

## Short Communication

# Flexible endoscopic tracheo-oesophageal puncture under local anaesthetic

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### Abstract

Blom–Singer valve prosthesis is an increasingly popular technique for voice rehabilitation in alaryngeal patients. Although primary voice puncture is being practised, the creation of the tracheo-oesophageal fistula is performed in the majority of patients as a secondary procedure.

We describe a technique of secondary tracheo-oesophageal puncture using the flexible endoscope which can be performed under local anaesthetic and sedation. The technique overcomes the difficulty of passing a rigid oesophagoscope or forceps to the level of the tracheostome in a scarred and irradiated neck. The new technique also obviates the need for general anaesthesia.

We have successfully used the technique in three patients.

**Key words:** Tracheo-oesophageal fistula; Larynx, artificial; Endoscopy, flexible; Anaesthesia, local

### Introduction

The use of the Blom–Singer valve prosthesis is an important technique for voice rehabilitation in alaryngeal patients and has become increasingly popular since its introduction in 1980 (Singer and Blom, 1980). The tracheo-oesophageal fistula needed for the placement of the valve can be performed as part of the primary laryngectomy procedure. However the creation of the tracheo-oesophageal fistula is performed in the majority of patients as a secondary procedure.

A secondary tracheo-oesophageal puncture is usually created under general anaesthesia using a rigid oesophagoscope. However this technique poses several problems in addition to the need for general anaesthesia. The major difficulty is passing the rigid endoscope to the level of the tracheostome in a scarred and irradiated neck. Moreover there is the possibility of oesophageal perforation in the attempt to reach the stoma site with a rigid endoscope (Silver *et al.*, 1985; Garth *et al.*, 1991). The use of the forceps technique as described by Rhys-Evans (1991) may not entirely overcome the problem of the rigid neck and this technique still requires general anaesthesia. Our technique using the flexible endoscope can be performed under local anaesthesia and sedation.

### Patients and technique

The secondary tracheo-oesophageal puncture using the technique described in this paper has been performed on three patients. The first patient had had a total laryngopharyngectomy and free jejunal graft reconstruction for laryngeal carcinoma one year previously. This patient had

the secondary tracheo-oesophageal puncture performed under general anaesthesia as an additional procedure to a stomaplasty required for stomal stenosis. The second patient had had a laryngectomy and partial pharyngectomy

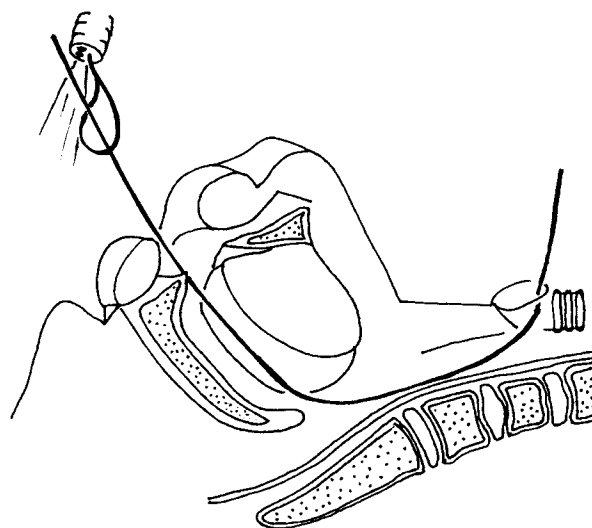


FIG. 1

The guide wire being passed through the tracheo-oesophageal puncture site and pulled out through the mouth by the snare.

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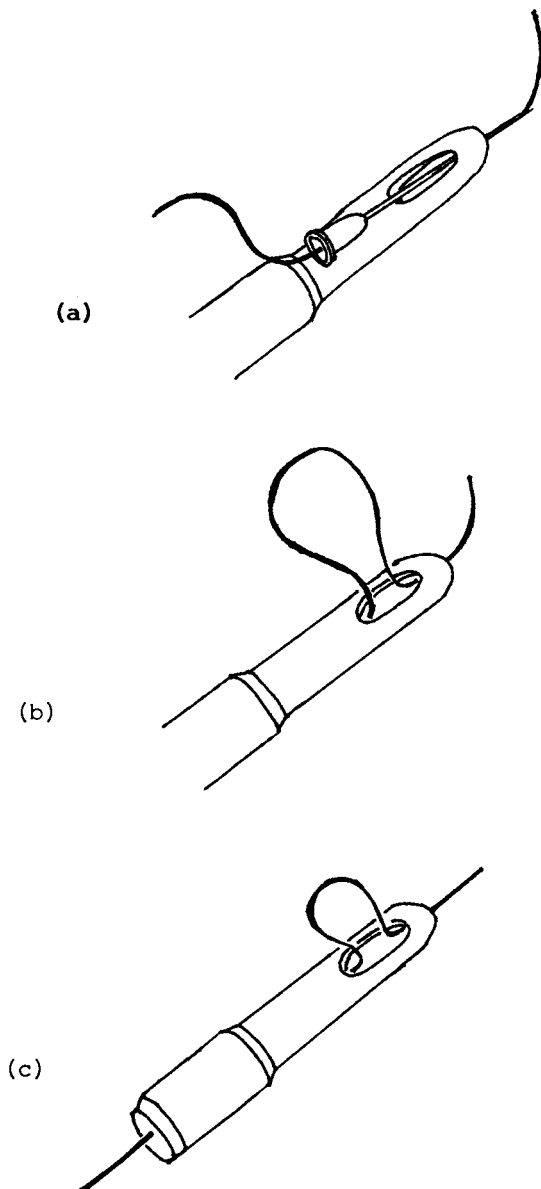


FIG. 2

Threading the silastic Foley catheter onto the guide wire. (a) 18F needle passing through the eye of the catheter and exiting through the centre of the tip of the catheter. (b, c) Needle removed and guide wire passing through the length of the catheter.

with a pectoralis major myocutaneous flap reconstruction for laryngeal carcinoma six months previously. This secondary tracheo-oesophageal puncture was performed under sedation and local anaesthesia. The third patient had had a laryngectomy for a laryngeal carcinoma carried out four years previously. He had a stomaplasty under general anaesthesia during which an attempt was made to create a secondary tracheo-oesophageal puncture. However this failed as it was not possible to pass the rigid endoscope to the level of the tracheostome. This patient subsequently had the secondary tracheo-oesophageal puncture created under local anaesthesia as an outpatient.

Sedation was achieved with intravenous midazolam (3 mg) and fentanyl (50 µg). The patient was monitored with continuous pulse oximetry. Topical 10 per cent xylocaine was then sprayed into the oropharynx and tracheostome. A video gastroscope (GIF 100; Olympus Co., Japan) was passed into the upper oesophagus and a

full upper gastrointestinal endoscopy was performed to exclude a tumour recurrence or second primary. The patient was turned to the supine position and the endoscope was withdrawn to the level of the tracheostome as judged by transillumination into the trachea. The oesophagus was easily inflated by insufflation of air despite the previous extensive surgery to the upper aerodigestive tract.

A Certofix Trio (B. Braun, Melsungen AG, Germany) venous catheterization set was used for the puncture. The 18G needle was slightly bent with a bevel-orientated cephalad and introduced directly into the oesophagus through the posterior tracheal wall. The entrance of the needle into the oesophagus was directly visualized endoscopically and the primary operator could regulate exactly the depth of penetration by observing the video monitor. A standard polypectomy snare was passed down the working channel of the endoscope and opened to encircle the needle. A 0.89 mm × 70 cm guide wire was next passed through the needle into the oesophagus. The guide wire was then grasped by the snare and pulled out of the mouth (Figure 1).

The puncture site was dilated sequentially over the guide wire with Russell percutaneous gastrostomy dilators (Wilson Cook Co., USA) introduced through the tracheostome to a size of 16F. The dilatation was facilitated by holding the guide wire taut between the neck and the mouth. A 14F silastic Foley catheter was threaded onto the guide wire (Figure 2) and railroaded through the fistula into the oesophagus and thence into the mouth. The guide wire was then removed and the catheter manoeuvred into the lower oesophagus under direct vision with the catheter tip grasped by the endoscopic snare. The balloon of the catheter was then inflated with 3 ml of water and the catheter sutured to the skin at the level of the tracheostome.

The whole procedure took less than 10 minutes in each patient and was very well tolerated by them. The catheter was left in place for the fistula to mature before being removed and replaced with a Blom-Singer speech valve seven days later. All patients subsequently had a Blom-Singer valve fitted and all had a good voice as a result.

## Discussion

The technique described offers several advantages over currently used procedures for secondary tracheo-oesophageal puncture for voice rehabilitation. The most important advantage is the ability of the flexible endoscope to easily, and safely, overcome the restriction posed by a rigid neck so often encountered after extensive surgery and irradiation. Even if the secondary tracheo-oesophageal puncture is being performed under general anaesthesia because of the need for other surgical procedures this important safety advantage remains. However, our technique allows the procedure to be performed under local anaesthesia and sedation. This makes the procedure eminently suitable for outpatient surgery.

Several technical details were of importance in our technique. The use of local anaesthesia obviates the use of an endotracheal tube, considerably improving access to the posterior tracheal wall. The use of the video endoscope allows the endoscopist and surgeon to co-ordinate their actions. With the guide wire passed per-orally, rather than distally, into the oesophagus tension can be maintained on the wire facilitating the dilatation and passage of the catheter. It was also found helpful to dilate the fistula tract to 16F to allow easier passage of a 14F catheter. The technique used to pass the guide wire through the catheter (as shown in Figure 2) was also crucial for success.

**Conclusion**

We have developed a technique for secondary tracheo-oesophageal puncture which is simple to perform under local anaesthesia. We hope the advantages offered by the flexible endoscope will be more widely recognized amongst ENT surgeons.

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