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SPECIAL RESEARCH REPORT

Myeloid sarcoma with megakaryoblastic differentiation presenting as a breast mass

Ifeyinwa E. Obiorah *, Metin Ozdemirli

Department of Pathology, Medstar Georgetown University Hospital, Washington, D.C. 20007, United States

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Abstract
Myeloid sarcoma is an extramedullary tumor that consists of myeloblasts or immature myeloid cells. The neoplasm can occur in any part of the body, including the bone, periosteum, lymph nodes, skin, and soft tissue and they may occur de novo or in association with acute myeloid leukemia, myeloproliferative neoplasms and myelodysplastic syndromes. Most cases display a myelomonocytic or pure monoblastic morphology. Tumors with megakaryoblastic differentiation are extremely uncommon and may occur in association with transformation of a myeloproliferative disorder. Myeloid sarcoma presenting as a breast mass is very rare and diagnostically challenging. We report a case of myeloid sarcoma with megakaryoblastic differentiation in the breast of a patient with history of essential thrombocythemia. The mass was composed of undifferentiated pleomorphic malignant cells in trabecular cords and nests with many scattered giant malignant cells and brisk abnormal mitoses. On immunohistochemistry, the neoplastic cells were positive for CD61, CD31, CD34, Factor VIII and CD43 which confirmed the diagnosis. To our knowledge, this is the first report of myeloid sarcoma with megakaryoblastic morphology occurring in the breast. Here we discuss the clinicopathologic features of this rare entity and the challenges involved in making this difficult diagnosis.
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Introduction

Myeloid sarcoma is a rare hematological malignancy consisting myeloblasts or immature myeloid cells occurring in an extramedullary site. Myeloid sarcoma was initially termed ''chloroma'' due to their green gross appearance which was due to myeloperoxidase in the immature myeloid cells

* Corresponding author at: Georgetown University Medical Center, Department of Pathology, 3800 Reservoir Road NW, Washington, D.C. 20007, United States.
E-mail address: Ifeyinwa.e.obiorah@gunet.georgetown.edu (I.E. Obiorah).

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[1]. However, it was later discovered that not all myeloid sarcomas are green thus leading to a name change to granulocytic sarcoma or the more preferred term myeloid sarcoma. Myeloid sarcoma (MS) may present de novo, or may be associated with acute myeloid leukemia (AML), or may present as progression of a prior myelodysplastic syndrome (MDS), myeloproliferative neoplasm (MPN), or MDS/MPN [2]. Myeloid sarcoma can occur at any site of the body including soft tissues, bone, peritoneum, lymph nodes, skin, genitourinary system and gastrointestinal system. Due to the diversity of the locations of the disorder, the clinical presentation is determined by the site of the tumor, thus making the diagnosis of primary myeloid sarcoma relatively difficult. Myeloid sarcoma occurring in the breast is extremely unusual and similar to most cases of MS, and typically presents with either a monoblastic or myelomonocytic morphology [3]. MS with megakaryoblastic differentiation (MS-MKD) is extremely rare [4], only 14 cases have been described usually involving the lymph nodes and soft tissue. To the best of our knowledge we present the first report of a MS-MKD, French American British (FAB) classification-M7 developing in the breast.

Case report

A 58-year-old woman presented to an outside facility with fatigue and anemia. Her past medical history was significant

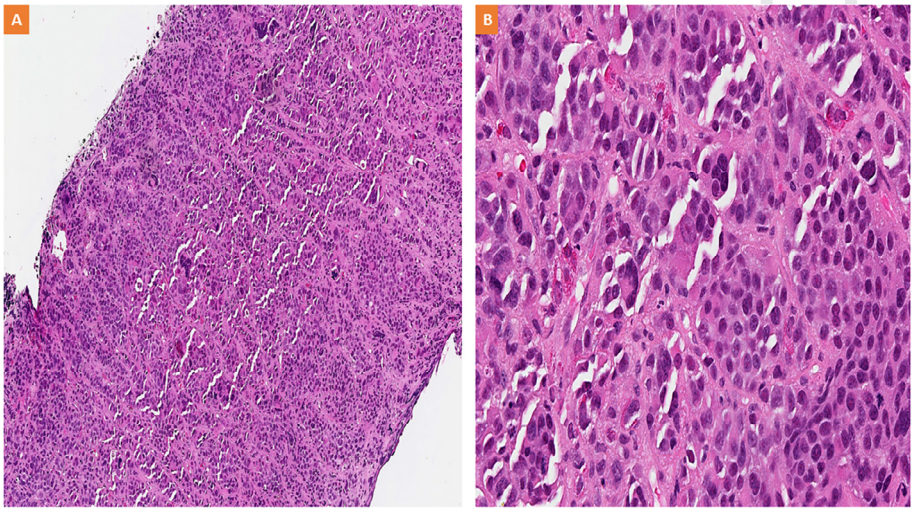

Fig. 1 Myeloid sarcoma with megakaryoblastic differentiation. Undifferentiated neoplastic cells are arranged in nests and cords with many scattered giant malignant cells with multilobated nuclei. (A) (hematoxylin and eosin (H&E) x500 (B) H&E x 4000.

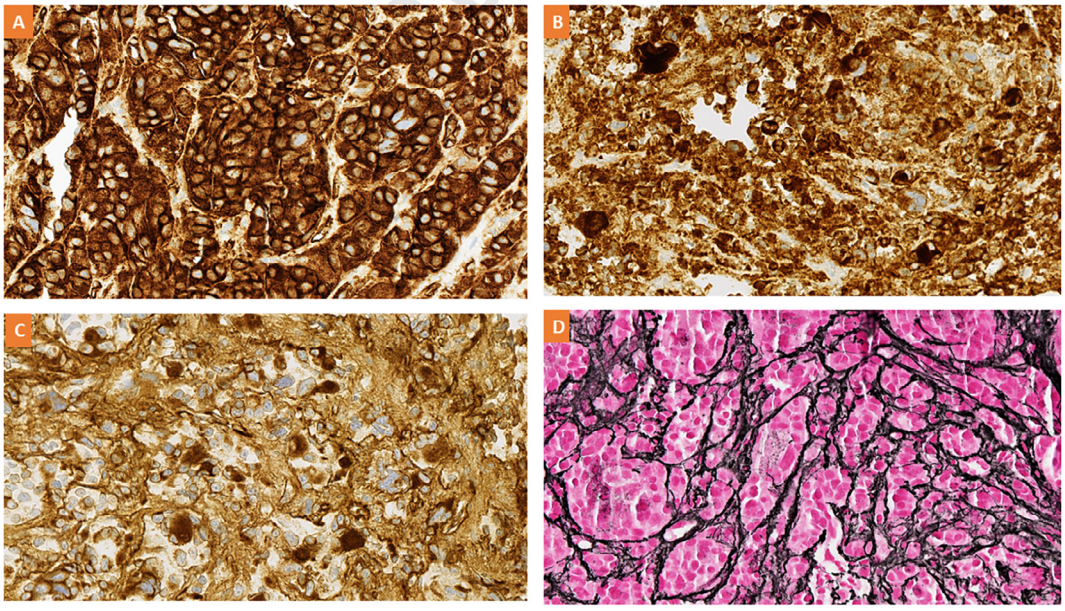

Fig. 2 Immunohistochemical staining of myeloid sarcoma of the breast. The neoplastic cells were positive for (A) CD34, (B) CD61 and (C) factor VIII. (x 4000 each). (D) Reticulin fibers surrounding the nests of malignant cells (x 4000).

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