RSM-7
LUNG TUMORS

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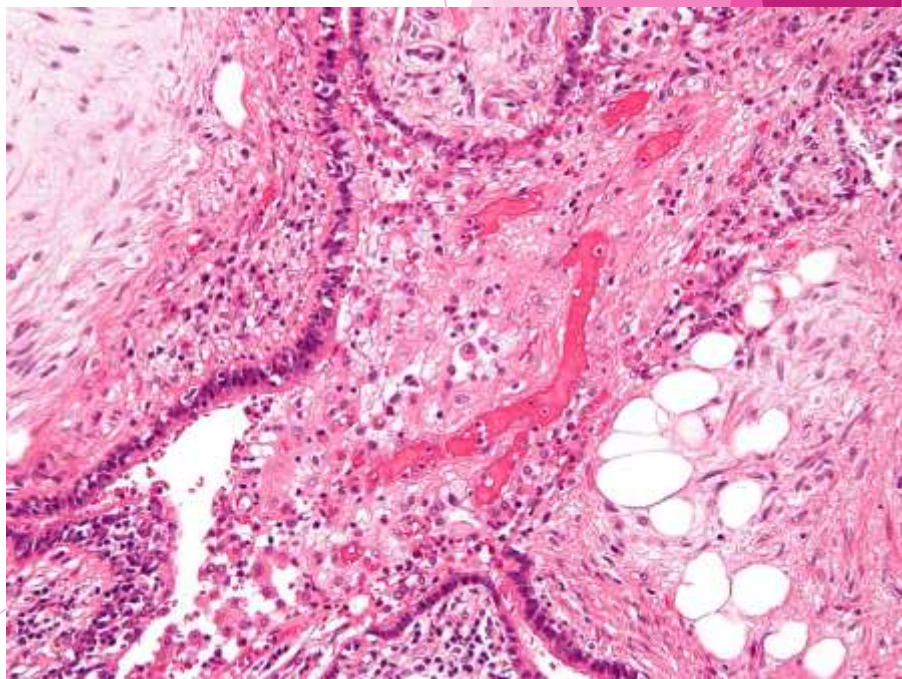
Asbestos Bodies

- Asbestos fibers accumulate in the interstitium of the lung and are coated by iron and hemosiderin in a beaded, clubbed fashion referred to as ferruginous or asbestos bodies.

- Roughly 95% of primary lung tumors are carcinomas; the remaining 5% span a miscellaneous group that includes:
  - carcinoids.
  - mesenchymal malignancies (e.g., fibrosarcomas, leiomyomas).
  - lymphomas.
  - benign lesions:
- The most common benign tumor is a spherical, small (1 to 4 cm), discrete “hamartoma”. It consists mainly of mature cartilage admixed with fat, fibrous tissue, and blood vessels in various proportions.



I. Carcinomas

- Carcinoma of the lung is the most important cause of cancer-related deaths in industrialized countries.
- The peak incidence of lung cancer is in individuals in their fifties and sixties.

- The four major histologic types of carcinomas of the lung are :
- Adenocarcinoma.
- squamous cell carcinoma.
- small cell carcinoma (a subtype of neuroendocrine carcinoma).
- large cell carcinoma

} strongest association with smoking,

Etiology and Pathogenesis

- 1. Genetic:
- Early: inactivation of the putative tumor suppressor genes located on the short arm of chromosome 3 (3p).
- Late: mutations in the TP53 tumor suppressor gene and the KRAS oncogene.
- A subset of adenocarcinomas, those arising in nonsmoking women, harbor mutations in (EGFR).
- 2. smoking:
- linear correlation between the frequency of lung cancer and pack-years of cigarette smoking.
- 3. occupational exposures

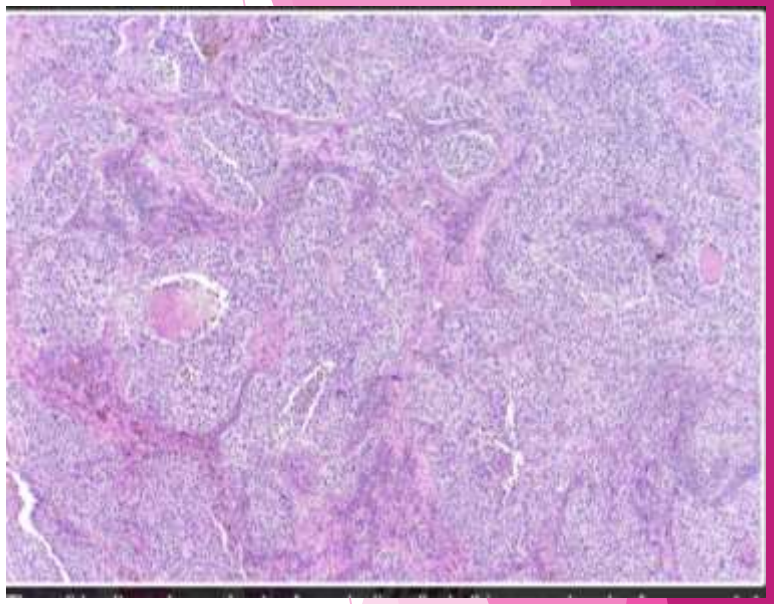
Table 13.6 Histologic Classification of Malignant Epithelial Lung Tumors (2015 WHO Classification, Simplified Version)

- Adenocarcinoma
  - Acinar, papillary, micropapillary, solid, lepidic predominant, mucinous subtypes
- Squamous cell carcinoma
- Large cell carcinoma
- Neuroendocrine carcinoma
  - Small cell carcinoma
  - Large cell neuroendocrine carcinoma
  - Carcinoid tumor
- Mixed carcinomas
  - Adenosquamous carcinoma
  - Combined small cell carcinoma
- Other unusual morphologic variants
  - Sarcomatoid carcinoma
  - Spindle cell carcinoma
  - Giant cell carcinoma

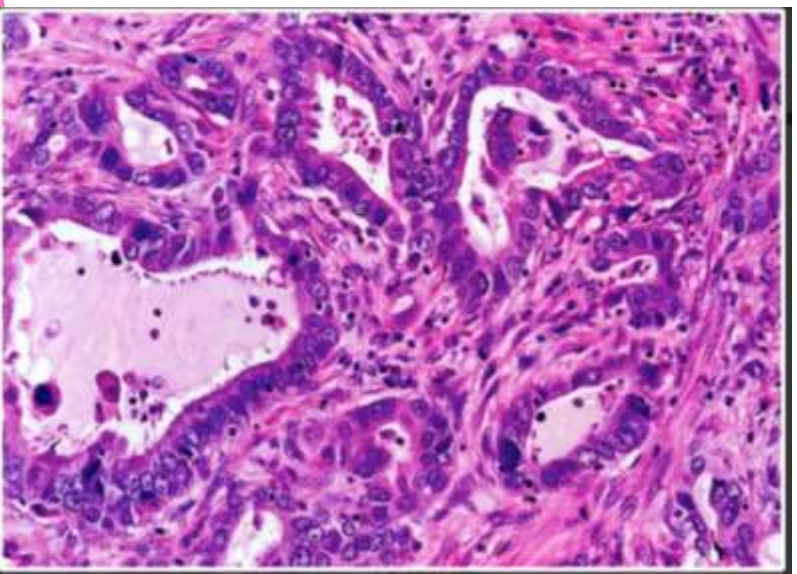
MORPHOLOGY

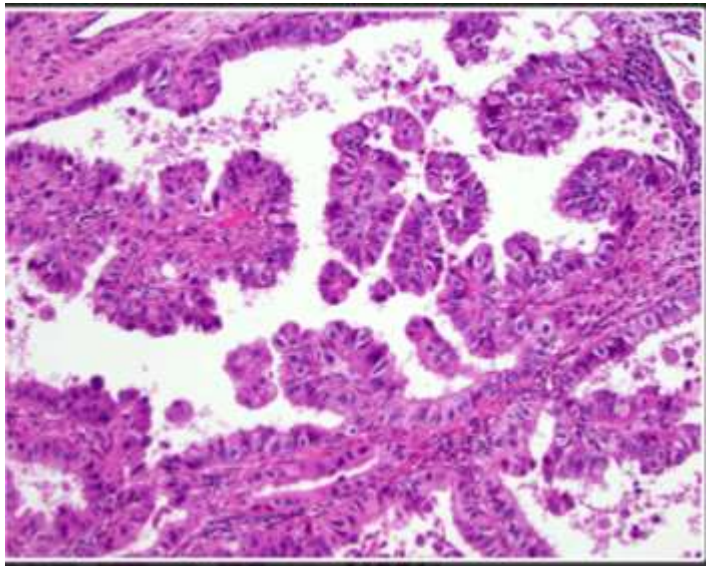
- Carcinomas of the lung begin as small lesions that typically are firm and gray-white.
- They may arise as intraluminal masses, invade the bronchial mucosa, or form large bulky masses pushing into adjacent lung parenchyma

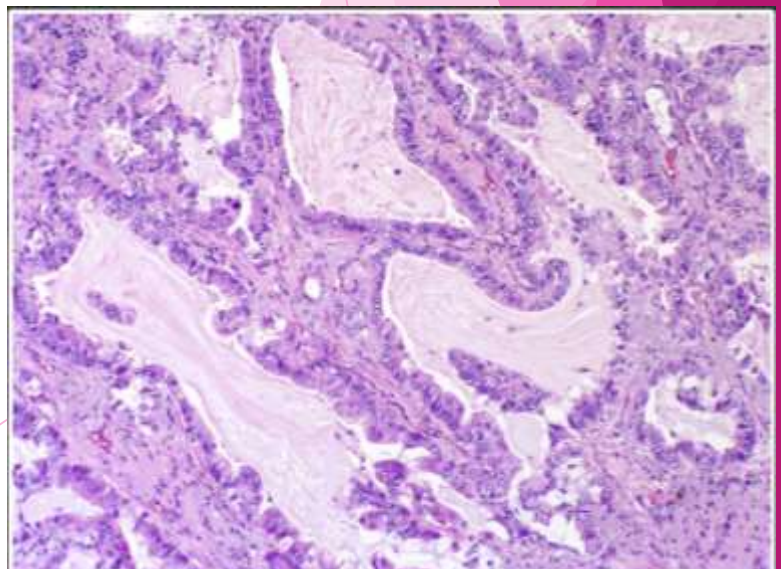
- 1. Adenocarcinomas:
- peripherally located lesions, grow slowly, tend to metastasize widely, at an early stage.



- They may assume a variety of growth patterns, including:
- acinar (gland-forming).
- Papillary.
- mucinous.
- solid types.

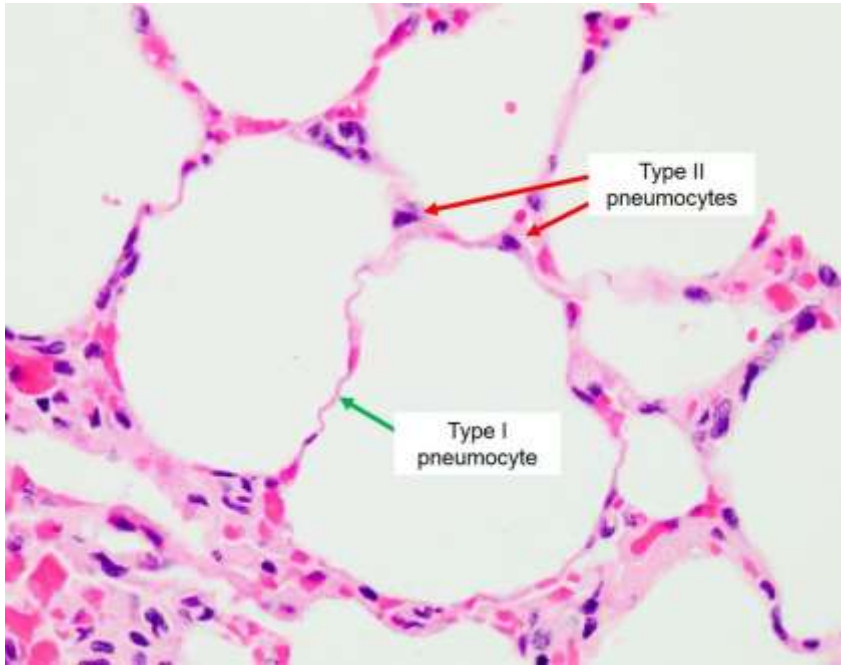


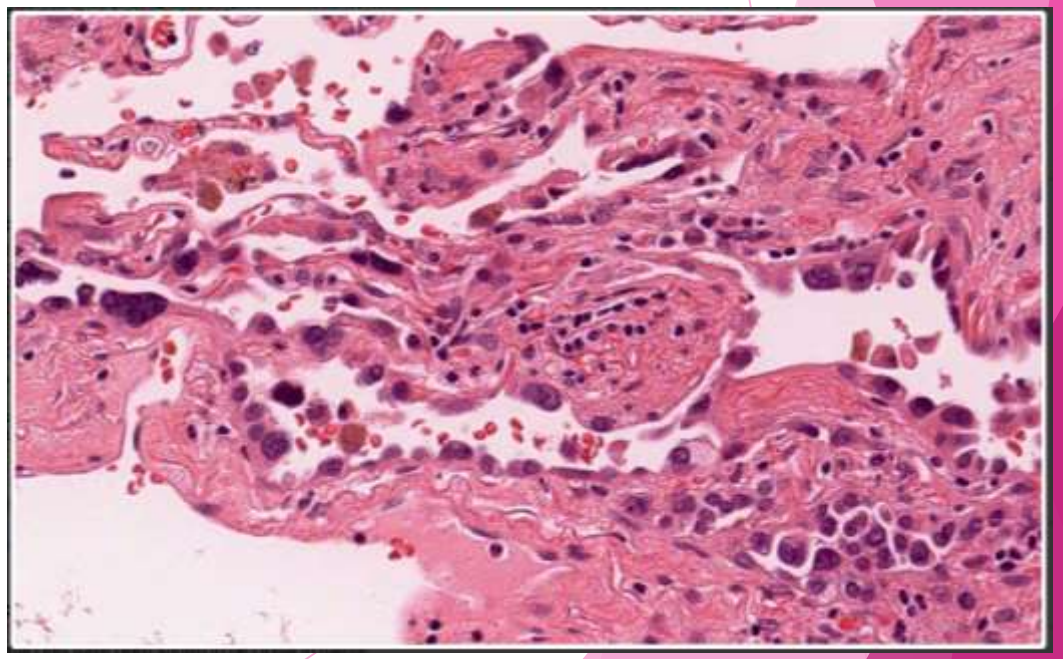




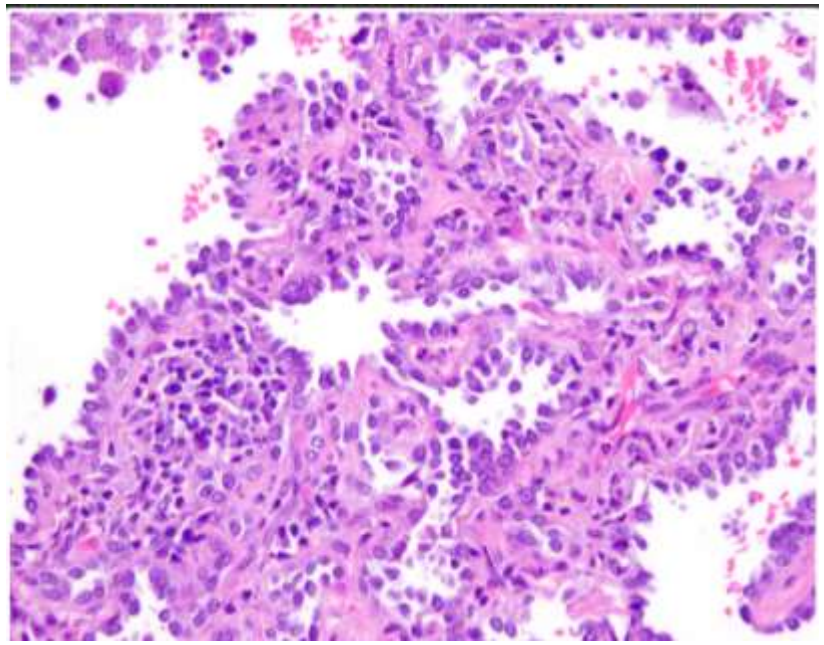
- The putative precursor of adenocarcinoma is :

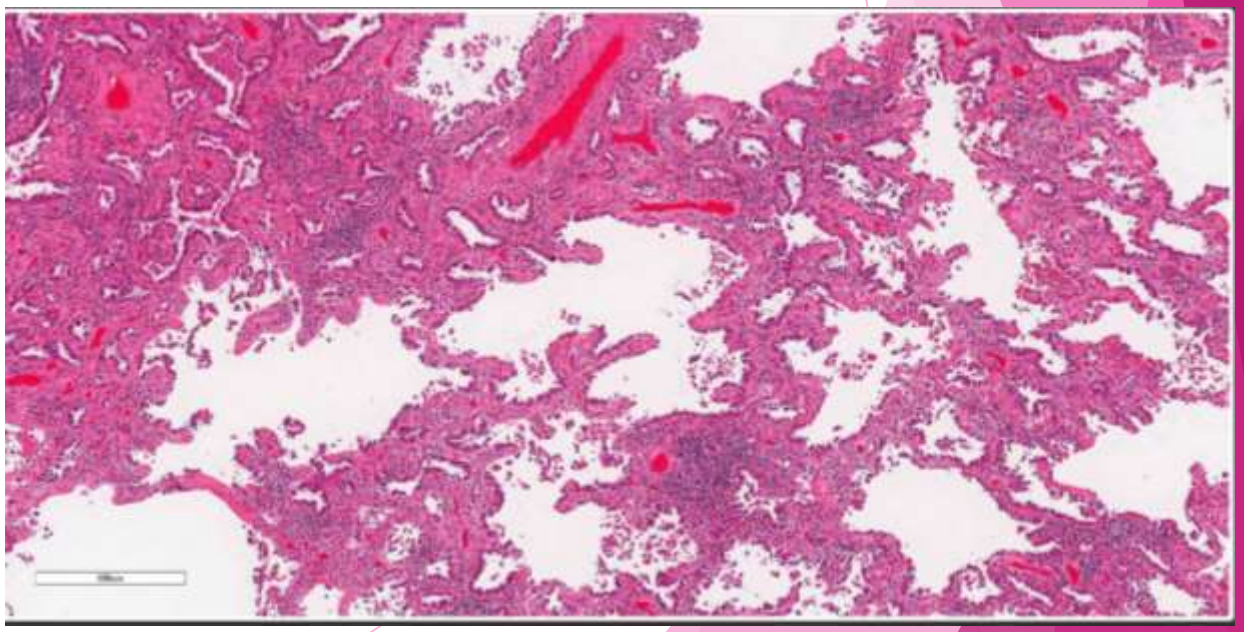
- Atypical adenomatous hyperplasia (AAH):
- well-demarcated focus of epithelial proliferation (with a diameter of 5 mm or less) composed of cuboidal to low-columnar cells that demonstrate nuclear hyperchromasia, pleomorphism, and prominent nucleoli, having KRAS mutations.





- Atypical adenomatous hyperplasia is thought to progress in a stepwise fashion to :
- adenocarcinoma in situ (diameter of 3 cm or less, growth along preexisting structures, and preservation of alveolar architecture).
- minimally invasive adenocarcinoma (<3 cm in diameter with an invasive component of <5 mm).
- Invasive adenocarcinoma (a tumor of any size with an area of invasion >5 mm).



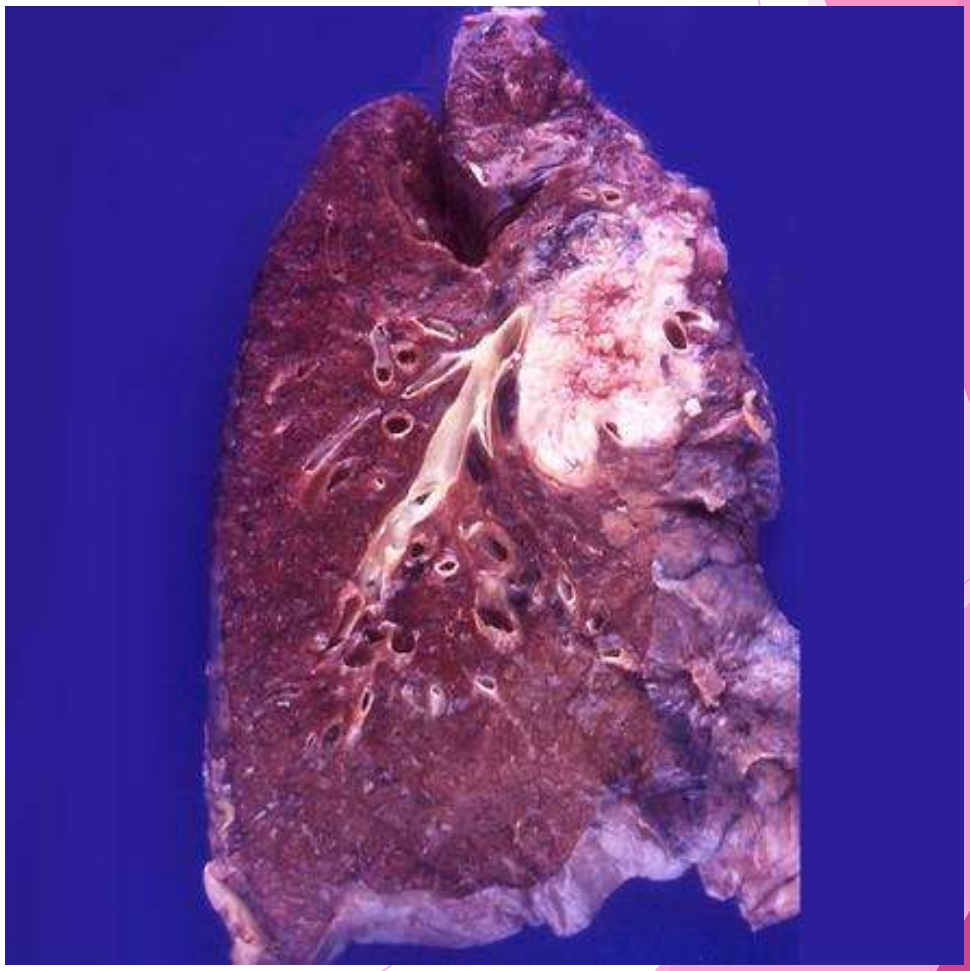


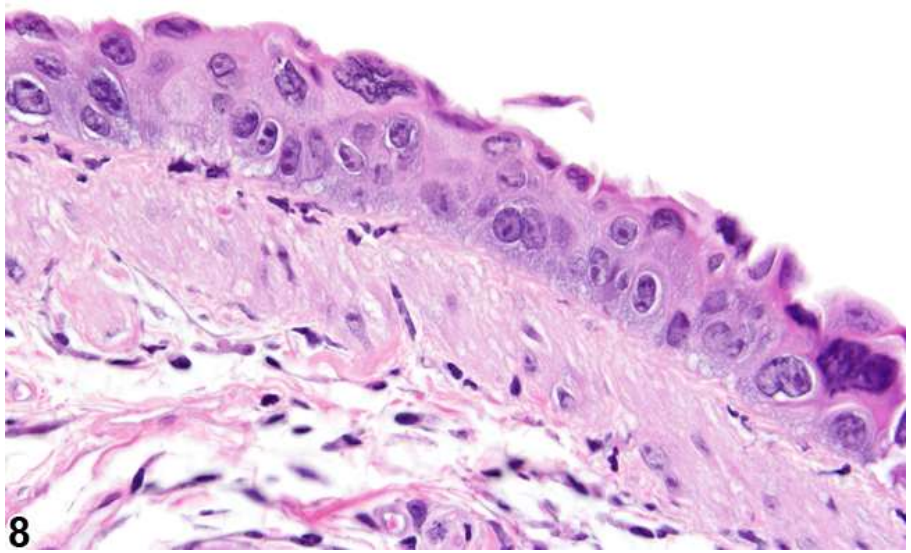
2. Squamous cell carcinomas

- More common in men than in women and are closely correlated with a smoking history.
- they tend to arise centrally in major bronchi and eventually spread to local hilar nodes.
- Large lesions may undergo central necrosis, giving rise to cavitation.

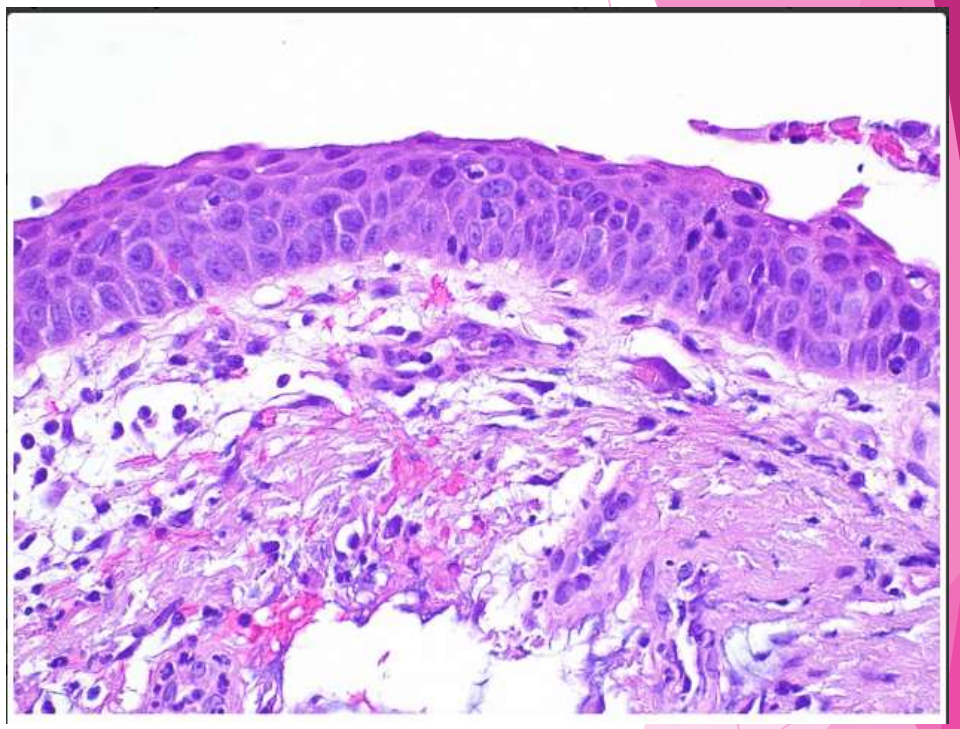
- squamous cell carcinomas often are preceded by the development of:
- squamous metaplasia or dysplasia.
- carcinoma in situ

- small neoplasm reaches a symptomatic stage, when a well-defined tumor mass begins to obstruct the lumen of a major bronchus, often producing distal atelectasis and infection



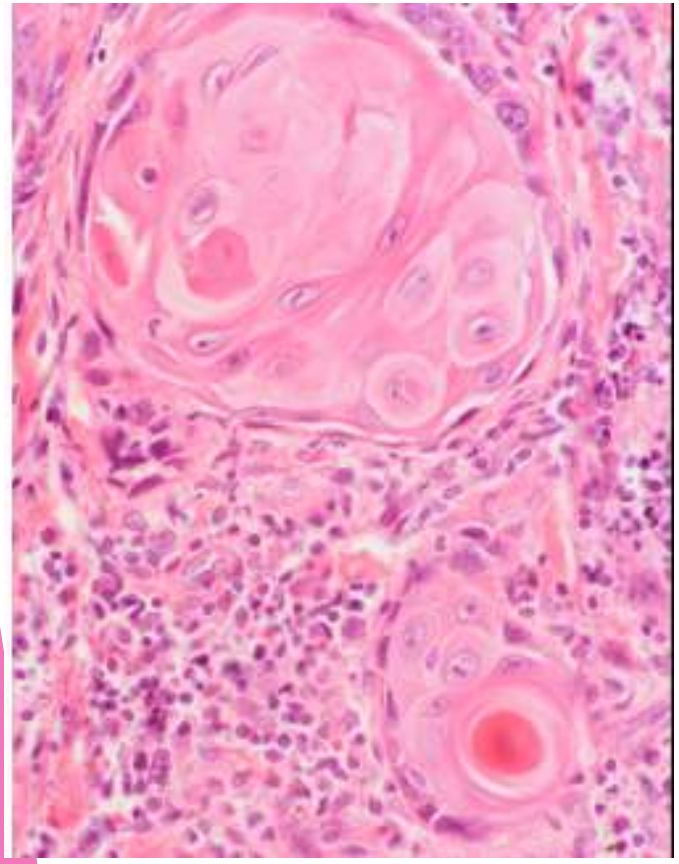


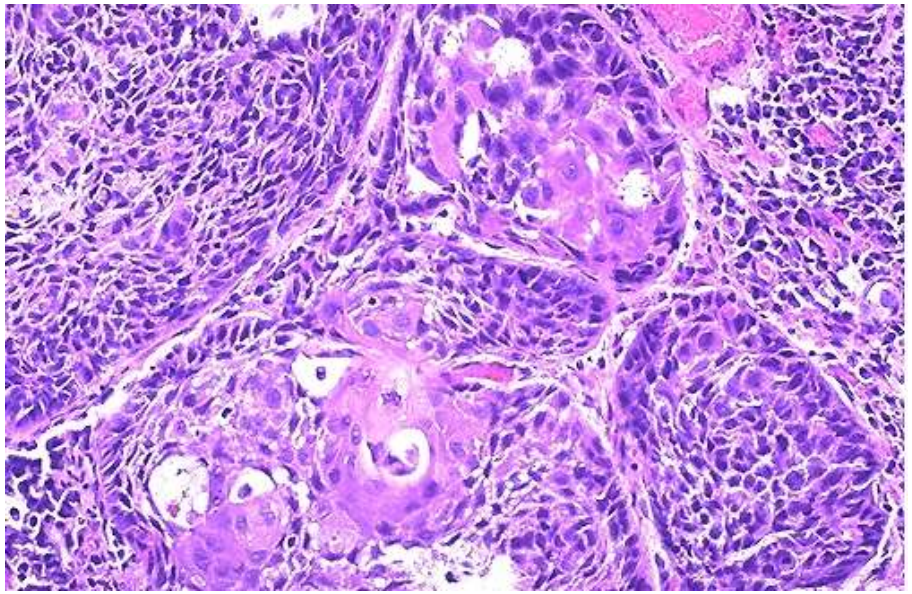
Squamous metaplasia

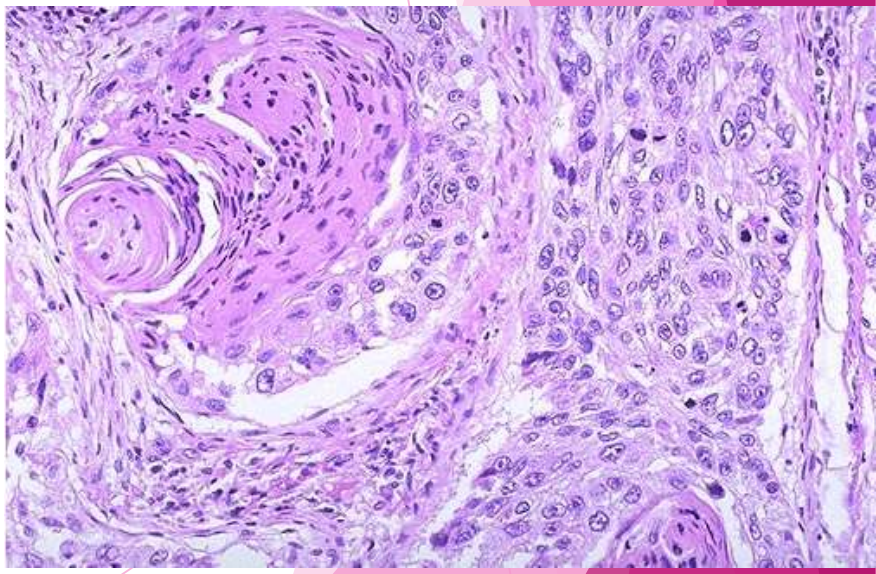


Squamous dysplasia

- On histologic examination, these tumors range from:
- well-differentiated squamous cell neoplasms showing keratin pearls and intercellular bridges.
- poorly differentiated neoplasms exhibiting only minimal squamous cell features

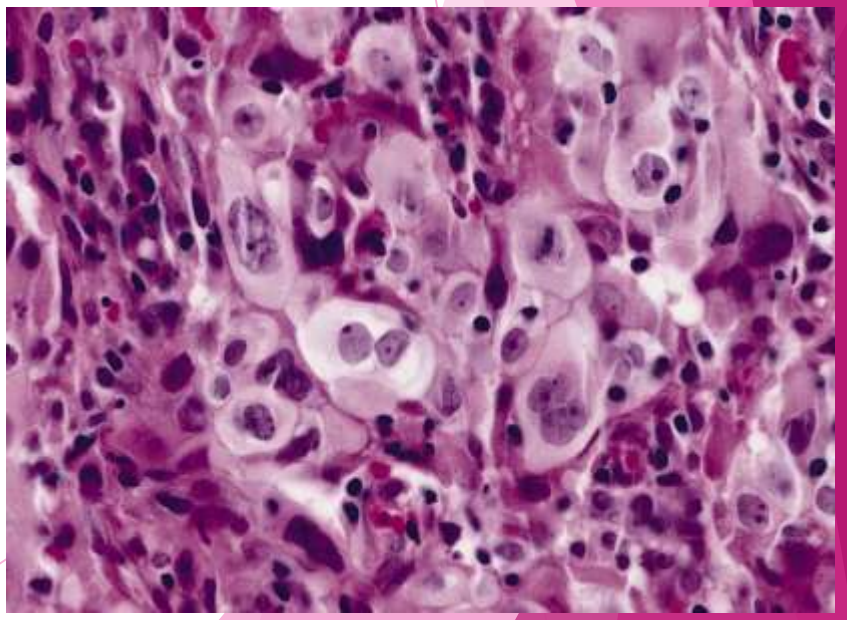






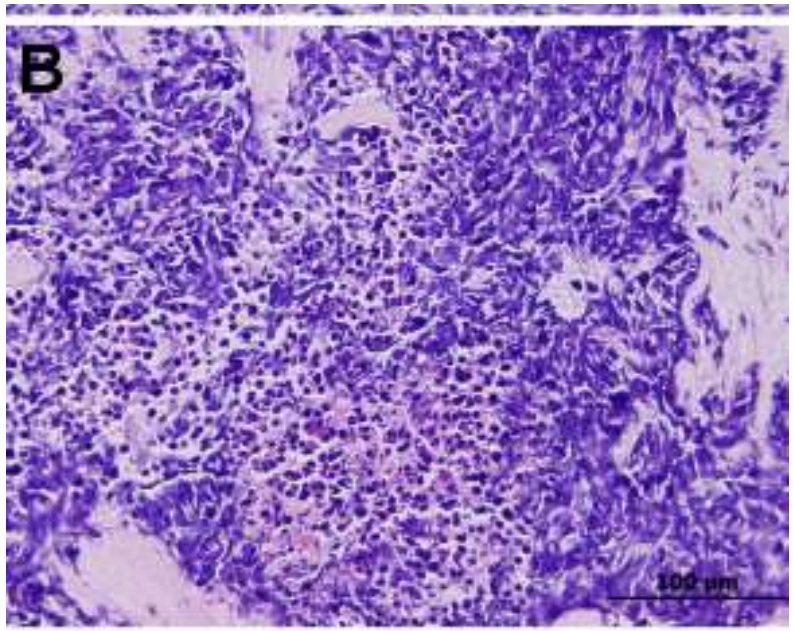
3. Large cell carcinomas

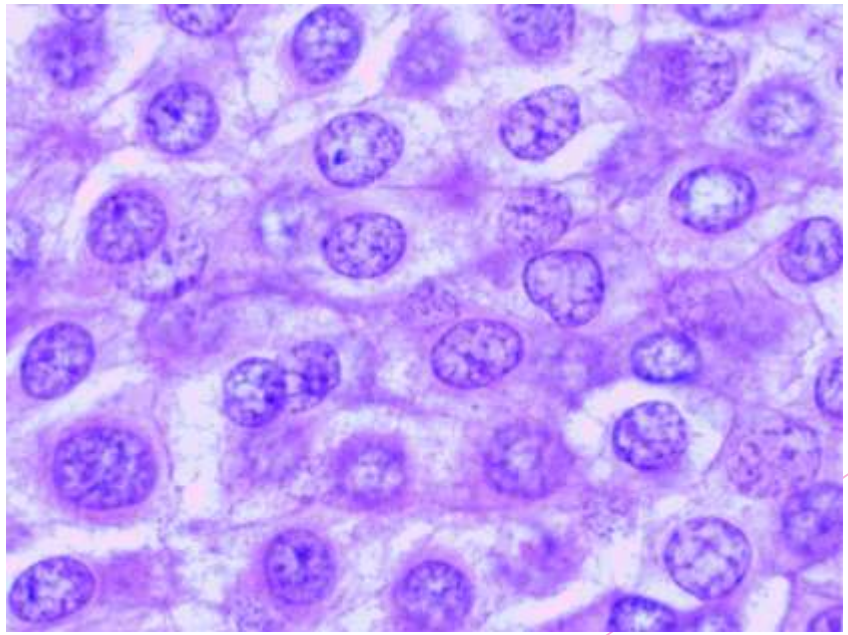
- undifferentiated malignant epithelial tumors that lack the cytologic features of neuroendocrine carcinoma and show no evidence of glandular or squamous differentiation.
- The cells typically have large nuclei, prominent nucleoli, and moderate amounts of cytoplasm



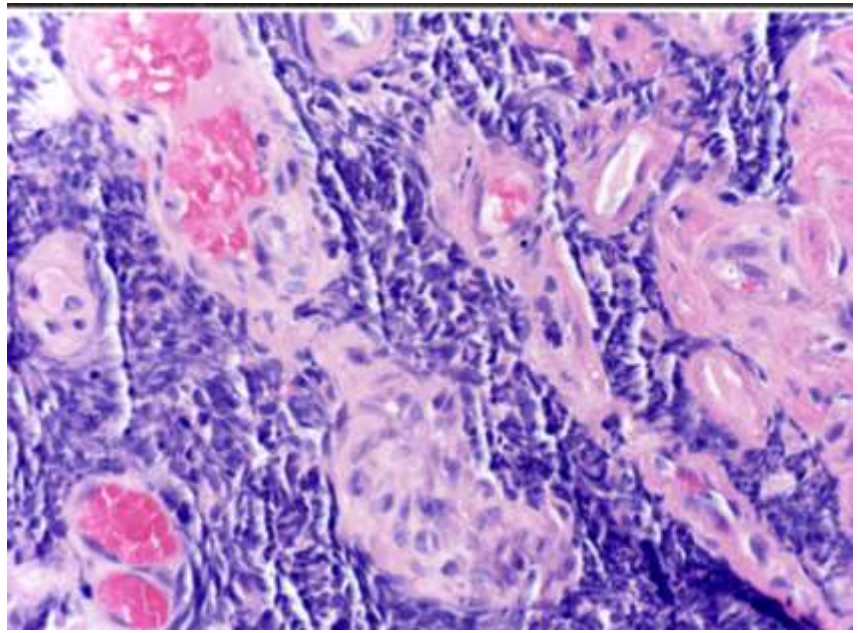
4. Small cell lung carcinomas (SCLCs)

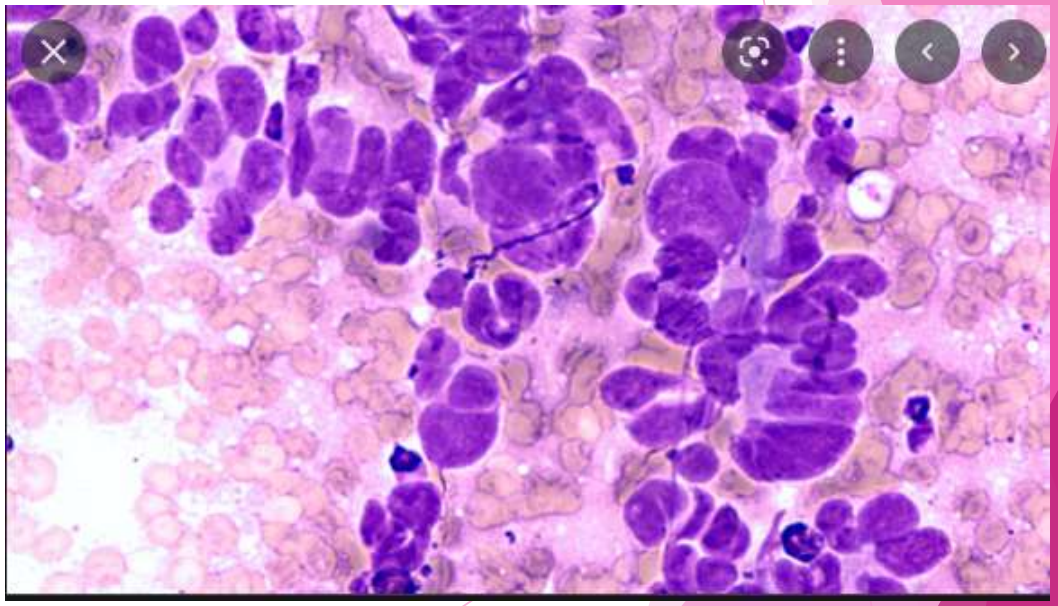
- Generally appear as pale gray, centrally located masses that extend into the lung parenchyma.
- These cancers are composed of relatively small tumor cells with a round to fusiform shape, scant cytoplasm, and finely granular chromatin with a salt and pepper..
- Extensive mitosis and necrosis.





- The tumor cells are fragile and often show fragmentation and “crush artifact” in small biopsy specimens.
- nuclear molding resulting from close apposition of tumor cells that have scant cytoplasm





Spread…

- Each of these lung cancer subtypes tends to spread to lymph nodes:
- carina ⇒ the mediastinum ⇒ the neck ⇒ clavicular regions.

- Involvement of the left supraclavicular node (Virchow node) is particularly characteristic and sometimes calls attention to an occult primary tumor.

- when advanced, lung tumors extend into the pleural or pericardial space, leading to inflammation and effusions

Pancoast tumor

- Apical neoplasms that may invade the brachial or cervical sympathetic plexus, causing severe pain in the distribution of the ulnar nerve or Horner syndrome (ipsilateral enophthalmos, ptosis, miosis, and anhidrosis)