Lung Tumors

95% of primary lung tumors arises from bronchial epithelium (bronchogenic carcinoma), the remaining 5% are a group that includes bronchial carcinoid, mesenchymal tumors (fibrosarcoma, leiomyomas) and lymphoma.

***A- Bronchogenic carcinoma:-***

Histologic classification of bronchogenic Ca.:-

I- non small cell carcinoma (70-75% ):-

1- squamous cell (epidermoid ) carcinoma

2- adenocarcinoma including bronchioloalveolar carcinoma

3- large cell carcinoma

II- small cell carcinoma (20-25%)

III- combined pattern

***Etiology***

1-bronchogenic Ca. Similar to cancers of other sites arise by stepwise accumulation of genetic abnormalities that results in transformation of benign bronchial epithelium into neoplastic tissue

2- smoking of cigarette

3- air pollution

4- radiation exposure

5- asbestos exposure ( increase incidence if combined with smoking )

***Morphology***

***1- squamous cell carcinoma*** is more common in men than in women they tend to arise centrally in major bronchi and spread to local hilar nodes but they disseminate outside the thorax later than the other types.

Large lesions undergo necrosis and cavitation these lesions greatly increase in cigarette smoking

Squamous cell carcninoma is preceded for years by squamous Metaplasia or dysplasia.

Microscopically:-

These tumors range from well differentiated sq.C.Ca showing keratin pearls to poorly differentiated Ca. Having only minimal residual sq. Cell features individual cells have abundant cytoplasm, pleomorphic nuclei, with coarse chromatin.

***2- Adenocarcinomas:-***

are usually more peripherally located, many arising in relation to peripheral lung scars

adenocarcinomas have the weakest association with previous history of smoking among the 4 major subtypes, they tend to metastasize at an early stage.

*Microscopically;-*

They assume a variety of forms including acinar, papillary and solid type.

The precursor lesion has been described as atypical adenomatous hyperplasia which appears as a focus of epithelial proliferation composed of cuboidal to low columnar cells with various degree of atypia (nuclear hyperchromasia, pleomorphism).

Individual cells in adenocarcinoma show abundant cytoplasm. prominent nucleoli.

*Bronchioloalveolar Ca.: -*

is a subtype of adenocarcinoma has peripheral location, less clearly related to smoking

on X-ray it appears as multiple densities mimicking pneumonia

*microscopically:-*

columnar to cuboidal tumor cells line alveolar wall.

***3- Small cell Carcinoma:***

it appears as pale gray mass, centrally located with early involvement of hilar and mediastinal LN. This tumor undergoes necrosis. S.C.ca. originates from neuroendocrine cells of the lung.

Microscopically: -

these cancers are composed of tumor cells with rounded shape and scanty cytoplasm and finely granular chromatin

mitotic figure are frequently seen, tumor cells are twice the size of lymphocytes.

In cytologic smears: - there's nuclear molding due to close apposition of tumor cells.

***B- Other lung tumors like:-***

***Bronchial Carcinoids***

are thought to arise from kulchitsky cells (neuroendocrine cells line bronchial mucosa)

Bronchial carcinoids Appears at early age (mean 40 years, and represent 5% of pulmonary tumor.

***Clinical features:-***

Cough, haemoptysis and recurrent bronchial and pulmonary infection (only rarely may result in carcinoid syndrome).

***Morphologic features***

Grossly :- most bronchial carcinoids arise in main stem bronchi in one of two forms

1- polypoid obstructing mass

2- mucosal plaque penetrating the wall

5-15% metastasize to hilar LN . With rare distant metastasis.

Microscopically :-

composed of nests of uniform cells that have round regular nuclei with little pleomorphism and rare mitosis ( abundant mitosis à atypical carcinoids )

***Clinical features of Bronchogenic Ca.***

1- cough , haemoptysis , bronchial obstruction with atelectasis and pneumonitis .

2- superior vena cava syndrome :- due to compression and invasion of superior vena cava which results in facial swelling and cyanosis , and dilation of the veins of head and neck and upper extremities

3- Horner syndrome: ( ptosis , miosis and anhidrosis ) due to involvement of cervical sympathetic plexus by apical lung tumor.

4- Hoarseness of voice due to involvement and paralysis of recurrent laryngeal nerve.

5- Pleural effusion: bloody effusion.

6- Paraneoplastic endocrine syndromes due to secretion of hormone and hormone related peptide by tumor cells like:

A- parathyroid hormone related peptide in Sq.C.Ca → hypercalcemia.

B- ACTH or ACTH like peptide → Cushing syndrome in S.C.Ca

C- antidiuretic hormone →inappropriate secretion of ADH in small cell Ca.