Air embolism


Key Points:
- Think about air embolism in your differential for a code, hypotension, altered mental status, or seizure in patients with risk factor (line or recent procedure)
- Prevent air embolism using good technique when inserting, removing, or manipulating central lines

- Venous pulmonary arterial embolism
  - Manifestations
    - Elevated PA pressures → RV failure and decreased LV preload → hypotension
    - Arrhythmia: tachy or bradyarrhythmia, asystole
  - Paradoxical embolism: via PFO due to acutely increased right-sided pressures
  - Risk factors:
    - Central lines
    - Neurosurgical operations
    - Pregnancy / delivery (via myometrium)
  - Diagnosis:
    - Mill-wheel murmur, spashing auscultatory sound
    - Decrease in end-tidal CO2
    - Doppler ultrasonography of intracardiac air
  - Treatment:
    - Left lateral decubitus positioning
    - ACLS
    - Oxygen
    - Aspiration by multiorifice catheter / PA catheter

- Arterial
  - Manifestations
    - Coronary arteries: MI, dysrhythmia, cardiac failure, arrest
    - Cerebral: headache, focal findings, seizures, coma
  - Risk factors:
    - Decompression barotraumas
    - Extracorporeal bypass
  - Diagnosis:
    - Head CT insensitive, occasionally showing air in vasculature
    - Retina: gas bubbles in vessels
  - Treatment
    - Not Trendelenberg: may increase edema
    - Seizures: barbiturates
    - Hyperbaric-Oxygen
    - IVF to establish normovolemia
    - Controversial or under study: heparin, corticosteroid, lidocaine

- Prevention
  - Trendelenberg position and prevent inspiration
  - Remember when you are at risk: insertion, removal, and manipulating catheters
  - Keep the catheters capped