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Case Report

Synchronous breast carcinoma and chronic lymphocytic leukemia in a Chinese young female: a rare combination

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Abstract: Chronic lymphocytic leukemia (CLL) is one of the most common lymphoid malignancies in western countries, however, infrequent in Eastern countries. We report on a rare case of synchronous breast carcinoma and chronic lymphocytic leukemia in a Chinese female patient. A 47-year-old female patient who presented with right breast lump for three month was admitted to our hospital. An ultrasound scan showed two mass in right breast and axillary swollen lymph node. Then, this patient was given right mastectomy and axillary lymph node dissection. Histology report showed invasive ductal carcinoma of the breast (grade I) and small lymphocytic lymphoma/chronic lymphocytic leukemia (SLL/CLL). Bone marrow was infiltrated by CLL cell. To the best of our knowledge, this is the first report of a Chinese patient suffering from breast carcinoma and chronic lymphocytic leukemia.

Keywords: Chronic lymphocytic leukemia, breast carcinoma, synchronous tumor

Introduction

Breast carcinoma is not uncommon combined with other cancer but synchronous multiple primary carcinomas are rare. Chronic lymphocytic leukemia (CLL) is one of the most common lymphoid malignancies in Western countries, but is, however, infrequent in Eastern countries. Among multiple primary carcinomas, synchronous breast carcinoma and CLL are extremely rare. Here we report one young female patient who developed simultaneous breast carcinoma and CLL.

Case report

A 47-year-old female patient with no comorbidities and a family history of cancer presented with a right breast lump of 3 month's duration. During a previous physical examination 3 months prior, right breast lumps were found in the patient, without pain and with no relationship to menstruation. In addition, there was no fever, skin edema or flushing, nipple discharge, or mammary areola erosion. Physical exam revealed there was hard mass in right breast, size of 1.4 cm × 0.8 cm and palpable bilateral axillary lymphadenopathy. The lymph nodes on the bilateral neck and clavicle were not swollen, and her liver and spleen were not palpable. Laboratory results revealed leukocytosis (WBC count, 13.39 × 10^9/L, lymphocyte count, 8.20 × 10^9/L). An ultrasound scan of her breast showed two mass in right breast (**Figure 1A**). Both of them are Breast Imaging Reporting and Data System (BI-RADS) grade IV (**Figure 1A**, white arrows). Then, this patient was given right mastectomy and axillary lymph node dissection. Histology report showed invasive ductal carcinoma of the breast (grade I) (**Figure 1B**) and IHC showed Estrogen receptor (ER) (+>70%), Progesterone receptor (PR) (3+>90%), CerbB-2 (+), E-cadherin (+), Ki67 (+, 3%-8%); Clusters of small lymphocyte scattered among the axillary lymph node (**Figure 1C**) and IHC showed: CD20 (+), CD79α (+), CD3 (-), cyclin D1 (-), CD23 (+), CD5 (+), Bcl-2 (+), CD21 (residual FDC net +), Ki67 (+, 10%). Pathologists diagnosed that the

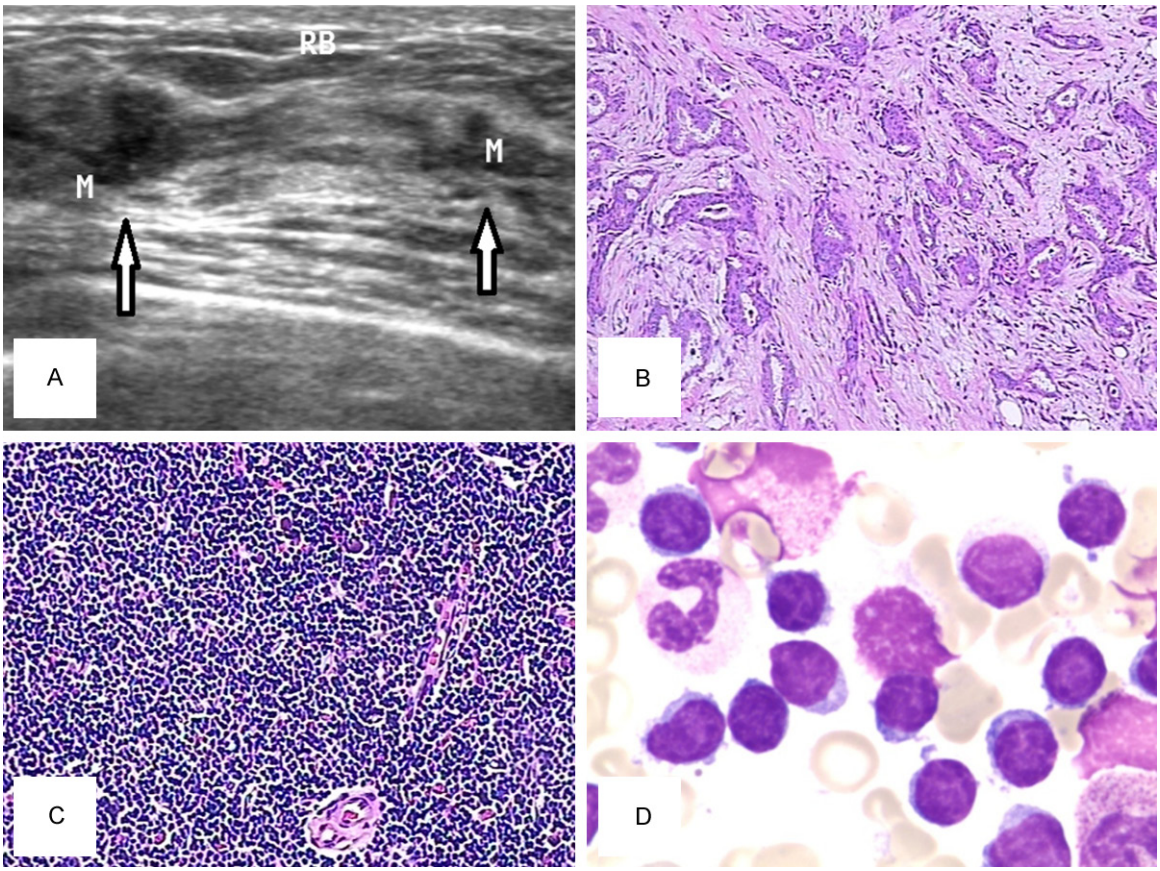

Figure 1. Right breast ultrasound (A), histopathology of the operative right breast specimen (B) and lymph node (C), bone marrow aspirates (D). (A) Right breast ultrasound demonstrating two solid mass suspicious for malignancy. (B) Definitive excisional specimen revealing 20 mm × 10 mm and 13 mm × 10 mm, grade 1 infiltrating ductal carcinoma. Cells have mildly pleomorphic nuclei with indistinct nucleoli and moderate amounts of eosinophilic cytoplasm, consistent with infiltrating ductal carcinoma (H&E, ×100). (C) Clusters of small lymphocyte scattered among the axillary lymph node (H&E, ×200). (D) Bone marrow aspirate (Wright and Giemsa; ×100).

lesions are small lymphocytic lymphoma/chronic lymphocytic leukemia (SLL/CLL). Bone marrow smear showed 74% abnormal lymphocyte (**Figure 1D**). Flow cytometry analysis of leukemic cells showed CD5 positive (79.02%), CD19 positive (61.60%), CD20 positive (63.18%), CD22 positive (69.13%), CD23 positive (58.96%), CD79a positive (34.51%), Kappa 2.87%, and Lambda 7.34%. Cytogenetic analysis demonstrated normal karyotype. Del (11q) and Del (17p) were not detected by interphase fluorescent in situ hybridization analysis (FISH). Together, these markers provided support for CLL (Rai 0). The final diagnosis was synchronous primary with right breast carcinoma (T1cN1M0) and CLL (Rai stage 0). Evaluate for indications for treatment for CLL, there was no therapeutic indications. She was given adjuvant chemotherapy after surgery.

Discussion

CLL/SLL is an indolent lymphoma with clonal proliferation of B-lymphocytes. It is characterized by accumulation of the mature form of lymphocytes in the body, leading to blood and bone marrow lymphocytosis, thereby causing lymphadenopathy, hepatomegaly, and splenomegaly, and involving other tissues and organs [1]. Tsimberidou *et al*. reviewed the records of consecutive patients with previously untreated CLL/SLL seen at The University of Texas M. D. Anderson Cancer Center from 1985 to 2005 [2]. Among 2,028 patients, 324 (16%) had a history of other cancers and 227 (11.2%) developed other malignancies during the follow-up period. The risk of second cancer for CLL was 2.2 times higher than the general population. Among these, 58 cases (9.3%) were merged

with breast carcinoma, including 38 CLL patients with a history of breast carcinoma and 20 cases with new breast carcinoma during CLL follow-up. However, CLL is relatively rare in Asian countries such as Japan, China, and India. The proportion among all leukemia is less than 5% and it occurs more often in the elderly (aged above 60 years). Our patient was younger and suffered from breast carcinoma and CLL simultaneously, in line with the internationally- recognized cancer diagnostic Multiple primary malignant (MPM) criteria proposed by Warren *et al* [3]. Although the presence of lymphoma and breast cancer may simply be due to chance, some have suggested that a possible relationship exists between the diseases. Whether lymphoma and breast cancer share a common genetic or viral cause in some patients, as they do in mice (mammary tumor virus) [4, 5], or whether one neoplasm stimulates the development of the other by an unknown mechanism, is undetermined.

The pathogenesis of CLL that is associated with breast carcinoma is unclear. They are mutually independent but also have a certain association: (1) CLL patients often combined with immune dysfunction and thus they are susceptible to secondary tumors; (2) Approximately 80% of CLL/SLL cases are associated with chromosomal abnormalities; Chromosomal abnormalities may be the cause of the second tumor; (3) The living environment of the patient and poor personal lifestyle may lead to tumor recurrences [6, 7]. MPM is extremely rare and easily misdiagnosed. Our ultrasound physicians and clinicians first considered it was breast carcinoma lymph node metastasis. We have a better understanding of breast lumps, particularly atypical sonographic images, by comparing ultrasound diagnostic results with pathological results.

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Disclosure of conflict of interest

None.

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