



HEMATOPOIETIC & LYMPHATIC SYSTEM

SUBJECT : pathology

LEC NO. : 11



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وَقُلْ رَبِّ زِدْنِي عِلْمًا

“Hematopoietic And Lymphoid System (HLS)”

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اي اشي مهم حكته الدكتورَة رح يكون بجنبه 
اي اشي ما حكته رح احط بجنبه 

Hodgkin Lymphoma

B cell origin

- A primary malignant neoplasm of the lymphoid system arising from germinal center B cells.
تختلف عن ال non Hodgkin lymphoma
- Unlike NHL, they arise in a single lymph node or chain of lymph nodes and spread characteristically in a stepwise fashion to the anatomically contiguous nodes then spleen, liver and BM.
الفرق بينه وبين ال NHL تحت
- Bimodal age distribution:
 - 20 - 30 years of age.
 - > 50 years of age.
- **Cervical and supraclavicular** nodes are the most commonly affected.

❖ Clinical Presentations

- ❑ Painless lymphadenopathy.
 - ❑ B-symptoms (cytokines release):
 - ✔️ Fever
 - ✔️ Night sweats
 - ✔️ Weight loss (10% of body weight)
 - ❑ Splenomegaly in 16% of the cases.
 - ❑ Anemia due to bone marrow involvement in 5% of the cases.
- نادر طبيعًا يصير involvement لل BM

Hodgkin Lymphoma

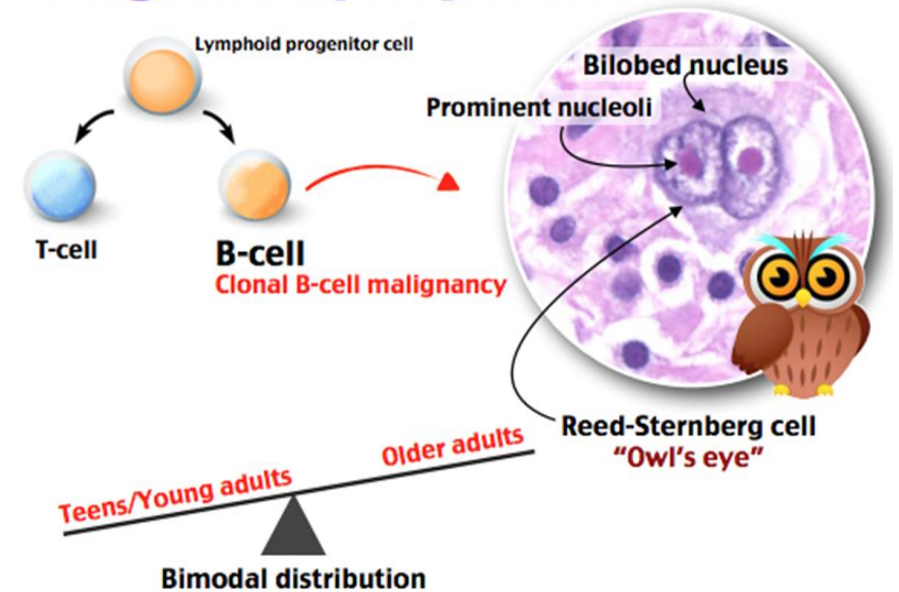



Table 12.9 Clinical Differences Between Hodgkin and Non-Hodgkin Lymphomas

Hodgkin Lymphoma	Non-Hodgkin Lymphoma
More often localized to a single axial group of nodes (cervical , mediastinal , paraaortic)	More frequent involvement of multiple peripheral nodes
Orderly spread by contiguity	Noncontiguous spread
Mesenteric nodes and Waldeyer ring rarely involved	Mesenteric nodes and Waldeyer ring commonly involved
Extranodal involvement uncommon 	Extranodal involvement common

1- بتتموا بمكان واحد (single lymph node) بمناطق ال axial اللي بالجسم

2- بنتقل بطريقة منتظمة stepwise fashion

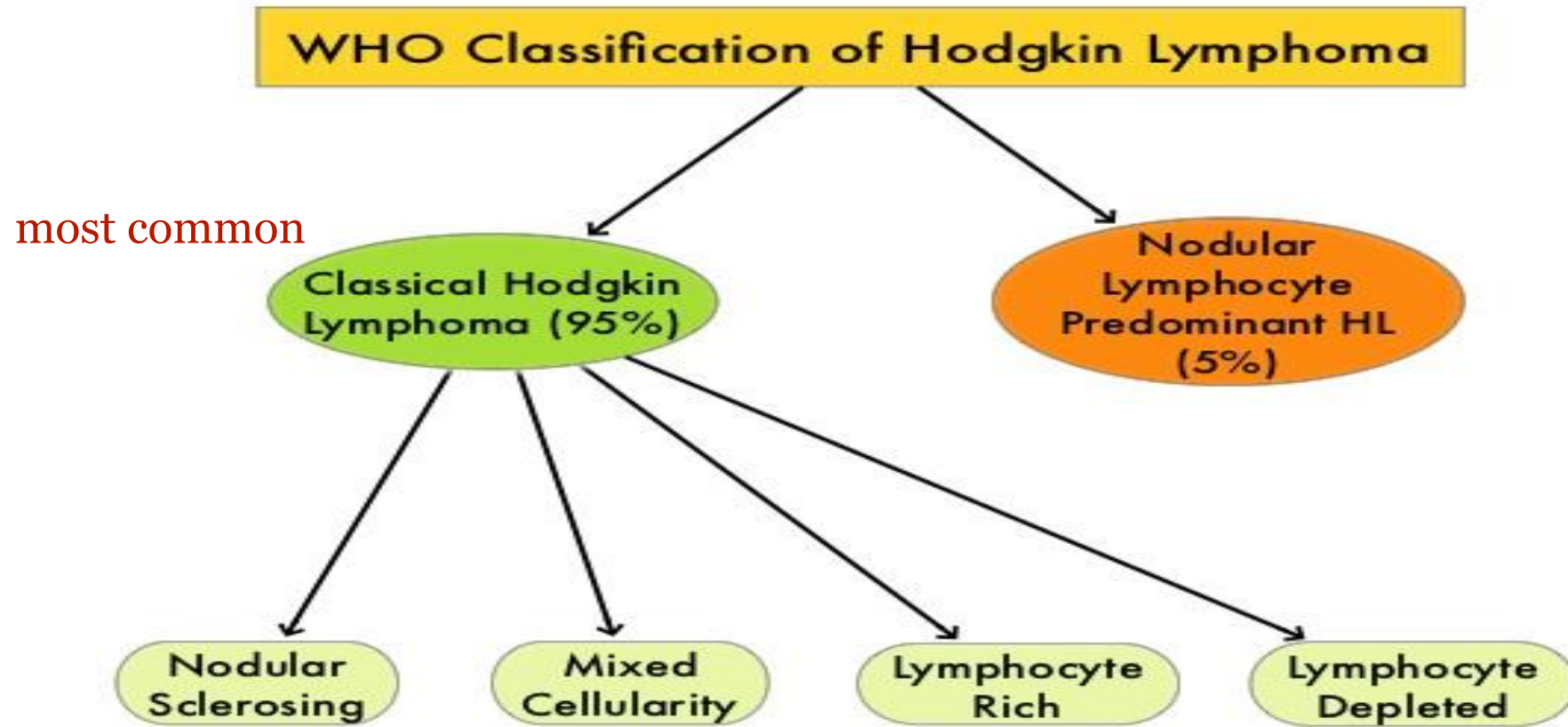
يعني المرض بنتقل من قروب ليمف نود للقروب اللي جنبه

3- نادر نشوف هالمرض يكون خارج ال lymph node

باكثر من مكان بنمو ،
بنمو باكثر من lymph node

بطريقة عشوائية بنتقل

❖ Classification Of Hodgkin lymphoma



❖ Morphology

1. Neoplastic cells ((Reed-Sternberg cells (RS)) (derived from B cells, minor fraction).
2. Immunologic reaction to tumor:
 - Lymphocytes composed mostly of small lymphocytes with the CD4 immunophenotype.
 - Histiocytes.
 - Eosinophils
 - Plasma cells.
 - Neutrophils.
 - Fibroblasts and fibrous tissue.

بنشوف reactive inflammatory cells، وبيناتهم RS



The quality and the quantity of each component determine the subtype of Hodgkin disease.



قلّة من الخلايا اللي بنشوفها بال lymph node همّي malignant cell والهم نوع

❑ Morphologic Features of CLASSIC Reed-Sternberg Cells

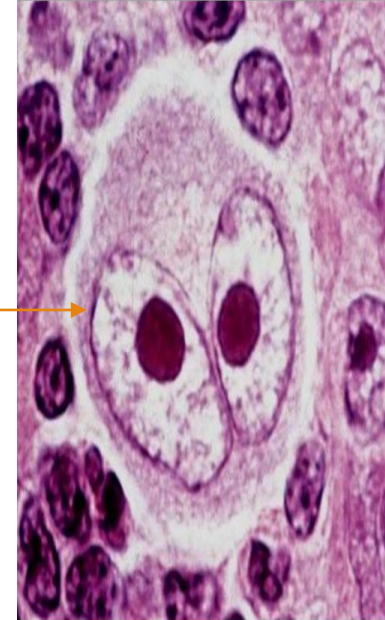
1. Large (15-45 μm in diameter).
2. Enlarged polylobated nucleus.
3. Huge round inclusion-like nucleoli. 🇸🇦 🇸🇦
4. Abundant, slightly eosinophilic cytoplasm.

نواة مقسومة نصين بالزبط، بشبهوا بعض

- **The CLASSIC RS** cells with two mirror-image nuclei or nuclear lobes, each containing a large (inclusion-like) acidophilic nucleolus surrounded by a distinctive clear zone; together, they impart an **owl-eye appearance**.

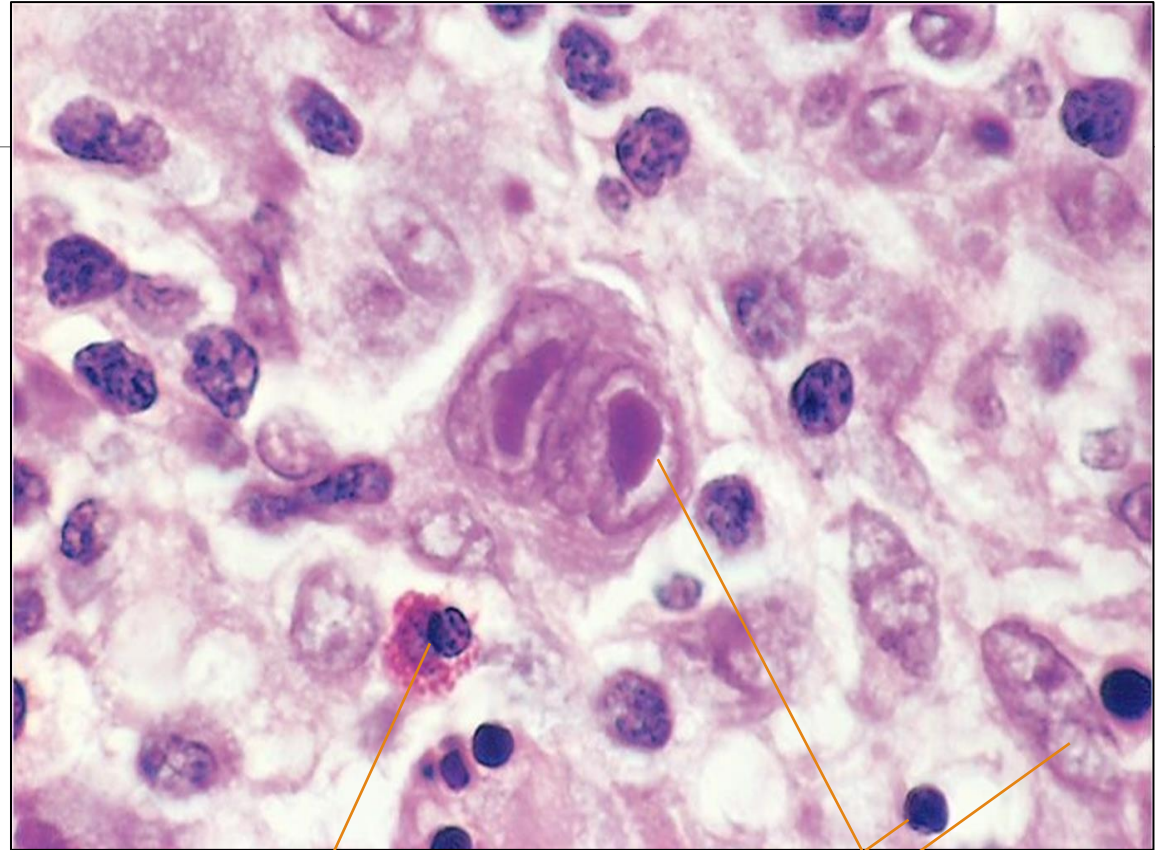
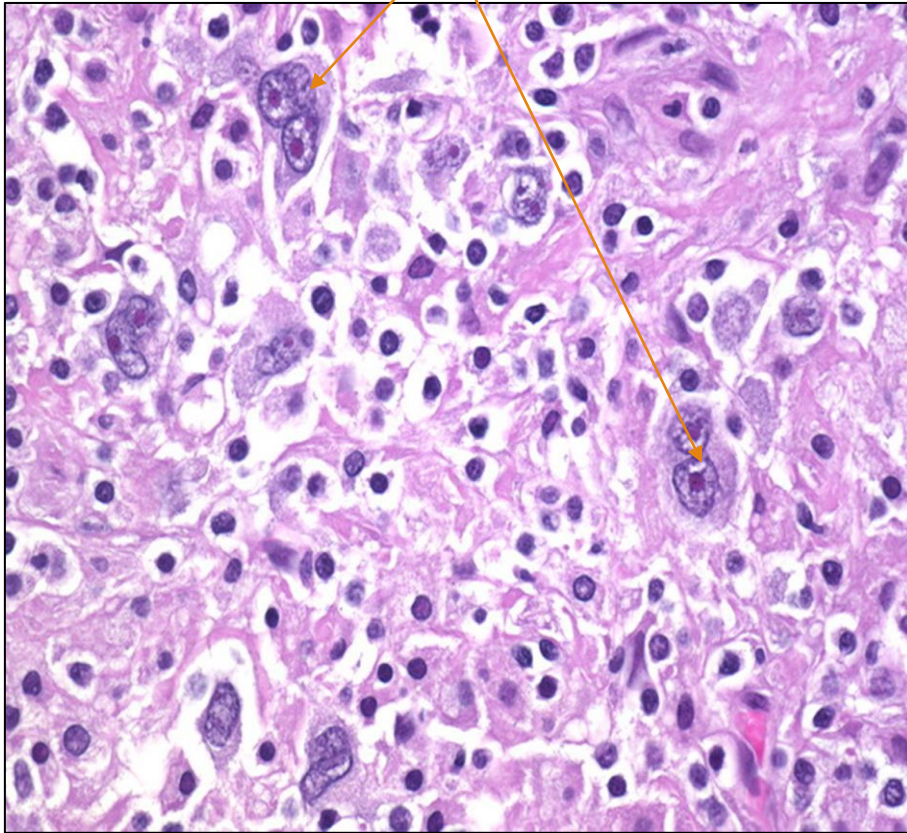
عيون البومة

حواليها فراغ 🇸🇦 🇸🇦



هسا مش حوليها فراغ؟ بس فيه نقط، ال background بكون فيه reactive cell
اللي همّي ال lympho ,macrophage ,eosin ,...

RS cells



Hodgkin's Lymphoma: showing classic Reed-Sternberg cell, lymphocytes , eosinophil & histiocytes



ممکن نشوفها باشكال ثانية

❑ Variants of Reed-Sternberg cells

نفس ال RS بس اله نواه وحدة

1. **Hodgkin cells (Mononuclear variant):** Insufficient for diagnosis.

بلشوا يموتوا ، النواة بلشت تصغر ، السيتوبلازم بلش يختفي... الخاليا يتموت

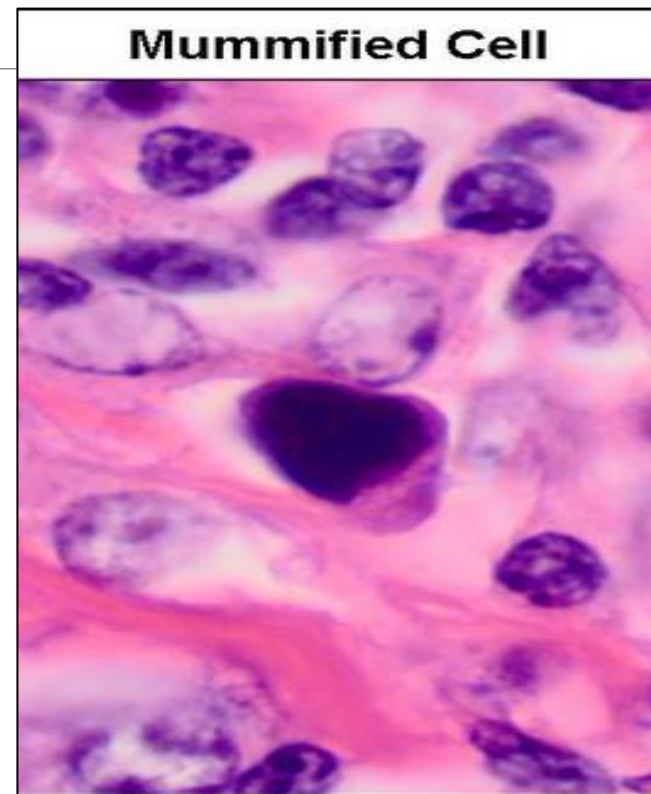
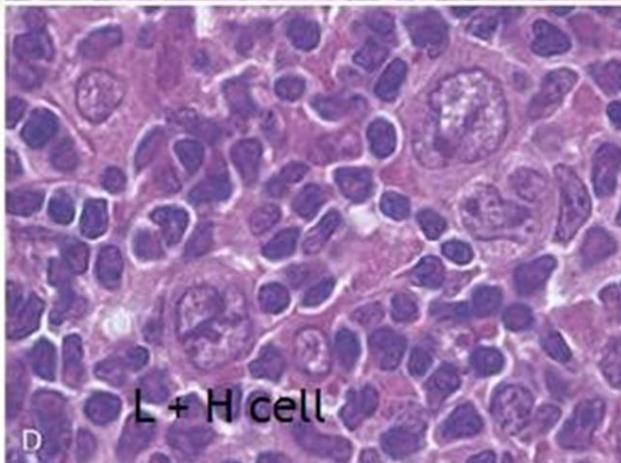
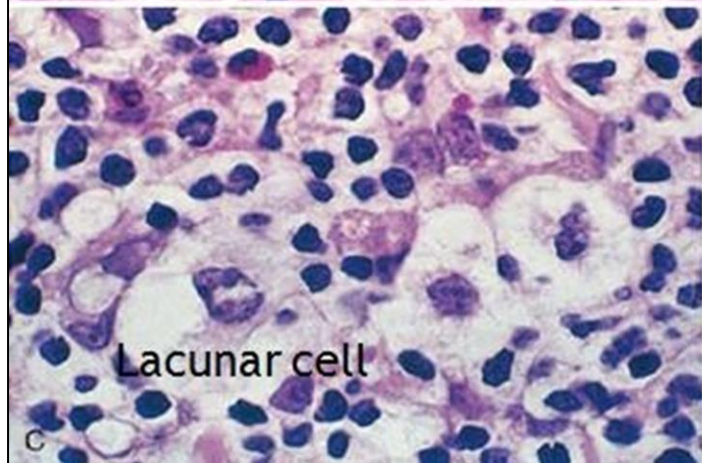
2. **Mummified cells:** dark smudge degenerating cells with pyknotic nuclei and eosinophilic cytoplasm.

نواة صغيرة ، السيتو فاتح ، ف ال nucleoli بتبين زي كأنها بتسبح بالفراغ

❗❗ 3. **Lacunar cells:** Large polylobated nuclei surrounded by **pale cytoplasm** and contain inconspicuous nucleoli.

4. **(LP) L&H cells:** cells with hyperlobated nuclei, finely granular chromatin, and inconspicuous small nucleoli. **non classical**


زي كأنه حدا فاعصها، وكثير غامقه



❖ Immunophenotyping Of HL

الـ RS اللي بنشوفهم بالـ classical الـ immunoprofile الهم
بختلف عن الـ non classical

▪ Classical HL:

- RS: CD45⁻, CD20⁻, CD15⁺, CD30⁺  [×], weak variable PAX5⁺, MUM1⁺

▪ NLPHL:

- RS: CD45⁺, CD20⁺, strong PAX5⁺, CD15⁻, CD30⁻ 

انتبه انه وحدة + والثانية -

Nodular Lymphocyte predominant

Classic Hodgkin lymphoma:

A. H&E

B. CD15

C. CD30

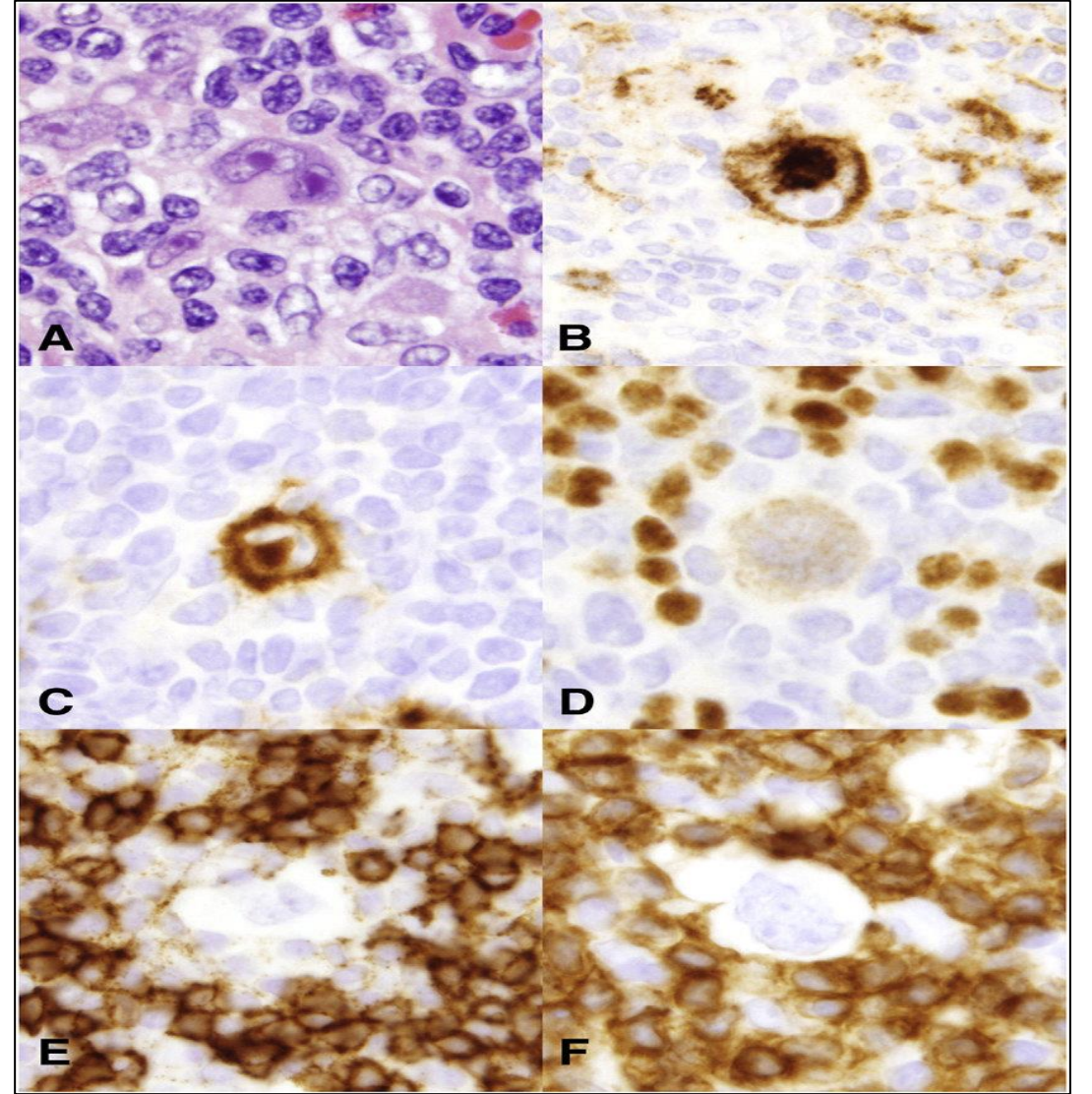
D. PAX5 (note decreased intensity compared to background B cells)

E. CD20

F. CD3.

بكون negative الهم

بتميز بانه بوخذ صبغة خفيفة
faint positiv، بني فاتح



الدكتورة حكت نركز على الاشياء اللي هيفيدنا بالتشخيص واللي همّي

C30+C15

وبتكون ال RS cell الهم + في حالات الكلاسيكال وبتكون - في حالات

ال non

ننتبه انه احنا بنحكي عن ال RS مش عن ال background reactive cells

بنحكي عن ال malignant cell

في اربع انواع

Classical Hodgkin Lymphoma

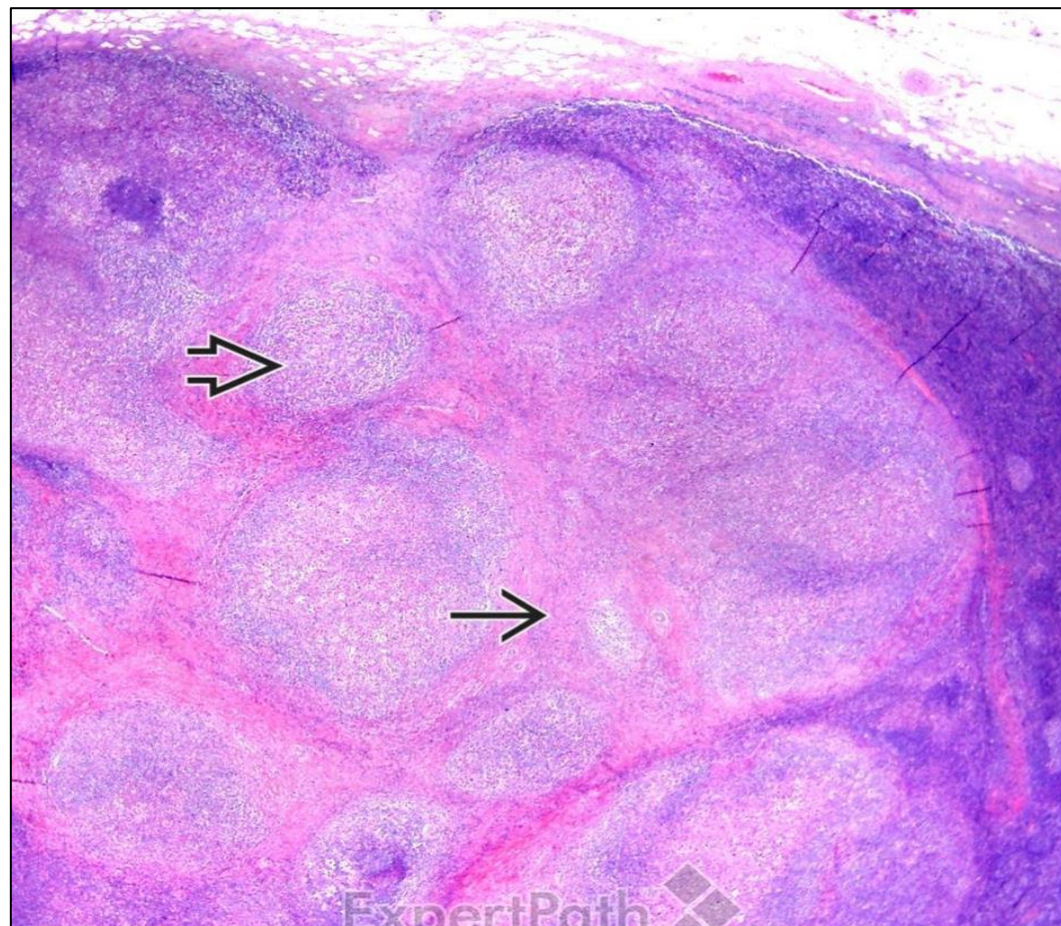
(1) Nodular Sclerosis

- This is the most common form.
- ✗ ▪ M=F.
- ✗ ▪ Has a striking propensity to involve the lower cervical, supraclavicular, and mediastinal lymph nodes.
- More in adolescents or young adults. ^{مراهقين}
- 🔴🔴 ▪ Patients present at an early stage (I&II) stage 1+2
- 🔴🔴 ▪ Overall prognosis is excellent.
- EBV - ما يكون Association مع ال EBV ، ما الهم علاقة ببعض اي اشي ببلش ب nodular ما فيه EBV

وجود الكولاجين صار يفصل بين ال tumour cell ويخليهم على شكل nodules
الكولاجين اللي باللون الزهري

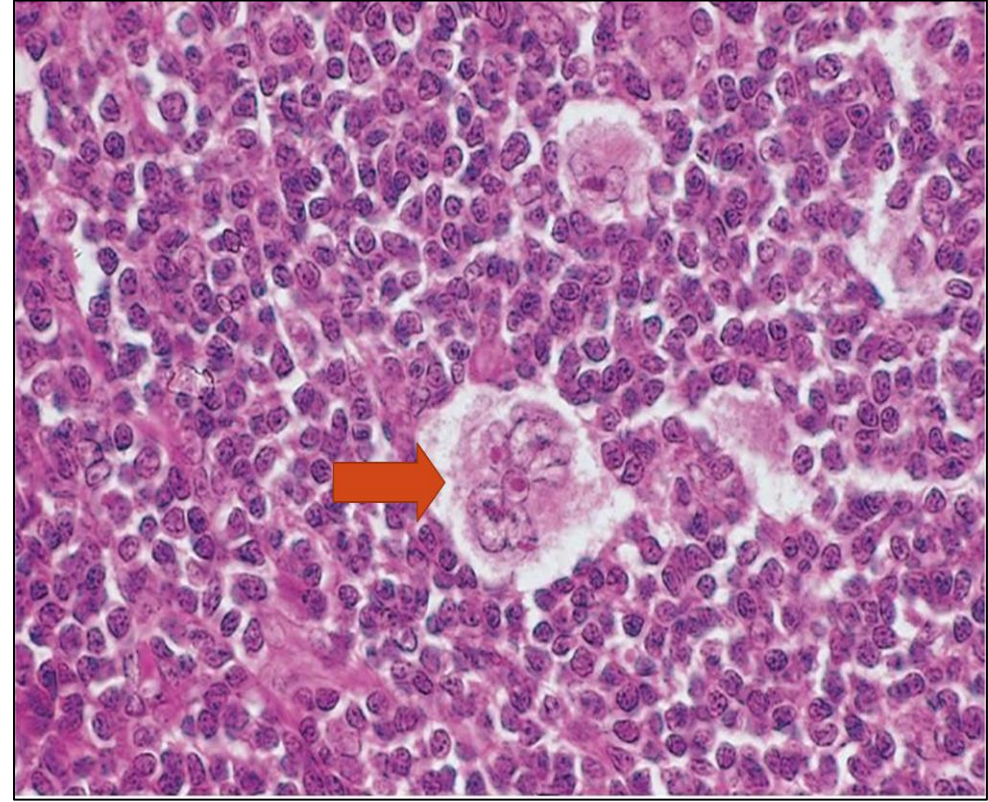
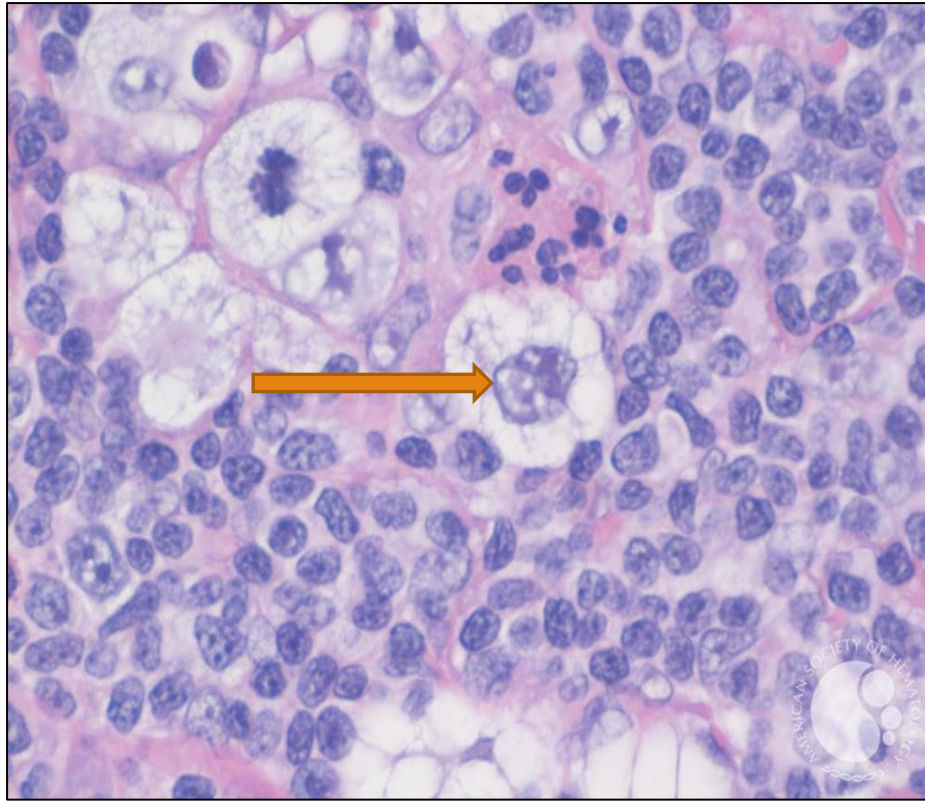
Morphology:

- The presence of **collagen bands** that divide the lymphoid tissue into **circumscribed nodules**.
- The cellular infiltrate may show varying proportions of lymphocytes, eosinophils, histiocytes, **and lacunar cells**. 🚫🚫
- ✂️ ■ The immunophenotype of the lacunar variants is identical to that of classic RScells.



- **The lacunar cell** (a variant of the RS cell, large and has a single multilobate nucleus with multiple small nucleoli and an abundant, pale-staining cytoplasm) بتسبح بفراغ
→ In formalin-fixed tissue, the cytoplasm often retracts, giving rise to the appearance of cells lying in **empty spaces or lacunae**.

هسا الفورمالين هو عبارة عن مركب كيميائي ، بحافظ على الانسجة ويمنعها من التحلل ف بس نغمس النسيج بهذا المحلول ببين عندي السيتوبلازم وكأنه تقلص وفيه فراغ



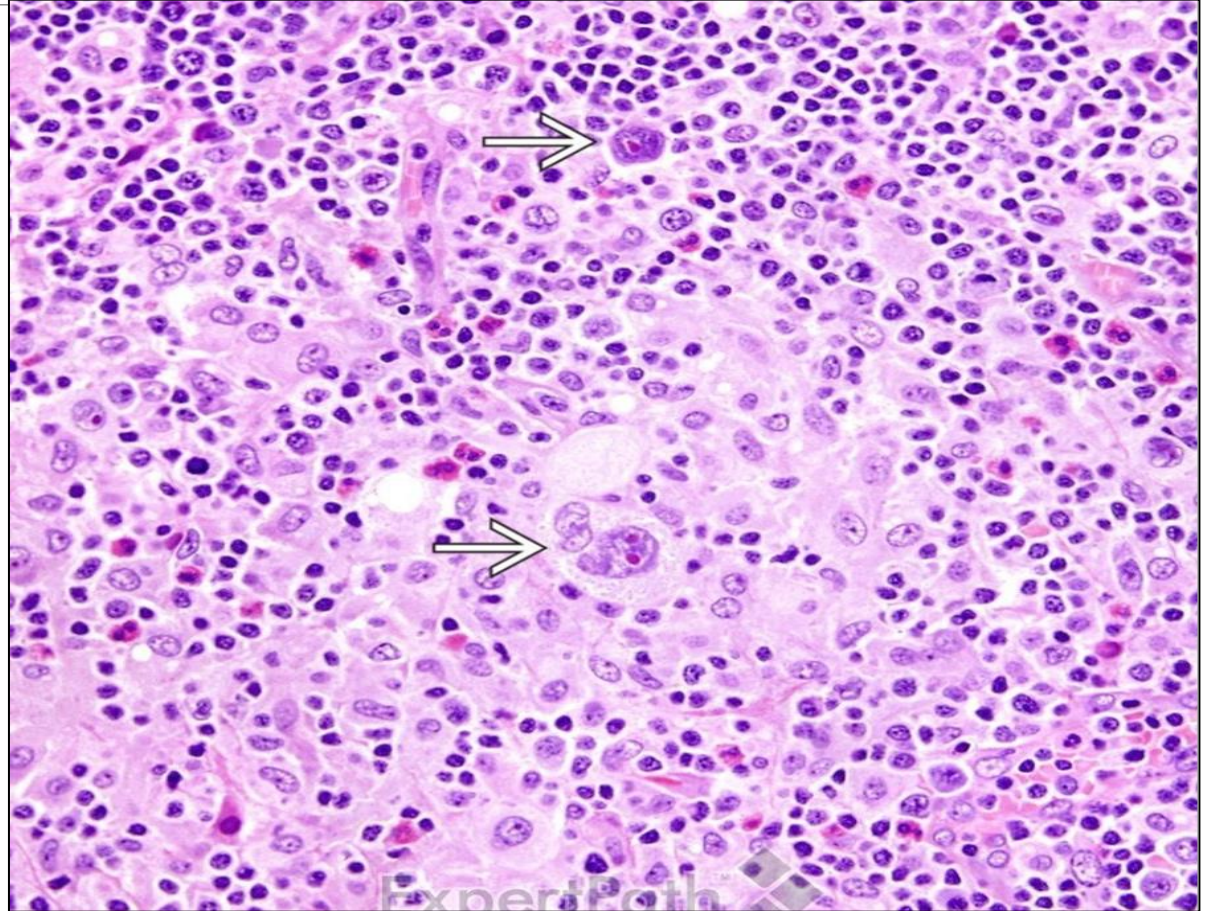
Classical Hodgkin Lymphoma

(2) Mixed Cellularity

رح نشوف كمية كبيرة من ال reactive cell + classical RS

- This is the most common form in patients > 50 yr.
- ✗ ▪ There is a Male predominance.
- Classic RS cells are **plentiful** within a distinctive heterogeneous cellular infiltrate, which includes small lymphocytes, eosinophils, plasma cells, and benign histiocytes. reactive cell
- ✗ ▪ More patients have **disseminated disease and systemic manifestations.**
- 🌟🌟 It is associated with **EBV** in about **70%** of cases.
- 🌟🌟 **Very good** prognosis.

The normal architecture is effaced by Reed-Sternberg and **mononuclear Hodgkin** (RS+H) (white solid arrow) cells in a background of small lymphocytes, epithelioid histiocytes, and eosinophils.



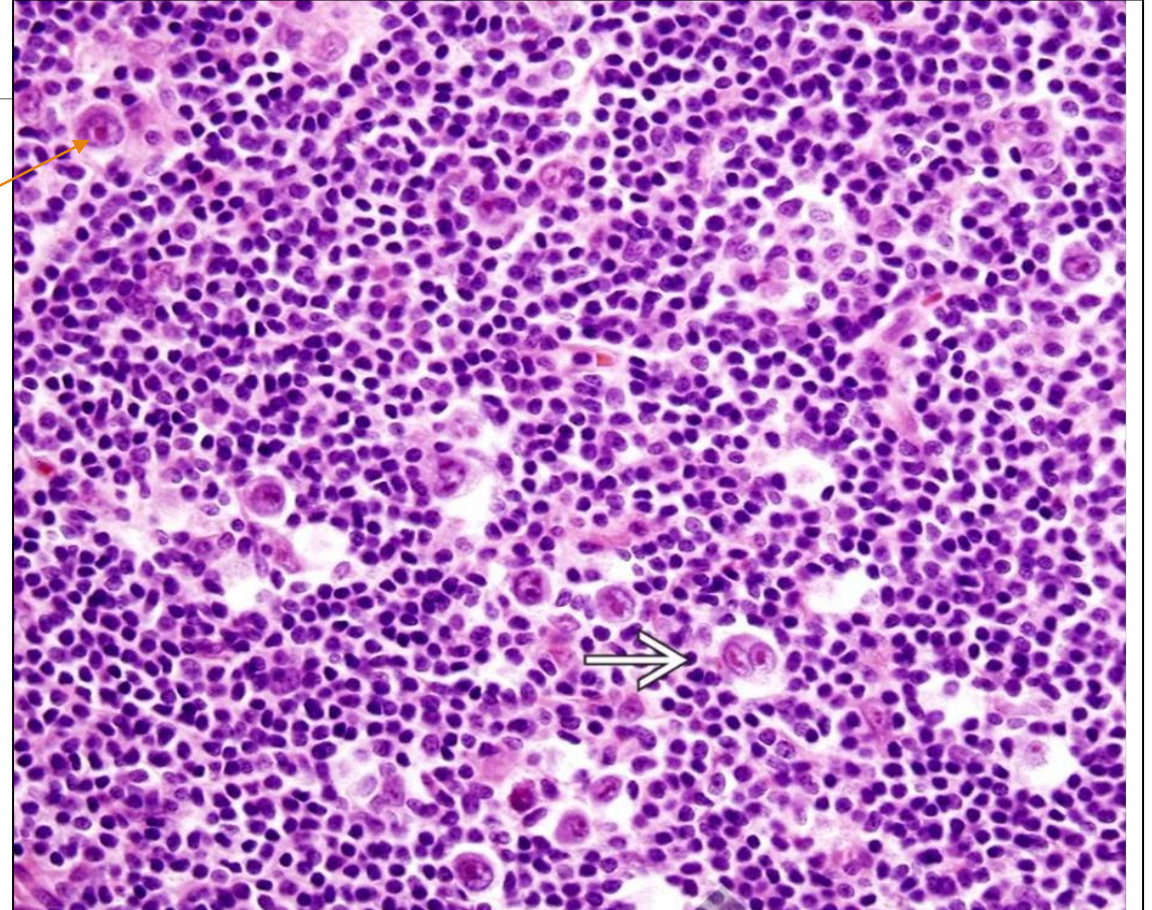
Classical Hodgkin Lymphoma

(3) Lymphocyte Rich

- The reactive lymphocytes make up most of the cellular infiltrate.
- ✗▪ M>F, older adults.
- This entity is distinguished from the lymphocyte predominance type by the presence of frequent mononuclear variants and diagnostic Reed-Sternberg cells with a “classical” immunophenotypic profile.
- 🌟🌟 It is associated with EBV in about 40% of cases.
- 🌟🌟 Very good to excellent prognosis.



- Mononuclear Hodgkin cells and one Reed-Sternberg cell (white solid arrow) in a background of small lymphocytes.



Classical Hodgkin Lymphoma

(4) Lymphocyte depleted

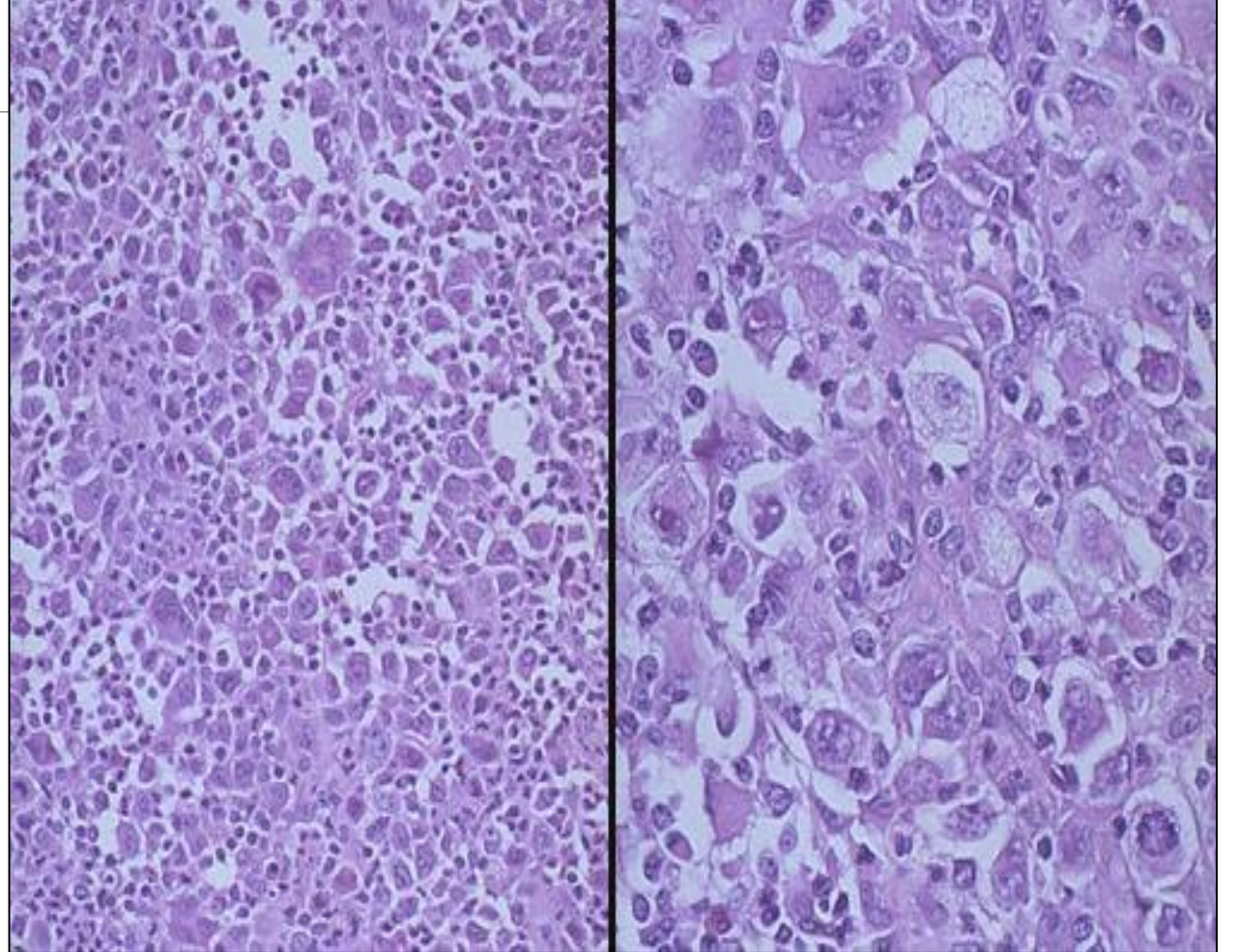
ما فيه lymphocyte ف التشخيص اله سيء وبيجي بمراحل متقدمة

- An aggressive form that affects older patients.
- M>F.
- It is more common in patients with HIV infection مرضى الايدز + immunodeficiency
- Associated with EBV infection in ~90% of cases.
- Characterized by the paucity of lymphocytic cells with the presence of numerous pleomorphic, mummified RS cells with maximum areas of necrosis.
- It has a poor prognosis. 🚨🚨
- Stages III & IV are usual. 🚨🚨

اكثر اشبي رح نشوف ال RS + اشكالهم غريبة + بقايا lymphocyte

Lymphocyte depleted HL:

Many Reed-Sternberg cells and variants are present, and small lymphocytes are depleted.



Non-Classical Hodgkin Lymphoma

Nodular Lymphocyte predominant (NLPHL)

ليش فصلناه عن الكلاسيكال ؟ لانه ال RS بتكون خاصه ومختلفة عن انواع الكلاسيكال
وحتى ما توخذ نفس الماركر والانتيجين تبعون الكلاسيكال

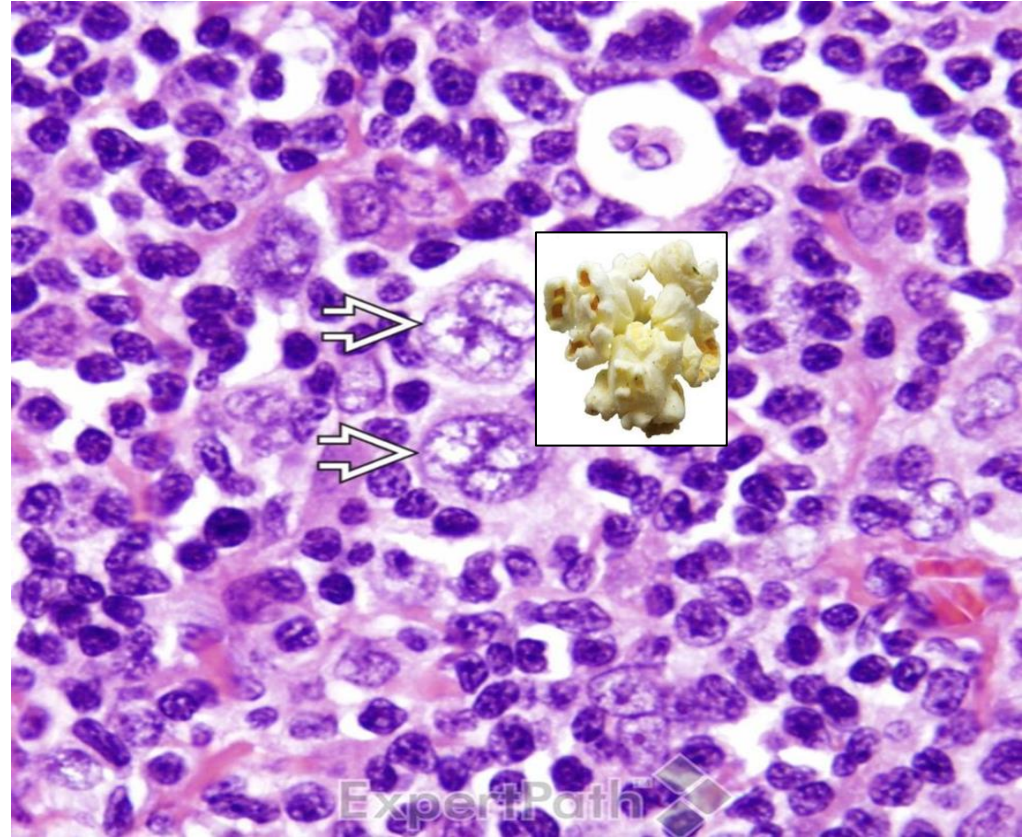
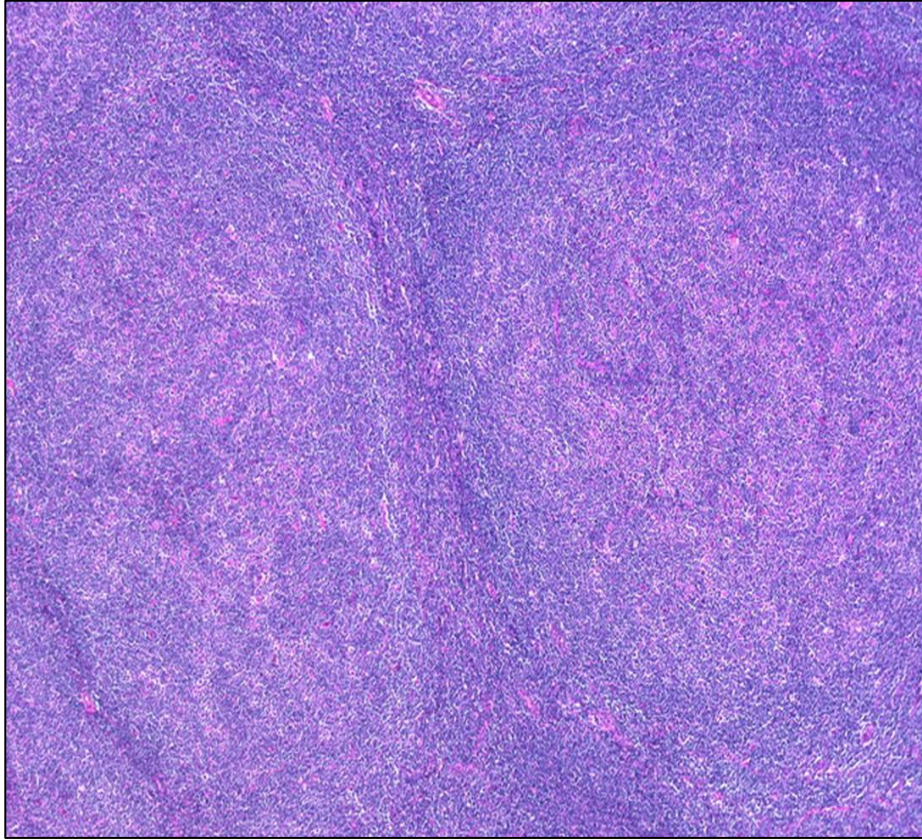
- **5%** of Hodgkin lymphoma.
- **Diffuse or nodules** with many small resting **lymphocytes** admixed with a variable number of **histiocytes**.
- Other types of reactive cells, such as eosinophils, neutrophils, and plasma cells, are scanty or absent, and classic RS cells are extremely difficult to find.
- Scattered among the reactive cells are **lymphohistiocytic (L&H)** variant RS cells that have a delicate multilobed, puffy nucleus that has been likened to a popcorn pattern called (**popcorn cells**).
- **Affects predominantly young males (<35 years)**.
- **Cervical and/or axillary nodes** are the most frequently involved.
- **EBV-**
- **Excellent prognosis** lymphocyte depleted كل الانواع كويسين معدا



نودول معبایین + R lymphocytes بشو تختلف ال RS ؟ ما بكون فيهم prominent nucleolus والنواة بتكون منفوخة .. بشبهوها بحبه البوشار (تختلف عن الكلاسيكال بالشكل) وعشان نفرقهم اكثر عت الكلاسيكال هذول بكونوا negative لل 30+15

NLPHL involving lymph node is shown.

The large neoplastic cells, known as lymphocyte-predominant (LP) cells (white open arrow), often have multilobated nuclear contours and resemble popcorn.





ركزوا على ال stage + prognosis+ EBV+ morphology
خذوا الموضوع ببساطة

❖ Hodgkin Lymphoma Poor Prognostic Factors

عوامل ثانية مع ال stage بتخلي التشخيص اسوأ حتى ال stage بكون early stage

حكينا عنهم اول المحاضرة

□ Stage IV, and B symptoms → هسا early stage وما في B symptoms بكون اشئ منيح

□ Age \geq 45yr كبير بالعمر + early stage بخلي ال prognosis اسوأ

□ Male gender

خصوصاً عند اللي عندهم نقص بالمناعة

□ Histology (particularly the lymphocyte-depleted)

□ ESR (>50) Erythrocyte sedimentation rate

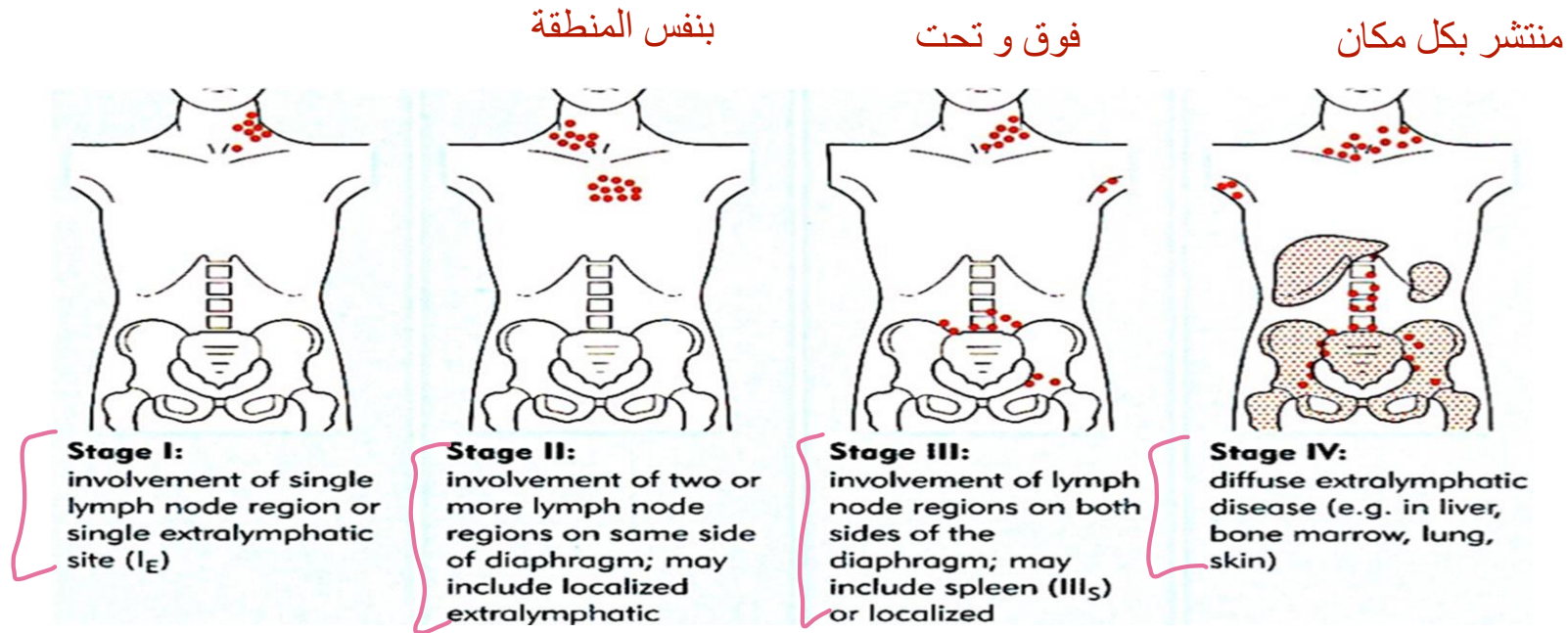
□ Albumin level ($<4\text{g/dl}$),

□ Low Hb. ($<10.5\text{g/dl}$)

□ Extra-nodal disease اذا اجت برا ال lymph node رح يكول المريض هوا

Clinical Staging Of Hodgkin And Non-Hodgkin Lymphomas (Ann Arbor Classification):

كيف ينصف ال stage ؟ حسب الموقع



All stages are further divided based on the absence (A) or presence (B) of the following systemic symptoms and signs: significant fever, night sweats, unexplained loss of more than 10% of normal body weight

تمر الكثير من الأيام وأنت تعتكف بين الكتب وتمر الكثير من لحظات التعب
وسيمر الكثير لتصل
ولكن لحظات الجبر تهون عليك كل ذلك التعب
تذكر بأنها دوماً تأتي في النهاية
كل تعب سيهون وكل ألم سيزول
وكل دعاء بالعمل سيتحقق
سر بقدميك تجاه من أعطاك تلك القدمين
اركض إن تطلب الأمر
اسع ولا تنتظر
وسيفرح الله قلبك بنهاية ترضيك.

وهيك الحمد لله مادة الباثو خلصت  لا تنسوا الدعاء لاهلنا بغزة والسودان ، الله ينصرهم ويكون معهم 

