Laryngotracheal Separation Procedure

Redirecting to: https://medicine.uiowa.edu/iowaprotocols/laryngotracheal-separation-procedure

See also: Laryngotracheal Separation with Tracheo Tracheal Puncture Case Example

1. DEFINITIONS
   a. Tracheoesophageal diversion: trachea divided with the lower open segment sutured to skin (tracheostome) and upper open segment sutured to esophagus (via esophagotomy)
   b. Laryngotracheal separation: trachea divided with lower open segment sutured to skin (tracheostome) and upper segment closed on itself (blind pouch)
2. GENERAL CONSIDERATIONS
   a. i. Intractable aspiration (see Management of Swallowing Disorders)
   ii. Desires to proceed by a well-informed patient (and family, support group, power of attorney)
      1. "Therapeutic strategies to prevent aspiration are usually determined by the families, since the patients are often suffering from stroke, brain damage, and intellectual disabilities." (ref Teramoto 2000)
   2. QOL study following laryngectomy (6 pts) and laryngotracehale separation (1 pt) for intractable aspiration (ref Takano 1999)
      a. Surgical treatment improves the depression and mood of patient and family
      b. Surgical treatment improves feeding status and clinical outlook
   iii. Discuss alternative to surgery: NPO (PEG), aggressive pulmonary toilet, treatment of recurrent lung infections, consider prophylactic antibiotics
   iv. Ensure conservative measures have been appropriately applied and found to be ineffective
   v. Surgical Options
      1. Tracheotomy alone (temporarily may help pulmonary toilet; may worsen chronic aspiration hence, may be done with:
         a. Obturation of larynx (placement of Montgomery solid stent) - greater ease of reversal, problems with leakage about the stent, inducing scarring in the larynx
         b. Glottic closure - considered unreliable in presence of mobile vocal cords
         c. Supraglottic Closure - efficacy questioned
      2. Near field laryngectomy - considered by some a procedure of choice
      3. Laryngo tracheal separation or tracheoesophageal diversion - potentially (very rarely due to underlying conditions) reversible
         a. See discussion of relative merits of each below
         b. Current philosophy at U of Iowa: favor laryngotracheal separation
3. Speech pathology swallowing evaluation
   a. OPMS
   b. FEES
   c. FEEST
   d. Bedside swallow
4. Speech pathology counselling "life w/o the larynx" (see Laryngectomy counselling)
5. Medical clearance
6. Consent for Surgery
a. Describe indications
   i. "Need to protect lungs from soiling by aspiration of secretions"

b. Describe procedure:
   i. General anesthesia - neck incision, separate trachea from larynx, suture trachea to skin as a permanent breathing opening, close off bottom of larynx (blind pouch)
   ii. May consider concurrent 'tracheo-tracheal puncture'

c. Describe alternatives:
   i. Manage recurrent pneumonias medically
   ii. Tracheotomy with obturation of larynx
   iii. Near field laryngectomy

d. Risks: bleeding, infection, reaction to anesthetic

e. Potential complications
   i. Damage to nerves: lip (marginal mandibular), tongue (hypoglossal, lingual), shoulder (spinal accessory), larynx (vagus/RLN), diaphragm (phrenic)
   ii. Leak of saliva (blind pouch, adjacent pharynx)
   iii. Mediastinitis
   iv. Narrowing of stoma (stenosis may require secondary opening, use of long term stent)

NURSING CONSIDERATIONS
# Patient head of bed elevated, rotate 180 degrees away from anesthesia

1. (Room Setup)
   a. Sub-Con
      i. Sub-sub-con

2. Consideration 2 (Instrumentation and Equipment)
   a. Sub Con

3. Consideration 3 (Medications (specific to nursing))
   a. Sub Con

4. Consideration 4 (Prep and Drape)
   a. Sub Con

5. Consideration 5 (Drains and Dressings)
   a. Sub Con

6. Consideration 6 (Special Considerations)
   a. Sub Con
      ANESTHESIA CONSIDERATIONS
      b. General anesthesia - oro-endotracheal
         i. Sub-sub-con

7. Consideration 2
   a. Sub Con
   b. OPERATIVE PROCEDURE: LARYNGEAL DIVERSION PROCEDURE
# Microdirect laryngoscopy (assess anatomy, arytenoid mobility)

1. Esophagoscopy
   a. To GE junction - possible biopsy (if signs of Barretts, reflux)
   b. Place Mahoney esophageal dilator for use during procedure to palpate esophagus

2. Injection 1% lidocaine with 1:100,000 epinephrine to stoma site (3 cm circular incision)
   a. access for separation (9 cm incision at level of cricoid) (ensure adequate skin bridge between to openings)

3. Prep and drape (from lower lip to mid sternum, from shoulder to shoulder)

4. Elevate subplatysmal flaps superiorly and inferiorly

5. Separate strap muscles and thyroid isthmus (consider thyroid isthmusectomy)

6. Bluntly mobilize trachea (finger dissection, blunt hemostat) to upper mediastinum - avoid injury to RLN's

7. Incise between 3rd and 4th tracheal ring trending superiorly (permit stoma to be bevelled) (depending on the length of the neck the incision may be made higher (between 2nd and 3rd ring) or lower.

8. Separate the posterior tracheal wall from esophagus carefully identifying the grey line (palpation of previously placed Mahoney may be helpful)

9. Create the tracheostomy by suturing the trachea circumference to the lower circular incision
   a. Small anesthetic tube placed through skin incision re-routing gas administration from trans oral to the stoma
   b. (3-0 vicryl deep, 4-0 chromic running 4 separate quadrants)

10. Use Senn retractor within the proximal tracheal stump to retract the stump into the wound
    a. Separate the posterior tracheal wall from esophagus superiorly
b. A small entry from into the esophagus may be established to provide a controlled port of exit of secretions from the otherwise blind pouch

c. Alternatively, a blind pouch may be created without and inferior point of egress - closure the tracheal on itself to create a blind pouch - relaxing incisions may be necessary -

i. (ref Snyderman 1988)
   1. Incise between 2nd and 3rd ring, do not violate esophagus, create blind pouch by removing 2nd tracheal ring - invert the underlying subglottic mucosa with interrupted 4-0 vicryl and oversewn with running 3-0 vicryl
   2. "Concern about pooling of secretions and food in the subglottic blind pouch do not appear to be warranted" (emptying of the pouch with the patient supine)

ii. (ref Eisele 1988)
   1. Tracheoesophageal diversion: trachea divided between 4th and 5th tracheal rings with proximal tracheal segment anastomosed in end-to side fashion to anterior esophagotomy.
   2. High trachotomy precludes establishment of a tension-free tracheoesophageal anastomosis, therefore perform Laryngotracheal separation with blind pouch in patients with previous high trachotomy.
   3. Tracheoesophageal diversion favored by these investigators to
      a. Avoid pooling in the subglottic tracheal pouch
      b. Permit easier tracheal reconstruction due to longer tracheal segment

11. Tack the anterior wall of the blind pouch to the posterior wall of the trachea (site of proposed TEP = 1.3 cm below muco-cutaneous edge of the tracheostome)

12. To prevent the laryngeal remnant from pulling away from the tracheostome, consider placement of 3-0 or 4-0 prolene sutures through the cricoid and tied over rubber-shods externally (over skin)

**OPERATIVE PROCEDURE: TRACHEO-TRACHEAL PUNCTURE** Concurrent placement of a tracheo-tracheal puncture can be done at the time of diversion

1. In the course of step (11) above, orient the anterior wall of the proximal trachea (blind pouch) to coapt the posterior wall of the tracheostome

2. Create and opening communicated from the tracheostome (1.3 cm below the muco-cutaneous edge) to the blind pouch and place a red rubber catheter through the fistula into the pouch exiting the pouch through the small communication into the esophagus.

3. Delay placement of TEP prosthesis until wounds healed.

**POSTOPERATIVE CARE**

4. Consideration 1
   a. Sub-con
   i. Sub-sub-con

5. Consideration 2
   a. Sub Con

SUGGESTED READING


