Progressive Diagnosis of Chronic Myeloproliferative Neoplasms: A Case Study

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

This patient is a 74-year-old male incidentally noted to have a leukocytosis, monocytosis, and rare blasts in his peripheral blood. He presented with a CBC showing 6.6 g/dL Hgb, 114fL MCV, 15.3x10(9)/L, WBC, 304.10(9)/L Platelet. WBC differential consisting 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 M:E 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, 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, 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, and 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 above laboratory finds were essential to the diagnosis of an unusual myelodysplastic/myeloproliferative neoplasm, Chronic Myelomonocytic Leukemia (CMML). The sequence of testing lead to the proper diagnosis and will aid in treatment options.