CARDINAL SIGNS AND SYMPTOMS IN CLINICAL MEDICINE

Lec 3

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Cough

Explosive expiration that provides a protective mechanism for clearing the bronchotracheal tree from foreign bodies & secreted material which are sometimes excessive or bothersome.

It is also one of the most common symptoms for which medical attention is sought.

Causes

1) Airway irritants, which enter bronchotracheal tree by inhalation (smoke, dust, foreign bodies in the upper airway), Secretion (Post nasal drip), Gastric content (gastro-esophageal reflux).
2) Inflammation, constriction, infiltration and compression of airway.

   Inflammation → Airway infection [Viral, Bacterial], bronchitis, bronchiectasis, pertussis, bronchial asthma (S.T without dyspnea & wheeze).

- **Neoplastic infiltration of the airway wall (bronchogenic CA & carcinoid Tumor), granulomatous infiltration with Sarcoidosis & Tuberculosis (TB).**
- **Compression of airway from extrinsic masses (left lung malignant tumor, aortic aneurysm).**

3) **Parenchymal lung disease: interstitial lung disease (pneumonia & lung abscess).**
4) **Congestive Heart Failure → interstitial & peribronchial edema.**

5)Use of ACE (Angiotensin Converting Enzyme) inhibitors:

- Non-productive cough usually within one week but may be delayed up to 6 months.
- 5-20% of patient (accumulation of bradykinin or substance P which are degraded by ACE).

Approach to the Patient

1. History

- Is the cough acute or chronic?
- Is it productive of sputum or associated with blood?
- Any associated symptoms suggestive of respiratory infection?
- Is it seasonal or associated with wheeze?
- Is there any postnasal drip or evidence of reflux?
- Any associated disease or risk factors for disease? (cigarette smoking, HIV, environmental exposure)
- Is the patient taking ACE inhibitors?

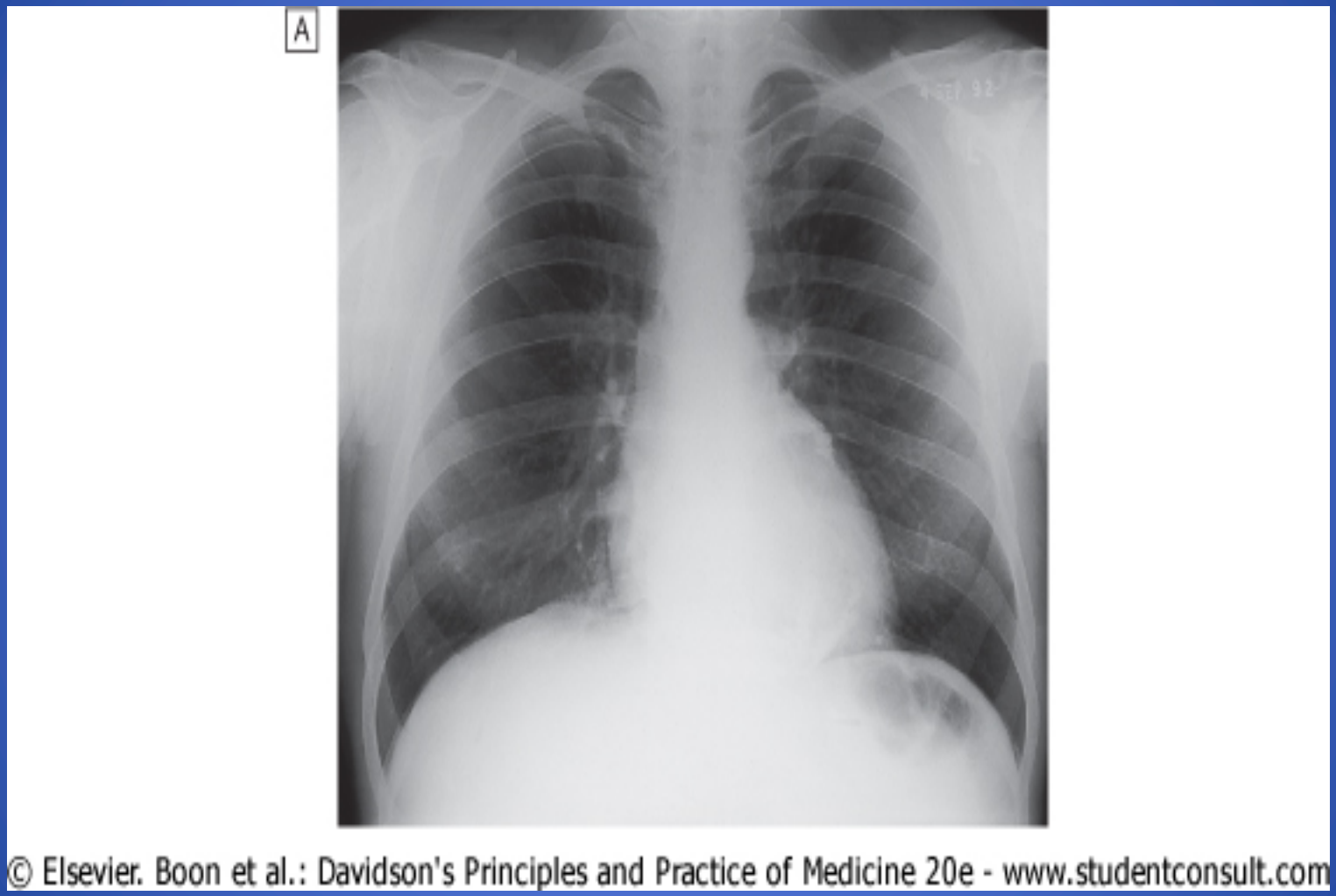
2. Physical Examination

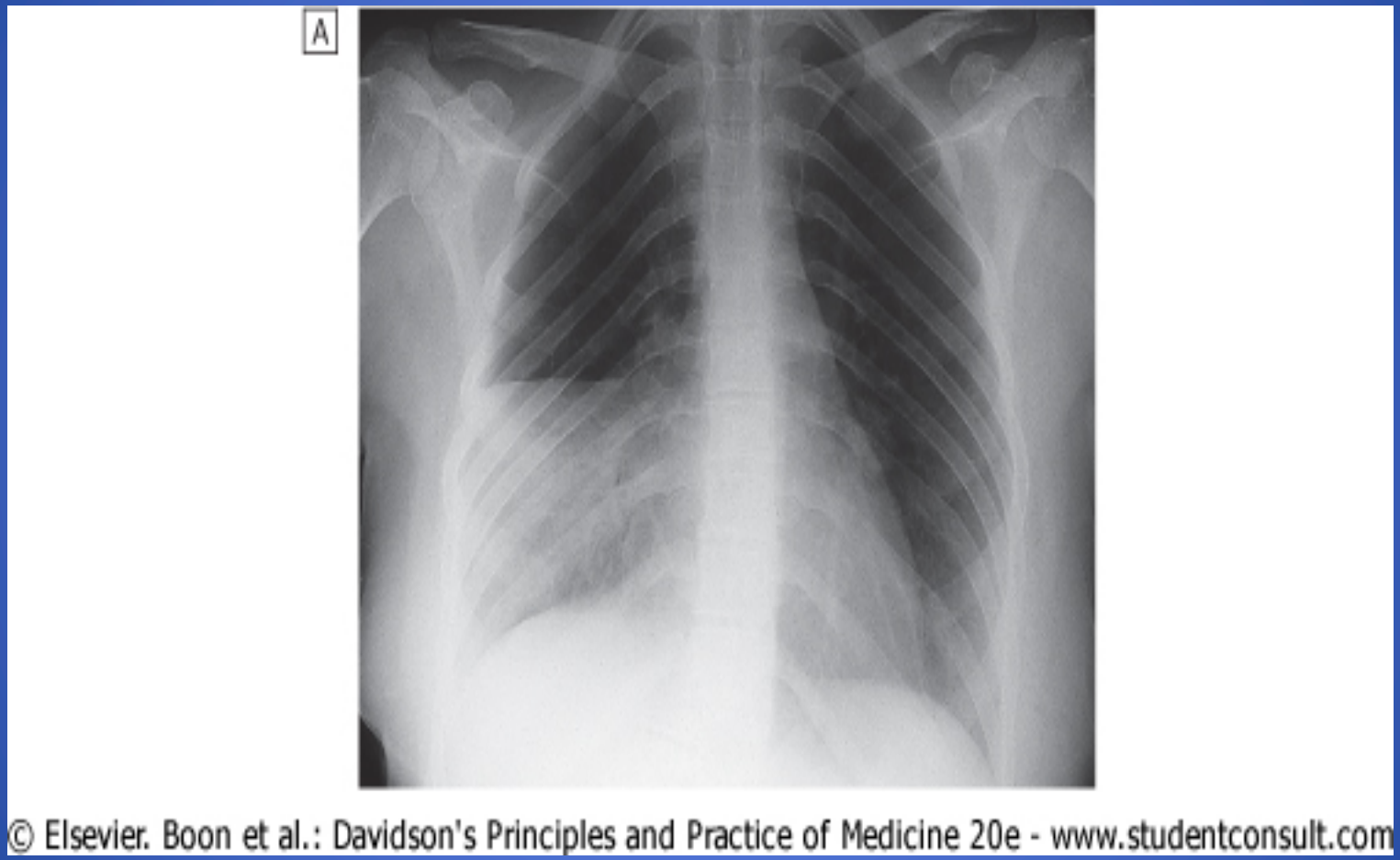
- Inspiratory stridor → upper airway disease.
- Rhonchi → lower airway disease. Mainly expiratory with wheeze.
- Inspiratory crackles → interstitial lung disease, pneumonia & pulmonary edema.

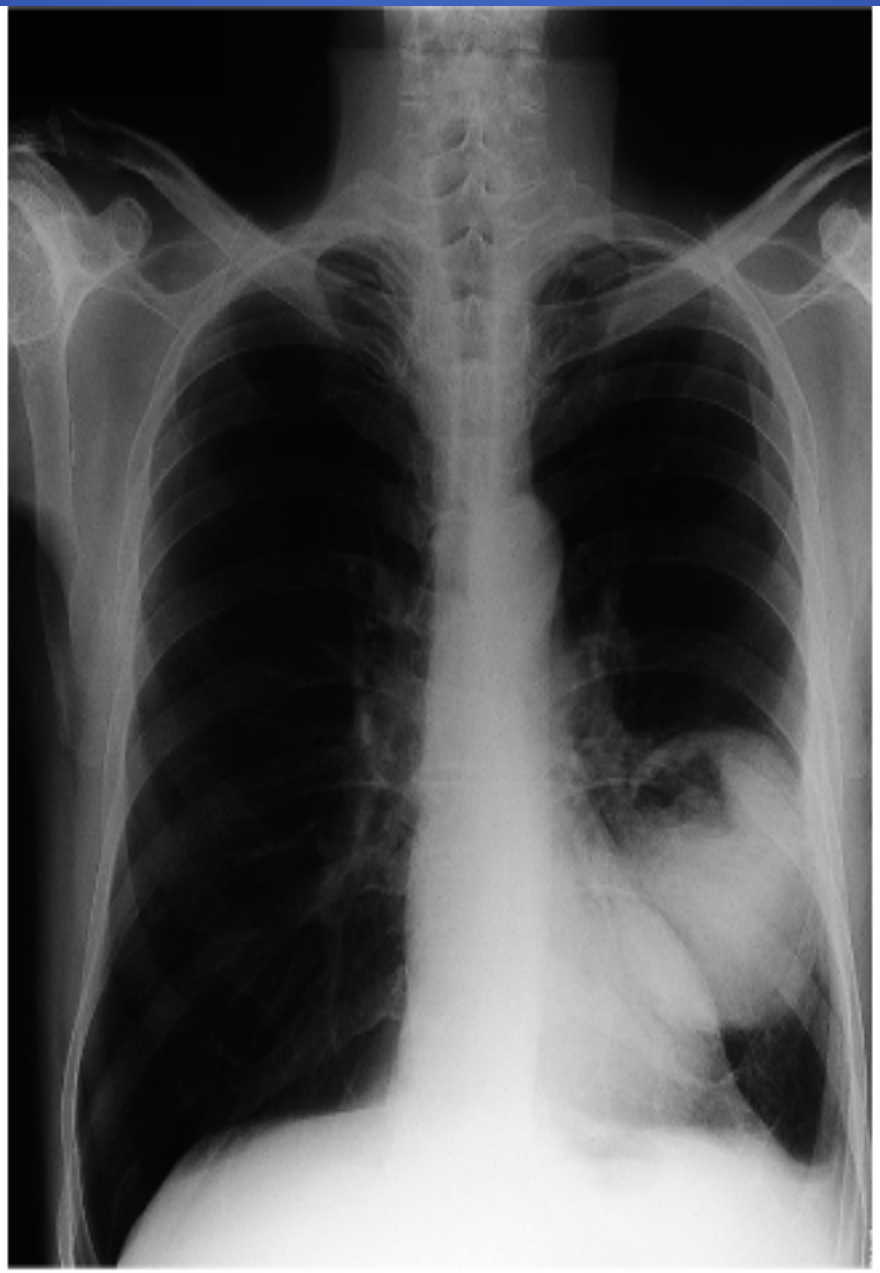
3. Investigation

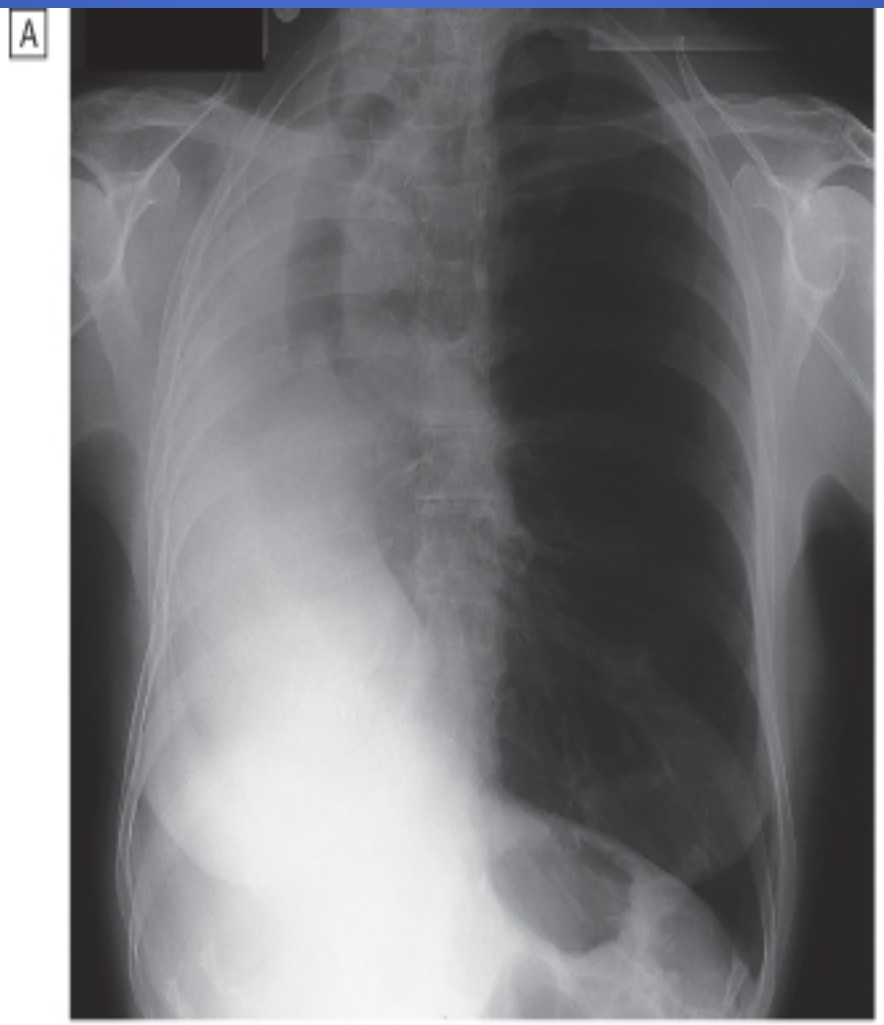
A. Chest X-Ray (CXR):

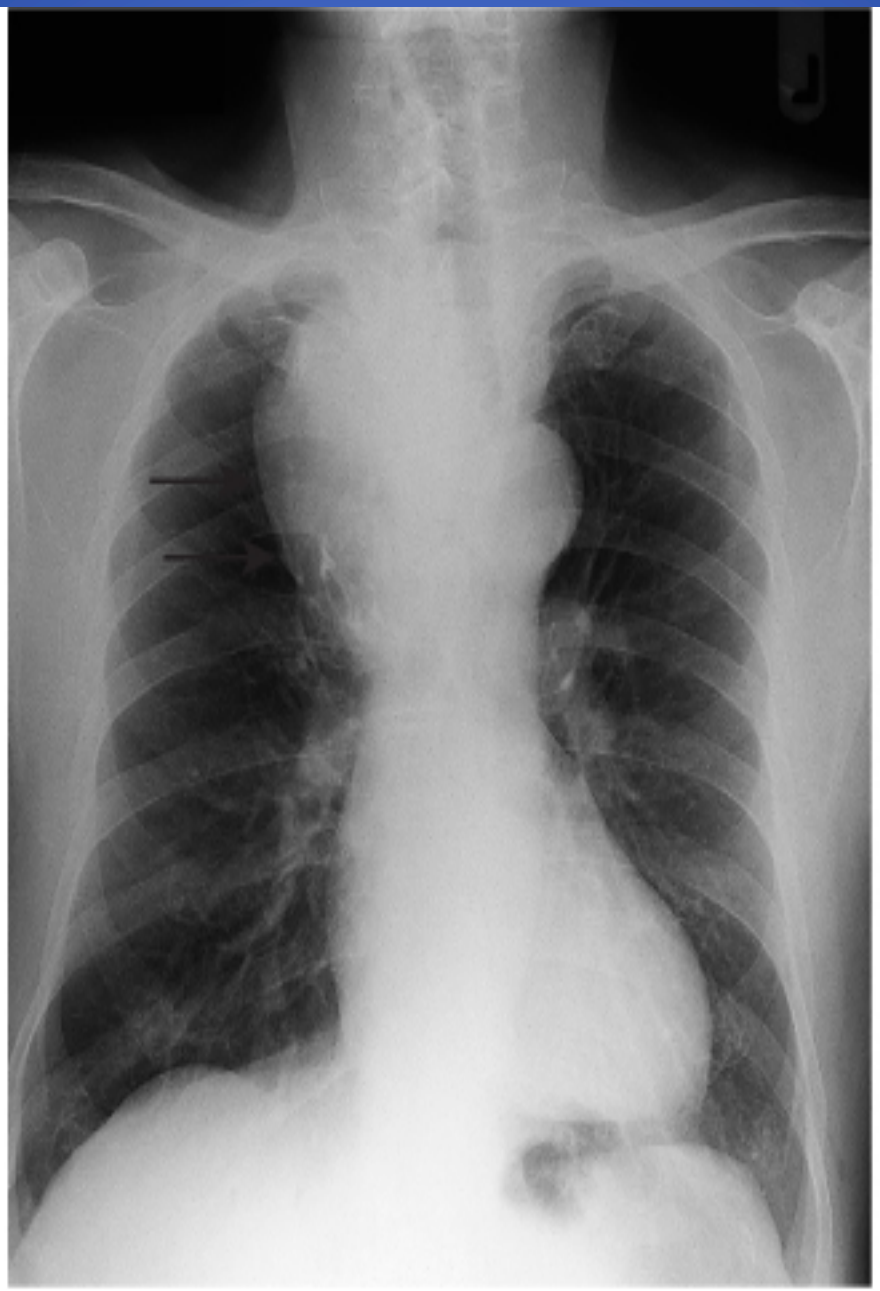
- Intra-thoracic mass lesion: (tumor)
- Honey combing: bronchiectasis
- Non-homogenous opacity: pneumonia
- Hilar adenopathy: Tumor, Tuberculosis (TB), Sarcoidosis
- Homogenous opacity: pleural effusion

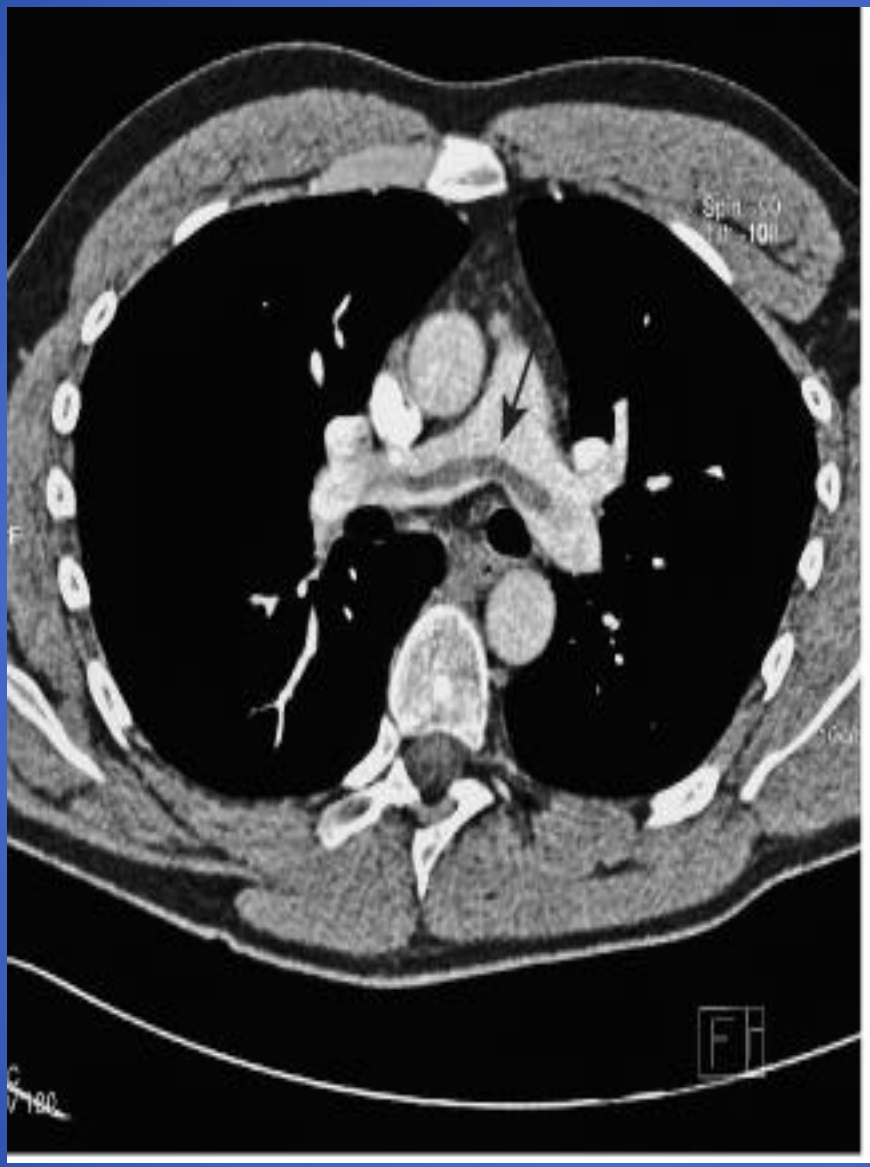




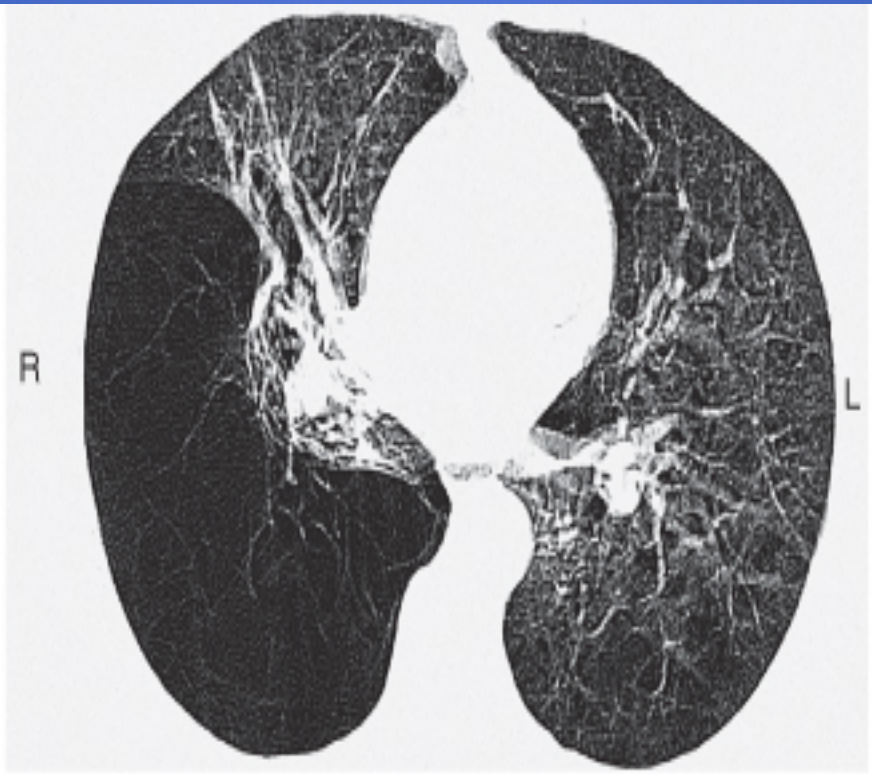








CTPA Saddle embolism in the bifercation of PA



B. PFT: Obstructive Pulmonary Defect, e.g., asthma or chronic bronchitis.

Restrictive Pulmonary Defect, e.g., Pulmonary Fibrosis.

C. Sputum Examination

- Purulent sputum → chronic bronchitis, bronchiectasis pneumonia, lung abscess.
- Blood with sputum → TB, bronchogenic CA.
- Gram & acid fast stain & culture → particular infection.
- Sputum cytology → pulmonary malignancy.

D. Fiberoptic bronchoscopy → Visualization of endobronchial tumor & collecting cytological & histological specimens.

E. CT (Computed Tomography) → interstitial lung disease, bronchiectasis.

Treatment

1. **Specific therapy of underlying pathology**
2. **Avoiding airway irritants.**
3. **Symptomatic therapy considered if the cause of cough is not known or specific TX is not possible & if it causes marked discomfort.**
4. **Irritant non-productive cough → suppressed by anti-tussive agent which increases threshold of cough center.e.g., codein → 15 mg, dextromethorphan 15 mg 3-4 times daily.**

- **Cough productive of significant amount of sputum should not be suppressed → why?**
- **Inhaled glucocorticoids: betamethasone, triamcinolone in patients with airyway inflammation (asthma).**
- ***Answer: Retention of sputum may interfere with distribution of ventilation, alveolar aeration and ability to resist infection.***
- **Inhaled anti-cholinergic agent: iprotrobium bromide 2-4 puffs gid → inhibits the efferent limb of cough reflex.**

Hemoptysis

Coughing up blood irrespective of the amount. Alarming symptom that bring the patient to the doctor.

- **It should be differentiated from haematemesis (bloody vomiting) and epistaxis (nose bleeding).**
- **This symptom must always be assumed to have a serious cause until appropriate investigation have excluded bronchial CA, thromboembolic disease and TB.**

causes

Note: the star sign (*) means common

1. **Bronchial diseases → *carcinoma, *bronchiectasis, bronchial adenoma, foreign body, *acute bronchitis.**
2. **Parenchymal diseases → *TB, lung abscess, *pneumonia, trauma, actinomycosis and aspergillosis.**
3. **Pulmonary vascular diseases → *pulmonary infarction, polyartitis nodosa, good pastures syndrome, idiopathic pulmonary hemosiderosis.**
4. **Cardiovascular diseases → *acute LVF, *mitral stenosis & aortic aneurysm.**
5. **Blood disorders → leukemia, hemophilia, anti coagulants.**

Diagnosis

- **History of repeated small hemoptysis is highly suggestive of bronchial carcinoma in a smoker.**
- **Chronic form & weight loss → TB.**
- **Chronic hemoptysis in the young female → bronchial adenoma.**
- **Chronic productive cough + hemoptysis which is sometimes massive associated with crepitation on lung → bronchiectasis.**

- In hospitalised patient pulmonary embolism is the most common cause.
- Major risk factors: immobilization, malignant disease, cardiac failure, pregnancy.
- Physical examination → may reveal clue to the underlying diagnosis,

  E.g., → finger clubbing in bronchogenic CA & bronchiectasis

  other signs of malignancy: cachexia, hepatomegaly, lymphadenopathy.

  fever, chest pain, sign of consolidation and pleurisy (pneumonia).

  pulmonary infarction: Leg swelling and tenderness (DVT).

Management

In massive hemoptysis patient should be nursed on the side of suspended source of bleeding; Hemodynamically resuscitated, then bronchoscoped ideally under general anesthesia using rigid bronchoscope to attempt bronchial suction & to maintain ventilation during anesthesia.

- **Angiography & arterial embolization can be life saving in acute situations.**
- **In majority hemoptysis is not life threatening & searching for a cause is logical by doing investigation:**

1. CXR: localized lesion → pulmonary infarction, tumor, pneumonia, TB.
2. Full blood count & coagulation screen.
3. Bronchoscopy for Dx of central CA & for tissue Dx.
4. Ventilation perfusion lung scan: pulmonary thrombo-embolic disease; pulmonary angiography sometimes needed
5. CT (Computed Tomography): investigation of peripheral chest radiographic lesion which is not accessible to bronchoscopy.

Cyanosis

Bluish discoloration of skin & mucous membrane resulting from an increased amount of reduced Hb in small blood vessel of skin and mucous membrane..

- **Most marked in lips, nail bed, ears, malar eminences.**
- **Cyanosis becomes apparent when the reduced Hb conc. > 50 g/L.**
- **Cyanosis can be masked in anemic patient.**

Central cyanosis → results from arterial blood desaturation or abnormal Hb derivatives. Both skin & mucous membrane are affected.

a) **Decreased arterial O_2 saturation**

1- impaired pulmonary function: alveolar hypoventilation and pulmonary embolism (ventilation-perfusion mismatch & impaired O_2 diffusion).

2- Anatomic Shunt:
(TOF/TOG) Cyanotic Congenital Heart Disease (CHD), pulmonary A-V fistula, and multiple small intra-pulmonary shunts.

3- Hb with low affinity for O_2 (Hb Kansas).

b) **Hb abnormalities:**

- **Methemoglobinaemia → hereditary or acquired.**
- **Sulfhemoglobinaemia → acquired.**

<u>Peripheral Cyanosis</u> → results from slowing of blood flow & abnormally great extraction of O_2 from normally saturated arterial blood.

- **Reduced cardiac output.**
- **Cold exposure.**
- **Redistribution of blood from extremities.**
- **Arterial obstruction: Raynaud,s, Arterial embolus, arterial constriction.**
- **Venous obstruction.**

  often the mucous membrane is spared.

- **Clinical differential between central & peripheral cyanosis may be difficult & in conditions like cardiogenic shock with pulmonary edema there may be a mixture of both.**

Approach

1. **History: duration → cyanosis since birth usually due to cyanotic CHD**
   exposure to drugs or chemicals → abnormal Hb.
2. **Clinical differentiation between central & peripheral cyanosis**
   - **Physical or radiographic examination of cardiac & respiratory system.**
   - **Massage or gentle rewarming of cyanotic extremities will improve peripheral blood flow in peripheral but not central cyanosis.**
3. **Presence or absence of finger clubbing**
   - **Clubbing without cyanosis → infective endocarditis, ulcerative colitis or familial.**
   - **Slight cyanosis of lips, checks without clubbing → mitral stenosis.**

- Cyanosis & clubbing → cyanotic CHD, pulmonary A-V shunt.
- Peripheral cyanosis & acutely developing central cyanosis is not associated with finger clubbing.

4. Measuring arterial blood O_2 tension or O_2 saturation, spectroscopic examination of blood for abnormal type of Hb.