Acute Promyelocytic Leukemia or Acute Myeloid Leukemia with Mutated NPM1?

Maximiliano C-Z. et al: Acute Myeloid Leukemia with Mutated NPM1

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A 76-year-old woman was admitted to our hospital and laboratory results showed a high WBC count of 527 × 10⁹/L; haemoglobin of 104 g/L, platelet count of 45 × 10⁹/L, fibrinogen 1.77 g/L and prolonged PT.

Peripheral blood (PB) smear revealed blasts with a prominent nuclear indentation (cup-like blasts) (Figure 1A).

Immunophenotype by multiparametric flow cytometry (MFC) showed 95% abnormal cells with low side scatter (SSC), heterogeneous expression of CD13, CD117, CD64 and MPO, bright expression of CD33 and absence of CD34, HLA-DR and CD15 (Figure 1B). This immunophenotype pattern is related to abnormal promyelocytes. However, FISH analysis using dual-color dual-fusion probes revealed absence of PML/RARA fusion gene. Molecular studies identified the presence of NPM1 exon 12 gene mutation. FLT3 and CEBPA mutations were not detected. Taken together, a diagnosis of Acute Myeloid Leukemia with mutated NPM1 (AML-NPM1) was made. Blasts of this subtype of AML can have immunophenotypic features of myeloid or monocytic differentiation. Some of the cases with myeloid differentiation can exhibit an acute promyelocytic leukemia like (“APL-like”) immunophenotype (1) (2). Thus, distinction between AML-NPM1 and APL can be challenging, especially with the hypogranular variant of APL which usually presents itself with higher WBC counts and lower SSC by MFC than the classical form of APL. Noteworthy, presence of cup-like blasts is associated with NPM1 mutations (3). It is well known that MFC plays an important role in identifying highly suggestive cases of APL. However, the immunophenotypic profile associated with abnormal promyelocytes might be present in other types of AML. Therefore, AML-NPM1 could
be suspected when the immunophenotype resembles that of APL in the absence of PML-RARA fusion gene.

**Keywords:** Flow cytometry, Acute myeloid leukemia, NPM1 mutation, acute promyelocytic leukemia like

The local Ethics Committee has approved the use of this data for publication.

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