ALL-004: Philadelphia Chromosome-Positive T-Cell Acute Lymphoblastic Leukemia/Lymphoblastic Lymphoma: A Rare Case Report

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Background

T-cell acute lymphoblastic leukemia/ lymphoblastic lymphoma (T-ALL/LBL) is a rare and aggressive leukemia.

Philadelphia chromosome–positive (Ph^+) T-ALL is exceedingly rare and has therapeutic and prognostic significance.

Objective

The case study herein is a very rare presentation. A case report of a 52-year-old Egyptian female, who presented in 2012 at Oncology Center Mansoura University (OCMU) with a 2-month history of fatigue, bone aches, and abnormal vaginal bleeding.

Patient & Methods

The patient appeared pale with significant splenomegaly.

Complete blood count: white blood cell count 6.9 k/µL, microcytic hypochromic anemia with hemoglobin 10.4 g/dL, and platelet count 149 k/µL. A peripheral blood smear showed neutrophil toxic granulation.

Bone marrow aspirate (BMA) was infiltrated with 45% blasts, and myeloid and erythroid series were suppressed. No significant dysplasia was noted.

Flow cytometry analysis performed on BMA (table 1) reported a case of **ALL (T-cell acute lymphoblastic leukemia/lymphoblastic lymphoma).**

Summary

The **fluorescence *in-situ* hybridization (FISH)** analysis performed on interphase nuclei obtained from a BMA sample revealed a dual-fusion hybridization signal pattern for **BCR** and **ABL1** probes on chromosomes 9 and 22, indicating **t(9:22)** in 100%.

Cytogenetic analysis revealed an abnormal complex karyotype, 46 XY t(9;22),(q34;q11.2)[25], in all counted cells. **BCR-ABL1** gene rearrangement by quantitative real-time PCR was 100% IS.

The patient was diagnosed with a case of **T-ALL/LBL with t(9;22); BCR-ABL1 (Ph^+).**

The patient started the **MRCUK** protocol in combination with **imatinib** 400 mg/d. She finished maintenance therapy on 10/12/2016. The patient is still on imatinib 400 mg/d. The patient is still in complete remission and in deep molecular response (table 2) with no detectable minimal residual disease.

Tables

Table 1. Flow cytometry test, 31/3/2012

Sample	BMA showing an abnormal population of blasts
Marker	TdT (20%)
Marker	CD22 (2.41%)
Marker	cCD3 (35%)
Marker	CD7 (64%)
Marker	CD2 (62%)
Marker	CD5 (61%)
Marker	CD1a (0.38%)
Marker	CD4 (27%)
Marker	CD8 (32%)
Marker	CD10 (3.6%)
Comment	CD117 (5.4%) CD34 (2.41%) CD79a (27%) **IPT: (T-cell acute lymphoblastic leukemia / lymphoblastic lymphoma)**

Table 2. Quantitative Molecular Detection of BCR/ABL Gene by RT-QPCR, 5-2-2022

Specimen	Peripheral Blood
Internal house Keeping Gene	ABL
Copy number	3300
Target Gene	BCR-ABL
Copy number	0.00
Ratio BCR-ABL/ABL	0.000 IS %
Comment	Philadelphia chromosome P210 & P190 (for ALL) not detected at level of 0.000 %

Discussion

Ph^+ T-ALL is rare. Differentiation between Ph^+ T-ALL/LBL and T-LB crisis of chronic myeloid leukemia (CML) was difficult because there was no prior history of CML. The addition of tyrosine kinase inhibitors to intensive chemotherapy has greatly improved the outcomes of Ph^+ ALL patients.

References

1. How I treat Philadelphia chromosome-positive acute lymphoblastic leukemia, *Blood*

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