Lung Tumours

- **Benign vs. malignant**
- **Epithelial vs. non-epithelial**
  - **Sarcomas, Lymphomas, Melanomas**
- **Primary vs. secondary**
  - Main metastatic neoplasms localisations:
    - ⇨ **Lung**
    - ⇨ **Liver**
    - ⇨ **Bones**
    - ⇨ **Brain**
  - Primary sorces of lung metastases:
    - ⇨ **Lung**
    - ⇨ **Breast**
    - ⇨ **Colon**
    - ⇨ **Pancreas**

- ***Pulmonary neoplasms*** may be benign or malignant. Benign lung tumors are scarce in comparison with malignant tumors. Malignant lung tumors may be:

- **primary** (arising from cells in the bronchi, lung parenchyma, or pleura) or
- **metastatic** (reaching the lung via the bloodstream or lymphatics or by direct invasion).

Lung Tumours

- **Benign:**
  - ⇨ Alveolar adenoma
  - ⇨ Squamous cell papilloma
  - ⇨ Sclerosing pneumocitoma (ex sclerosing haemangioma)
  - ⇨ Lung Hamartoma polmonare
  - ⇨ Chondroma
  - ⇨ Myofibroblastic tumour
  - ⇨ PEComas
    - ⇨ Limphangioleiomyomatosis
    - ⇨ PEComa benign/malignant
    - ⇨ Clear cell tumour

Lung Tumours

- **Non-invasive (*in situ*)**
  - Atypical adenomatous hyperplasia
  - Adenocarcinoma in situ (+/- mucinoso)
  - Squamous cell carcinoma in situ
  - Diffuse neuroendocrine cell hyperplasia

Lung Tumours

Primary lung tumours

- Bronchogenic (columnar cells) carcinomas, including adenocarcinomas and squamous cell carcinomas.
- Bronchoalveolar (cuboidal cells) carcinomas, which may be present as multiple nodules (nowadays considered "*in situ*" adenocarcinomas and better named "*lepidic pattern*")
- Endocrine

Pulmonary neoplasias

- **Malignant:**
  - carcinoma

Lung Tumours

- **Lung carcinoma**
  - ⇨ Most frequent human malignancy
  - ⇨ Highest tumour-related mortality
  - ⇨ Progressively increased over last 50 years
  - ⇨ Ratio M/F = 1.3/1

Lung Tumours

Lung carcinoma: etiopathogenesis

- **Cigarette smoking (**major aetiologic factor in 80%-85% of all bronchogenic cancers)
- **Environmental pollution**
  - **Air pollution** may play a role for developing lung cancer as mortality rates for lung cancer are higher among urban dwellers than among rural inhabitants
  - **Asbestos (**naturally occurring silicate minerals) Occupational exposure to asbestos fibers and to radioactive gases has been linked to increased incidence of lung cancer

Lung Tumours
Risk factors

Parenchimal diseases:

- **Tuberculosis**
- **Silicosis**: (pneumoconiosis) occupational lung disease caused by inhalation of crystalline silica dust, marked by inflammation and scarring, presenting as nodular lesions in the upper lobes of the lungs
- **Diffuse post-inflammatory fibrosis**

Lung Tumours

- **Lung carcinoma:**
  - ⇨ **Adult/elderly subjects**
  - ⇨ **Perseverant smokers**
  - ⇨ **BCOP**
  - ⇨ **Nuanced symptoms:**
    - **Persistent cough**
    - **Haemophtysis**
    - Paraneoplastic syndromes
    - **Cryptogenic iron-deficiency anemia**

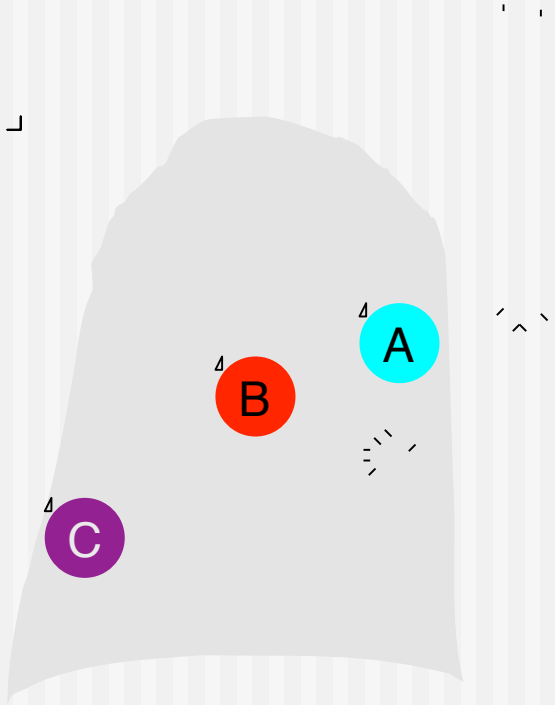
Lung Tumours: carcinoma

Topography:

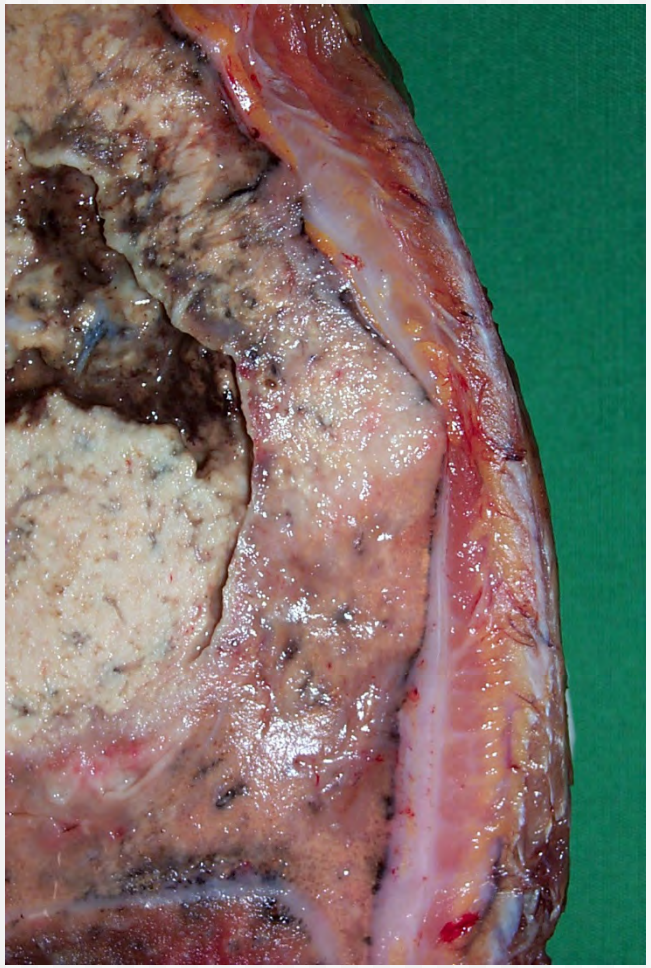
A. Hylar (bronchocentric)

B. Central (intra-parenchymal)

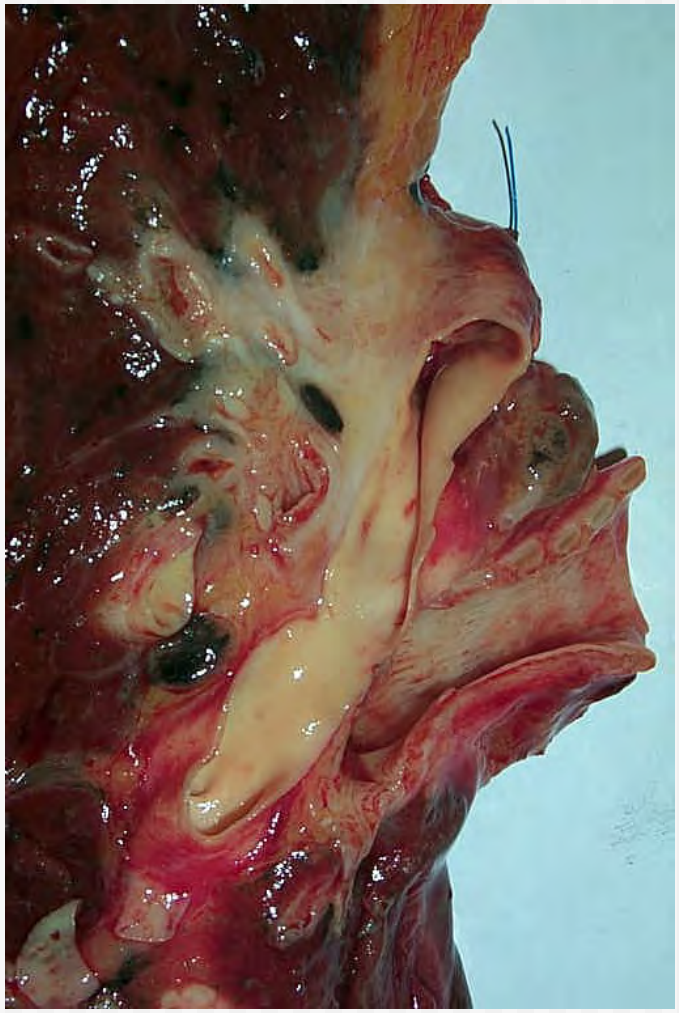
C. Peripheral (sub-pleuric)

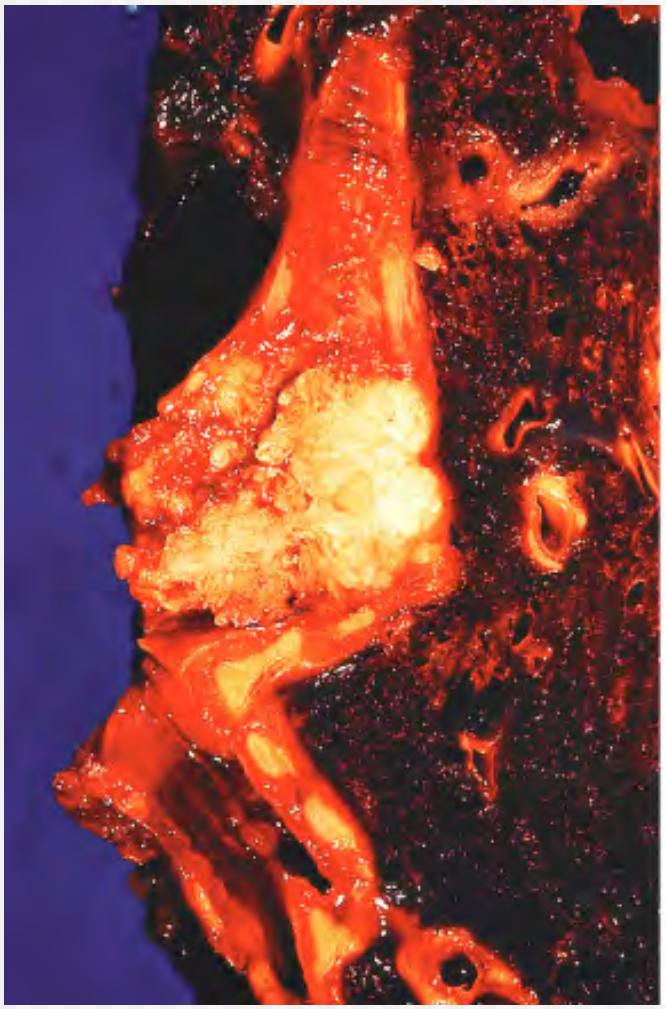


Lung Tumours: carcinoma



Lung Tumours: carcinoma





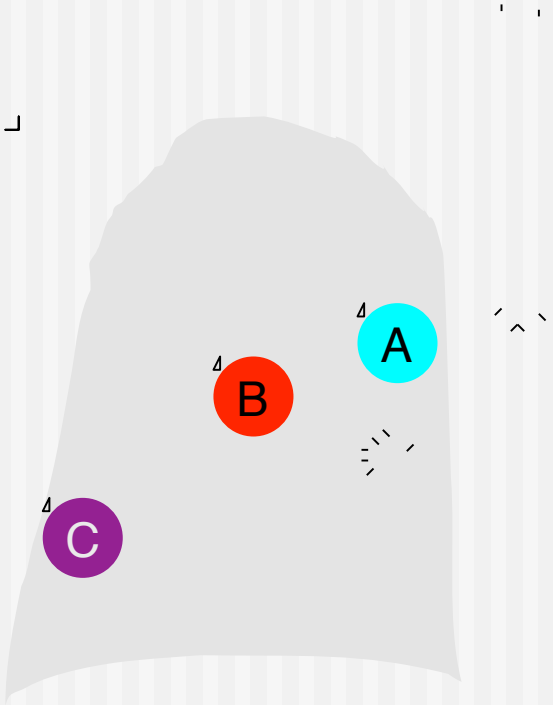
Lung Tumours: carcinoma

Clinical classification

A. Non- Small-cell lung carcinoma (NSCLC)

B. Small cell lung carcinoma (SCLC)

C. Non –Small-cell lung carcinoma (NSCLC)



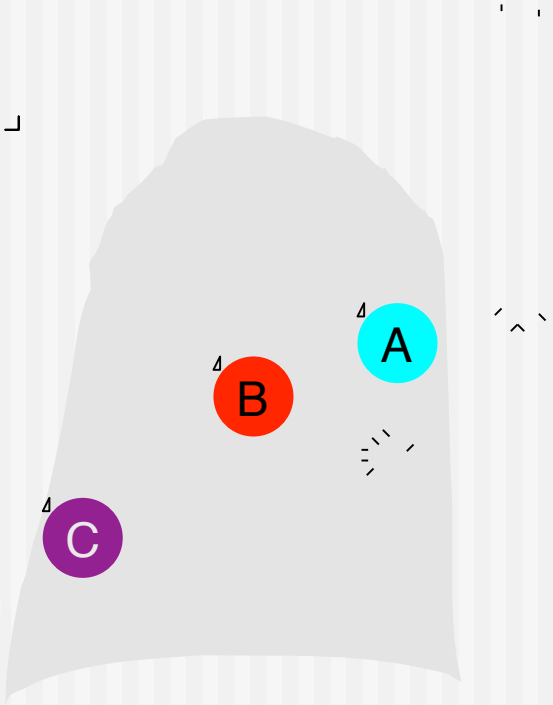
Lung Tumours: carcinoma

Histotypes

A. Squamous-cell carcinoma

B. Large/small cell lung carcinoma

C. Adenocarcinoma & variants (EGFR, ALK, ROS1)



Lung Tumours: carcinoma

- **Diffusion pathways**
  - ⇨ Intra-pulmonary (lymphatic)
  - ⇨ Trans-pleural
  - ⇨ Lymphogenous (mediastinum)
  - ⇨ Haematogenous (brain)

Lung tumours:
Adenocarcinoma

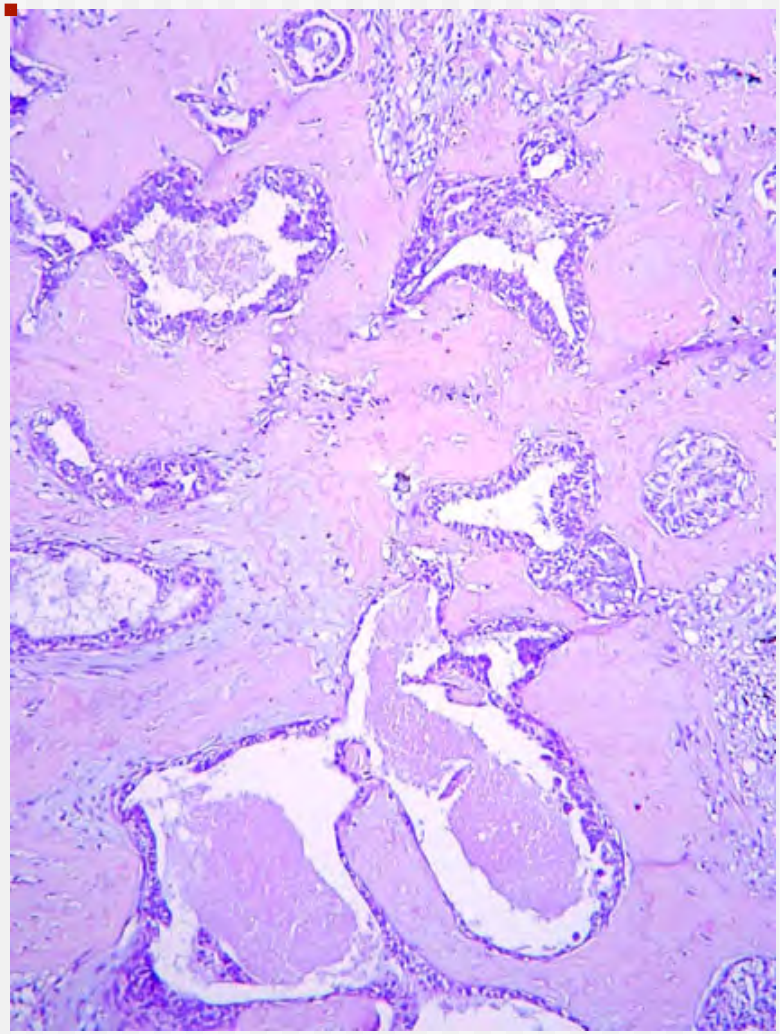
- **Histotypes**
  - ⇨ Lepidic G1
  - ⇨ Acinar, papillary G2
  - ⇨ Invasive mucinous, colloid
  - ⇨ Micropapillary & solid G3

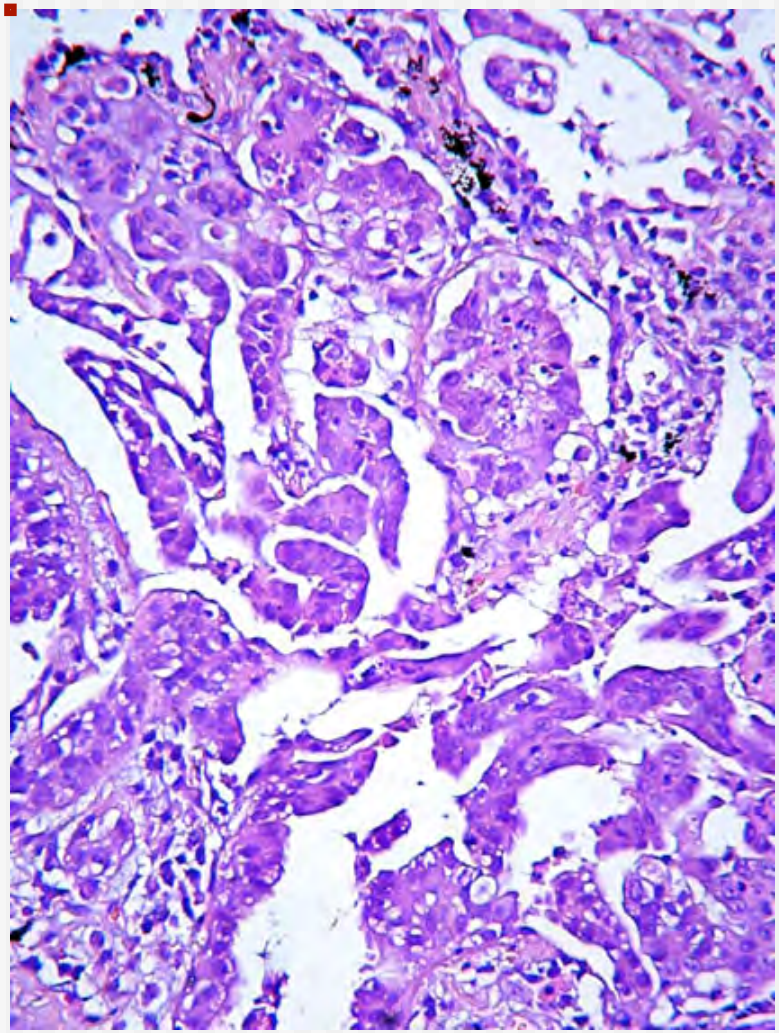
- Minimally invasive adenoca. ≤5 mm.
- IHC: TTF-1, Napsina A, CK7

Lung tumours:
Adenocarcinoma

FIGURE 1. *A*, Core biopsy shows an "adenocarcinoma with a lepidic pattern." *B*, Correlation with the computed tomography (CT) scan shows a 2.5-cm pure ground glass nodule with no solid component, favoring a diagnosis of adenocarcinoma in situ (AIS), although a small invasive component or minimally invasive adenocarcinoma (MIA) cannot be excluded. *C*, This part solid nodule is from a resected lepidic predominant adenocarcinoma. If a core biopsy came from the ground glass area highlighted by the arrow, it could show the same pathologic findings as in *A*. It would be misleading to make a pathologic diagnosis of AIS in such a case as the entire lesion has not been sampled and the invasive component is not represented in the biopsy specimen.

Lung Tumours: carcinoma





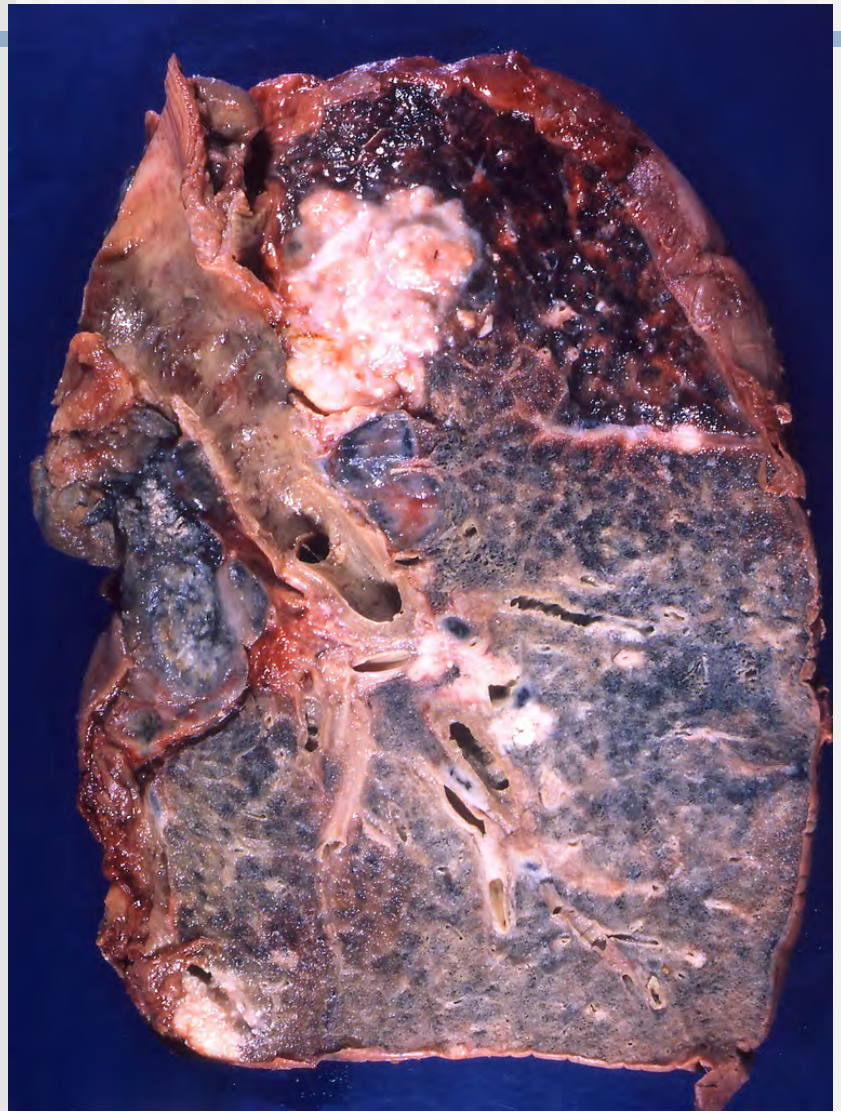
Lung tumours:
Squamous cell carcinoma

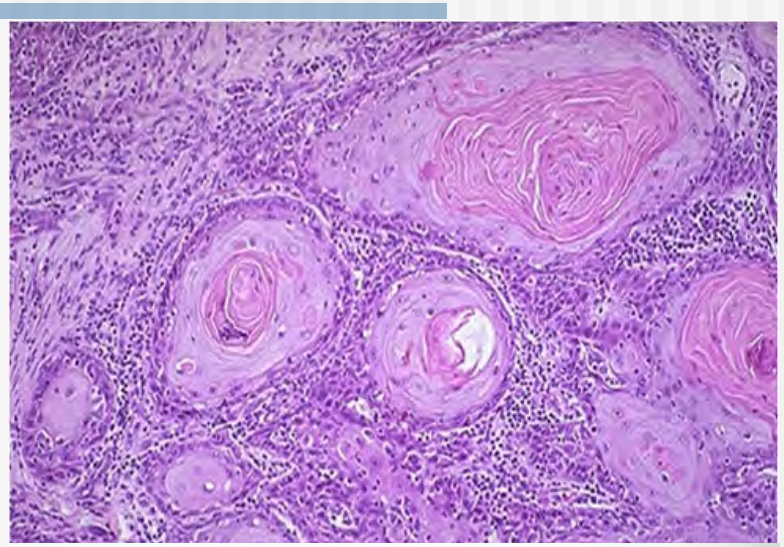
- **Variants**
  - ⇨ Keratinizing
  - ⇨ Non-keratinizing
  - ⇨ Basaloid

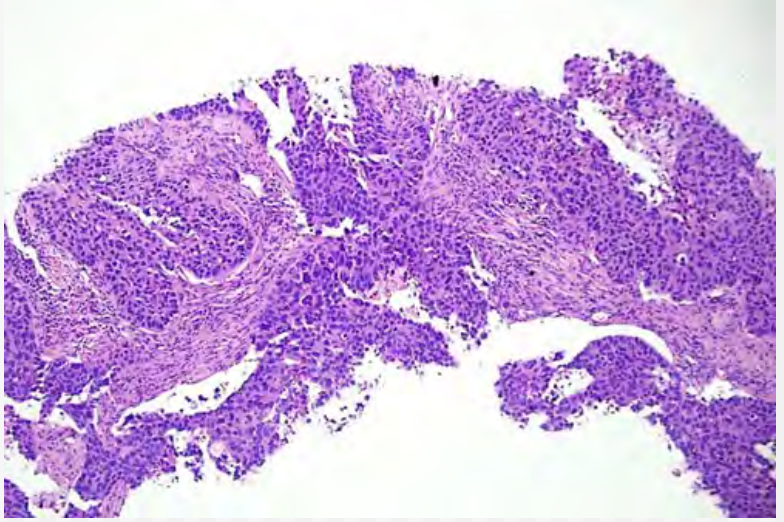
+/- In situ component

IHC: p40/p63+, TTF-1-, CK7 +/-

Lung tumours:
Squamous cell carcinoma





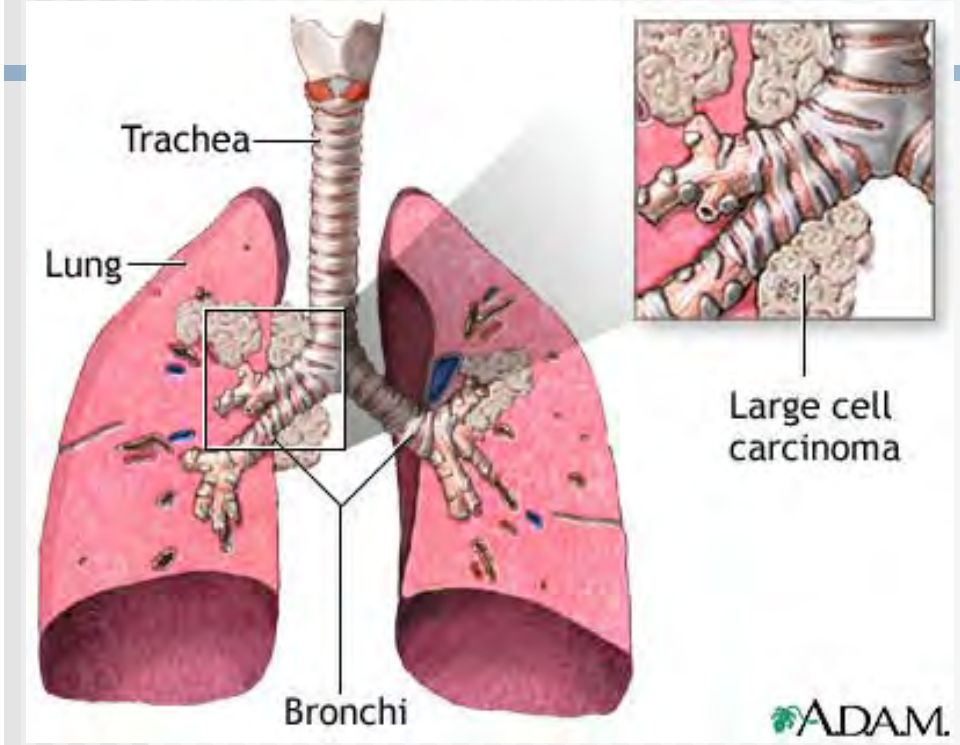


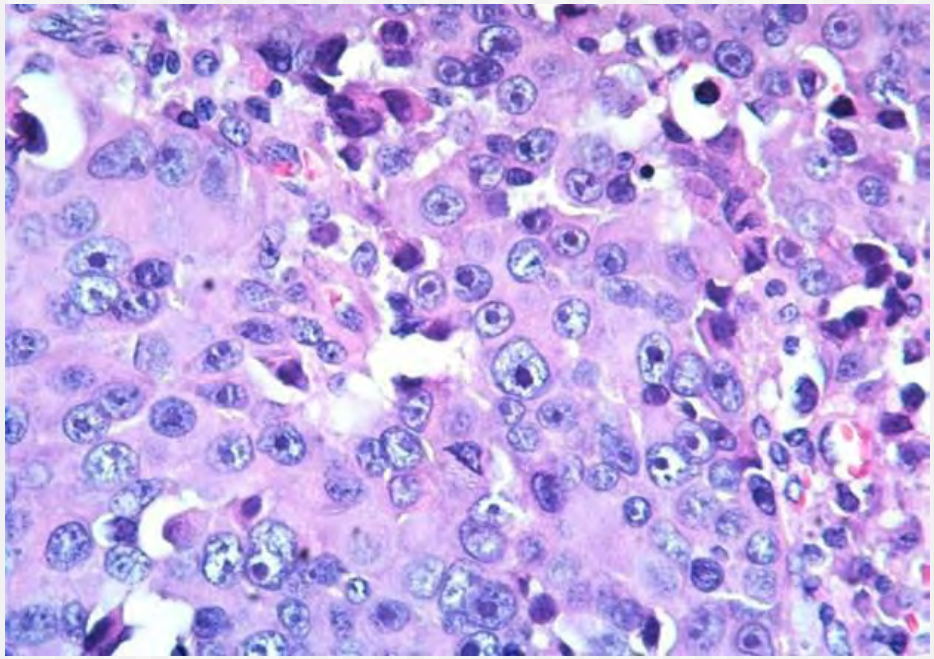
Lung tumours:
Large cell carcinoma (LCC)

- High grade
- Aggressive clinical course
- By exclusion diagnosis
  - ⇨ Non-adenocarcinoma
  - ⇨ Non-squamosous
  - ⇨ Non-neuroendocrine

IIC: p40/p63-, TTF-1-, CK7 +/-,
Chromogranin/sinaptophysin-

Lung tumours:
Large cell carcinoma (LCC)





Lung neoplasms:
Neuroendocrine tumours

- **Diffuse neuroendocrine cell hypeplasia**
- **Typical carcinoid** **G1**
- **Atypical carcinoide** **G2**
- **Neuroendocrine carcinoma** **G3**
  - → **SCLC (>50%)**
  - → **LCNEC**

  - ⇨ **Iceberg shaped**
  - ⇨ **Progressively more aggressive**
  - ⇨ **Endocrine marker (chromogranin, sinaptophysin, CD56)**
  - ⇨ **Endocrine symptoms**
    - **ACTH, gastrin, serotonin**

Pulmonary neoplasias:
Endocrine tumors

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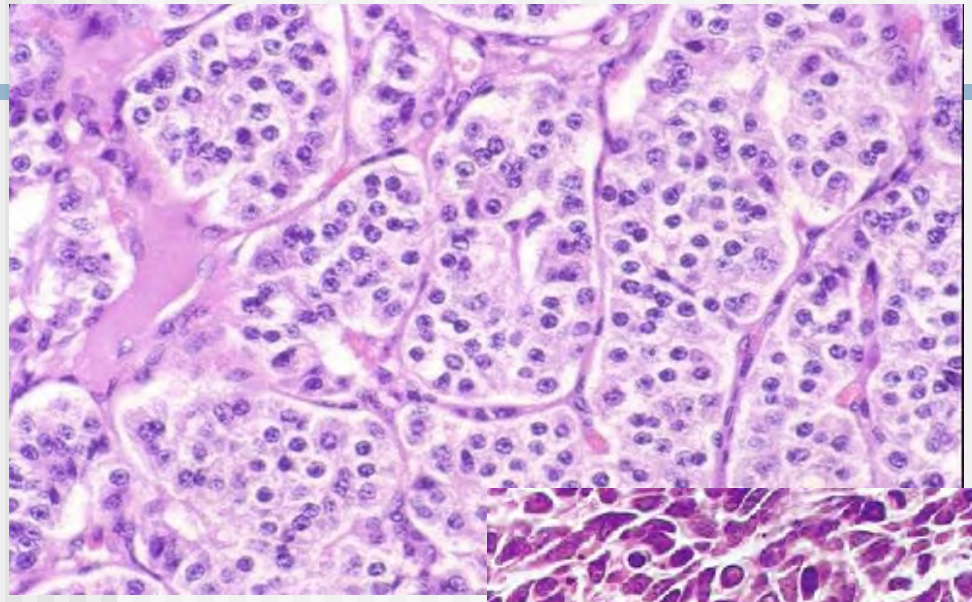
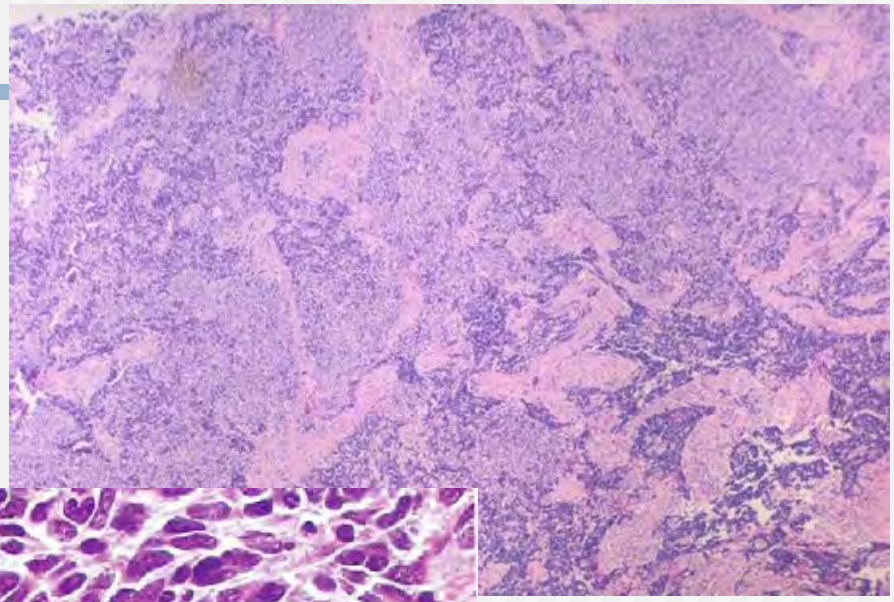
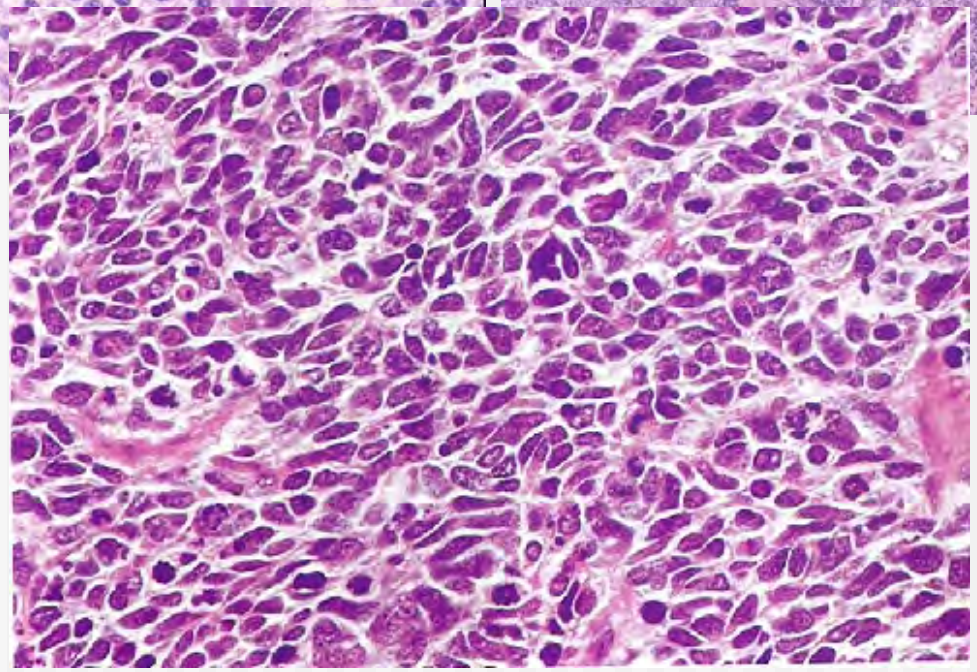
Neoplasie polmonari:
Tumori endocrini







Lung Tumours: secondary

- ***Secondary (metastatic spread)***
  Primary lung tumours can spread within the lung itself by lymphogenous and haematogenous routes or by transmigration of cells across alveoli and bronchi.
- The lung is a major site for metastases of tumours from other organs
- The most frequent primary sites include **breast, colonic** and **pancreatic carcinomas, skin squamous cell carcinoma, melanoma, lymphoma** and **osteosarcoma**.
- Multicentric neoplasms, such as lymphoma and mastocytoma, may have the lung as one of the tumour sites.
- Tumours of the larynx are rare and those of the trachea exceptional