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Case Report

An unexpected finding of bone marrow metastasis from adenocarcinoma of lower gastrointestinal tract origin: Case report

Saket Sharma[1,*], **Jhanvi Makwana**[1], **Riya Kaka**[1], **Moushumi Mandal**[1]

[1]*Dept. of Pathology, Medical College Baroda, Vadodara, Gujarat, India*

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ABSTRACT

Introduction: Bone marrow examination is an essential tool for diagnosis of many diseases including both hematological and non hematological tumors. Bone marrow is commonly involved by many metastatic solid tumors. Bone marrow aspirates, and biopsies have been found to be more useful than radiological investigations in early diagnosis of bone marrow metastasis.

Case Report: Here we present a case of a 75 years old male patient presenting with acute sudden onset chest pain along with multiple lytic sclerotic foci in lumbar vertebrae, bilateral ribs, clavicle, scapula and sternum along with fractures in multiple ribs. CBC findings showed anemia with thrombocytopenia. Bone marrow examination revealed an infiltration of a metastatic tumor in bone marrow which was further confirmed to be of lower gastrointestinal tract in origin on IHC findings.

Conclusion: A high suspicion for bone marrow metastasis should be considered in cases who present primarily with abnormalities in peripheral blood count and a vigilant search for metastatic cells on aspirate smears and imprint smears can help in early diagnosis of bone marrow metastasis by solid tumors.

1. Introduction

Bone marrow examination is an essential investigation for diagnosis of many diseases including both hematological and non hematological tumors. The bone marrow gives rise to many primary hematological malignancies and is also commonly involved by many metastatic solid tumors.[1,2] Bone metastasis occurs when cancers travel from their primary sites to bone, primarily via blood vessels. Bone marrow aspirates, and biopsies have been found to be more useful than radiological investigations in early diagnosis of bone marrow metastasis. Moreover, bone marrow biopsy is way more helpful than bone marrow aspirates in detection of involvement of bone marrow by solid tumors.[3] It is quite imperative to rule out bone marrow involvement in any malignancy in order to decide further therapeutic options.[4]

In this case report, we present a case of bone marrow metastasis from adenocarcinoma of lower gastrointestinal tract origin which was first and unexpectedly diagnosed on bone marrow aspiration and biopsy.

2. Case Report

A 75 years old male patient who is a chronic cigarette smoker presented in OPD with chief complaints of acute sudden onset chest pain, pedal edema and black stool since last few days. The patient also had a chronic backache and bilateral lower limb pain since 4 months and diffuse abdominal pain and breathlessness since last 1 month. The patient was a known case of hypertension and is on Tab Nifedipine since last 4 months. There were no complaints of hematuria, fever and vomiting. No significant family history was found. CECT abdomen-pelvis showed multiple lytic sclerotic foci in lumbar vertebrae, bilateral

* *Corresponding author*.
E-mail address: doctorss081992@gmail.com (S. Sharma).

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pelvis bone and femur. Hepatomegaly with fatty infiltration and cholelithiasis was also noted. Overall findings were suggestive of either Marrow infiltrative disease or Multiple Myeloma. CT chest also showed similar multiple sclerotic lesions in dorso-lumbar vertebrae, bilateral ribs, clavicle, scapula and sternum along with fractures in multiple ribs. Bilateral mild pleural effusion along with pulmonary artery hypertension was also observed. The findings were suspicious of metastasis.

CBC findings were as follows: Hb-8.68gm/dl; RBC count-3.29x10^6/cmm; Total WBC count-8300/cmm and Platelet count-35000/cmm. RBC Indices were as follows: PCV-28.29%; MCV-85.88fl; MCH-26.35pg; MCHC-30.68 gm/dl; RDW(cv)-17.93%. Peripheral smear examination showed mild aniso-poikilocytosis with mildly microcytic and hypochromic RBCs and severely reduced platelets. Few Pseudo Pelger-Huet like cells were also observed. No parasites or plasma cells were detected on peripheral smear. Corrected reticulocyte count was noted to be 6. M-spike was not seen on protein electrophoresis; both kappa and lambda light chains were increased but the ratio was observed to be in the normal range. The patient was referred for Bone marrow aspiration and biopsy examination. Bone marrow aspiration and biopsy was done from right posterior superior iliac spine. The aspirate smears were diluted and showed very scarce small groups of epitheloid looking cells with moderate amounts of cytoplasm, indinstinct cell borders, coarse chromatin and irregular nuclear contours suspicious of malignancy. (Figure 1) The trephine biopsy imprint smears were also prepared which showed clusters of malignant epithelial cells arranged in a glandular configuration. (Figure 2) The bone marrow trephine biopsy sections showed intertrabecular spaces with fibrosis and few vaguely gland forming as well as trabeculae of epithelial malignant cells. (Figure 3) Findings of both aspirate smears and biopsy sections were suggestive of Metastatic adenocarcinoma. Immunohistochemical analysis of biopsy sections showed nuclear positivity for CDX2; TTF-1, PSA, CK7 were found to be negative. (Figure 4) The diagnosis was confirmed to be metastatic adenocarcinoma in bone marrow with a high possibility of lower gastrointestinal tract origin. The patient was referred to higher centre for further workup and treatment. No follow up was available for the patient.

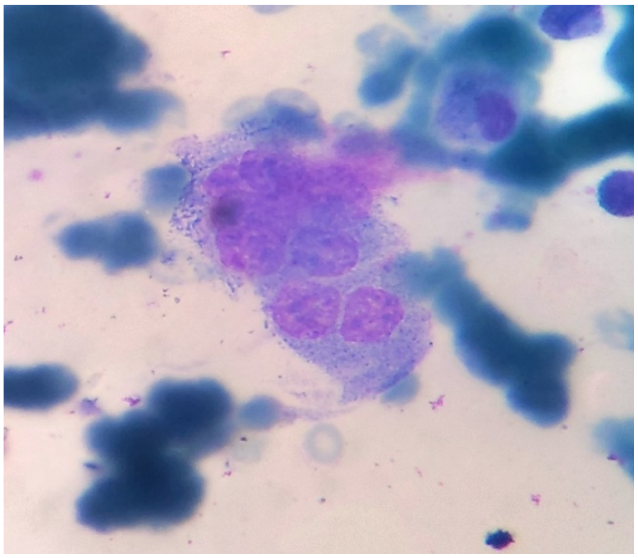

Fig. 1: Bone marrow aspirate smear showing very scarce groups of epitheloid looking cells with moderate amounts of cytoplasm, indinstinct cell borders, coarse chromatin and irregular nuclear contours suspicious of malignancy. (Giemsa stain, 100x)

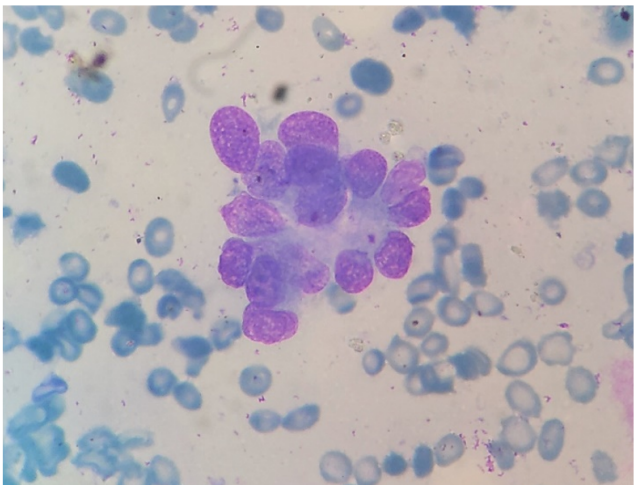

Fig. 2: The trephine biopsy imprint smear showing clusters of malignant epithelial cells arranged in a glandular configuration. (Giemsa stain, 100x)

3. Discussion

Metastatic involvement of bone marrow can have a profound effect on prognosis and treatment of the patients.[5] The bone marrow metastasis can be difficult to detect as it may be missed by bone scans or even advanced radiological techniques.[6] Breast, gastric and prostatic carcinomas are some of the most common solid malignancies that metastasize to the bone marrow,[7] whereas lower gastrointestinal malignancy/colorectal carcinoma are rarely reported in the literature to metastasize to bone marrow.[8] Bone marrow metastasis is best assessed by bone marrow aspirate as well as biopsy examination which is a relatively simple and cost effective procedure and can also help to monitor the prognosis in such patients.[9,10] Some patients of bone marrow metastasis may present with symptoms of malignancy or with pathological fractures but without any clinically detectable primary site of origin; bone marrow examination can be particularly advantageous in these patients, not only to detect the metastasis in bone but also to determine the site of origin with the help of

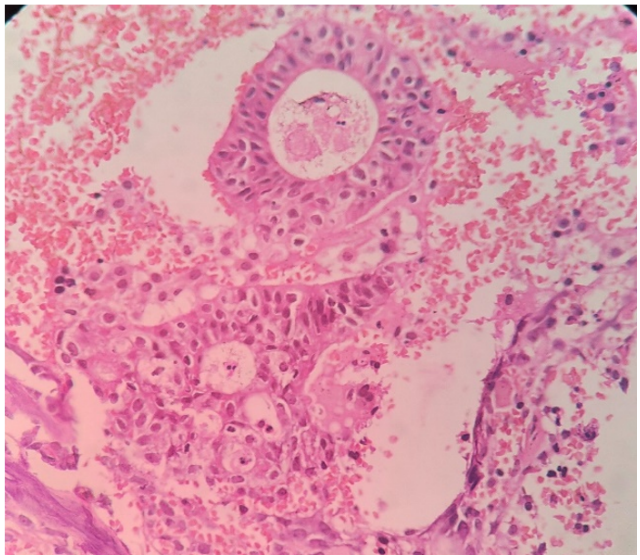

Fig. 3: Trephine bone marrow biopsy section showing few vaguely gland forming as well as trabeculae of malignant epithelial cells suggestive of metastatic adenocarcinoma. (Hematoxylin and Eosin, 40x)

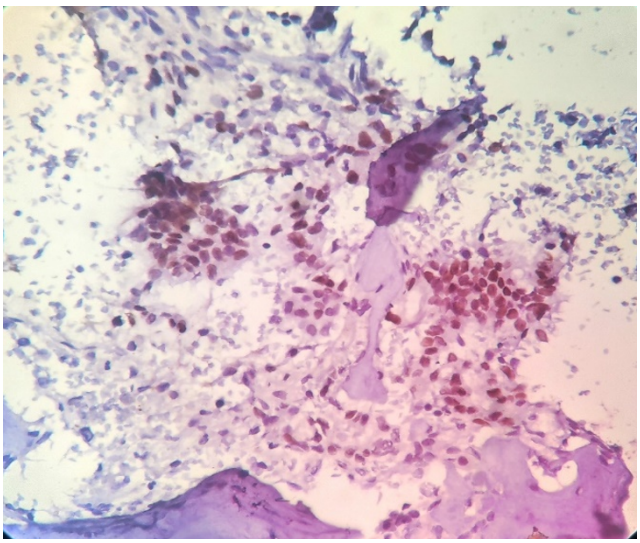

Fig. 4: CDX2 positivity in malignant epithelial cells inbone marrow trephine biopsy section confirming it to be of lower gastrointestinal tract in origin. (IHC, 40x)

appropriate immunohistochemical markers. In the present case, bone marrow metastasis was the first presentation of adenocarcinoma of lower GI origin and there was no primary tumor detected on radiological investigations.

The bone marrow metastasis affects the normal haemopoiesis leading to myelophthisic anemia and other cytopenias.[11] The metastatic cells can be easily identified in contrast to the normal hemopoietic tissue however the morphology may not reveal exact site of origin and immunohistochemistry is required in such cases to determine the primary site of origin. The morphology of metastatic tumor cells should be correlated with the clinical presentation and histopathological as wells as immunohistochemical findings of the tumor to determine the final diagnosis. Bone marrow metastasis can lead to cytopenias thereby increasing the risk of bleeding and infection. Factors affecting long term survival include presence of other metastasis, platelet count, and the patient's performance status.

According to our experience from the present case study, an early diagnosis of bone marrow metastasis is possible by combining vigilant search of metastatic cells on bone marrow aspirate along with imprint cytology smears. These procedures will avoid the unnecessary delay caused by decalcification and processing of trephine biopsy in routine histopathological laboratory settings. Moreover, it has been observed that the diagnostic accuracy of imprint cytology is almost similar to that of bone marrow examination by trephine biopsy.[12]

4. Conclusion

A high suspicion for bone marrow metastasis should be considered in cases who present primarily with abnormalities in peripheral blood count and a vigilant search for metastatic cells on aspirate smears and imprint smears can help in early diagnosis of bone marrow metastasis by solid tumors. Once a diagnosis is reached, rapid and appropriate treatment should be initiated to defeat the inevitable deterioration of the disease.

5. Source of Funding

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6. Conflict of Interest

None.

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Author biography

Saket Sharma, Senior Resident https://orcid.org/0000-0001-8503-2471

Jhanvi Makwana, 2nd Year Resident Doctor

Riya Kaka, 2nd Year Resident Doctor

Moushumi Mandal, 2nd Year Resident Doctor

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