THE ART AND SCIENCE OF VOICE AND SWALLOWING RESTORATION FOLLOWING TOTAL LARYNGECTOMY

Amy Stone, MS, CCC-SLP
Pamela O'Fally, MS, CCC-SLP
Vanderbilt University Medical Center

ANATOMICAL CHANGES FOLLOWING TOTAL LARYNGECTOMY (1.)

COMMUNICATION OPTIONS

Electrolarynx (EL)/alaryngeal (AL) device
Esophageal speech
Tracheoesophageal puncture (TEP) speech
SERVES AS AN EXTERNAL SOUND SOURCE TO REPLACE THE INTERNAL SOUND SOURCE THE VOCAL FOLDS PROVIDED

MAY BE USED FOLLOWING SURGERY IN ORDER TO COMMUNICATE AS SOON AS POD 1 AFTER TOTAL LARYNGECTOMY, GIVEN USE OF INTRAORAL ADAPTOR

INTRAORAL ADAPTER USE S/P SURGERY IS NECESSARY TO AVOID CONTACT WITH DRAINS AND AVOID PLACING PRESSURE ON FRESHLY OPERATED TISSUE AT THE NECK

AL DEVICE TRAINING: PRIMARY GOALS

- Focus on maximizing intelligibility through:
  - OVERARTICULATION
  - SLOWED SPEECH RATE
  - ON/OFF TIMING
  - PROPER DEVICE PLACEMENT
AL DEVICE TRAINING: PROPER PLACEMENT

- Intraoral Adapter
  - Find "sweet spot" intraorally
  - Lateral placement between tongue and lingual side of upper teeth
  - Mounting bar should be oriented 1-3 m
  - Articulation will be somewhat compromised due to oral tube
  - Course: This is generally the most challenging method of AL device use, and is often temporary

AL DEVICE USE: NECK PLACEMENT

- May initiate neck placement upon NO combination of adequate tissue holding post TL
- Faciopharyngeal
  - “Faulty lips” by entering neck underside of chin. Other areas into -1/4” in squares
  - Use mirror to promote visual reinforcement for PT
- Adequate pressure at all contact of device

AL DEVICE USE: NECK PLACEMENT

- [Illustration of neck placement]
- [Additional diagrams or illustrations related to AL device use]
AL DEVICE TRAINING: SECONDARY GOALS

- Phrasing
- Echoing control
- Improved voiceless phonation to distinguish between voiced and voiceless cognates in speech
- Nonverbal behaviors

COMMUNICATION OPTIONS: ESOPHAGEAL SPEECH

- Involves swallowing air into the esophagus that can be used to speak
- The head, tongue, and lips are used to articulate as they had been preoperatively
- Does not require additional surgical intervention or devices but typically requires extensive practice and instruction
COMMUNICATION OPTIONS: TEP SPEECH

\* Surgical creation of a tract causes the patient's trachea to extend beyond the larynx
\* Double-barrelled tracheal tube
\* TEP: Wire and tube inserted into the trachea
\* The patient can then be intubated

TEP SPEECH: ADDITIONAL CONSIDERATIONS

\* Significant majority of Pts opt for TEP speech as their primary mode of communication
\* Though vs secondary function (typically 3-4 months post TE), based on physician and pt preference
\* Patient may need to consult with occupational therapists
\* Accessory anterior to a foreign object is available
\* Intraoperative placement of prosthesis vs gastrostomy preferred
\* Aspiration through tracheostomy possible
\* Ctemplate removal
\* Remodeling (surgical changes) vs nonremodeling (pt changes) prosthesis options

TEP SPEECH: INDWELLING PROSTHESIS

\* Indwelling prosthetic features
  \* Presbylarynx, mandibular fitting and plating
  \* Size and shape vary widely
  \* Larger trachea seen with higher risk of prosthesis displacement
  \* Size range from 45mm to 75mm in length
TYPES OF INDWELLING PROSTHESSES

- Canaeva Resrat
- Enlarged Flange (Esophagyal, trachial, & trachial)
- Dual Flange
- Increased Resistan (also available in non-indwelling)

TEP SPEECH: NON-INDWELLING PROSTHESI

- Nonindwelling prosthesis features:
  - PI managed
  - Increased autonomy from clinic or PT
  - PI requiring minimal for follow-up
  - Lower cost
  - Smaller flange size increases portability of device
  - Must secure stethoscope at the back of neck or all times to prevent aspiration
  - Size 4 or 5F in diameter
  - Size 3R in length

TEP: FITTING A PATIENT WITH A VOICE PROSTHESIS

- Remove old prosthesis
- Use dilator to mold new diameter of tract and feel for directionality and fixity of tract
- Measure tract length using a 10cm scale
- Insert new prosthesis of appropriate size
- Perform swallow test to ensure there is no leakage into the lungs
- Have patient speak to test voicing function
- Cut stethoscope to fit placing an indwelling prosthesis
TEP CARE AND MAINTENANCE

• Requires daily cleaning using a brush and/or flush.

PROSTHESIS LIFE

• Parents typically get 2-3 months of life out of a prosthesis.
• Clinical indications for TEP change:
  • Leakage
  • Loss of voice/effortful voice
  • After six months even if no problems.

METHODS OF OCCLUSION: DIGITAL
METHODS OF OCCLUSION: HEAT AND MOISTURE EXCHANGER (HME)

- Fluorescein dye
- Rapidly spreads throughout the airways
- Provides a rapid and effective means of assessing respiratory tract integrity

METHODS OF OCCLUSION: HANDS FREE DEVICE

- Device takes the place of the HME button and uses a valve system to direct airflow through the moisture
- Provides a convenient alternative for individuals who may find the HME cumbersome

PULMONARY REHABILITATION

- Trents differ for upper and lower airway
- Loss of nasal respiratory function to provide pulmonary resistance as well as to warm, moisten, and filter the air that enters the lungs
- HMEs stimulate nasal function
- For reports reduced mucus, decreased coughing, decreased drowsiness, decreased need for supplemental oxygen
- Minimizes HME use for respiratory control exposure
HME OPTIONS

STOMA CARE

SUPPORT

- Peer Visits
- Support Network Resources:
  - The International Association of Laryngectomees (IAL)
  - Vocal Freesis (www.vocalfreesis.org)
  - Local/living head and neck cancer support groups
LITERATURE REVIEW AND RESEARCH FINDINGS

AN INVESTIGATION OF THE COUNSELING NEEDS OF MALE AND FEMALE LARYNGECTOMEEES
SALVA AND KALLAIL (1989)

- 120 LARYNGECTOMEEES
- Given survey investigating the differences in counseling needs of male vs. female laryngectomiees
- Women reported more fear and anxiety postoperatively than men
- Women reported more embarrassment than men regarding new mode of communication
- Women more than men found help from friends and family effective
- Clinical implications: the needs of female laryngectomiees differ from those of men and counseling should strive to meet those needs as best as possible

EFFECT OF PREOPERATIVE RESIDENT AND HOSPITAL LENGTH OF STAY AND COMPLICATIONS ON PSYCHOLOGICAL LARYNGECTOMY
SALVA AND KALLAIL (1989)

- Postoperative pain
- Anxiety reoperation
- Depression
- Anger
- Postoperative complications
- Psychological adjustment
- Medical patient is an integral part of laryngectomiees care and should be posted to every p.

LIT Review and Research Findings

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Effect of Preoperative Resident and Hospital Length of Stay and Complications on Psychological Laryngectomy
Salva and Kallail (1989)

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PSYCHOSOCIAL DETERMINANTS OF SUCCESSFUL VOICE REHABILITATION AFTER LARYNGECTOMY
SAGER, MERBACH, DIETZ, AND SCHWARTZ (2007)

• Systematic literature review on prospective looking at factors associated with successful voice rehabilitation
• Demographic variables related to success include:
  - Age
  - Communication behaviors
  - Employment
• General physical condition
• Alcohol consumption had no effect on successful rehabilitation
• Clinical variables (predictors) associated with success include:
  - Age
  - Systemic condition
  - Speech therapy intervention

INFLUENCE OF SPEAKER GENDER ON LISTENER JUDGEMENTS OF SPEECH
EADE, DOYLE, HANSEN, AND BEOUDIN (2006)

• Six male and 25 female talkers were judged by "texts" listeners on gender, speech acceptability, and naturalness
• All males were accurately identified as male, but only two of the females were accurately identified as female
• Pitch is not necessarily the main feature of being perceived as male vs. female, of the two females who were gender identified, one had an F2 of 110.50 Hz, but had a female speech rate
• Males were judged more acceptable when gender was known, females were judged less acceptable and less natural when gender was known.
• Clinical implication: changes may have a tendency to shifting to voice quality following laryngectomy.


