

CD7⁺ acute leukemia switching from a lymphoid to a myeloid phenotype

We report a case of CD7⁺ T-acute lymphoblastic leukemia (T-ALL) which relapsed as acute myeloid leukemia and whose immunophenotype maintained CD7 expression. The significance of the CD7 antigen as a marker of stem-cell disease is discussed.

In a recent issue of this journal, Bellido *et al.*¹ reported the case of a patient with acute myeloid leukemia relapsing as acute T-lymphoblastic leukemia. The authors attributed the relapse to a minor lymphoblastic clone already phenotypically identifiable at diagnosis. We have observed a reverse sequence: a case of T-ALL relapsing as acute myelomonocytic leukemia. In 1997, a 52-year old male was admitted to hospital because of leukocytosis (WBC $63 \times 10^9/L$; blast cells 90%), anemia and thrombocytopenia. A bone marrow aspirate documented 90% lymphoblasts with L1 morphology. Leukemic cells were CD1⁺, CD5⁺, CD7⁺, TdT⁺, cyCD3⁺, CD4⁺, CD11a⁺ and CD2⁻, CD8⁻, CD13⁻, CD33⁻, CD11b⁻, CD11c⁻, CD117⁻, CD34⁻. Cytogenetic analysis showed a normal (46, XY) karyotype. A clonal T-cell receptor (TCR) γ rearrangement was documented. A computed tomography scan revealed mediastinal lymph node enlargement. The patient was enrolled in the GIMEMA 0496-ALL trial, consisting of a four drug induction regimen including high dose daunorubicin,² followed by consolidation and maintenance. Complete remission was achieved one month later, and was maintained until December 1999, when pancytopenia occurred. Clinical examination revealed purple maculopapular lesions on the left leg. The bone marrow showed 26% blasts with morphological appearance of myelomonocytic cells. Indeed, cytometric immunophenotyping revealed: CD13⁺, CD33⁺, CD117⁺, CD11b⁺, CD11c⁺, CD34⁺, MPO⁺, CD7⁺, DR⁺, and CD2⁻, CD3⁻, CD5⁻. A CD13⁺/CD7⁺ leukemic cell population (31%) was detected by dual fluorescence (Figure 1). Cytogenetics showed 46 XY, del(20)(q11;13)/45 XY del(20)(q11;13), -7. A biopsy of a maculopapular skin lesion documented leukemic infiltration. Three courses of idarubicin and cytarabine were given, leading to a brief remission. The patient relapsed a few weeks later and was submitted to a haploidentical allogeneic bone marrow transplant, but died of infectious complications.

This patient, like the one reported by Bellido,¹ is an example of lineage switch, with blast cells retaining the CD7 antigen both at diagnosis and at relapse. Possible interpretations of the switch include: (1) this was a biphenotypic leukemia since diagnosis, with an initial small myeloid clone, whose expansion could have been enhanced by the ALL- oriented treatment, as suggested for other cases;³ (2) the patient developed therapy-related acute myeloid leukemia (sAML) following high dose chemotherapy for ALL. Although monosomy 7 has been described in sAML,⁴ the short latency and a phenotype different from that of Topo II-inhibitor-induced AML does not fit with such an interpretation; (3) CD7⁺ acute leukemias are stem cell disorders,⁵⁻⁶ capable of differentiation along lymphoid⁷ or myeloid pathways simultaneously or at different times, according to changes in the bone marrow microenvironment (stroma, cytokines). According to this hypothesis, which we favor, CD7 expression on leukemic blasts can be thought of as an *alarm marker*, to raise the suspicion of multipotential progenitor cell leukemic transformation.

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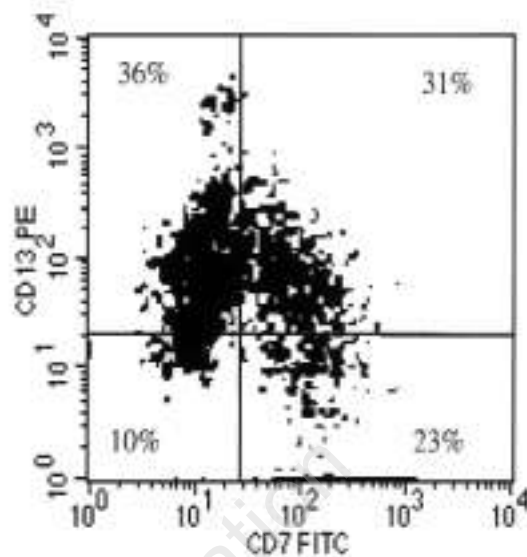


Figure 1. Cytometric analysis at relapse, showing a dual labeling CD7⁺/CD13⁺ leukemic cell population representing 31% of mononuclear cells.

Key words: CD7 antigen, acute leukemia, stem cell leukemia.

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