Introduction

Tracheoesophageal puncture (TEP) is the preferred method for voice restoration following total laryngectomy (TL).1 Several techniques for secondary puncture have been described, most of which require general anesthesia or intravenous sedation.2 Techniques for in-office, unsedated secondary TEP have been developed, avoiding anesthetic risk and improving recovery time for the patient, but all have significant limitations.3 In-office TEP typically requires the placement of a red rubber catheter to stent the TEP until the tract becomes more formalized; this requires the patient to return for placement of a voice prosthesis and therapy. We present a safe and effective technique for in-office secondary TEP with immediate placement and use of a voice prosthesis.

Surgical Technique

1. Preparation and Local Anesthetic
   • All patients return to clinic approximately 2-4 weeks after TL.
   • Patients are seated upright in an examination chair.
   • The nasal cavity is anesthetized with aerosolized 4% tetracaine and phenylephrine. Both the posterior oropharynx and stoma are anesthetized with aerosolized 4% lidocaine. The pharynx and esophagus are anesthetized with an oral mixture of 8 mL 2% viscous lidocaine and 2 mL milk of magnesia. The anesthetic is allowed to take effect.
   • An assistant inserts the TNE to inspect the pharynx and esophagus. If the suture line is healing well with no evidence of breakdown, the patient is deemed an appropriate candidate.

2. Determining the Appropriate Level
   • The TNE is brought to the proximal esophagus.
   • With the assistance of a speech language pathologist (SLP), the appropriate TEP site is identified, typically 10-12 mm from the superior aspect of the stoma on the posterior tracheal wall.
   • This area is transilluminated and injected with 1 mL 1% lidocaine with 1:100,000 epinephrine.
   • The TNE is held at the level of or just superior to the puncture site throughout the procedure.

3. Performing the Puncture
   • A multi-lumen central venous catheter kit is used (Reading, PA: Arrow) (Figure 1). The 18-g introducer needle included in the kit is bent at the distal 2 cm tip at an approximate 160 degree angle with the bevel of the needle facing superiorly. Once visualized within the esophageal lumen, the needle is rotated 180 degrees so that the bevel faces inferiorly. The soft-tipped guidewire supplied in the kit is inserted through the needle and directed towards the distal esophagus. The introducer needle is removed as the guidewire is held in place.
   • The posterior tracheal wall is entered with the bevel facing superiorly (Figure 2A). Once visualized within the esophageal lumen, the needle is rotated 180 degrees so that the bevel faces inferiorly (Figure 2B).
   • The soft-tipped guidewire supplied in the kit is inserted through the needle and directed towards the distal esophagus (Figure 2B).
   • The dilator is inserted into the esophageal lumen along the guidewire via Seldinger technique (Figure 3A). The dilator is held in place for several minutes to allow adequate dilation of the TEP before it is removed (Figure 3A).

4. Prosthesis Placement
   • The SLP proceeds with placement of the voice prosthesis using a gel capsule insertion method. A 16 Fr Classic Indwelling Blom-Singer voice prosthesis is used (Carpinteria, CA: Inhealth Tech). Most often a 10 mm voice prosthesis is placed, although the length of the prosthesis is selected based on the thickness of the party (TE) wall.
   • The capsule is placed onto the guidewire followed by the voice prosthesis. The esophageal retention collar of the voice prosthesis is hand-loaded into the gel capsule. Once visualized within the esophageal lumen, the capsule enters the esophagus, it quickly dissolves, releasing the esophageal retention collar with proper placement confirmed via direct visualization.

Conclusions

We describe the first safe and effective technique for in-office secondary TEP with immediate placement of a voice prosthesis using the Seldinger technique and visualization with a TNE.

This technique is advantageous for the following reasons:
• Patients require only one office visit for both puncture and voice prosthesis placement.
• Patients are satisfied as they almost always speak immediately.
• We have noticed less need for downsizing the length of the voice prosthesis, which commonly occurs with prosthesis insertion following TEP and red rubber catheter stenting. Thus, there appears to be more stability of the TEP with our technique.

References