Swallowing after a Total Laryngectomy

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Disclosure Statement

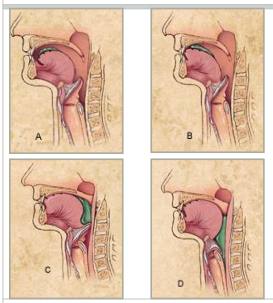
No relevant financial relationship(s) or nonfinancial relationship(s)

- I have no relevant financial or nonfinancial relationships in the products or services described, reviewed, evaluated or compared in this presentation.

Objectives

- Identify anatomical and surgical factors changing swallow function following Total Laryngectomy (TL).
- To identify additional risk factors impacting probability of dysphagia after primary and salvage TL
- Illustrate common causes of dysphagia after TL
- Understand the role of the SLP in evaluation and management of dysphagia after TL

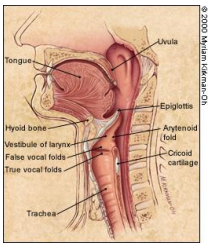
Swallowing before TL

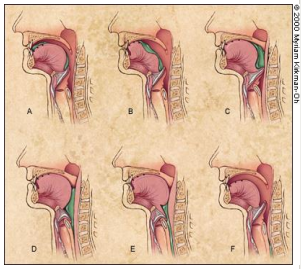


4 Phases

- Oral Preparation
  - Mastication
  - Bolus formation
- Oral Phase
  - AP transfer of bolus
- Pharyngeal Phase
  - Moves food and liquid into the esophagus
- Esophageal Phase
  - Evaluation/management by GI

Swallowing before TL





Normal Pre-TL Swallow

Abnormal Pre-TL Swallow

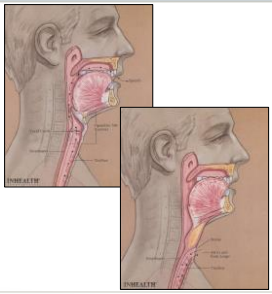
Swallowing after TL

Myths	Reality
TL is a cure for dysphagia	TL eliminates "traditional" aspiration
Gravity is the only thing needed to swallow after a TL	Swallowing after TL still requires propulsive forces to clear a bolus
Incidence of dysphagia is low after TL	Dysphagia is often under reported and prevalence maybe up to 71.8% of patients (Maclean 2009)
Dysphagia after TL is due to stricture	Stricture is only one of many possible causes of dysphagia after TL

Considerations that change how the swallow functions after a TL

- Primary/1st line treatment vs. "salvage" treatment.
- Radiated vs Non-Radiated tissue
- Surgical closure
  - Primary vs pedicle/patch flap vs. free flap reconstruction
- How extensive was the reconstruction?
  - Partial vs circumferential
- Lingual deficits
  - Baseline?
  - Was a glossectomy also performed?
- Did the patient have pre-operative dysphagia?

Anatomical Changes after TL



- Separation of the airway from the esophagus; trachea brought forward below level of larynx creating a permanent tracheostoma (trans-nasal airflow eliminated)
- Removal of laryngeal structures and hyoid bone.
- Neo-pharyngeal creation and pharyngeal closure with alteration of base to tongue as upper anastomosis leading to the pharyngo-esophageal sphincter now known as PE segment.
  - Primary closure vs flap closure?
- Cricopharyngeal (CP) myotomy is completed to release muscle fibers superiorly and inferiorly to ensure that all of the muscle has been released and decrease tonicity of sphincter.
- OPTIONAL: Formation of tracheal-esophageal puncture with intra-operative placement of primary prostheses (indwelling) vs. red rubber catheter.

Oral Phase: Expected Structure and Function after TL

- Altered sensory recognition of food due to lack of trans-nasal airflow (hyposmia-smell; Dysguesia-taste)
- Lingual instability (removal of the hyoid)?

TL with glossectomy required as part of resection?

- may impact bolus formation, mastication, consolidation, and lingual propulsion of bolus (complex resection)

Oral phase impairment from prior treatment or other medical diagnosis?

- Altered Saliva production—if h/o xerostomia (XRT)
- Jaw opening/ROM impairment

Neo-pharyngeal Phase: Expected Structure after TL

- Structure:
  - Funnel shape of neo-pharynx
  - Edema (submental/ prevertebral tissue)
  - BOT alteration/formation of upper anastomosis site
  - Diameter of neo-pharyngeal lumen
    - Stricture vs narrow secondary to closure?
  - Pharyngo-esophageal segment (PES) location C5-C7
  - Location of TEP (is applicable)
  - CP Myotomy: aides with relaxing CP junction to assist with bolus transit

Neopharyngeal Phase: Expected Functional after TL

- Function:
  - Varies depending on radiation history, dysphagia history and reconstruction preformed
  - BOT retraction still required
    - Increased pressure required compared to non-TL swallow
  - Contractility/motility of neo-pharynx?
  - Separation of trachea and esophagus =
    - no traditional aspiration
    - also eliminate necessary negative pressure (sub-atmospheric pressure) to create pressurization of swallow or vacuum for bolus propulsion and CP relaxation.

Esophageal Phase: Expected Structure and Function after TL

- Impaired motor function of UES and abnormalities in peristalsis
  - Secondary to sacrifice of pharyngeal branches of the vagus bilaterally?
- CP Myotomy: aides with relaxing CP junction to assist with bolus transit
- High incidence of reflux!
- Abnormalities in peristalsis motility of proximal esophageal body
  - Esophageal dysmotility needs to be considered in the dysphagic laryngectomee, particularly if they fail to respond to dilatation of the frequently identified concurrent cricopharyngeal stricture.
- Remember we are using the esophagus for functions not originally intended after a TL

Post-operative timelines

Considerations for starting PO intake

- Primary/1st line treatment vs. "salvage" treatment.
- Radiated vs Non-Radiated tissue
- Surgical closure
  - Primary vs pedicle/patch flap vs. free flap reconstruction
- How extensive was the reconstruction?
  - Partial vs circumferential
- Immediate post-operative recovery

Immediate Post-op Recovery

Post-Operative Timeline to return to PO intake

NPO pending clearance by Head and Neck Surgery for swallow evaluation

- NGT vs g-tube

Clinical/bedside swallow evaluation vs Esophagram vs MBS

- **Timeline and preferred diagnostics before PO intake is variable per MD discretion/practice pattern and post-operative recovery**
- Approximately 7 days after surgery if primary closure and **NOT** previously radiated
- Approximately 2-4 weeks if primary closure and previously received radiation therapy.
- Approximately 4-8 weeks if free flap used for closure.

Leak Study

- Conducted by Radiologist
  - Independently performed Esophagram
  - Integrated into beginning of the MBS procedure
- Uses a water soluble contrast (Omnipaque)
  - Able to be re-absorbed into neck tissue and does not impair healing
  - Not as radio-opaque and disperses quickly—may miss subtle leaks?
- Completed prior to initiating P.O diet
  - post-operative protocol
  - Concern for post-operative leak/fistula (visual assessment or JP drain contents)

Leak/Fistula

- A fistula/leak is an abnormal communication between neo-pharynx and soft tissue.
- One of the more common complications after total laryngectomy
- Usually occurs within 1-3 weeks after surgery and may be coupled with infection.
- Risk factors:
  - Salvage TL;
  - h/o XRT;
  - Other co-morbidities that impair healing – i.e., DM; anemia; hypothyroidism; etc.
  - poor nutrition;

+ Leak – Now what?

- NPO until fistula/leak is either healed or repaired
- Usually identified by physician prior to inpatient discharge but can be found by SLP after discharge
- Presence of fistula will impact progress with alaryngeal speech methods

Initiating PO intake?

- NO LEAK!
  - Liquid diet and advance as tolerated slowly to regular p.o diet
  - Educate patient on the changes in swallow function after surgery
    - Patient might report odd sensation and difficulty with swallowing due to new but normal changes with swallow function post TL
    - Education on food choices
  - Patient will need encouragement for p.o intake if h/o prolonged NPO status
  - Educated on basic reflux precautions and upright positioning after meals
  - Provide recommendations for xerostomia (dryness) and for optimizing taste/smell impacting appetite.

No leak but they still cannot swallow?

MBS is for more than identifying aspiration!

Possible Causes of Dysphagia after TL

- Edema (submental/ prevertebral tissue)
- BOT weakness
- Diameter of neo-pharyngeal lumen
  - Stricture vs narrow secondary to closure?
- Incomplete UES relaxation/cricopharyngeal dysfunction
- Poor contractility/poor motility of neo-pharynx
- Structural Abnormalities
  - Stricture
  - Large pseudo-epiglottis/pseudo-valleculae

- Leak + Dysphagia

SLP Intervention: Oral Phase Dysphagia

Without experiencing the aroma of food, interest in eating can deteriorate

- Try foods never tried before
- Try foods that were previous dislikes
- Use seasonings and spices
- Avoid dependence on liquid supplements
- Wafting aromas to promote smell

SLP Intervention: Neo-pharyngeal Dysphagia

- Modified Barium Swallow Study
  - You have to know the cause to treat this effectively
- Traditional swallowing exercises?
  - Weak BOT? Increase retraction and bolus propulsion?
- Compensatory Swallow Strategies
  - Upright sitting posture
  - Alternate liquids and solids
  - Effortful swallow
  - Head Rotation

Conclusion

Patients after TL can still have dysphagia

Know when PO intake is appropriate and when it is not!

Know WHY your patient cannot swallow so that you are able to effectively help them!

Questions?

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