

Case Report Section

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A novel chromosomal translocation t(6;14)(p22;q32) in a case of precursor B-cell acute lymphoblastic leukemia

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Clinics

Age and sex: 25 years old male patient
Previous History: no preleukemia; no previous malignant disease; no inborn condition of note.
Organomegaly: no hepatomegaly (Negative to palpation; Ultrasound not done); no splenomegaly (Negative to palpation; Ultrasound not done).

Blood

WBC: $19.6 \times 10^9/l$; Hb: 12.3 g/dl; platelets: $15 \times 10^9/l$; blasts: 68%; Bone marrow: The specimen was taken from the iliac crest and particle crush smears appeared cellular but dilute. The trephine imprints were cellular. No significant maturation of the myeloid series was present. The myeloid series were primarily composed of segmented neutrophils. No erythroid dyspoiesis was evident. Only a rare magakaryocyte was seen. Blasts were similar to those of the peripheral blood and appeared very delicate and easily crushed. No Auer rods were seen.

Cytopathology classification

Cytology: Precursor B-cell acute lymphoblastic Leukemia (WHO).

Immunophenotype: Flow cytometric analysis of the marrow was performed at the Methodist Hospital. The blasts had a precursor B-lymphoblast phenotype: CD19 positive, CD20 positive, CD10 positive, CD79a positive (cytoplasmic) and TdT positive. Myeloid markers (CD13, CD33, CD14, CD117 and myeloperoxidase) are negative. T-cell markers (CD3,

CD5, CD7, CD4 and CD8) are also negative. CD34 is positive (partial).

Rearranged Ig or Tcr: Not done.

Electron microscopy: Not done.

Precise diagnosis: Precursor B-cell Acute Lymphoblastic Leukemia.

Survival

Date of diagnosis: 11-2006

Treatment: Asparaginase, Cyclophosphamide, Daunorubicin, Vineristine.

Complete remission was obtained.

Comments: Bone marrow examination on 12-04-2006 is compatible with early remission.

Treatment related death: No; Discharged from hospital on 12-06-2006.

Relapse: -

Status: Alive

Survival: N/A

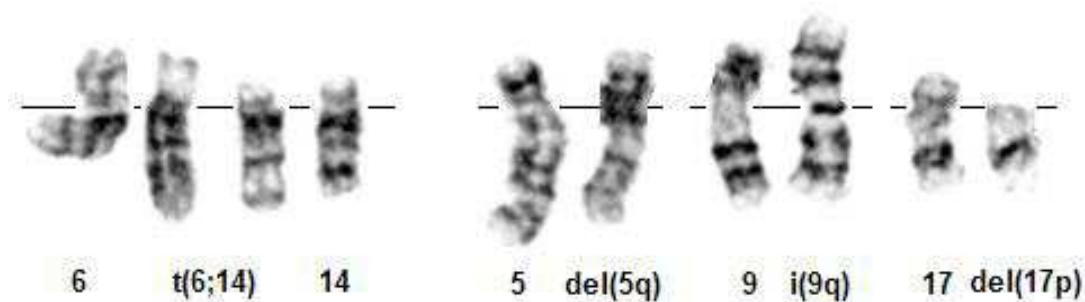
Karyotype

Sample: Peripheral Blood; Culture time: 24/48; Banding: GTW.

Results: 46-47, XY,del(5)(q34),t(6;14)(p22;q32),i(9)(q10),del(17)(p10),-20,+mar[cp6]

Other molecular cytogenetic technics: Fluorescence In Situ Hybridization (FISH).

Other molecular cytogenetics results : FISH was performed using Vysis LSI IGH dual color, break apart rearrangement probe. The analysis revealed an IgH rearrangement with the green signal on der (6).



Partial karyotype of case number 06-1570 showing the new t(6;14)(p22;q32) and other anomalies.

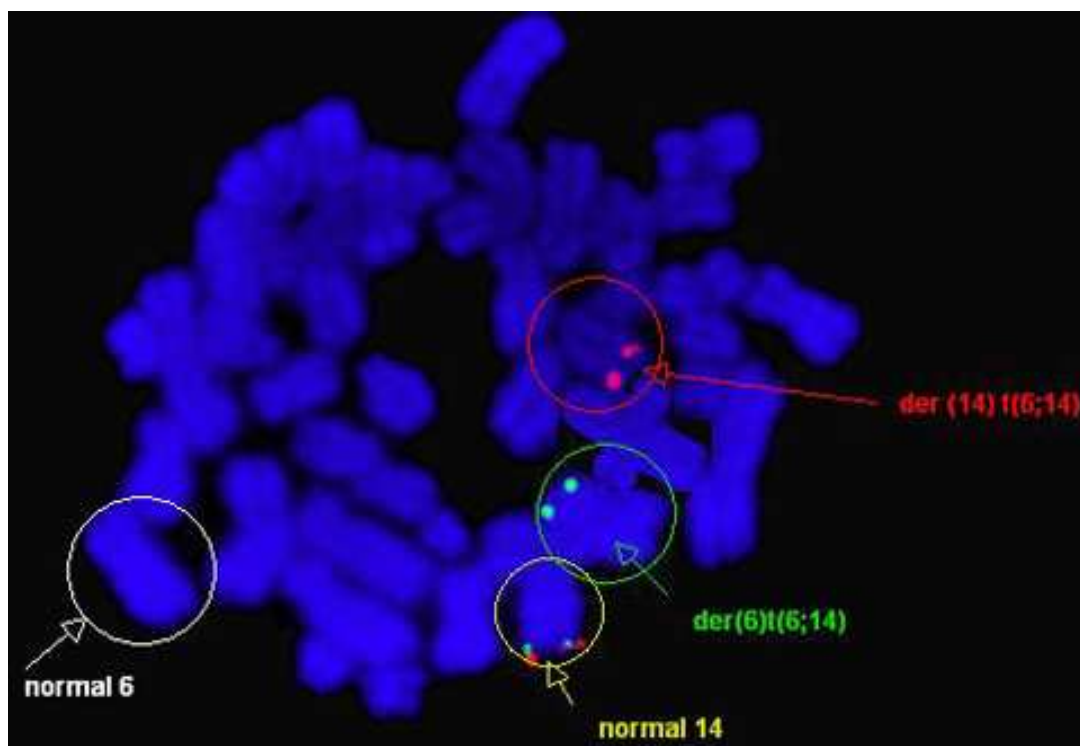
Comments

There are few reports documenting t(6;14)(p21.1;q32.3), in cases of multiple myeloma/plasma cell leukemia and diffuse large B cell non Hodgkin lymphoma. Our case report shows a karyotype with multiple abnormalities. One significant abnormality observed was the loss of 9 p in the form of i(9)(q10), which is a common finding in precursor B-cell lymphoblastic leukemia. Our case also showed partial deletions of 5q and 17p. We observed a novel translocation t(6;14) (p22;q32) in a patient with

Precursor B-cell Acute Lymphoblastic Leukemia. FISH studies performed on the metaphases of this specimen confirmed the translocation of IGH (located on 14q32.3). E2F3 is a transcription factor located on 6p22 that is reported to play a critical role in regulating normal cellular proliferation and differentiation. Though the exact gene in 6p22 translocation is not yet known, it is speculated that E2F3 might be clinically significant in leukemia/MDS. However, involvement of Geminin, DNA replication inhibitor (GMNN) located on 6p22.2 cannot be ruled out.



Representative metaphase of case number 06-1570.



FISH results showing 14q32 translocation.

References

Humberto PO, Verona R, Trimarchi JM, Rogers C, Dandapani S, Lees JA. E2F3 is critical for normal cellular proliferation. *Genes Dev* 2000;14(6):690-703.

Sonoki T, Harder L, Horsman DE, Karran L, Taniguchi I, Willis TG, Gesk S, Steinemann D, Zucca E, Schlegelberger B, Solé F, Mungall AJ, Gascoyne RD, Seibert R, Dyer MJ. Cyclin D3 is a target of t(6;14)(p21.1;q32.3) of mature B-cell malignancies. *Blood* 2001;98(9):2837-2844.

Zhu W, Chen Y, Dutta A. Rereplication by depletion of geminin is seen regardless of p53 status and activates a G2/M checkpoint. *Mol Cell Biol* 2004;24(16):7140-7150.

Viguié F. t(6;14)(p21;q32). *Atlas Genet Cytogenet Oncol Haematol* 2005;9(3):476-478.

Oeggerli M, Schraml P, Ruiz C, Bloch M, Novotny H, Mirlacher M, Sauter G, Simon R. E2F3 is the main target gene of the 6p22 amplicon with high specificity for human bladder cancer. *Oncogene* 2006;25(49):6538-6543.

D'Achille P, Seymour JF, Campbell, LJ. Translocation (14;18)(q32;q21) in acute lymphoblastic leukemia: a study of 12 cases and review of literature. *Cancer Genet Cytogenet* 2006;171 (1):52-56.

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