Extramedullary Deposits in Leukemia: Out of Blood but Not Out of Mind

Dear Editor,

Gomaa *et al*. reported a challenging case of breast myeloid sarcoma in a young woman.[1] Extramedullary granulocytic sarcomas (EMS) have varied presentations depending on the site of involvement. It is very important to be aware of extramedullary deposits while treating any patient to monitor the size, to assess the need of local radiotherapy, and to evaluate for any mass effect compromising organ function. We hereby share our institutional experience on extramedullary deposits with special emphasis on female reproductive system.

Author's case was worked up for breast lump and was found to have EMS of the left breast.[1] Other than in acute myeloid leukemia (AML), EMS are also seen in chronic myeloid leukemia (CML), myelodysplastic syndrome etc [Table 1: Case no. 3, 5, and 9]. Case no. 3 had CML in chronic phase (CML-CP) and was on imatinib therapy (400 mg/day) for 10 years before she had disease progression to accelerated phase (AP) requiring dose escalation.[2] One year later, she developed a left shoulder EMS requiring local radiotherapy and higher dose of chemotherapy. Contrarily, Case no. 9 developed dual-site EMS at the scalp and spinal cord but unfortunately died secondary to sepsis.[3]

Chatterjee *et al*. (Case no. 6) reported bilateral breast lumps as an initial presentation of AML.[4] Case no. 4 was diagnosed with B-cell acute lymphoblastic leukemia and received modified BFM-90 chemotherapy successfully. On follow-up, she presented with postcoital bleeding and was diagnosed to have extramedullary relapse involving ovary.[5]

As evident in Table 1, we recently reported other cases of EMS involving other rare sites such as orbit, spinal cord, uterus, paravertebral mass presenting as Horner's syndrome, pleura, and mediastinum.[6-11] In most cases, any meningeal or parenchymal lesion in a known case of leukemia should prompt us to think of central nervous system relapse. However, Salunke *et al*. from our institute recently reported biopsy-confirmed meningeal-based tuberculoma in a known CML case which teaches us not to limit the differentials only to relapse based on history of malignancy.[12]

In our recent review of literature on EMS of vulva and heart, we found that these rare sites of involvement are more challenging and can be easily missed unless a strong suspicion is kept.[13-16] It is important to know that besides leukemia, renal cell carcinoma, carcinoma of lung, plasmacytoma, and Burkitt's lymphoma are also reported to present as breast lumps.[17-20] However, we want to reemphasize to readers to consider common causes of breast lump such as fibroadenoma and benign fibrocystic disease as the first possibilities and not to forget the above-mentioned conditions in the differentials.

We conclude with the hope to enhance knowledge about the rare entities presenting as breast lumps. EMS of breast can mimic as common benign entities such as fibroadenoma and hamartoma, especially in reproductive age group. Hence, combined effort of oncologists, gynecologists, and pathologists

Table 1: Recent institutional experience of Postgraduate Institute of Medical Education and Research, Chandigarh, on extramedullary deposits (secondary to leukemias)

Authors	Years of publication	Age/sex	Basic disease	Site of EMS/presentation	Development of EMS
Mishra *et al*.	2018	36/female	AML with t (5;12) and trisomy 21	Uterus	At presentation
Jandial *et al*.	2017	50/female	Acute myelomonocytic leukemia with translocation (8;21) (AML-ETO1)	Paravertebral mass extending from C7 to D4 level causing preganglionic right-sided Horner's syndrome	At presentation
Jain *et al*.	2016	35/female	CML - Myeloid accelerated phase (TKD$^{\neq}$ mutation - H396R mutation)	Left shoulder	At follow-up
Sahu *et al*.	2015	47/female	B-cell ALL$^{\beta}$ (post-BFM chemotherapy)	Right adnexal mass	At follow-up
Sahu *et al*.	2015	23/male	AML-M2	Orbit	At follow-up
Chatterjee *et al*.	2015	30/female	AML$^{\mu}$-M5	Bilateral breast lump	At presentation
Sahu *et al*.	2015	28/male	AML-M2	Orbit, conjunctiva, spine	At diagnosis
Sahu *et al*.	2015	27/male	Isolated myeloid sarcoma	Mediastinal mass with malignant pleural effusion	Before systemic involvement
Sahu *et al*.	2014	38/female	CML - Myeloid blast crisis (TKD mutation - M351T mutation)	Spinal cord and scalp	At presentation and follow-up both
Chauhan *et al*.	2007	53/female	CML - Myeloid blast crisis	Spinal cord	At follow-up

€: Chronic myeloid leukaemia, £: Hematopoietic stem cell transplantation, ≠: Tyrosine kinase domain, β: Acute lymphoblastic leukaemia, μ: Acute myeloid leukaemia

is of utmost importance to hasten the diagnosis and treatment in any proven case.

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Conflicts of interest

There are no conflicts of interest.

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References

1. Gomaa W, Ghanim A, Emam E, Bayoumi K, Ghanim A. Primary myeloid sarcoma of the breast: A case report and review of literature. J Microsc Ultrastruct 2018;6:212-4.
2. Jain A, Sahu KK, Sharma S, Rajwanshi A, Suri V, Malhotra P. Shoulder myeloid sarcoma: An initial presentation of CML blast crisis. Indian J Hematol Blood Transfus 2016;32:361-3.
3. Sahu KK, Malhotra P, Uthamalingam P, Prakash G, Bal A, Varma N, *et al.* Chronic myeloid leukemia with extramedullary blast crisis: Two unusual sites with review of literature. Indian J Hematol Blood Transfus 2016;32:89-95.
4. Chatterjee D, Bal A, Das A, Ahluwalia J, Singh G. Extramedullary myeloid sarcoma of bilateral breast as first manifestation of acute myeloid leukemia – A diagnostic challenge. Breast J 2015;21:679-80.
5. Sahu KK, Prakash G, Sanamandra P, Khadwal A, Dey P, Sharma P, *et al.* An unusual site of acute lymphoblastic leukaemia relapse: Challenge for gynaecologists. J Obstet Gynaecol India 2016;66:656-61.
6. O'Neill JP, Harrison AR, Cameron JD, Mokhtarzadeh A. Granulocytic sarcoma of the orbit presenting as a fulminant orbitopathy in an adult with acute myeloid leukemia. Ophthalmic Plast Reconstr Surg 2017;33:S118-20.
7. Sahu KK, Tyagi R, Law AD, Khadwal A, Prakash G, Rajwanshi A, *et al.* Myeloid sarcoma: An unusual case of mediastinal mass and malignant pleural effusion with review of literature. Indian J Hematol Blood Transfus 2015;31:466-71.
8. Sahu KK, Sanamandra P, Jeyaraman P, Kumar G, Prakash G, Kumar N, *et al*. Unusual cause of cord compression – A pressing issue for neurosurgeons. World Neurosurg 2015;92:565-7.
9. Sahu KK, Yanamandra U, Malhotra P. Orbital myeloid sarcoma: Rare presentation of AML. Orbit 2016;35:157-8.
10. Mishra K, Muralidaran C, Jandial A, Mittal BR, Varma S. Uterine mass and menorrhagia: A rare presentation of acute myeloid leukemia with arduous clinical course Balkan Med J 2018;35:282-4.
11. Jandial A, Nampoothiri RV, Malhotra P, Singh P, Sachdeva MU, Varma S. Horner's syndrome in a case of granulocytic sarcoma. Indian J Hematol Blood Transfus 2017;33:285-7.
12. Salunke P, Gupta K, Singla N, Singh H, Singh P, Mukherjee KK. Meningeal tuberculoma mimicking chloroma in a patient with chronic myeloid leukemia on imatinib. Neurol India 2011;59:628-30.
13. Sahu KK, Jain A, Yanamandra U, Varma SC, Malhotra P. Myeloid sarcoma of vulva: A short update. Indian J Hematol Blood Transfus 2016;32:69-71.
14. Gautam A, Jalali GK, Sahu KK, Deo P, Ailawadhi S. Cardiac myeloid sarcoma: Review of literature. J Clin Diagn Res 2017;11:XE01-4.
15. Sahu KK, Gautam A, Ailawadhi S. Re: FDG PET/CT findings of intracardiac myeloid sarcoma. Clin Nucl Med 2017;42:242-5.
16. Sahu KK, Thakur K. Role of positron emission tomography imaging in myeloid sarcoma. Indian J Nucl Med 2018;33:90.
17. Ganapathi S, Evans G, Hargest R. Bilateral breast metastases of a renal carcinoma: A case report and review of the literature. BMJ Case Rep 2008;2008:bcr0620080239.
18. Dharmshaktu P, Jain A, Gupta N, Garg A, Kaushal S. Bilateral breast lumps as a presentation of disseminated squamous cell carcinoma of lung. Clin Med Insights Case Rep 2014;7:21-3.
19. Bloomberg TJ, Glees JP, Williams JE. Bilateral breast lumps: An unusual feature of extramedullary plasmacytoma. Br J Radiol 1980;53:498-501.
20. Thieringer F, Sartorius G, Kalf K, Heinzelmann V, Vetter M. Bilateral breast masses with a rare etiology. Case Rep Oncol Med 2013;2013:412368.

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