

HEMOPTYSIS

(Last updated 02/16/2019; Reviewers: Sidhant Singh, MD)

PRESENTING COMPLAINTS: Cough, pain, fever, shortness of breath

FINDINGS

- A Check airway
- B ↑/N RR, stridor, coughing
- C ↓/N BP, ↑/N HR, weak/N pulse
- D Variable altered (V,P,U,D)*
- E Rash, fever+/-, pallor, cyanosis, contusion/ deformity (chest trauma)
- L_{PC} ↓Hb, CBC with platelets, ABG (↓/↑/N pH; ↓ PaO₂, ↓/↑ PaCO₂), ↑PT/↑PTT/↑INR
- U_{PC} USG- air, fluid, consolidation, cavity, Kerley B lines, FAST- lung injury

*V (verbal), P (pain), U (unconsciousness), D (delirious)

Up_c (point of care ultrasound) Lp_c (point of care labs)

DEFINITION- Massive hemoptysis is defined as bleeding > 500 mL/24 h or >100 mL/h.

OTHER HISTORY

- **History** -recent trauma, recent procedure like bronchoscopy, upper or lower respiratory tract infection, family or personal history of bleeding disorders, tuberculosis contact, migration from endemic country, cardiac or valvular heart disease, smoking, cancer, immunocompromised
- **Symptoms**- palpitation, PND, weight loss, anorexia, dyspnea, orthopnea
- **Signs**- characteristic faces like blue bloaters or pink puffers, barrel chest, intercostal retraction, sign of respiratory distress, accessory respiratory muscle use, nasal flaring, cardiac murmurs, petechiae, purpura, skin rash(connective tissue disease),murmur (pulmonary AV malformation or valvular heart disease)
- **Predisposing conditions**- acute exacerbation of chronic bronchitis, bronchiectasis, infections (TB, fungal), bronchogenic CA, arteriovenous malformation, autoimmune disease (SLE, vasculitis, Goodpasture's), pulmonary hypertension (e.g. valvular heart disease), PE, broncholithiasis.

DIFFERENTIAL DIAGNOSIS

Pulmonary causes: Infection, tumor, infraction and AV malformation

Cardiac causes: Heart failure, aortic aneurysm ruptured

OTHER INVESTIGATIONS

- **Labs:** CBC, BUN/Creatine, ECG, D-Dimer, coagulation, ABG, urinalysis; blood culture, sputum culture, gram staining for bacteria, fungi, AFB staining; consider Rheumatoid Factor, ANCA, Anti-GBM
- **Monitoring:** airway, blood pressure, SpO₂
- **Imaging:**

- Chest X-ray
- If CXR abnormal, >40 years, smoking history, or >1-week hemoptysis:
 - High Resolution CT (bronchiectasis, AVM) if stable enough to leave the acute care setting
 - Bronchoscopy (tumor, chronic bronchitis)
- V/Q scan (pulmonary embolism), angiography (location of bleed), bronchoscopy (diagnostic and or therapeutic)

THERAPEUTIC INTERVENTIONS

- **Initial Steps:**

- First step is to identify the side of bleeding (auscultation CXR, CT)
- Position: bleeding lung should be in dependent position (if bleeding unilaterally)
- Airway patency: if oxygenation is a concern, airway should be protected with a large caliber ET tube; emergent bronchoscopy for suction +/- selective intubation of the non-bleeding lung or placement of bronchial blocker/balloon.

Airway obstruction/asphyxia is a primary concern rather than hemorrhagic shock

If the patient is adequately coughing, postponing intubation may be wise as the airway clearance through ETT may be less efficacious than with cough

- Increase PEEP if bleeding from pulmonary circulation (i.e. pulmonary artery catheter related, pulmonary hypertension)
- Consider topical or nebulized TXA (tranexamic acid)

- **Blood Products:**

- RBC transfusion for shock or to maintain Hb >7 mg/dL
- Platelets or FFP may be needed in patients who are on antiplatelets meds or in cases of coagulopathy

- **Procedures:**

- **Bronchoscopy:** localize the site and perform interventions such as suction, saline lavage, balloon tamponade, injection of topical vasoconstrictor, laser therapy or electrocautery
- **Angiography:** consider early arterial embolization in massive hemoptysis

- **Consult:** endoscopy/ interventional pulmonology, interventional radiology, thoracic surgery

CAUTIONS

- **Complications:** death from asphyxiation rather than exsanguination when bleeding not controlled

REFERENCES & ACKNOWLEDGMENTS

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