NHS
The Leeds Teaching Hospitals
NHS Trust

Venous Air Embolism

Signs

- Sudden decrease in EtCO2, hypotension, decreased SpO2, mill-wheel murmur (late).
- Dyspnoea, gasp or respiratory distress if awake.

Immediate Action

- Get help & notify surgeon to flood the field with saline and compress the site
- Cardiovascular collapse – ALS resuscitation
- Increase FiO2 to 1.0, support ABC, stop any nitrous
- Stop further air entry
  - Identify the source (surgical site vs. IV/central lines)
  - Place the surgical site below the heart level – e.g. head down position if cranial surgery and/or left lateral decubitus (sitting cervical case- beware of Mayfield stabilizer).
  - Valsalva or careful bilateral transient jugular compression

Ongoing Management 0-15 mins

Assessment

- Auscultation/praecordial doppler to identify a mill-wheel murmur or turbulence
- Transthoracic/transoesophageal echo to identify presence/location of air
- Insert arterial line (if not in place)
- Monitor and treat dysrhythmias

Management

- Consider placing in Left lateral decubitus position if not already done so and safe to do so
- Fluid bolus(es) to help increase RAP
- Use of vasopressors and inotropes to maintain MAP (e.g. metaraminol/phenylephrine/ephedrine/noradrenaline/dobutamine)
- Consider inserting a multi-orifice catheter (Bunegin-Albin/ mutli roi) to help aspirate air
- Insert CVC if persistent cardiovascular instability – attempt to aspirate air when first inserted, then use line for inotropes
- Consider chest compressions to break-up air lock

Ongoing Management 15-30+ mins

Ongoing Assessment

- CT to rule out other causes (e.g. PE) if not responding to treatment for VAE

Ongoing Management

- If still having difficulties removing air, consider
    - Cardiopulmonary by-pass if unstable
    - Hyperbaric oxygen therapy if safe for transfer

Differential Diagnosis

- Anaphylaxis, Acute MI, Bronchospasm, Pulmonary Embolism.