Hemoptysis

Summary from Rosen's By Brandon Morshedi

Epidemiology

- Most cases of hemoptysis in the ED are small-volume, usually from blood-tinged sputum or minute amounts of frank blood.
- Only 1-5% of hemoptysis patients have "massive or life-threatening" hemorrhage, defined as 100-600mL of blood loss in any 24-hour period, resulting in up to 80% mortality.

Pathophysiology

- Trace hemoptysis occurs via disruption of tracheobronchial capillaries from vigorous coughing or minor bronchial infections.
- Massive hemoptysis occurs via disruption of pulmonary or bronchial arteries. The bronchial arteries are small-caliber and high-pressured and are the culprit in 90% of massive hemoptysis.

Differential Diagnosis

- Airway Disease (i.e. bronchitis, bronchiectasis, neoplasm, trauma, foreign body)
- Parenchymal Disease (i.e. TB, pneumonia, lung abscess, fungal infection)
- Vascular Disease (i.e. PE, AVM, aortic aneurysm, pulmonary HTN, vasculitis)
- Hematologic Disease (i.e. coagulopathy, DIC, platelet dysfunction, thrombocytopenia)
- Cardiac Disease (i.e. congenital heart disease, valvular heart disease, endocarditis)
- Miscellaneous (i.e. cocaine, post-procedural injury, tracheal-arterial fistula, SLE)

Signs and Symptoms

- Ranging from blood-tinged sputum to massive amounts of frank blood from the oropharynx
- Patient may be either be coughing up blood (hemoptysis) or vomiting blood (consider GI sources of bleeding)

Work-up

- Primary survey and stabilization
- Remainder of work-up guided by physical exam findings
    - Focal adventitious breath sounds = pneumonia or lung abscess
    - New heart murmur, especially in a febrile patient = infectious endocarditis with septic PE
    - Signs and symptoms of a DVT = pulmonary embolus
    - Ecchymoses and petechiae = coagulopathy and thrombocytopenia, respectively
- CBC, coagulation studies, type and screen or crossmatch, renal function tests if vasculitis suggested or CT planned
- Plain film CXR has poor sensitivity, but can identify sources of infection or malignancy
- CT chest in high-risk patients (smokers, oncology patients), or in pt with moderate to severe bleeding even if the initial CXR is negative. Do not delay CT scan to obtain a CXR.
- Angiography is first-line study when cause of hemoptysis is known (e.g. malignancy) and embolization is contemplated

Empiric Management

- Primary survey, including airway management and maintenance of hemodynamic instability
- Further management determined by CXR or CT results
- Bronchoscopy may benefit stable pts with mild to moderate hemoptysis by facilitating airway mgmt and allowing for balloon and topical hemostatic tamponade, thermocoagulation, and injection of vasoactive agents
- Bronchial arterial embolization is a first-line therapy for pts with massive hemoptysis who are unable to tolerate surgery and for whom bronchoscopy has been unsuccessful
- Emergency thoracotomy for life-threatening bleeding uncontrolled by bronchoscopy or percutaneous embolization

Disposition

- Healthy patients with minor bleeding and resolution of symptoms and stable vital signs ☒ d/c with outpatient f/u

- High-risk patients with minor bleeding OR all patients with moderate to large bleeding ☒ CT ☒ admit for obs ☒ consider bronchoscopy
- All patients with massive hemoptysis ☒ admit ICU