Introduction

B lymphoblastic leukemia (B-ALL) is a neoplasm of hematopoietic precursor B cells characterized by the expression of various B-cell lineage associated antigens. CD5 is a T-cell membrane glycoprotein expressed on T-cells and on a subset of T-independent and memory B-cells. CD5 in humans appears to contribute to B-cell survival and IL-10 production. CD5 expression in B-cell neoplasms is relatively confined to chronic lymphocytic leukemia (CLL)/small lymphocytic lymphoma, or mantle cell lymphoma (MCL) and rare other B cell lymphomas. However, it is nearly always negative in B-ALL (1). The immunophenotypic expression of the leukemic cells in B lymphoblastic leukemia can sometimes be asynchronous and aberrant. The expression of T-cell antigens in B lymphoblastic leukemia may sometimes complicate the lineage assignment in leukemia and raises concern for ambiguous lineage acute leukemia. However, per WHO criteria, T cell lineage assignment requires CD3 expression and in the absence of CD3, the other T-cell antigens (e.g., CD2, CD5, and CD7) are generally considered as aberrancies. Aberrant expression of CD5 in B-ALL is uncommon, seen in 2% in a series of 200 cases of B-ALL cases and 4.5% cases in a series of 134 cases (2,3).

Case Report

A 14 year-old male presented with fatigue, intermittent fevers, night sweats, and leukocytosis of 130 k/mm3 with circulating blasts (Figure A). On examination, he was febrile with temperature of 101 F with marked pallor and bilateral discrete enlarged axillary lymph nodes. Systemic examination revealed hepatomegaly. CT scan of the abdomen showed hepatomegaly with mild ascites. A complete blood count showed normocytic anemia with hemoglobin of 8.1g/dL, total leucocyte count 130 k/mm3 and platelet count of 84 k/mm3. Peripheral blood smear showed 90% blasts. Follow up bone marrow aspirate smears showed sheets of blasts (95%) (Figure B) which were positive for TdT (Figure C) and PAX-5 by immunostains. Flow cytometry profile showed abnormal B lymphoblast population (96% of the total cells) with dim+/low side scatter expression of CD45, CD10 subset dim+, CD19+, CD20 subset dim +, CD22+, CD34 subset dim +, CD38+, cCD79a+, dim TdT+, and HLA-DR+) with bright expression of CD5 (~92%) (Figure D). This patient had complex cytogenetic abnormalities such as homozygous CDKN2A deletion (at 9p21) and a JAK2 deletion (at 9p24), which are consistent with the complex abnormal clone identified in chromosome studies which included structural abnormalities of both chromosomes 9p, along with deletion 10 and addition 15,16.

Discussion

Expression of CD5 in B lymphoblastic leukemia is extremely rare and its significance remains to be evaluated. However, the known reported cases have suggested it to be a poor prognosticator which may be a useful marker for identifying the future patients who are at increased risk for relapse and for harboring poor cytogenetic abnormalities.

References