Lung Cancer (Carcinoma)

- Cancer arising from the epithelium cells of the respiratory tract.

Aetiology

1) Cigarette smoking 40 times more than a non smoker
2) Passive smoking 5/.
3) Radon Gas
4) Asbestos Disease
5) Air pollution
6) Radiation - xray, CT scan.

Risk Factor

- Male Predominance, Passive smoking, Age.

Pathology

Types of epithelial cells in Respiratory tract.
1) Ciliated cells → sweep bacteria.
2) Goblet cells → Mucin
3) Basal Cells → Differentiate
4) Neuroendocrine cells → Produce hormones in blood.

- Mutation of the epithelial cells when they are triggered by smoking or other factor.
↓
Uncontrolled proliferation
↓
Angiogenesis
↓
Breaks from the Basement membrane
↓
Metastasis → 6) Adrenal.
→ 5) Liver
↓ ↓
1) Mediastinum 2) Pleura 3) Heart 4) Breast 7) Bone
↓ Hilar Lymph nodes
8) Brain.

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Types:

1) Small Cell 2) Non-Small Cell.

1) Small Cell :→ Divide and spread fastly.
- Small portion
- From small immature neuroendocrine cells.
- Associated with smoking
- Main Bronchous, Rapidly metastize.
- Large and multiple site.
- Secrete hormones (Paraneoplastic syndromes)
  1) ACTH → ↑ Cortisol → Cushing syndrome.
     ↑ Proteolysis → Muscle Wasting
     ↑ lipid metabolism → Moon Face, Buffalo hump.
     ↑ Glucose level → ↑ Insulin
     ↑ Hypertension
  2) ADH → ↑ Na^+ & Water → ↑ Blood pressure, Odema, Thirst, Edema
  3) Autoantibodies → Destroy Neurons.
     - Lambert-Eaton Myasthenic Syndrome.
     (Type II hypersensitivity).

2) Non-Small Cell → Divide slowly
  1) Adenocarcinoma → Glandular, Peripheral
  2) Squamous cells → Produces Keratin, Central
  3) Large Cell → ~~Het~~ No Glandular or Squamous
  4) Bronchial carcinoid → Mature Neuroendocrine cells.

↳ Present throughout.

Pancoast tumours
- Adenocarcinoma & Squamous cell Carcinoma in the upper lung compress the structures (Nerves and Blood vessels)

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→ Thoracic inlet, Brachial plexus :
→ Cervical sympathetic nerve → Horners syndrome, (Ptosis)
i) Constricted pupil (Miosis), ii) Droppling of Eyelid (~~Miosis~~)
iii) Can't sweat on side of Damage (Anhydrosis).
→ Brachial plexus →
→ Shoulder pain
→ Paraesthesia → Weakness, Numbness, Tingling.
→ Left Recurrent Laryngeal Nerve → Voice Hoarseness.
→ Superior Vena Cava →
→ Flushing of Face, odema → ↑ Venous pressure
→ Shortness of Breath → ↓ Venous pressure.
→ Squamous cells → Secrete hormone (Paraneoplastic syndrome.
1) Parathyroid hormone
↑ PTH → ↑ Calcium in Blood & ↓ Ca in Bone
↓
Bones Brittle.

→ Bronchial carcinoid
↳ Secretes Seratonin causing Carcinoid syndrome
1) Less frequently emesis and flushing diarrhea & Right sided heart symptoms.
2) Bronchoconstriction causing asthma.

TNM Staging
$T_0 - T_4$ → Tumor size.
$N_\phi - N_3$ → Nodes involved
$M_\phi - M_1$ → Metastasis.

Clinical features
Depends upon size, location & Hormone.
→ Body mount Immune responses
TNFα, IL 1β & IL-6.
- Weightloss, Fever, Night sweats, Clubbing Cyanosis

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→ If Tumor obstructs airways.
- Dry Cough, shortness of Breath, Wheeze
- Pneumonia.
→ Nerve → Laryngeal → Voice Hoarseness.
Phrenic Nerve → Difficulty in Breathing.
→ Blood Vessel → Superior Vena Caval
- Coughs up Blood clots.

Investigation
Imaging → X ray PA view → Coin shaped lesions
→ CT & MRI
Histopathology → Tissue Biopsy with Bronchoscopy
CT guided FNAC.
- Sputum Culture.
- Arterial Blood gas analysis.
- Spirometry.

Treatment
- Removal of Tumor
- Chemotherapy
- Immunotherapy
- Radiational therapy.

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