

Foamy Histiocytic Cells in a Pediatric AML Case: Lysosomal Storage Disease or Secondary to Chemotherapy?

Pediatric Bir AML Olgusunda Köpüksü Histiyoitik Hücreler: Lizozomal Depo Hastalığı mı, Kemoterapiye Sekonder mi?

Meriç Kaymak, Ahmet Emin Kürekçi, Üstün Ezer, Türkan Patiroğlu

LÖSANTE Children and Adults Hospital, Division of Pediatric Hematology, Ankara, Türkiye

To the Editor,

Acute myeloblastic leukemia (AML) is an aggressive hematological malignancy characterized by uncontrolled proliferation of myeloid precursor cells in the bone marrow [1]. Chemotherapy is the cornerstone of AML treatment; however, in addition to eliminating malignant cells, it may also induce morphological changes within the bone marrow microenvironment [1,2].

Foamy cells are characterized by a multivacuolated, bubbly cytoplasm and most commonly present as lipid-laden histiocytes. They are typically observed in bone marrow aspiration (BMA) specimens from patients with lysosomal storage disorders, including Niemann-Pick, Gaucher, and Wolman diseases [3]. Nevertheless, similar foamy histiocytic cells have also been reported following chemotherapy, hemophagocytosis, or prolonged total parenteral nutrition (TPN). They can also be caused by specific drug usage, i.e., polyvinylpyrrolidone [4].

A 12-year-old boy presented with eyelid swelling and pancytopenia. Bone marrow examination revealed myeloblastic predominance, and the diagnosis of AML subtype M2 with associated granulocytic sarcoma was made using flow cytometric immunophenotyping and orbital magnetic resonance imaging. Cytogenetic analysis demonstrated t(8;21). Induction chemotherapy with cytarabine, liposomal daunorubicin, and etoposide was administered according to the AML-Berlin-Frankfurt-Munster 2019 protocol. Two weeks after induction therapy for the evaluation of treatment response, we performed BMA. It revealed hypocellularity, markedly reduced myeloblasts, and numerous foamy histiocytic cells (Figure 1). We also detected hemophagocytosis in the BMA. At this time, the patient's serum triglyceride level was 42 mg/dL, his fibrinogen was 235 mg/dL, and he did not have fever or hepatosplenomegaly upon physical examination. His white blood cells were 1410/mm³, hemoglobin level was 8.5 g/dL, neutrophils were 290/mm³, and platelets were 54,000/mm³. According to his test results and physical

examination we excluded hemophagocytic lymphohistiocytosis. Whole-exome sequencing (WES) revealed no pathogenic variants associated with lysosomal storage diseases and the patient did not receive TPN. In follow-up, no further foamy histiocytic cells were seen in BMAs performed after consolidation and reinduction courses. He was in remission morphologically after induction and consolidation but his t(8,21) positivity continued during the treatment. Because he did not have a fully matched related donor we performed allogeneic stem cell transplantation from a fully matched unrelated donor and the patient is still in remission 1 year after the transplantation.

Until now, post-chemotherapy foamy cells had only been reported in a few cases of AML and acute lymphoblastic leukemia after induction chemotherapy [2,5]. These reports suggested that

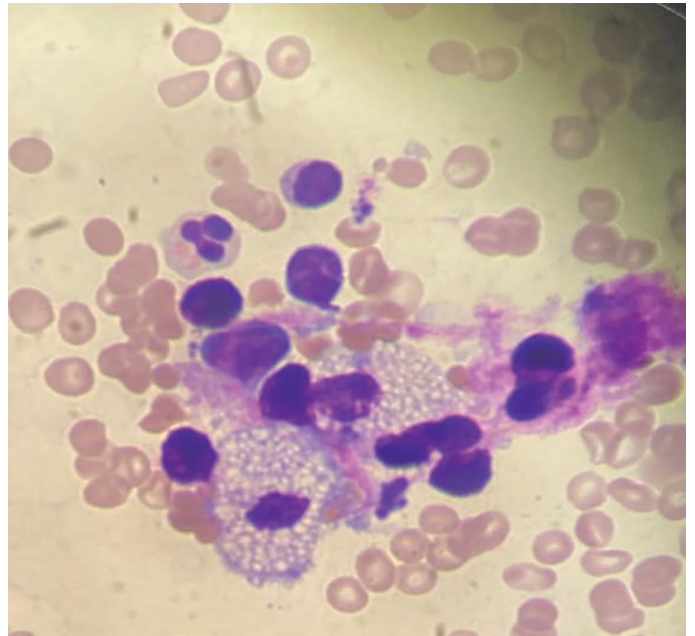


Figure 1. Bone marrow aspirate revealed foamy histiocytes (Giemsa staining, 100 \times).

the foamy histiocytes were related to degradation products of blasts phagocytized by the histiocytes. This finding can also be an idiosyncratic response to the chemotherapy [2,5]. Our case is different because we performed WES analysis, which was not performed in the previously reported cases, for our patient for differential diagnosis.

In conclusion, when foamy histiocytes are seen in bone marrow specimens of a patient with leukemia, it should be considered that after induction chemotherapy these types of cells can be seen in bone marrow examinations. We used WES for an accurate diagnosis. Recognition of this finding is essential to avoid the misdiagnosis of concomitant lysosomal storage diseases.

Keywords: Acute myeloblastic leukemia, Foamy cells, Histiocytes

Anahtar Sözcükler: Akut miyeloblastik lösemi, Köpüksü hücreler, Histiyositler

Ethics

Informed Consent: Informed consent for participation was obtained from the patient's' guardian.

Footnotes

Authorship Contributions

Concept: M.K., A.E.K., Ü.E., T.P.; Design: M.K., T.P.; Data Collection or Processing: M.K., T.P.; Analysis or Interpretation: M.K., A.E.K., Ü.E., T.P.; Literature Search: M.K., T.P.; Writing: M.K., T.P.

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Address for Correspondence/Yazışma Adresi: Assoc. Prof. Meriç Kaymak, M.D., LÖSANTE Children and Adults Hospital, Division of Pediatric Hematology, Ankara, Türkiye

E-mail: merckaymak@gmail.com **ORCID:** orcid.org/0000-0002-4785-5714

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