Title: Safety of MAC Sedation for Esophageal Dilation

Authors: Amy E. Jacks, MD[1], Mayuri Srikanth, BS[2], Apoorva Ramaswamy, MD[2]

Institutions: 1. The University of Oklahoma Health Science Center 2. The Ohio State University Wexner Medical Center

The James

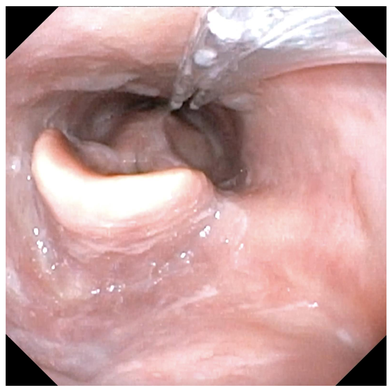
The Ohio State University Comprehensive Cancer Center

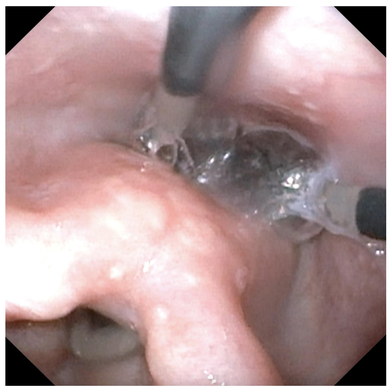
Introduction

- Upper esophageal stricture resulting in dysphagia can lead to diminished quality of life for patients.[1]
- In addition to impacts on social and emotional well-being, ongoing dysphagia could lead to physical consequences of malnutrition, dehydration, aspiration, chronic lung disease and potentially even death. [1,2]
- A common etiology of esophageal stricture results from post-radiation induced stenosis in head and neck cancer survivors. [3,4]
- Many patients, due to their prior surgical and radiation history, are at higher risk of undergoing general anesthesia (GA).[5]
- The primary aim of this study was to assess the safety and tolerance of esophagoscopy with balloon dilation under monitored anesthesia care (MAC) sedation in the OR.

Methods

- A prospective chart review was conducted from November 2022 – January 2023 including patients > 18 years old who underwent flexible esophagoscopy with balloon dilation for treatment of dysphagia.
- The procedure entailed a MAC sedation protocol with combination of dexmedetomidine and propofol. Once adequate sedation was achieved, a pediatric esophagoscope was used to complete a thorough esophagoscopy exam. The identified stricture was then dilated using a one or two balloon technique as indicated with representative photos below.
- Data of interest collected included demographics, cancer history, radiation history, intraoperative airway adjuncts, body mass index (BMI), difficult airway classification, ASA classification, anesthesia evaluation of mallampati score, mouth opening, thyromental (TM) distance and cervical neck range of motion (ROM).





Results

- Of the 27 patients reviewed, the majority were male (55.6%), with 88.9% of patients having a history of head and neck malignancy and prior radiation.
- A summary of these demographics are detailed in Table 1.

Table 1: Demographics

Characteristics	N (%)
Age	
<65	13 (48.1%)
>65	14 (51.9%)
Mean (SD)	66.48 (8.68)
Sex	
Male	15 (55.6%)
Female	12 (44.4%)
History of Head and Neck Cancer	
Yes	24 (88.9%)
No	3 (11.1%)
History of Head and Neck Radiation	
Yes	24 (88.9%)
No	3 (11.1%)
Body Mass Index (BMI)	
BMI < 25	16 (59.3%)
BMI ≥ 25	11 (40.7%)

- 48.1% of patients were classified as difficult airways. Pre-operative anesthesia evaluation demonstrated an average ASA classification of 2.81 with 78% of patients classified as ASA class 3 or higher.
- The average mallampati score was 2.67 with 58.3% of patients with a mallampati score of 3 or 4.
- Additionally, 26.1% of patients demonstrated a mouth opening < 3 finger breaths, 13.6% had a shortened TM distance and 12.5% of patients had limited neck ROM.
- Average ASA classification was the only characteristic found to predict patients classified as difficult airways (p=0.0042).
- These findings are summarized in Table 2.
- Esophagoscopy with balloon dilation was successfully completed in all subjects.
  - Only 3 laryngectomy patients (11.1%) required intubation via stoma and GA.
  - One additional patient required a short period of bag masking for desaturation below 90%.
- There were no post-operative complications seen following esophagoscopy with balloon dilation.

Results

Table 2: Anesthesia Characteristics

	Difficult Airway (N=13)	Not Difficult Airway (N=14)	P-value
Average Mallampati	2.92	2.42	0.1309
Mouth Opening			0.6600
<3 finger breaths	2	4	
>3 finger breaths	8	9	
Thyromental Distance			1.0000
<3 finger breaths	1	2	
>3 finger breaths	8	11	
Cervical ROM			1.0000
Normal	9	11	
Limited	1	2	
Average ASA classification	3.08	2.57	**0.0042**
BMI			0.581
<25	6	5	
≥25	7	9	

Conclusions

- Our cohort comprised largely of head and neck cancer survivors, who often are deemed higher risk for GA. All were able to safely and successfully undergo evaluation and treatment with esophagoscopy and balloon dilation in the OR.
- No complications were seen in our cohort following dilation.
- Patients with a higher average ASA classification were significantly more likely to be classified as a difficult airway.

References

1. Nguyen NP, Frank C, Moltz CC, Vos P, Smith HJ, Karlsson U, Dutta S, Midyett A, Barloon J, Sallah S. Impact of dysphagia on quality of life after treatment of head-and-neck cancer. Int J Radiat Oncol Biol Phys. 2005 Mar 1;61(3):772-8. doi: 10.1016/j.ijrobp.2004.06.017. PMID: 15708256.
2. Francis DO, Weymuller EA Jr, Parvathaneni U, Merati AL, Yueh B. Dysphagia, stricture, and pneumonia in head and neck cancer patients: does treatment modality matter? Ann Otol Rhinol Laryngol. 2010 Jun;119(6):391-7. doi: 10.1177/000348941011900605. PMID: 20583737.
3. Lawson JD, Otto K, Grist W, Johnstone PA. Frequency of esophageal stenosis after simultaneous modulated accelerated radiation therapy and chemotherapy for head and neck cancer. Am J Otolaryngol. 2008 Jan-Feb;29(1):13-9. doi: 10.1016/j.amjoto.2006.12.002. PMID: 18061826.
4. Park JH, Kim KY, Song HY, Cho YC, Kim PH, Tsauo J, Kim MT, Jun EJ, Jung HY, Kim SB, Kim JH. Radiation-induced esophageal strictures treated with fluoroscopic balloon dilation: clinical outcomes and factors influencing recurrence in 62 patients. Acta Radiol. 2018 Mar;59(3):313-321. doi: 10.1177/0284185117713351. Epub 2017 Jun 2. PMID: 28573925.
5. Jain D, Khan Joad AS. Head and neck radiotherapy - A risk factor for anaesthesia? Indian J Anaesth. 2020 Jun;64(6):488-494. doi: 10.4103/ija.IJA_864_19. Epub 2020 Jun 1. PMID: 32792713; PMCID: PMC7398013.