Tumors of lung

- A number of benign and malignant tumours occur in lungs but the primary lung cancer, commonly termed bronchogenic carcinoma, is the most common (95% of all primary lung tumours).
- Lung is also commonest site for metastasis from carcinomas and sarcomas.
- WHO classification of lung tumors

I. **EPITHELIAL TUMOURS**

A. Benign

1. Papilloma
2. Adenoma

B. Dysplasia and carcinoma in situ

C. Malignant

Bronchogenic carcinoma

1. Squamous cell (epidermoid) carcinoma
2. Small cell carcinoma

i) Oat cell carcinoma
ii) Intermediate cell carcinoma
iii) Combined oat cell carcinoma

3. Adenocarcinoma

i) Acinar adenocarcinoma
ii) Papillary adenocarcinoma
iii) Bronchiolo-alveolar carcinoma
iv) Solid carcinoma with mucus formation

4. Large cell carcinoma
5. Adenosquamous carcinoma

Other carcinomas

1. Pulmonary neuroendocrine tumour (carcinoid tumour)
2. Bronchial gland carcinomas

i) Adenoid cystic carcinoma
ii) Mucoepidermoid carcinoma

II. **SOFT TISSUE TUMOURS**
(Fibroma, fibrosarcoma; leiomyoma,
leiomyosarcoma; lipoma,
chondroma, haemangioma, lymphangioma, granular
cell
myoblastoma)
III. **PLEURAL TUMOURS**
A. Benign mesothelioma
B. Malignant mesothelioma
IV. **MISCELLANEOUS TUMOURS**
1. Carcinosarcoma
2. Pulmonary blastoma
3. Malignant melanoma
4. Malignant lymphoma
V. **SECONDARY TUMOURS**

Bronchogenic carcinoma

- Lung cancer is most common primary malignant tumour in men and accounts for nearly 30% of all cancer deaths in both sexes in developing countries.
- Disease of middle and late life with peak incidence in 55-65 years of age.
- Slight decline in lung cancer deaths in males due to smoking cessation
- For therapeutic purposes, bronchogeni carcinoma classified into 3 groups:
- 1. Small cell carcinomas, SCC (20-25%)
- 2. Non-small cell carcinomas, NSCC (70-75%) (includes squamous cell carcinoma, adenocarcinoma, and large cell carcinoma)
- 3. Combined/mixed patterns (5-10%).

Aetiology

Smoking:

- i) Total dose
- ii) Histologic alterations
- iii) Mechanism

Other factors:

- Atmospheric pollution
- Occupational causes
- Dietary factors
- Chronic scarring

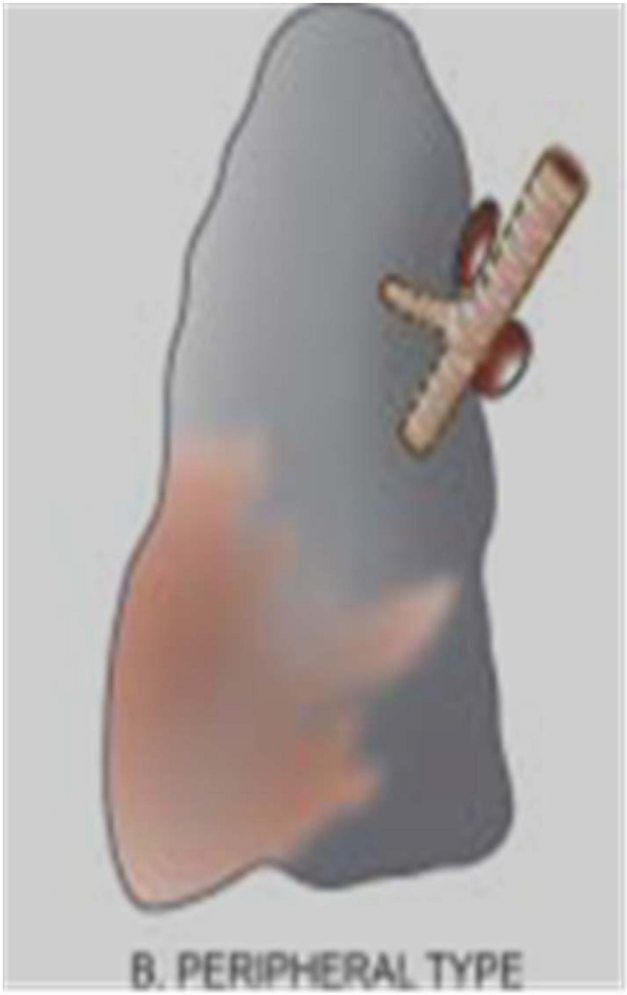
- **Molecular Pathogenesis:**
- 1. Activation of growth-promoting oncogenes-Mutation in *K-RAS oncogene*
- 2. Inactivation of tumour-suppressor genes-inactivation of *p53 and Rb gene*
- 3. Autocrine growth factors-multistep process—initiator carcinogen causing mutation, followed by action of tumour promoters
- 4. Inherited predisposition-inherited *p53* mutation, Mutations of cytochrome P450
- 5. Molecular targets for therapy and survival prediction-*EGFR mutations and NSCC therapy, VEGF and monoclonal therapy, Molecular signature gene for prediction*

Morphology

- Most common location is *hilar, followed in descending frequency by peripheral type.*
- ***Hilar type:*** arises in the main bronchus or one of its segmental branches producing nodular or ulcerated surface, carcinoma grows into a friable spherical mass, 1 to 5 cm in diameter, narrowing and occluding the lumen. The c/s of the tumour is yellowish-white with foci of necrosis and haemorrhages which may produce cavitary lesions- Squamous and small cell carcinoma


A. HILAR TYPE

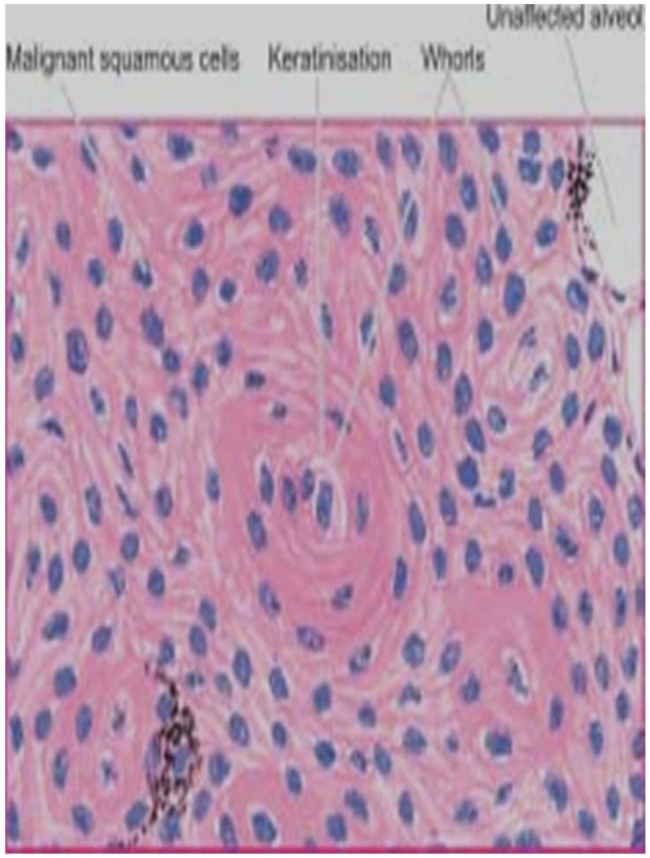
- ***Peripheral type:*** chiefly adenocarcinomas including bronchioloalveolar carcinomas, originate from a small peripheral bronchiole
- Tumour is single nodule or multiple nodules in the periphery of the lung producing pneumonia-like consolidation of a large part of the lung.
- c/s of the tumour is greyish and mucoid.

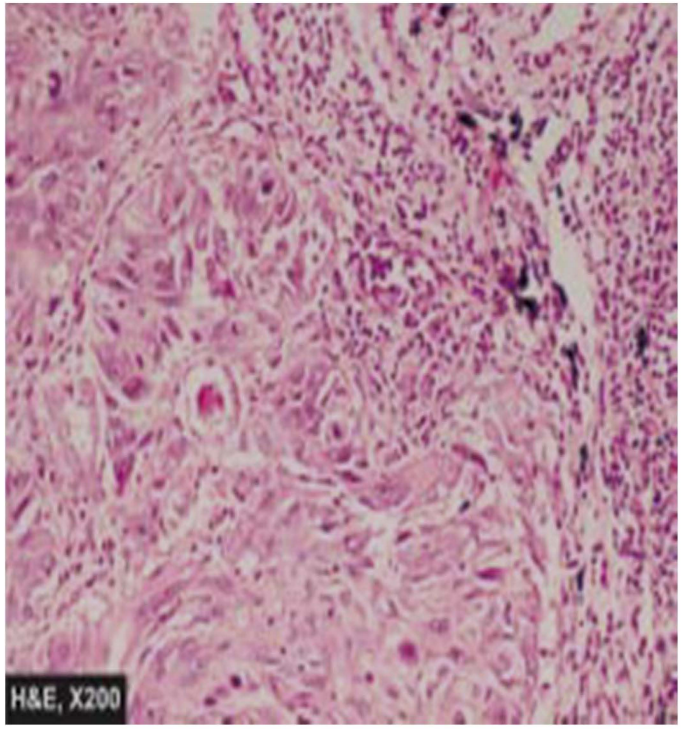


B. PERIPHERAL TYPE

Squamous cell carcinoma

- **G/A:**
- Most common histologic subtype of bronchogenic carcinoma more common in men, often with history of tobacco smoking.
- Tumour usually arise in a large bronchus and prone to massive necrosis and cavitation.
- **M/E:**
- Diagnosed by identification of either intercellular bridges or keratinisation. The tumour may show varying histologic grades of differentiation as well-differentiated, moderately-differentiated and poorly differentiated


Malignant squamous cells
Keratinisation
Whorls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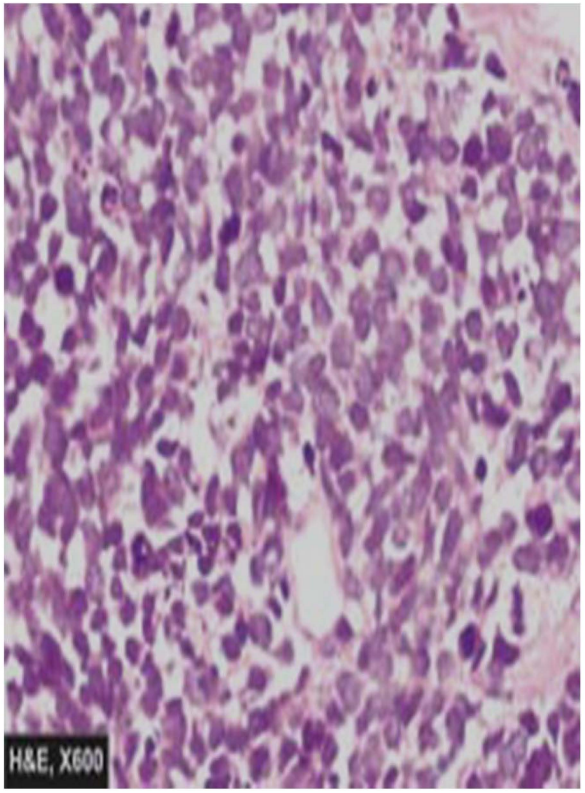
Small cell carcinoma

- Frequently hilar or central in location, have strong relationship to cigarette smoking and are highly malignant tumours.
- *Also called oat cell carcinoma, is composed of uniform, small cells,* larger than lymphocytes with dense, round or oval nuclei having diffuse chromatin, inconspicuous nucleoli and very sparse cytoplasm (*oat = a form of grain).*
- *Cells are* organised into cords, aggregates and ribbons or around small blood vessels forming pseudorosettes


Small tumour cells
Pseudorosette
Sheets and cords
Fibrovascular septa
Necrosis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- **Spread:**
- Direct spread
- Lymphatic spread
- Hematogenous spread
- **Clinical features:**
- Diagnostic test include CT scan of the chest, cytologic examination of the sputum, bronchial washings and bronchioalveolar lavage.
- Local symptoms
- Bronchial obstructive symptoms
- Symptoms due to metastases
- Paraneoplastic syndromes

Metastatic tumors

- Metastatic tumours of the lungs are more common than primary tumours
- Metastases from carcinomas as well as sarcomas arising from anywhere in the body may spread to the lung by haematogenous or lymphatic routes, or by direct extension. Blood-borne metastases are the most common.
- Metastases most common in the peripheral part of the lung forming single or multiple, discrete nodular lesions which appear radiologically as *'cannon-ball secondaries'*
- Most common metastases in the lungs are: carcinomas of the bowel, breast, thyroid, kidney, pancreas, lung (ipsilateral or contralateral) and liver.