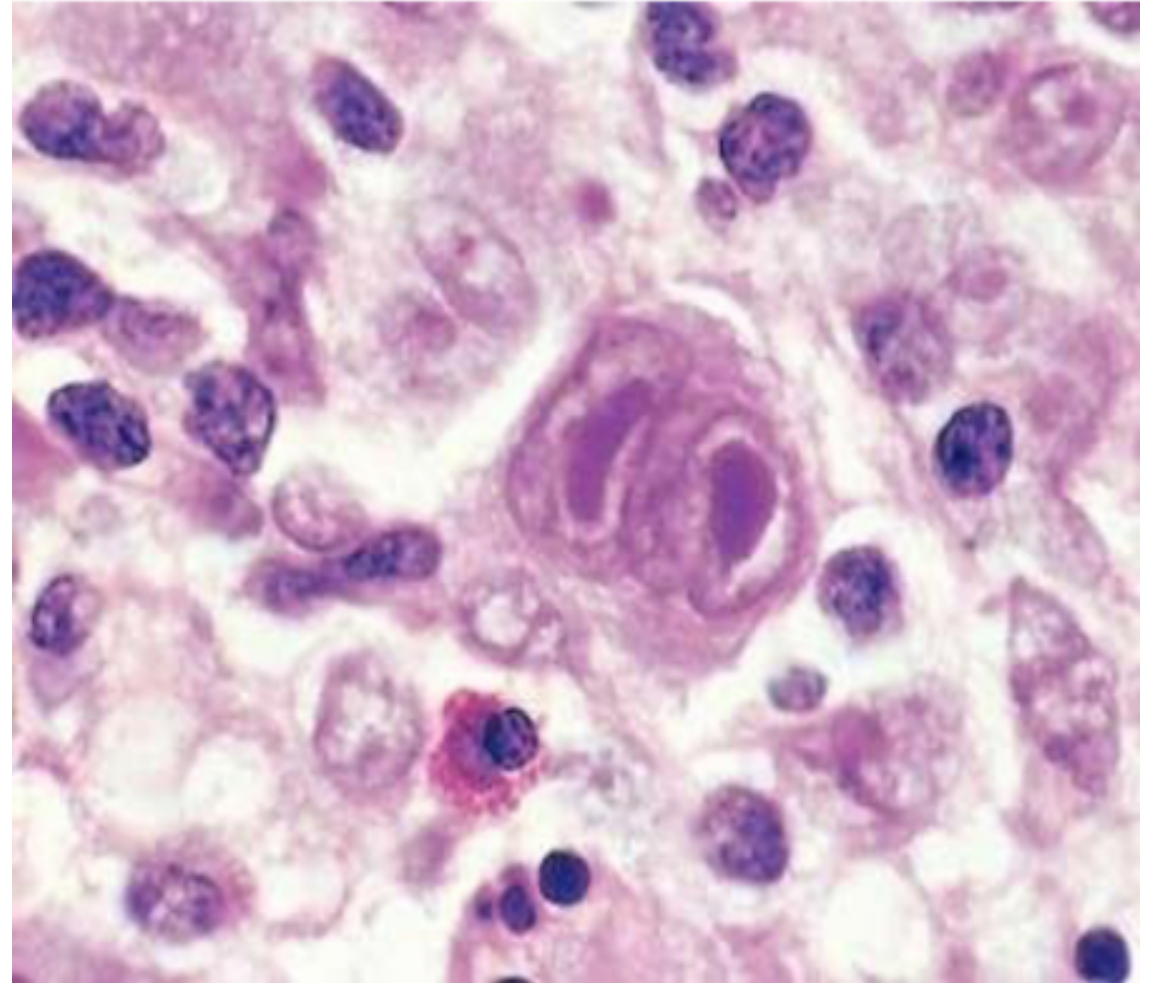


Pathology lab

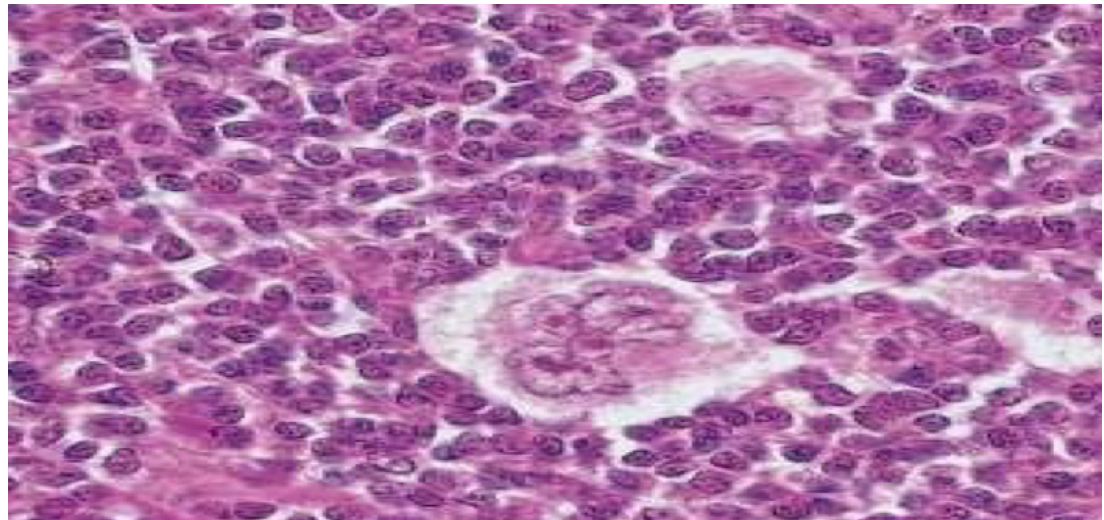
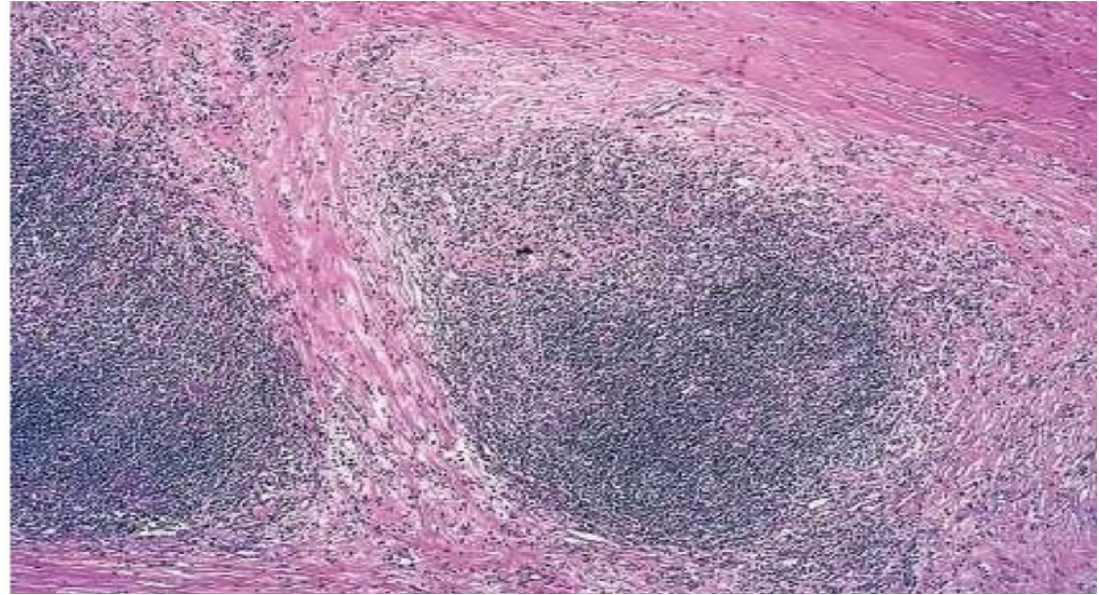
Done by : Hana Arikat

Corrected by : Ahmad Qatawneh

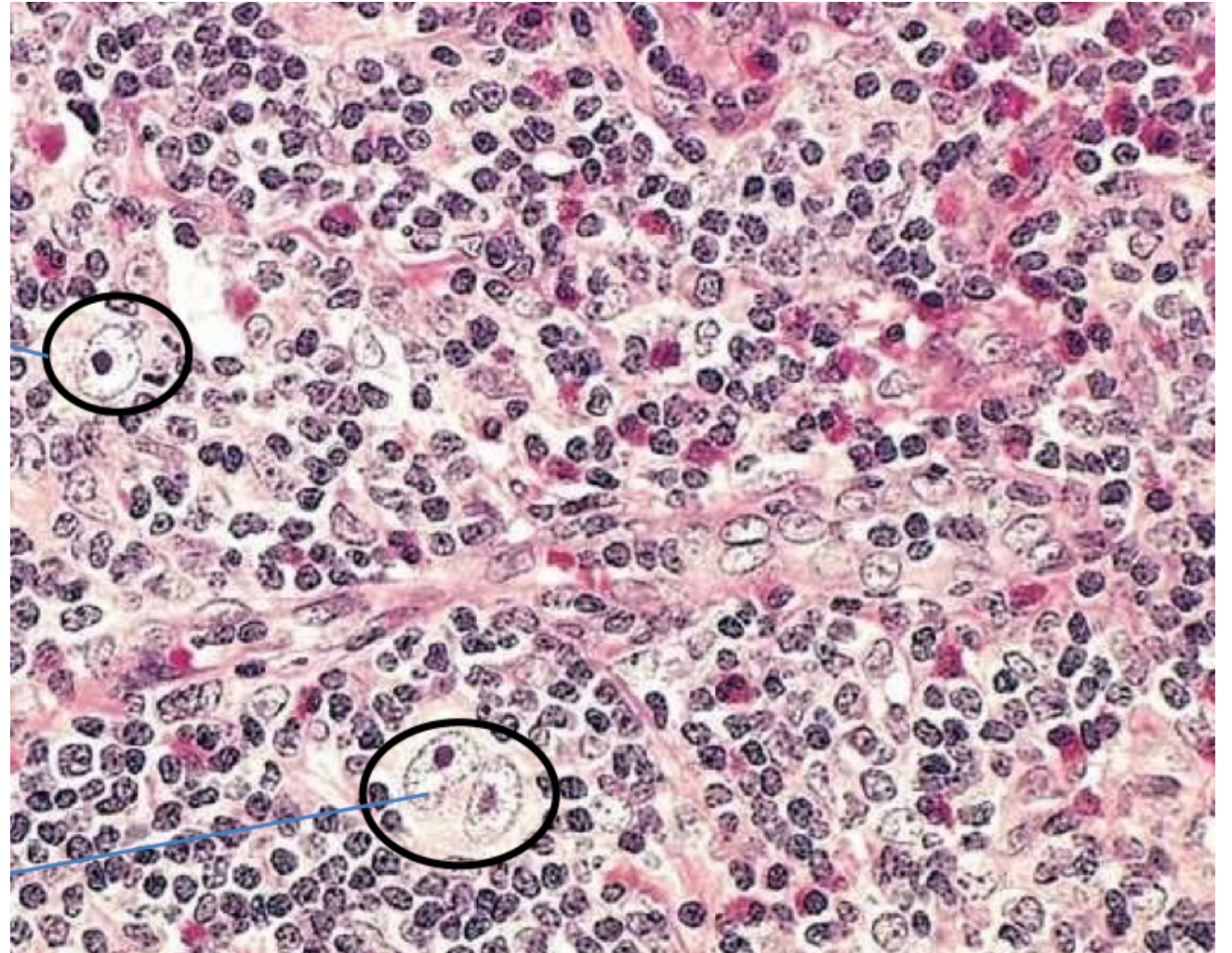
- ✓ RS cells (bi or multi-nucleated giant cells).
- ✓ Positive for CD30, CD15 and negative for CD20, CD3, CD45.
- ✓ Secrete IL-5 : eosinophilia
- ✓ Express PD



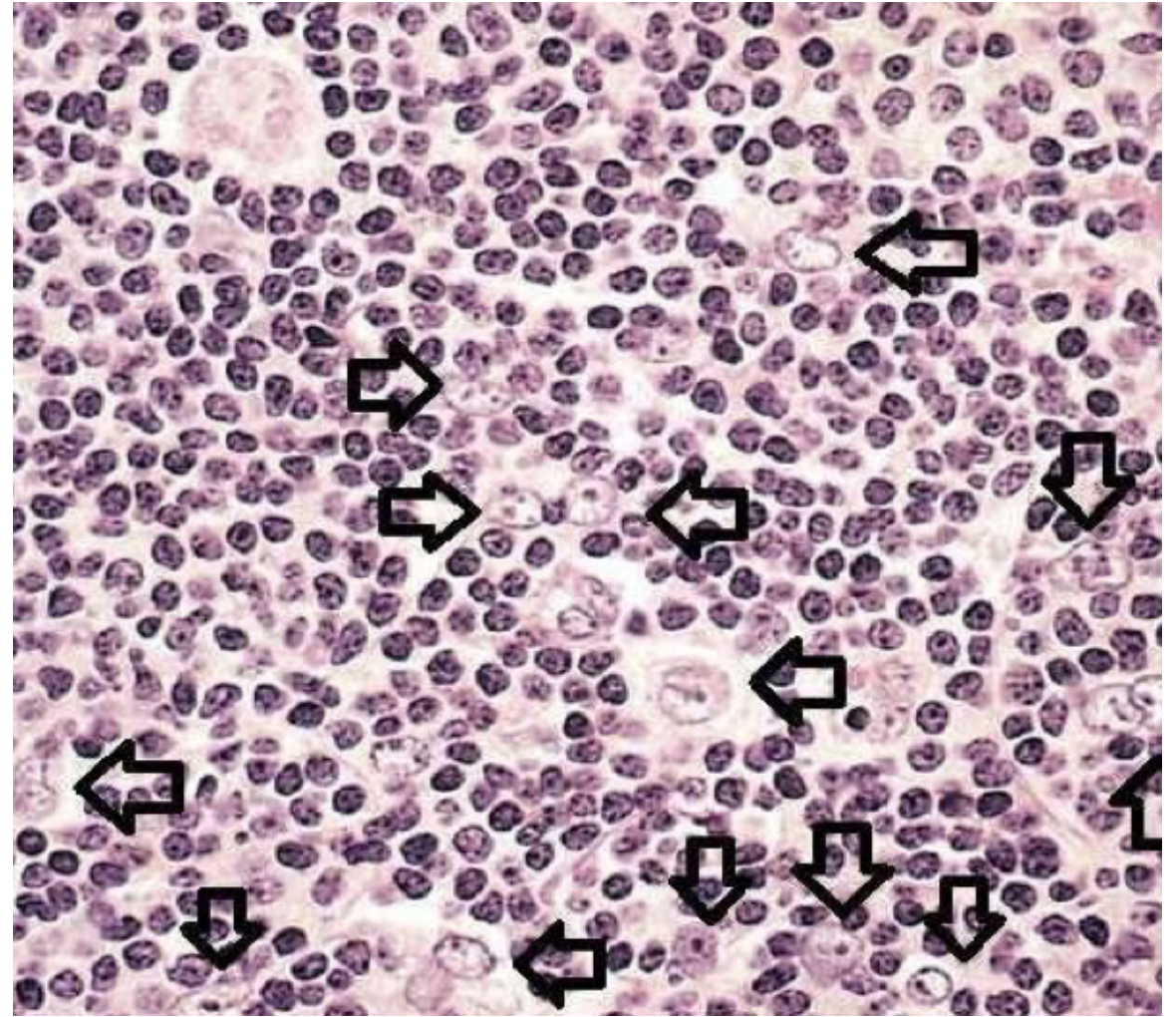
- ✓ **Nodular sclerosis HL**
- ✓ **Lacunar cells**
- ✓ **Common in children**
- ✓ **Thick fibrous band**



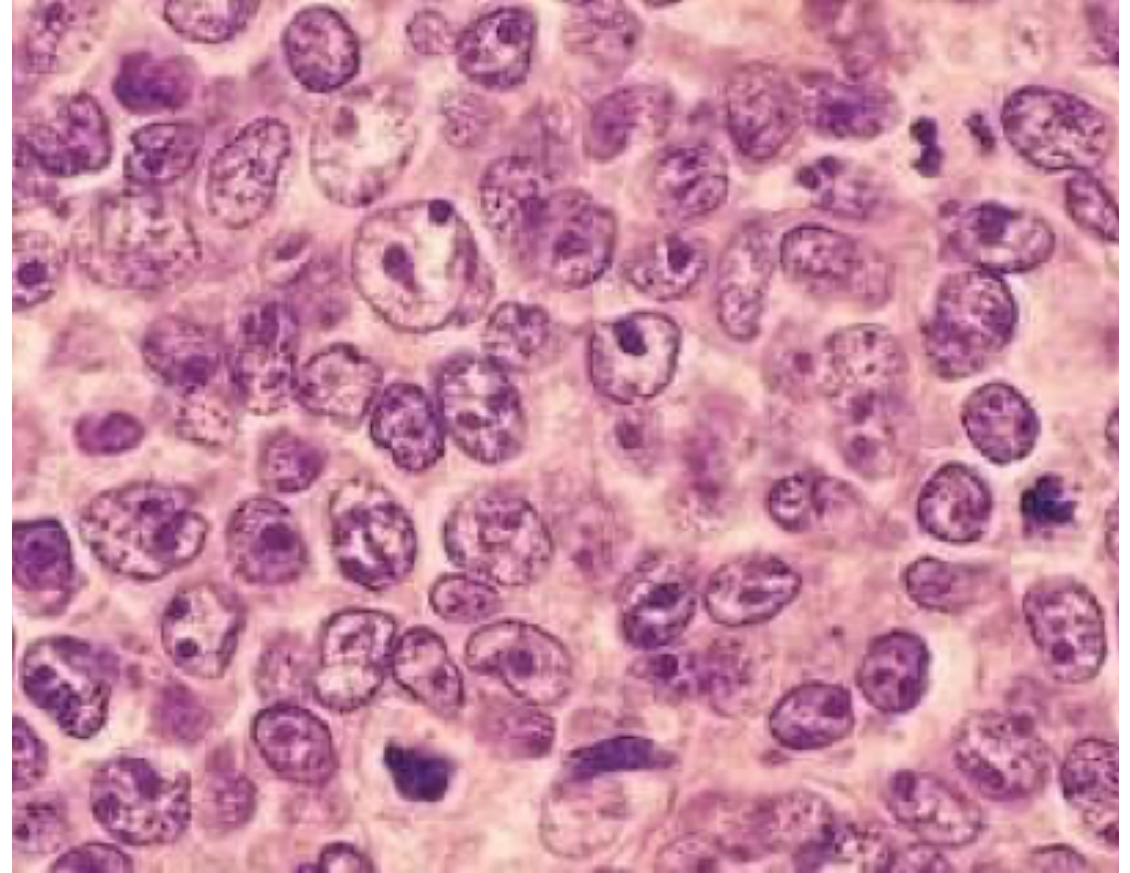
- ✓ **Mixed cellularity HL**
- ✓ **Lacks fibrous bands**
- ✓ **Associated with EBV**
- ✓ **Old ages**



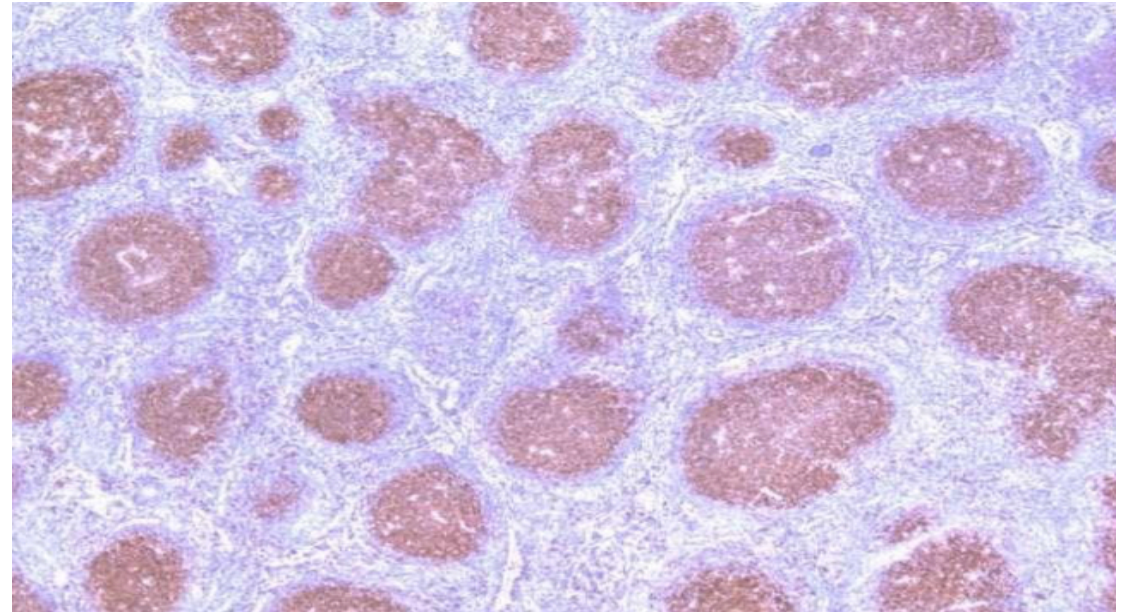
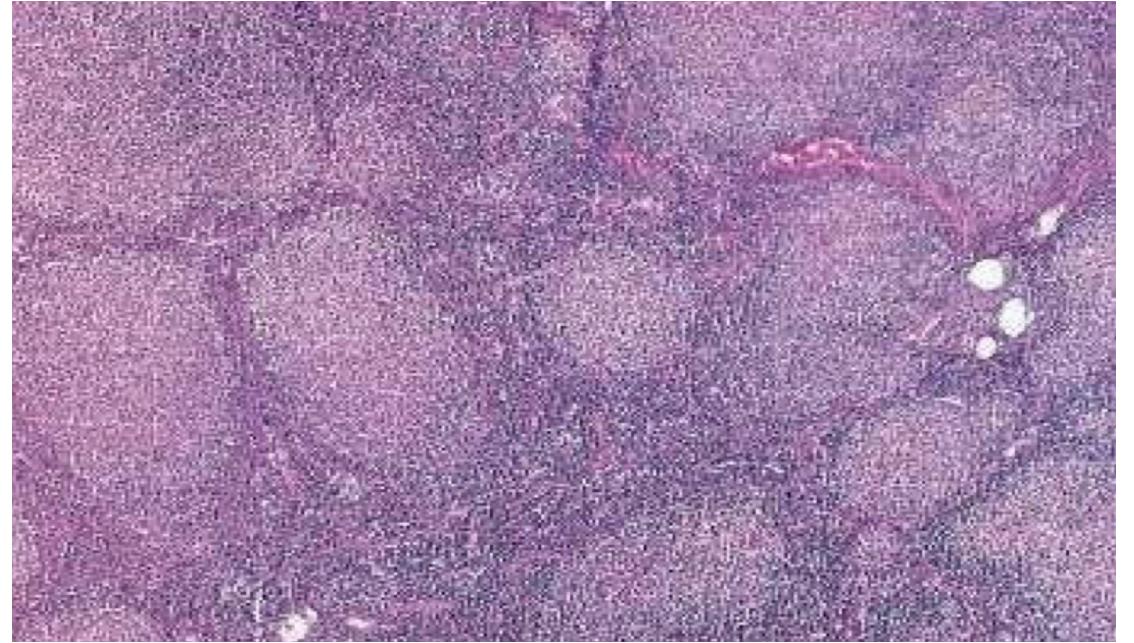
- ✓ Lymphocyte predominant HL.
- ✓ Popcorn cells (multi-lobulated giant cells)
- ✓ Express CD45, CD20 and negative for CD30, CD15.



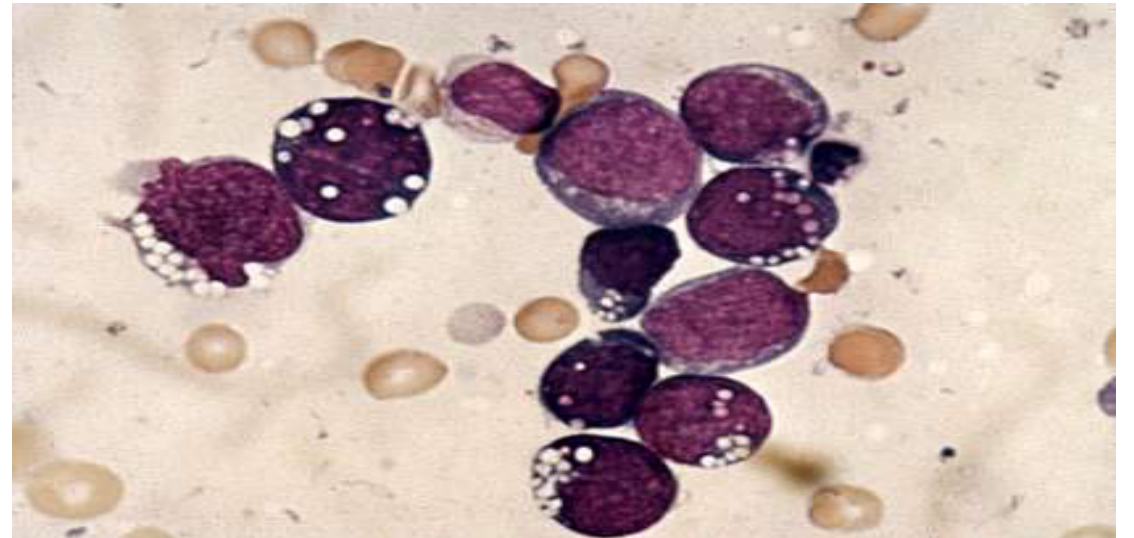
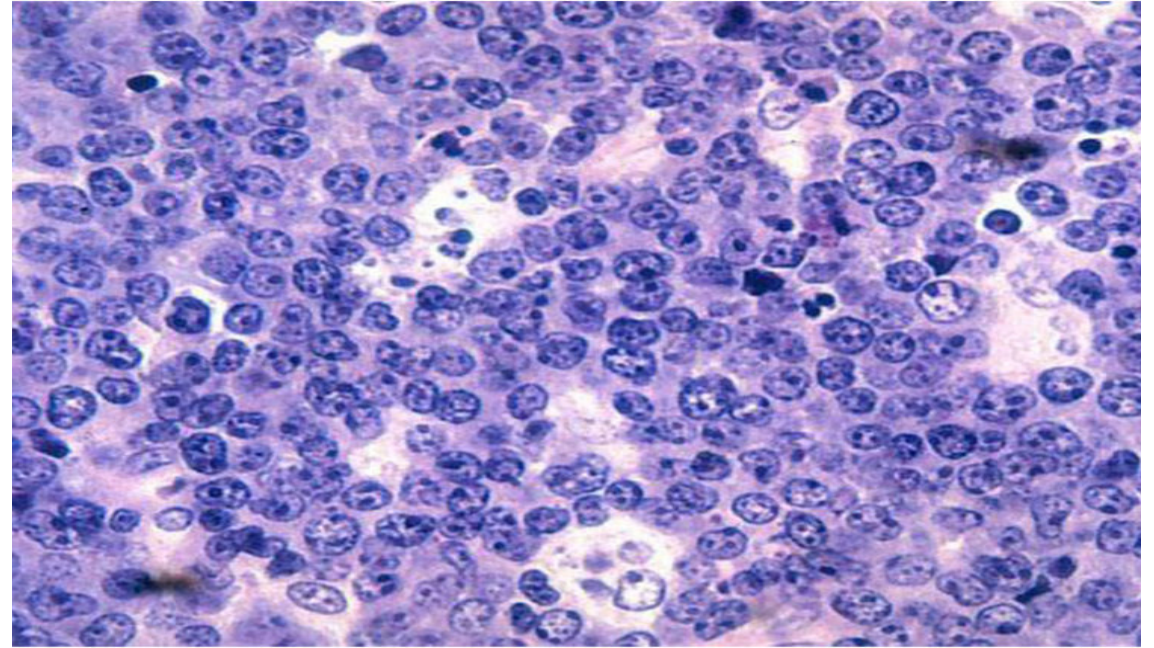
- ✓ DLBCL : most common NHL.
- ✓ t(14;18) (Bcl2 → IgH).
- ✓ Mutation in MYC.
- ✓ Positive for CD20.
- ✓ Cells are large with irregular nuclei.



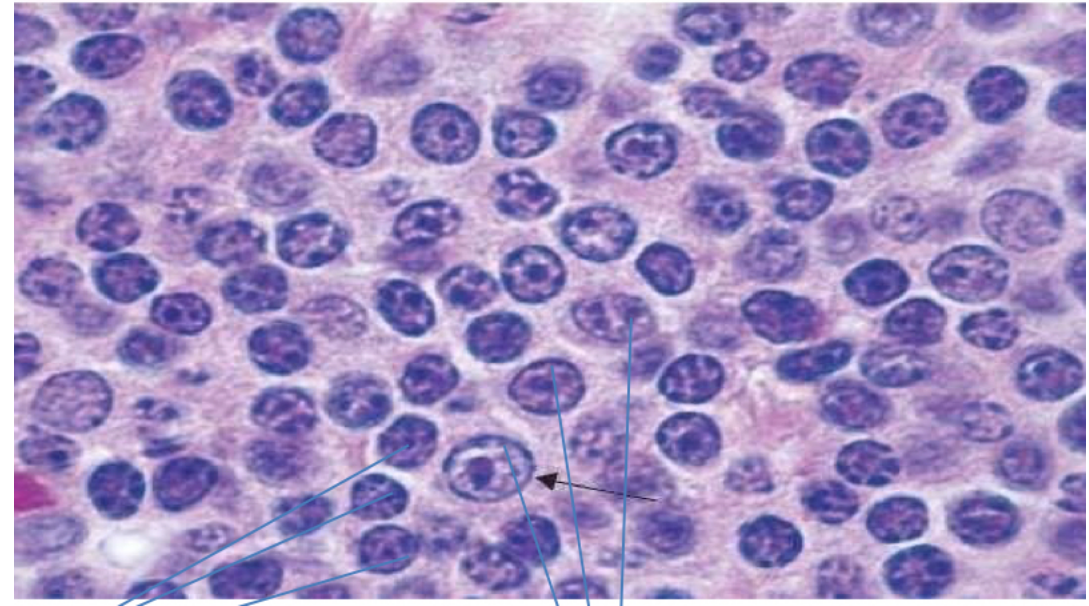
- ✓ Follicular lymphoma
- ✓ t(14;18) (Bcl2 → IgH)
- ✓ Mutation in genes encoding histone modifying protein (epigenetics)
- ✓ Express CD20, Bcl2 and Bcl6.
- ✓ Centrocytes (cleaved lymphocytes)



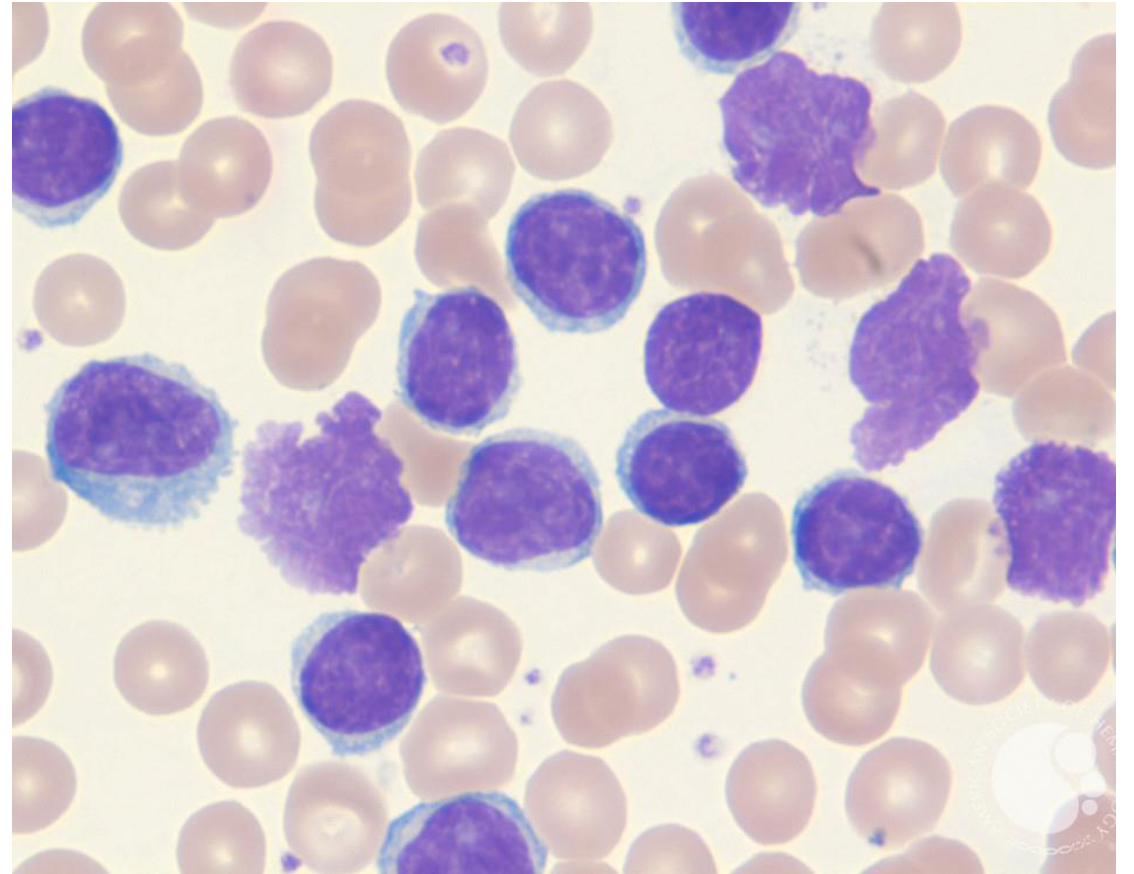
- ✓ Burkitt lymphoma : most common NHL in children.
- ✓ Associated with EBV in endemic areas.
- ✓ t(8;14) (MYC → IgH).
- ✓ Warburg metabolism.
- ✓ Express CD20, CD10 and Bcl6.
- ✓ Tingible macrophages that engulf nuclear debris.
- ✓ Starry sky appearance.
- ✓ Lipid vacuoles in cytoplasm.



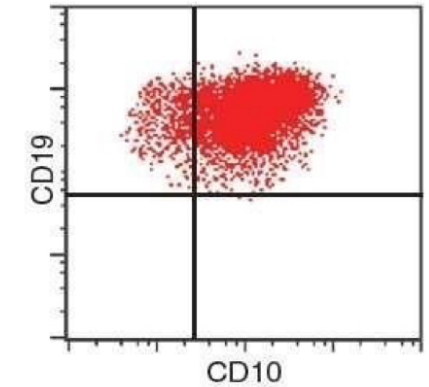
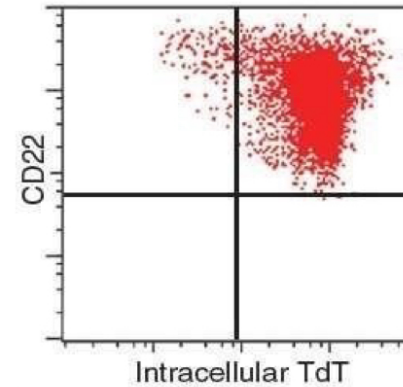
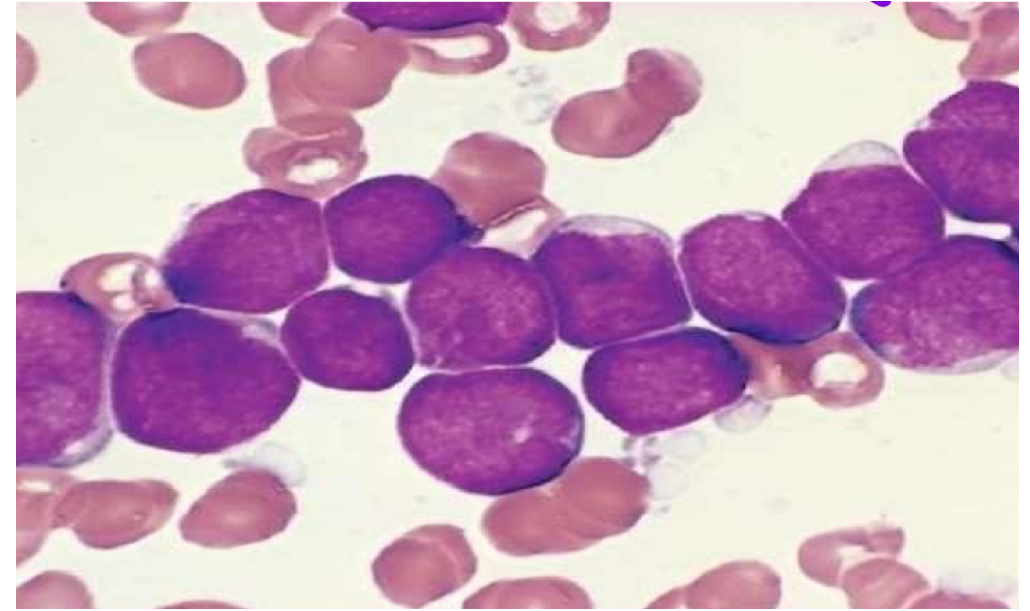
- ✓ **Small lymphocytic lymphoma (SLL) :**
arises in LNs and solid tissues.
- ✓ **Increased Bcl2 protein secondary to**
deletion mutation in genes coding
miRNA.
- ✓ **Active BCR – Active Bruton Tyrosine**
kinase (BTK) — promotes cell survival
and prevents apoptosis.
- ✓ **Chromosomal translocation is rare.**
- ✓ **Express CD20, CD5 and Bcl2.**
- ✓ **Large number of prolymphocytes and**
increased mitosis.
- ✓ **Richter transformation.**



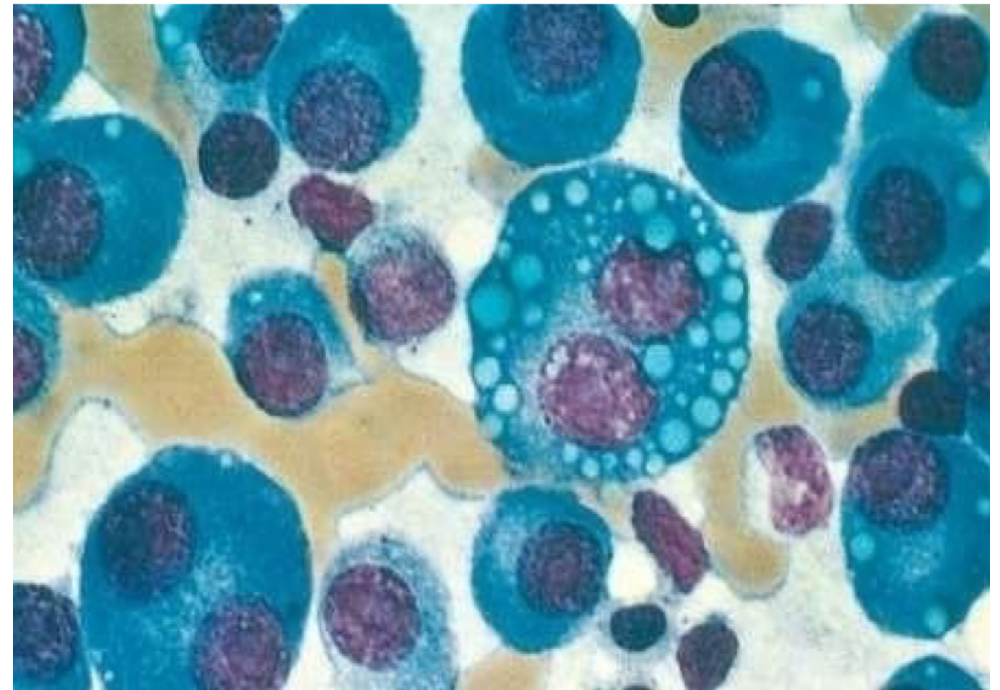
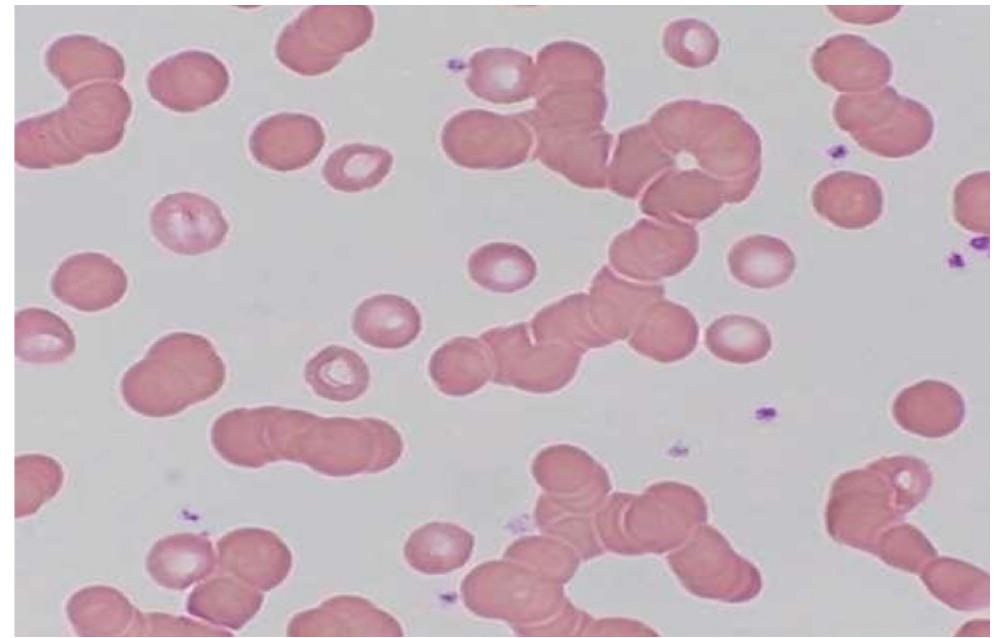
- ✓ **Chronic lymphocytic leukemia (CLL) :**
arise in BM and peripheral blood.
- ✓ **Same mutations as SLL.**
- ✓ **Smudge cells.**
- ✓ **Leukemic cells**
- ✓ **Prolymphocytes with central prominent nucleolus).**
- ✓ **Richter transformation.**



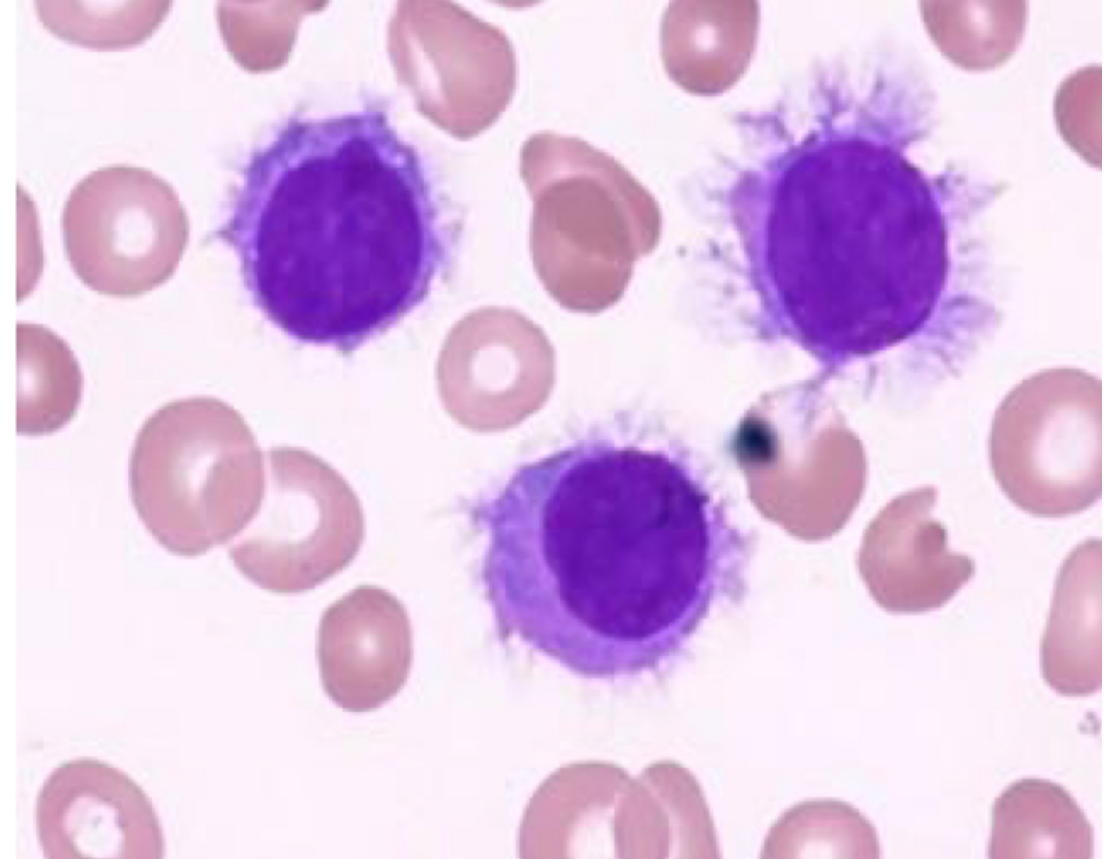
- ✓ **ALL** : mutations in transcription factors involved in maturation of blasts, RAS and tyrosine kinase. Classified into **B-ALL** (which is the most common childhood malignancy) and **T-ALL** (less common, involving thymus).
- ✓ **B-ALL** : mutation in PAX5 gene.
 - Childhood B-ALL have hyperdiploidy, t(12;21) a translocation involving ETV6 and RUNX1 genes.
 - Adult B-ALL exhibits t(9;22) between ABL & BCR genes (Philadelphia).
- ✓ **T-ALL** : mutation in PTEN and CDKN2A.
- ✓ B-ALL cells express CD34, TdT, CD10 and normal B cells markers
- ✓ T-ALL cells express CD34, TdT, CD10 and normal T cells markers



- ✓ **Multiple myeloma : plasma cell myeloma.**
- ✓ **t(11;14) (cyclin D1 or D3 → IgH)**
- ✓ **MYC mutation**
- ✓ **CRAB criteria**
- ✓ **Bench Jones protein**
- ✓ **Rouleaux formation in peripheral blood**
- ✓ **Multinucleation and cytoplasmic vacuoles (contain immunoglobulins)**
- ✓ **M protein**
- ✓ **AL- Amyloidosis**
- ✓ **Very high ESR**
- ✓ **Pancytopenia**



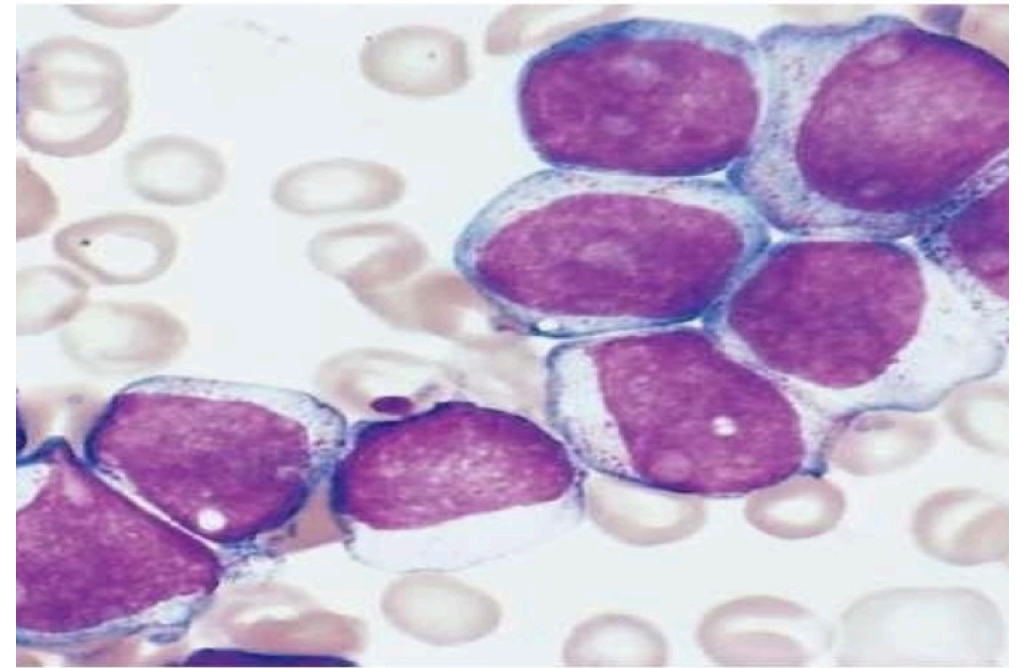
- ✓ **Hairy cell leukemia.**
- ✓ **Elderly, men, smokers.**
- ✓ **Mutation in serine theronine kinase (BRAF gene).**
- ✓ **Bone marrow fibrosis**
- ✓ **Prominent cytoplasmic projections.**
- ✓ **Pancytopenia**



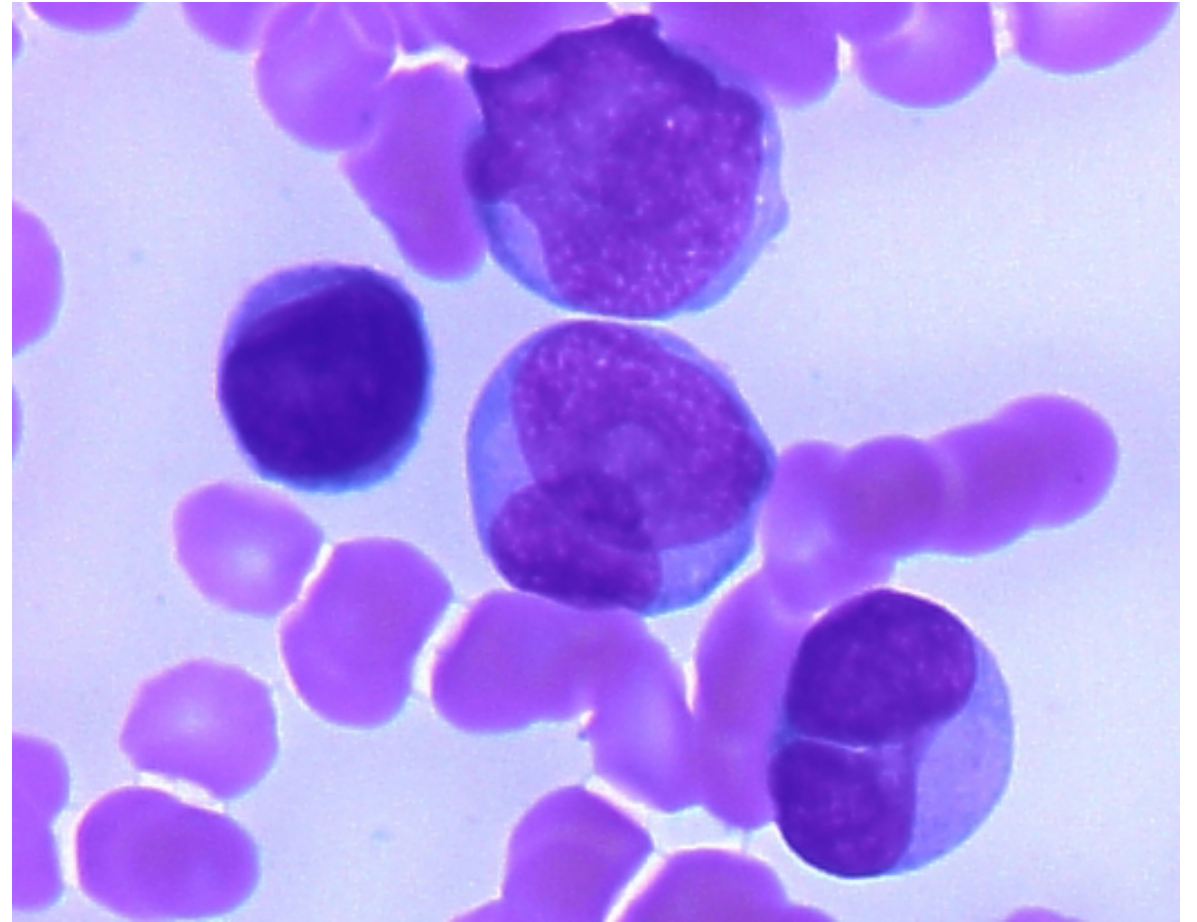
- ✓ **Mycosis fungoides**
- ✓ **Neoplastic CD4+**
- ✓ **Erythema – plaque – tumor.**
- ✓ **Cerebriform nucleus.**
- ✓ **Sezary syndrome : variant of MF.**



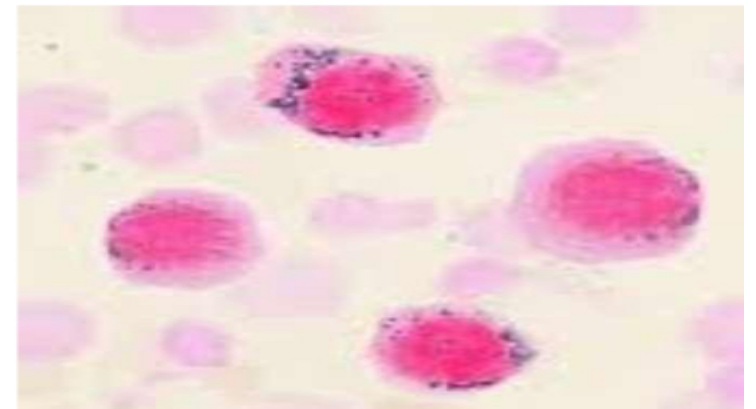
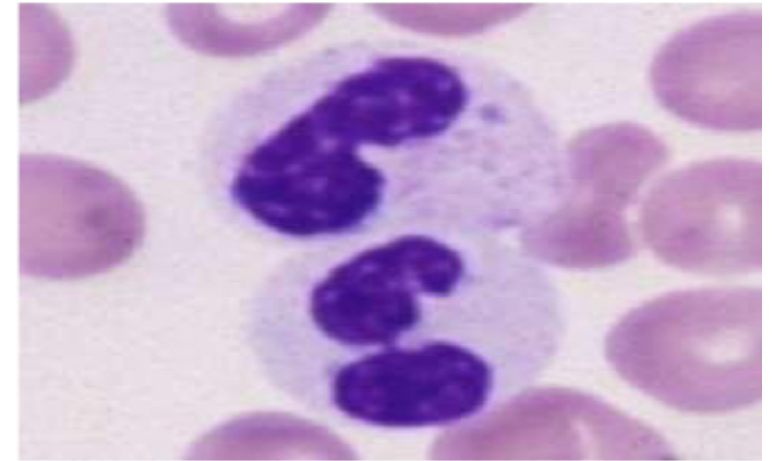
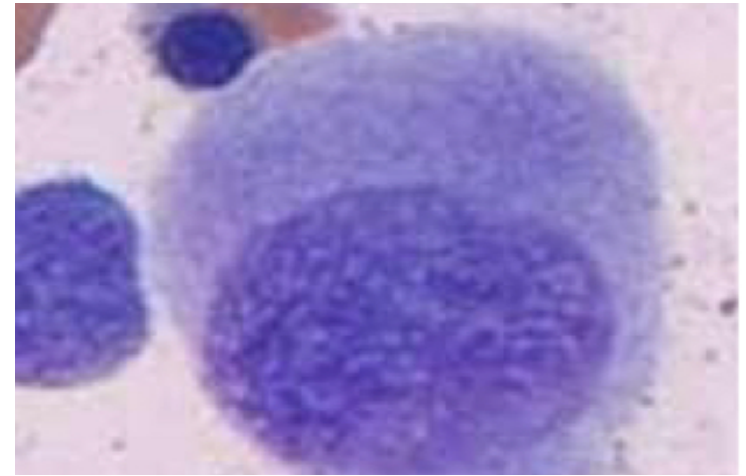
- ✓ Acute myeloid leukemia (AML).
- ✓ Mutations : RAS, P53, IDH, epigenetics and transcription factors required for maturation and differentiation of myeloblasts.
- ✓ Auer rods : small pink rods in cytoplasm, represent peroxidase enzyme.
- ✓ Express CD34, MPO, CD13 and CD33.



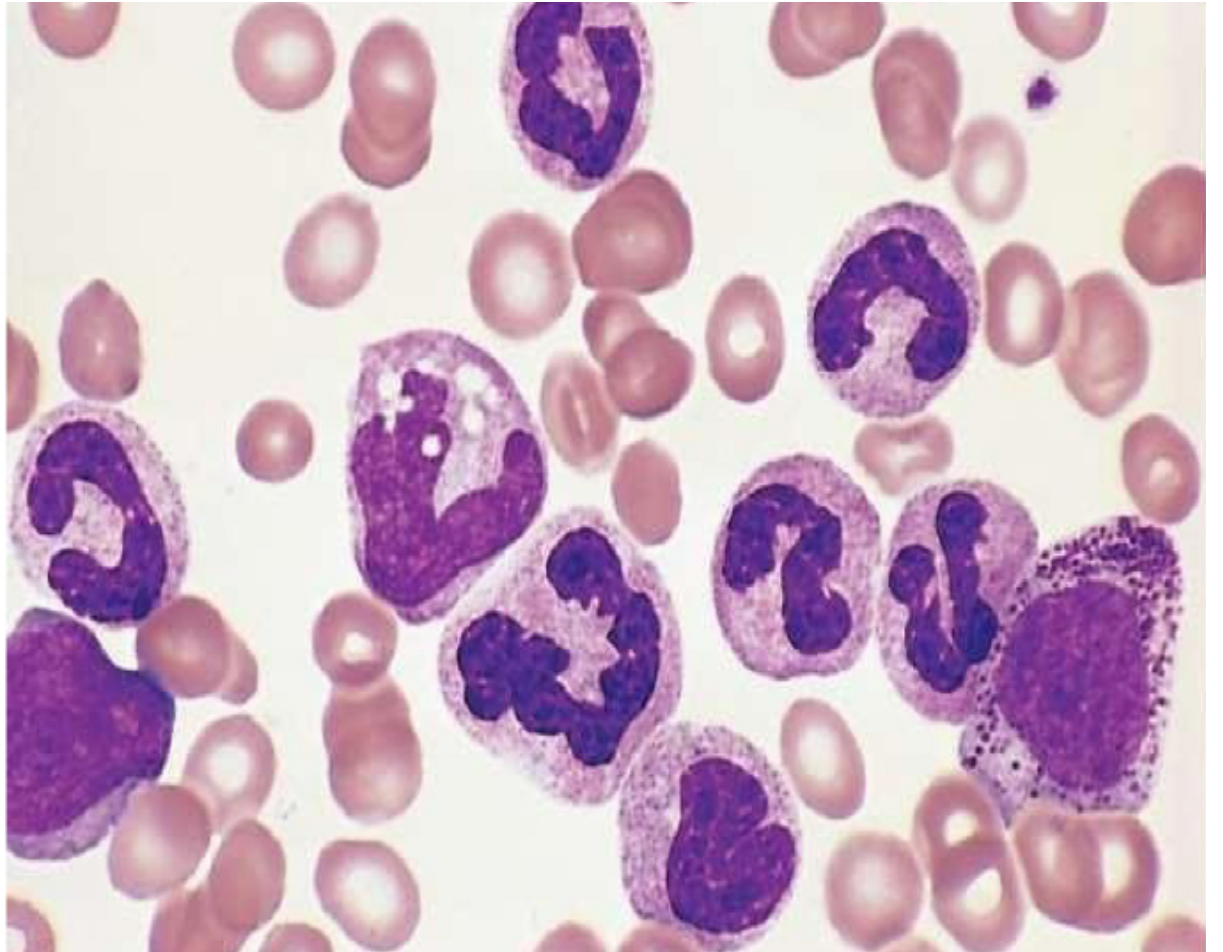
- ✓ **APL : t(15;17) (PML → RARA) .**
- ✓ **Auer rods.**
- ✓ **Cleaved nuclei.**
- ✓ **Negative for CD34**
- ✓ **Malignant promyelocytes secrete tissue factor causing life-threatening (DIC).**



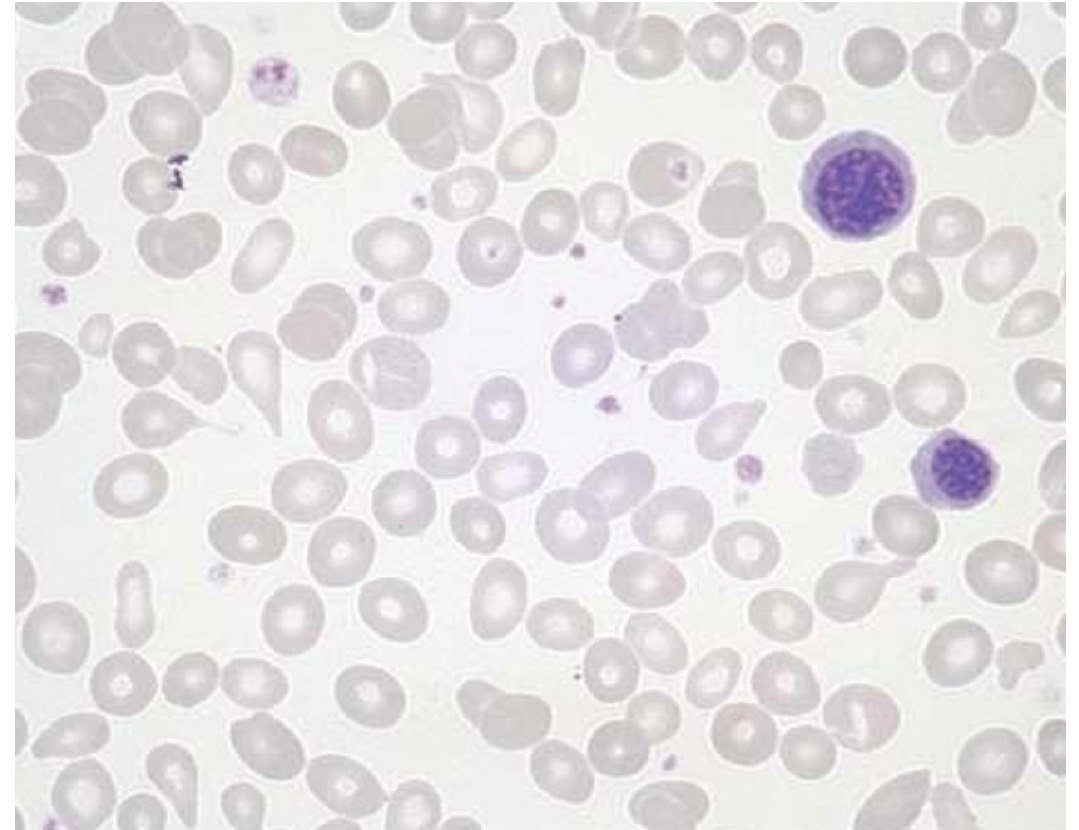
- ✓ **MDS : mutation in DNA methylation and histone modification.**
- ✓ **Chromosomal aberration: monosomy 5, monosomy 7, trisomy 8, deletions of 5q, 7q, 20q.**
- ✓ **P53 mutation.**
- ✓ **Abnormal RNA splicing —> ring sideroblasts.**
- ✓ **Hypercellular BM.**
- ✓ **Thrombocytopenia**
- ✓ **Neutropenia**
- ✓ **Refractory anemia**



- ✓ **CML : most common MPN.**
- ✓ **harbor t(9;22) (BCR —> ABL).**
- ✓ **Basophilia.**
- ✓ **Shift to left.**
- ✓ **Leukocytosis, thrombocytosis, anemia.**
- ✓ **Blasts : low.**



- ✓ **Primary myelofibrosis.**
- ✓ **Mutations: JAK-STAT pathway, MPL gene and JAK2.**
- ✓ **Worse outcome than CML and P.Vera.**
- ✓ **Tear-drop RBCs.**
- ✓ **Shift to left (leucoerythroblastic anemia)**
- ✓ **Megakaryocytes are increased and form clusters.**
- ✓ **Cytopenia and massive EMH.**



Good Luck