

Precursor T lymphoblastic leukemia/lymphoma

Precursor T lymphoblastic leukemia/lymphoma

Definition: a neoplasm of lymphoblasts committed to the T-cell lineage.

- lymphoma: mass, without or minimal blood and BM involvement
- lymphoblastic leukemia: extensive BM and blood involvement (>25% BM cells)

Precursor T lymphoblastic leukemia/ lymphoblastic lymphoma

Epidemiology

- 15% of childhood ALL
- 25% of adult ALL
- 80-95% of lymphoblastic lymphoma
- More in adolescents and males

Precursor T lymphoblastic leukemia/ lymphoblastic lymphoma

Clinical features:

- Leukemia: high WBC
- Lymphoma: large mediastinal mass (or other tissue mass),
rapid growth, pleural fluid involvement

Precursor T lymphoblastic leukemia/ lymphoblastic lymphoma

Sites of involvement:

- Leukemia: blood and BM, all cases
- Lymphoma: mediastinal mass: 50%;
Others: LN, skin, liver, spleen,
Waldeyer's ring, CNS, gonads

Precursor T lymphoblastic leukemia/ lymphoblastic lymphoma

Morphology:

Similar to precursor B-ALL/LBL

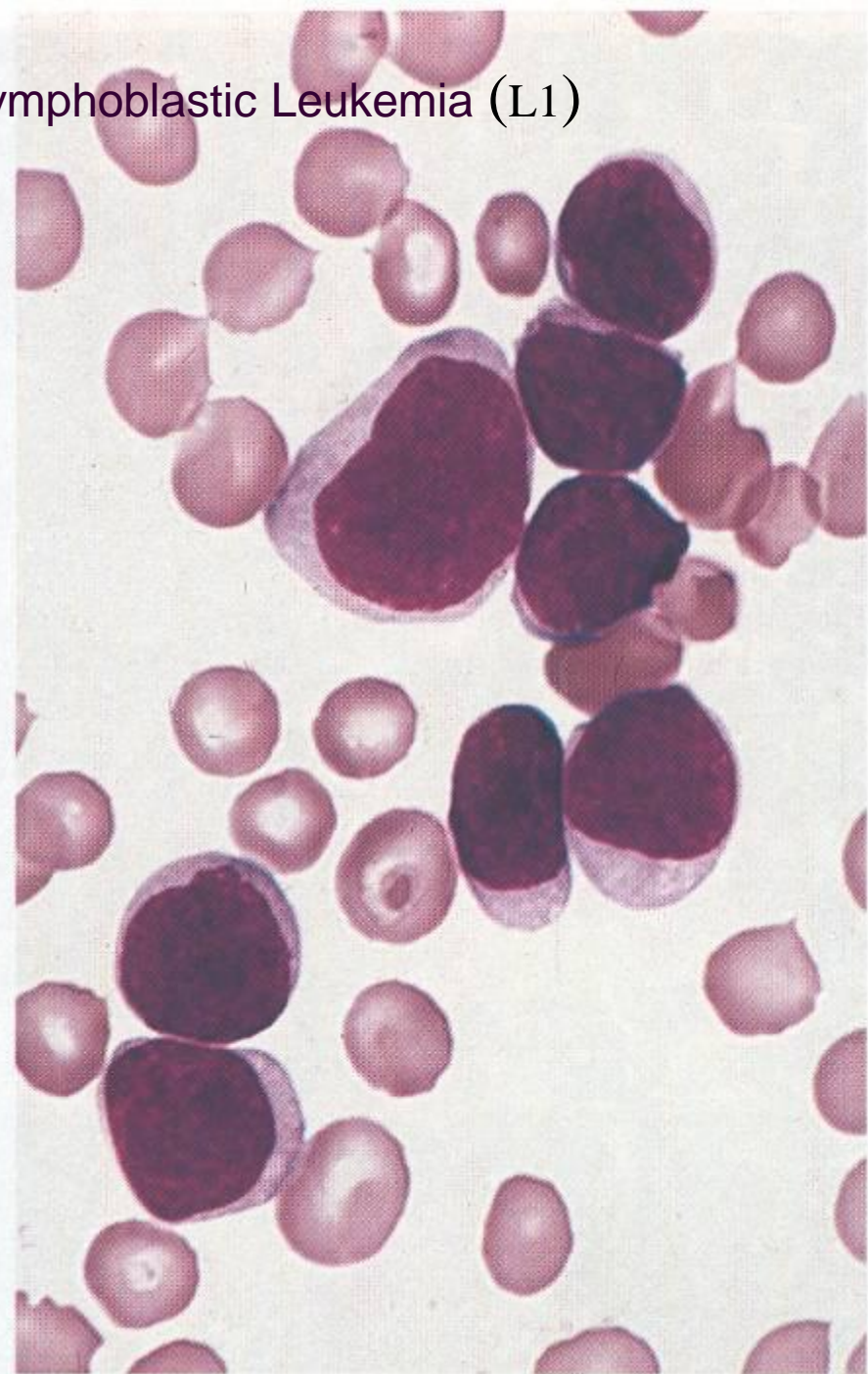
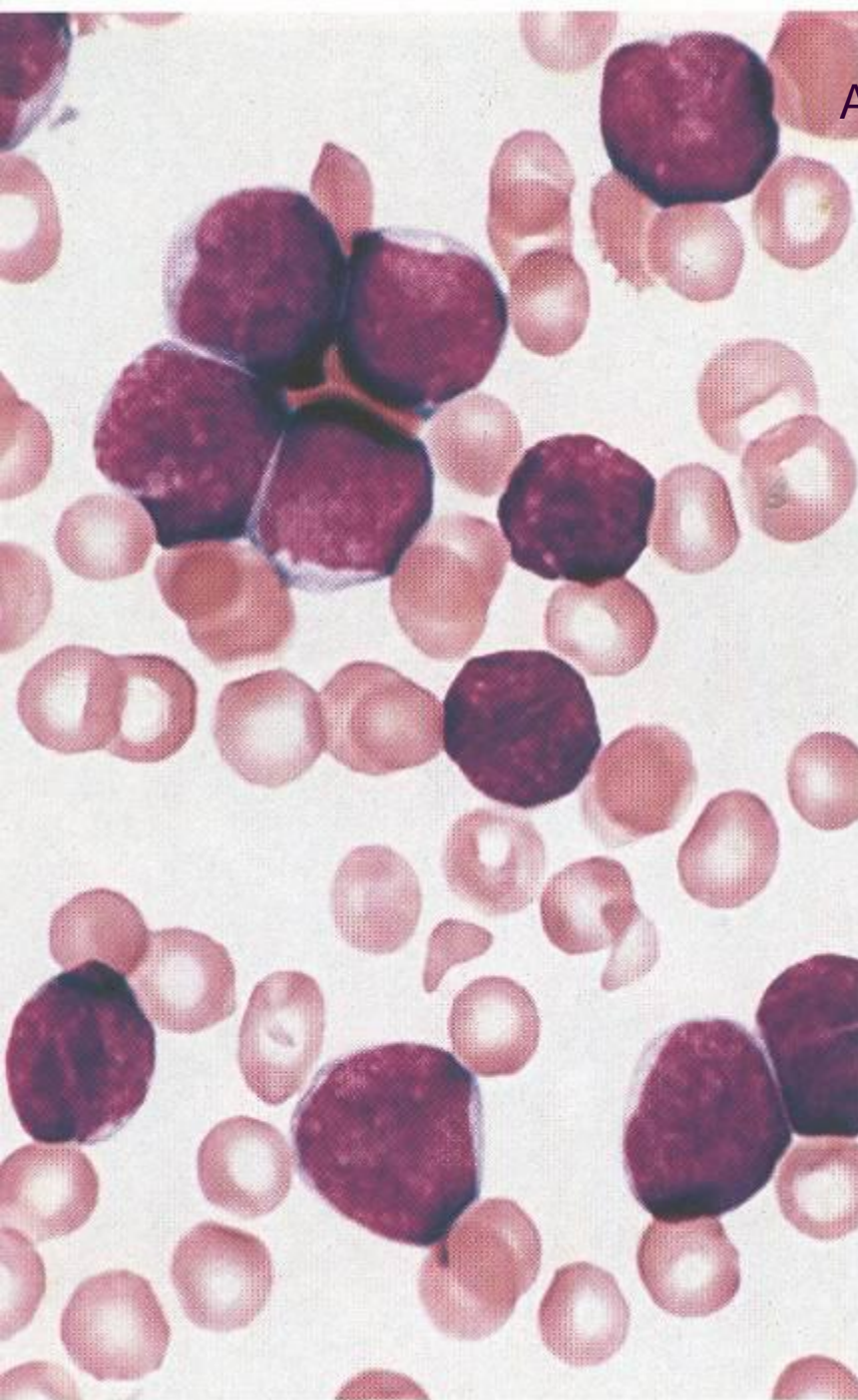
High number of mitotic figures

A small number of LBL cases with eosinophilia,
myeloid hyperplasia:

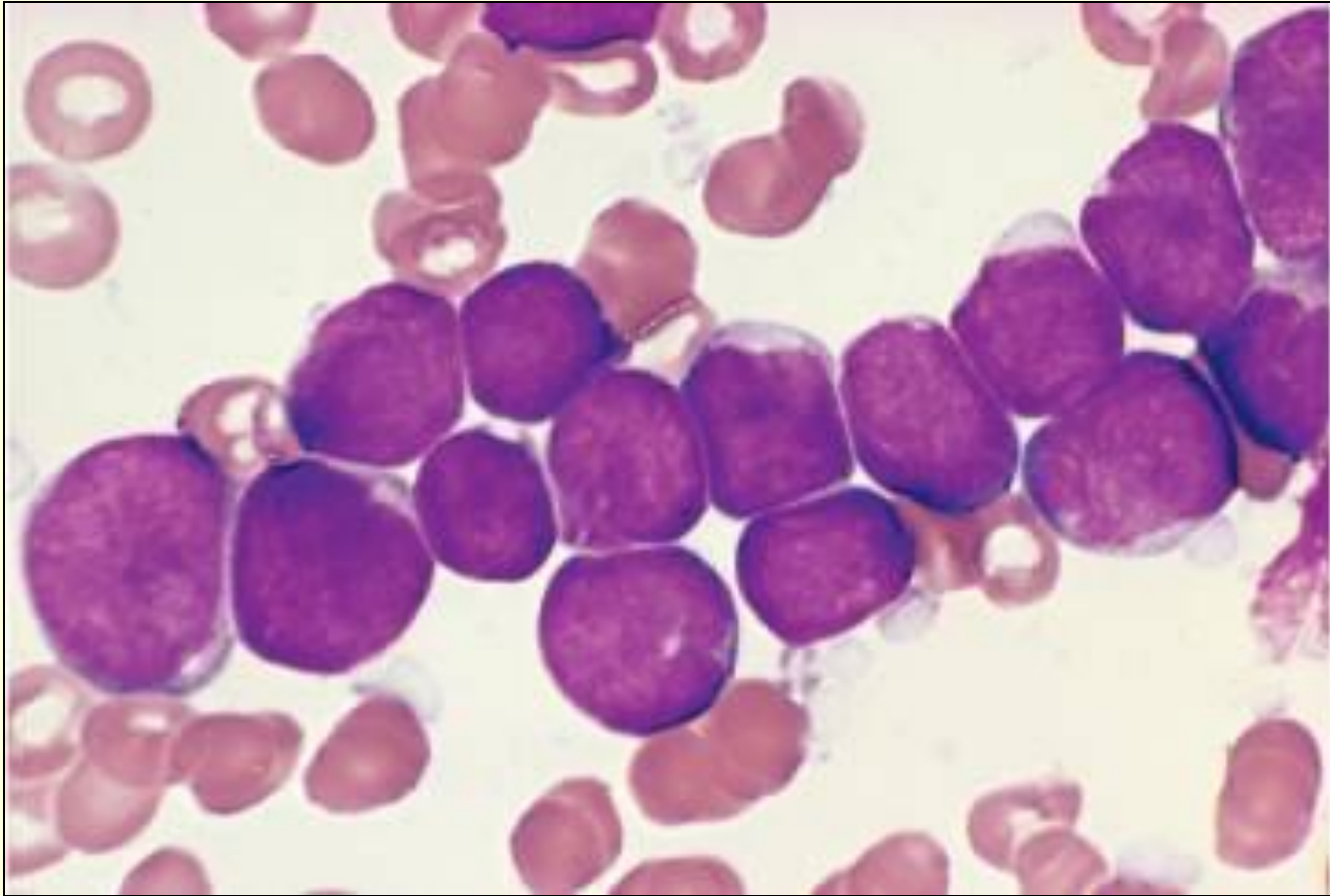
some of them associated t(8;13)(p11.2;q11-22)

some of them developed myeloid malignancy

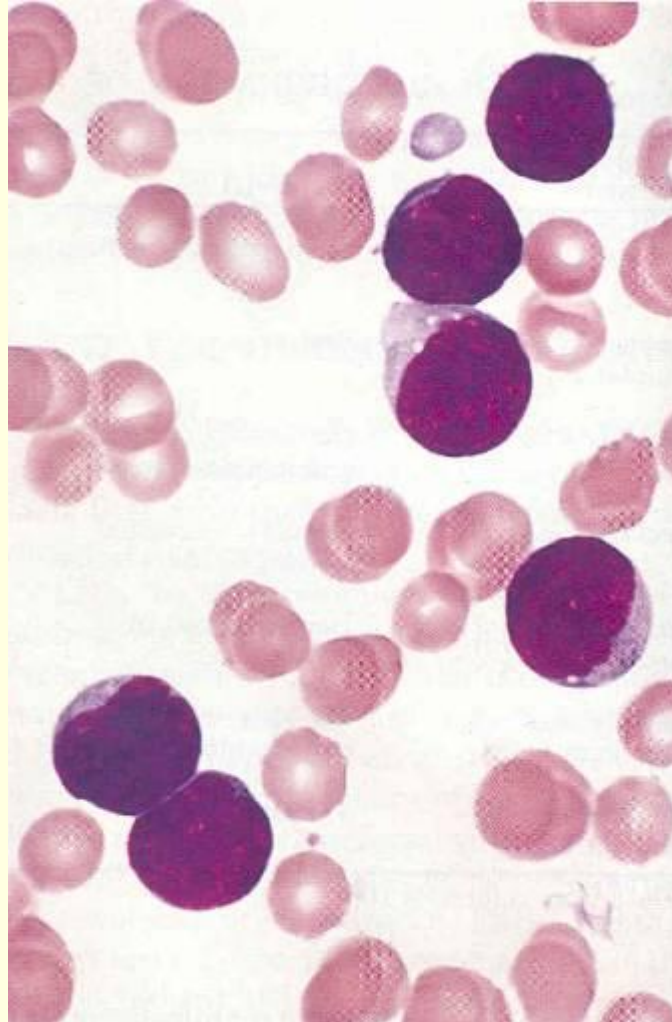
Acute Lymphoblastic Leukemia (L1)



Acute Lymphoblastic Leukemia

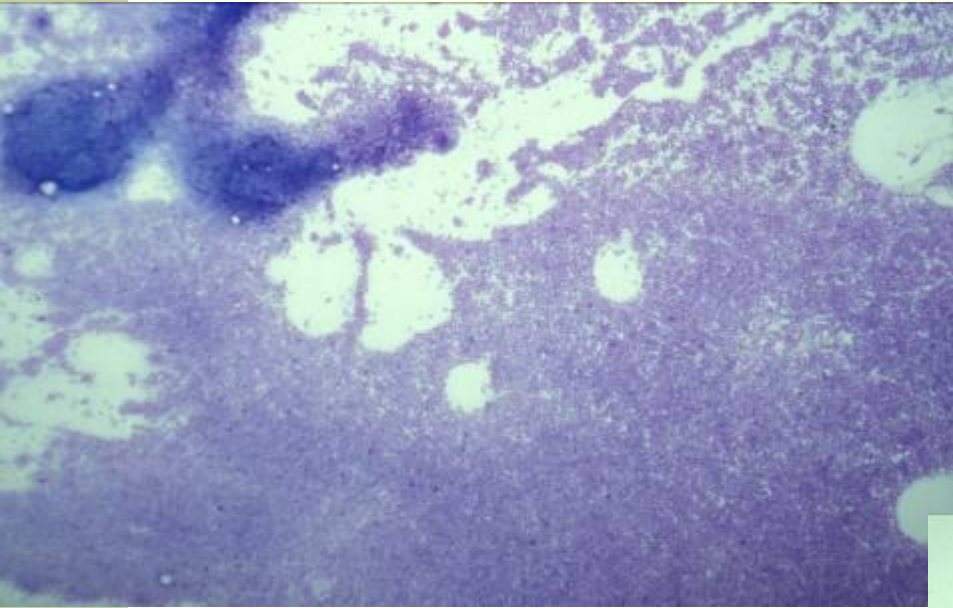


Acute Lymphoblastic Leukemia



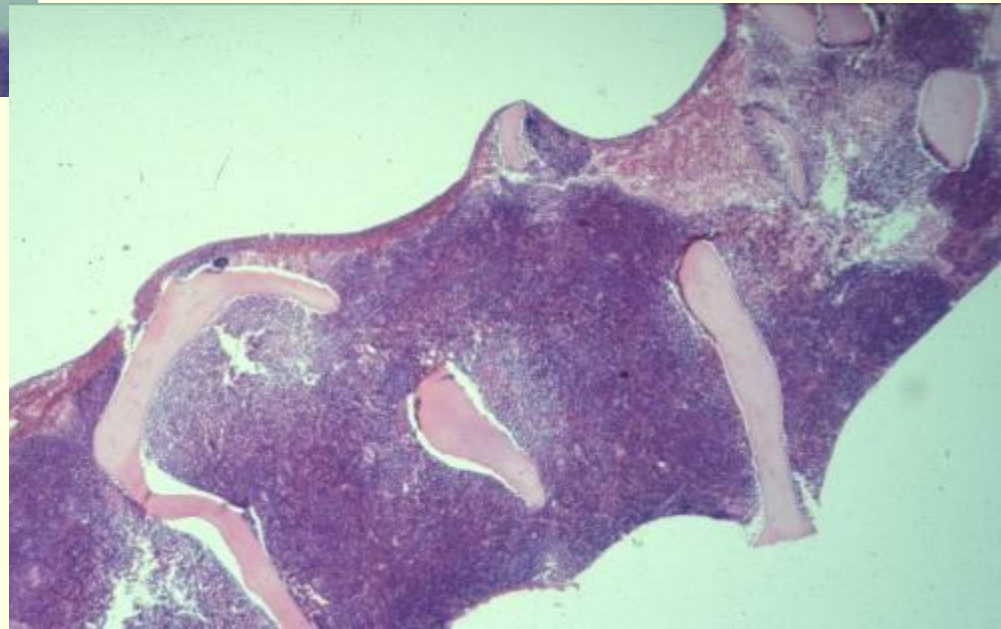
Acute Lymphoblastic Leukemia

Bone Marrow

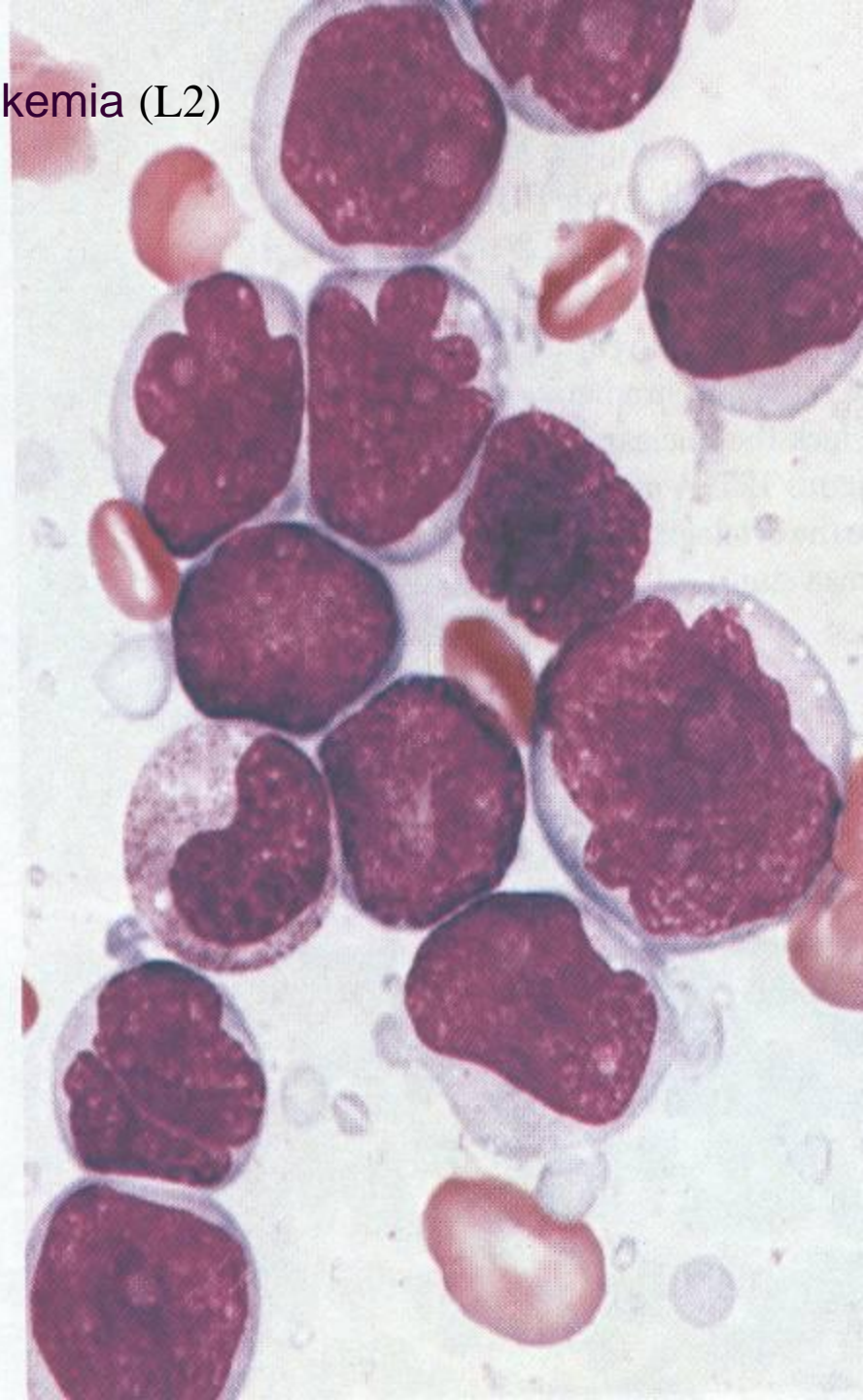
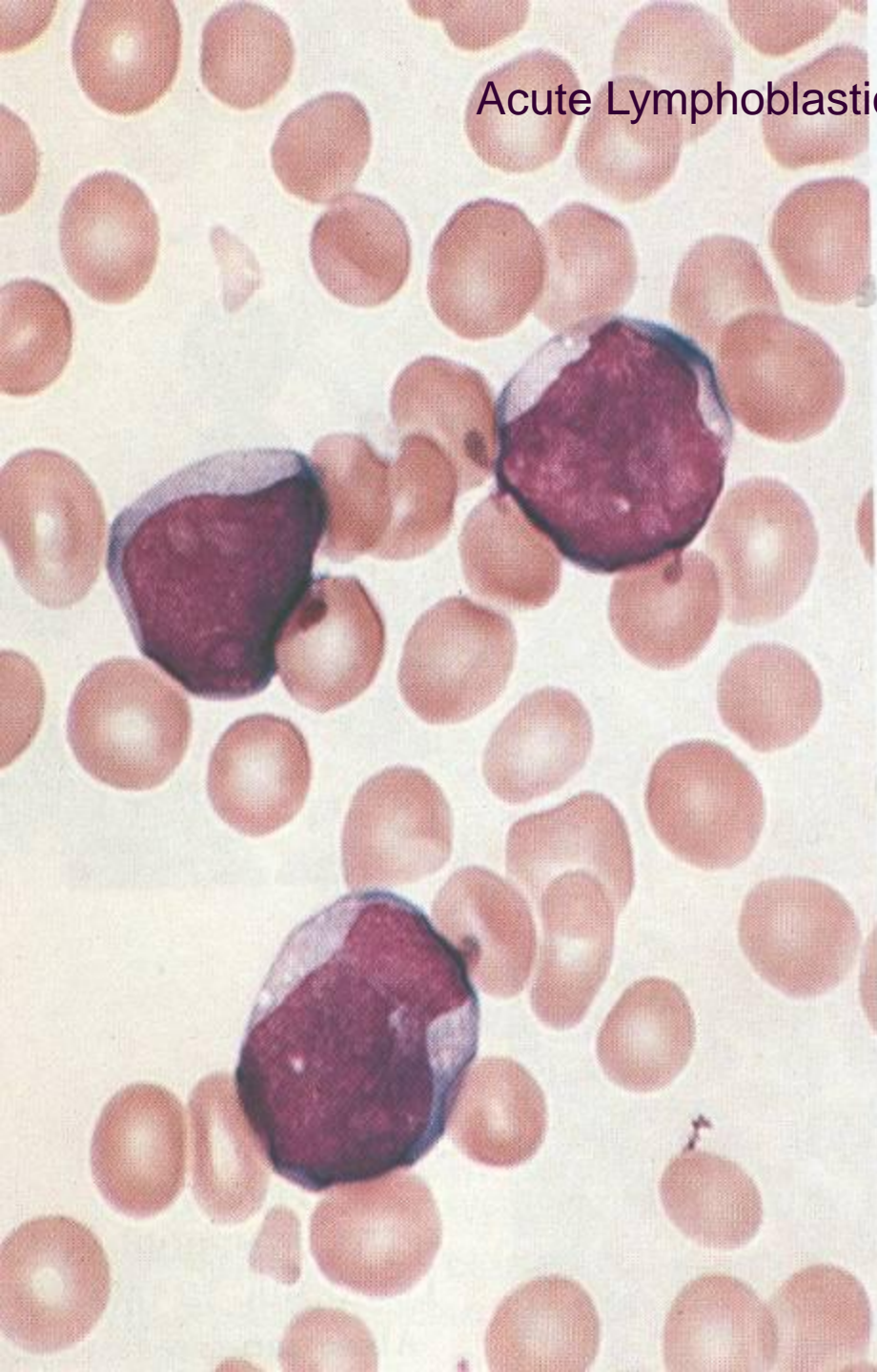


Bone marrow aspirate smear

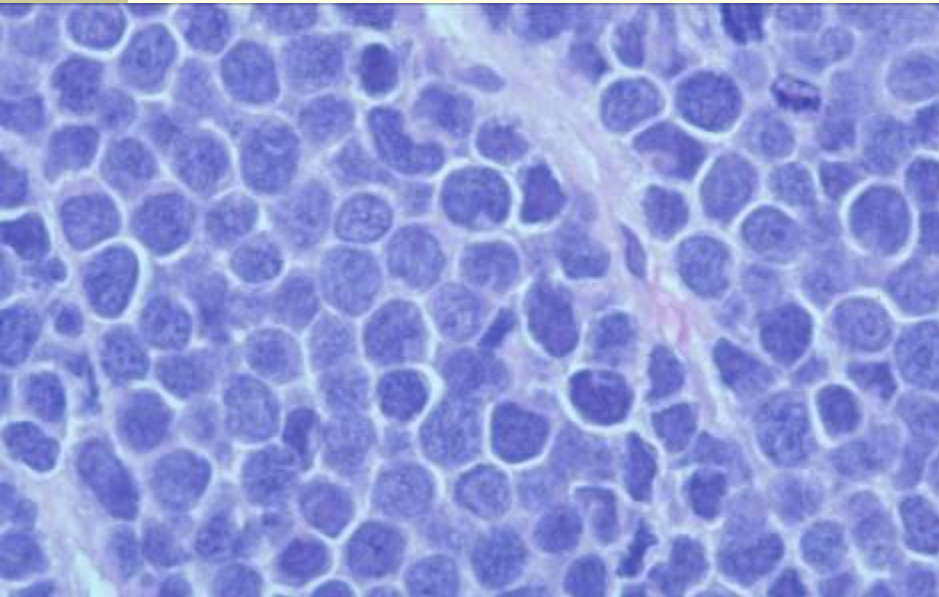
Bone marrow biopsy



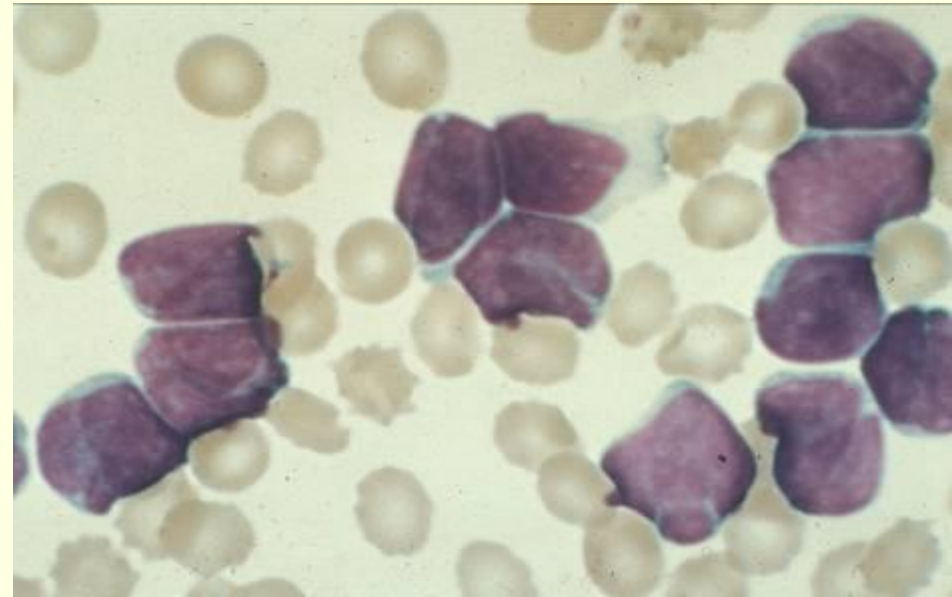
Acute Lymphoblastic Leukemia (L2)



Lymphoblastic Lymphoma

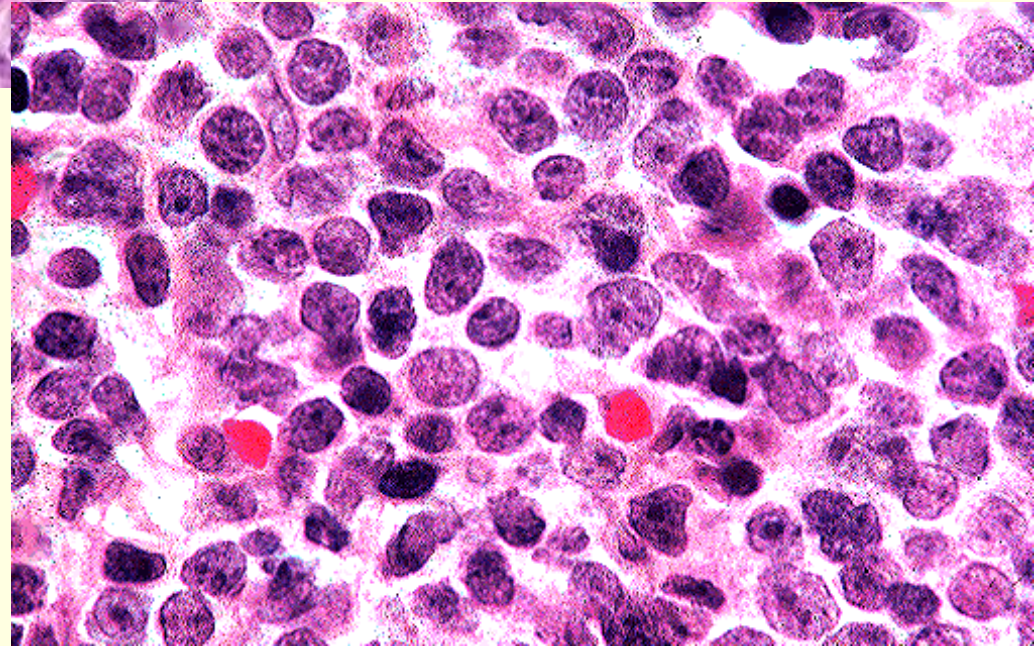
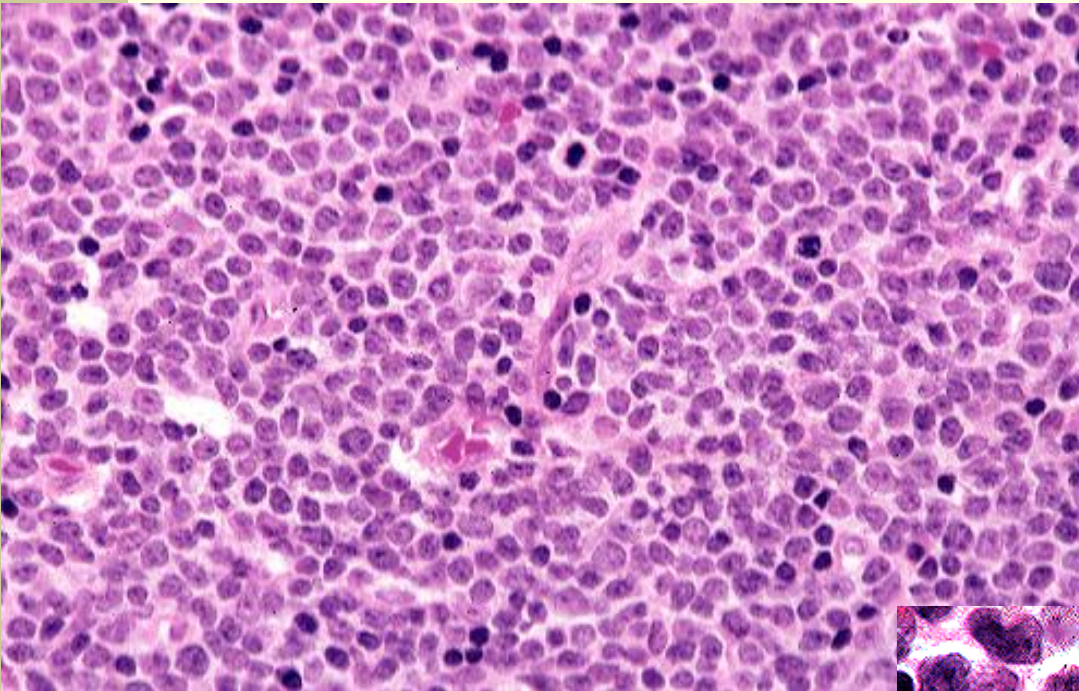


**Mediastinal mass:
Lymphoblastic lymphoma**



**Peripheral blood:
Acute lymphoblastic leukemia**

Precursor T Lymphoblastic Lymphoma



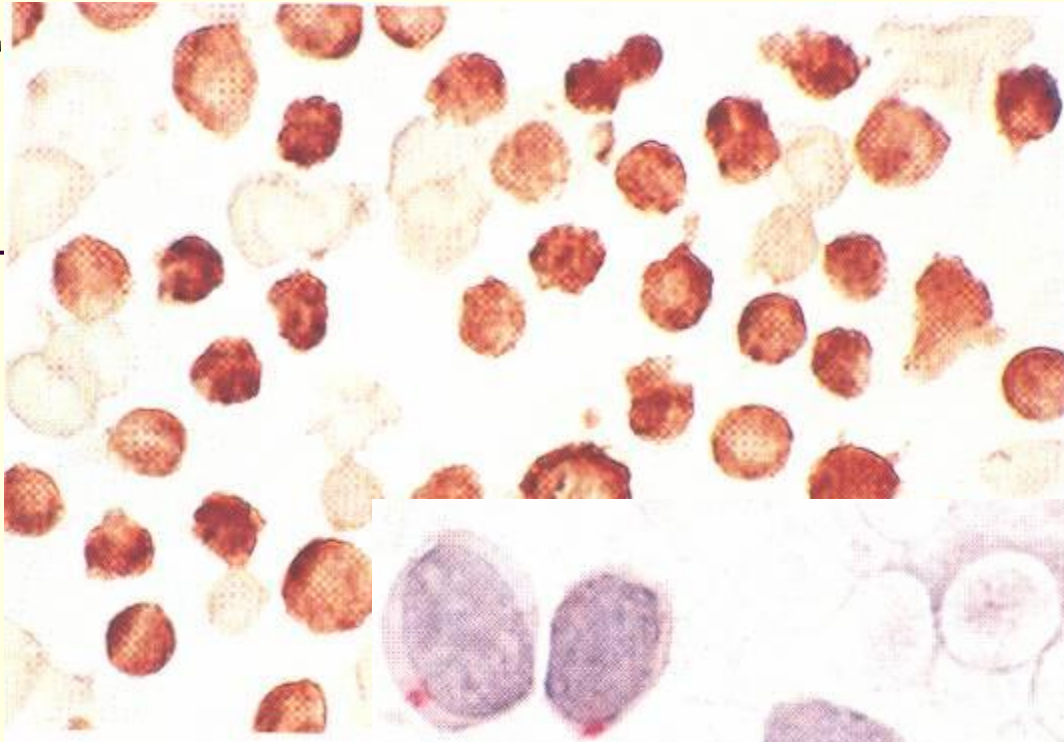
Precursor T lymphoblastic leukemia/ lymphoblastic lymphoma

Cytochemistry:
Acid phosphatase

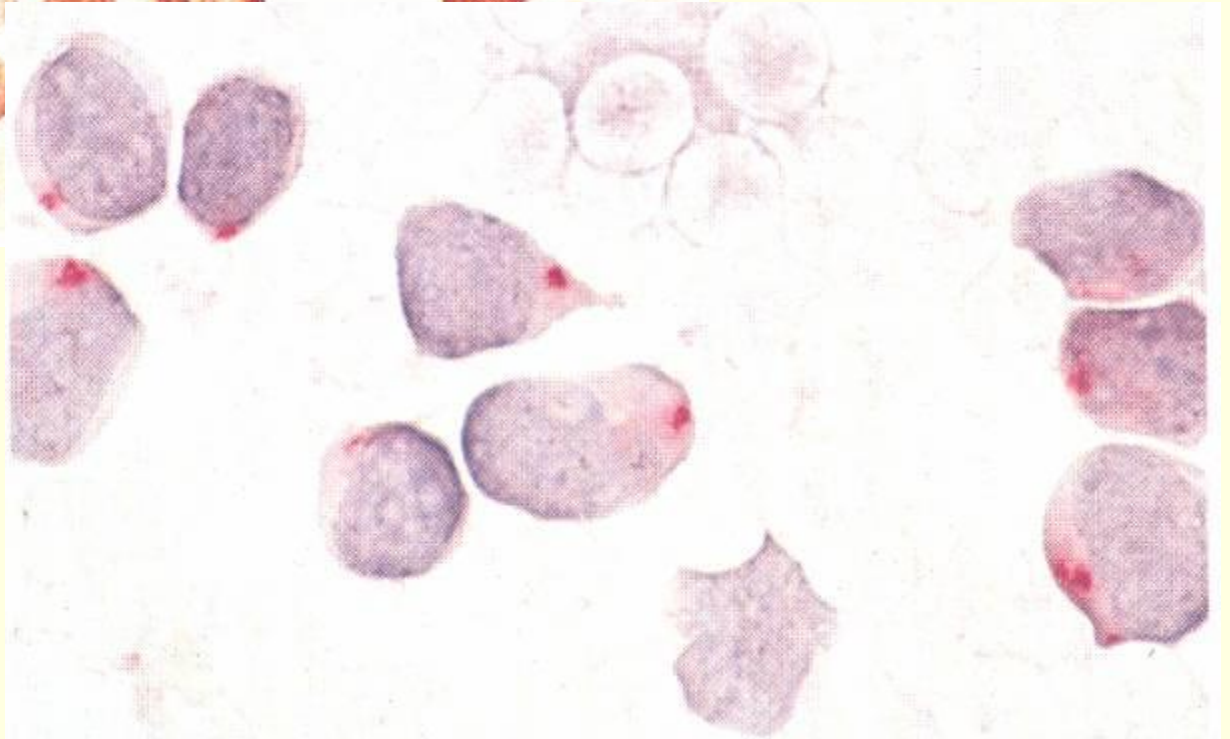
TdT

PAS: nuclear

TdT

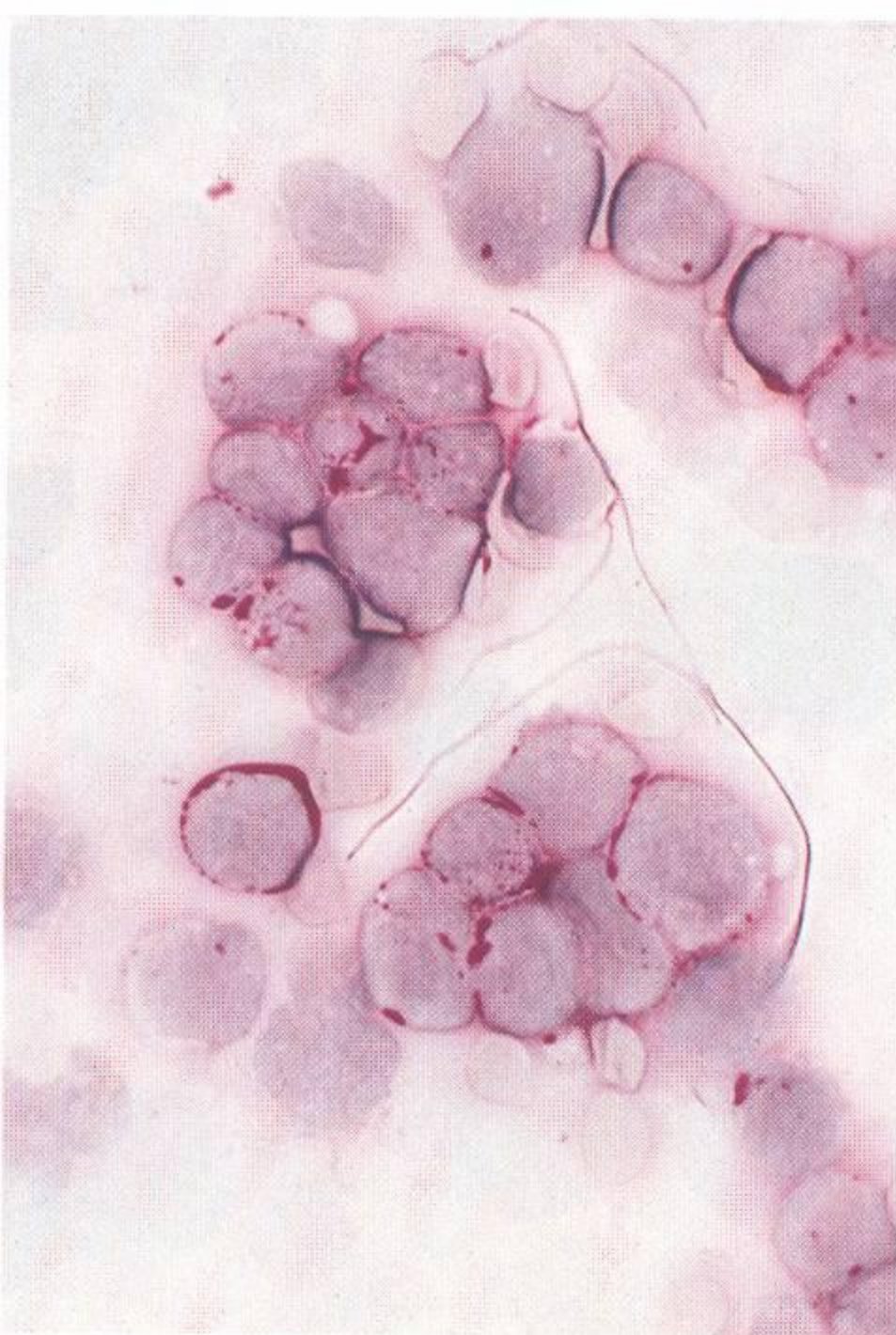


T-ALL



Acid phosphotase

Precursor T lymphoblastic leukemia/lymphoblastic lymphoma



PAS Stain

Nuclear is partially encircled
By a rim of PAS reactivity.

Precursor T lymphoblastic leukemia/ lymphoblastic lymphoma

Immunophenotype:

- TdT: +
- cCD3, the only lineage specific marker
- CD4,8: double – or +
- Variable surface: CD1a,2,3,5,7,10,79a,13,33,117(rare)
- TCR: may have rearrangement, not lineage specific

Precursor T lymphoblastic leukemia/ lymphoblastic lymphoma

Genetics:

TCR loci(**1/3** of T-ALL):

14q11.2(alpha, delta)

7q35(beta)

7p(14-15)(gamma)

Genes: MYC(8q24.1)

TAL(1p32)

RBTN1(LMO1)(11p15)

RBTN2(LMO2)(11p13)

HOX11(10q24)

LCK(1p34.3-35)

Precursor T lymphoblastic leukemia/ lymphoblastic lymphoma

Differential diagnosis:

-B-ALL and AML(M0)

by immunophenotyping, not morphology

-Hematogones (normal B precursors)

mimic blasts morphologically

TdT,CD34,CD10, pan B markers

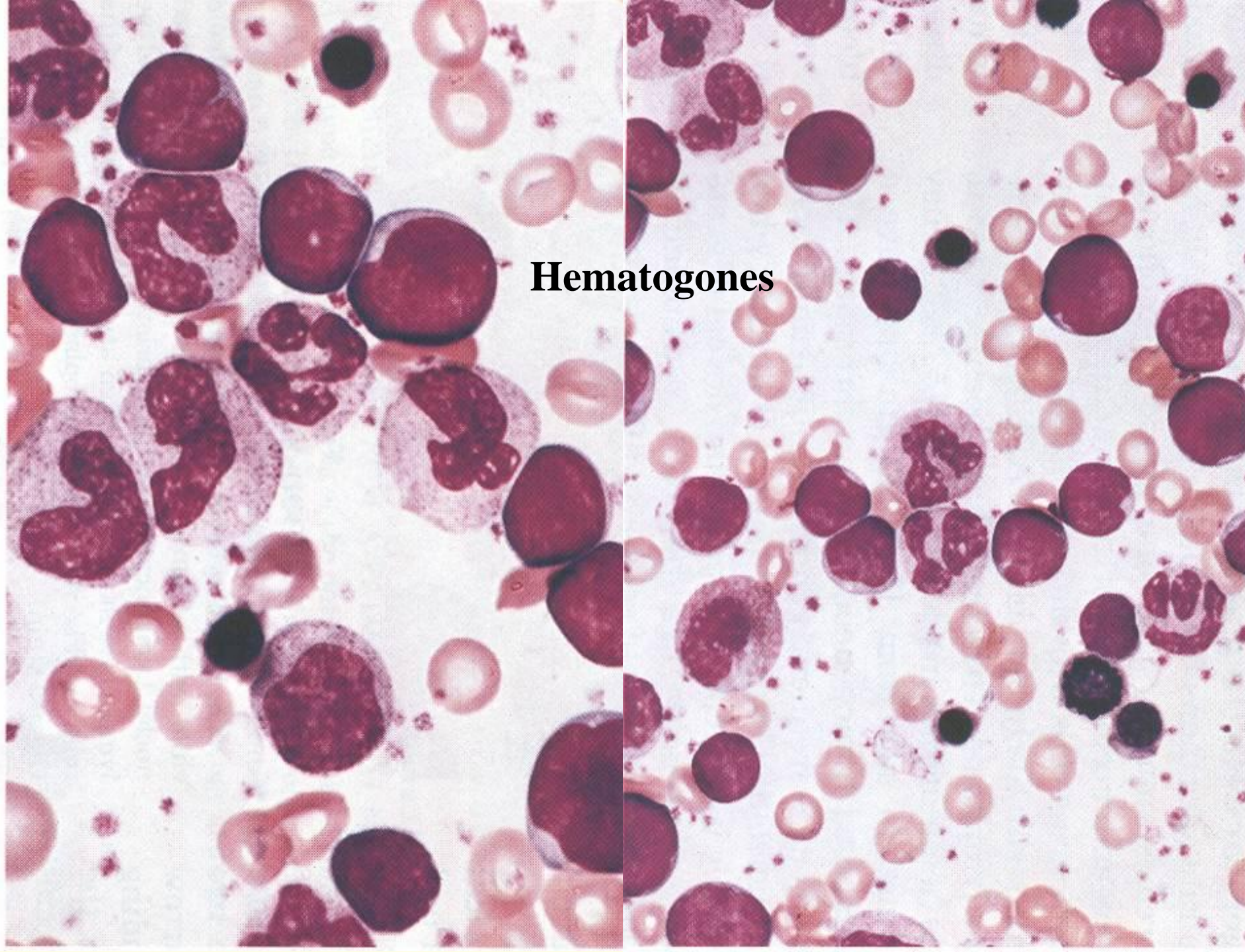
maturing, no marker aberrance or clonality

(neuroblastoma, post-chemo, iron deficiency, ITP)

-Burkitt

-Blastoid variant of mantle cell lymphoma

Hematogones



Precursor T lymphoblastic leukemia/ lymphoblastic lymphoma

Prognosis: survival comparable to B-ALL
with current treatment