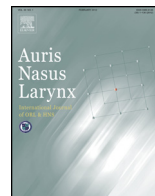




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## Salivary bypass tube placement in esophageal stricture: A technical note and report of three cases

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### ABSTRACT

Hypopharyngeal and cervical esophageal strictures can be caused by advanced malignancies, ingestion of caustic materials, or can follow surgery or radiation therapy.

They cause marked dysphagia and consequently patients need nasogastric or gastrostomy tube feeding, with a remarkable impact on quality of life.

To restore oral feeding, the stenosis can be progressively dilated by using rubber bougies of increasing diameter, and a Montgomery<sup>®</sup> Salivary Bypass Tube can then be inserted to maintain the obtained calibre. However, while its flexibility makes it easy to tolerate, it has the drawback of making insertion difficult because the tube tends to bend.

The aim of this paper is to present a possible solution to this problem. A Montgomery<sup>®</sup> Salivary Bypass Tube was distally sutured to a Cook Airway Exchange Catheter<sup>®</sup> to simplify its initial insertion through a laryngoscope and following replacements. The catheter was then easily removed leaving the bypass tube in the correct position.

In our experience, this innovative approach proved effective in facilitating Montgomery<sup>®</sup> Salivary Bypass Tube insertion in three patients, without risks for the patient, additional operative time or increase in costs.

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### 1. Introduction

Hypopharyngeal and cervical esophageal strictures can be caused by advanced malignancies and ingestion of caustic materials or they can follow surgery or radiation therapy [1,2]. Affected patients suffer from marked dysphagia [3] and consequently require nutrition support through intravenous or enteral (nasogastric or gastrostomy tube) feeding, with an important decline of quality of life. In the management of a hypopharyngeal and cervical esophageal stricture, the dilation has first to be accomplished by using bougie dilators, which come in a variety of designs, calibres and lengths [4]. Once the stricture has been dilated, the diameter needs to be maintained constant. To this end, the use of a Montgomery<sup>®</sup> salivary bypass tube (MSBT) can be an effective solution allowing for the patient's

physiological nutrition. However, in some cases, placement of this tube may prove difficult because the flexibility of the tube combined with the need to lubricate it to negotiate the stricture can result in slippage and difficulty in handling it. These problems may be experienced not only during the first insertion of the tube, but also when it deteriorates and has to be replaced. In this paper we propose a new technique to simplify the placement of a MSBT by using a Cook Airway Exchange Catheter.

### 2. Case report

This study was conducted in accordance with the principles stated in the Declaration of Helsinki (1964) and was approved by our University ethics committee; patients gave their written informed consent for the publication of case details, images and video.

Patient #1 was a 58-year-old man with a history of T1a squamous cell carcinoma of the right vocal cord treated with

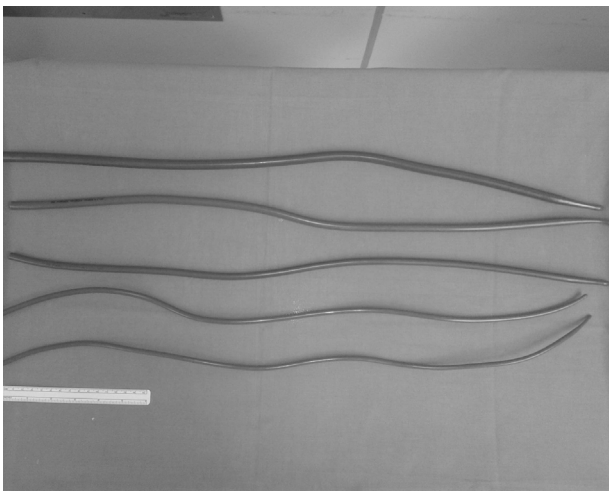
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type III right laser cordectomy in October 2011 and adjuvant radiation therapy for the presence of “close” margins (0.1–3 mm, according to our Pathology Department) at histology. In December 2012 the patient underwent a total laryngectomy with bilateral neck dissection and hemi-thyroidectomy for a T4a laryngeal cancer. One month later he experienced a salivary fistula requiring a surgical revision; after two failures, a pectoralis major flap was set up, the fistula was closed and an esophageal stent was placed. The stent was removed two months later but the patient developed near total dysphagia. Microlaryngoscopy revealed near total hypopharyngeal stenosis; so, in September 2014, the stenotic tract was removed and a radial free flap with an esophageal stent to maintain patency was used to rebuild the damaged tract. The stent was removed three months later but the patient complained of total dysphagia, so a number 12 Montgomery<sup>®</sup> salivary bypass tube (MSBT) was inserted to maintain patency. During the following replacements, the procedure proved to be rather difficult.

Therefore, for the last replacement procedure in September 2015 we decided to attempt a new insertion method. After positioning a laryngoscope under general anaesthesia, we first used rubber bougie dilators (Fig. 1) of progressive diameters (Porges<sup>®</sup> Neoplex France) to dilate the stenosis; we then inserted a 19.0-French Cook Airway Exchange Catheter<sup>®</sup> (Cook Medical USA) inside a no. 16 MSBT (Boston Medical Products, USA) and anchored it with a stitch passing through the hole at its distal tip (Fig. 2). We introduced the system through the laryngoscope (Fig. 3) until the proximal end of the MSBT was positioned at the level of the base of the tongue. Finally, we withdrew the Cook Airway Exchange Catheter<sup>®</sup> while maintaining the MSBT in the correct position and, with the scissors generally used for microlaryngoscopy, we cut the residual thread (Video 1). The same procedure was used in January and May 2016 to replace the tube with a new no. 16 MSBT.

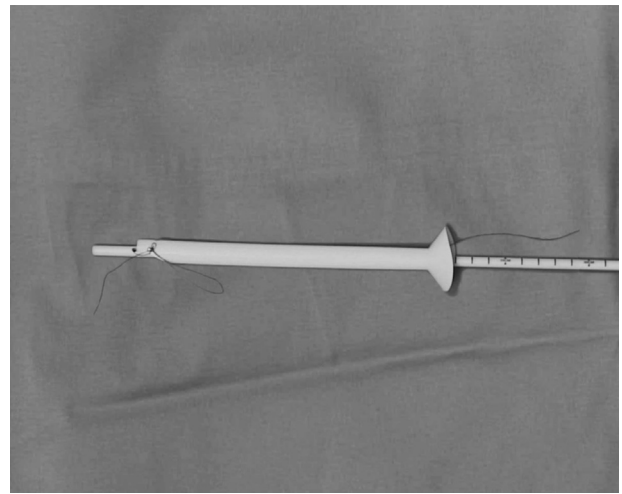
Supplementary Video 1 related to this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.anl.2016.11.007>.



**Fig. 1.** Rubber bougie dilators of progressive diameters (Porges<sup>®</sup> Neoplex France).



**Fig. 3.** The tool obtained by suturing the Montgomery<sup>®</sup> Salivary Bypass Tube (MSBT) to a Cook Airway Exchange Catheter<sup>®</sup> distally is introduced through the laryngoscope until the proximal extremity of the MSBT is positioned at the level of the base of the tongue.



**Fig. 2.** A Cook Airway Exchange Catheter<sup>®</sup> with a diameter of 19.0 French (Cook Medical USA) is inserted inside a no. 16 Montgomery<sup>®</sup> Salivary Bypass Tube (Boston medical products USA) and distally sutured with a stitch passing through the hole at its distal end.

Patient #2 was a 71-year-old man with a previous history of radiotherapy for positive surgical margins after an anterior pelvicotomy for a T1 squamous cell carcinoma of the anterior floor of the mouth in October 2007. In May 2015, the patient underwent a total laryngectomy with bilateral neck dissection for a T3 laryngeal cancer. Six days after surgery he developed a salivary fistula requiring a cervicotomy. Two surgical repairs were unsuccessful so a pectoralis major flap was set up and the fistula was closed. Twenty-three days after surgery the patient started to complain of dysphagia, and a tight stenosis of the neo-esophagus was found on microlaryngoscopy. A no. 8 MSBT was inserted but the procedure proved rather difficult. During the last replacement procedure in September 2015, we decided to use the method reported above. In this patient a no. 10 MSBT was initially used, and a no. 12 MSBT was placed during the last replacements in January and May 2016.

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