

Granulocytic sarcoma of the breast: A case report in Lao PDR

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Abstract

Granulocytic sarcoma (GS) also known as myeloid sarcoma, chloroma, myeloblastoma, or extramedullary myeloid tumor is a neoplasm composed of immature myeloid cells. The common sites of involvement include bone, central nervous system, soft tissue, lymph nodes, and skin. The involvement of GS in breast tissue is very rare. The incidence of breast GS is 2/1,000,000 in adults. Those affected range in age from 16 to 72 years, with the mean age of 31 years. Primary, isolated, or non-leukemic GS of the breast is defined when bone marrow biopsy confirms the absence of other hematologic malignancy. We here report a case of granulocytic sarcoma of the left breast in a 33 year-old woman who presented with a breast mass. She was initially diagnosed as having diffuse lymphoma, large cell type on Hematoxylin and eosin stain (H&E) histopathology. The tumor cells were, however, strongly positive for myeloperoxidase (MPO), CD117, CD34, and CD43 but negative for CD45, CD20, CD3, or cytokeratin. Although further clinical information, such as complete blood count or aspiration biopsy of bone marrow tissue, was absent, we finally diagnosed this case as GS by additional immunohistochemical study. What happened to the patient?

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Keywords: Granulocytic sarcoma, immunohistochemistry study, fluorescence in situ hybridization, histopathology diagnosis.

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Introduction

Granulocytic sarcoma (GS) known as myeloid sarcoma, chloroma, myeloblastoma, or extramedullary myeloid tumor is a neoplasm composed of immature myeloid cells.^{[1][2][3][4]} The common sites of this tumor involvement include bone, central nervous system, soft tissue, lymph nodes, and skin.^{[5][6][7]} The involvement of GS in breast tissue is very rare.^{[1][3]} The incidence of breast GS is 2/1,000,000 in adults.^[8] The affected people range in age from 16 to 72. The mean age is 31. The GS in breast presents with an infiltrative pattern which is similar to lymphoma or invasive lobular carcinoma.^{[1][9]} Primary, isolate, or non-leukemic GS of breast is defined when bone marrow biopsy confirms the absence of other hematologic malignancy.^[8] We here report a case of granulocytic sarcoma of the left breast in 33 years old woman who presented with a breast mass.

This case was initially diagnosed as diffuse lymphoma, large cell type on Hematoxylin and eosin stain (H&E) histopathology. Although the clinical information such as complete blood count or aspiration biopsy of bone marrow tissue was absent.

Case report

The patient was 33 years old female presenting with a palpable mass in the left breast. No enlargement of axillary lymph nodes was found by the physical examination. She had neither nipple discharge nor skin lesion, and had no history of familial breast cancer. The breast mass was removed by mastectomy. We received the breast mass as a mastectomy specimen. It measured 10 x 6 x 4.5 cm. The macroscopic findings showed solid, soft to rubbery consistency and whitish, yellow-colored tissue mass. We couldn't obtain

further clinical information of echography, complete blood count, or aspiration biopsy of the bone marrow tissue because the patient was lost during follow-up and the medical records was not available. Thus, the probability of secondary involvement of breast could not be ruled out. The breast mass was predominantly composed of uniform tumor cells with scant cytoplasm (Figures 1-3). In addition, small lymphoid infiltration was found. Based on this microscopic feature on H-E staining, malignant lymphoma of large cell type was diagnosed. To confirm our diagnosis and characterize it further, we sent a paraffin block of the specimen tissue to a consultant pathologist, one of the authors (M.K.) for immunohistochemical study. The tumor cells were strongly positive for myeloperoxidase (MPO), CD117, CD34, and CD43 but negative for CD45, CD20, CD3, or cytokeratin (Figures 4-7). From the histological and immunohistochemical findings, the diagnosis of GS was made.

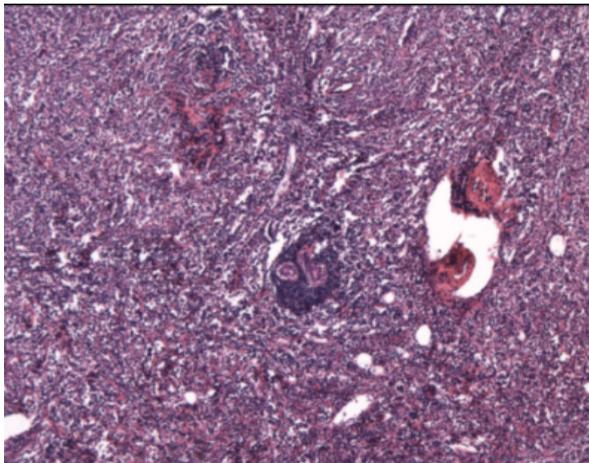


Figure 1. Low-power view of breast tissue showing diffuse tumor cell infiltration in the stroma (H&E, x40)

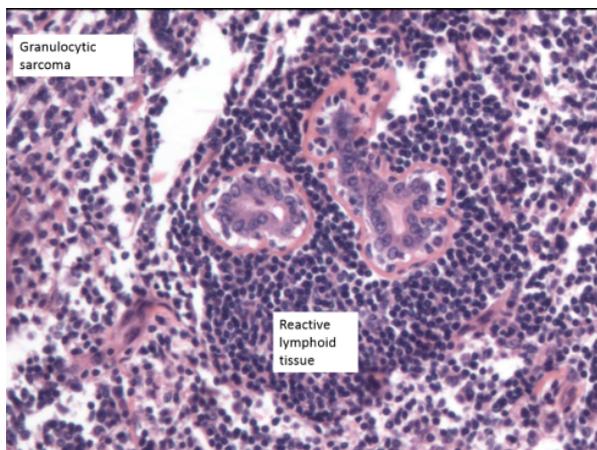


Figure 2. Microscopic picture of breast tissue showing diffuse tumor cells infiltration with focal lymphoid cell aggregation (H&E, x100)

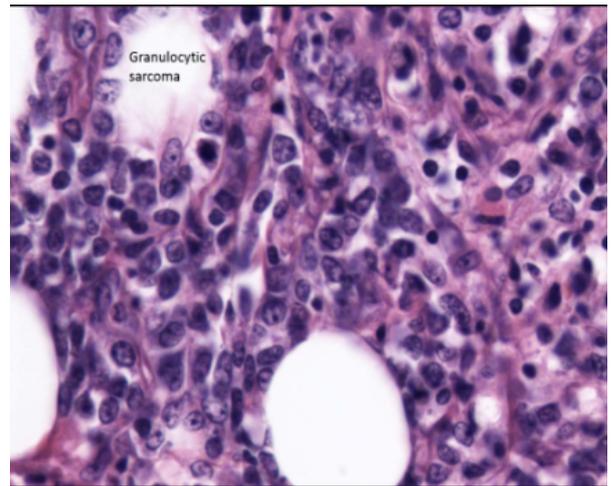


Figure 3. High power view of tumor cells in breast tissue H&E, (400)

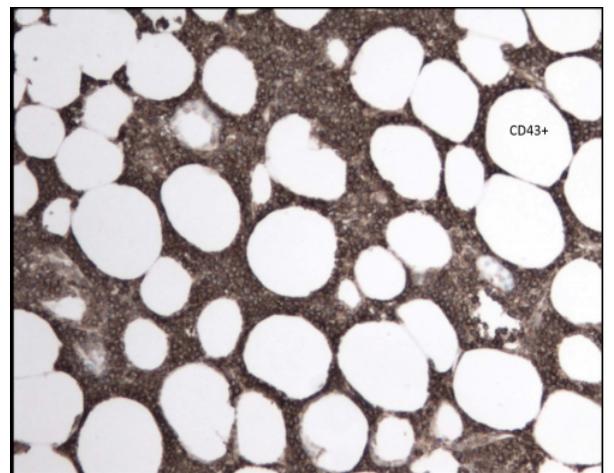


Figure 4. Microscopic picture of CD43-positive tumor cells (x100)

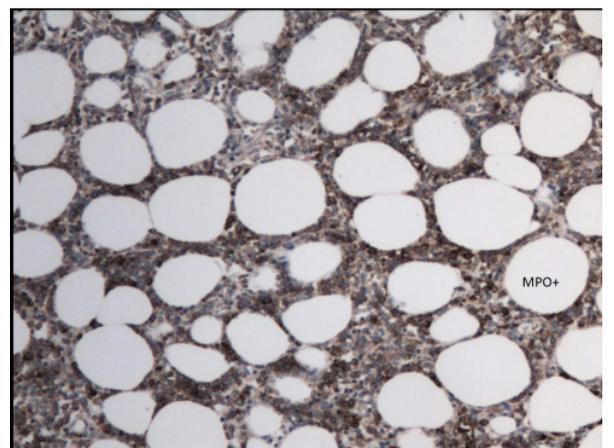


Figure 5. Microscopic picture of myeloperoxidase-positive tumor cells (x400)

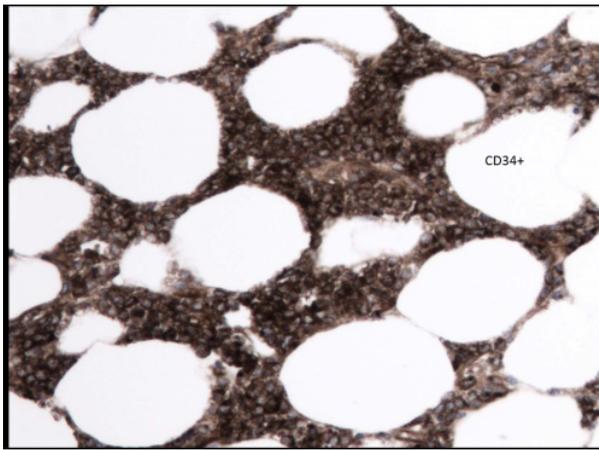


Figure 6. Microscopic picture of CD34-positive tumor cells (x400)

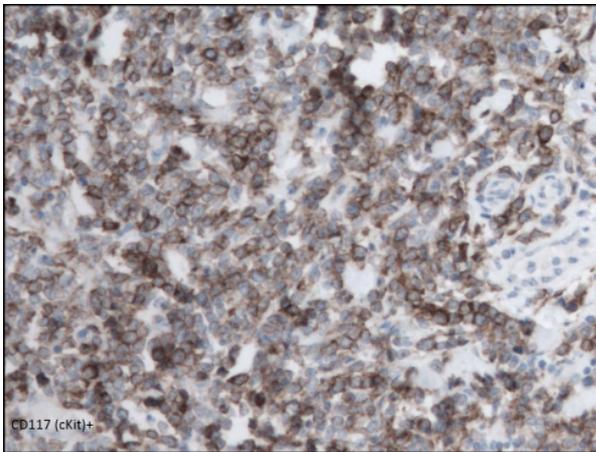


Figure 7. Microscopic picture of CD117-positive tumor cells (x400)

Discussion

The GS of the breast is a rare malignant tumor. The immunohistochemical staining is essential to establish the diagnosis. The immunohistochemical staining usually shows the tumor cells are positive for myeloperoxidase (MPO), CD43, CD34, TDT, CD117, CD68,^{[1][5][7][10]} and negative for CD20, CD30, CD3, CD56, CD79 and UCHL1.^{[6][10]} Fluorescence *in situ* hybridization and molecular analysis are also recommended.^[8] Bone marrow aspiration biopsy should be performed to rule out other possibilities of hematological malignancies.^[8] The differential diagnosis includes non-Hodgkin lymphoma, especially MALT Lymphoma, diffuse large B-cell lymphoma, lobular carcinoma and small round cell tumor.^{[1][4]} Prognosis is poor in non-leukemic patients with a median survival of 22 months. Combination of surgical excision and chemotherapy must be performed as a treatment.^[5]

The term “chloroma” had been used for this lesion because of the presence of green-colored tumor as a result of the enzymatic action of myeloperoxidase in neoplastic cell.^{[11][12][9]} Reviewing all case reports from 1970 to 2006 on Medline shows only

24 cases of GS involving breast, and they were mostly unilateral in location.^[11] Four cases were bilateral.^[10] The most common hematologic malignancies presenting as a breast mass is malignant lymphoma, followed by leukemia and multiple myeloma.^[2]

Conclusion

The GS of the breast is uncommon and the patients present no specific systemic signs. Therefore, histological diagnosis is essential. For an appropriate pathological diagnosis, the quality of staining and immunohistochemistry is the most important, to avoid incorrect pathological diagnosis and subsequent treatment of a potentially curable condition.

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