Case Report

An uncommon case of an adult with del(5)(q) in acute lymphoblastic leukemia

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Del(5)(q) is a common chromosomal abnormality with favourable prognosis in Myelodysplastic Syndrome (MDS) and Acute myeloid leukemia (AML). However, del(5)(q) is also seen rarely in Acute lymphoblastic leukemia (ALL) and its significance remains poorly understood. We present here, a case report of diagnosis of an adult 75 year old patient of ALL with a cytogenetic abnormality of del(5)(q32). His clinical features, morphology and immunophenotyping findings were suggestive of T-ALL. Relevant literature has been reviewed and discussed.

Keywords: Acute lymphoblastic leukemia, del(5)(q), rare abnormality

Introduction

The deletion of long arm of chromosome 5 (del(5)(q32)) is a very rare event in Acute Lymphoblastic Leukemia (ALL) and has not been analyzed extensively. The del (5)(q) is associated with 20-30% of MDS, either as the sole identifiable abnormality, or in combination with one or more additional abnormalities.[1-4] Although, this particular abnormality is common to myeloid lineage associated neoplasias, nevertheless, we present a case of T-ALL with del(5)(q32) as a sole chromosomal abnormality with case history and discussed with relevant literature.

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A 75-year-old male patient presented to the OPD of Bangalore Institute of Oncology with a one month history of intermittent fever and loss of appetite. There was no history of bleeding tendency, diabetes mellitus, hypertension and IHD. On physical examination, his abdomen, cardiovascular and respiratory system were normal. He had a bilateral axillary and inguinal lymphadenopathy. Laboratory investigations were carried out in Triesta Sciences-HCG. Complete blood count showed Hb12.5g/dl, WBC 130.46 $\times$ 10^9/L, neutrophils 2%, lymphocytes 20%, blasts 78%, RBC 4.33 $\times$ 10^9/L, platelet count 127 $\times$ 10^9/L and LDH was high with an activity of 1949U/L. The HIV and HBsAg were negative. Bone marrow aspirate was hypercellular and showed 90-95% MPO negative blasts. Neutrophil precursors, erythroblasts, megakaryocytes were not seen. The diagnosis of ALL-L2 was made as per FAB classification. Immunophenotyping performed on bone marrow aspirate with a gating on SSC/FSC showed majority of the gated cells to be strongly expressing CD45, CD5, CD10, CD7, cCD3, CD34, and CD13 and weakly positive or negative for CD14, CD33, CD19, CD3, HLA-DR, CD117, CD8, CD22, CD4, cCD22, MPO and TdT. The scattered parameters and antigen profile as analyzed by flow cytometry (CyAn-DAKO) correlated with morphology and diagnosis of T-Acute lymphoblastic leukemia (CALLA +ve) was rendered.

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Materials and Methods

The bone marrow aspirate was cultured for direct and 24hrs in RPMI-1640 medium supplemented with 20% qualified; heat inactivated fetal bovine serum, 100 U/ml Penicillin and streptomycin, without any mitogen at 37°C. The cultures were exposed to Colcemid (final concentration- 0.1 μg/ml) for 30 minutes followed by hypotonic treatment (0.075 M KCl) for 20 minutes at 37°C and fixed in methanol: Glacial acetic acid (3:1) overnight at 4°C. Later, air dry slides were made and incubated at 60°C overnight for aging. The chromosomes were G-banded with trypsin-giemsa banding. A total of 25 metaphases were screened, captured, karyotyped and analyzed using Applied Spectral Imaging software (ASI). The results were interpreted according to the international system for chromosome nomenclature.[5]

Results

All 25 metaphases consistently showed a karyotype of 46, XY, del(5)(q32) [Figure 1].

Discussion

Del(5)(q32) is a most frequent and documented recurrent chromosome abnormality with favourable prognosis in MDS.[1,3,4,6-8] This is also reported in acute myeloid leukemia (AML) transformed from MDS (1). The rarity of (5)(q) deletion in ALL and the same abnormality in our patient persuaded us to explore the literature. Del(5)(q) is uncommonly observed in ALL. Until now, nearly 20 cases of ALL with del(5)(q) has been reported in literature.[9] Theodossiou *et al.* (1992) have reported three cases: del(5)(q) in ALL with biphenotypic and early progenitor phenotype as sole abnormality in the first case, as an evolutionary event in another and with Ph positivity in a third case. In contrast to its presence in AML, del(5) (q) in ALL is not an adverse prognostic indicator, and it appears to be more frequent in children.[10] Our patient is an adult and has been diagnosed as having T-ALL by flow cytometry and ALL-L2 by morphology. The patient is undergoing treatment and will be followed up to evaluate the prognostic significance of del(5)(q).

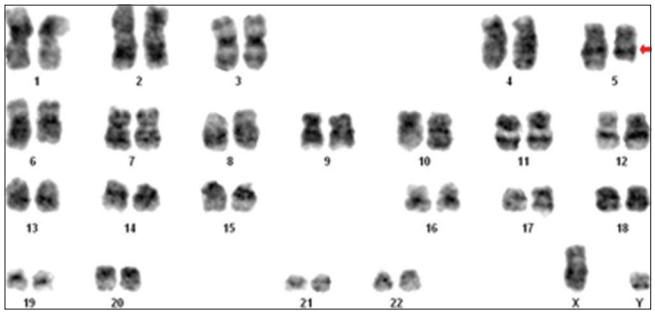

Figure 1: G-Banded karyotype of the bone marrow showing the del(5)(q32)

Literature review reveals, that del(5)(q) is also reported in chronic lymphocytic leukemia (CLL). However, they are rare and been reported only as karyotypic results without known prognosis.[11] Karakosta *et al.* (2010) describe two CLL cases with del(5)(q) not associated with adverse prognosis and not related to induced chromosome changes. This abnormality is not only reported in leukemia but also reported in small cell neuroendocrine lung carcinoma.[12]

The break point may vary from ALL to MDS to CLL to lung carcinoma. These are difficult to estimate by conventional cytogenetic analysis, because small differences in base pairs at deletions are beyond the sensitivity of the technique. Further studies are required to elucidate the prognostic value of del(5)(q) in more ALL patients and to identify candidate genes that may play a vital role in the pathogenesis of ALL.

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