Haematologica 2000; 85:98-99
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Micromegakaryocytic transformation of myelofibrosis with myeloid metaplasia

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A 63-year old man was referred to our Institute in 1995 because of asthenia, dyspnea and melena. In 1975 he had been found to have myelofibrosis with myeloid metaplasia; after a few months, because of a rapid enlargement of the spleen, he underwent splenectomy; then, because of progressive increases in his leukocyte and platelet counts, he was treated continuously with hydroxyurea. At admission he was pale and had massive hepatomegaly. Laboratory findings were as follows: Hb 6 g/dL, leukocyte count 153×10^9/L, platelets 197×10^9/L.

A peripheral blood smear showed anisopoikilocytosis, many erythroblasts (16 per 100 leukocytes), neutrophils 35%, lymphocytes 10%, monocytes 5%, metamyelocytes 6 %, myelocytes 5%, other mononuclear cells 57%, and blasts 8% (Figure 1). There were evident morphological anomalies of the erythroid and granulocytic cells, i.e. polychromatic macrocytes, Howell-Jolly bodies, binuclear erythroblasts, with basophilic punctuation and cytoplasmic areas devoid of hemoglobin, tetraploid macropolycytes with twin or hypersegmented nuclei. Mononuclear cells were heterogeneous: some cells had lymphocyte-like features, with minimal cytoplasm, sometimes acidophilic, sometimes arranged in perinuclear spikes; other cells were larger, had eccentric nucleus, basophilic cytoplasm, cytoplasmic protrusions or budding. In these cells, often seen in groups, chromatin was condensed and hyperchromatic, with absent nucleoli.

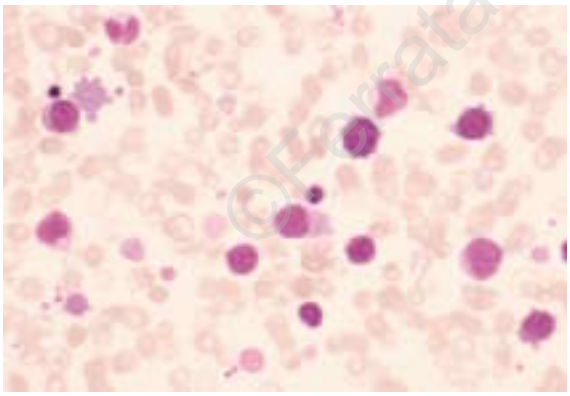

Figure 1. Peripheral blood smear showing many heterogeneous mononuclear cells, including some blasts, and numerous giant platelets (MGG ×300).

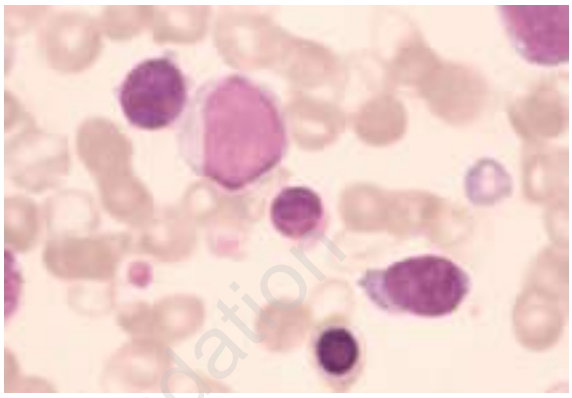

Figure 2. Peripheral blood smear (MGG ×1,200). Two lymphocyte-like cells, a larger cell with basophilic cytoplasm and a morphologically undifferentiated blast.

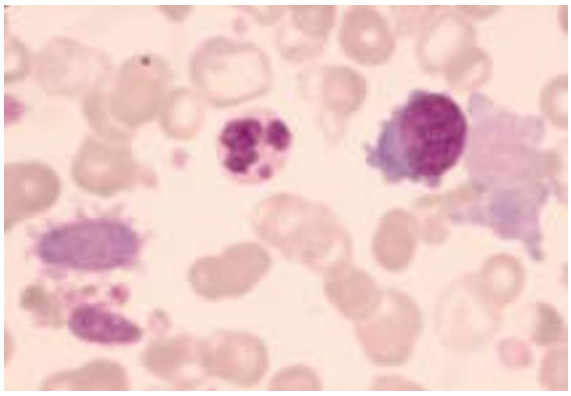

Figure 3. Peripheral blood smear (MGG ×1,200). A dysplastic neutrophil, a cell with basophilic cytoplasm and cytoplasmic protrusions, many abnormal large platelets.

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There were also rare blast cells, morphologically undifferentiated (Figure 2). The platelets varied considerably in size, shape and staining quality: they were often giant, agranular and vacuolated (Figure 3).

Immunocytochemical studies with the immunoalkaline phosphatase method using an anti CD61 monoclonal antibody demonstrated the megakaryocytic nature of the small mononuclear cells and of the blasts. Morphological anomalies of platelets were associated with severe dysfunction, responsible for the hemorrhagic diathesis.

A diagnosis of micromegakaryocytic leukemia as transformation of myelofibrosis with myeloid metaplasia was made.

About 15% of patients with myelofibrosis with myeloid metaplasia develop terminal blast crisis,[1] usually either myeloblastic or myelomonocytic, whereas the presence in the peripheral blood of immature cells exclusively of the megakaryocytic type is uncommon.[2,3] Its association, however, with evident morphological anomalies of the erythroid and granulocytic series indicates a disorder of the stem cell.

References

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