





Case Report

Esophageal Cancer, Central Airway Obstruction, and Lots More: A Collaborative Approach to a Challenging Scenario

Ram Niwas , Gopal Chawla , Nishant Kumar Chauhan , Naveen Dutt 

Department of Pulmonary Medicine, All India Institute of Medical Sciences, Jodhpur, India

Cite this article as: Niwas R, Chawla G, Chauhan NK, Dutt N. Esophageal cancer, central airway obstruction, and lots more: A collaborative approach to a challenging scenario. Turk Thorac J 2021; 22(2): 175-8.

Abstract

Esophageal cancer is the most common cause of extrapulmonary malignant central airway obstruction (MCAO). MCAO is usually managed by a multidisciplinary approach involving tumor debulking, stent placement, and palliative radiotherapy. MCAO is a challenge in itself; here, it becomes even more challenging as it was accompanied by grade 3 oral submucous fibrosis, nasal synechia, and multiple enlarged cervical nodes causing excessive compression of the trachea along with acute hypercapnic respiratory failure. Herein, a 65-year-old woman with multiple challenges, where death was imminent, managed with a collaborative approach involving awake nasal intubation in the sitting position and placement of a stent via a flexible bronchoscope, as rigid bronchoscopy was not possible in view of limited mouth opening. Overcoming these challenges led to completing the procedure successfully and palliating the symptoms.

KEYWORDS: Esophageal cancer, stridor, submucosal fibrosis, critical airway obstruction, tracheal stent

Received: October 25, 2019

Accepted: March 9, 2020

INTRODUCTION

Malignant central airway obstruction (MCAO) is usually defined as $\geq 50\%$ occlusion of the cross-sectional area of large airways because of malignancy, irrespective of its origin [1]. Esophageal cancer is the most common extra pulmonary cause of MCAO followed by thyroid and head and neck tumors [2]. Most of the time, interventions using bronchoscopy, such as coring, debulking, and stent placement, provide an appropriate method of achieving immediate airway relief by maintaining airway patency, resulting in an improved quality of life and functional status [3, 4]. Ideal management in this case would have been rigid bronchoscopy with jet ventilation along with stent placement and palliative radiotherapy (RT), which, however, was not possible, and there were multiple challenges.

CASE PRESENTATION

A 65-year-old housewife, who was a chronic tobacco and areca nut chewer, presented to the emergency with difficulty in breathing for the past 2 months along with difficulty in swallowing solids for 1 week. On presentation, the patient had stridor and was unable to complete a sentence. Her performance status, according to the Eastern Cooperative Oncology Group (ECOG) Performance Status, was 4. On examination, she had expiratory stridor with tracheal tug and audible wheeze. She had limited mouth opening with a width of only one and half fingers because of the presence of oral submucous fibrosis (OSF). Routine blood investigations were within normal limits. ABG showed type 2 respiratory failure with a pH of 7.25 and paCO_2 of 74, and chest radiology showed tracheal narrowing with normal lung parenchyma. Contrast-enhanced computerized tomography of the neck, chest, and abdomen was suggestive of enlarged cervical nodes (largest 5x4 cm) and mediastinal nodes along with long-segment circumferential nodular thoracic esophageal growth extending cranio-caudally from the D1 to D6 vertebral level (approximately 11 cm) with a maximum transverse diameter of approximately 15x18 mm. This mass was extending through periesophageal mediastinal fat and was infiltrating the posterior wall of trachea causing critical compression. Upper gastrointestinal endoscopic biopsy was done, which was suggestive of squamous cell cancer of the esophagus. Transnasal video bronchoscopy using a 6.2-mm scope (Olympus BF-1TH190, Olympus Medical Systems, Japan) was attempted but could not be performed as the patient had multiple nasal synechia (right more than left). Later, it was done using Karl storz (C-MAC® FIVE S, Karl Storz SE & Co. KG, Germany) with an outer diameter of 3.5 mm, and it revealed extraluminal compression of the posterior wall of trachea along with infiltration, although the carina was spared. Tracheal lumen was severely compromised causing more than 70% obstruction (Figure 1).

Address for Correspondence: Ram Niwas, Department of Pulmonary Medicine, All India Institute of Medical Sciences, Jodhpur, India
E-mail: rniwasaiims@gmail.com

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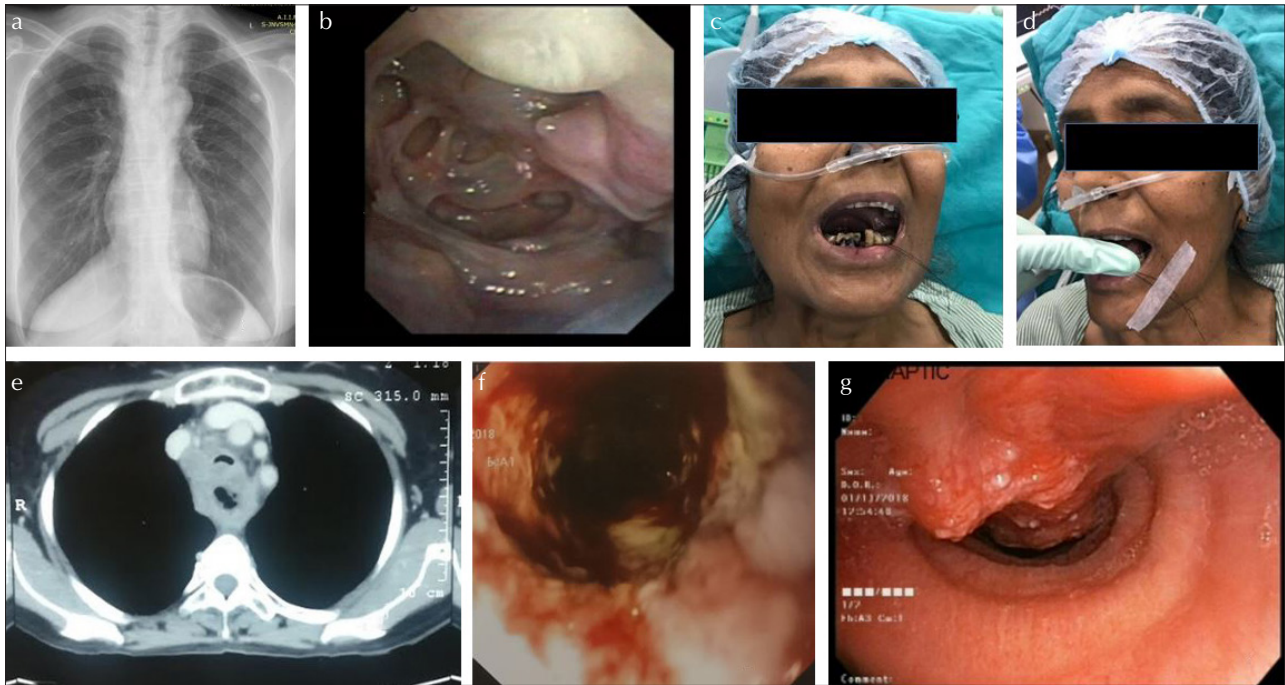


Figure 1. a-g. (a) Chest x-ray showing tracheal lumen narrowing, (b) Bronchoscopic view of Nasal Synechiae, (c, d) Limited mouth opening due to submucosal fibrosis with loose tooth, (e) CECT chest showing eccentric growth, posterior wall infiltration with CAO. (f) Endoscopic view of esophagus showing unhealthy friable mucosa, (g) Bronchoscopic view showing tracheal posterior wall infiltration causing CAO

Informed consent taken from the patient.

The patient needed self-expanding metallic tracheal stent (SEMS) for critical airway obstruction and palliation of symptoms. Using a rigid bronchoscope (RB) with jet ventilation would have been ideal, but the present scenario had many limitations and challenges, the first and foremost being grade 3 OSF, which made RB almost impossible because of a limited mouth opening; hence, SEMS via flexible bronchoscopy was considered, but that plan as well was filled with hurdles. The patient was having acute hypercapnic respiratory failure with high cardio-respiratory work, and conscious sedation would have worsened it to respiratory arrest. Therefore, it was needed to be done with mechanical ventilator support and that required endotracheal intubation. In view of limited mouth opening, nasal intubation was needed, but the patient had nasal synechiae. Second, she was not able to lie down as the airway was critically narrowed. The patient was intubated via flexible bronchoscopy with a size 6 endotracheal tube (ET) in a sitting position, and when ventilation was secured, she was paralyzed and given general anesthesia with constant vigil of hemodynamic and vital parameters.

With neuromuscular blockade, there was a slight increase in the mouth opening, and a MB-142 Olympus regular bite

block (insertion diameter 15 mm; height: 31 mm) was placed after cutting and modifying to fit in the mouth with a limited opening. The flexible bronchoscope was introduced through the bite block to place a guide wire for stent deployment. It was passed along with already placed nasal ET after cuff deflation. Following this, a 3.5-mm bronchoscope was passed via nasal ET, which was used for visualization. A stent deployer was railroaded over the guide wire, and under the vision, a tracheal stent (18x60 mm: Ottomed, J. Mitra & Co., New Delhi, India) was deployed. The procedure was completed uneventfully, and the patient was extubated after 2 h. There were no peri- and postprocedural complications. She improved dramatically and was maintained on noninvasive ventilation and undertaken for palliative RT along with chemotherapy (Figure 2).

After 2 months, she was able to carry out her daily activities as her ECOG improved from 4 to 2. She is still under follow-up and doing fine considering the nature of her disease and initial presentation.

DISCUSSION

Airway stenting is a well-established method for relieving and palliating MCAO. A critically obstructed airway presents a real challenge during the procedure as there is limited space available for bronchoscopy, stent deployment, and ventilation. However, in our case, we had many other challenges, as described earlier.

We had two options. The first was that we could have either foregone stent placement or instead intubate the patient and later put a tracheostomy tube. This too would have been challenging as critical obstruction was in lower third of trachea. Eventually, the patient would be taken for radiotherapy and chemotherapy, but palliation would have taken days [2,

MAIN POINTS

- Advanced rigid or flexible bronchoscopic techniques have a significant role in the palliation of central airway obstruction in nonsurgical patients.
- There are conditions where rigid bronchoscopy may not be possible and individualized management with a multidisciplinary approach may help to achieve an optimal success.

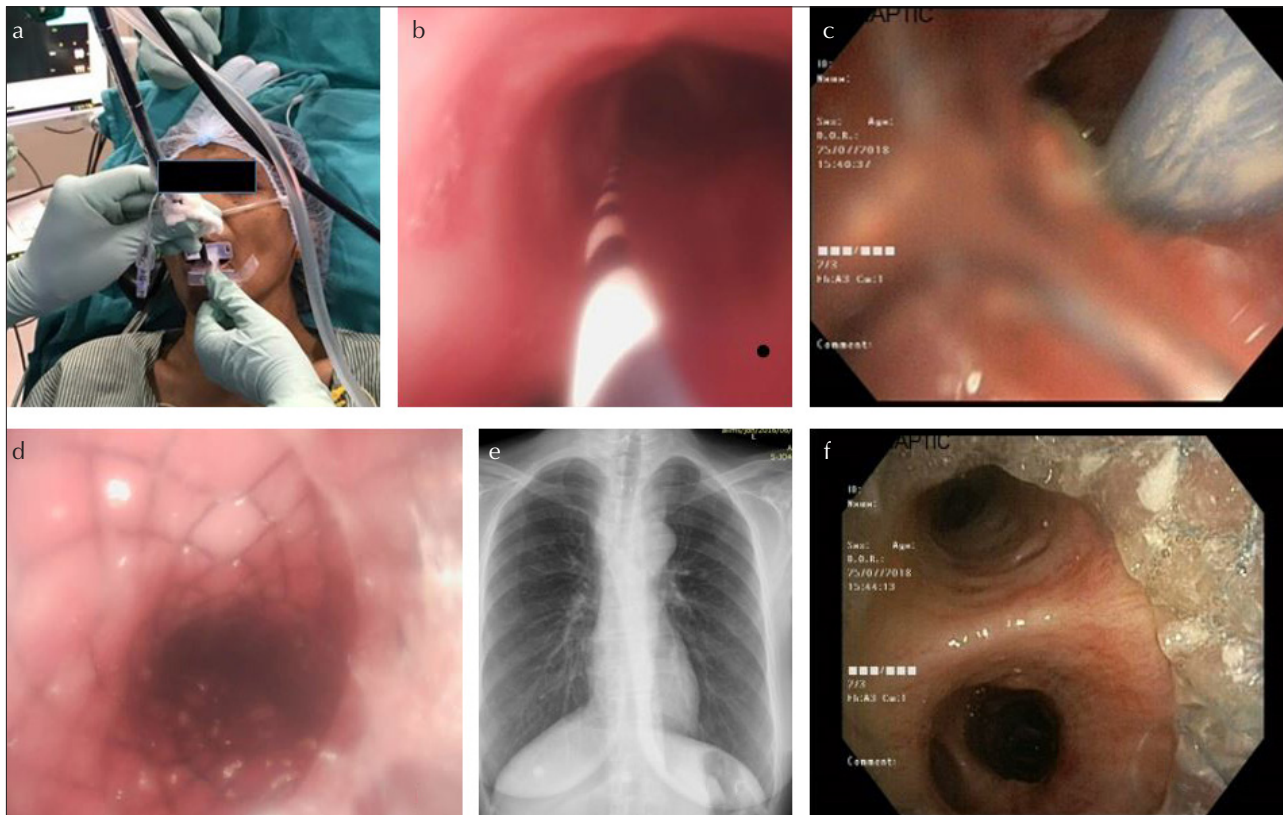


Figure 2. a-f. (a) Flexible bronchoscopic left sided nasal intubation in sitting position. (b) Insertion of guide wire by 2nd bronchoscope aside ET. (c) Deploying of Hybrid SEMS. (d) Stent placement with ET insitu, (e) Chest xray showing succesful stent placement. (f) Bronchoscopic view of stent just above carina

4]. The second option was using a collaborative approach, which we used and overcame the challenges.

Each challenge was needed to be taken care of, and proper planning was needed. Rigid bronchoscopy was not possible owing to limited mouth opening because of OSF. OSF is a condition usually caused by betel (areca) chewing. Alkaloids, polyphenols, and nitrosamines along with hard metals such as copper present in areca nut cause fibroblast dysfunction and excess collagen deposition resulting in the formation of fibrous bands, which limit the mouth opening. In our case, the distance between upper and lower incisors was only 23 mm, and cheek flexibility was reduced to more than 50% because of grade III OSF; therefore, the procedure could not be delayed to manage it with steroids or surgery [5].

Tracheal stenting had been done via flexible bronchoscopy under conscious sedation without any complications in past [6]. However, conscious sedation in our case would have worsened respiratory failure that would have led to respiratory arrest [7, 8].

Apart from nasal intubation, the other option was submental intubation, but that would have increased morbidities and complications [9]. Previously, tracheal stenting had been done in the sitting position under regional anesthesia with conscious sedation, but this was not an appropriate option for this case as the patient had hypercapnic respiratory failure and she might develop respiratory arrest without proper ventilatory support [10].

There is no mention of decreased mouth opening as a contraindication for rigid bronchoscopy in the literature, which also needs to be reconsidered [11]. While searching the literature, we found use of a rigid endolaryngeal tube in the retro molar approach for intubation in a case of decreased mouth opening. No study mentions its direct use in central airway obstruction and stenting, but it could have been used to intubate orally. Later, rigid or flexible could have been passed through it, and stenting could have been done through it [12].

CONCLUSION

There can be conditions where rigid bronchoscopy may not be possible like in ones with limited mouth opening, e.g., temporomandibular joint ankylosis, tetanus, oral cavity cancer, or OSF. In such cases, one should be prepared with alternatives and work as a team with other disciplines to achieve a desired outcome. Our case apart from this had other challenges too, where a multidisciplinary approach involving a pulmonologist, an anesthesiologist, an otorhinolaryngologist, and an oncologist helped in overcoming them and saving the patient from imminent death.

Informed Consent: Informed consent was obtained from the patient.

Peer-review: Externally peer-reviewed.

Acknowledgment: We would like to thank the Department of Anaesthesiology, Otorhinolaryngology, and Oncology, All India

Institute of Medical Sciences, Jodhpur, India, for helping out in the present case with various useful suggestions.

Author Contributions: Concept – R.N.; Design – R.N., G.C.; Supervision - R.N., N.D; Resources – R.N., G.C., N.K.C, N.D.; Materials - R.N., G.C., N.K.C, N.D; Data Collection and/or Processing –G.C., R.N.; Analysis and/or Interpretation –R.N., G.C.; Literature Review - R.N., G.C., N.K.C, N.D.; Writing Manuscript – R.N., G.C.; Critical Review - R.N., G.C., N.K.C, N.D.

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES

1. Ost DE, Ernst A, Grosu HB, et al. Therapeutic bronchoscopy for malignant central airway obstruction: success rates and impact on dyspnea and quality of life. *Chest* 2015;147:1282-98. [\[CrossRef\]](#)
2. Shin B, Chang B, Kim H, Jeong BH. Interventional bronchoscopy in malignant central airway obstruction by extra-pulmonary malignancy. *BMC Pulm Med* 2018;18:46. [\[CrossRef\]](#)
3. Amjadi K, Voduc N, Cruysberghs Y, et al. Impact of interventional bronchoscopy on quality of life in malignant airway obstruction. *Respiration* 2008;76:421-8. [\[CrossRef\]](#)
4. Ernst A, Feller-Kopman D, Becker HD, Mehta AC. Central airway obstruction. *Am J Respir Crit Care Med* 2004;169:1278-97. [\[CrossRef\]](#)
5. Passi D, Bhanot P, Kacker D, et al. Oral submucous fibrosis: Newer proposed classification with critical updates in pathogenesis and management strategies. *Natl J Maxillofac Surg* 2017;8:89-94. [\[CrossRef\]](#)
6. Lin S-M, Lin T-Y, Chou C-L, et al. Metallic stent and flexible bronchoscopy without fluoroscopy for acute respiratory failure. *Eur Respir J* 2008;31:1019-23. [\[CrossRef\]](#)
7. Chadha M, Kulshrestha M, Biyani A. Anaesthesia for bronchoscopy. *Indian J Anaesth* 2015;59:565-73. [\[CrossRef\]](#)
8. Narang S, Harte BH, Body SC. Anaesthesia for patients with a mediastinal mass. *Anesthesiol Clin North Am* 2001;19:559-79. [\[CrossRef\]](#)
9. Etemadi SH, Bahrami A, Farahmand AM, Zamani MM. Sitting Nasal Intubation with Fiberoptic in an Elective Mandible Surgery under General Anesthesia. *Anesth Pain Med* 2015;5:e29299. [\[CrossRef\]](#)
10. Dey S, Bhattacharyya P, Medhi J, Nellappa AK. Successful tracheal stent placement for central airway obstruction using dexmedetomidine and regional airway anesthesia. *J Anaesthesiol Clin Pharmacol* 2014;30:438-9. [\[CrossRef\]](#)
11. Batra H, Yarmus, L. Indications and complications of rigid bronchoscopy. *Expert Rev Respir Med* 2018;12:509-20. [\[CrossRef\]](#)
12. Marchis IF, Radeanu D, Cosgarea M. Tracheal intubation with the rigid tube for laryngoscopy - a new method. *Ther Clin Risk Manag* 2019;15:309-13. [\[CrossRef\]](#)