



## **Tracheoesophageal puncture (TEP) and management of TEP voice prosthesis problems**

### **Introduction**

- Phonation after total laryngectomy can be achieved through three main mechanisms: use of an electrolarynx, tracheoesophageal puncture (TEP), and esophageal speech.
- Esophageal speech often requires significant practice and training. Some patients may not be able to reliably reproduce esophageal speech for a primary means of communication.
- Many patients prefer the more natural sounding voice afforded by a TEP over the more monotone voice created with an electrolarynx.

### **Scientific Premise**

- The TEP allows a one-way valve to be placed in the party wall between the esophagus and trachea. This valve allows passage of air from the trachea to the esophagus but blocks liquid and food passage from the esophagus into the trachea
- The patient inhales and then occludes the laryngectomy stoma, forcing air into esophagus and vibrating the remnant upper esophageal sphincter. This vibration is then modulated by the resonance chamber as it is during normal laryngeal speech.

### **Indications and Contraindications**

- Indications: Patient having undergone total laryngectomy who desires TEP phonation
- Contraindications: Patients unable to form speech, patients with inconsistent or unreliable follow-up, patient without financial means to obtain subsequent TEP care and/or replacements
- Relative contraindication: patient without manual dexterity to occlude stoma (hands-free devices are available), patients with small laryngectomy stoma may find care and replacement of TEP difficult

### **Treatment Method**

- The creation of the tracheoesophageal fistula is referred to as the puncture – a primary puncture is done at the time of the laryngectomy while a secondary puncture is done in a delayed fashion after the patient has healed from the laryngectomy and/or received adjuvant treatment.



- The timing of the installation of the prosthesis is referred to as the placement. A primary placement indicates the prosthesis is placed into the fistula at the time of the puncture. A secondary placement indicates the prosthesis is placed into the fistula once it has formalized; in this case, a red rubber catheter is often placed through the puncture to aid in fistula formalization.
- A puncture can be performed in either the awake setting or with a patient under general anesthesia. In the awake setting, a transnasal esophagoscopy is performed to aid guidance of the puncture.
- Several TEP kits are available to aid in primary placement of voice prostheses.
- The timing of the puncture and placement of the prosthesis are often surgeon- or institution-dependent.

### **Management of Complications**

- Intraoperative complications include esophageal perforation; while usually minor, these can often be managed with non-parenteral feeding for several days to allow the perforation to heal.
- Post-placement complications are best managed in conjunction with a speech language pathologist experienced in care of TEPs.
- Leaks can occur both through and around the prosthesis. Leaks of any kind warrant examination and may indicate the TEP needs to be replaced. Leaks through the TEP may indicate the one way valve has ‘flipped’ and needs to be reset to a functional position with brushing. Leaking around the TEP may indicate the fistula has enlarged and should warrant resizing if needed.
- Fistula enlargement can also occur over time. Prosthesis diameter can be enlarged in these cases or small amounts of filler material can be injected to seal around the center strut of the prosthesis. Larger degrees of enlargement may necessitate removal of the TEP and ultimately closure of the fistula to reduce the potential for aspiration.

### **References:**

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