

An Unusual Case of Megakaryocytic Blast Crisis of Chronic Myeloid Leukemia

Abibatou Sall*, Diama Samb, Moussa Seck, Seynabou Fall, Blaise Félix Faye, Awa Oumar Touré and Saliou Diop

*Hematology, Cheikh Anta Diop University, Dakar, Sénégal.

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INTRODUCTION

Chronic myeloid leukemia (CML) is an acquired myeloproliferative neoplasm characterized by a cytogenetic abnormality, the t(9;22); leading to the chromosome Philadelphia or its molecular expression the BCR-ABL gene.

The natural history of untreated CML is biphasic or triphasic: an initial indolent chronic phase (CP) is followed by an accelerated phase (AP), a blast phase (BP), or both. Although tyrosine kinase inhibitors are highly effective in the treatment of CML, some patients evolve into a blast crisis.

Megakaryocytic blast crisis is a rare manifestation of CML, we report here an unusual case of megakaryocytic blast crisis. The morphology with a careful study of the blood smear as well as the flow cytometry were decisive to make the diagnosis. This was performed using an 8 color-BD FACS Lyric cytometer and positivity of CD41 and CD61 confirmed the megakaryocyte lineage.

CASE PRESENTATION

A 59-year-old woman BCR-ABL positive, diagnosed 2 years ago and under Dasatinib, was referred to our hospital for back pain, disorientation and fever. Physical examination revealed splenomegaly type 2 and pallor.

The blood count showed severe normocytic anemia: Hb=58g/L and MCV = 90fL; high leukocytosis ($405 \times 10^9/L$) and low platelet count ($89 \times 10^9/L$).

Blood examination showed hypercellularity with marked increase in granulocytes and their precursors. The megakaryocytic lineage was present in the blood film with very atypical morphology.

In **Figure 1A**, the 3 cells (blue arrows) are megakaryoblasts (17%) with a high N:C ratio, their nucleus is homogeneous and the nucleoli are not visible. The cytoplasm, basophilic, is agranular with cytoplasmic protrusions (blebs) that appear ragged but well defined.

In **Figure 1B**, similar cells are visible but they seem to be megakaryocytes (22%) with clumped chromatin and granulations are seen in their cytoplasm which is less basophilic. Many circulating giant platelets are also seen in the blood smear (**Figure 1C**).

The flow cytometry, on peripheral blood, confirmed the megakaryocytic lineage with the positivity of CD61 (51%) and CD41 (58%). The expression of myeloid markers such as CD117, CD33 and CD11b were weak.

Bone marrow aspiration revealed a hypercellularity with the same cytological findings as in peripheral blood and no fibrosis was observed on bone marrow biopsy. Cytogenetic as well as molecular biology were not performed at this time. Palliative care (transfusions, antibiotics) was introduced as a first step but the patient passed away few days later.

In CML blast crisis with a significant megakaryoblastic component is rare and bone marrow fibrosis is often marked and leading to peripheral cytopenia [1,2].

This case of megakaryocytic blast crisis with a high cellularity is quite uncommon: lack of fibrosis, hypercellularity and atypical morphology of megakaryocytes. This atypical appearance of megakaryocytes makes necessary confirmation of their nature by immunophenotyping to demonstrate platelet membrane antigens.

Corresponding author: Abibatou Sall, Hematology, Cheikh Anta Diop University, Dakar, PB 16928 Dakar Fann, Senegal, Tel: +221777566006; E-mail: sallabibatou@gmail.com

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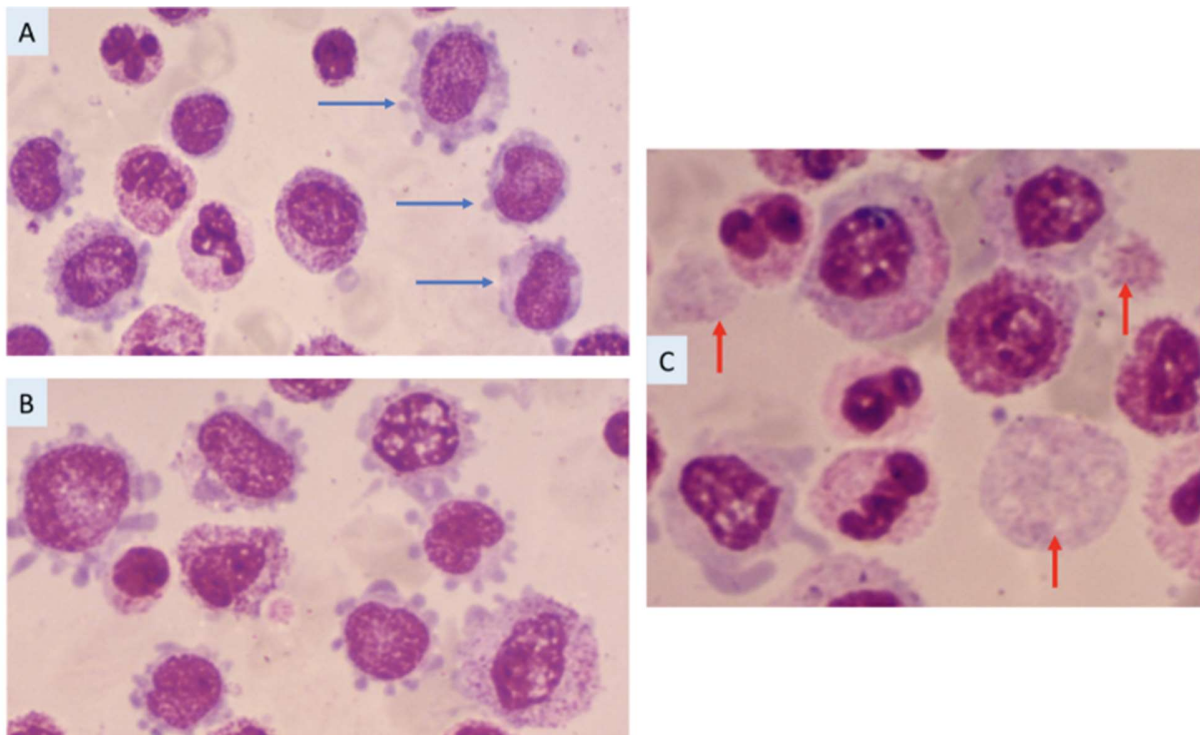


Figure 1. Blood smear. A: Megakaryoblasts with homogenous nucleus and pale basophilic cytoplasm without granulations (blue arrows). B: Megakaryocytes with clumped chromatin and some cytoplasmic granulations. C: Giant platelets (red arrows).

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CONFLICT OF INTEREST

None

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