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Pseudo-Chediak-Higashi Granules in a Case of Acute Lymphoblastic Leukemia Mimicking Acute Myeloid Leukemia

Akut Myeloid Lösemiyi Taklit Eden Akut Lenfoblastik Lösemili Bir Olguda Pseudo Chediak-Higashi Granülleri

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To the Editor,

A 19-year-old male patient presented to our hospital due to a 1-week history of malaise manifested by chest tightness and palpitation without obvious triggers. He had a mild enlargement of the axillary lymph nodes bilaterally. Laboratory tests showed a total white blood cell count of 18.92x10^9/L, lymphocyte count of 13.8x10^9/L, platelet count of 131x10^9/L, hemoglobin concentration of 50 g/L, and lactate dehydrogenase level of 316 U/L. Differential leukocyte count on peripheral blood smear revealed 66% blast cells characterized by large size and a high nuclear-to-cytoplasmic ratio, prominent nucleoli, and giant pink granules in the cytoplasm (Figure 1 A). The patient was then admitted for further evaluation. The bone marrow aspirate was hypercellular with approximately 90% blast cells, characterized by peculiar pink or purple cytoplasmic inclusions (pseudo-Chediak-Higashi granules) of variable sizes (Figures 1B-1D), suggesting an underlying acute myeloid leukemia. No cells with Auer rod-like inclusions were detected in the peripheral blood or the bone marrow smear. The cells were negative for myeloperoxidase (Figure 1E) and staining of bone marrow blast cells with periodic acid-Schiff revealed a spotty or beard-like pattern of positivity (Figure 1F). Flow cytometry immunophenotyping demonstrated that malignant clones were positive for CD45, CD34, CD19, CD10, TDT, CD22, and

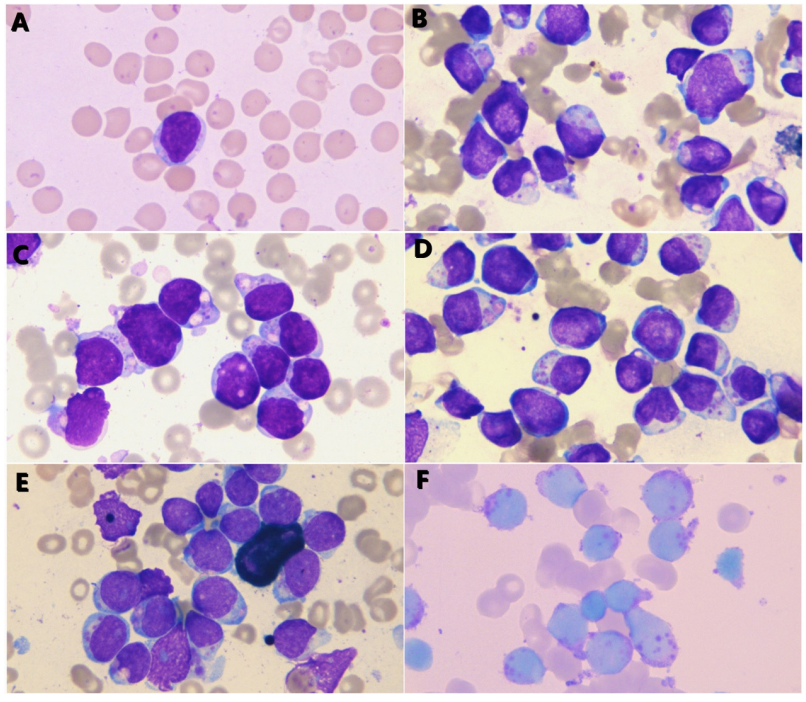

Figure 1. A) Peripheral blood smears exhibited blast cells characterized by giant pink granules in the cytoplasm. **B-D)** Bone marrow aspirate revealed blast cells characterized by peculiar pink or purple cytoplasmic inclusions (pseudo-Chediak-Higashi granules) of variable size. **E)** The blasts were negative for myeloperoxidase. **F)** The blasts revealed a spotty or beard-like pattern of positivity for periodic acid-Schiff.

cCD79a, and they were $CD33^{dim}$, consistent with B-cell acute lymphoblastic leukemia (ALL). Myeloid antigen markers such as lysozyme, CD68, CD14, and CD163 were negative. Cytogenetic analysis of the bone marrow revealed a normal male karyotype (46, XY). No fusion genes associated with ALL were detected. Next-generation sequencing did not identify any mutations. A final diagnosis of ALL with pseudo-Chediak-Higashi granules was made.

Pseudo-Chediak-Higashi anomalies manifest as purplish cytoplasmic inclusions, often seen in myeloid precursors, similar to those present in cases of Chediak-Higashi syndrome. The formation of cytoplasmic granules in lymphoblasts is thought to result from abnormal organelle formation, fusion, or degeneration [1]. At the ultrastructural level, this class of granules in the cytoplasm resembles multivesicular bodies or Gall bodies. These granules may stain positive with Sudan black. It has to be remembered that such rare cases of granular ALL can easily be mistaken for acute myeloid leukemia on morphologic evaluation. This possibility underscores the significance of combined cytochemical staining and immunophenotyping by flow cytometry during the characterization of leukemias.

Keywords: Pseudo-Chediak-Higashi granules, Acute lymphoblastic leukemia, Acute myeoloid leukemia

Anahtar Sözcükler: Pseudo-Chediak-Higashi granül, Akut lenfoblastik lösemi, Akut myeloid lösemi

Ethics

Informed Consent: Informed consent was obtained from the patient.

Authorship Contributions

Concept: X.Q., X.C.; Design: X.Q., X.C.; Analysis or Interpretation: T.T.; Writing: X.Q.

Conflict of Interest: No conflict of interest was declared by the authors.

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