

Tracheostomy

Is surgical procedure whereby stoma is created in the anterior wall of the trachea which brought out to cervical skin.

Indications:

I- Upper airway obstruction

1. Congenital causes:
 - a. Laryngeal: subglottic stenosis, laryngomalacia, glottis web, subglottic hemangioma.
 - b. Extralaryngeal: bilateral choanal atresia, cystic hygroma, maemangioma of the base of tongue.
2. Inflammatory:
 - a. Laryngeal: acute laryngotracheobronchitis, acute epiglottitis, odema of larynx, diphtheria.
 - b. Extralaryngeal: retroph, parapharyngeal abscess, Ludwig's angina.
3. Traumatic:
 - a. Laryngotracheal: truma, inhalational fumes or corrosive poisoning.
 - b. Extralaryngeal: maxillofacial trauma mandibular fractures.
4. Neoplastic:
 - a. Benign: juvenile recurrent respiratory papillomatosis.
 - b. Malignancy: tumor of tongue, pharynx, larynx, thyroid.
5. Neurological: bilateral vocal cord palsy mainly after surgery, cardiac surgery.
6. Foreign body: impacted in larynx or trachea.
7. Angionurotic edema.
8. Burn: face, neck and upper airway.

II- Non obstructive causes:

1. Pulmonary toilet for removal of blood and secretion in comatosed patients.
2. Assisted ventilation.
3. For anesthesia purpose.
4. Prevention of aspiration.

Types:

I- According to urgency:

- Elective
- emergency

II- according to the site:

- high tracheostomy: when laryngectomy is planned
- mid tracheostomy: commonly done.
- Low tracheostomy: when thyroid isthmus is enlarged.

III- According to duration:

- Temporary
- Permanent

Technique:**Position:**

Patient is placed in spire position with pillow under the shoulder, head ring to stabilize the head, over extension to avoid mainly in children, the area from chin to upper chest prepared and draped.

Anesthesia:

- Local anesthesia: for elective tracheostomy the area of 2 fingers above suprasternal notch infiltrated with 2% lignocaine. For emergency tracheostomy the area between cricoids and suprasternal notch is infiltrated.
- General anesthesia: with orotracheal intubation.

Incision:

In case of emergency tracheostomy, vertical skin incision is made in midline of neck extending from cricoids cartilage to suprasternal notch. Advantages of this incision: easier, less bleeding and no lower flap under which the secretion accumulate, but it leave prominent scar.

In elective incision: 2 fingers below cricoids its more difficult, more bleeding but cosmetically better.

Dissection:

Following skin incision, superficial fascia and platysma is dissected care to preserve or ligate anterior communicating vein.

Investing layer of deep fascia is dissected strap muscles retracted laterally. Thyroid fascia identify and divided to expose thyroid isthmus either retracted upward or down, or isthmus can be clamped, divided and ligated.

Exposure of trachea:

Pretracheal layer is divided trachea is exposed; cricoids cartilage is palpated and stabilized using cricoids hook.

Tracheal opening:

In adult, window is created in 3rd to the tracheal ring using no. 15 or no. 11 scalped blade. Tracheal rings are grasped in Allis tissue forceps and remaining incision is completed in (u) shape in children vertical incision is made in midline through the 2nd and 3rd ring and 2 stay sutures are placed on either side at incision.

Tracheostomy tube of appropriate size is inserted and stabilized with ties sutures. Tube tied around the neck with flexion of neck incision is loosely sutured because tight sutures can lead to surgical emphysema suture removed after (7) days.

Postoperative care:

- Deflate the cuff every 1 hour for 10 min.
- AB and analgesia.
- Frequent suctioning.
- Humidification of inspired air, or gauze soaked in saline is used to cover tracheostomy tube to prevent crusting.
- Removal of thick secretion by instillation of 5% sodium bicar.
- Tracheostomy tube should be change after 3 days in adult and 7 days in children.

Complications:

- **Intraoperative:**

1. Hemorrhage.
2. Injury to trachea or larynx.
3. Injury to paratracheal structures: RLN, carotid artery, jugular vein.
4. Air embolism.
5. Apnea due to sudden drop in P_{CO₂} level and corrected by carbogen (5% Co₂ and 95% O₂).
6. Cardiac arrhythmias.
7. Cardiac arrest: due to excessive adrenaline production.

- **Early post-operative:**

- 1- Subcutaneous emphysema is common in patients receiving PPV, too tight closure of wound incurred size tracheostomy tube.
- 2- Pneumo mediastinum and pneumothorax mainly in children, because of trauma of apical pleura.
- 3- Tube displacement: this avoided by proper size tube that scurried around the neck.
- 4- Tubal blockage: created by crust because of failure to humidity inspired air.
- 5- Wound infection.
- 6- Tracheal necrosis: because of pressure effect of tube.
- 7- Secondary hemorrhage: because of infection.
- 8- Dysphasia.

- **Late:**

- 1- Hemorrhage.
- 2- Granuloma formation.
- 3- Trachea cutaneous fistula.
- 4- Trachea esophageal fistula.
- 5- Laryngo tracheal stenosis.
- 6- Difficult decanulation.
- 7- Trachea arterial fistula.