

Hemoptysis

A presentation by Marshall Marcus,
Tel Hashomer Hospital
Medicine B

Hemoptysis

- ⊙ Hemoptysis - the expectoration of blood from the respiratory tract.
 - Do not confuse with hematemesis!
- ⊙ Hemoptysis is “Massive” if >100 mL to >600 mL
- ⊙ We will discuss
 - Most common causes
 - Origen of Blood
 - Differential Diagnosis & Diagnostic Clues
 - Important Advice for Doctors
- ⊙ Treatment
- ⊙ Prognosis
- ⊙ Prevention

Hemoptysis

Most Common Causes

- ◉ Most common overall causes
 - Bronchitis (26%)
 - Bronchogenic Carcinoma (~23%)
- ◉ Most common causes of Massive Hemoptysis
 - Tuberculosis (8%)
 - Bronchiectasis

The Source of blood in Hemoptysis

Where does the blood come from?

◉ Most common source = Bronchial Tree

- High pressure arterial blood from the aorta / intercostal arteries
 - Inflammation: bronchitis / bronchiectasis
 - Neoplasm: metastasis, carcinoid tumor, bronchogenic carcinoma

◉ Less common source = Lung Parenchyma

- Lower pressure pulmonary capillaries and veins

Hemoptysis Differential Diagnosis

Tracheobronchial source

Neoplasm (bronchogenic carcinoma, endobronchial metastatic tumor, Kaposi's sarcoma, bronchial carcinoid)

Bronchitis (acute or chronic)

Bronchiectasis

Broncholithiasis

Airway trauma

Foreign body

Primary vascular source

Arteriovenous malformation

Pulmonary embolism

Elevated pulmonary venous pressure (especially mitral stenosis)

Pulmonary artery rupture secondary to balloon-tip pulmonary artery catheter manipulation

Pulmonary parenchymal source

Lung abscess

Pneumonia

Tuberculosis

Mycetoma ("fungus ball")

Goodpasture's syndrome

Idiopathic pulmonary hemosiderosis

Wegener's granulomatosis

Lupus pneumonitis

Long contusion

Unveiling Hemoptysis

Using Patient History to Reveal Etiology

- Look for clues accompanying the hemoptysis, eg:
 - Blood-streaking of mucopurulent sputum → bronchitis (usually)
 - Fever/Chills + Blood-streaked purulent sputum → pneumonia
 - Putrid smell of sputum → Lung Abscess
 - Renal Disease → Wegener's / Goodpasture's
 - AIDS → Kaposi's Sarcoma

Unveiling Hemoptysis

Using the Physical Exam to Reveal Etiology

- Hemoptysis along with the following findings narrow the differential diagnosis
 - Saddle nose → Wegener's
 - Apical dullness to percussion → pneumonia
 - Mucus Membrane Telangiectasia → Osler-Weber-Rendu disease

4 main Causes of Hemoptysis

1. Infection (60% - 70%)

- Pathogens: Staphylococcus Aureus, Pseudomonas Aeruginosa, Aspergillus, Influenza Virus, etc
- Bronchitis (26%)
- Pneumonia (10%)
- Tuberculosis (Tb) (8%)
- Lung Abscess

2. Cancer

- Primary (23%)
 - Bronchogenic (90% of primary Lung Cancers)
- Metastases DO NOT normally cause hemoptysis!

4 Main Causes of Hemoptysis cont.

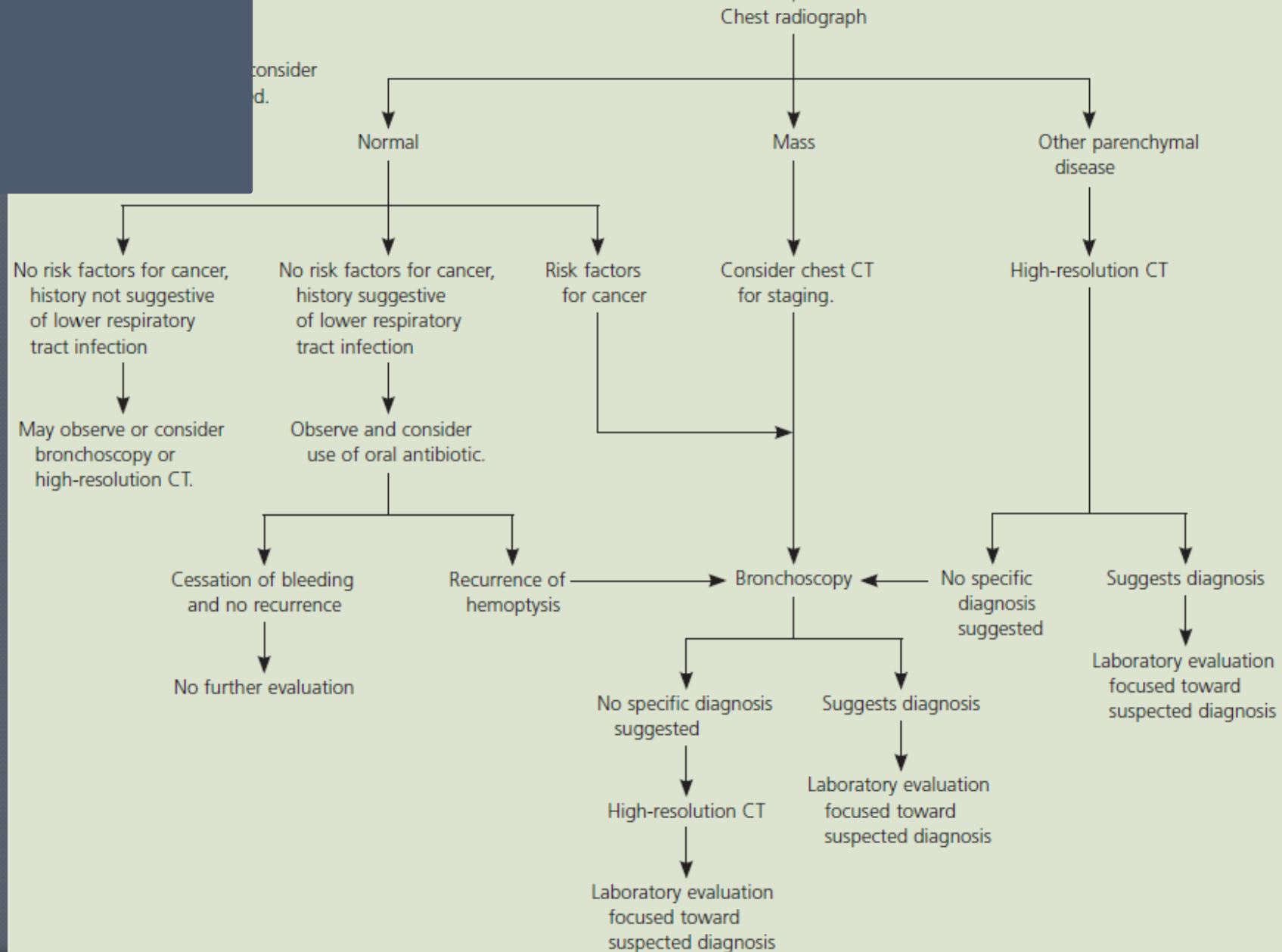
3. Pulmonary Venous Hypertension

- (most → least common causes)
- Left Ventricular Systolic Failure
- Mitral Stenosis
- Pulmonary Embolism

4. Idiopathic Hemoptysis (7% – 34% of cases)

- Pay Attention [ישם לב!!!]... Smokers > 40 yrs/old in this group have increased incidence of Cancer

Non-Massive Hemoptysis - Diagnostic Algorithm



Managing Non-Massive Hemoptysis

Know Your ABCs

- Carefully Monitor
 - Airways
 - Breathing
 - Circulation
- Treatment Goals
 - Aspiration Prevention
 - Bleeding Cessation
 - Cause of Bleeding



Massive Hemoptysis

An Emergency!

- Mortality is 80% in cases of Hemoptysis of 1L/24hrs in Patients with Malignancy
 - Why? Exsanguination?...
 - NO!!
 - The Most common cause of Death in Such cases is Asphyxiation

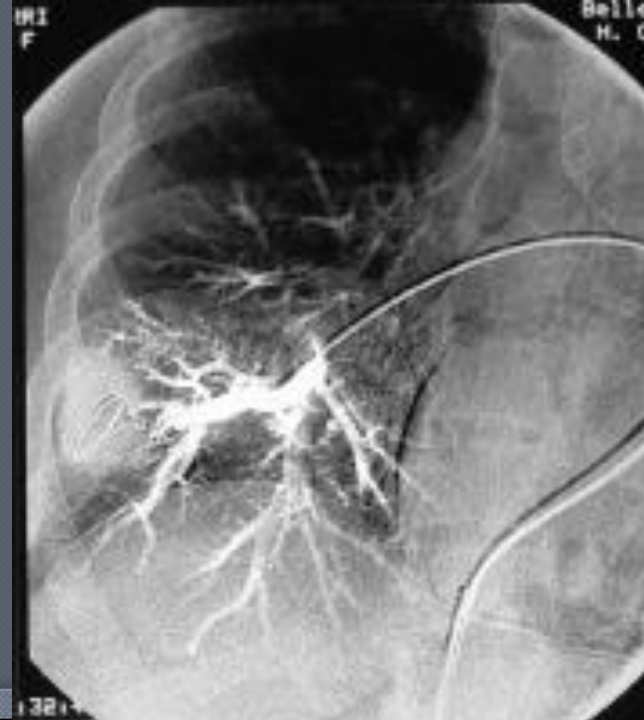
Managing Massive Hemoptysis

- Try to preserve gas exchange
 - Consider Intubation (with special double-lumen tube)
- Prevent Asphyxiation
 - Place bleeding lung in the “dependent position”
 - Balloon bronchial occlusion can contain blood
- Control Bleeding
 - Laser phototherapy
 - Neodymium:yttrium-aluminum-garnet laser
 - Electrocautery
 - Embolotherapy
 - Gelfoam Vascular injection
 - Surgical Lobe resection



Hemoptysis – Treated with Embolotherapy

- Embolotherapy involves injecting a Substance in the vasculature for mechanical ablation
 - Alcohol, Gel, Silicon Beads, Etc
 - Before and After embolotherapy of an AV shunt



An Obscure Cause of Hemoptysis...

Catamenial Hemoptysis from Bronchotracheal Endometriosis



Hemoptysis Question 1

7-14. A 54-year-old obese woman presents with the chief complaint of hemoptysis. She states that over the last day she has coughed up approximately 10 cc of blood-streaked sputum. She denies any fever, chills, chest pain, or shortness of breath. She does admit to a recent upper respiratory tract infection with cough and a copious amount of sputum production. She remembers similar episodes of cough with bloody sputum occurring after colds for the last several years. She has smoked 1 pack of cigarettes per day since high school. Examinations of the pharynx and lungs are normal. Which of the following is the most likely diagnosis?

- a. Chronic bronchitis
- b. Tuberculosis
- c. Adenocarcinoma of the lung
- d. Congestive heart failure
- e. Pulmonary infarction

7-14. The answer is a. (*Fauci, 14/e, pp 1451–1455.*) Massive life-threatening hemoptysis is >100 cc of blood in 24 h. The most common cause for nonmassive hemoptysis (<30 cc/day) in smokers and non-smoking patients with a normal chest radiograph is bronchitis. Chronic bronchitis is characterized by excessive secretions manifested by a productive cough, often purulent or bloody, for 3 mo or more for 2 consecutive years in the absence of any other disease to explain the symptoms.

Hemoptysis Question 2

A 55-year-old man with a 55 pack year history of smoking cigarettes has recently experienced an episode of hemoptysis along with his usual cough. On physical examination there are no abnormal findings. He has a sputum cytology examination performed that demonstrates the presence of atypical cells with hyperchromatic nuclei and orange-pink cytoplasm. Laboratory studies show a serum calcium of 11.3 mg/dL, with phosphorus 2.1 mg/dL. Which of the following chest radiographic findings is this man most likely to have?

- A ☐ Large hilar mass
- B ☐ Pneumonia-like consolidation
- C ☐ Peripheral nodule
- D ☐ Carinal compression
- E ☐ Left pleural thickening

NEXT QUESTION - - INDEX OF QUESTIONS - - EXAM MENU

Thank You!!!

References Cited

- Harrison TR, Baurwald E. Hemoptysis. In: *Harrison's Principles of internal medicine*. 16th Ed. New York: McGraw-Hill
- Bidwell, Jacob L., Pachner, Robert W., Hemoptysis: Diagnosis and Management. *American Family Physician*, October 1, 2005, Vol 72, No. 7.,
- J. Roy Duke, Jr., m.d., Frontline Assessment of Common Pulmonary Presentations, 2001 The Snowdrift Pulmonary Foundation