize the disease by assessing the breast mass accurately with more entities to provide the possibility of distinguishing the disease via proper diagnosis, including core biopsy (incisional biopsy), and thus eliminate PBL before further treatment is required.

Authors Contributions

All authors have made substantial contributions to conception and design, acquisition of data, and analysis and interpretation of data. All authors were involved in drafting the manuscript and its critical revision. All authors have given

final approval of the version to be published. Each author has participated sufficiently in the work to take public responsibility for appropriate portions of the content. All authors agree to be accountable for all aspects of the work in terms of ensuring that questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved.

Ethical Approval

We confirm that no ethical approval is required to publish case reports from our institutions and the collaborative hospital.

Conflicts' of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Abbreviations

Primary breast lymphoma (PBL); Extranodal-lymphoma (ENL); non-Hodgkin's Lymphoma (NHL); Cyclophosphamide, Doxorubicin, Vincristine and Prednisolone (CHOP); Fine-needle aspiration cytology (FNAC)