003_b

Laboratory Results

White Blood Cell Count (WBC)	6,000 - 10,000 cells/μL	4,500 - 10,000 cells/μL
Neutrophils	55%	40% - 60%
Lymphocytes	35%	20% - 40%
Monocytes	5%	2% - 8%
Eosinophils	3%	1% - 4%
Basophils	2%	0% - 1%
Hemoglobin (Hgb)	12.0 - 14.5 g/dL	11.5 - 15.5 g/dL
Hematocrit (Hct)	36% - 44%	35% - 45%
Platelet Count	150,000 - 450,000 cells/μL	150,000 - 450,000 cells/μL

Pathology Report 10/4/24

Date of Birth: 7/30/2017
Date of Procedure: 10/4/24
Referring Physician: Dr. Oncoso
Clinical History: B-cell precursor acute lymphoblastic leukemia (B-ALL), post-consolidation phase treatment.

Procedure: Bone Marrow Biopsy

Gross Description

Specimen Received: Bone marrow biopsy core (2 fragments). The bone marrow biopsy core is measured at 2.5 cm in length and is of adequate quality for analysis. The aspirate sample is also sufficient for examination.

Microscopic Description

Bone Marrow Biopsy: Examination of the bone marrow biopsy shows marked hypercellularity, with an estimated cellularity of 90%, which is significantly higher than normal. The predominant cellular population consists of blasts, which are lymphoid in appearance, with scant cytoplasm, fine chromatin, and nucleoli. These features are consistent with B-cell acute lymphoblastic leukemia (B-ALL). There is minimal residual normal hematopoiesis, with a decrease in myeloid and erythroid elements, indicating replacement of the marrow by leukemic blasts.

Immunohistochemistry:

CD19: Positive, confirming B-cell lineage.

CD34: Positive, indicating a precursor phenotype.

PAX5: Positive, supporting B-ALL.

CD3: Negative, ruling out T-cell lineage.

Myeloperoxidase (MPO): Negative, excluding myeloid leukemia.

TdT (Terminal deoxynucleotidyl transferase): Positive, confirming immaturity of the blasts.

CD10: Positive, consistent with precursor B-cell phenotype.

CD20: Positive, confirming B-cell malignancy.

Kappa/Lambda light chains: Polytypic, indicating the absence of a monoclonal population.

The presence of CD10+, CD19+, and CD34+ blasts with positive TdT supports the diagnosis of relapsed or refractory B-ALL. There is no evidence of maturation into a more differentiated B-cell lineage or other hematologic malignancy.

Bone Marrow Aspirate: Examination of the bone marrow aspirate reveals >90% blasts, which are consistent with the findings observed on biopsy. The blasts are small to medium-sized, with high nuclear-to-cytoplasmic ratios and irregular nuclear contours. Flow cytometry on the aspirate sample further confirms the presence of B-cell precursor blasts, with the following immunophenotype:

Conclusion

The bone marrow biopsy and aspirate findings confirm the diagnosis of relapsed or refractory B-cell acute lymphoblastic leukemia (B-ALL) in this 7-year-old male patient. The marrow is highly infiltrated by immature B-lymphoid blasts, with minimal residual normal hematopoiesis. There is no evidence of myeloid or T-cell differentiation, supporting the diagnosis of relapse in

the context of prior standard chemotherapy. Further clinical management, including evaluation of available salvage therapies, is recommended.

Pathology Report 3/29/24

Date of Birth: 7/30/2017
Date of Procedure: 03/29/2024
Referring Physician: Dr. Oncoso
Clinical History: Patient presented with fatigue and recurrent infections. Bone marrow biopsy performed to evaluate for acute lymphoblastic leukemia.

Procedure: Bone Marrow Biopsy

Specimen Received: Bone marrow aspirate and core biopsy.

Findings:

- **Bone Marrow Cellularity:** Hypercellular (approximately 90% cellularity).
- **Blast Cell Percentage:** 85% lymphoblasts present in the marrow, confirming the diagnosis of B-cell precursor acute lymphoblastic leukemia (B-ALL).
- **Differential Cell Count:**
    - Lymphoblasts: 85%
    - Myeloid series: 5%
    - Erythroid series: 5%
    - Other cell types: 5%

Cytogenetic Analysis:

- **Cytogenetic Findings:** Philadelphia chromosome-positive (Ph+), confirming the presence of the BCR-ABL fusion gene..

Interpretation:
The findings confirm a diagnosis of B-cell precursor acute lymphoblastic leukemia (B-ALL) characterized by hypercellularity and a high percentage of lymphoblasts. The presence of the Philadelphia chromosome indicates a higher risk profile and may necessitate more intensive treatment. Further clinical management, including targeted therapy with tyrosine kinase inhibitors and monitoring for minimal residual disease, is recommended.