

# A Special Case of Acute Myelomonocytic Leukemia Morphologically Mimicking Acute Lymphoblastic Leukemia

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December 27, 2022

## Abstract

We present the case of a 70-year-old man diagnosed with acute myelomonocytic leukemia, albeit that his leukemic blasts at initial presentation had scant cytoplasm, inconspicuous cytoplasmic granules, and morphologically mimicked lymphoblasts. We would like to raise the recognition that acute myelomonocytic leukemia can actually present with atypical blast morphology.

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## Patient Consent Statement

Written informed consent was obtained from the patient to publish this report.

**Keywords :** Acute myelomonocytic leukemia, Acute lymphoblastic leukemia, Flow cytometry, Myeloperoxidase, Alpha-naphthyl butyrate esterase

**Funding and Acknowledgement Statements :** none

A 70-year-old man with an unremarkable past medical history presented to our hospital because of fever and shortness of breath for two weeks. On laboratory examination, he was found to have hyperleukocytosis with abundant blasts in the peripheral blood (PB). (white cell count  $103.47 \times 10^9/L$  (94.8% blasts), hemoglobin level 65 g/L, platelet count  $60 \times 10^9/L$ ). Bone marrow (BM) aspiration and trephine biopsy revealed a leukemic marrow filled with small-sized blasts having scant cytoplasm without noticeable cytoplasmic granules (Figure 1A), morphologically suggestive of acute lymphoblastic leukemia. However, cytochemical stain for myeloperoxidase (Figure 1B) and alpha-naphthyl butyrate esterase (Figure 1C) turned out to be both positive. Additionally, flow cytometry of the BM (Figure 1D) demonstrated that the blasts actually expressed cytoplasmic (cy) MPO, CD117 (partial), CD33, CD11b, CD64, CD38, but lacked the expression of cyCD3, cyCD79a, surface membrane (sm) CD3, CD19, CD34, HLA-DR, CD13, CD14, CD35, CD300e. Aberrant expression of CD56 on these blasts was also noted. Based on the results of lineage-specific stains and flow cytometric analysis, the patient was diagnosed with acute myeloid leukemia with myelomonocytic differentiation (French-American-British (FAB) M4). Low-dose cytarabine and venetoclax

was started for induction, and he later achieved partial remission. We would like to raise the recognition that acute myelomonocytic leukemia may present with blasts resembling lymphoblasts based on morphological examination. A multi-modality diagnostic procedure is necessary for making the correct diagnosis and guiding appropriate treatment.

Figure legend:

(A) Bone marrow aspiration showed a leukemic marrow filled with blasts having scant cytoplasm, and no cytoplasmic granules. (Liu's stain, 1000X magnification) The blasts stained positive for myeloperoxidase (B, 100X, brown denotes positivity) and alpha-naphthyl butyrate esterase (C, 1000X, red denotes positivity). (D) Flow cytometric analysis of the blasts; the majority of the blasts are colored red, with the CD117-positive portion colored green.

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