

# Tracheo-oesophageal puncture by retrograde passage of a gastroscop e via mini-laparotomy and gastrotomy

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## Abstract

Secondary tracheo-oesophageal puncture is frequently used for voice restoration after laryngectomy. A method utilizing a flexible gastroscop e passed via a mini-laparotomy and gastrotomy in a retrograde manner is described in a patient where extensive pharyngeal resection made it impossible to cannulate the upper aerodigestive tract. The patient suffered minimal morbidity and produced reasonable speech.

**Key words:** Tracheo-oesophageal fistula; Gastroscopy; Laparotomy

## Introduction

Following the introduction of the valve prosthesis first described by Singer and Blom in (1980), use of tracheo-oesophageal puncture has become the most widely used technique for surgical voice restoration. It may be performed as a primary puncture during the initial surgical resection or as a secondary puncture in laryngectomees who have requested it or failed with other forms of voice rehabilitation. A secondary puncture is usually carried out under general anaesthesia using a rigid oesophagoscope, or occasionally via the use of a flexible gastroscop e under sedation, which may be indicated due to local difficulties (Barkin *et al.*, 1991; Hong *et al.*, 1995; Chan *et al.*, 1997; Singh *et al.*, 1997). Secondary puncture is often a technically demanding procedure and carries the risk of a number of problems including, oesophageal perforation (Silver *et al.*, 1985; Garth *et al.*, 1991) and failed intubation of the upper oesophagus. The latter was the case in our patient, and the novel use of a retrograde passage of a flexible gastroscop e is described.

## Patient and technique

A 51-year-old gentleman who presented with a T4 N2b squamous cell carcinoma of the left pyriform fossa and a secondary left neck abscess underwent total pharyngolaryngectomy, left block dissection, free jejunal graft and left pectoralis major flap reconstruction, followed by radical radiotherapy. Following this the patient made a good recovery, was able to swallow and gained weight; however, he was unable to produce any usable speech. The use of an electronic larynx also proved difficult due to the effects of the radiotherapy on the tissues of the neck. A videofluorogram showed a large cavity had formed behind the tongue base with the jejunal segment draining the contents from a point high up on the left side of the cavity (see Figure 1). On phonation there was no visible vibrating pharyngo-oesophageal segment, voice was soft with little improvement by digital pressure. On Taub testing, the tube was

only positioned as far as the large cavity with little improvement in voice production. It was not possible to pass a tube below the level of the anastomosis.

Despite these negative findings, the patient could not tolerate aphonia and secondary tracheo-oesophageal puncture was attempted by conventional means. He underwent an attempted oesophagoscopy nine months after his initial resection with the aim of producing a secondary tracheo-oesophageal fistula. Unfortunately at endoscopy it was impossible to visualize or enter the upper end of the jejunal segment, it was felt that an attempt with a flexible scope would not be successful and therefore the procedure was abandoned. The patient became depressed at the lack of voice, so after discussion of the risks involved it was decided to attempt insertion via a retrograde oesophagoscopy and mini-laparotomy. The procedure was performed jointly with a general surgical colleague performing a mini-laparotomy through an upper midline incision and fashioning a small gastrotomy. A sterile flexible gastroscop e was inserted via the gastrotomy and passed in a retrograde manner up into the oesophagus. The light of the scope was visible within the stoma and an incision was performed down onto the scope, a 14G Foley catheter was pulled into the stomach, secured by adhesive tape and the gastrotomy and abdomen closed. The whole procedure took less than an hour, and the patient made an uneventful recovery and was discharged well 48 hours following the procedure. The patient was originally fitted with a 10 mm Blom-Singer ex-dwelling valve, voice was achieved immediately. Out-patient speech therapy resulted in maximizing the technique even though voice quality remained tight and wet. The subsequent change to a 10 mm 22 Fr Provox 2 valve resulted in easier voicing due to reduced air flow resistance through the valve.

## Discussion

Occasionally production of a secondary tracheo-oesophageal puncture is technically not possible using rigid endoscopes, but this may be overcome by the use of a flexible gastroscop e in most cases. However, after exten-

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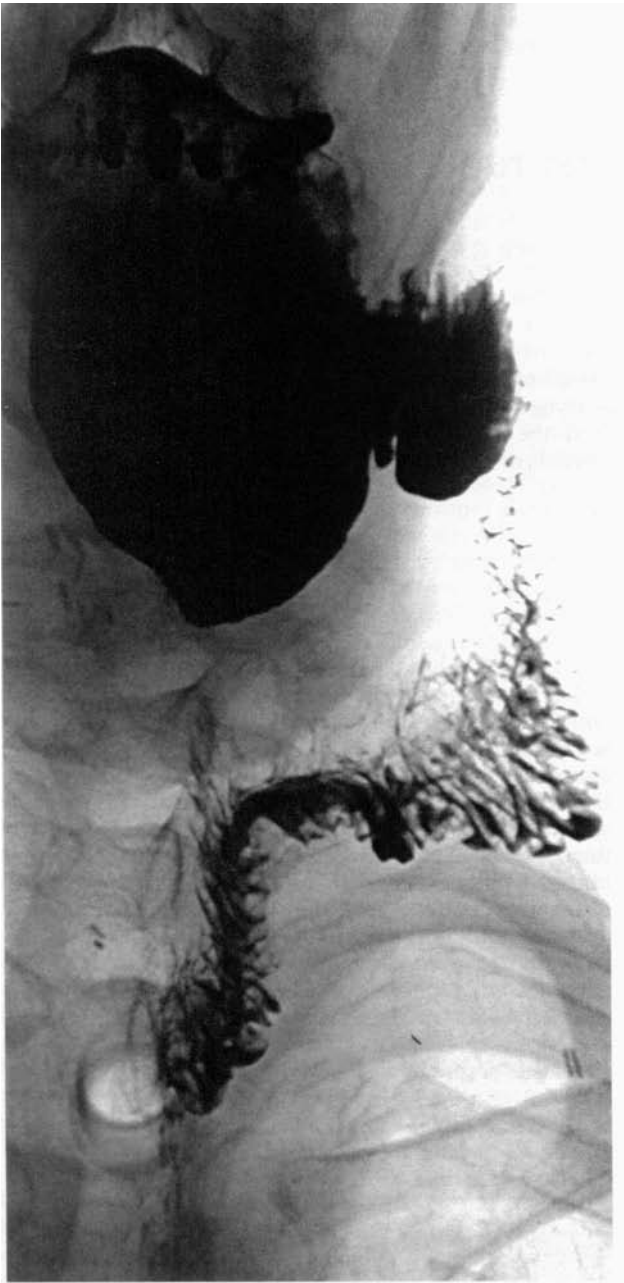


FIG. 1

Videofluorogram: The video swallow shows the jejunal graft has formed a 'sump' which fills with barium, the barium then exits into the oesophagus at a point high up on the left side of the graft.

sive head and neck resections it may not be possible to safely cannulate the upper oesophagus. The production of an open gastrotomy is a well practised procedure with a very low incidence of complications or morbidity, and will permit the retrograde passage of a gastroscop into the upper oesophagus to allow the safe production of a tracheo-oesophageal fistula. There have been a number of recent studies comparing the morbidity and mortality of open surgical gastrotomy versus percutaneous endoscopic

gastrotomy, and the complication rate of surgical gastrotomy has been found to be similar or only slightly higher than for PEG placement (Jones *et al.*, 1990; Scott *et al.*, 1991; Consentini *et al.*, 1998). The passage of a retrograde gastroscop via a gastrotomy has been performed in the past for dilatation of pharyngo-oesophageal obstruction, van Twisk *et al.* (1988) describe two cases where transoropharyngeal identification was impossible and the patients were successfully dilated using a retrograde approach. In both cases the patients suffered no significant morbidity.

To the best of our knowledge, this is the first report of the use of a gastroscop used retrogradely to assist in fashioning a tracheo-oesophageal fistula. Personal communication with Eric Blom as well as Forth Medical Limited and Provox confirms that in their experience no such method has been described previously.

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