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# Replacement of a Malpositioned Tracheoesophageal Catheter in the Radiology Department

Jane L. Weissman, Gerald A. Niedzwiecki, and David E. Eibling

**Summary:** This article describes a safe and easy method to position a tracheoesophageal catheter correctly. The procedure is carried out under fluoroscopic guidance and requires neither general nor local anesthesia. The only modification necessary was removal of the tip of the hollow rubber catheter, to create an opening through which the guide wire could be passed.

**Index terms:** Catheters and catheterization, technique; Neck

After laryngectomy, patients can learn to produce "esophageal speech" by directing air from trachea to esophagus through a tracheoesophageal puncture fitted with a valved prosthesis (1–4) (Fig 1). Should the prosthesis become dislodged, a catheter is placed to keep the tracheoesophageal puncture patent. In one difficult case, a guide wire was passed through the tract into the esophagus, the catheter was threaded over the wire, and the wire was withdrawn.

## Case Report

A 68-year-old woman who had undergone total laryngectomy and tracheoesophageal puncture 7 months previously presented to her otolaryngologist with a dislodged Blom-Singer prosthesis. She had been unable to insert the prosthesis or a catheter, although the puncture site was mature. Physical examination demonstrated granulation tissue surrounding the tracheoesophageal puncture. The surgeon gently dilated the tract with a hemostat and threaded a 14F rubber catheter through the tracheoesophageal puncture. Instead of passing down into the stomach, the catheter repeatedly advanced superiorly and coiled in the mouth. The patient was referred to the radiology department.

The initial attempt to redirect the catheter from the mouth into the distal esophagus by having the patient ingest barium under fluoroscopic observation was unsuccessful (Fig 2). The catheter was therefore removed from

the tracheoesophageal puncture. Under fluoroscopic guidance, a 0.038-mm polytetrafluoroethylene-coated Newton guide wire with Amplatz heparin coating and a J-curve (Cook, Bloomington, IN) was threaded through the tracheoesophageal puncture. Initially, the wire headed up toward the mouth, as the catheter had. Gentle manipulation of the wire at the junction of the stoma with the skin directed the wire down into the thoracic esophagus.

The tip of the tracheoesophageal puncture catheter was removed to create an end hole, through which the free end of the wire was threaded. The catheter was then advanced over the wire, through the tracheoesophageal puncture, and into the thoracic esophagus.

The position of the wire (the catheter is radiolucent) was confirmed fluoroscopically. The wire was withdrawn. The catheter was opacified with a small amount of barium. Barium flowed freely out the end of the catheter into the lower thoracic esophagus and stomach. The patient tolerated the procedure well, and was relieved to have the catheter in proper position.

## Discussion

The acquisition of tracheoesophageal speech can greatly improve the quality of life of patients who have undergone total laryngectomy (1). The Blom-Singer prosthesis is a one-way valve, inserted through a tracheoesophageal puncture (1, 2) (Fig 1). The valve allows air to pass from the trachea into the esophagus for "esophageal speech," but keeps food and saliva out of the trachea (1, 2).

The puncture may be made at the time of laryngectomy and creation of the tracheal stoma (primary tracheoesophageal puncture) or subsequently (secondary tracheoesophageal puncture) (4). The puncture location (superior aspect of the tracheal stoma) is accessible to the patient, who removes the prosthesis daily for cleaning (1). Most patients readily learn to

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occlude the tracheal stoma and force air from the trachea through the prosthesis into the esophagus, then up into the mouth for phonation (1, 2).

Ordinarily, the Blom-Singer valve is removed only to be cleaned or changed. The mature (healed) tract usually remains patent; the valve also helps to keep the tract open. The patient usually can replace the valve without assistance (3, 4).

Occasionally, an oblique tract or granulation tissue at the puncture can make replacement difficult or impossible. While not uncommon (4) or dangerous, this can be quite anxiety provoking for the patient, who may present to an otolaryngologist, internist, general surgeon, or emergency room physician for assistance.

Maintaining a patent tract after a Blom-Singer valve becomes dislodged is very important. If the tract is allowed to close, another surgical procedure (under general anesthesia) is necessary to create a new tracheoesophageal puncture (4). Stenting with a catheter facilitates insertion of the prosthesis (4) and also keeps the tract open until granulation tissue heals.

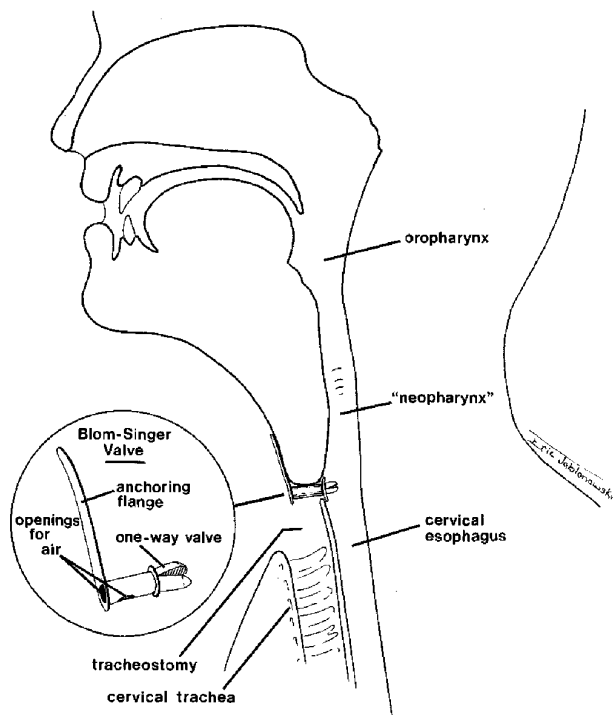


Fig 1. Smaller diagram shows a magnified view of the Blom-Singer valve. Larger diagram shows the valve properly positioned in the tracheoesophageal puncture at the superior aspect of the tracheal stoma.



Fig 2. Oblique view from the barium swallow (before the catheter was repositioned) shows the malpositioned catheter. The catheter (arrows) runs up through the "neopharynx" to the oropharynx. The course of the catheter through the tracheoesophageal puncture tract is oblique (arrowheads); compare to Figure 1. The tracheal stoma itself is not seen well.

The specific problem addressed here is unusual: a catheter, once advanced through the tracheoesophageal puncture, tends to proceed toward the stomach rather than the mouth. More often, the physician encounters difficulty in passing the rather soft, large (4) red rubber catheter through the puncture site. Presumably, the patient presented here had an unusually oblique tract, which, in conjunction with granulation tissue, prevented reinsertion of the prosthesis and deflected the catheter into the mouth.

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