INTRODUCTION

Metastasis of extramammary malignancies to the breast are very unusual. Lymphoma, malign melanoma and rhabdomyosarcoma are the most common tumors that metastasise to the breast tissue. Breast metastases in cases of leukemia are very rare and occur primarily in patients with acute myeloid leukemia. Secondary ALL breast involvement is uncommon. In a patient with malignancy, any enlarging breast mass, even with benign radiologic appearance, should be investigated carefully and metastasis should not be forgotten.

Key Words: Acute lymphoblastic leukemia, Breast, Magnetic resonance imaging, Neoplasm metastasis

CASE REPORT

A 32-year-old woman with ALL under remission was admitted to the Department of Internal Medicine in our institution. This patient was first diagnosed with ALL in 2004. She did not continue the follow-up after 2008. She was presented with a giant, progressive right breast palpable mass in 2010. Mass, contralateral breast tissue were evaluated with MRI, diffusion weighted imaging and MR spectroscopy. With MRI findings, lesion was evaluated as malignant, tru-cut biopsy revealed recurrence of ALL. Lymphoma, malignant melanoma, rhabdomyosarcoma are most common tumors metastasise to breast. Breast metastases of leukemia are rare and occur primarily in patients with acute myeloid leukemia. Secondary ALL breast involvement is uncommon.

Key Words: Acute lymphoblastic leukemia, Breast, Magnetic resonance imaging, Neoplasm metastasis
intense on STIR and fat saturated T2W images (Figure 1B and 1C). In the VIBRANT sequence, there was a prominent enhancement of the solid components (Figure 1D and 1E). Time-signal intensity curves obtained by post-processing were classified as type 2 (Figure 1F). The lesion was hyperintense on DWI (Figure 1G), and hypointense in apparent coefficient diffusion (ADC) maps (Figure 1H). The ADC value was extremely low ($3.12 \times 10^{-6}$ mm$^2$/sec) representing prominent restricted diffusion. A prominent choline peak compatible with malignancy was detected at 3.2 ppm in the BREASE sequence (Figure 1I). There were also multiple malignant lymph nodes. There was no sign of chest wall invasion and the other breast was normal. With these findings the lesion was evaluated as a malignant lesion and core needle was applied. Core needle biopsy revealed recurrence of ALL (Figure 2). The cellularity of the mass was 95% and 80% of the cells were blastic. CD34 (+), Tdt (+), CD20 (-), CD3 (-), CD79 (-), MPO (-) were found in immunohistochemical analysis. A new chemotherapy regimen was started, but unfortunately the treatment was not successful and the patient died.
DISCUSSION

Metastases to the breast from extramammary malignant neoplasms are unusual and were described first in 1903. Breast metastases may be the initial manifestation of malignant disease. Nipple retraction is usually absent and axillary nodal involvement is frequent. Metastatic cancer to the breast is often discovered as a superficial solitary mass (85%), located in the upper outer quadrant (66%) [3]. Metastases are frequently multiple and bilateral, but they are more commonly large, solitary tumors [4]. They clinically manifest as well marginated, mobile, rapidly enlarging masses [5].

Metastatic breast leukemia is very rare and occurs primarily in patients with acute myeloid leukemia [6]. MRI features include T2 hyperintensity and rapid ring-enhancement of the lesions [7]. The explanation of this ring-enhancement is reported due to the central necrosis and peripheral angiogenesis in the literature [8].

Malignant tumors, show attenuated diffusion on DWI, and the ADC values are low secondary to high cellular density. Malignant lesions are hyperintense on DWI images and hypointense on ADC maps. Necrotic areas are hyperintense in both DWI and ADC maps [9]. During pathologic situations, the chemical content of tissues and organs change. Choline takes part in cellular membrane turnover and is a marker of cellular proliferation. In malignancy, the choline concentration increases as a result of both intracellular phosphocholine and high cellular density of the lesion. Moreover, it was reported that high choline content was compatible with the increase of angiogenic activity [10].

In our case both conventional and advanced MRI findings were compatible with the literature. The extremely rare involvement of the breast in cases of leukemia can be the only complaint at initial presentation or seen as relapse. Moreover, radiotherapy performed for breast malignancies can also cause acute leukemia in breast tissue [2]. In a patient with a known malignancy, any enlarging breast mass, even one with a reassuring benign sonographic appearance must be investigated promptly [11], initially with fine-needle aspiration or core needle biopsy [4]. Breast metastases are usually associated with disease originating elsewhere, and the prognosis is generally poor [12].

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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