

## Case Report

# Diagnosis of Myeloid Sarcoma of Female Breast by Routine Microscopic Findings Using Immunohistochemical Method, Bone Marrow Aspiration and Flow Cytometry

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### ABSTRACT

Myeloid sarcoma of female breast is a rare presentation of acute myeloid leukemia (AML). The tumor mass may precede or occur concurrently with AML, CML, myeloproliferative disorders, and/or myelodysplastic syndromes. Histologically, it looks like a large cell lymphoma and can be misdiagnosed.

A case referred as a suspected case of large cell lymphoma. Initial morphological study with conventional H and E staining showed diffuse infiltration of pleomorphic large blast cells with occasional mature cells showing eosinophilic cytoplasmic granules. Immunohistochemical study was done on paraffin material for this suspected case of myeloid sarcoma and tumor cell reaction with myeloperoxidase was positive. The histological diagnosis was finalized as myeloid sarcoma. Initial bone marrow aspiration showed less than 20% myeloid blasts but after three weeks the marrow aspiration showed 30% of myeloid blasts. Flow cytometry was also performed and proved the diagnosis of acute myeloid leukemia.

It is concluded that in conditions of an unusual case of pleomorphic large cell lymphoma, myeloid sarcoma may be a possibility.

**Key words:** Myeloid sarcoma, Acute myeloid leukemia, Breast malignancy

### Introduction

Myeloid sarcoma (MS) is an uncommon manifestation of myeloproliferative disorders including acute myeloid leukemia (AML). The common sites of tissue involvement include subperiosteal region of bones, lymph nodes, and skin (1). The most common sites for bone involvement include skull bones, paranasal

sinuses, sternum, ribs, vertebra, and pelvis. Breast mass is an uncommon presentation of myeloid sarcoma (2). When the pathologist is not aware of this tumor, it is usually misdiagnosed as large cell lymphoma or malignant round cell sarcoma. Bone marrow aspiration can be negative in some cases at the time of presentation.

Such cases can show bone marrow infiltration

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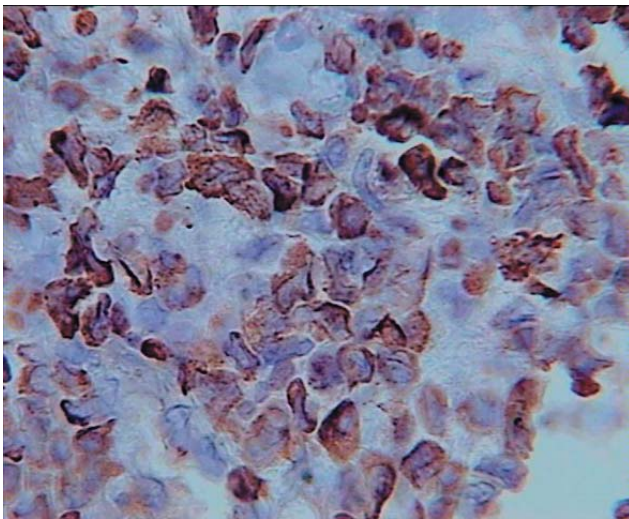
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after a variable period of time or they can be a primary extramedullary myeloid sarcoma with different presentation, prognosis, and mode of treatment. Such isolated cases of myeloid sarcoma with no history of myeloproliferative disorder or subsequent development are very rare (2).

### **Case Report**

Herein we report a case of myeloid sarcoma of breast with an initial presentation as breast mass in a 41 years old female. The general condition was good and routine CBC showed leukopenia (2900 mm<sup>3</sup>), thrombocytopenia (45000 mm<sup>3</sup>) and mild anemia (Hb 12 g %).

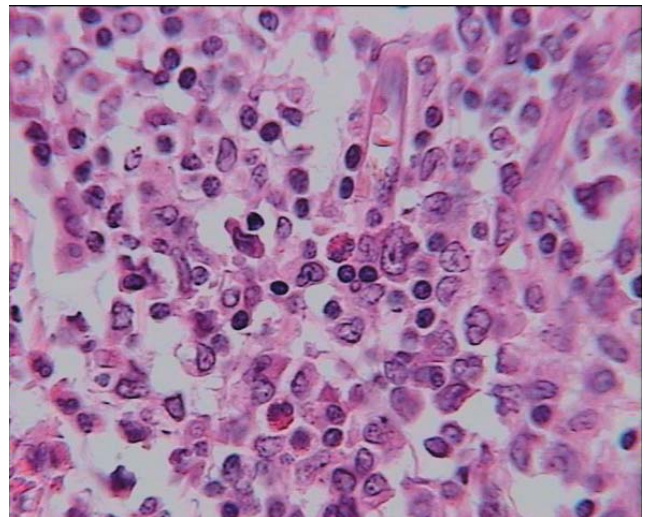
The tumor was excised in a general hospital and initial pathologic study ruled out breast carcinoma. The paraffin material was referred to university hospital for immunohistochemical study as a suspected case of large cell lymphoma. Our H and E stained sections showed a large cell tumor with diffuse sarcomatous pattern of infiltration in breast including inter- and intra-lobular stroma. The pattern of infiltration and pleomorphic tumor blasts including few differentiated myeloid cells showing eosinophilic cytoplasmic granules suggested a myeloid origin for the tumor (Figure 1).



**Figure 1: H&E staining x100. Sheet of dyscohesive blast cells with some more differentiated myeloid cells showing eosinophilic cytoplasmic granules.**

Immunohistochemical study was performed with a panel of monoclonal antibodies (Dako

Company). It was found out that there is a positive cytoplasmic reaction for myeloperoxidase in about 50% of tumor cells (Figure 2). Meanwhile, CD20 showed a negative reaction with tumor cells, and cytokeratin and estrogen receptor antibodies showed also a negative reaction. Flow cytometry result was in favor of AML with 47% positive reaction with anti HLADR, 39% with anti CD13, and 31% with anti CD33.



**Figure 2: Myeloperoxidase staining on paraffin material x400, showing positive cytoplasmic reaction with many blast cells.**

### **Discussion**

Myeloid sarcoma occurs de novo as an early manifestation of AML, as a tumor mass in a known case of AML, or as tumoral manifestation of CML blastic transformation. De novo myeloid sarcoma may precede AML by several months. AML-M2 with t(8; 21) and AML-M4 Eo with t(16; 16) or inv-16 are associated with increased risk of developing myeloid sarcoma (2). Acute monoblastic leukemia with t(9; 11) is also associated with an increased incidence of extramedullary involvement.

Leukemic infiltration in soft tissue, especially in the breast has been reported as an uncommon finding with 61 cases in the literature (2). De novo cases with negative bone marrow at the time of tissue diagnosis as in our case are rare (2,3). Only 19 cases have been reported out of 1970 up to 2001 (3). Six of the 19 cases (32%) were initially misdiagnosed as breast carcinoma, cystosarcoma

phylloides, and small cell carcinoma (3). Follow up of six cases did not show development of AML after a median of 13 months with a range of 5 months to 6 years (3).

In two separate extensive necropsy studies, breast involvement was found out in only 2 cases of a total number of 472 cases of AML (4,5).

Granulocytic sarcoma is difficult to diagnose by conventional histological study and it may be misdiagnosed as a large cell lymphoma or some other type of round cell sarcoma. Pleomorphic large tumor cells with occasional dyscohesive cells showing eosinophilic cytoplasm are important microscopic clue. Immunohistochemistry is a great help for its histological diagnosis because sometimes the marrow aspiration is negative for a short or long period of time. Myeloperoxidase, immunohistochemical study along with anti-CD13, -CD33, -CD34, -CD117, and and -lysozyme can be used but the most specific ones are anti-myeloperoxidase anti-lysozyme, and anti-CD33 (1,2). In this case, we did not use other antibodies because finally bone marrow involvement appeared after three weeks.

Enzyme histochemistry using chloroacetate esterase is another important diagnostic test which can be used on smear or tissue sections (1-2). Correct diagnosis of myeloid sarcoma is very important. Mansi et al reported that correct diagnosis and treatment at presentation time will lead to remissions lasting from 2 to 16 months, while a misdiagnosis of lymphoma will lead to no remission (6). Correct microscopic diagnosis is also important because it can prevent unnecessary mastectomy (7). Correct diagnosis of de novo cases by conventional microscopy and immunohistochemical confirmation with a panel of antibodies has another importance since earlier chemotherapy (when bone marrow still has not been involved) improves the patient's prognosis (7).

Finally, it is concluded that in conditions of an unusual case of pleomorphic large cell lymphoma, myeloid sarcoma may be a possibility.

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