Progressive Diagnosis of Chronic Myeloproliferative Neoplasms: A Case Study

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ABSTRACT

Chronic myeloproliferative neoplasms are hematologic diseases characterized by the clonal proliferation of peripheral blood components. A series of laboratory tests are required for diagnosis.

The patient was a 74-year-old male incidentally noted to have leukocytosis, monocytosis, and rare blasts in his peripheral blood. He presented with a complete blood cell count showing 6.6 g/dL hemoglobin, 114 fL mean corpuscular volume, 15.3 x 10(9)/L white blood cell (WBC), and 304.10(9)/L platelet. WBC differential consisted of 21% neutrophils, 21% lymphocytes, 45% monocytes, 6% eosinophils, 4% basophils, and 3% blasts. The peripheral blood smear showed hypochromic microcytic red cells with marked macrocytosis and slight polychromasia. In addition, atypical hypogranular neutrophils and hypogranular platelets were revealed.

A pathology consultation reported a bone marrow aspirate of 22% neutrophils, 6% metamyelocytes, 11% myelocytes, 1% promyelocytes, 12% eosinophils, 8% blasts, 18% normoblasts, 15% monocytes, and 7% lymphocytes. The myeloid-to-erythroid ratio was increased 4:1 with 90% hypercellularity. There was a decreased quantity of erythroid precursors and an increased quantity of myeloid precursors. Blasts contained intermediate-sized nuclei and reticulated chromatin, and variably granulated cytoplasm and megakaryocytes were markedly increased.

Ancillary tests included both iron and reticulin staining of the bone marrow. Storage iron was decreased, and reticulin fibers increased with a myelofibrosis grade 1 of 3. Flow cytometry immunophenotyping of the bone marrow revealed mildly increased myeloid blasts, increased mature monocytes, and increased monoblasts/promonocytes with other abnormal findings consistent with a myeloid neoplasm with high-grade features.

In summary, the pertinent and unusual findings were the rare blasts, increased monocytes and basophils, dysplastic neutrophils, and leukocytosis seen in the peripheral blood along with slightly increased blasts in the marrow. Along with additional cytogenetic and molecular testing results, the previously mentioned laboratory findings were essential to the diagnosis of an unusual finding of myelodysplastic/myeloproliferative neoplasm, chronic myelomonocytic leukemia. The sequence of testing led to the proper diagnosis and will aid in treatment options.

ABBREVIATIONS: WBC - white blood cell.

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