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Journal

International Journal of Hematology, 102(3)

ISSN

0925-5710

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Publication Date

2015-09-01

DOI

10.1007/s12185-015-1842-9

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Peer reviewed

B lymphoblastic leukemia with granules mimicking acute myeloid leukemia

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Received: 1 May 2015 / Revised: 30 June 2015 / Accepted: 7 July 2015
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The patient is a 24-year-old man who presented with malaise and severe dyspnea on exertion. He was found to have leukocytosis of 184.4 K/mm^3 , thrombocytopenia, and blasts in the peripheral blood. These blasts were medium-sized with round to slightly irregular nuclear contours, fine chromatin, prominent nucleoli, and multiple eosinophilic cytoplasmic granules (Fig. 1, left image). Examination of the bone marrow revealed extensive involvement by blasts (95 %), which also had these prominent granules (Fig. 1, middle image). Initially, the presence of cytoplasmic granules favored an acute myeloid leukemia; however, flow cytometry showed these blasts had a phenotype consistent with B lymphoblasts and were positive for CD19, CD10, CD34, TdT, and negative for both myeloid and monocytic markers. Conventional cytogenetics showed trisomy 10 and 22. Cytochemical stains for Sudan Black and myeloperoxidase were negative. A diagnosis of B lymphoblastic lymphoma/leukemia was rendered. Electron microscopy

was performed and the granules showed a homogeneous density reminiscent of Golgi vesicles (Fig. 1, right image). The patient was treated with hyper-CVAD (cyclophosphamide, vincristine, doxorubicin, and dexamethasone) for eight cycles and went into remission, but later relapsed and subsequently died of the disease. Interestingly, the cytoplasmic granules were still present in the lymphoblasts at relapse.

B lymphoblastic lymphoma/leukemia with cytoplasmic granules is seen in 2–7 % of childhood cases [1–3], but is exceedingly rare in adults. The initial finding of cytoplasmic granules in blasts may lead to improper triage of ancillary studies, such as molecular or fluorescence in situ hybridization, when relying on histologic examination alone. It is, thus, important to perform further testing, such as cytochemical staining and flow cytometry, to make the distinction between acute myeloid and lymphoblastic leukemia.

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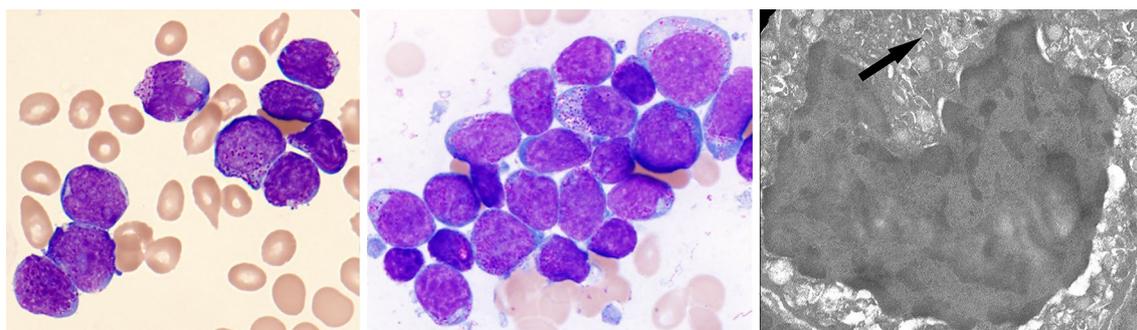


Fig. 1 B lymphoblastic leukemia with granules. *Left* circulating lymphoblasts with eosinophilic granules in the peripheral blood. *Middle* the bone marrow is extensively involved with lymphoblasts with

these same granules. *Right (arrow)* electron microscopy shows the granules have a homogeneous density similar to Golgi vesicles

Compliance with ethical standards

Conflict of interest There are no financial disclosures.

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