

Circulating CAR-T Impostors: Monocyte-Like Cells Marking Successful MRD-Negative Remission

Dolaşımdaki CAR-T Taklitçileri: Başarılı MRD-Negatif Remisyonu Gösteren Monosit Benzer Hücreler

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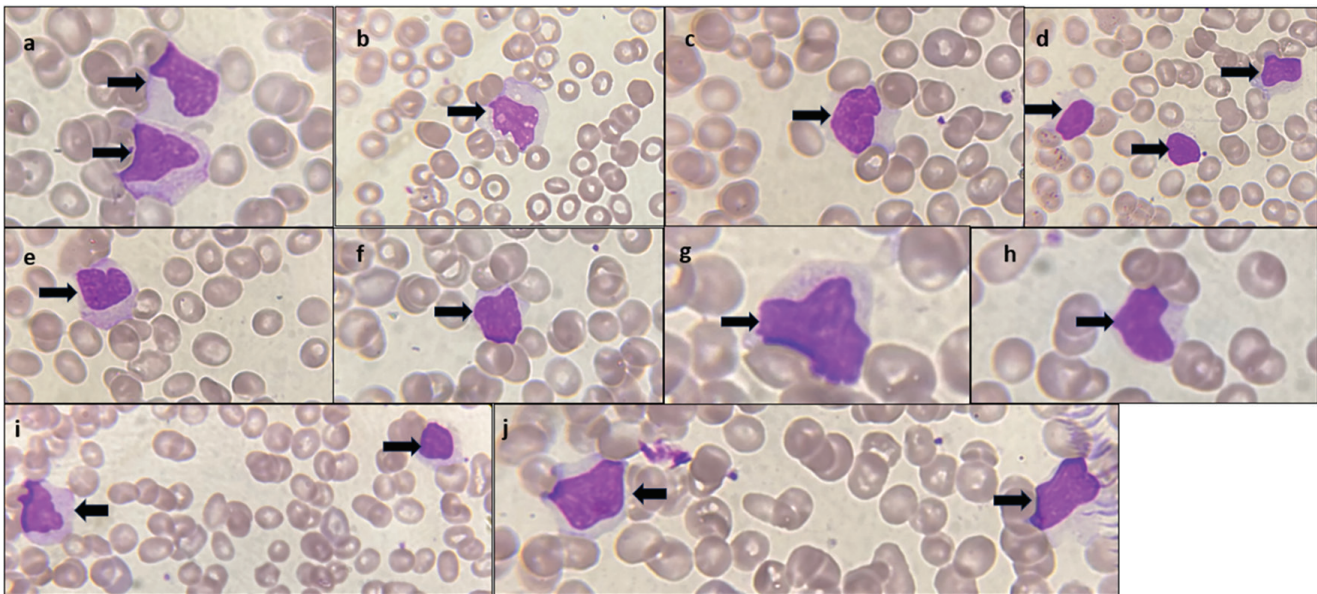


Figure 1. a-j) Chimeric antigen receptor-T cells appeared as large, irregular, monocyte-like forms with blastoid nuclei, loose chromatin, inconspicuous nucleoli, and abundant light blue cytoplasm.

A 42-year-old male patient with relapsed/refractory B-acute lymphoblastic leukemia underwent CD19-directed chimeric antigen receptor (CAR)-T cell therapy. A marrow evaluation on day +30 demonstrated minimal residual disease (MRD)-negative complete remission (CR) by multicolor flow cytometry. Peripheral blood counts on day +30 showed hemoglobin of 106 g/L, total

leukocyte count of $5.4 \times 10^3/\mu\text{L}$, absolute neutrophil count of $1.9 \times 10^3/\mu\text{L}$, absolute lymphocyte count of $0.21 \times 10^3/\mu\text{L}$, and platelet count of $113 \times 10^3/\mu\text{L}$. Notably, the absolute monocyte count was markedly elevated at $3.24 \times 10^3/\mu\text{L}$; morphological review confirmed that these cells were circulating anti-CD19 CAR-T cells rather than true monocytes. The CAR-T cells appeared



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as large, irregular, monocyte-like forms with blastoid nuclei, loose chromatin, inconspicuous nucleoli, and abundant light blue cytoplasm (Figures 1a-1j) [1]. The atypical cells demonstrated features similar to those previously described in circulating activated CAR-T cells. Although flow cytometric confirmation was not performed, the morphological features and temporal association with CAR T-cell infusion strongly suggested that these atypical cells were circulating CAR-T cells. Circulating atypical cells may be blasts or reactive atypical lymphocytes associated with viral infection. However, the demonstration of MRD-negative CR in the bone marrow, together with the absence of fever or constitutional symptoms, excluded disease persistence and active infection in the present case. Given that the patient achieved MRD-negative CR, the atypical cells observed on peripheral smear were most consistent with circulating CAR-T cells. These striking cytomorphologic features highlight the dynamic immunological activity following CAR-T therapy and emphasize the importance of careful peripheral smear evaluation to correctly identify therapeutic cellular populations during post-infusion monitoring [2].

Keywords: B-acute lymphoblastic leukemia, Minimal residual disease, CD19 CAR-T cells, Absolute monocyte count

Anahtar Sözcükler: B-akut lenfoblastik lösemi, Minimal rezidüel hastalık, CD19 CAR-T hücreleri, Mutlak monosit sayısı

Ethics

Informed Consent: Informed consent was obtained from the patient.

Footnotes

Authorship Contributions

Surgical and Medical Practices: B.K., V.P., I.R., H.Q.; Concept: B.K., M.N.C.K.; Design: B.K., V.P., M.N.C.K.; Data Collection or Processing: B.K., I.R., H.Q.; Analysis or Interpretation: B.K., I.R.; Literature Search: B.K., I.R., H.Q.; Writing: B.K., I.R., M.N.C.K.

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