

Medical Case Report

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Pharyngoplasty effectively relieves dysphagia from radiation-induced upper gastrointestinal tract strictures: A report of two cases

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Abstract

Pharyngoesophageal strictures following external beam radiation therapy for nasopharyngeal tumors are common. The management has mainly been repeated dilatation. We report two cases of pharyngeal strictures following radiation therapy. Management modalities were repeated dilatation followed by colopharyngoplasty for the first case, and sternocleidomastoid myocutaneous pharyngoplasty for the second case. Both had uneventful post-operative recovery and have no dysphagia to solids or liquids since surgery.

Keywords: Colopharyngoplasty, radiation therapy, sternocleidomastoid myocutaneous pharyngoesophagoplasty

INTRODUCTION

Pharyngeal strictures may manifest as late complications of external beam radiation therapy for head and neck tumors. It is a sign of late toxicity observed in some patients after the radiation therapy. Microvascular injury is reported to be involved in both early and late phases as part of the molecular mechanisms involved in the toxicity of irradiation [1]. The development of hypopharyngeal and esophageal stricture is caused by progressive obliterative endarteritis leading to ischemia of the esophageal wall [1]. The estimated risk of developing radiation-induced stricture is less than 2% in patients treated with a dose of 50Gy or less but rises to 15% in those treated with a dose of 60Gy [2,3]. Pharyngeal and esophageal strictures following external beam radiation impacts significantly on patients' quality of life. Management of this complication in majority of cases has been by dilatation and it becomes challenging when dilatation fails to relieve dysphagia permanently. Two patients who underwent radiation therapy for head and neck tumors and developed post radiation pharyngeal stricture benefited from colopharyngoplasty and sternocleidomastoid myocutaneous pharyngoplasty.

CASE 1

A 25-yr. old man presented at the National Cardiothoracic Center in August, 2015 with progressive dysphagia secondary to chemoradiotherapy. He was diagnosed with invasive nasopharyngeal carcinoma in February 2013 confirmed by preauricular lymph node biopsy. The clinical stage was T2N2M0. He underwent chemoradiation, received 5 cycles of cisplatin/xeloda concurrently with radiotherapy 68Gy/34 fractions. He was followed up without any complaint till a year later when he presented to the oncologist with dysphagia to solids. This progressively became worse and barium studies showed hypopharyngeal stricture at the level of C5 vertebral body. Further evaluation with chest and abdominal CT scans were normal. He had rigid esophagoscopy and serial dilatation to 30FR with Maloney dilators with resolution of symptoms. He presented again in February 2016 and March 2017 respectively with dysphagia to liquids and had repeat rigid esophagoscopy and dilatation. 2 wk after the last dilatation the symptoms of dysphagia recurred. He was prepared and had augmentation colopharyngoplasty. The left colon pedicled on the left colic artery routed retrosternally was used to repair the pharyngeal stricture as illustrated by Tetley et al. (2015) [4]. Post-operative recovery was uneventful, and patient obtained complete relief of dysphagia to solids and liquids. Barium swallow 32 mos after the procedure is shown in Plate 1.

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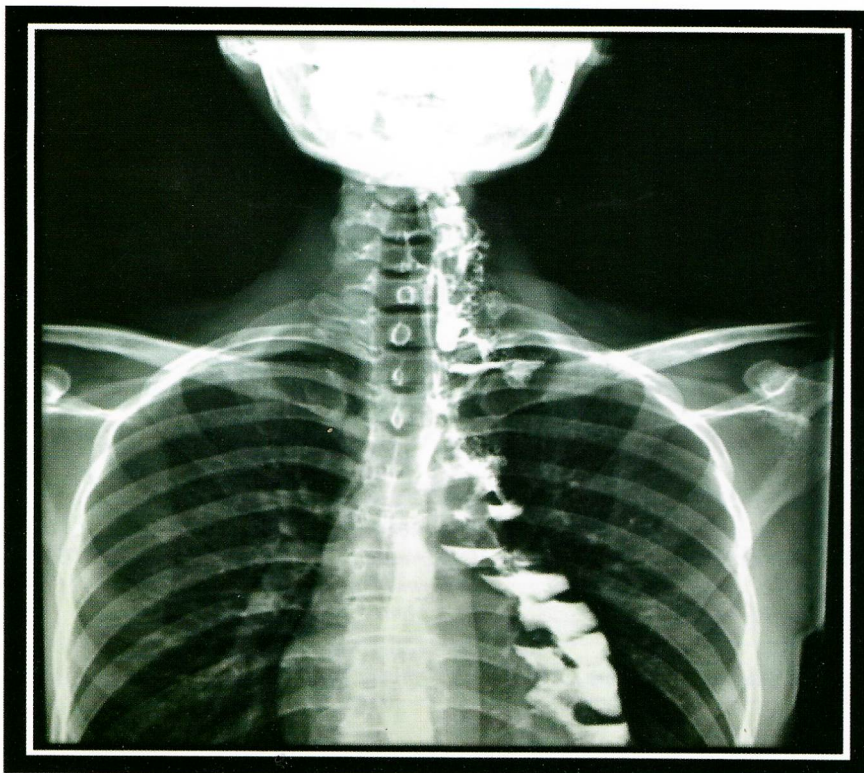


Plate 1: Barium swallow 32 months after colopharyngoplasty

CASE 2

A 35-yr. old man presented in May, 2017 with a 3-yr. history of progressive dysphagia. This started 2 yr. after external beam radiation for brain tumor. The histopathological report of the tumor could not be traced when he reported. At the time of presentation, he could only swallow liquids. There was no history of corrosive injection during the period. On examination, he looked well with no lymphadenopathy. His body mass index (BMI) was 19. His cardiovascular, respiratory and gastrointestinal systems were normal. The barium swallow studies before surgery showed a short segment stricture in the hypopharynx (Plate 2). After repeated dilations failed to provide lasting relief from dysphagia for Case 1, we took the decision to repair the lesion surgically. He was prepared for surgery and underwent sternocleidomastoid myocutaneous flap repair of the stricture. The intraoperative finding was a tight short segment stricture about 8 mm. Post-operative recovery was uneventful with complete relief of dysphagia after 2 yr. of follow up. Barium swallow after surgical intervention showed no hold-up of barium at the site of repair (Plate 3).

DISCUSSION

The presentation of toxicity to radiation therapy of nasopharyngeal tumors often starts with dysphagia. The incidence of esophageal stricture after radiation therapy ranges from 3.3% to 23% [1,3,5]. This complication is believed to be due to chronic inflammation and fibrosis and usually occurs 3-8 mos after completion of radiation therapy [2]. The two cases

presented respectively developed symptoms of pharyngeal stricture 12 mos and 2 yr. after the radiation therapy.

The management of pharyngoesophageal strictures following radiation therapy has been largely successful with balloon dilatation or bougienage. These dilatations usually have to be repeated because of re-stenosis and recurrence of symptoms of dysphagia [1]. The first case had this typical history of repeated dilatations and eventually a colopharyngoplasty. Three prognostic factors for recurrence were identified by Jung-Hoon et al. [2]. These include stricture at the cervical esophagus, stricture longer than 2 cm and time of stricture after radiation therapy. Dilatation is significantly ineffective if treatment is required less than 4 mos after radiation injury. This is explained by incomplete healing after the initial injury as the process continues with or without dilatation. This is not only applicable to radiation strictures but also to corrosive strictures. The first case had none of the identified risk factors for failed dilatation. Intraoperatively, the pharyngeal wall thickness at the site of the stricture may be contributory to the risk of recurrence. A serious complication of balloon dilatation is rupture at the site of the stricture. The rate is about 34% in patients with radiation induced strictures and most of these cases are managed conservatively [2]. Reconstructive surgical techniques have been developed for patients who have failed dilatation attempts. This is tailored to the extent of narrowing and other details of each patient [6]. A flap may be used as a patch to increase the diameter of the stenotic segment but if the stenosis is severe, it may require segmental resection with pharyngeal reconstruction [7]. The options for surgical reconstruction of pharyngeal and esophageal

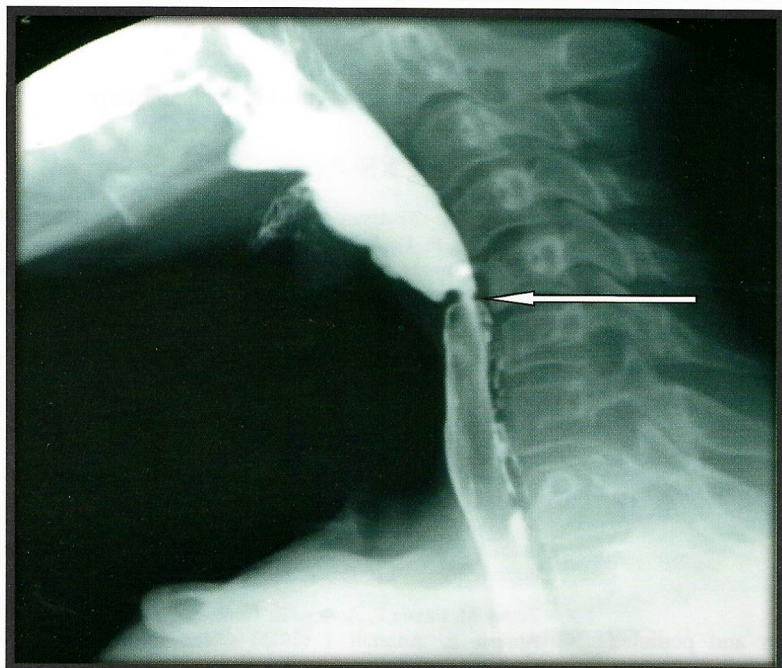


Plate 2: Pre-operative barium swallow showing hypopharyngeal Stricture opposite the 4th cervical vertebrae with hold-up of barium (arrow)

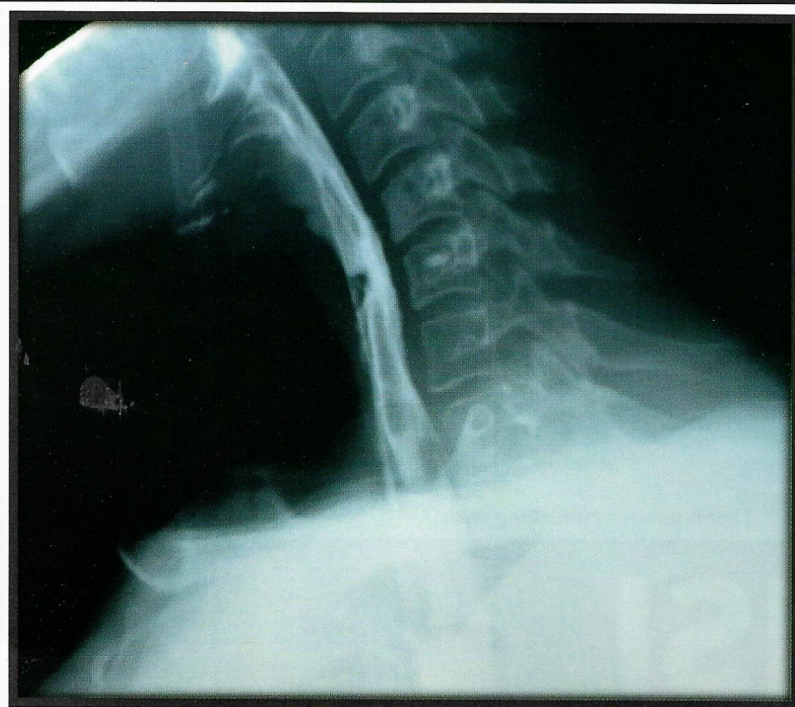


Plate 3: Post-operative barium swallow showing free flow of barium with no obstruction

stenosis include incision and transverse closure, esophagectomy and gastric pull-up, surgical resection and reconstruction with free forearm flap or pedicled pectoralis major myocutaneous flap [3,7,8]. The cases reported had two different procedures tailored according to stricture characteristics. Colopharyngoplasty was used in the first case. A flap of the proximal end of a pedicled left colon routed retrosternally was used to perform an augmentation pharyngoplasty after repeated attempts at dilatation [4]. The patient had uneventful recovery and has never had any symptoms of dysphagia for the past 2 years. The second case did not benefit from dilatation initially. We took the decision to perform a sternocleidomastoid myocutaneous pharyngoesophagoplasty to increase the diameter of the pharyngeal stenosis [9]. Recovery was also good with no leak after surgery. Both patients were satisfied with their swallowing and did not need any further intervention after surgery. The surgical option reduces the burden of repeated dilatations. Compared to surgery dilatation is less expensive. However, repeated dilatation without lasting relief from dysphagia may ultimately prove more expensive and unsatisfactory in terms of improved quality of life.

Conclusion

In conclusion, the use of pedicled left colon and pedicled sternocleidomastoid myocutaneous flap constitute effective surgical interventions in patients with radiation induced pharyngoesophageal strictures

DECLARATIONS

Ethical considerations

None

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None

Competing Interests

No potential conflict of interest was reported by the authors

Author contributions

MT contributed to the management of cases, drafting of report, and final review of report. FE contributed to management of cases, drafting of report, and reading through final report. EA contributed to managements of cases, and final review of report. MT contributed to management of cases, and final review of report. GO-L contributed to management of cases, and final review of report. All authors agreed to content of the final paper.

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Availability of data

All relevant data are provided in the manuscript

REFERENCES

1. Ahlberg A, Al-Abany M, Alevronta E, Friesland S, Hellborg H, Mavroidis P, Lind BK, Laurell G (2010) Esophageal stricture after radiotherapy in patients with head and neck cancer: experience of a single institution over 2 treatment periods. *Head Neck* 32:452–461. <https://doi.org/10.1002/hed.21201>
2. Park JH, Kim KY, Song HY, Cho YC, Kim PH, Tsauo J, Kim MT, Jun EJ, Jung HY, Kim SB, Kim JH (2018) Radiation-induced esophageal strictures treated with fluoroscopic balloon dilation: clinical outcomes and factors influencing recurrence in 62 patients. *Acta radiol* 59:313–321. <https://doi.org/10.1177/0284185117713351>
3. Laurell G, Kraepelien T, Mavroidis P, Lind BK, Fernberg JO, Beckman M, Lind MG (2003) Stricture of the proximal esophagus in head and neck carcinoma patients after radiotherapy. *Cancer* 97:1693–1700. <https://doi.org/10.1002/cncr.11236>
4. Tetty M, Edwin F, Aniteye E, Tamatey M, Entsua-Mensah E, Offosu-Appiah E, Adzaml I (2015) Colon bypass with a colon-flap augmentation pharyngoesophagoplasty. *Pan Afr Med J* 21:275–281. <https://doi.org/10.11604/pamj.2015.21.275.6717>
5. Francis DO, Hall E, Dang JH, Vlacich GR, Netterville JL, Vaezi MF (2015) Outcomes of serial dilation for high-grade radiation-related esophageal strictures in head and neck cancer patients. *Laryngoscope* 125:856–862. <https://doi.org/10.1002/lary.24987>
6. Institute for head and neck and thyroid cancer. Pharyngeal stenosis (post treatment). Available: www.headneckandthyroid.com/Patients/Pharyngoesophageal-Stenosis. Accessed 21/11/2019
7. Mcquone SJ, Eisele DW (1997) Management of pharyngeal and esophageal stenosis. *Oper Tech Otolaryngol - Head Neck Surg* 8:231–241. [https://doi.org/10.1016/S1043-1810\(97\)80037-1](https://doi.org/10.1016/S1043-1810(97)80037-1)
8. Pierrel C, Bodin F, Schultz P, Dupret-Bories A (2015) Semi-free forearm flap for pharyngeal-esophageal reconstruction after radiation therapy. *Eur Ann Otorhinolaryngol Head Neck Dis* 132:101–103. <https://doi.org/10.1016/j.anorl.2014.09.002>
9. Frimpong Boateng K (1994) Sternocleidomastoid myocutaneous esophagoplasty. *Eur J Cardio-thoracic Surg* 8:660–662. [https://doi.org/10.1016/S1010-7940\(05\)80176-9](https://doi.org/10.1016/S1010-7940(05)80176-9)

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