MICHIGAN MEDICINE

A Case Study: Total Laryngectomy and the Speech Language Pathologist

Pre to Post Operative Evaluation and Treatment of Alaryngeal Communication and Swallowing

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Ultimate Goals for Every Patient

1. Cancer Free
2. Return to independence
3. Safe and efficient swallow of a functional diet
4. Able to achieve efficient and functional alaryngeal communication
5. Healthy pulmonary function and tracheal climate

The Role of the SLP

- Care initiating pre-operatively and continues throughout lifetime
- Evaluation and treatment of alaryngeal communication and swallowing
- Where do we start?

Pre-Operative

Pre-Operative Evaluation

- Swallow/Speech/Voice evaluation
- Primary focus: Educate patient on the anatomy before and after total laryngectomy surgery
- Changes to breathing, swallowing, and voicing
- Laryngectomy visitor?
- Introduce SLPs role in rehabilitation and treatment
- Why is pre-op important?

Clinical Evaluation of Swallowing

History/Chart Review

Review of Symptoms/Patient Complaints

Oral Mechanism Examination

- Inventory structures
- ROM
- Strength
- Sensation

Assess Swallowing

- Consistency types/trials dependent upon specific patient
- Use of blue food dye (tracheotomized; “window”)
- Results to guide non oral vs. oral nutrition, diet level, use of strategies/maneuvers
- Provide strategies and recommendations to continue with least restrictive diet pending surgical intervention

Dysphagia: Formal Evaluation

- In event of total laryngectomy for nonfunctional larynx, surgeons may request formal swallow evaluation prior to or same day as pre op visit to assess if swallowing can be rehabilitated through traditional swallow therapy

Fiberoptic Endoscopic Evaluation of Swallowing (FEES)

Modified Barium Swallow Study/3 Phase:

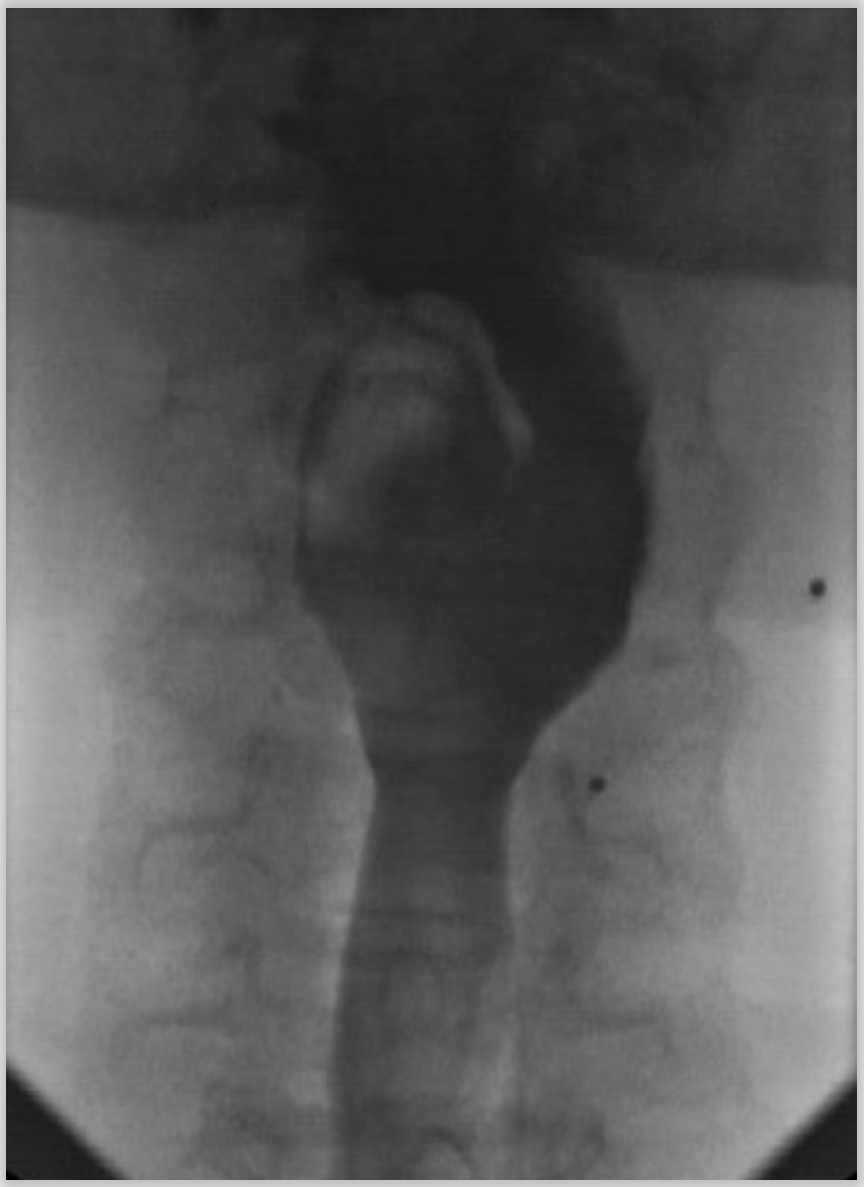
Dynamic procedure to view all phases/stages of swallowing

Impact of H&N Cancer and Treatment on Swallowing

Size and location of tumor can impact swallowing

SLP can provide patient with strategies for maintaining the safest and least restrictive diet prior to surgery

Tumor Burden



Speech and Voice Evaluation

Speech

- Intelligibility
- Distortion

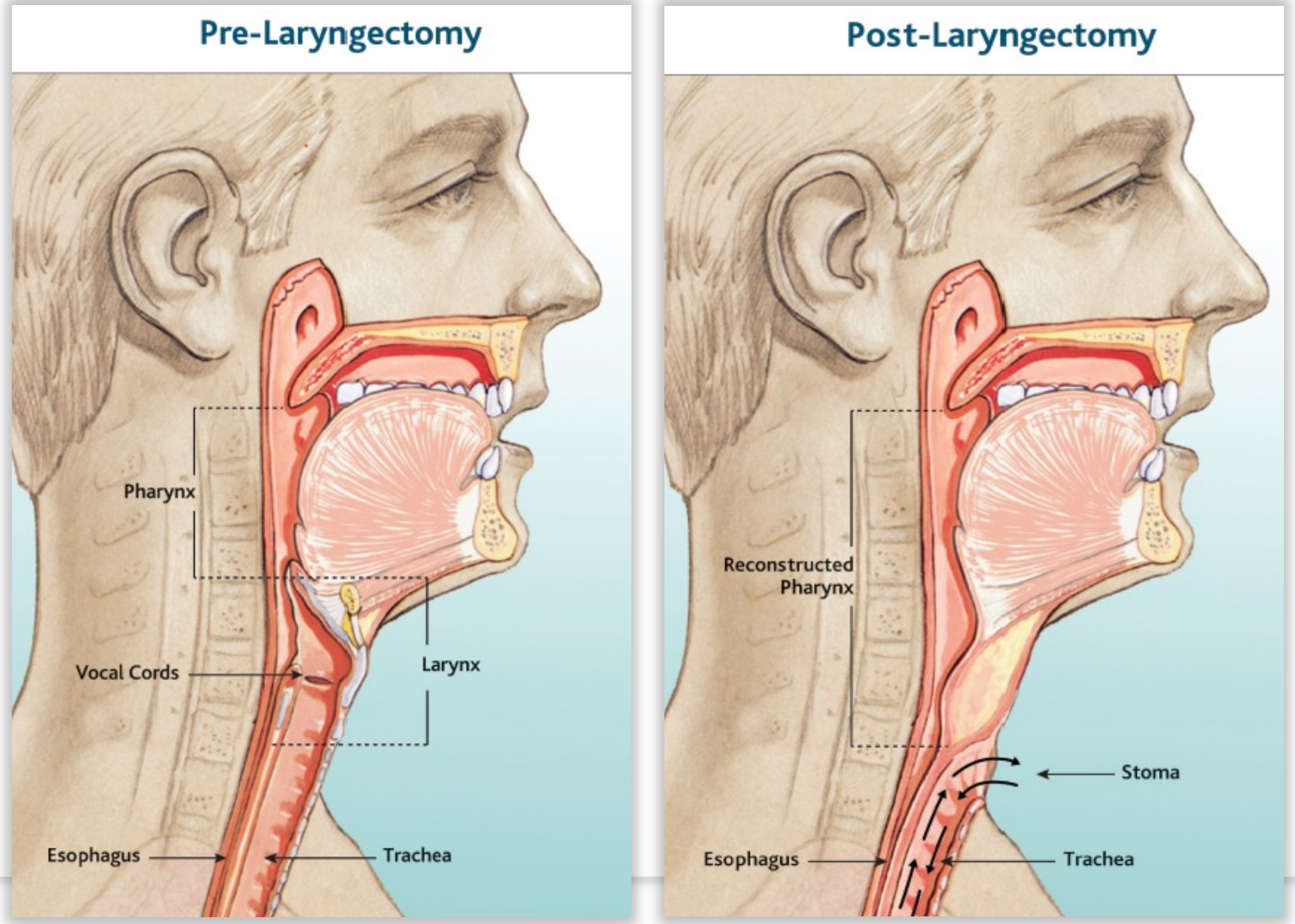
Voice

- Dysphonia
- Vocal intensity
- Aphonia

Non-Verbal communication

- Writing, gestures, augmentative communication/ text to speech

Pre-Operative Counseling



Images from InHealth.com

Pre-Operative Video Example

- Patient has given consent for us to follow him on his journey from pre to post laryngectomy.
- Initial diagnosis: Right vocal fold cancer s/p radiation therapy, with recurrent T2N0 (Stage II) glottic SCC
- Recommended procedure: Total Laryngectomy, Left ALT free flap, CP myotomy

Voice: Vocal hoarseness and reduced intensity.

Swallowing: Tolerating a soft solid diet. He had to modify his diet secondary to cancer diagnosis due to pain with swallowing solid foods.

Procedure Completed

- Procedure completed 11/29/2022: Bilateral SND, Total laryngectomy, Left ALT free flap , CP myotomy by Surgeon Andrew Rosko, MD

Operative

Warning: **Graphic** surgical pictures to follow

Total Laryngectomy: Intra-Operative

- Entire removal of the larynx/voice box/ ‘Adam’s apple’
- The incision is made from ear to ear
- The structure from the hyoid bone down to the larynx are removed
- Larynx and margins are biopsied
- Approximately the 2nd or 3rd tracheal ring is turned anteriorly and sewn to create a stoma
- A cricopharyngeal myotomy is performed
- The neck is stapled back
- Surgery is approximately 6 hours with free flap reconstruction and 4 hours with primary closure

Flap Reconstruction

- Microvascular Free Flap
- Transplant of tissue from one site to another site to reconstruct a deficit
- Microvascular tissue transplant: blood supply disrupted for a short time and reconnected at the site of deficit
- Common harvest sites:
  - Radial forearm (RFFF)
  - Anterolateral thigh (ATL)
- Surgeon determines transplant site

Post-Operative

Acute Post-Operative SLP Intervention

- POD 1-2: Introduction to Laryngectomy Pulmonary Kit including HME system
- Patient with aphonia due to removal of the larynx
- Patient is communicating with writing, gestures, mouthing words, text to speech applications
  - His preferred to use text to speech for primary communication
  - Artificial Larynx?

Post-Operative Care Kit

- SLP introduces POD 1-2
- Components
  - 2, 10X55 Blom-Slinger StomaSoft Laryngectomy tube
  - Blom-Singer Classic Flow HME (30 count)
  - Tracheostomy Necktie
    - With medical clearance from surgeon
  - Blom-Singer Shower Guard
  - Mirror with stand
  - Flashlight

Post-Operative Care Kit Components

Blom-Slinger 10X55 StomaSoft Laryngectomy Tube

- Placed following TL procedure
- Made of soft silicone
- Insert into stoma using water based lubricant

InHealth Classic Flow HME

- Pulmonary heat and moisture is retained and exchanged
- Increased moisture retention
- SLP evaluates patient for HME use (more to come on evaluation)

Post-Operative Care Kit Components

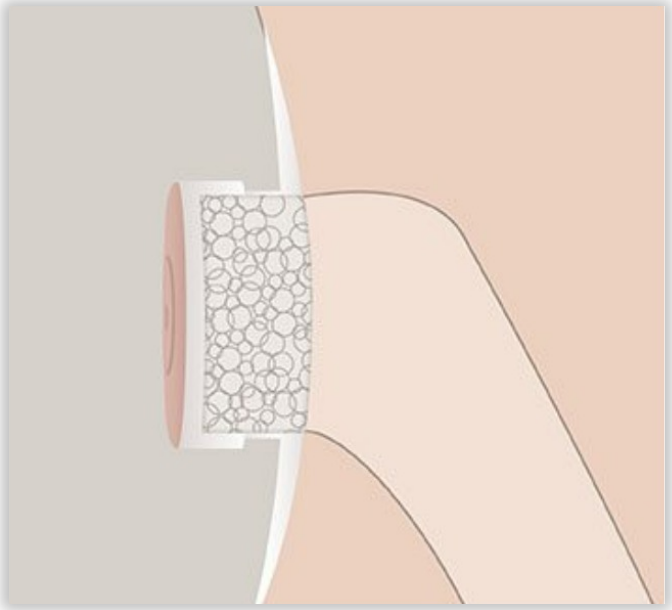
Tracheostomy Necktie

- With medical clearance from surgeon

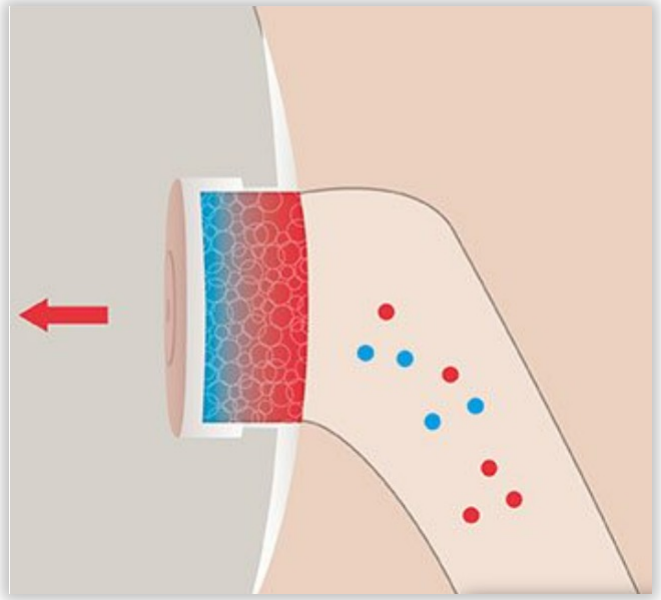
Shower Guard

- Protect airway while showering
- Reusable housing with tape discs

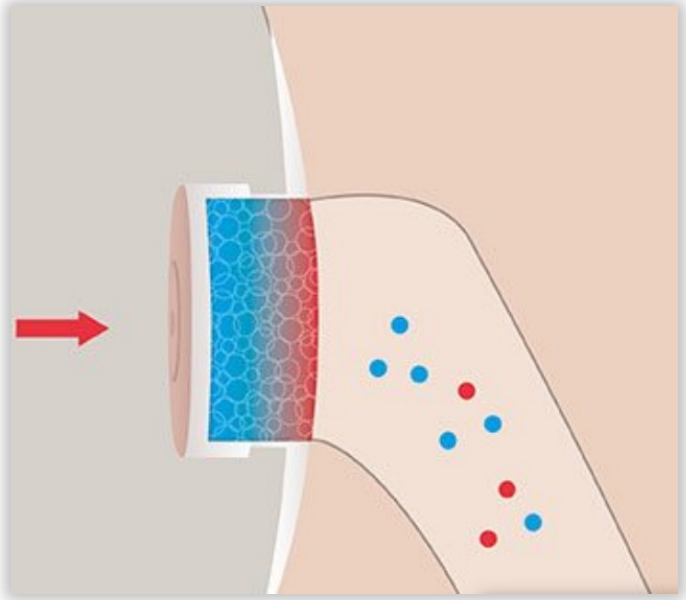
What is an HME and How Does it Work?



The foam is treated with a salt called calcium chloride



When you breathe out through your stoma, the foam collects and saves the humidity and warm air



When you breathe in, the humidity and warm air that are saved in the foam are given back to the air you breathe in

Images from Atosmedical.com

Importance of HME

- Importance of the Heat Moisture Exchanger (HME)
  - Heating
  - *Filtering
  - Humidity
- Transition from trach collar to HME as tolerated

Swallowing During Inpatient Stay?

- Patient is typically NPO during inpatient stay depending on extent of surgery
  - Ice chips +/- sugar free clear liquids at discharge if medically cleared
- Receiving primary nutrition, hydration, and medication via feeding tube
  - Most patients have Dobhoff feeding tube in place
- Patients are trained and typically independent with DHT feeding prior to discharge

First Outpatient Post Operative Visit-Swallowing

- In conjunction with surgeon
- Surgeon provides medical clearance for oral diet
  - Based on degree of healing
- Assessment options
  - Clinical exam-Primary means of examination at MM
  - MBBS [video]/Esophagram
  - FEES

- Typical progression of oral diet at Michigan Medicine
  - Completion of clinical swallow evaluation if no s/s of fistula...
    - Full liquids for 4-5 days
    - Advance to pureed foods 4-5 days
    - Soft mushy foods (minimal chewing) 4-5 days later
    - Advance to general diet by week 4-6 of oral diet

Potential Post Op Issues and Management

- Fistula (10% non radiated; up to 30% patient in radiated patients)
  - Connection from one cavity to another
    - Tracheoesophageal (from esophagus to trachea)
    - Pharyngocutaneous (from pharynx to neck; peak day is around day 6)
  - Blue food coloring test (impressive coffee video coming shortly!)
    - Surgical lines, drain sites, stoma
  - NPO (DHT) pending reassessment by MD with no s/s of fistula
- Nasal regurgitation (swelling, lymphedema, weakness-path of least resistance)
  - Controlling bolus volume/rate of presentation
  - Head position
  - Body position [slight recline]
  - Control consistency
- Reduced transfer (swelling, lymphedema, weakness, Need for wash or repeat swallows)
  - Control consistency
  - Implement strategies/maneuvers/etc [bolus volume, chin tuck, carbonated beverage, use of oil as a lube, liquid wash, repeat swallow]

Long Term Swallowing

- Ongoing swallowing considerations:
  - Long vs. short term swallow therapy?
  - Train on use of swallow strategies including: small bites/sips, liquid wash, use of liquid moisturizers
  - Management of strictures and prominent CP
- Update:
  - As of today he is ~4 months out of treatment. He is currently consuming a general diet.
  - Swallow complaint is occasional solid food lodgment which he is managing with a liquid wash
  - He did not require any swallow exercises to date, he was able to adv w/o.

TracheoEsophageal Voice

- What is it?
  - One-way valve TE prosthesis
  - PE segment as sound source
- How does it work?
  - use of a TE voice prosthesis
  - Allows for direction of air flow to a new sound source
  - Prevents aspiration of food/fluids from esophagus into trachea

Timing of the Tracheoesophageal Puncture (TEP)

Two Types:

1) **Primary TEP**
   - TEP tract created with placement of TE voice prosthesis at the time of total laryngectomy surgery

2) Secondary TEP
   - TEP created with placement of a voice prosthesis as a separate procedure in clinic (after initial surgery)

Secondary TEP Day

- 2-4 weeks after surgery depending on healing
- SLP Role:
  - Training prior to TEP
  - Placement of the voice prosthesis on guidewire

Training Prior to TEP

- Training
- Accidental dislodgment of voice prosthesis
- Sudden onset leaking through of the TE voice prosthesis
- Defer cleaning of the TE voice prosthesis in situ

TEP Training One

- ~1.5 weeks following secondary TEP
- Evaluate …
  - Fit of the voice prosthesis
  - TE sound fluency, quality, and intensity
  - Ongoing troubleshooting

- Training on …
  - Digital occlusion for production of TE sound
    - Train on airtight and well-timed stoma occlusion
    - Light occlusion*
  - Cleaning of the voice prosthesis in situ / instructions on daily care and maintenance
  - Pulmonary Rehabilitation with Heat Moisture Exchange (HME system)
  - Review training packet (previously pictured)
  - Complete new patient paperwork/ insurance coverage

Ongoing Training: Baseplates

- Follow up 1-2 weeks later / 2.5 weeks from secondary TEP
- Introduction of adhesive baseplates
  - Wean from wearing laryngectomy tube
  - Another option to hold HME cartridge
  - Various shapes, sizes and components
  - External (sits outside the stoma)
  - Disposable

Ongoing Training: Stoma Button and Hands Free

- Stoma button evaluation
  - Dependent upon healing and medical clearance
  - Various diameters and lengths
  - Maintain stoma patency (sits within the stoma)
  - Attachment for HME cartridge/cassette and hands free speaking valve
  - Reusable
- Hands-Free Speech Evaluation if appropriate
  - Once patient is tolerating stoma button 8+ consecutive hours per day introduce HF speech
  - Benefits:
    - Patient free to use hands while speaking
      - Can work more safely
      - Talk and hold the telephone while writing a message down
    - Improved social acceptance
    - More hygienic

Subsequent Outpatient Treatment Sessions

1. Resize TE puncture if indicated and change voice prosthesis
   - Average device life is 3-6 months
   - We replace at 12 months whether device is failing or not
2. Work on obtaining fluent TE voice, good digital occlusion, adequate care and HME use
3. Reassess HME attachment use and function
4. Continuous follow up until patient is independent
5. Total rehabilitation of patients following TL goes beyond just providing products and changing prostheses!

Thank You!

Questions?