Troubleshooting the Trach

Key Article

Przbylo JA, Wittels K, Wilcox SR. Respiratory distress in a patient with a tracheostomy. J Emerg Med. 2019; 56:97-101.

Initial Management of Respiratory Distress in the Patient with a Tracheostomy

- Consider the mnemonic "DOPES" to help create a DDx for respiratory distress
  - D: dislodgement/displacement of the trach; deflation of the cuff
  - O: obstruction of the tube with mucus or blood
  - P: pneumothorax, PE, pulmonary edema, bronchospasm
  - E: equipment failure – problem with the ventilator – connection, power source, circuit
  - S: stacking – breath stacking – expiratory time is not long enough – leads to hyperexpansion of the lungs, reduces venous return, reduces cardiac output, and can cause barotrauma
- Consider the mnemonic "DOTTS" for troubleshooting
  - D: disconnect the patient from the ventilator
    - Listen for a "hissing" sound – a release of air may indicate hyperinflated lungs/breath stacking – consider pressing down on the patient's chest to help release trapped air
  - O: provide supplemental oxygen
    - BMV with PEEP valve may be needed
    - If it is difficult to ventilate the patient via BMV, consider things that decrease lung compliance (e.g., pulmonary edema, PTX)
    - If it seems too easy to ventilate the patient, consider an air leak, deflated cuff, or dislodged tube
  - T: confirm tube position
    - Check tube depth in relation to prior recordings
    - Pass a suction catheter to ensure it isn't obstructed
    - If the tube is obstructed and can't be cleared with suctioning, consider deflating the cuff so the patient can breathe
    - If the patient is still unable to breathe after suctioning and deflating the cuff, replace the trach tube
  - T: "tweak" the ventilator
    - Might need to lower the RR or adjust Vt

Tracheostomy Emergencies

- The types of complications and emergencies seen are often dependent on when the trach was placed
- Immediately after insertion
  - Posterior wall lacerations
  - Paratracheal insertion – "false track"

- Within the first 7 days of placement – trach stoma not mature
    - Bleeding from procedure
    - Stoma infection
    - Accidental decannulation
    - Subcutaneous emphysema
    - Aspiration
    - Pneumothorax
- After 7 days of placement – trach stoma usually mature
    - Tracheal stenosis
        - Most common long-term complication
        - Can occur above, below, or at the level of the stoma
        - Usually due to formation of granulation tissue from inflammation or infection
        - Tends to present 1 to 6 months after decannulation
        - Usually requires surgery or tracheal dilatation
    - Tracheomalacia
        - Pathophysiology similar to tracheal stenosis
        - However, in tracheomalacia, cartilage is weakened or destroyed
        - Patient's airway may end up collapsing during exhalation
        - Definitive management may require stenting of the airway or resection of select segments of the trachea
        - Short-term solution may be to place a longer trach tube
    - Delayed stoma closure
    - Vocal cord paralysis
    - Tracheoarterial fistula
        - Any brisk bleeding from the trach should be considered a tracheoarterial fistula until proven otherwise
        - 80% mortality
        - Most common location is innominate artery, followed by the aortic arch, right common carotid
        - Usually results from anterior tracheal wall erosion into the vessel
        - Usually occurs within the first 3 weeks of trach placement, but can really occur at any time!
        - About 50% of patients with this condition will present with a sentinel bleed – typically a brief, self-limited brisk bleed that is stopped at the time of medical evaluation
        - If you suspect a tracheoarterial fistula, the first step is to over inflate the cuff to tamponade bleeding
        - If that doesn't work, remove the trach and manually compress the artery against the posterior sternum with your finger in the stoma
    - Tracheoesophageal fistula