



Total neopharyngeal stenosis following pharyngolaryngo-oesophagectomy with gastric interposition: Successful recanalisation using a transcervical radiologically guided technique

Mark D. Wilkie*, Iain F. Hathorn, Andrew S. Evans

Department of Otorhinolaryngology and Head and Neck Surgery, St. John's Hospital, Howden Road West, Livingston, West Lothian EH54 6PP, UK

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ABSTRACT

INTRODUCTION: Pharyngo-oesophageal stricturing is common following treatment of head and neck cancers. Absolute dysphagia secondary to total stenosis, although rare, is particularly debilitating and presents a significant therapeutic challenge. We present a strategy for managing total neopharyngeal stenosis following pharyngolaryngo-oesophagectomy (PLOG).

PRESENTATION OF CASE: A 71-year-old female developed total neopharyngeal stenosis following PLOG with gastric interposition for squamous cell carcinoma of the proximal cervical oesophagus/post-cricoid. A transcervical, percutaneous, radiologically guided procedure was performed to restore luminal patency, which enabled resumption of oral feeding.

DISCUSSION: Established treatments for pharyngo-oesophageal strictures are frequently limited by complications in patients with complex strictures or total stenoses. Whilst several interventions have been described, recent interest has focussed on combined antegrade/retrograde endoscopic procedures dilating a pre-existing gastrostomy site for access. This was not possible in our patient due to the surgically altered anatomy which posed a unique therapeutic challenge.

CONCLUSION: This is the first reported percutaneous, transcervical, radiologically guided technique to treat neopharyngeal stenosis following PLOG. It demonstrates a novel and efficacious approach which may be considered in the management of this rare but significant complication.

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1. Introduction

Cancers of the hypopharynx and cervical oesophageal frequently present late with locally advanced disease and carry a poor prognosis.^{1,2} Tumours arising in the proximal oesophagus or distal hypopharynx pose a considerable management problem with their tendency for submucosal spread and development of skip lesions.¹ It is necessary, therefore, when surgically ablating these tumours to allow for considerable proximal and distal margins to optimise local control. Surgical resection together with reconstruction of the resultant defect has remained a surgical challenge, the goals being a single stage reconstruction, low morbidity and mortality, short hospital stay and early restoration of swallowing function.² Historically, a variety of techniques have been employed and pharyngolaryngo-oesophagectomy with gastric pull-up (PLOG) is a widely accepted one-stage procedure for pharyngolaryngeal and oesophageal cancers allowing a single anastomosis.^{2,3}

Despite technical advances, surgery of this magnitude remains subject to considerable morbidity, often as the result of anastomotic

stricturing.^{3–6} Increased mucosal toxicity associated with organ preserving chemoradiation regimes also frequently results in pharyngeal or upper oesophageal stricturing.^{5–7} Although some degree of swallowing dysfunction is almost universal following both non-surgical and surgical treatments, absolute dysphagia from total luminal stenosis is rare but particularly debilitating, and many patients undergo repeated endoscopic dilatation and occasionally further surgery to palliate this symptom.^{5–11}

Such cases present a significant management dilemma and a variety of recanalisation techniques have been previously described. We report a novel percutaneous, transcervical, radiologically guided, combined antegrade/retrograde technique for managing total neopharyngeal stenosis following PLOG.

2. Presentation of case

A 71-year-old female presented with progressive dysphagia and concomitant weight loss over a three-month period. She had suffered from no prior medical problems, had no smoking history and reported an alcohol intake of 40 units/week. There was no family history of aerodigestive tract malignancies.

A proximal cervical oesophageal tumour extending into the post-cricoid region was subsequently diagnosed, and computerised tomography (CT) scanning demonstrated a full thickness cervical

* Corresponding author at: 305A, 31 Strand Street, Liverpool L1 8LN, UK. Tel.: +44 7736679810; fax: +44 1517065847.

E-mail address: mdwilkie@doctors.org.uk (M.D. Wilkie).

oesophageal tumour with no evidence of pathological lymph node involvement. There was no evidence of tracheal breach during bronchoscopy and biopsies confirmed moderately differentiated squamous cell carcinoma (SCC). Clinical stage was T4N0M0.

It was felt that the patient would be best served from an oncological and swallowing perspective by surgery and adjuvant radiotherapy. She underwent a thoracoscopically assisted PLOG with bilateral selective neck dissections as a combined procedure between Upper GI and Head and Neck surgeons. A feeding jejunostomy was inserted during laparotomy. This was necessary to allow a route for enteral nutrition required following surgery due to the high rate of swallowing dysfunction experienced by patients, particularly when accompanied by adjuvant neopharyngeal irradiation. Whilst insertion of a nasojejunal feeding tube was considered as an alternative option, our experience suggests that these are not well tolerated by patients in the longer-term and also have the disadvantage of having to be passed across the anastomosis.

Post-operative recovery was complicated by a left-sided bronchopneumonia which was treated with antibiotics, chest physiotherapy and a period of non-invasive ventilatory support. Recovery was otherwise uncomplicated. Contrast swallow on post-operative day 10 demonstrated no anastomotic leak and free flow of contrast through a patent neopharynx.

Histological assessment confirmed complete resection of the cervical oesophageal tumour and a single involved level VI lymph node was found with no pathological nodal involvement in either lateral neck specimen. An incidental finding of a synchronous T1N0 mid-oesophageal SCC was also noted.

Adjuvant radiotherapy was abandoned after only three fractions due to patient anxiety.

Two months post-operatively the patient complained of worsening dysphagia, intermittent regurgitation and constant expectoration. Contrast swallow demonstrated neopharyngeal stricturing and pharyngoscopy confirmed a tight anastomotic stricture. Atraumatic bougie dilatation of the stricture to 36F was performed. Unfortunately the symptoms recurred and further dilatation along with tracheal stomaplasty was required four months later. On this occasion dilatation was performed only to 28F prior to a minor mucosal tear and was abandoned. Planned further elective redilatation after one month was undertaken and was complicated by an iatrogenic perforation of the gastric tube. This settled with conservative treatment but repeat contrast swallow confirmed further tight neopharyngeal stricturing. CT scan and clinical examination at this stage demonstrated no evidence of recurrent disease.

Shortly thereafter the patient developed absolute dysphagia with inability to swallow saliva. Pharyngoscopy demonstrated total neopharyngeal stenosis with no evidence of a lumen and no indication as to where the distal lumen may lie. After consultation with the radiologists, it was felt that it would not be possible to place a guidewire retrograde through the jejunostomy tube due to distal placement and the remaining option of a mini-laparotomy to pass a wire or endoscope retrograde into the gastric tube was felt to pose too significant a risk in a malnourished patient.

Due to the potential morbidity associated with re-opening the abdomen, we opted to perform a transcervical, combined antegrade/retrograde procedure under radiological guidance, directly puncturing into the proximal stomach tube percutaneously just above the stoma. A radiological guidewire was passed through the neck into the gastric tube distal to the occlusion under X-ray screening and this was identified by direct vision via a pharyngoscope proximal to the occlusion (Figs. 1 and 2). The guidewire was then passed through the stenotic segment and the passage was subsequently gently dilated to allow a 12F nasogastric tube over the guidewire (Fig. 3). This was left in situ for one month and serially larger tubes were placed on a monthly basis until a stable 24F lumen was established after five months.



Fig. 1. Guidewire passed retrograde through proximal stomach tube towards pharyngoscope.



Fig. 2. Guidewire passed antegrade from pharynx into stomach tube across stenosis.

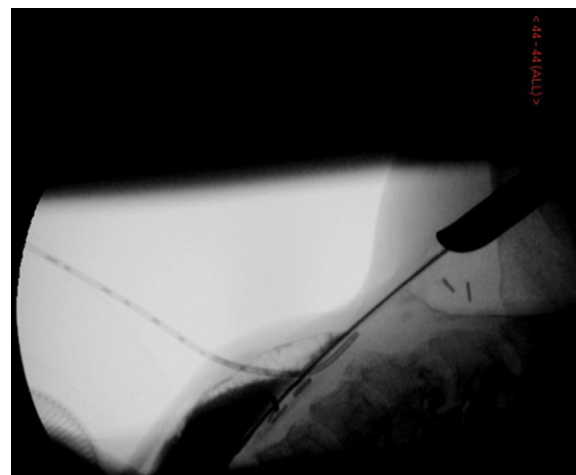


Fig. 3. 12F catheter passed across stenosis.

This resulted in the patient being able to take oral diet, albeit supplemented by jejunostomy feeds, but above all allowed restoration of run off for saliva.

3. Discussion

Antegrade bougienage and balloon dilation are well established therapeutic procedures to improve luminal calibre in patients with pharyngo-oesophageal strictures.^{6–9,12,13} Balloon dilation is now more widely used due to its superior safety profile.⁸ The main limitation of balloon or bougie dilation, however, is re-stenosis.^{6–9,13} This remains a significant problem and repeat dilation is required in up to 58% of cases following treatment for head and neck cancer.^{6,13} An association has been demonstrated with initial stricture dilatation within 90 days of surgery and the objective severity of the stricture, specifically a luminal diameter of <13 mm post-dilatation.⁸

Patients with complex strictures or total stenoses present a particular management problem as antegrade dilations are more frequently complicated by re-stenosis necessitating multiple dilations, and complications including perforation and fistula formation may occur.^{11,13–16} This is particularly true in patients treated surgically for head and neck malignancy in whom tissue oedema, altered anatomy and the propensity to depart from the true lumen pose even greater risks as a result of errant dissection.¹⁴ Furthermore, visualisation of the lumen is frequently suboptimal and to carry out such dilatation safely one must be able to identify a lumen at all times.^{14–16}

For complex or complete pharyngo-oesophageal strictures refractory to serial dilation positive outcomes have been described with intra-lesional steroid injection,¹⁷ self-expanding plastic and partially covered metal stents,¹⁸ or even on occasion oesophageal resection.^{11,15} Some authors have reported success in dilating tight strictures with a retrograde approach through a previously placed gastrostomy.¹⁶ More recently, reports have described combined antegrade/retrograde endoscopic procedures for cases of complete pharyngo-oesophageal obstruction to facilitate stricture access and dilation to restore luminal patency and avoid the need for major surgery. Combined retrograde/antegrade “rendezvous” techniques were first described in 1998 by Van Twisk et al.,¹⁹ and several subsequent small case series describe similar methods for complete luminal obstruction.^{5,14,15,20} The majority of patients have responded well to subsequent serial dilations and most have been able to discontinue gastrostomy tube use. Whilst subtle differences in technique have been reported these do not appear to impact upon efficacy.

All reports to date have studied patient groups with either benign pathology or those who have undergone non-surgical, organ preservation treatment for head and neck cancer. Furthermore, they have all relied on the ability to dilate a pre-existing gastrostomy site to access the stomach and distal oesophagus. This was not possible in our patient due to the surgically altered anatomy which posed a unique therapeutic challenge to restore continuity of the digestive tract. Whilst laparotomy and attempted retrograde dilation was an option for our patient, this posed significant morbidity in the previously operated abdomen in a malnourished patient. The procedure presented is minimally invasive and technically straightforward and should be considered as part of the multidisciplinary approach to treating the debilitating condition.

4. Conclusion

Total luminal stenosis is a rare, debilitating and therapeutically challenging complication of treatment of head and neck cancers. In challenging cases with surgically distorted anatomy, this

percutaneous, transcervical minimally invasive technique should be considered in part of the armamentarium against this condition.

Conflict of interest statement

The authors declare no competing interests.

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Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Authors' Contribution

Mark D. Wilkie contributed to data collection, writing of manuscript, major revisions, and literature review.

Iain F. Hathorn contributed to conception, manuscript review and major revisions.

Andrew S. Evans contributed to conception, manuscript review and major revisions.

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References

- Oswens SHL, Law S, Wei WI, Ng WM, Wong KH, Tong KH, et al. Esophageal cancers with synchronous or antecedent head and neck cancers: a more formidable challenge? *Ann Surg Oncol* 2008;**15**:1750–6.
- Pesko P, Sabljak P, Bjelovic M, Stojakov D, Simic A, Nenadic B, et al. Surgical treatment and clinical course of patients with hypopharyngeal carcinoma. *Dis Esophagus* 2006;**19**:248–53.
- Briel JW, Tamhankar AP, Hagen JA, DeMeester SR, Johansson J, Choustoulakis E, et al. Prevalence and risk factors for ischemia, leak, and stricture of esophageal anastomosis: gastric pull-up versus colon interposition. *J Am Coll Surg* 2004;**198**:536–42.
- Williams VA, Watson TJ, Zhovtis S, Gellersen O, Raymond D, Jones C, et al. Endoscopic and symptomatic assessment of anastomotic strictures following esophagectomy and cervical esophagogastrostomy. *Surg Endosc* 2008;**22**:1470–6.
- Sullivan CA, Jaklitsch MT, Haddad R, Goguen LA, Gagne A, Wirth LJ, et al. Endoscopic management of hypopharyngeal stenosis after organ sparing therapy for head and neck cancer. *Laryngoscope* 2004;**114**:1924–31.
- Ahlawat SK, Al-Kawas FH. Endoscopic management of upper esophageal strictures after treatment of head and neck malignancy. *Gastrointest Endosc* 2008;**68**:19–24.
- Nguyen NP, Molts CC, Frank C, Vos P, Smith HJ, Karlsson U, et al. Dysphagia following chemoradiation for locally advanced head and neck cancer. *Ann Oncol* 2004;**15**:383–8.
- Chung WC, Paik CN, Lee KM, Jung SH, Chang UI, Yang JM. The findings influencing restenosis in esophageal anastomotic stricture after endoscopic balloon dilation: restenosis in esophageal anastomotic stricture. *Surg Laparosc Endosc Percutan Tech* 2009;**19**:293–7.
- Laurell G, Kraepelien T, Mavroidis P, Lind BK, Fernberg JO, Beckman M, et al. Stricture of the proximal esophagus in head and neck carcinoma patients after radiotherapy. *Cancer* 2003;**97**:1693–700.
- Moghissi K, Pender D. Management of proximal esophageal stricture. *Eur J Cardiothorac Surg* 1989;**3**:93–8.
- Swaroop VS, Desai DC, Mohandas KM, Dhir V, Dave UR, Gulla RI, et al. Dilation of esophageal strictures induced by radiation therapy for cancer of the esophagus. *Gastrointest Endosc* 1994;**40**:311–5.

12. Polese L, Angriman I, Bonello E, Erroi F, Scarpa M, Frego M, et al. Endoscopic dilation of benign esophageal strictures in a surgical unit: a report on 95 cases. *Surg Laparosc Endosc Percutan Tech* 2007;**17**:477–81.
13. Dhir V, Vege SS, Mohandas KM, Desai DC. Dilation of proximal esophageal strictures following therapy for head and neck cancer: experience with Savary Gilliard dilators. *J Surg Oncol* 1996;**63**:187–90.
14. Maple JT, Petersen BT, Baron TH, Kasperbauer JL, Wong Kee Song LM, Larson MV. Endoscopic management of radiation-induced complete upper esophageal obstruction with an antegrade-retrograde rendezvous technique. *Gastrointest Endosc* 2006;**64**:822–8.
15. Baumgart DC, Veltzke-Schlieker W, Wiedenmann B, Hintze RE. Successful recanalization of a completely obliterated esophageal stricture by using an endoscopic rendezvous maneuver. *Gastrointest Endosc* 2005;**61**:473–5.
16. Lew RJ, Shah JN, Chalian A, Weber RS, Williams NN, Kochman ML. Technique of endoscopic retrograde puncture and dilatation of total esophageal stenosis in patient with radiation-induced strictures. *Head Neck* 2004;**26**:179–83.
17. Kochhar R, Makharia GK. Usefulness of intralesional triamcinolone in treatment of benign esophageal strictures. *Gastrointest Endosc* 2002;**56**:829–34.
18. Repici A, Conio M, De Angelis C, Battaglia E, Musso A, Pellicano R, et al. Temporary placement of an expandable polyester silicone-covered stent for treatment of refractory benign esophageal strictures. *Gastrointest Endosc* 2004;**60**:513–9.
19. Van Twisk JJ, Brummer RM, Manni JJ. Retrograde approach to pharyngoesophageal obstruction. *Gastrointest Endosc* 1998;**48**:296–9.
20. Bueno R, Swanson SJ, Jaklitsch MT, Lukanich JM, Mentzer SJ, Sugarbaker DJ. Combined antegrade and retrograde dilation: a new endoscopic technique in the management of complex esophageal obstruction. *Gastrointest Endosc* 2001;**54**:368–72.