

Primary high-grade diffuse large B-cell lymphoma of the breast

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Introduction

Lymphomas of the breast comprise fewer than 0.5% of all malignant breast tumours. The prevalence of lymphoma of the breast has been reported at 1.6% (Jeanneret-Sozzi et al, 2008), so primary breast lymphoma represents a small proportion of extranodal lymphomas (0.85–2.2%) (Surov et al, 2012).

This article reports a case of high grade diffuse large B-cell lymphoma in a 26-year-old woman, which presented clinically as inflammation of the breast, diagnosed by core needle biopsy of the breast and the axillary lymph nodes. This diagnostic procedure prevented unnecessary breast surgery and delay of chemotherapy.

Case report

A 26-year-old woman presented with signs of inflammation, hardness, pain and minimal lymphoedema of the right breast for about 2 weeks. During the patient's first presentation, although axillary lymphadenopathy was positive, there were no defined lesions in the breast parenchyma. However, hypoechoic amorphous heterogeneities resembling inflammation were seen in the breast parenchyma on ultrasound examination. Antibiotic treatment was started because of the findings of mastitis.

She did not respond to the antibiotic therapy, and the patient came for follow up about 5 months later. At follow up, the axillary lymphadenopathy was seen to have increased and there were additional multiple lesions in the breast, with the largest about 4×3 cm. Lesions were larger and more clearly defined than they had been 5 months earlier and had not responded to treatment with antibiotics. There were no specific findings in her medical history. Ultrasound demonstrated hypoechoic, partially ill-defined lesions in the right breast and enlarged axillary lymph nodes (Figures 1a–c). Baseline positron emission tomography-computed tomography images showed clearly enlarged right breast and axillary lymph nodes (Figures 1d–f). Because of the patient's age, magnetic resonance imaging was used for assessment. An axial T1-weighted fat suppressed contrast image and sagittal T2-weighted fat-suppressed image showed asymmetric size increase in the right breast, multiple rounded lesions in the breast, and axillary lymphadenopathy accompanied by nipple retraction and skin oedema (Figures 2a and b). A clinical diagnosis of inflammatory breast carcinoma was initially made based on the ultrasound and magnetic resonance imaging findings, and core needle biopsy of the breast and axillary lymph nodes was planned. Histopathological assessment showed high grade diffuse large B-cell lymphoma (Figures 3a–d). The patient was treated by the R-CHOP (rituximab, cyclophosphamide, vincristine, prednisolone, doxorubicin) protocol for six cycles.

Magnetic resonance imaging after treatment showed no lesions in the breast or axillary region (Figures 2c and d). After 2 years of follow up, the patient is free of disease, in good health, and the breast has returned to normal. After treatment there were no recurrent clinical or imaging findings.

Discussion

Lymphomas are rare masses of the breast that may be primary or secondary (Nirupama and Ratnakishore, 2011). Patients are mostly women, although a few cases have been reported in men, which suggests the importance of sex hormones in the pathogenesis. There is a peak in incidence in the middle of the fourth decade and another one in the seventh decade (Joks et al, 2011). The median age for breast lymphoma is 58 years (Raza, 2006), whereas this patient was 26 years old – very young compared to the average age of the disease.

Most cases of primary breast lymphoma are found in the right breast and in the upper outer mammary quadrant, as seen in this patient. Approximately one-quarter of masses are

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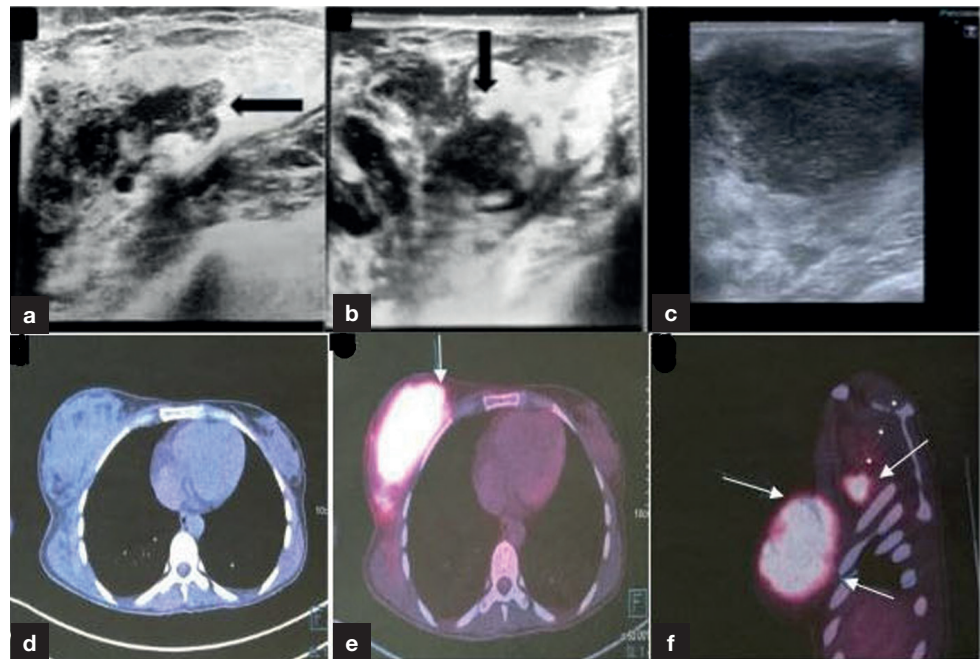


Figure 1. Ultrasound of the right breast shows (a, b) hypoechoic, partially ill-defined lesions (arrows) and (c) enlarged axillary lymph node. d–f. Baseline positron emission tomography-computed tomography images showed clearly enlarged right breast and axillary lymph node (arrows). The standardised uptake value was 24.1 for breast and 27.1 for axillary lymph node.

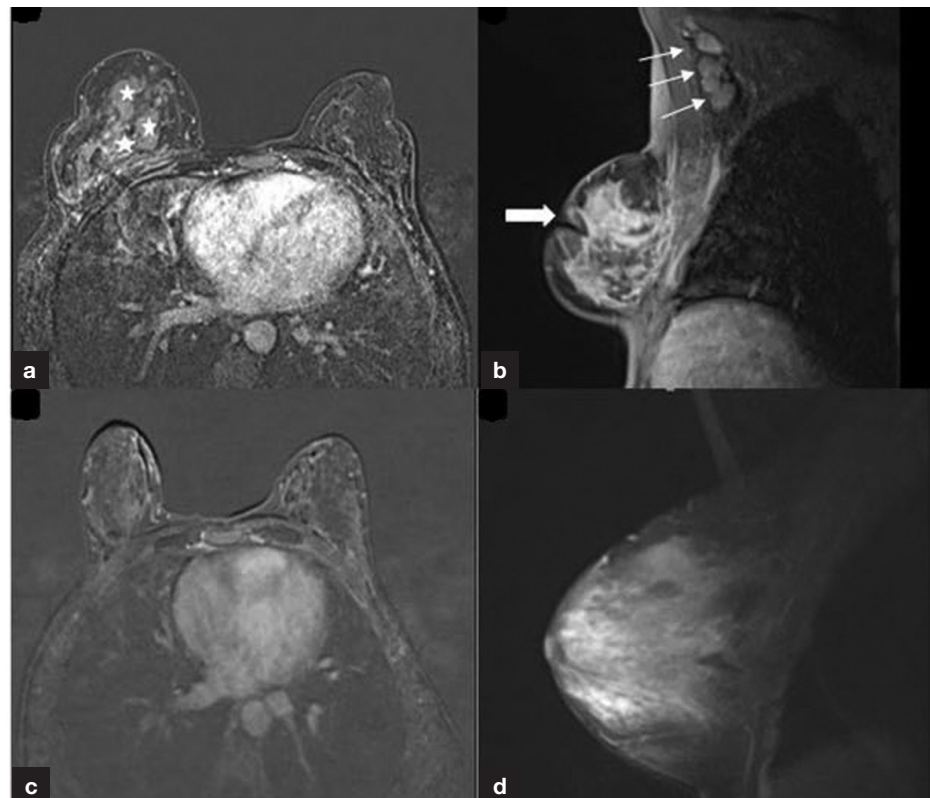


Figure 2. On magnetic resonance imaging (a) axial T1-weighted fat-suppressed contrast image showed asymmetric size increase in the right breast and rounded lesions in the breast (stars) and (b) sagittal T2-weighted fat-suppressed image showed axillary lymphadenopathies (thin white arrows) accompanied by nipple retraction (thick arrow) and skin oedema. On magnetic resonance images taken after treatment (c) axial T1-weighted fat-suppressed contrast image and (d) sagittal T2-weighted fat-suppressed image showed no asymmetry and no lesion in the breast and axillary region.

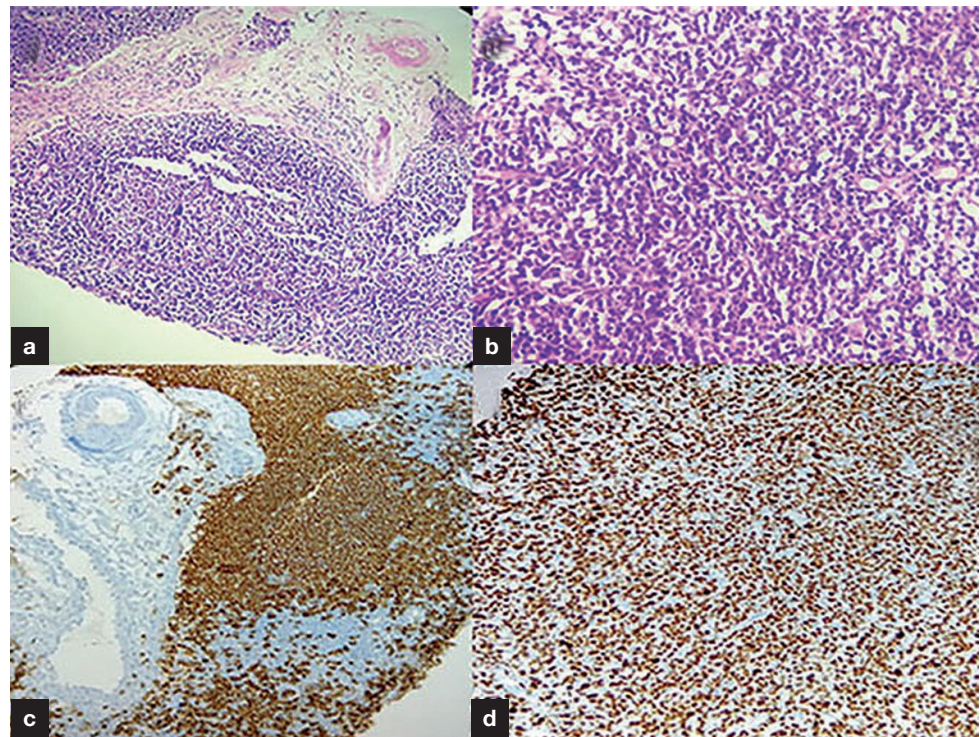


Figure 3. a. Haematoxylin and eosin stain, magnification $\times 200$. The neoplastic structure formed by monotonous atypical cells was observed, which completely eliminated the breast parenchyma, showing diffuse infiltrative distribution. b. Haematoxylin and eosin stain, magnification $\times 400$. Tumour cells were 3–4 times the size of mature lymphocytes and had high mitotic activity. c. CD20 stain, magnification $\times 200$, showing strong cytoplasmic CD20 reactivity in infiltrated neoplastic cells. d. Ki-67, magnification $\times 200$. Tumour cells were observed to have 85–90% Ki-67 proliferative index.

painful. Nipple retraction and skin changes are rare (Surov et al, 2012). Diffuse parenchymal involvement is more common in high grade lymphomas (Garg et al, 2008).

Mammography and ultrasound features have not been described which could differentiate lymphoma from breast carcinoma or benign breast lesions (Surov et al, 2012). In young women, especially those under 40 years of age, mammography is not a suitable imaging modality because of the dense breast parenchyma.

Biopsy is the gold standard procedure for diagnosis. The prognosis of the disease is closely related with grade, stage and histological subtypes at the time of diagnosis. According to the World Health Organization classification, the prognosis of diffuse large B-cell lymphoma is worse than that of other histological subtypes (Jain et al, 2015).

The treatment of breast lymphoma is with systemic chemotherapy (Mouna et al, 2012). This patient was successfully treated with systemic chemotherapy and did not require surgery.

Conclusions

Breast lymphoma, especially in breast masses accompanied by cutaneous inflammatory changes, should be kept in mind in the differential diagnosis for conditions such as inflammatory breast cancer and granulomatous mastitis. Useful information can be obtained in the diagnosis and follow-up phase, in which magnetic resonance imaging is added to ultrasonography, especially in younger patients and in the presence of dense breast structures. Magnetic resonance imaging can provide more objective information, excluding bilaterality and showing recurrences.

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Learning points

- Although breast lymphoma is seen mainly in the fourth and seventh decade, this patient was 26 years old.
- Nipple retraction and skin changes are rarely seen in primary breast lymphoma, but were evident in this case.
- Axillary lymphadenopathy and heterogeneous parenchymal changes in a young woman may reflect inflammation, even if there is no demarcated lesion in the breast. In such a case, it is important to consider the possibility of breast malignancy.

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