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Burkitt leukemia with immature B-cell phenotype mimicking acute lymphoblastic leukemia

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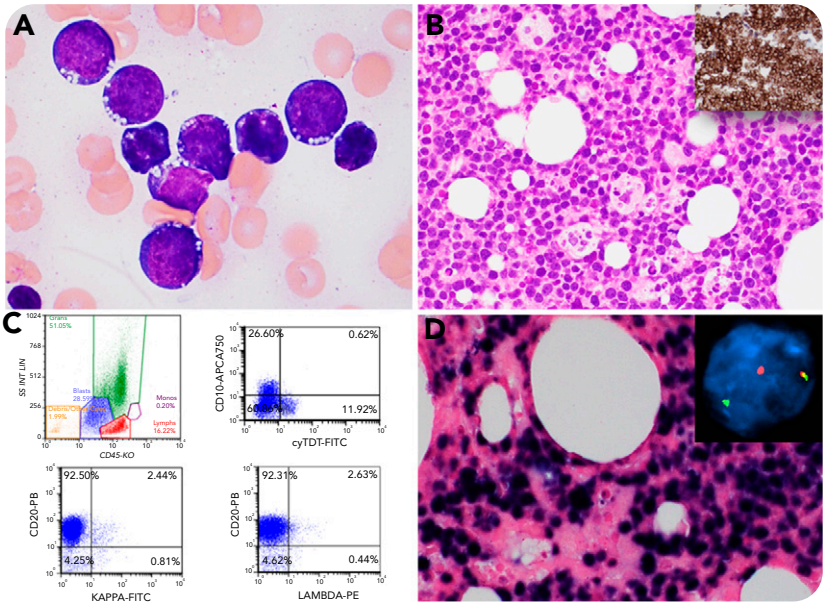

A 68-year-old woman presented with a 6-week history of generalized fatigue, decreased appetite, profound all-day sweating, and 40-pound weight loss. Physical examination revealed no lymphadenopathy or hepatosplenomegaly. Laboratory test results showed normocytic anemia with normal WBC and platelet counts. Magnetic resonance imaging revealed heterogeneous mixed T_1 and T_2 signal changes but with no solid mass. A bone marrow aspirate showed many blasts with dispersed chromatin and scanty deeply blue cytoplasm containing numerous vacuoles (panel A, Wright-Giemsa stain; original magnification ×1000). Results of marrow biopsy revealed sheets of blasts with a starry sky pattern (panel B, hematoxylin and eosin stain, original magnification ×400; insert, CD20 stain by immunohistochemistry, original magnification ×400). Using flow cytometry, a B-lymphoid blast population showing low side scatter and dim CD45 characteristics, and expressing CD19, CD20, and CD10 with a subset of terminal deoxynucleotidyltransferase but complete absence of surface light chains, was detected; this was consistent with immature B-cell phenotype (panel C). However, strong positivity for Epstein-Barr virus (EBV) by EBV-encoded small RNA (EBV latency-1 infection) (panel D, EBV in situ hybridization; original magnification ×400) and solo c-MYC gene rearrangement by fluorescence in situ hybridization analysis (panel D, insert, c-MYC break apart probe, original magnification ×1000) supported the diagnosis of Burkitt leukemia.

Burkitt leukemia is an extremely rare mature B-cell neoplasm recognized by the recent World Health Organization classification as a leukemic variant of typical Burkitt lymphoma. However, a study recently showed that Burkitt leukemias with immature B-cell phonotype that mimic precursor B-acute lymphoblastic leukemias are molecularly distinct from Burkitt lymphomas.

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