وَقُل رَّبِّ زِدْنِي عِلْمًا

النادي الطبي

RESPIRATORY SYSTEM

HAYAT BATCH

SUBJECT : _____

LEC NO. : lecture 9

DONE BY : Heckyan Sarsak

Respiratory System
RS

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بالمحاضرة السابقة حكينا عن الكانسرز يلي بتصير من الرئة نفسها (primary), اليوم هنحكي عن الكانسرز يلي بتصير بالرئة واصلها من مكان اخر (metastasis),طبعاً يلي درس المحاضرة الماضيه هيعرف انه
The lumgs are the most common site of metastases

Metastatic tumors in lung

- ✓ All types of cancer can metastasize to the lung.
- ✓ Reach the lung by lymphatic or hematogenous route (through the blood stream) & may show : Different presentations
  - ✓ Multiple discrete nodules (Cannon Ball)
  - ✓ Single nodule.
  - ✓ Endobronchial, pleural
  - ✓ Pneumonic consolidation
  - ✓ Diffuse lymphatic dissemination called ***Lymphangitis Carcinomatosa.*** → the infiltration and inflammation of lymphatic vessels secondary to the spread of malignancy from a primary site

بيكون لـ Tumor وجي كل لـ lymphatics جوا لـ lung.

Neuroendocrine proliferation and tumors

-The normal lung contains neuroendocrine cells within the epithelium as single cells or as clusters, the neuroepithelial bodies.

✶ Neoplasms of neuroendocrine cells in the lung:

↳ originate from Neuroendocrine cells.

1. **Tumourlets:** → The most simple Tumor of neuroendocrine cells. ; Just increase in Neuroendocrine cells without complication.

- Nodular proliferation of neuroendocrine cells that invade beyond the bronchiolar wall and measure <5 mm. Small size

-Inconsequential, hyperplastic nests of neuroendocrine cells seen in areas of scarring or chronic inflammation.

2. **Carcinoid tumors (≥ 5 mm)**
3. **Large cell neuroendocrine carcinoma**
4. **Small cell carcinoma** ☠ → The worst one. → very high grade Neuroendocrine Carcinomas. #

Carcinoid Tumors

- Are **malignant** tumors composed of cells that contain dense-core neurosecretory granules in the cytoplasm and, rarely, may secrete hormonally active polypeptides.

- They are best thought of as **low-grade neuroendocrine carcinomas.** Malignant tumor, but better than SCC.

- Are subclassified as **typical** or **Atypical**.

I can get rid of them with Surgery

- Both are often resectable and curable.

- Occur in young adults (mean 40 years), M=F.

- ~ 20-40% of the patients are **non**smokers.

Clinically

ال**clinical manifestations** ممكن تيجي من احد هادي الأمور:

The clinical manifestations may arise from: 1. intraluminal growth, 2. capacity to metastasize and 3. ability of some to elaborate some vasoactive amines.

↳ Tumor cells بتفرز زي هرمونات Polypeptides

↳ it has the ability to spread. But to a lesser extent than Small cell Carcinomas.

- Can be central or peripheral (less common).

- Most present with signs and symptoms related to their intraluminal growth, including cough, hemoptysis, and recurrent bronchial and pulmonary infections.

-Peripheral tumors are often asymptomatic and are discovered incidentally on chest radiographs.

Morphology

-Most originate in main bronchi and grow in one of two patterns:

(1) an obstructing (in Lumen) polypoid mass, or (2) a mucosal plaque penetrating the bronchial wall to fan out in the peribronchial tissue.

Histologically: مهم كتيررررر كتيررر علشان نميز بين typical و Atypical

Typical carcinoid:

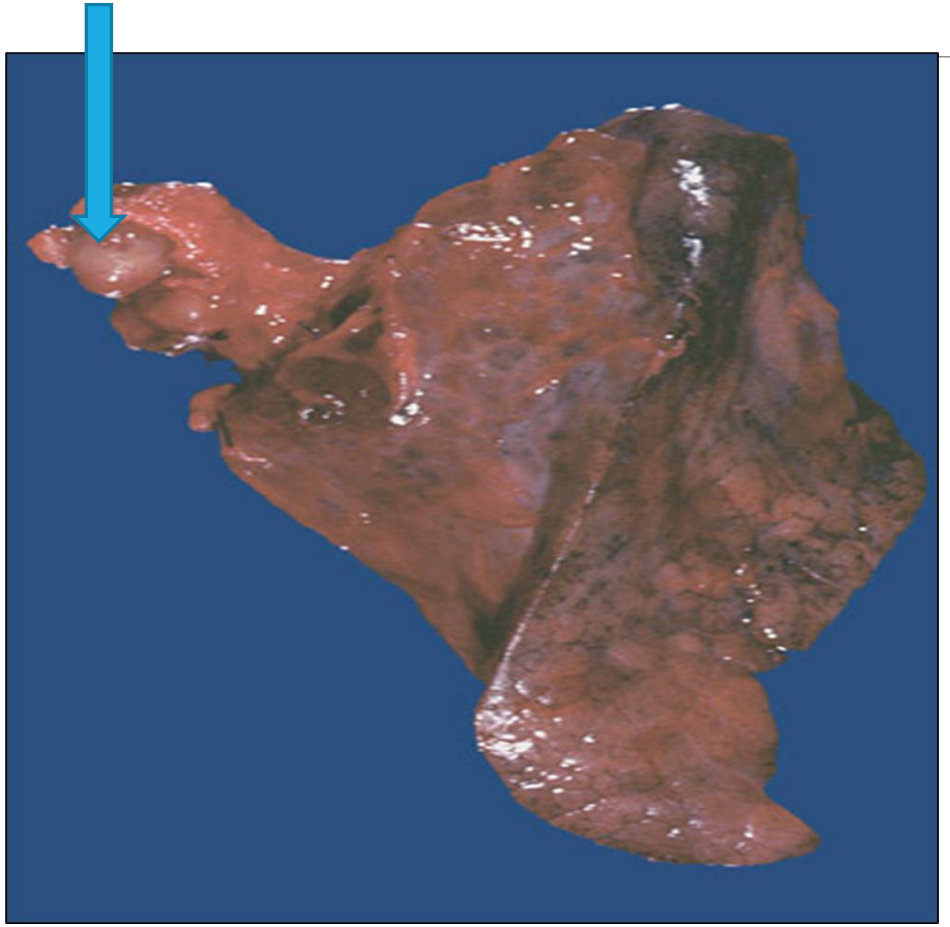
- Composed of nests or trabeculae of uniform cells with regular round nuclei with **"salt-and-pepper"** chromatin, absent or rare mitoses, and little pleomorphism. → in Both typical & Atypical

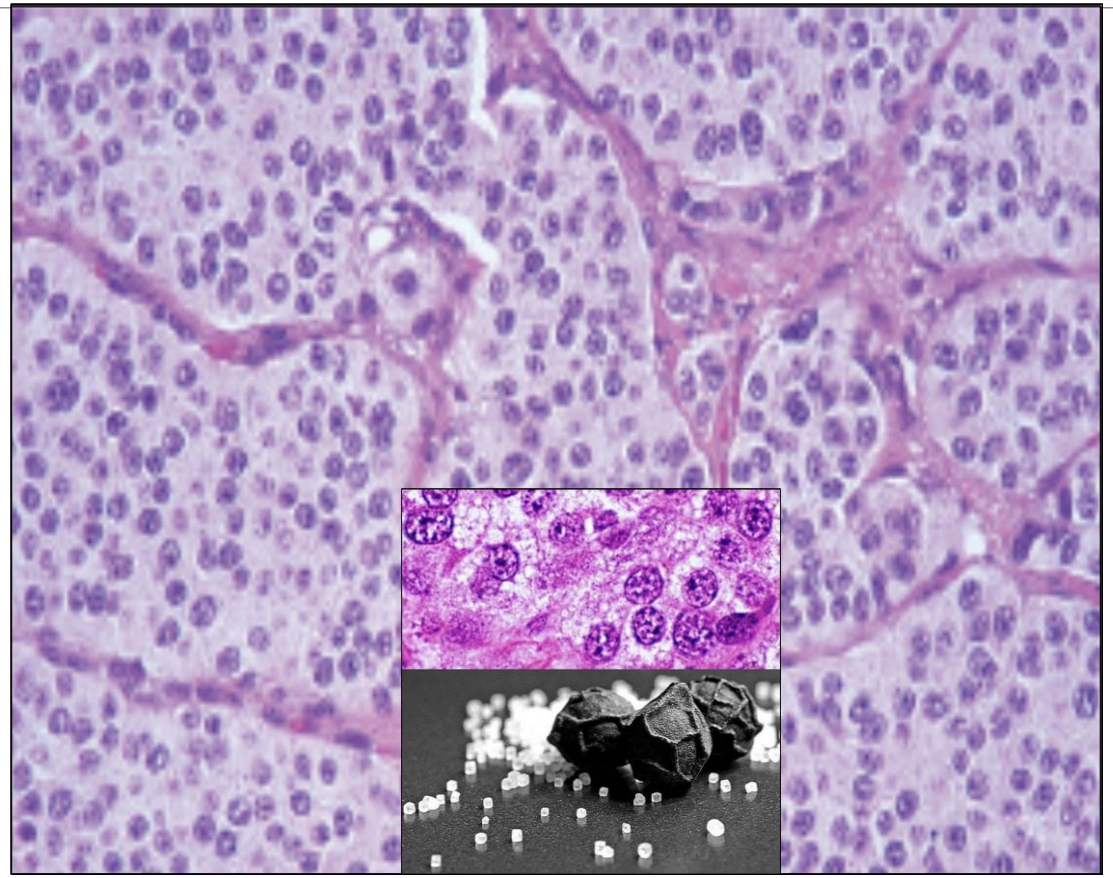
يجب تحقق الشرطين لأقدر احكي عنو typical carcinoid

<2 mitoses/2 mm² and NO necrosis

يلي بميزلي ال typical عن atypical هو عدد mitotic figure و وجود ال necrosis

Bronchial carcinoid grows as a spherical, pale mass (arrow) protruding into the lumen of the bronchus. Histologic appearance demonstrating small, rounded, uniform nuclei and moderate cytoplasm.





Atypical carcinoid

- Display a higher mitotic rate and small foci of necrosis.
- Have a higher incidence of lymph node and distant metastasis than typical carcinoids.

اهم شي يجماعة البوكسات الزرقا اوكيييييي؟؟؟

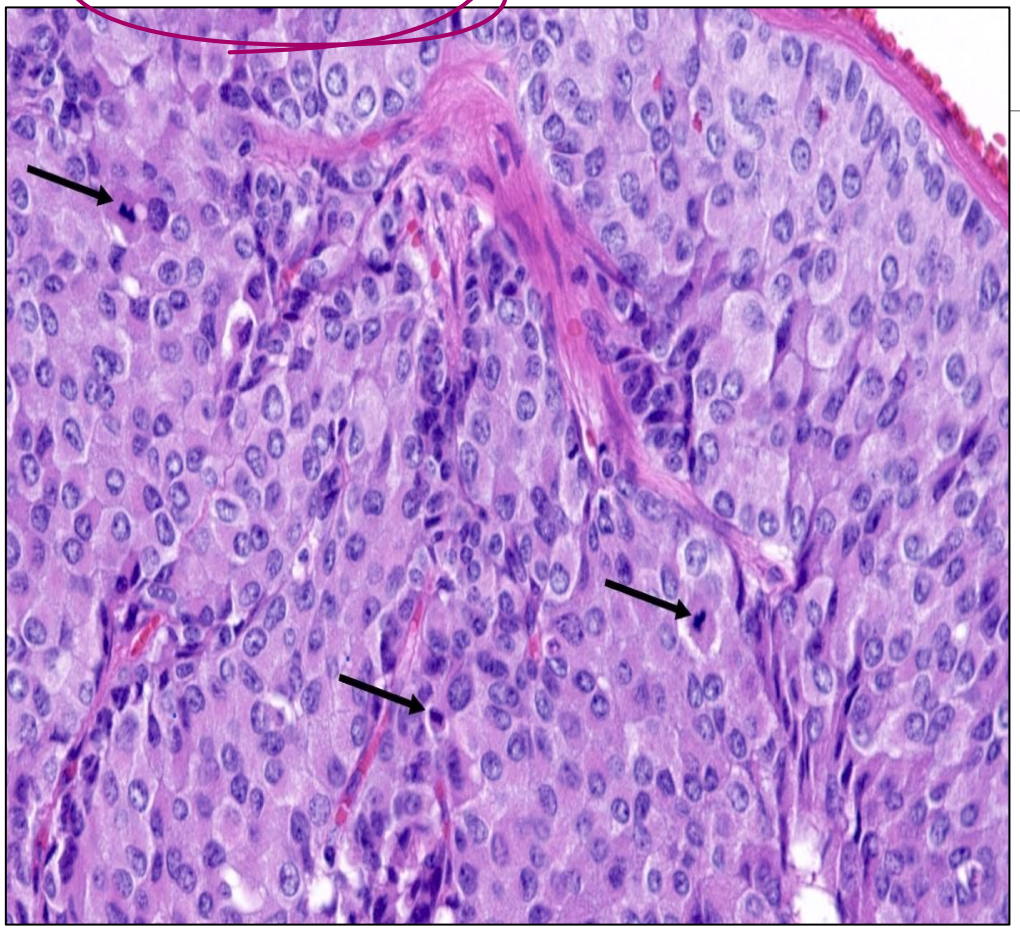
2-10 mitoses/ 2mm² and/or foci of necrosis, usually punctate and focal

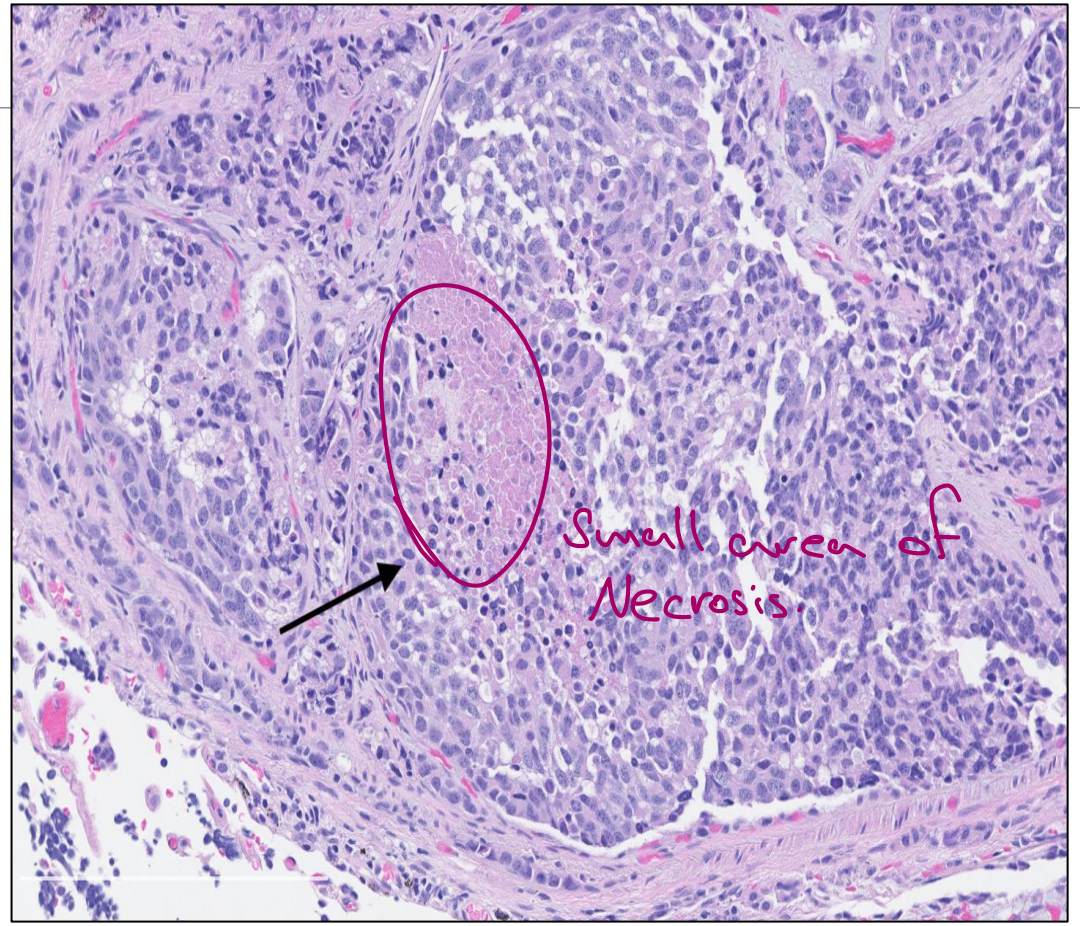
Very small amount of Necrosis.

- Unlike typical carcinoids, atypical tumors have *TP53* mutations in 20% to 40% of cases.

Atypical Carcinoid

mitotic figures < 10





Benign Tumors of the lung :

Pulmonary Hamartoma : (most common benign tumor)

(Symptoms ما بيكون في)

- Usually discovered as an incidental, rounded radio-opacity (coin lesion) on a routine chest film. (على شكل نقود كـ)
- Most are solitary, peripheral, small, and well-circumscribed.
- May simulate tumor radiologically

The traditional term hamartoma is retained for this lesion, but it is in fact a **clonal neoplasm**

ال hamartoma لا تعتبر tumor و إنما هي :
Abnormal mixture of cells and tissue
لكن هنا الlung hamartoma بنعتبرها tumor لانه وجدنا
chromosomal abnormalities انه في 😔

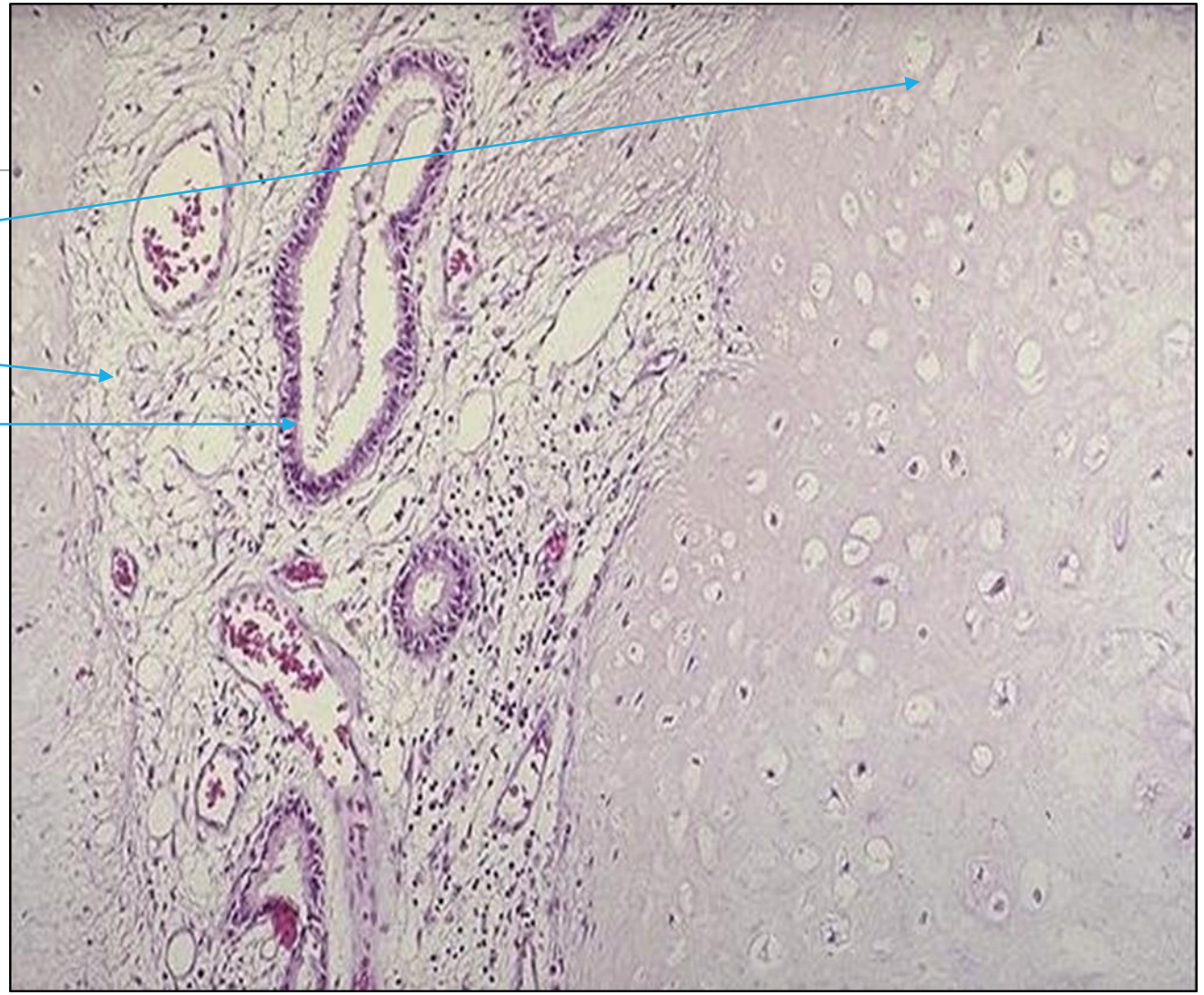
Histologically:

نفس الاشياء يلي موجودة بالوضع الطبيعي
ولكن بكمية اكبر او ترتيب مختلف...

- Consists of nodules of **cartilage,**
- **cellular fibrous tissue and fat intersected by epithelial clefts.**

Respiratory epithelium.

- The epithelial clefts are lined by ciliated columnar epithelium or non-ciliated epithelium and probably represent entrapment of respiratory epithelium



Pathology of the Pleura :

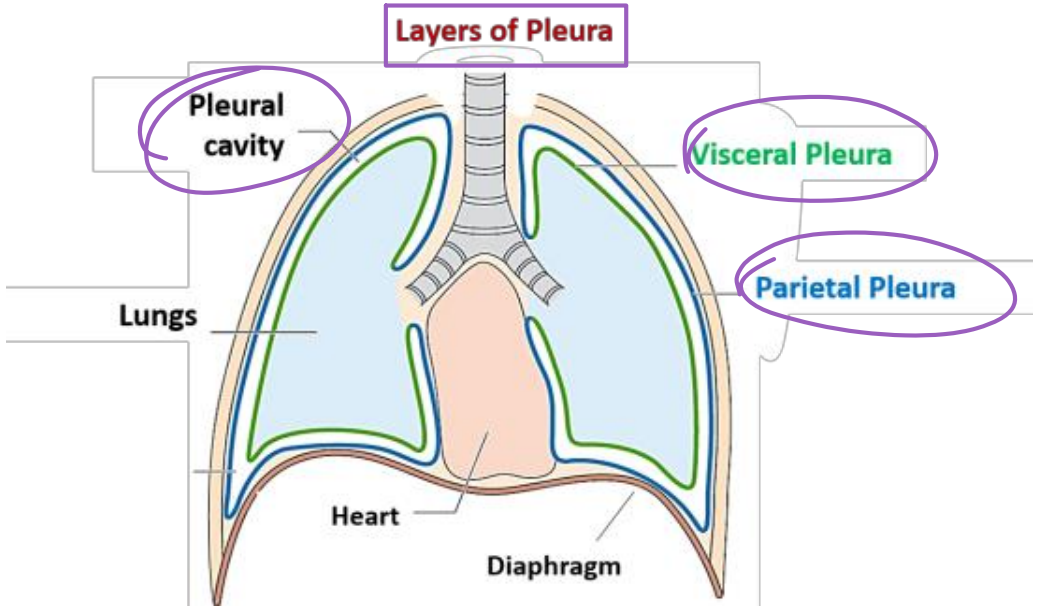
يعني بيكون مرض بالlung وبيوصل لعند ال pluera

- Disease of the pleura usually is a complication of an underlying pulmonary disease.
- Secondary infections and pleural adhesions are common findings at autopsy.

Important primary disorders:

(1) Primary intrapleural bacterial infections

(2) Malignant mesothelioma.

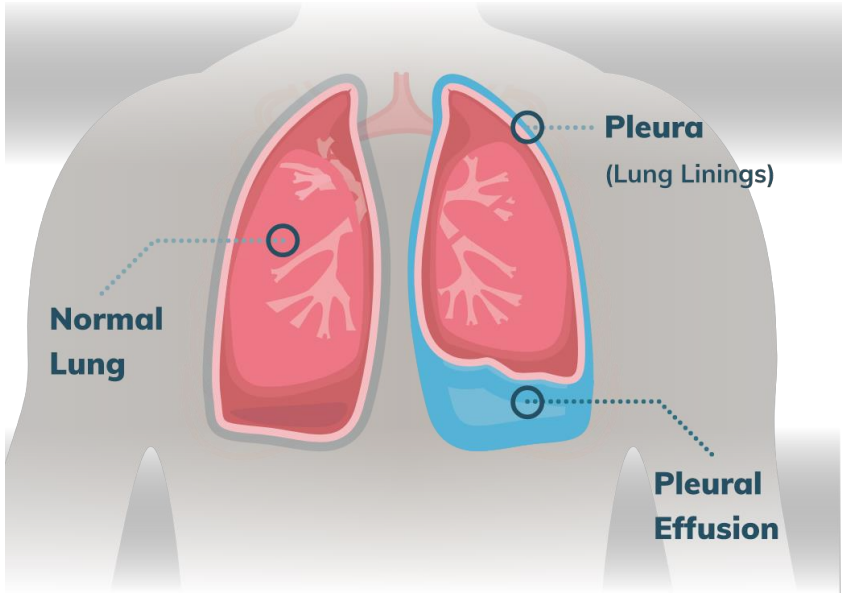


❑ Pleural Effusion And Pleuritis

(Between visceral pleura & parietal pleura)

Pleural effusion: Accumulation of **fluids** in the pleural space

- It is a common manifestation of both primary and secondary pleural diseases and may be **inflammatory or noninflammatory.**



No significant protein or inflammation, like water.

- ❑ Hydrothorax: When the effusion is a transudate, e.g. Congestive heart failure.
- ❑ Exudates: Characterized by protein content greater than 30 g/L and, often, inflammatory cells, suggests pleuritis, e.g. infection, cancer or systemic diseases
- ❑ Hemorrhagic (bloody): Malignant effusions, TB, infarcts

(Mixture of fluid & Blood)

Pneumothorax, Hemothorax, And Chylothorax

Pneumothorax: Presence of air or other gas in the pleural sac.

- Simple or spontaneous pneumothorax: It may occur in young, apparently healthy adults, usually men without any known pulmonary disease. (فجأة بيصير تجمع للهواء وبنكون مو عارفين السبب :)
- Secondary pneumothorax: as a result of some thoracic or lung disorder

Hemothorax: Just Blood

- Collection of whole blood (in contrast with bloody effusion) in the pleural cavity.

✓ A complication of a ruptured intrathoracic aortic aneurysm

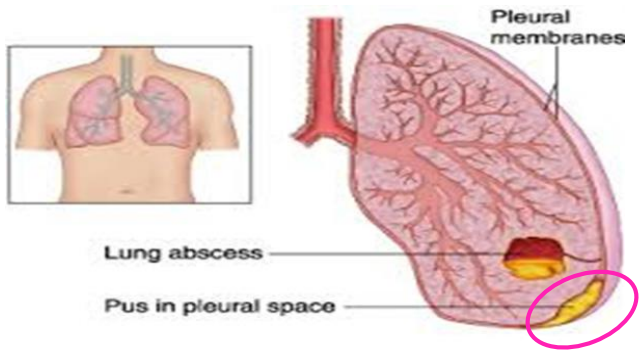
✓Vascular trauma.

Chylothorax

- A pleural collection of a milky lymphatic fluid containing microglobules of lipid.

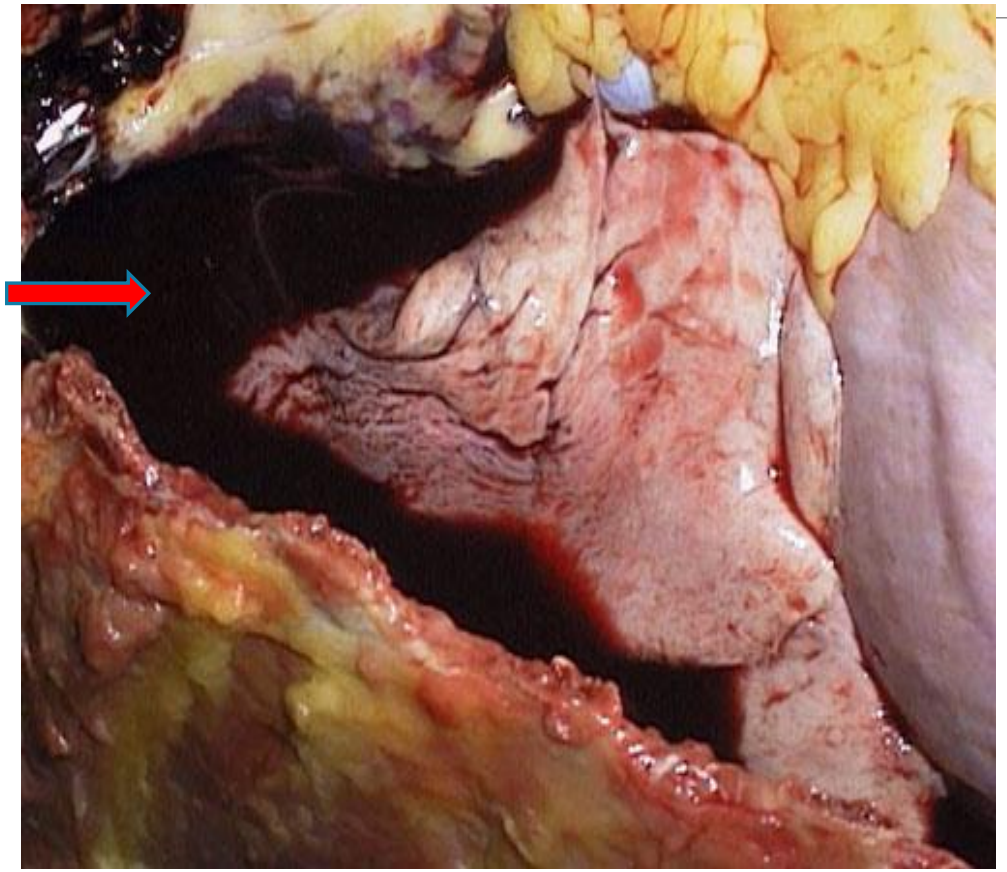
Pyothorax/Empyema:

- Pus in the pleural cavity

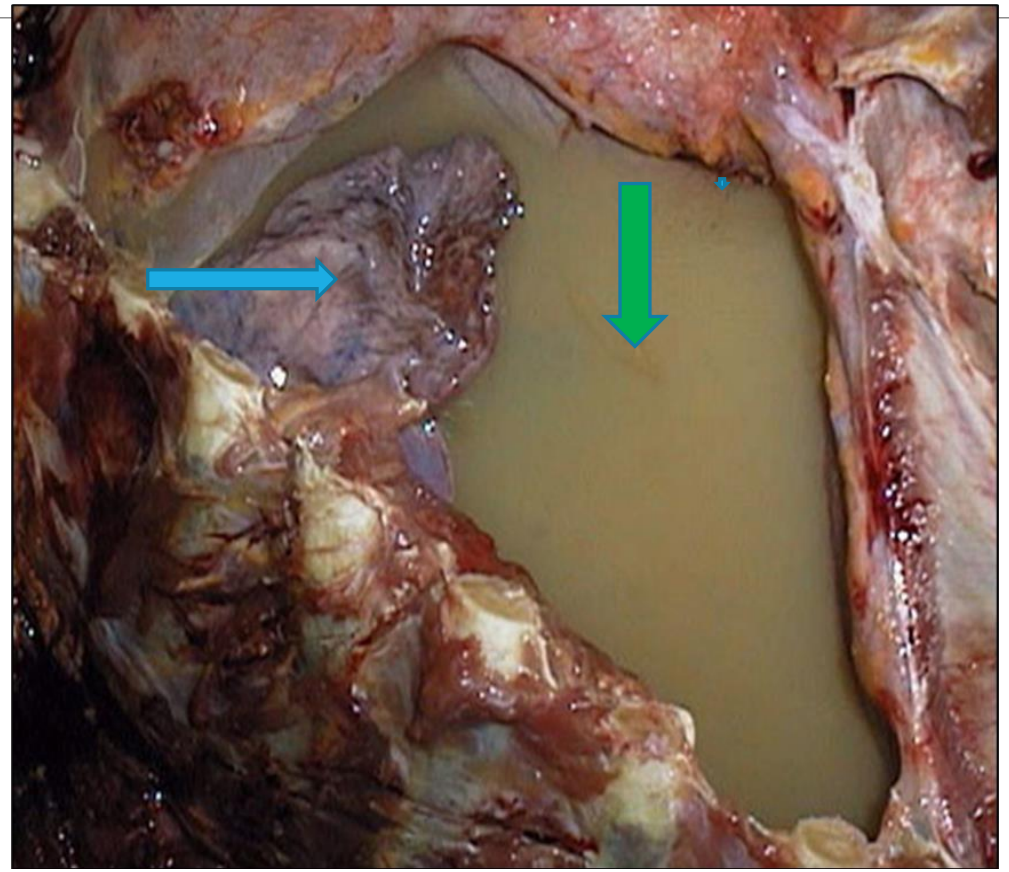


هادا الشي بيعمللي نوع من انواع الatelactasis ، يلي هو compression atelactasis بسبب الضغط يلي بيعملو الfluid المتجمع حوالين الlungs

The lung is atelectatic and floating in bloody fluid filling the chest cavity because of trauma. This is a hemothorax.



The pleural cavity is filled with a cloudy milky yellowish-tan fluid, characteristic for a chylothorax. The lung is markedly atelectatic.



❖ Pleural Tumors

Secondary > Primary

-The pleura may be involved by primary or secondary tumors.

-Secondary **metastatic involvement is far more common** than primary tumors.

-The most frequent metastatic malignancies arise from primary neoplasms of the lung and breast.

لإنهم قريب على الـ Pleura

Malignant Mesothelioma

↳ Primary, arises from mesothelial cells in Pluera.

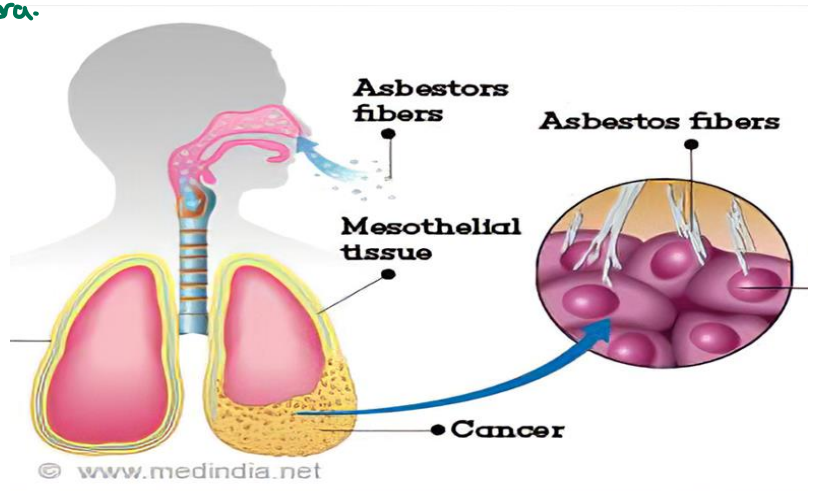
❖ A **rare cancer** of mesothelial cells.

❖ Usually arises in the **parietal or visceral** pleura

❖ Approximately 80% to 90% of individuals have a history of exposure to Asbestos.

The most important Risk factor

مهم



- Those who work directly with asbestos (shipyard workers, insulators) are at the greatest risk.

- The latent period for developing malignant mesothelioma after the initial exposure is 25 to 40 years long. يعني شي أكيد مش من اول مرة هيصير معي كانسر

- Once inhaled, asbestos fibers remain in the body for life. Thus, the lifetime risk after exposure does not diminish over time

- The combination of cigarette smoking and asbestos exposure greatly increases the risk of developing lung carcinoma but not developing malignant mesothelioma.

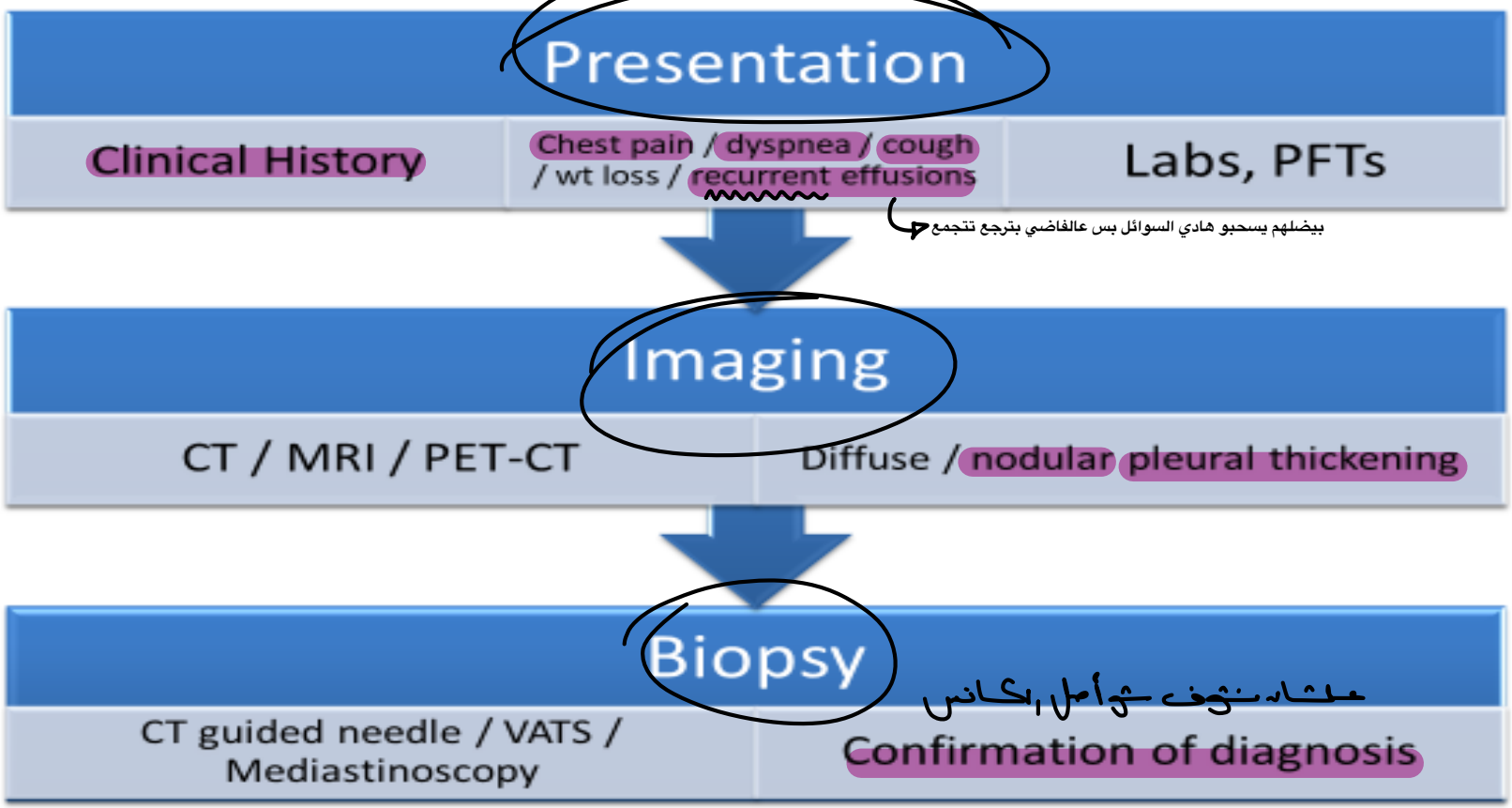
→ Asbestos is enough.

Sequencing of mesothelioma genomes has revealed multiple driver mutations.

- The commonest genetic change in malignant mesothelioma is the homozygous deletion of P16. معلومة مهمة كتير كتير كتير بتساعدك بالتشخيص👍🏻

- The most frequently mutated genes are BAP1 (**lost on IHC**), NF2 and TP53. ← other genetic Mutations بس أهم وحدة P16

Typical presentation & work up



Morphology:

- Begin in a localized area and, over time, spread widely. At autopsy, the affected lung typically is ensheathed by a layer of yellow-white, firm tumor that obliterates the pleural space

محالفة

مغطي الplueral space

Histologically:

الها تلات أشكال

- Three morphologic appearances:

(1) **Epithelioid:** cuboidal cells with small papillary buds, line tubular and microcystic spaces

(2) **Sarcomatoid:** spindled grow in sheets

(3) **Biphasic:** both sarcomatous and epithelial areas.

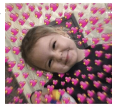
Confirmation of Diagnosis:

Mesothelioma markers (positive):

Calretinin, WT-1, D2-40

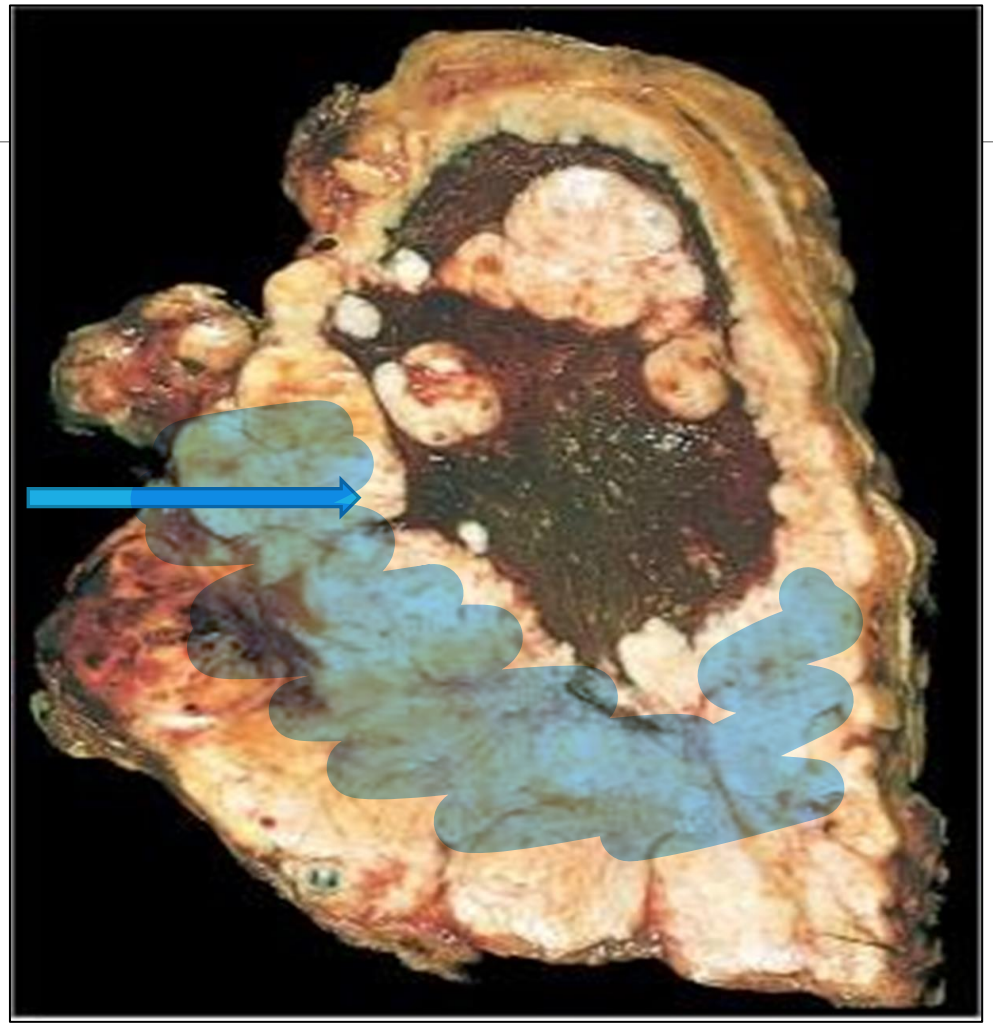
احفظو بس هاد حل

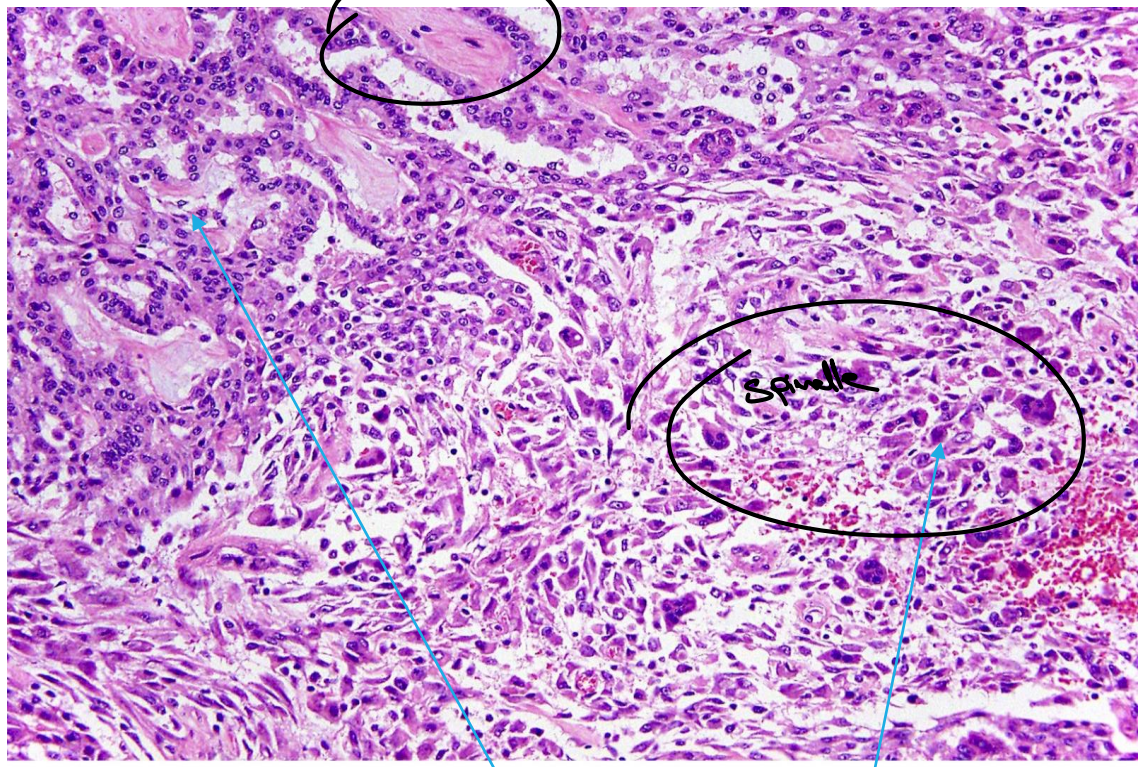
يا الله اديه دكتورة علا عسل بالشرح وبالتسهيل علينا وبأسئلتها جد الله يرزقها الجنة



Morphology

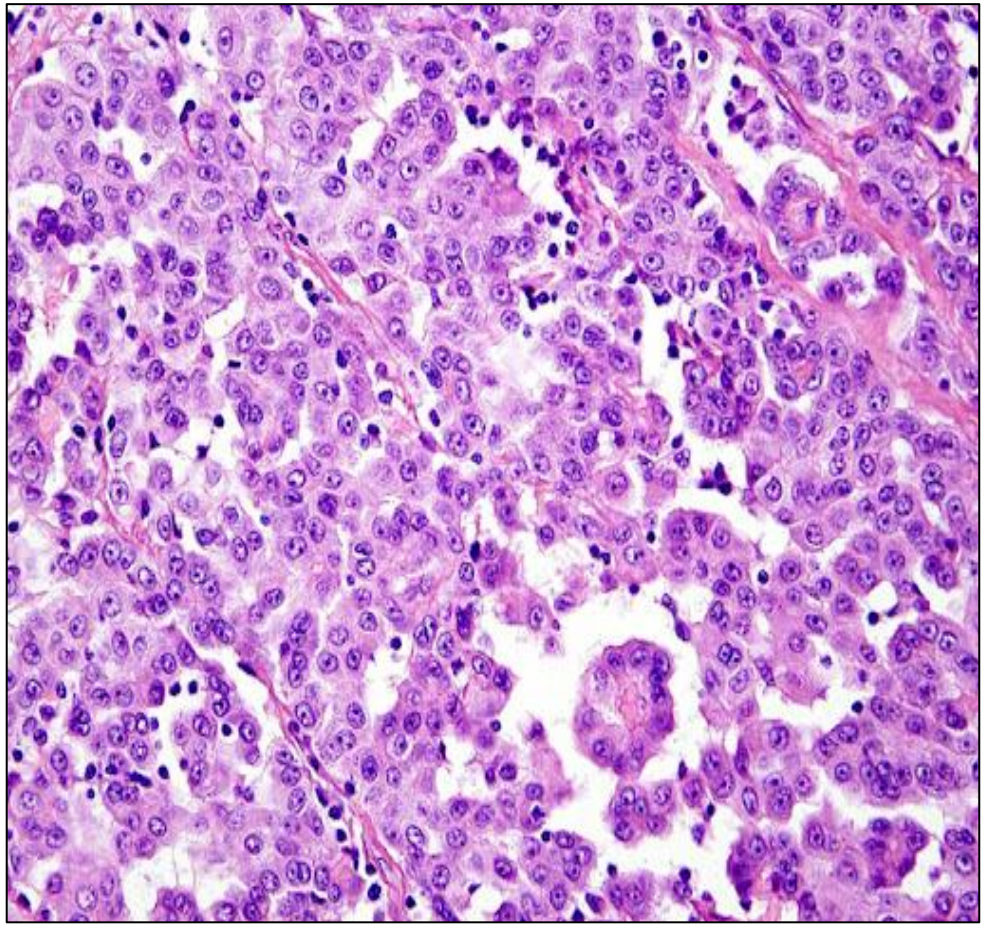
A thick, firm, white pleural tumor that is ensheathing this bisected lung.



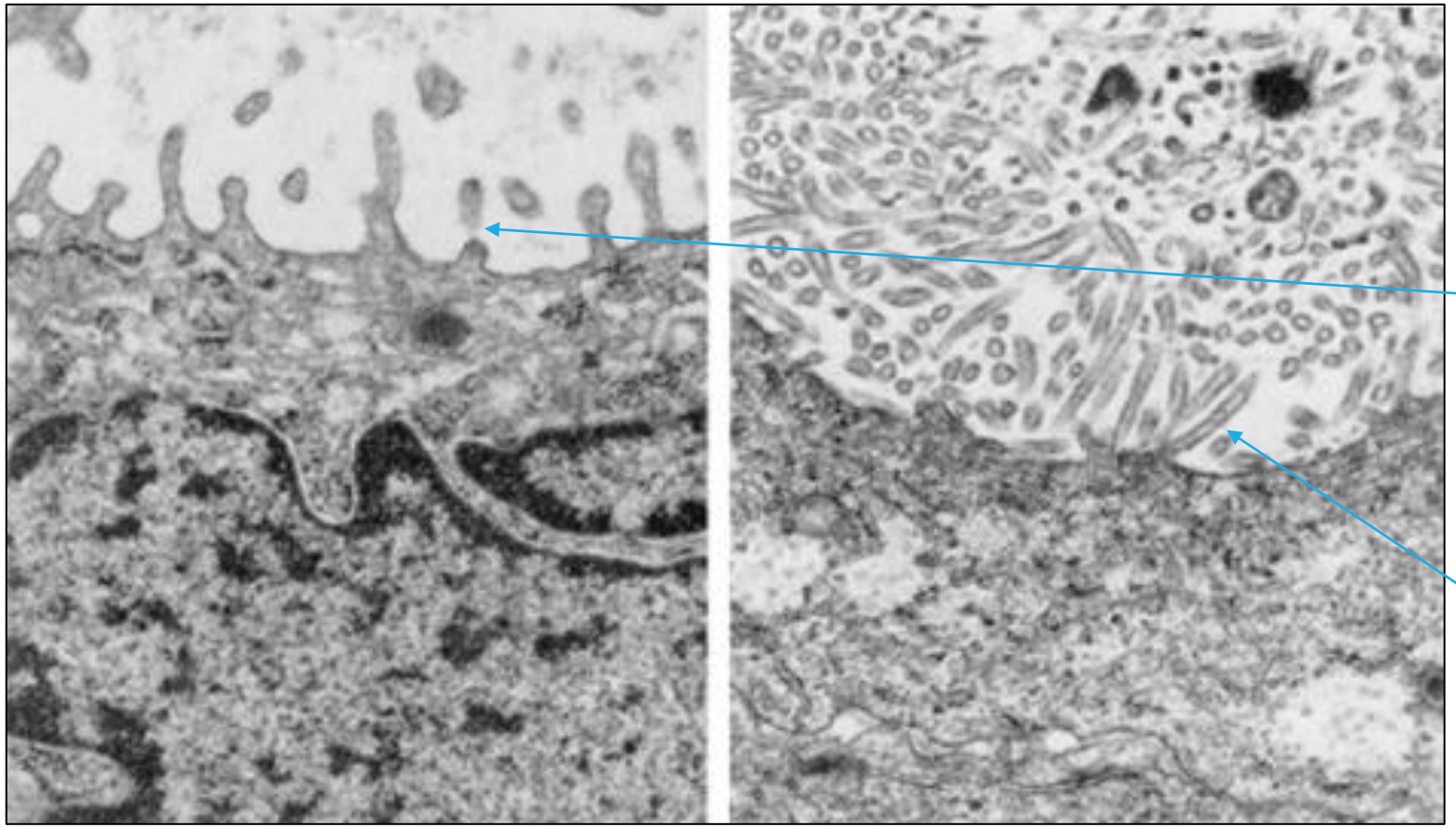


Biphasic mesothelioma is characterized by the presence of both epithelioid component (upper left; tubulopapillary pattern) and sarcomatoid component (lower right) (H&E 200×).

Epithelioid



❖ On electron microscopy, MM characterized by the presence of long microvilli.



بدنا نميز بين الكارسينوما والميزوثيليوما عن طريق EM

Ultrastructural features of pulmonary adenocarcinoma: Characterized by short, plump microvilli, contrasted with ناصحات وقصار those of **mesothelioma**: in which microvilli are **numerous, long, and slender.** كتار،طوال،نحاف

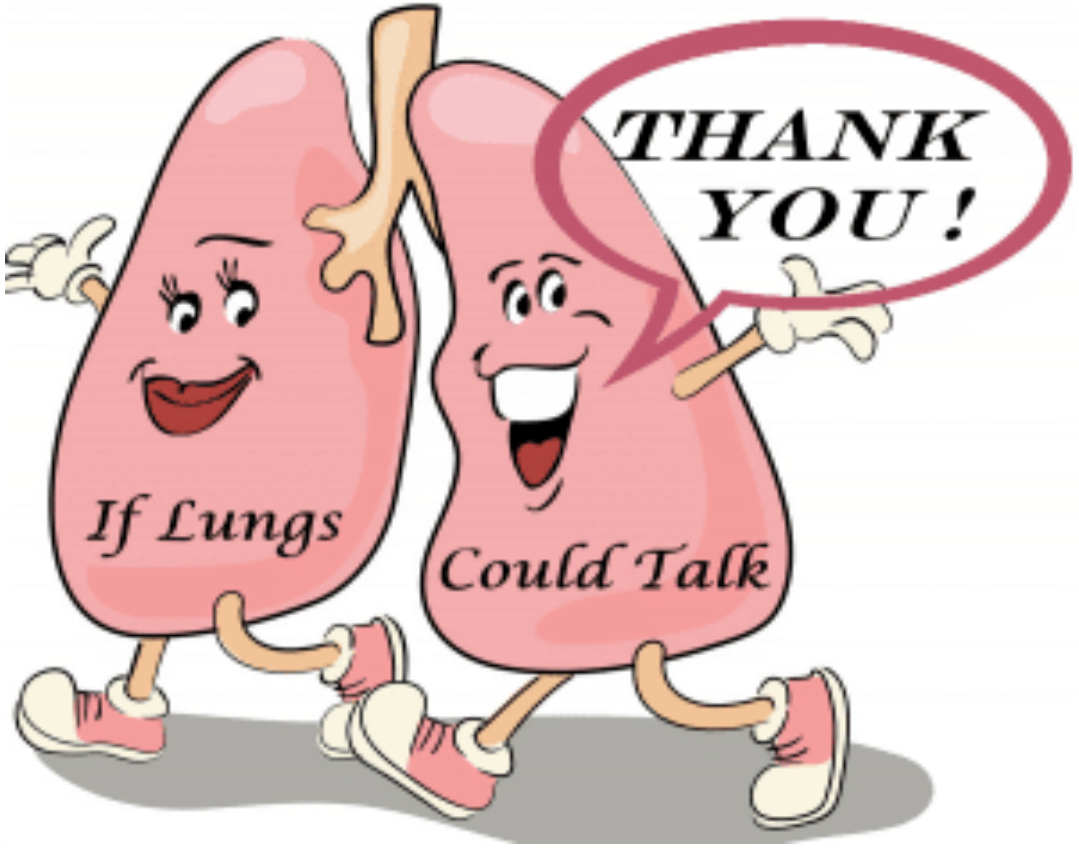
Prognosis

- Has poor prognosis

- The lung is invaded directly, and there is often metastatic spread to the hilar lymph nodes and, eventually, to the liver and other distant organs.

- 50% of patients die within 12 months of diagnosis

- Concurrent pulmonary asbestosis (fibrosis) is present in only 20% of individuals with pleural mesothelioma.



يعطيكم العافية يا حلوين💗
الله يقوينا💗

Thank you

Hedaya

Good Luck