

## Hydrogen peroxide aids assessment of pharyngeal closure after laryngectomy

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### Abstract

**Objective:** Pharyngocutaneous fistula is a serious complication following total laryngectomy. We report a simple technique which is useful in assessing the adequacy of pharyngeal closure following total laryngectomy.

**Method:** Installation of 1.5 per cent hydrogen peroxide into the oral cavity, while observing for leakage at the pharyngeal repair.

**Results:** We have found this technique to be useful in 22 patients undergoing total laryngectomy with pharyngeal resection and neck dissection.

**Conclusion:** This method ensures that pharyngeal closure has been technically adequate.

**Key words:** Laryngectomy; Fistula; Hydrogen Peroxide

### Introduction

The development of a pharyngocutaneous fistula is a well recognised and serious complication following total laryngectomy. It can result in significant morbidity and prolonged in-patient stay, and may require further surgical intervention to achieve closure. Many risk factors for pharyngocutaneous fistula have been identified, including previous radiotherapy, positive margins, extent of pharyngeal resection, cricopharyngeal myotomy and the presence of systemic disease.<sup>1–3</sup> While the actual pharyngeal closure technique and the suture material used have been proposed to be important in the avoidance of pharyngocutaneous fistula, it seems logical that a satisfactory intra-operative closure must initially be achieved.<sup>4,5</sup>

We report here a simple intra-operative technique, which we have found useful in assessing the adequacy of pharyngeal closure following total laryngectomy.

### Materials and methods

Following pharyngeal closure, 50 ml of 1.5 per cent hydrogen peroxide at 20°C is instilled through the oral cavity. Rapid decomposition of the hydrogen peroxide results in the formation of oxygen, which fills the neopharynx. The pharyngeal suture line is closely observed for one minute, and any defects in closure are identified by emergence of the foaming solution (Figure 1). If a defect is identified, repair is performed, followed by installation of a further 50 ml of hydrogen peroxide to ensure satisfactory closure. Excess hydrogen peroxide is removed by suction, and the oral cavity is irrigated with sterile water.

### Results

We found this technique to be useful in 22 patients undergoing total laryngectomy with pharyngeal resection and neck dissection as appropriate.

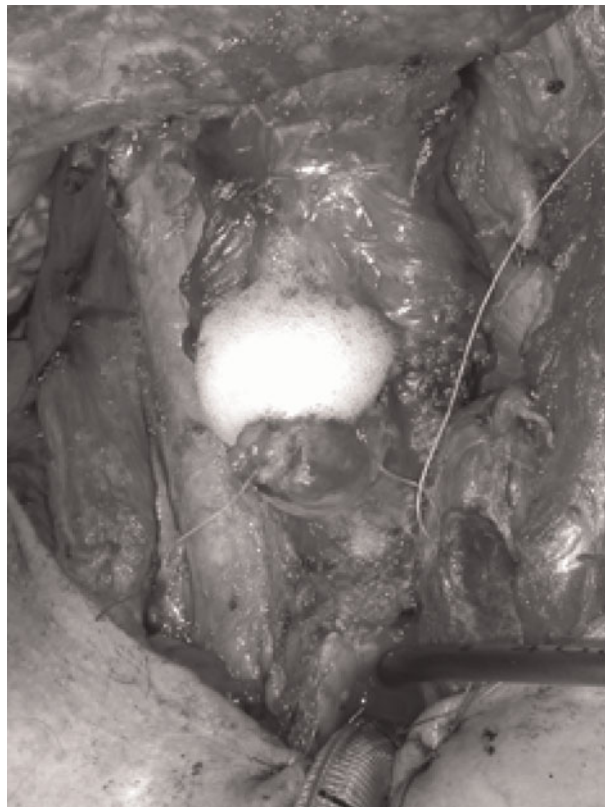


FIG. 1  
Hydrogen peroxide foaming through defect in pharyngeal repair after total laryngectomy.

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### Discussion

While any liquid could be used for this technique, in order to identify leaks in the pharyngeal repair, 1.5 per cent hydrogen peroxide solution instilled via the oral cavity creates oxygen gas due to the action of endogenous catalase, which has an extremely high turnover rate, resulting in the degradation of hydrogen peroxide into water and oxygen. This inflates the neopharynx and causes foam to emerge through any defects in the pharyngeal closure, enabling any technical deficiencies to be identified easily and then rectified intra-operatively.

Three per cent hydrogen peroxide solution is widely used in clinical practice for cleaning wounds and as an oral debriding agent. Therefore, a 1.5 per cent solution is safe for use in this setting, as it does not cause mucosal burns and also has antimicrobial properties.

While we make no claim that this technique decreases rates of pharyngocutaneous fistula following total laryngectomy, it does help ensure that there is no leakage at the end of the procedure and that pharyngeal closure has been technically adequate.

### References

- 1 Galli J, De Corso E, Volante M, Almadori G, Paludetti G. Postlaryngectomy pharyngocutaneous fistula: incidence, predisposing factors, and therapy. *Otolaryngol Head Neck Surg* 2005;**133**:689–94
- 2 Markou KD, Vlachtsis KC, Nikolaou AC, Petridis DG, Kouloulas AI, Daniilidis IC. Incidence and predisposing factors of pharyngocutaneous fistula formation after total laryngectomy. Is there a relationship with tumor recurrence? *Eur Arch Otorhinolaryngol* 2004;**261**:61–7
- 3 Redaelli de Zinis LO, Ferrari L, Tomenzoli D, Premoli G, Parrinello G, Nicolai P. Postlaryngectomy pharyngocutaneous fistula: incidence, predisposing factors, and therapy. *Head Neck* 1999;**21**:131–8
- 4 Ikiz AO, Uca M, Guneri EA, Erdag TK, Sutay S. Pharyngocutaneous fistula and total laryngectomy: possible predisposing factors, with emphasis on pharyngeal myotomy. *J Laryngol Otol* 2000;**114**:768–71
- 5 Soyulu L, Kiroglu M, Aydogan B, Cetik F, Kiroglu F, Akcali C *et al.* Pharyngocutaneous fistula following laryngectomy. *Head Neck* 1998;**20**:22–5

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Mr J R Tysome takes responsibility for the integrity of the content of the paper.

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