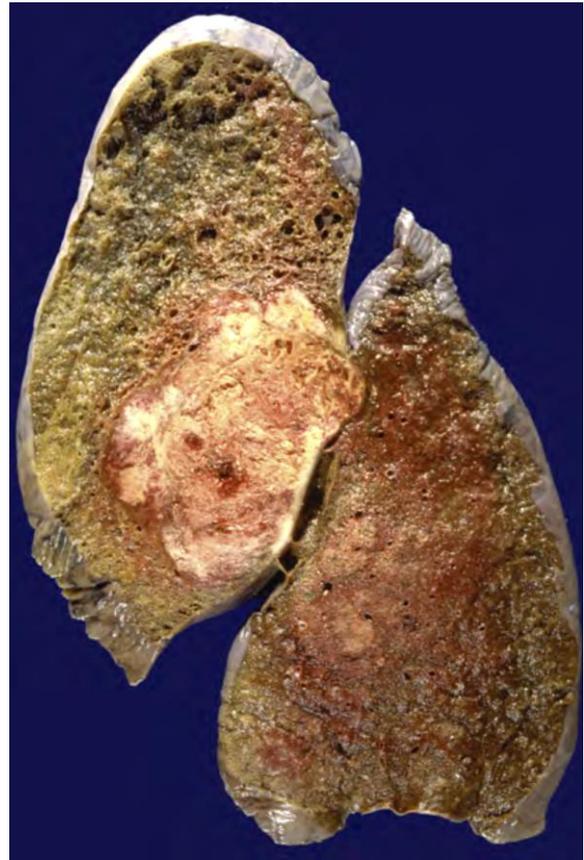


Lung Tumors

Bronchogenic carcinoma

The term bronchogenic carcinoma is used for cancer of the lung which includes carcinoma arising from the respiratory epithelium lining the bronchi, bronchioles, and alveoli.

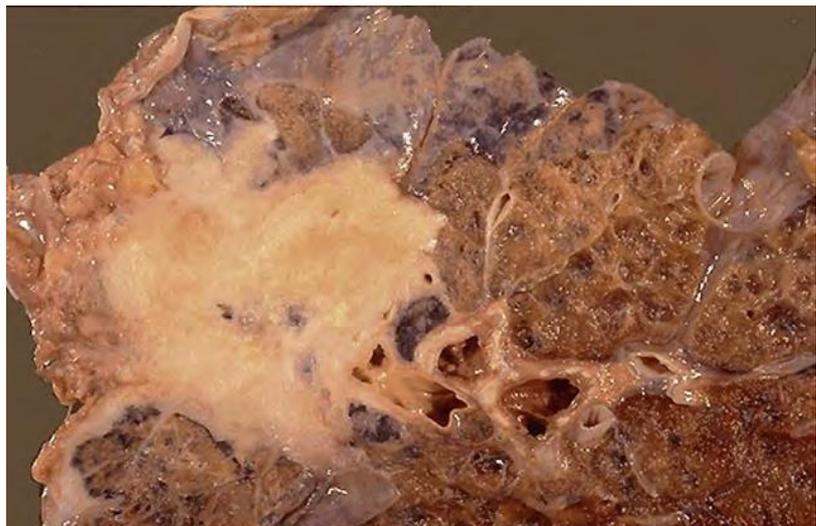
Gross section: The large carcinoma (◆) in the upper lobe is arising in a lung with emphysema, suggesting cigarette smoking as a risk factor. There are patchy infiltrates in the lower lobe representing pneumonia, likely from central airway obstruction by this large mass. Common genes that cause cancers are TP53 and KRAS.



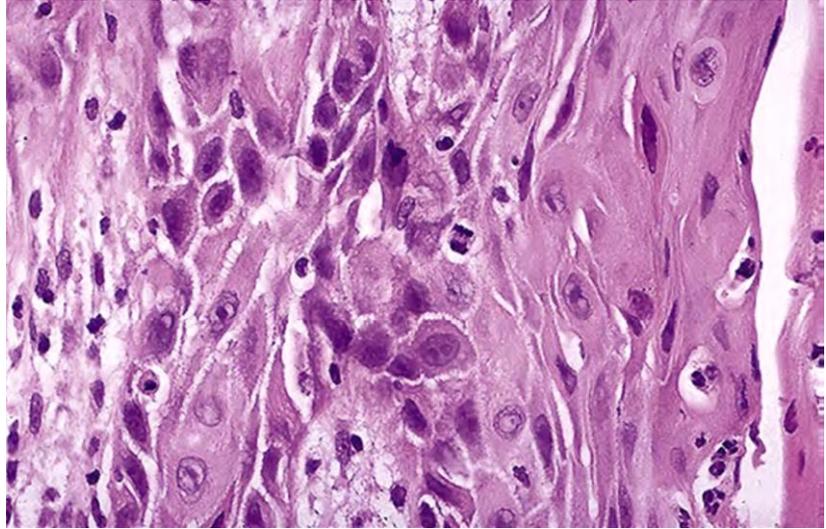
1. Squamous cell carcinoma

Gross: This carcinoma (◆) is arising centrally in the lung and is obstructing the main bronchus.

This neoplasm is very firm and has a pale white cut surface. This is one of the most common primary malignancies of the lung and is most often seen in smokers; emphysema is also seen here. The black areas represent anthracosis pigment trapped in the tumour and lymph nodes.



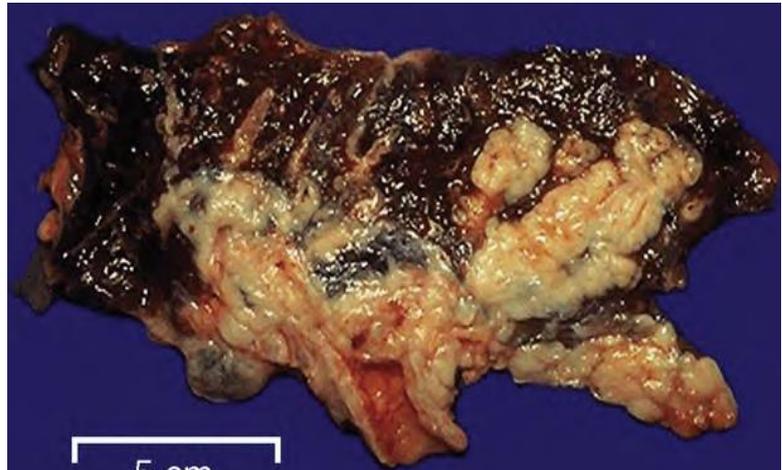
Microscopic: The cells with their pink cytoplasm containing keratin along with distinct cell borders and intercellular bridges (▲) are characteristic of squamous cell carcinoma. mitotic figure (◆) is



present. Most bronchogenic carcinomas are poorly differentiated, however. *RB*, *TP53*, and *p16* gene mutations are often present.

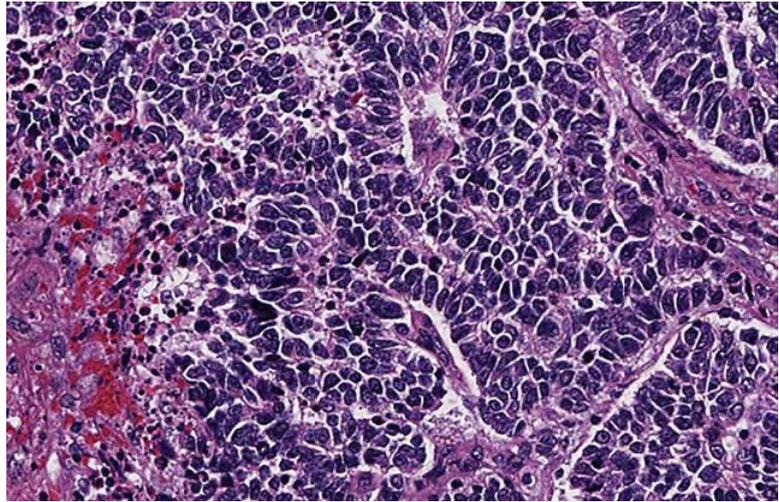
2. Small cell carcinoma

Gross: Arising centrally in this lung and spreading extensively is a small cell anaplastic (oat cell) carcinoma. The cut surface of this tumour has a soft, lobulated, white appearance.



This tumour has obstructed the main bronchus so that the distal lung (↓) is collapsed (atelectatic). Oat cell carcinomas are very aggressive and often metastasize widely before the primary tumour mass in the lung reaches a large size. These neoplasms are more amenable to chemotherapy than radiation therapy or surgery, but the prognosis is still poor. Oat cell carcinomas occur almost exclusively in smokers.

Microscopic: The small dark-blue cells (resembling rolled oats; hence “oat cell”) with minimal cytoplasm (high nuclear-to-cytoplasmic ratio) are packed together in sheets and irregular nests. Mutations in *TP53* and *RB* tumour suppressor genes and antiapoptotic *BCL2* genes are often present.



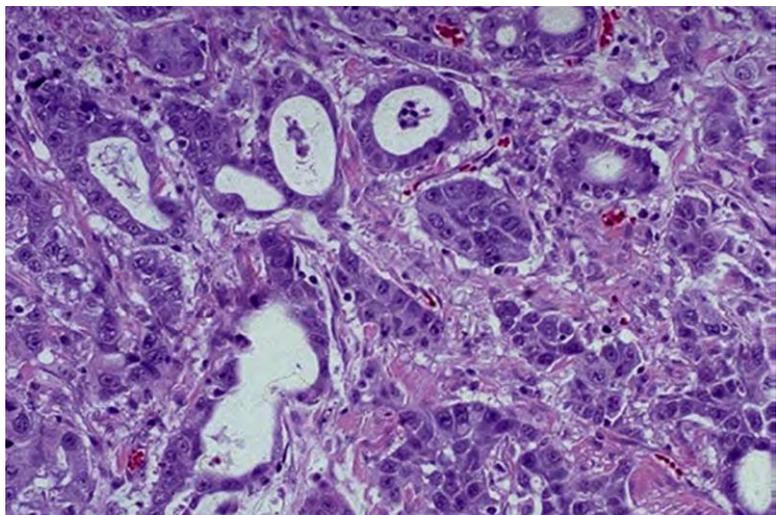
3. Adenocarcinoma

Gross: Adenocarcinomas and large-cell anaplastic carcinomas tend to arise peripherally in the lung. Adenocarcinoma is the one cell type of primary lung tumour that occurs more



often in non-smokers and in smokers who have quit. If this neoplasm were confined to the lung (a lower stage), resection would have a greater chance of cure. The solitary appearance of this neoplasm suggests that the tumour is primary rather than metastatic.

Microscopic: The glandular structures (◆) formed by this neoplasm are consistent with a moderately differentiated adenocarcinoma. Droplets of mucin may be found within the tumour cell cytoplasm.

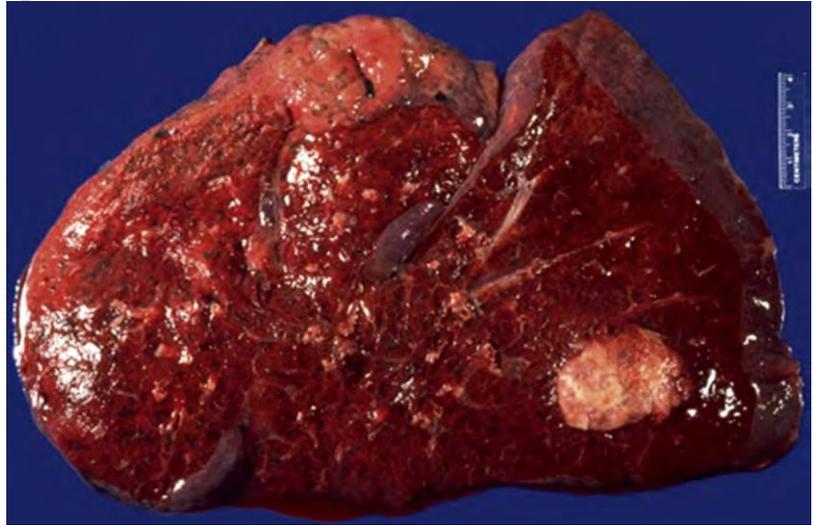


Prominent nucleoli are often present. Many bronchogenic carcinomas, including

adenocarcinomas, are poorly differentiated, however, making a diagnosis of the cell type difficult. *EGFR* mutations are characteristic in nonsmokers; *K-RAS* mutations are more likely to be present in smokers.

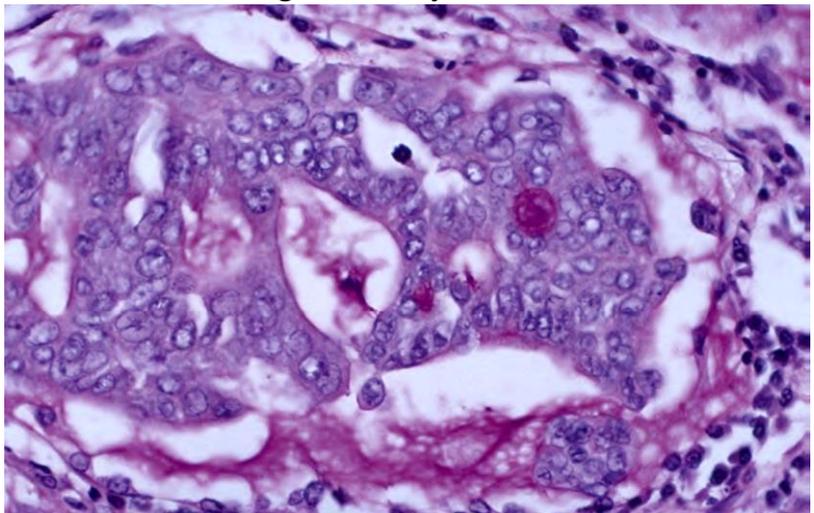
4. Large cell carcinoma

Gross: The peripheral lung mass (↓) seen here in a smoker proved to be a large cell anaplastic carcinoma. This type of bronchogenic carcinoma is poorly differentiated, without light



microscopic features of either adenocarcinoma or squamous cell carcinoma.

Microscopic: A large cell carcinoma is distinguished by its distinct lack of glandular or squamous differentiation. Many large cell carcinomas are probably adenocarcinomas or squamous carcinomas that are so poorly differentiated that it is difficult to determine the cell of origin. Seen here



with PAS stain are droplets (↑) of intracellular mucin that suggest adenocarcinoma.