
Apnoeic oxygenation during rigid bronchoscopy: An unconventional and novel technique

Sir,

Tracheal stenosis is a life-threatening condition characterized by abnormal narrowing of airway passageways leading to restriction of pulmonary ventilation. The stenosis may result from extrinsic compression or intrinsic narrowing resulting from variety of benign and malignant causes. The intrinsic narrowing can be further classified into glottic, subglottic and at carina, or bronchi according to the level of stenosis. Endotracheal tuberculosis, sequelae of pulmonary tuberculosis that extends to endotracheal wall causes inflammation, edema, ulceration, granulation, or fibrosis of mucosa and submucosa is among one of causes of subglottic stenosis.^[1] We report airway management of a tracheostomized patient with subglottic stenosis in stridor. A 33-year-old female presented to us for preanesthetic check-up for tracheal dilatation and stenting. Patient was apparently alright 2 years back when she developed shortness of breath with hoarseness of voice. She underwent evaluation for tuberculosis. Sputum smear examination was found to be positive for acid fast bacilli (AFB). She took antitubercular treatment but shortness of breath persisted. In view of increased respiratory distress, emergency tracheostomy was performed. On fiberoptic evaluation of upper airway, the patient was found to have subglottic stenosis. Later, stenosis was managed with laser surgery followed by serial dilatation. Tracheostomy tube was repositioned

and changed with adjustable flange. However, complain of respiratory distress with stridor was persistent. Fiberoptic bronchoscopic view obtained under sedation was suggestive of edematous carina and lower end of tracheostomy tube was seen upto carina. It was planned to dilate the tracheal stenosis followed by stenting under general anesthesia.^[2]

Various techniques including apnoeic oxygenation, spontaneous-assisted ventilation, controlled ventilation manual jet ventilation, and high-frequency jet ventilation have been already described in literature for ventilation during rigid bronchoscopy.^[3] Preanaesthetic check-up and routine investigations were within normal limits. Patient was kept fasting as per guidelines of no solids by mouth for 8 hours and was allowed to drink clear liquids up to 2 hours prior to the procedure. Patient was premedicated with injection glycopyrrolate 0.1 mg i.v. Anesthesia was induced with injection propofol 1 mg/kg titrated to loss of verbal commands. After confirmation of ventilation, neuromuscular relaxation was achieved with injection vecuronium 0.1 mg/kg. Anesthesia was maintained with sevoflurane in mixture of 50% O₂ in air. Tracheal dilatation was achieved with rigid bronchoscope. It was decided to introduce rigid bronchoscope further for evaluating lower airway and proceed with stenting. For executing planned procedure, removal of tracheostomy



Figure 1: Suction catheter –stoma circuit assembly

tube, and provision of apnoeic ventilation were required. The clinical scenario was perplexed by the fact that if airway collapses after removal of tracheostomy tube, then introduction of both rigid bronchoscope and tracheostomy tube will be impossible. Further, patient complained of stridor despite tracheostomy tube *in situ* preoperatively. These circumstances left us in clinical dilemma whether to remove tracheostomy tube without immediate cardiopulmonary bypass backup. Tracheal insufflations of oxygen with a suction catheter was planned, but with slight modification. This suction catheter was connected to endotracheal tube connector which in turn was connected to closed circuit of machine [Figure 1]. With this modification, we were able to ventilate patient with approximately 150 ml of tidal volume [Figure 2]. Now, another concern was, if we removed the tracheostomy tube, whether we would be able to reinsert it when required. Here, suction catheter came to rescue as we removed tracheostomy tube over suction catheter where catheter could again be used to rail road the tube. Tracheostomy tube was then removed from stoma, with suction catheter inside. Rest of evaluation of lower airway took approximately 30 minutes. During this period, ventilation was performed with ventilation through suction catheter uneventfully. Alas! Due to severe edema and involvement of long length of airway, stenting including both tracheal and bronchial segments was planned for further management. At the end, bronchoscope was withdrawn and tracheostomy



Figure 2: Ventilatory parameters

tube was rail roaded. Position of tracheostomy tube was confirmed with fiberoptic bronchoscope and square wave capnograph. Neuromuscular blockade was reversed with injection neostigmine 50 µg/kg in combination with injection glycopyrrolate 10 µg/kg. Hence, with quick, rational decision and application of knowledge about modifications that we routinely do in our day to day practice, we were successfully able to manage airway in this patient.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

**DEEPTI AHUJA, WASIMUL HODA, ABHISHEK KUMAR,
SACHIDANAND J. BHARATI**

Department of Onco-Anaesthesia and Palliative Medicine,
Dr B.R.A.I.R.C.H, All India Institute of Medical Sciences,
New Delhi, India

Address for correspondence:

Dr. Sachidanand J. Bharati,
Department of Onco-Anaesthesia and Palliative Medicine,
Dr B.R.A.I.R.C.H, All India Institute of Medical Sciences,
New Delhi, India.
E-mail: sachidadr@yahoo.co.in

References

1. Cary C, Jhaji M, Cinicola J, Evans R, Cheriya P, Gorrepati VS. A rare case of fibrostenotic endobronchial tuberculosis of trachea. *Ann Med Surg (Lond)* 2015;4:479-82.
2. Daniel N, Todd WS. Rigid Bronchoscopy- Indications and techniques. *Oper Tech Thorac Cardiovasc Surg* 2012;17:44-51.
3. Vikas P, Ian W, Kamran M, Momen W, Neil M, Shofer S. Focussed reviews. Ventilation and anaesthetic approach for rigid bronchoscopy. *Ann Am Thorac Soc* 2014;11:628-34.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online	
<p>Website: www.saudija.org</p>	<p>Quick Response Code</p> 
<p>DOI: 10.4103/sja.SJA_406_18</p>	

How to cite this article: Ahuja D, Hoda W, Kumar A, Bharati SJ. Apnoeic oxygenation during rigid bronchoscopy: An unconventional and novel technique. *Saudi J Anaesth* 2019;13:167-9.
© 2019 Saudi Journal of Anesthesia | Published by Wolters Kluwer - Medknow