

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

Kazi B. et al.: Circulating CAR-T Impostors: Monocyte-Like Cells

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A 42-year-old male with relapsed/refractory B-acute lymphoblastic leukemia underwent CD19-directed CAR-T cell therapy. Day +30 marrow evaluation demonstrated Minimal residual disease (MRD)-negative complete remission (CR) by multicolor flow cytometry. Peripheral blood counts at Day +30 showed hemoglobin 106 g/L, TLC $5.4 \times 10^3/\mu\text{L}$, ANC $1.9 \times 10^3/\mu\text{L}$, ALC $0.21 \times 10^3/\mu\text{L}$, and platelets $113 \times 10^3/\mu\text{L}$. Notably, the absolute monocyte count was markedly elevated at $3.24 \times 10^3/\mu\text{L}$; morphological review confirmed that these cells represented circulating anti-CD19 CAR-T cells rather than true monocytes. The CAR-T cells appeared as large, irregular, monocyte-like forms with blastoid nuclei, loose chromatin, inconspicuous nucleoli, and abundant light blue cytoplasm (Figure 1 a–j) [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 suggest these atypical cells represent circulating CAR T cells. Circulating atypical cells may represent blasts or reactive atypical lymphocytes associated with viral infection. However, demonstration of MRD- negative CR in the bone marrow, together with the absence of fever or constitutional symptoms, excludes disease persistence and active infection. Given that the patient achieved MRD-negative CR, the atypical cells observed on peripheral smear are most consistent with circulating CAR T cells. These striking cytomorphologic features highlight the dynamic immunologic 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 cell, Absolute monocyte count.

References:

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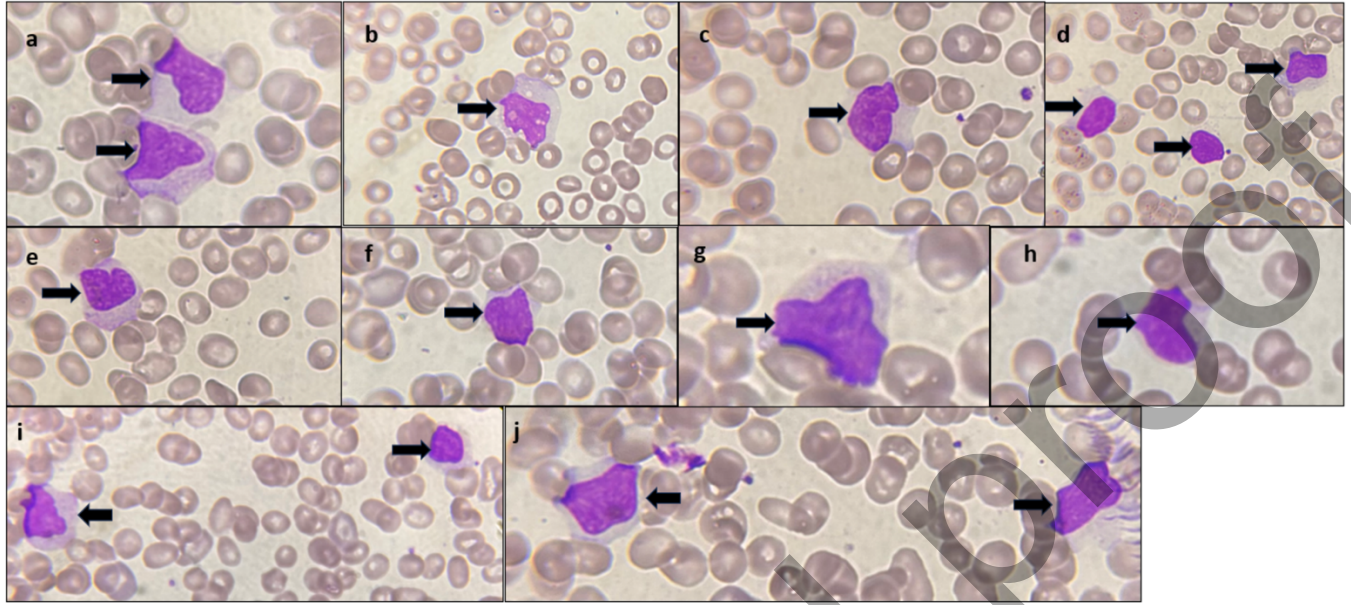


Fig a-j: CAR-T cells appeared as large, irregular, monocyte-like forms with blastoid nuclei, loose chromatin, inconspicuous nucleoli, and abundant light blue cytoplasm.

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