Tracheostomy management

Aliases

None

Patient care goals

1. Meet airway management goals in a patient with a tracheostomy.
    a. Assure patent airway, understand how to troubleshoot tracheostomy in a patient with respiratory distress.
    b. Assure adequate oxygenation and ventilation.

Patient presentation

Inclusion criteria:

Any adult or pediatric patient with an existing tracheostomy *greater than* 7 days post placement and a mature stoma tract.

Exclusion criteria:

Adult or pediatric patient with tracheostomy *less than* 7 days post placement (i.e., no mature stoma tract).

Patient management

Assessment

1. Evaluate patient respiratory status as per Airway Management Guideline**.**
2. In a patient with respiratory distress, evaluate for DOPE:
    a. **D**islodgement or misplaced tracheostomy (e.g., decannulation).
        i. Assess for subcutaneous air in the neck which may indicate the tracheostomy is not in the trachea.
        ii. Directly visualize the tracheostomy and the stoma (i.e., remove anything obstructing direct view of stoma including clothing/bandages/sponges etc.) to assure it remains properly seated in the stoma.
    b. **O**bstruction or secretions in tracheostomy.
        i. Assure tracheostomy is patent. Especially in pediatric tracheostomy patients with significant respiratory distress, plugging or dislodgement/decannulation of the tracheostomy is the problem until proven otherwise.
        ii. Auscultate breath sounds, consider potential for plugging of large airways in patients with significant respiratory distress.
    c. **P**neumothorax.
    d. **E**quipment connection problems.
3. As with any patient with respiratory distress, appropriate monitoring with pulse oximetry and waveform capnography should be provided as per Airway Management Guideline**.**

Treatment and troubleshooting interventions

1. In patient with **mild respiratory distress and adequate oxygenation**:
    a. **Suctioning/clearing obstruction [EMR-O, EMT-R]:**
        i. If the patient is not on a ventilator, remove any cap, filter, or speaking valve that may be connected to the tracheostomy.
        ii. Provide passive oxygenation with high flow oxygen over nose/mouth and stoma to avoid hypoxia during procedure.
        iii. Remove inner cannula if present.
        iv. If needed, use 1–3 mL sterile saline directly into the tracheostomy to loosen secretions and help clear obstruction.
        v. Pass appropriately sized suction catheter through tracheostomy.
        vi. Once obstruction is cleared, assist ventilations as needed with BVM to tracheostomy tube, provide passive oxygenation or return patient to ventilator if patient on chronic ventilator via tracheostomy.
2. **In patient with significant/severe respiratory distress and/or inadequate oxygenation:**

a. If patient on ventilator, remove from vent and attempt BVM ventilation [EMR-R].
b. **Suctioning/clearing obstruction [EMR-O, EMT-R]:**
    i. If the patient is not on a ventilator, remove any cap, filter, or speaking valve that may be connected to the tracheostomy.
    ii. Provide passive oxygenation with high flow oxygen over nose/mouth and stoma to avoid hypoxia during procedure.
    iii. Remove inner cannula if present.
    iv. Attempt to pass appropriately sized suction catheter through tracheostomy.
    v. If needed, use 1–3 mL sterile saline directly into the tracheostomy to loosen secretions and help clear obstruction.
    vi. If suction catheter will not pass, the tracheostomy needs to be changed emergently due to obstruction. (See below).
    vii. Once obstruction is cleared, assist ventilations as needed with BVM to tracheostomy tube, provide passive oxygenation or return patient to ventilator if patient on chronic ventilator via tracheostomy tube.

3. Consider use of humidified air or oxygen in any patient with a tracheostomy.
4. Cuff may need to be inflated to provide adequate oxygenation and ventilation when positive pressure ventilation is required. However, cuff should never be inflated if positive pressure ventilation is not being performed, or in patients with a Passy-Muir (teal colored) speaking valve in place.
5. **For recent tracheostomy patients who present with bleeding from the tracheostomy in the early (up to 3 weeks) postoperative period, a tracheoinnominate arterial bleed is an uncommon and life-threatening complication** (0.7% incidence and a 90% mortality rate).
    a. 50% of these patients present initially with a smaller sentinel bleed/hemoptysis which appears to have stopped.
    b. Inflation of the tracheostomy balloon to the maximum is a potential temporizing measure until definitive care can be provided, even overinflation may be needed. If the tracheostomy is uncuffed, it can be replaced with a cuffed endotracheal tube and the balloon maximally inflated.
    c. Any patient in the early postoperative period (within a month of surgery) with hemoptysis or bleeding from a tracheostomy should be transported for evaluation, even if bleeding has stopped.

Patient safety considerations

1. Especially in pediatric tracheostomy patients with significant respiratory distress, plugging or dislodgement of the tracheostomy is the problem until proven otherwise. Signs and symptoms of respiratory distress, cyanosis, ventilator alarms sounding, decreased level of consciousness, decreased SpO2 or cardiac arrest in patients with a tracheostomy, as well as bradycardia in pediatric tracheostomy patients should be presumed due to a tracheostomy obstruction.
2. Laryngectomy patients and some patients with congenital or surgical airway abnormalities cannot be orally intubated. Patients with tracheostomy alone (e.g., for mechanical ventilation) and no airway abnormalities should be able to be orally intubated.
3. Prompt tracheostomy replacement is important. Delays allow for narrowing of the stoma and can make recannulation more difficult.

Notes and educational pearls Key considerations

1. Tracheostomy tube components.
    a. Outer cannula: the tracheostomy size is stamped on the collar
    b. Inner cannula: not found in all tracheostomies
        i. Not commonly used in pediatric patients
        ii. Removed by gently twisting a quarter turn to the left and pulling out
    c. Balloon cuff: protects lower airway from secretions/blood from above, allows for better mechanical ventilation
    d. Collar: includes imprint of tube size and attachment for umbilical tape/tracheostomyties
    e. Obturator: stiffens and provides shape to tracheostomy tube to facilitate insertion. Must be removed for ventilation

2. To determine the appropriate size suction catheter, double the size of the tracheostomy (number on collar of tracheostomy tube).
3. A bougie may aid in the placement of an endotracheal tube into a mature stoma.
4. An inner cannula may be required to ventilate through the tracheostomy tube.
5. Uncuffed and fenestrated cuffed tracheostomy tubes may not protect the patient from aspiration.
6. If transporting a patient with a tracheostomy either in an emergency or routine transport, the patients home tracheostomy equipment (e.g., "Go bag") should accompany them. The equipment that needs to be at the bedside to ensure safety includes appropriately sized French suction catheters, operating suction system, and spare tracheostomy tubes. Sterile saline, sterile gloves and water-soluble medical lubrication packets should also be available. Most tracheostomy patients will maintain a kit with these supplies to travel with.
7. Inadvertent tracheostomy decannulation incidence is the second most frequent life- threatening pediatric tracheostomy complication, occurring at rates of 0.35– 15%, with the vast majority occurring more than 7 days postoperatively.
8. Tracheostomy obstruction can occur for several reasons, including mucus plugging, abnormal/excess granulation tissue, tracheomalacia causing collapse of the tracheal wall around the tube.
9. Do not replace a heat moisture exchange (HME) filter cap if soiled or wet as it can impede airflow.

Pertinent assessment findings

1. Adequate oxygenation without respiratory distress suggests that the tracheostomy is patent and functioning correctly.
2. Inadequate oxygenation and ventilation, respiratory distress, air hunger in a patient with a tracheostomy should first be presumed to be due to tracheostomy obstruction.
3. Neck or chest crepitus on palpation suggests tracheostomy misplacement outside the trachea.