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CASE REPORT

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p210$^{BCR-ABL1}$- Chronic myeloid leukemia presents with monocytosis

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Abstract

Rare cases of CML present with monocytosis as well as morphologic dysplasia and harbor p210$^{BCR-ABL1}$. Cytogenetic and molecular studies must be performed to confirm the diagnosis of this kind of CML.

KEYWORDS

chronic myeloid leukemia, monocytosis, p210$^{BCR-ABL}$

1 | CASE PRESENTATION

Chronic myeloid leukemia (CML) is a myeloproliferative neoplasm characterized by BCR-ABL1 translocation. It often presents with leukocytosis without morphologic dysplasia. The diagnosis is established by the demonstration of BCR-ABL1 using cytogenetic or molecular studies. There are three main BCR-ABL1 fusion transcripts, p190, p210, and p230. Monocytosis is an uncommon feature of CML at presentation,[1] and if present, it is often associated with p190

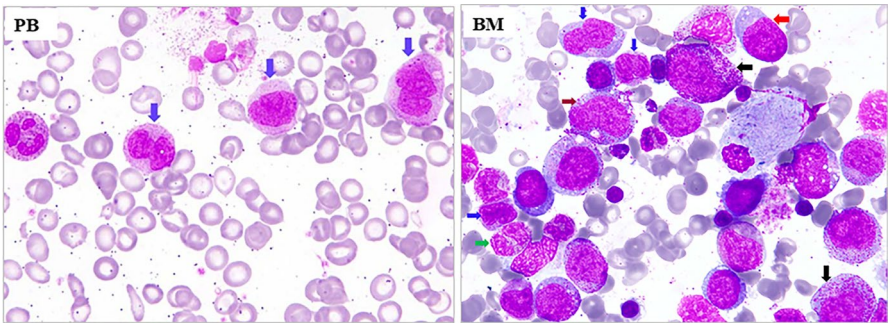

FIGURE 1 Left: peripheral blood (PB) smear shows monocytosis (blue arrows) and some monocytes are atypical. Right: bone marrow (BM) smear shows increased myeloblast (red arrow) and monocytes (blue arrows). Cells in myeloid lineage show hypergranulation (black arrows) and cytoplasmic vacuolization (brown arrow). Some mature neutrophils are hypoloabted (green arrow)

transcript.[2,3] Here, we report a rare case of $p210^{BCR\text{-}ABL1}$ CML that presents with monocytosis and dysplasia.

A 39-year-old woman was admitted with cough and fever for 1 month. She had no splenomegaly. A complete blood count showed leukocytosis (white blood cell 30.8×10^9/L), anemia (hemoglobin 87 g/L), and thrombocytosis (platelet 728×10^9 L). Review of the peripheral blood smears showed monocytosis (21%) with 3% circulating blasts and left-shifted granulocytes (Figure 1, left: blue arrows for monocytes that were increased in numbers with some atypical and immature forms). Bone marrow core biopsy and smears (Figure 1, right) showed a hypercellular marrow with 14% myeloblasts (red arrows) and 12% monocytes (blue arrows). Early myeloid cells showed some atypical morphology, including hypergranulation (black arrows) and cytoplasmic vacuolization (brown arrow). Some mature granulocytes (green arrow) were hypolobated. Many megakaryocytes were small and hypolobated (not shown). The numbers of basophils and eosinophils were within normal ranges in both peripheral blood and bone marrow smears. The concurrent flow cytometric analysis of bone marrow cells demonstrated that blasts were CD34+, CD117+, and HLA-DR + dim with partial CD7 expression. Granulocytes showed an asynchronous CD13/CD16 maturation pattern. Monocytes were increased in numbers, about 14% of total cells, and they were positive for CD14 and CD64 with decreased HLA-DR. Given monocytosis and atypical morphology identified in granulocytes and megakaryocytes, chronic myelomonocytic leukemia (CMML) was considered. However, conventional cytogenetic analysis of bone marrow cells revealed a complex karyotype with t(9;22): 51, X, del(X)(p22.3), t(9;22)(q34;q11), +10, +?10, +19, +20, +der(22) t(9;22)(q34;q11). Molecular study confirmed BCR-ABL1 translocation with p210 fusion transcript, and no p190 transcript was detected.[4] Based on these findings, a diagnosis of CML accelerated phase with $p210^{BCR/ABL1}$ and monocytosis was rendered. Next-generation sequencing (NGS) analysis detected the following mutations: *RUNX1*-p.R201X, *ASXL1*-p.E727X, *BCOR*-p.R1183X, *CUX1*-p.L264Sfs*17, *DIS3*-p.D268N, *EP300*-p.F1374L, and *FBXW7*-p.P66R. Other mutations commonly seen in CMML such as *TET2* and *SRSF2* were negative.

Following the diagnosis of CML, the patient received imatinib in combined with decitabine, homoharringtonine, and cytarabine. After three cycles of treatment, minimal residual disease was detected with $p210^{BCR\text{-}ABL1}$ transcript level of 16%. The patient then underwent allogeneic stem cell transplant and is currently under complete remission, 30 days after the transplant.

2 | DISCUSSION

Monocytosis and morphologic dysplasia are common morphological features in CMML. In this study, we present a case of CML with monocytosis and dysplasia as the initial presentation. Monocytosis in CML is rare, and monocytosis accompanied with morphologic dysplasia is even rarer. The differential diagnosis between CML and CMML in this scenario can be challenging. Karyotyping and/or molecular studies for BCR-ABL1 are essentially required for the correct diagnosis. $p190^{BCR\text{-}ABL1}$ in CML is often associated with monocytosis. In the case described here, monocytosis is associated with $p210^{BCR\text{-}ABL1}$. The association between monocytosis and $p210^{BCR\text{-}ABL1}$ is rarely reported previously.[5] Mutation analysis using next-generation sequence (NGS) in our case showed *RUNX1* and *ASXL1* mutations. *RUNX1* mutation has been reported as a key genomic event during CML disease progression,[6] and ASXL1 mutations were associated with a poor prognosis.[7] *ASXL1* is also a common mutated gene in CMML. Whether *ASXL1* mutation is associated with monocytosis in our CML case is uncertain but worth further investigation.

3 | CONCLUSION

Rare cases of CML harbored $p210^{BCR\text{-}ABL1}$ presented with monocytosis and dysplasia at initial diagnosis. It is important

to perform karyotyping and/or molecular studies to confirm the diagnosis for further TKIs targeted therapy. Stem cell transplantation will be considered if patients cannot get remission after conventional therapy.

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CONFLICT OF INTEREST

All authors declare no conflict of interest.

AUTHOR CONTRIBUTION

HW: designed and performed the study. XW and FW: organized the material and wrote the paper. ZW: completed the cytometry detection, and YL: helped on morphological observation. DW: gave language review, and BZ: provided some financial support on this article. All authors approved the final version of this manuscript.

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