Approach to Internal Medicine

A Resource Book for Clinical Practice

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Hemoptysis

DIFFERENTIAL DIAGNOSIS

NON-CARDIOPULMONARY—epistaxis, upper GI bleed, coagulopathy

CARDIAC—HF, mitral stenosis

PULMONARY

- **AIRWAY**—bronchitis (acute, chronic), bronchiectasis, malignancy, foreign body, trauma
- **PARENCHYMA**
  - **MALIGNANCY**—lung cancer, metastasis
  - **INFECTIONS**—necrotizing pneumonia (*Staphylococcus, Pseudomonas*), abscess, septic emboli, TB, fungal
  - **ALVEOLAR HEMORRHAGE**—granulomatosis with polyangiitis, eosinophilic granulomatosis with polyangiitis, anti-glomerular basement membrane disease, pulmonary capillaritis, connective tissue disease
- **VASCULAR**—pulmonary embolism, pulmonary hypertension, AVM, iatrogenic

PATHOPHYSIOLOGY

MASSIVE HEMOPTYSIS—100–600 mL blood in 24h. Patients may die of asphyxiation (rather than exsanguination)

CLINICAL FEATURES

HISTORY—characterize hemoptysis (amount, frequency, previous history), cough (productive), dyspnea, chest pain, epistaxis, hematemesis, weight loss, fever, night sweats, exposure, travel, joint inflammation, rash, visual changes, past medical history (smoking, lung cancer, TB, thromboembolic disease, cardiac disease), medications (warfarin, ASA, NSAIDs, natural supplements)

PHYSICAL—vitals, weight loss, clubbing, cyanosis, lymphadenopathy, Horner syndrome, respiratory and cardiac examination, leg swelling (HF or DVT), joint examination, skin examination

INVESTIGATIONS

BASIC

- **LABS**—CBC, lytes, urea, Cr, INR, PTT, urinalysis, type and screen, crossmatch
- **MICROBIOLOGY**—blood C&S, sputum Gram stain/C&S/AFB/fungal/cytology
- **IMAGING**—CXR, CT chest (warranted in most patients unless obvious explanation)
- **BRONCHOSCOPY**—warranted in most patients unless obvious explanation

SPECIAL

- **ETIOLOGY WORKUP**—ANA, p-ANCA (myeloperoxidase MPO antibodies), c-ANCA (antiproteinase-3 PR3 antibodies), anti-GBM antibody, rheumatologic screen (extractable nuclear antigens)
- **ABG**—if respiratory distress

MANAGEMENT

ACUTE—ABC, **O_2**, **IV**, **intubation** to protect airway if significant hemoptysis (consider selective intubation down unaffected side, double lumen tube if anesthesia expertise available), position patient in lateral decubitus position with affected lung on bottom to preserve non-affected lung. Urgent interventional **bronchoscopy** (cold saline, topical epinephrine, tranexamic acid instillation, cautery, airway blocker, double lumen endotracheal tube). Discuss with interventional radiology for consideration of **angiographic bronchial artery embolization** (<5% risk of spinal cord ischemia due to the inadvertent embolization of a spinal artery), **lung resection**

TREAT UNDERLYING CAUSE—patients on anticoagulation should be reversed. Consider *tranexamic acid* 500 mg/5 mL inhaled × 5 days for non-massive hemoptysis. **Correct coagulopathy** (*vitamin K* 10 mg SC/IV × 1 dose or FFP); **antibiotics**; **radiation** for tumors; **diuresis** for HF; **immunosuppression** for vasculitis

MANAGEMENT (CONT'D)

SYMPTOM CONTROL—cough suppressants, sedatives, stool softeners, transfusions

SPECIFIC ENTITIES

ANTI-GLOMERULAR BASEMENT MEMBRANE DISEASE (GOODPASTURE DISEASE)

- **PATHOPHYSIOLOGY**—anti-glomerular basement membrane antibodies → attack pulmonary and renal basement membrane

SPECIFIC ENTITIES (CONT'D)

- **CLINICAL FEATURES**—hemoptysis and hematuria, with respiratory and renal failure if severe
- **DIAGNOSIS**—lung/kidney biopsy
- **TREATMENTS**—steroids, cyclophosphamide, plasmapheresis