T-cell rich B-cell lymphoma of the breast: A rare case report with emphasis on the role of immunohistochemistry in the diagnosis

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ABSTRACT

Primary breast lymphoma is one of the rare tumors that commonly presents as a lump with <0.5% incidence rate. It may be misdiagnosed as poorly differentiated carcinoma on routine fine-needle aspiration cytology. With appropriate treatment, this breast malignancy has a relatively better prognosis. Here, we report the case of a mammary T-cell rich B-cell non-Hodgkin lymphoma in a pre-menopausal woman diagnosed by biopsy and later confirmed by immunohistochemistry.

Key words: *Biopsy, Immunohistochemistry, Lymphoma, Premenopausal*

Primary lymphomas of the breast are very rare breast malignancies with an incidence rate of 0.12–0.5% and 2.2% of extranodal lymphomas [1,2]. Majority of the breast lymphomas are the non-Hodgkin's type, representing approximately 70–90% [3]. Diffuse large B-cell lymphomas (DLBCL) mainly form the bulk of about 46–71% of all primary breast lymphomas [4]. There are still studies going on to reveal the pathogenesis of breast lymphomas. Prognostic factors include clinical staging, histological type, and patient's age. Diagnosis is mostly by routine fine-needle aspiration cytology (FNAC) performed for breast lumps, but sometimes it can lead to misdiagnosis as poorly differentiated duct carcinoma.

T-cell rich BCL (TCRBCL) is a recently described histologic variant of BCL characterized by a minor population of clonal B cells distributed in a background of numerically preponderant polyclonal T lymphocytes. While precise histologic criteria have not yet been defined, clonal B cells typically comprise 10% or less of the total cellular constituency [5]. Controversy persists with regard to both the clinical relevance and the proper classification of this histologic variant. The latter is largely a semantic issue, provided these cases are distinguished from both peripheral T-cell lymphoma and Hodgkin's disease, with which they may be easily confused. We report the case of a TCRBCL of the breast in a premenopausal woman.

CASE REPORT

A 41-year-old African woman presented in our multi-specialty cancer hospital in February 2016 with the history of a non-tender lump in the left upper outer quadrant of the breast for re-evaluation. She had the breast lump since October 2014 for which she was evaluated with Biopsy in February 2015 and was diagnosed as T-cell non-Hodgkin lymphoma in her native place. She had received 6 cycles of cyclophosphamide, doxorubicin, Oncovin, and prednisolone chemotherapy in her country after which the scan in July 2015 showed stable disease. In our hospital, the patient presented for re-evaluation of the breast with the history as mentioned above. There was no history of nipple discharge, fever, bone pain, or respiratory discomfort. There was no history of cancer breast as well as lymphoma in the family.

The patient was clinically stable with negative serology. Clinical examination revealed a rubbery, non-tender, ill-defined, and mobile lump in the axillary tail of the left breast of size about 3 cm × 4 cm with normal overlying skin. There was no retraction of or discharge from the nipple. Ipsilateral axilla had multiple, enlarged, firm and fixed lymph nodes. Opposite breast and axilla were unremarkable. There was no other significant lymphadenopathy. Per abdominal examination was normal.

Bilateral mammography showed multiple ill-defined nodular opacities in the left axillary tail, and corresponding sonomammography revealed multiple enlarged left axillary lymph nodes with distorted architecture, likely metastatic. Positron emission tomography-computed tomography scan revealed bulky metabolically active left axillary, left deep pectoral and left internal mammary, and portocaval interval lymph nodes. Metabolically active subcutaneous soft tissue lesion in the left lower axilla, mild splenomegaly with multiple metabolically active focal lesions and the small metabolically active focal lesion in the right posterior iliac bone as depicted in Fig. 1.

Biopsy of the breast lump and lymph node was done which revealed TCRBCL of the breast. On immunohistochemistry (IHC),

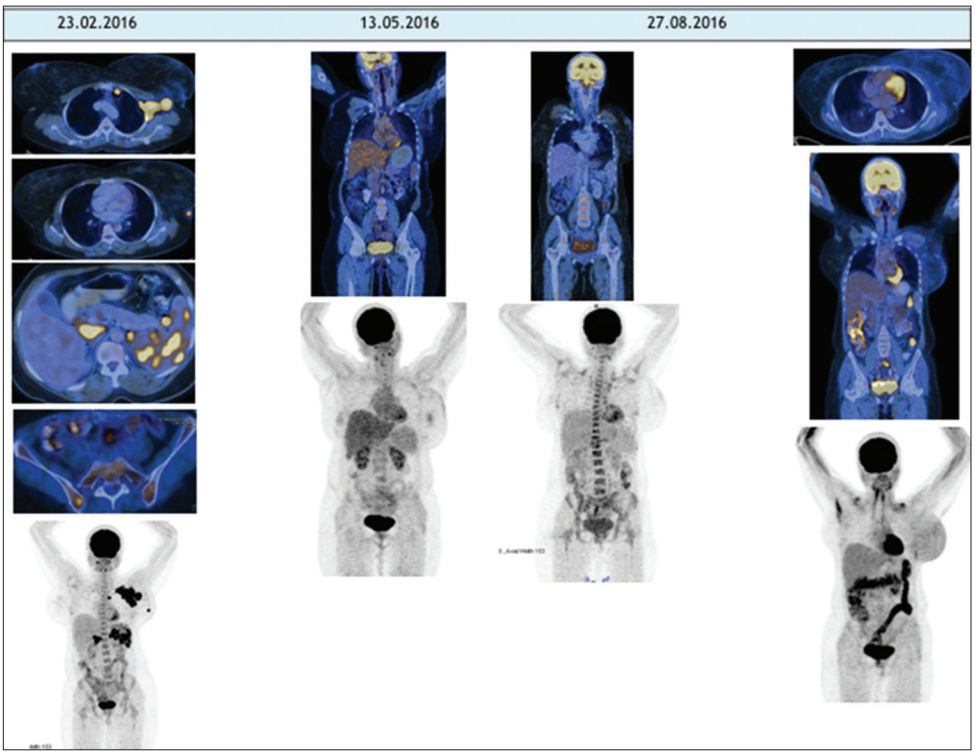

Figure 1: Positron emission tomography-computed tomography scan whole body showing breast lesion before after treatment

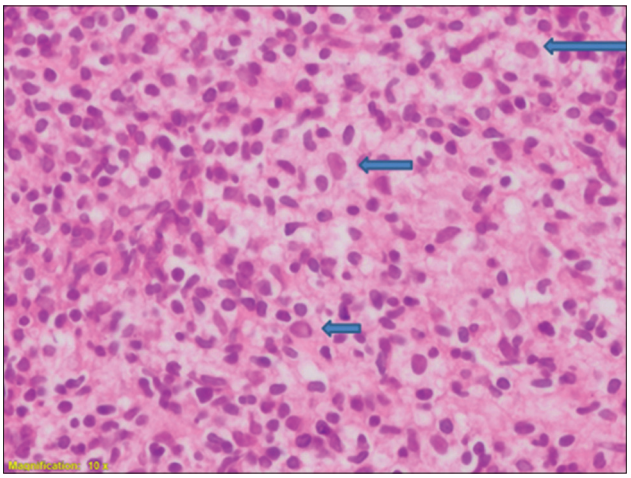

Figure 2: Histopathology T-cell rich B-cell lymphomas showing monomorphic lymphoid cells with large scattered cells

the large neoplastic lymphoid cells expressing CD-20, CD-30 (focal and weak), Oct-2, and BoB-1 (focal and weak), negative for CD-79a and EMA, and background cells richly positive for CD-3, CD-23, and Ki-67 index 60% in T-cells were found as depicted in Fig. 2. Bone marrow aspiration and biopsy were done, which showed hypercellular marrow with trilineage hematopoiesis with no definite evidence of lymphomatous involvement in the aspirate.

On these investigations, we came to a diagnosis of T-cell rich B-cell non-Hodgkin lymphoma Stage IV of the left breast with a low international prognostic index score. She was planned for 3 cycles of 2nd line chemotherapy with Rituxan, Ifosfamide, Carboplatin, Etoposide regimen followed by a bone marrow transplant. The patient had a good response after the treatment. At present, the patient is under follow-up.

DISCUSSION

Non-Hodgkin's lymphoma especially TCRBCL involving the breast as a primary site or as a secondary site is a very rare malignancy. T-cell/histiocyte-rich BCL (T/HRBCL) is a very uncommon morphologic variant of DLBCL. Pathologically, it is distinguished by <10% malignant B-cells along with majority population of reactive T lymphocytes/histiocytes. Diagnosis of this entity is usually difficult, as it may appear similar to other lymphoid diseases, such as nodular lymphocyte-predominant Hodgkin's lymphoma and classic Hodgkin's lymphoma.

The incidence of clonal B-cell neoplasms with reactive T lymphocytes infiltrates was first recognized by Jaffe *et al*. [6] in a report of "pseudo-peripheral T-cell lymphoma." Mirchandani *et al*. [7] also reported a series of similar cases in his study. The term T-cell-rich BCL was discovered by Ramsay *et al*. [8] who described five BCL in which clonal B cells comprise <10% of lymphoid cells. The clinical significance of the preponderant T-cell response that characterizes these lymphomas is uncertain. Various authors have described a host-immune response to the neoplastic clone, analogous to that seen in Hodgkin's disease [9].

Scarpa *et al*. [10] made an observation in his study that the T-cell reaction tends to diminish as the disease progresses and escapes immune surveillance. Besides, it could also represent a response of the reactive T-cells to some cytokine secreted by the tumor cells. Accurate diagnosis requires careful immunohistochemical analysis of the tumor cells and the inflammatory microenvironment. IHC forms the main test to diagnose this rare lymphoma which could have been missed or misdiagnosed. It helps to differentiate properly from simple T-cell lymphoma due to the presence of markers. Like other DLBCLs,

TCRBCLs follow an aggressive clinical course. It progresses very rapidly; the relapse rate is also very high. In case, if it is not treated with multidisciplinary modalities, recurrence is high with poor prognosis.

CONCLUSION

Core biopsy with IHC is essential to diagnose T-cell rich B-cell non-Hodgkin lymphoma of the breast which is more conclusive than FNAC and helps in the accurate management of treatment that is different from the ductal breast cancers as well as other lymphomas.

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