Research Article

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Primary Breast Lymphoma: A Case Report

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Key Clinical Message

Primary breast lymphomas are a very rare group of breast malignancies and account for 2.2% of all extra nodal lymphomas and for 0.04% to 0.5% of malignant breast neoplasms. Most of the cases are diffuse large B-cell non-Hodgkin's lymphoma with T-cell, MALT and Burkett's Lymphoma being further uncommon. Imaging findings in lymphoma are nonspecific and whole body imaging is an essential part of the workup to rule out disease in other parts of the body and to be labelled as primary breast lymphoma. Here we present a rare case of primary B-cell lymphoma involving bilateral breasts and presenting as multiple nodular masses.

1. Introduction

Primary Breast Non-Hodgkin's Lymphoma (PBNHL) are very rare breast malignancies, accounting for 2.2% of all extra nodal lymphomas and for 0.04% to 0.5% of malignant breast neoplasms [1-7]. Primary breast lymphomas are mainly diffuse large B-cell non-Hodgkin lymphoma (B-DLC-NHL and T-Cell, MALT and Burkett's being extremely uncommon. Those of T-cell origin have been associated with breast implants. Although exact etiology is unknown, chronic infection, immune suppression, environmental exposures to ionizing radiation and hereditary traits are the proposed risk factors the rarity of PBL may be related to the small amount of lymphoid tissue present in the breast as compared to the gut or lung, in which the occurrence of primary lymphomas is much more frequent. Mostly unilateral involvement has been reported but the lesions may even be bilateral [8,9]. Bilateral synchronous breast lymphoma occurs in 10% of patients, and contralateral metachronous disease occurs in up to 15%. Bilateral disease is a poor prognostic factor with higher rates of CNS metastasis. The Ann Arbor classification of PBNHL also has been defined.

Stage 1: tumor limited to the breast
Stage 2: Tumor confined to the breast with palpable ipsilateral axillary lymphadenopathy.
Stage 3: Tumor confined to the breast with metastasis on both sides of the diaphragm
Stage 4: Tumor limited to the breast with spread to extra nodal lymphoid tissue.

2. Case Report

49-year-old female patient presented with palpable painless mass in her left breast with palpable left axillary nodes. X Ray Mammogram done as preliminary investigation revealed diffusely glandular dense breasts with only a vague asymmetric density in upper outer quadrant of left breast. No obvious mass lesion was seen on right side. DCE - MR revealed multiple round to oval well defined masses with slightly irregular margin in left breast ranging between 1.2 to 2 cm in size. All these lesions had isointense to hypo intense signal on T2W images with hypo intense signal on T1W images. ADC value within these masses ranged between .7 to 0.9 x 10mm/sec. On post contrast study they showed early enhancement with type 2 and type 3 kinetics. One of the lesions also showed enhancing internal septations. One similar mass of approx. 1cm was also seen in right breast with plateau type 2 kinetic enhancement pattern. Multiple other small enhancing foci were seen in bilateral breasts which were indeterminate in nature in the sense that they could be representing part of the disease process or benign proliferative changes. There were also enlarged left axillary nodes seen which showed asymmetrical cortical thickening. Correlative ultrasound done for biopsy guidance showed these masses to be hypoechoic with slightly irregular margins without any significant posterior shadowing or calcifications. Initially FNAC was done from bilateral breasts which revealed primary lymphoid cellular pattern. Biopsy was then done which showed Non-Hodgkin's lymphoma - SLL, B-cell type confirmed on IHC. Subsequent bone marrow biopsy was done to rule out breast involvement from systemic disease. The bone marrow showed normocellular marrow with no evidence of CD 23 expressing lymphoid cells. FDG PET was also done which showed FDG avid multiple masses in left breast and one lesion in right breast with no evidence of any activity in rest of the body. The patient was treated with chemotherapy followed by radiotherapy to the left breast.

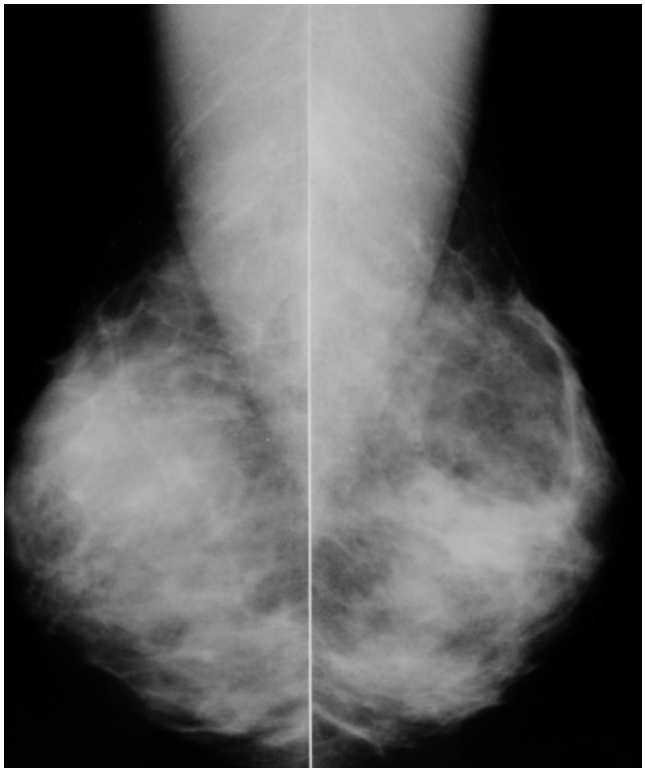

Figure 1: X Ray Mammogram(MLO view) shows dense glandular breasts with poorly marginated density in upper outer quadrant of left breast.

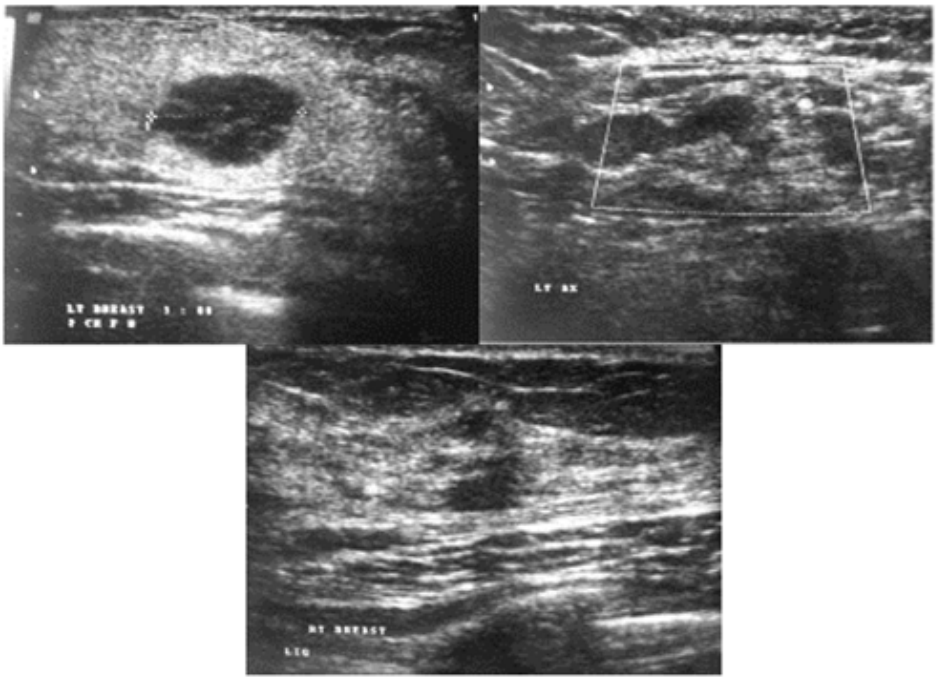

Figure 2: Ultrasound breast shows an ovoid hypoechoic lesion with slightly irregular margins in upper outer quadrant of left breast (a) with a similar smaller lesion in right breast (b). Enlarged left axillary node seen (c).

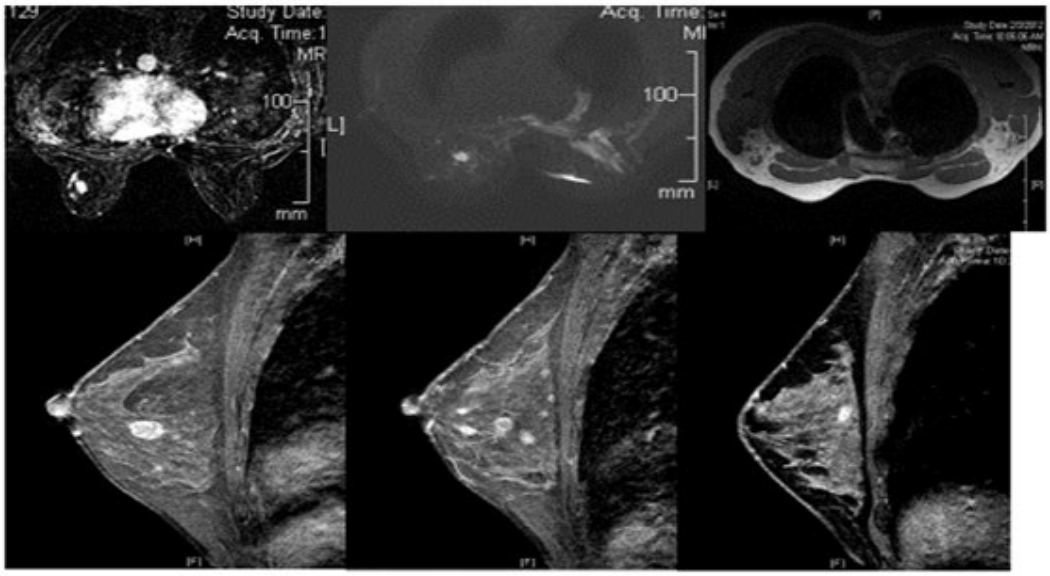

Figure 3: Rounded lesion of altered signal intensity seen in the left breast (a), showing restricted Diffusion on DWI (b). Left axillary node is enlarged with cortical thickening (c).

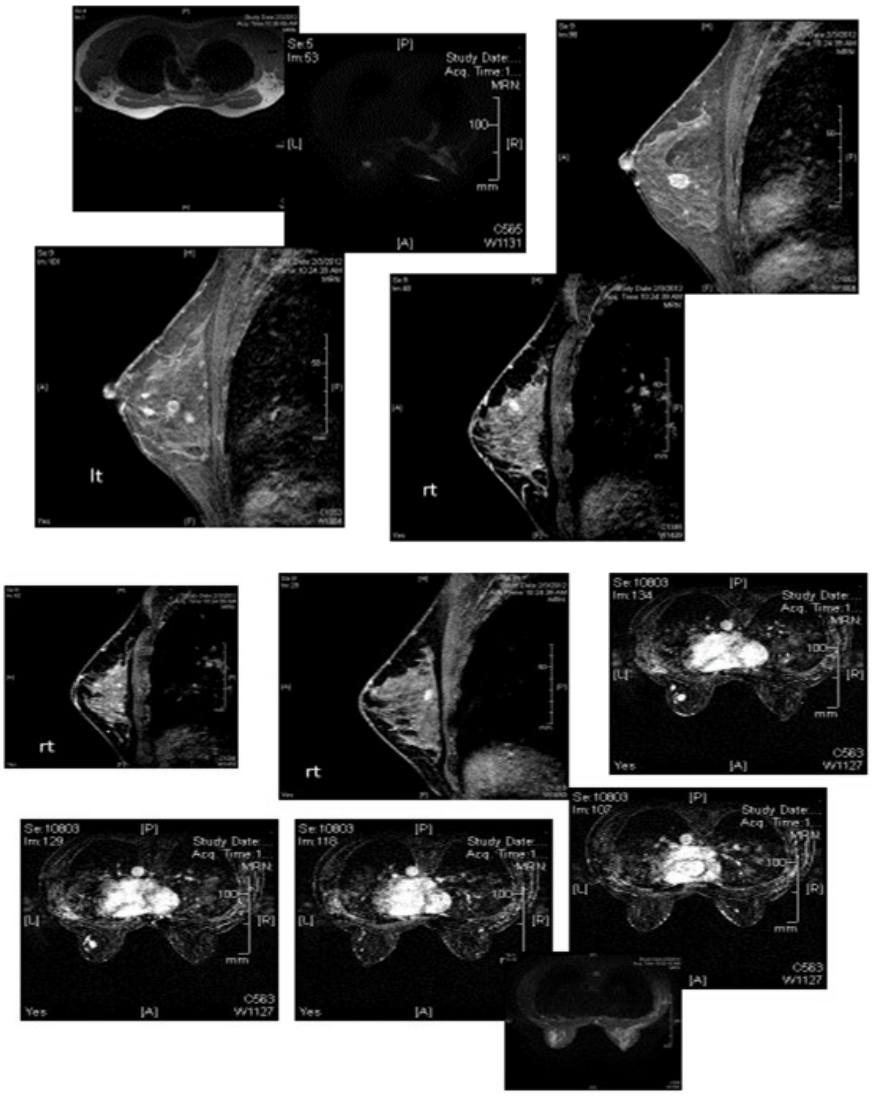

Figure 4: Multiple enhancing nodular lesions seen in left breast. Similar lesion seen in right breast close to the chest wall.

3. Discussion

The imaging features of PBNHL are indistinguishable from other malignancies, but the main aim of imaging in these cases is for evaluating the disease extent, possible involvement of other sites and for appropriate treatment planning and follow up for recurrence. The age of presentation of PBL can vary from 9-85 years and the mean age is 58 yrs. Both males and females can be affected and it is most common in upper outer quadrants of the breast. Clinically they present as single or multiple palpable breast masses or diffuse breast enlargement [10-13]. Pain is not a common feature [14]. Inflammatory skin change and overlying skin fixation may be encountered. Nipple or skin retraction or discharge is uncommon. In our patient, painless palpable mass was present on left side and the skin or nipple changes were not present. Diagnosis is primarily based on histopathology.

Pathologically, Wiseman and Lia have proposed three criteria for the definitive diagnosis of primary breast non-Hodgkin lymphoma (PBNHL):
1) Primary lesion should be in the breast
2) Both mammary tissue and lymphomatous infiltrate should be seen in close association, and 3) Systemic lymphoma or previous extra mammary lymphoma should be excluded.
Ipsilateral axillary adenopathy may be present which should develop at the time of primary breast disease. On mammography the typical appearance is of a solitary, noncalcified circumscribed mass with adjacent lymphadenopathy.. Marginal irregularity or microlobulations may be seen in some cases. Calcification is not a common feature and multicentric and multifocal disease may be present. Even miliary appearance or diffusely increased density have been reported on mammography along with skin thickening. Ipsilateral axillary adenopathy may be seen [15]. Microcalcifications and spiculations are a rare finding in PBL. In our case due to diffusely increased glandular density of the breasts, the lesion was not very well visualized. Ultrasonographically, breast lymphoma is seen as well-defined or poorly defined single or multiple masses with hypoechoic or hyperechoic appearance. They may also present as diffusely hypoechoic breast parenchyma without a distinct mass . Posterior acoustic shadowing is not present and the lesions may even have an echogenic rim. In our case, the lesions in both breasts had hypoechoic appearance with irregular margins without posterior shadowing. Hyper vascularity may be present. which was seen in one of the left breast lesions in our patient. The enlarged left axillary node demonstrated loss of fatty hilum and a rounded shape which is suggestive of pathological malignant involvement [16]. On MRI, these lesions may be indistinguishable from other invasive carcinomas. They are seen as heterogeneously enhancing mass with rapid initial enhancement with washout. [17]. They show isointense to hypo intense signal on T1W images and are seen as non spiculated masses. MRI is highly sensitive for detection of multicentric/ multifocal tumors and also for the follow up after treatment. Only one case report has reported the ADC value which was low in their case. In our patient, bilateral breast lesions showed low ADC values of 0.7-0.9 x 10-3 mm-2/sec. On FDG PET, these lesions are avid. This is also a useful technique for staging and treatment response evaluation. Radiotherapy along with chemotherapy is the mainstay of treatment of PBL. Contralateral breast is the most common site of recurrence and CNS and bone marrow are common sites of metastasis. Miller et al in their study have proven that concurrent use of radiotherapy after 3 cycle of CHOP has better outcomes than 8 cycles of CHOP alone. Addition of Rituximab further improves outcomes. PBL tends to relapse to CNS, therefore, CT or MR image of CNS is necessary during follow-up.

The differential diagnosis in this case includes multicentric infiltrating ductal carcinoma and metastatic involvement of the breast. IDC are characterized by spiculated margins, architectural distortion and posterior shadowing on ultrasound, none of which were seen in our case. Metastasis to the breast from melanoma, sarcoma, gastric carcinoma may also present with multiple bilateral breast lesions However FDG PET failed to show evidence of any other primary in the body in our case [18-20].

4. Conclusion

Primary breast lymphoma is a rare clinical condition and can affect men and women in wide range of age group. The imaging findings are nonspecific. Therefore, PBL must be considered as a possible diagnosis when dealing with nonspecific breast masses. Biopsy confirmation along with IHC is recommended to avoid delays in diagnosis. Whole body imaging is essential to rule out any other lesions.

Consent

Hereby. I Dr. Kundana Rayamajhi, MD consciously assure that for the breast lymphoma: Case report author has confirmed during submission that patient consent has been signed and collected in accordance with the journal's patient consent policy. I agree with the above statements and declare that this submission follows the policies as outlined in the Guide for authors and in the ethical statements.

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Detailed Author's Contribution

KR and RB contributed to the collection of data. KR wrote the initial draft of the manuscript. KR, RB and BA revised and prepared the final version of the manuscript. All authors have read and approved the final manuscript and agree to take full responsibility for the integrity and accuracy of the work.

Consent

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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