

# **Chronic Lymphocytic Leukaemia**

**Mansour Mohamed Omer El-Sharief**

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# The Chronic Lymphocytic Leukemias (CLL)

- ***The chronic lymphocytic leukemias are characterized by an increased number of small, mature-appearing lymphocytes in the blood.***

- The most common is a proliferation of small B cells that express the T cell–associated antigen CD5.
- The CLL differ from ALL in that:
- The *cells appear mature and have a mature phenotype in CLL.*
- There are immature cells (blasts) in ALL.

## **Epidemiology**

- **CLL is predominantly a disease of older ages; the median age at diagnosis is ~55 to 65 years.**
- **It is uncommon below the age of 40 years.**
- **There is slight male predominance.**
- **CLL does not seem to be related to exposure to radiation.**

# Pathophysiology

- **CLL is characterized by a *slow accumulation of small lymphocytes.***
- **The cells in CLL are arrested at a functionally immature level.**

# Factors contributing to the complications of CLL

- 1- Immunosuppression: Patients are exposed to infections.
- 2- Autoimmune phenomena: (autoimmune hemolytic anemia and autoimmune thrombocytopenia).
- 3- Mass effects: neoplastic lymphocytes invade and colonize organs.

## Lab. Δ of CLL

- **CBC:**
- **Lymphocytes: >5,000 lymphocytes/ $\mu$ L in the blood.**
- **Neutrophils: decreased as a percentage of white cells.**
- **Mild anemia and/or thrombocytopenia are common at diagnosis.**

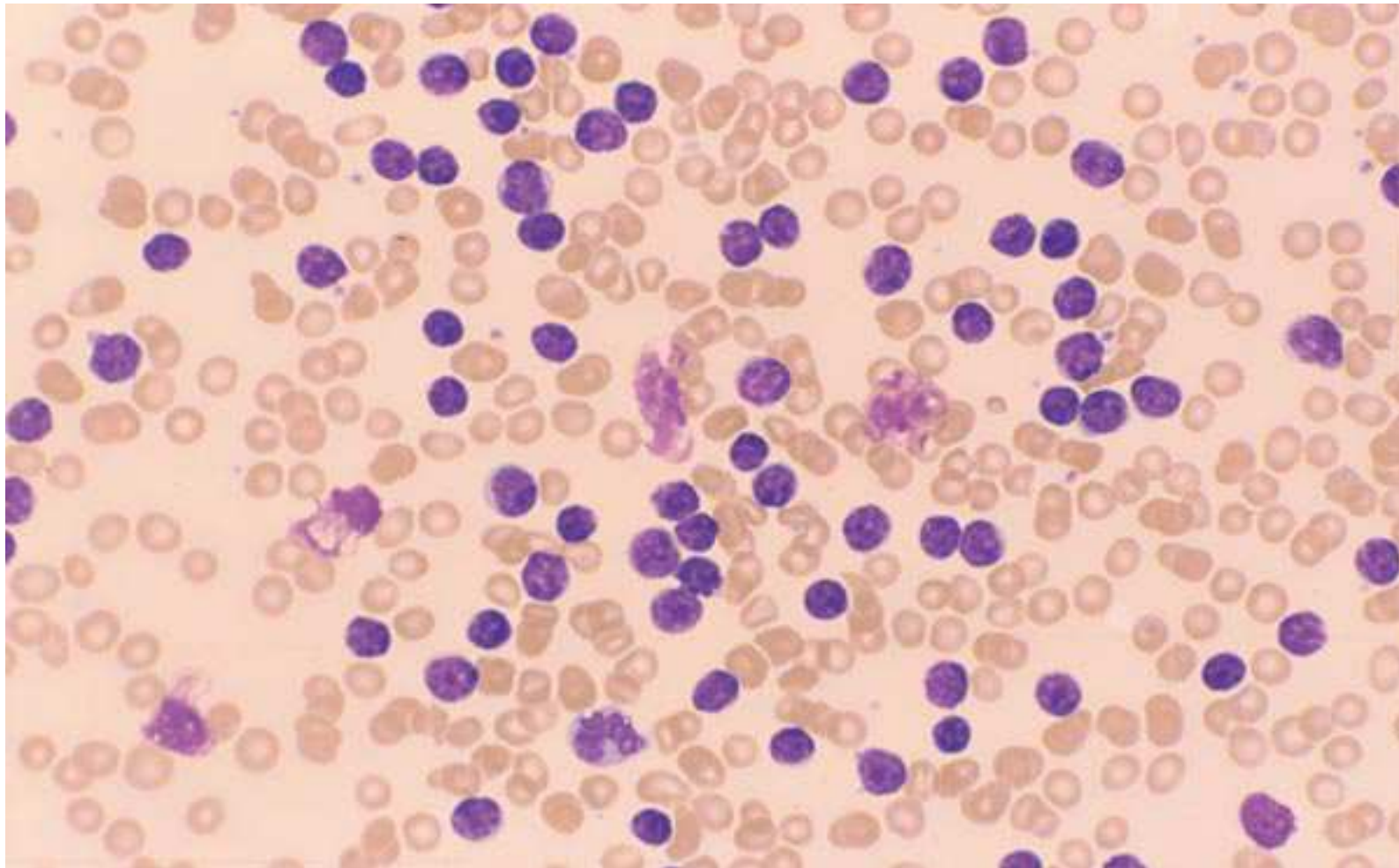
- **\*Peripheral blood picture (PBP):**
- - Increased number of small mature-appearing lymphocytes.
- The lymphocytes show “soccer ball” nucleus:  
dense areas of chromatin surrounded by  
white spaces.



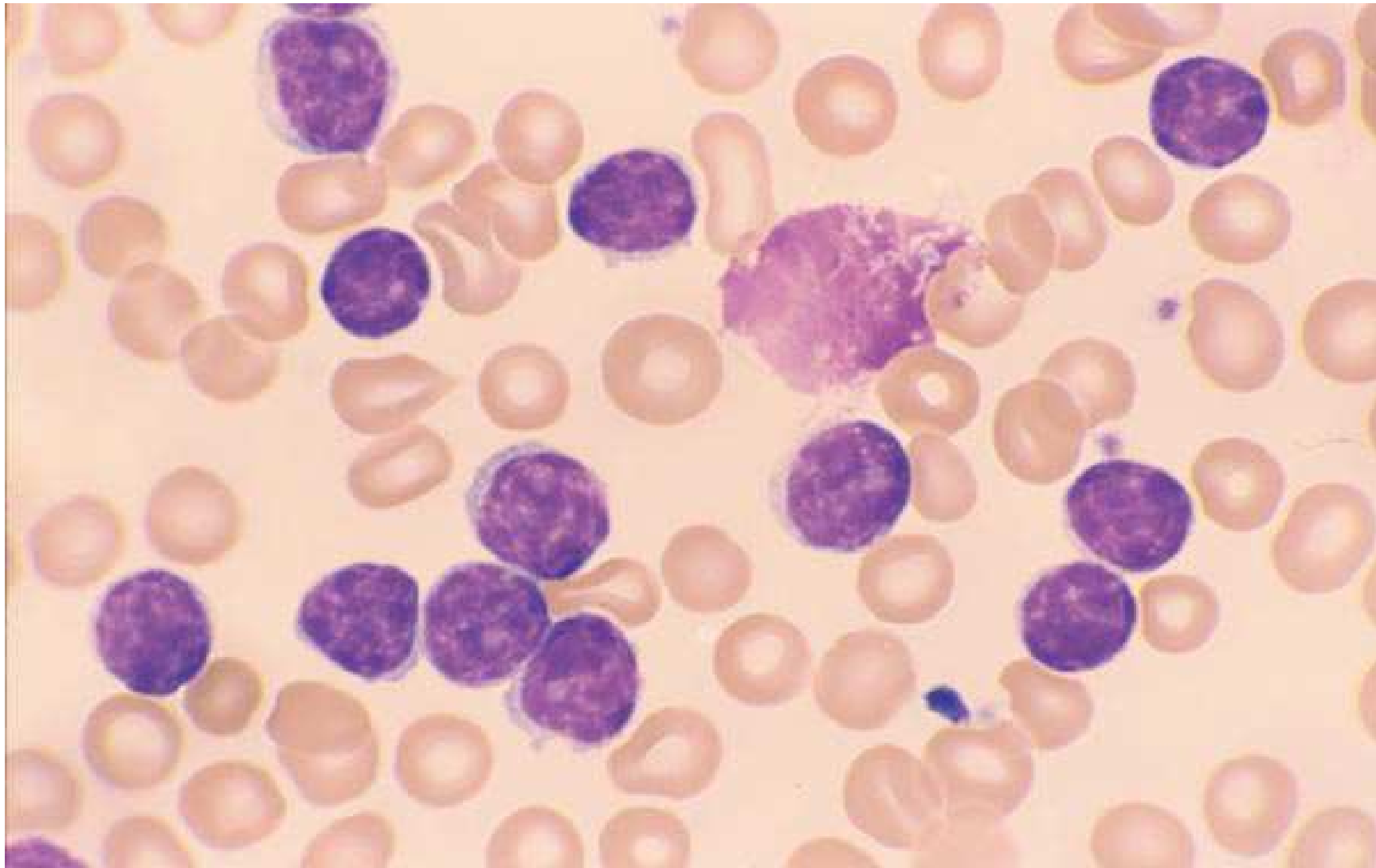
- There are many disintegrated cells on the smear (“smudge” or “basket” cells).
- *The combination of many “soccer ball” lymphocytes with numerous “smudge” cells is **DIAGNOSTIC** for CLL.*

- **Biochemical tests:**
- **Elevated: Lactic dehydrogenase (LDH) and serum calcium.**
- **Serology:**
- **Direct antiglobulin (Coombs') test: Positive with the disease progression.**

**CLL (low power): Lymphocytosis of small mature-appearing lymphocytes. Numerous “smudge” cells are present.**



**CLL (high power): Condensed “soccer ball” nuclear chromatin; one “smudge cell” is present.**



- **Bone Marrow:**
- **Bone marrow aspirate usually shows:**
- **≥30% small lymphocytes.**

- **Immunophenotype:**
- **(1) Expression of B-cell markers (CD19, CD20, CD23).**
- **(2) Co-expression of CD5 (usually considered a T-cell marker), suggests malignancy.**

- **Cytogenetics:**
- **The most common abnormality found is trisomy 12, in ~20% of cases.**
- **The next most common abnormalities are deletions of the long (q) arms of chromosomes 13 and 11.**

## Differentiation of CLL from reactive lymphocytosis:

CLL	Reactive lymphocytosis
Common in older patients	Common in younger patients
Absence of atypical lymphocytes	Presence of atypical lymphocytes
Primary condition is unknown	Primary condition is known (e.g, viral infection)



**THANK YOU**

