

CLINICAL TECHNIQUES AND TECHNOLOGY

Unsedated office-based tracheoesophageal puncture using a novel guidewire technique

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Tracheoesophageal puncture (TEP) is an effective and preferred means by which laryngeal patients can achieve post-laryngectomy speech. While TEP has traditionally been performed in the operating room (OR) with the patient under general anesthesia, the availability of the transnasal esophagoscope has allowed TEP to be performed as an unsedated, office-based procedure.¹ Additional advantages include a reduction in surgery time and procedure-related cost, and improved collaboration between the otolaryngologist and the speech pathologist to achieve improved clinical outcomes.²

Despite its advantages, office-based TEP is occasionally difficult to perform due to variations in tracheoesophageal anatomy. The puncture is typically performed using a transnasal esophagoscope (TNE) to insufflate the esophagus and visualize the puncture site while a variety of instruments (needles, knife blades, and hemostats) are used to probe, puncture, and enlarge the TEP.^{3,4} Ideally, the esophagus at the puncture site can be continuously insufflated and the esophageal lumen will not collapse during the puncture. However, inadequate visualization of the puncture site causing difficulty with the use of knife blades or hemostats is occasionally encountered. In addition, these patients may still pose a challenge in the OR because of esophageal stenosis, trismus, or neck flexion. Therefore, we have sought ways to perform in-office TEP in these patients, and have adopted a wire-guided method. In this report, we perform an institutional review board–approved retrospective review of office-based wire-guided TEP and describe the technique.

Methods

The nasal cavity is decongested with 1% neosynephrine and anesthetized with 4% lidocaine. A transnasal esophagoscope is passed through the nasal cavity into the esophagus. The esophagus is insufflated, and the proposed puncture site is located by inserting a 25-gauge needle from the tracheostomal side (approximately 5 mm below the superior-



Figure 1 A 16-French introducer set (Model G04500 G-PLI-16.0-38, Cook Medical, Bloomington, IN). A percutaneous needle, guidewire, sheath, and dilator are included in the set.

midline mucocutaneous junction) into the esophageal lumen. The wire-guided technique is chosen if the surgical site cannot be adequately exposed due to excessive muscular tension, flaccidity of the party wall, or an excessively lateralized esophagus. However, for the wire-guided technique to be feasible, the needle tip must be visualized in the esophageal lumen. We use a 16-French introducer set (model G04500 G-PLI-16.0-38, Cook Medical, Bloomington, IN) to complete the puncture. This set includes a percutaneous needle, guidewire, peel-away sheath, and dilator (Fig 1). An assistant holds the TNE scope as the surgeon performs the puncture. The percutaneous needle is used to puncture the party wall at as much of a perpendicular angle as possible, and the guidewire is inserted through the needle and directed toward the stomach. The guidewire needle is removed, and the 16-French dilator is passed over the guidewire to create the puncture. The dilator is removed and attached to the peel-away sheath, and both are reinserted via the guidewire into the esophagus. The dilator and guidewire are then removed, leaving the Peel Away sheath in place. A 14-French red rubber catheter is inserted through the lumen

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Figure 2 After removal of the needle and guidewire, a red rubber catheter is inserted through the sheath. The sheath can then be peeled away, as depicted here.

of the Peel Away sheath. After the catheter tip is past the Peel Away sheath, the sheath can be peeled away and removed (Fig 2). A knot is made on the catheter outside to prevent leaking of gastroesophageal reflux, and the catheter is then fixed to the neck with sutures or tape. The voice prosthesis is placed a few days later by the speech pathologist.

Results

Eighteen patients underwent office-based TEP during a two-year period (July 2007 to July 2009). Three patients (average age 72 yrs, range 68-75 yrs) required the wire-guided method. The indications for utilizing the wire-guided method were deep concavity of the lower neck with excessively deep and low laryngectomy stomas in two patients, and excessive secretions and spasm in one patient. In each patient there was an inadequate view or angle for the use of a surgical blade and hemostat. However, the needle tip could be visualized in all patients, and therefore the wire-guided method was used. There were no procedure-related complications. All patients had speech prostheses placed successfully three to five days after puncture. All patients continue to maintain adequate TEP speech at early follow-up.

Discussion

The standard technique and setting for performing TEP for post-laryngectomy speech rehabilitation is the OR-based approach. Over the past decade, there has been a shift toward office-based, unsedated TEP, and at our institution, nearly all TEPs are now office based. The standard technique uses TNE for direct visualization, a surgical blade to

create a cruciate incision, and curved forceps to dilate the puncture site. Until recently, the exceptions to office-based TEP were patients with anatomic constraints making esophageal visualization difficult or instrumentation unsafe. As a result, these patients received OR-based TEP.

We have previously performed OR-based TEP using the catheter introducer set described above.² We have now adapted this technique for office-based TEP. We find that guidewire-assisted TEP is safe to perform in the clinic and extends the advantages of office-based TEP to more patients. In awake patients, with limited visibility of the esophageal lumen, the use of the surgical blade and curved hemostat for incision and dilation of the puncture site can be challenging and may also pose some risk of damage to the posterior esophageal wall.⁵ In contrast, the use of the guidewire method allows for reduced procedure time and greatly reduces or eliminates the risk of injury to the posterior esophageal wall. In addition, this method has the potential to be utilized in all office-based TEPs, especially when a speech pathologist is not present to place a voice prosthesis at the same time.

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Author Contributions

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