

Short endotracheal tube: An approach to shorten procedure time in bronchial thermoplasty

Sir,

Bronchial asthma is a chronic debilitating disorder characterized by the presence of symptoms, such as dyspnea, cough, wheeze, respiratory distress, and death during exacerbations. The contraction of airway smooth muscles leading to bronchoconstriction forms pathophysiologic basis of asthma. Severe exacerbations may occur even in patients on multiple lines of pharmacological therapy, including antiinflammatory agents, long-acting β_2 -adrenoceptor agonists, and high-dose oral corticosteroids. Bronchial thermoplasty (BT), using Food and Drug Administration (FDA)-approved device,^[1] delivers controlled radiofrequency-generated heat via catheter inserted into bronchial tree of lungs through flexible bronchoscope and by blocking bronchial smooth muscle tone reduces bronchoconstriction response, resulting in amelioration of chronic symptoms and reduced exacerbations.^[2,3] We report airway management of a patient during general anesthesia undergoing BT. A 64-year-old female, diabetic, hypothyroid, and controlled on drugs was planned for BT for severe bronchial asthma not responsive to conventional pharmacological therapy. The patient unveiled dyspnea (NYHA grade 3), bilateral wheeze on auscultation, moderate restrictive abnormality on pulmonary function test. BT is a procedure requiring manipulation on airways with already increased responsiveness. The anesthetic management of intricate clinical scenario is challenging as it is associated with occurrence of various peri-procedural airway adverse events such as bronchospasm and laryngospasm that may manifest as coughing, dyspnea, etc.^[4,5]

In order to avoid occurrence of these adverse events, procedure is performed under moderate to deep sedation or general anesthesia. The BT sessions performed under moderate to deep sedation were associated with drawbacks such as suboptimal procedural conditions due to hypoventilation, airway obstruction requiring jaw thrusts, and introduction of oropharyngeal or nasopharyngeal airway to maintain upper airway patency. The cases where airway patency was lost were later administered general anesthesia with the use of airway [laryngeal mask airway (LMA) or endotracheal tube (ETT)].^[5] Thus, we administered general anesthesia for procedure in beginning itself. After nebulizing with salbutamol and ipratropium, patient was taken on procedure table and monitoring devices including electrocardiogram, heart rate, pulse oximetry (SpO₂), and noninvasive blood pressure were applied and baseline values of 91/minute, 100%, and 130/77 mmHg were noted. General anesthesia was induced with inj. fentanyl 100 μ g, inj. propofol

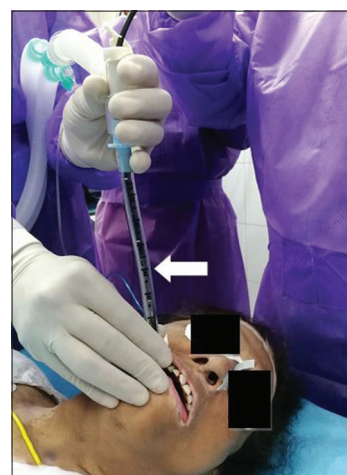


Figure 1: Arrow highlighting point from where ETT can be cut to shorten its length

100 mg, and inj. atracurium 40 mg. We decided to use ETT instead of LMA as the potential for LMA to decrease airway stimulation and risk of bronchospasm is counterbalanced by procedure itself.^[4] An 8 mm ID sized PVC tube was used for endotracheal intubation and was fixed at 19 cm mark. Inj. dexamethasone (0.1 mg/kg) and inj. paracetamol (15 mg/kg) were administered immediately after induction. Anesthesia was maintained with mixture of O₂/air, target-controlled infusion of propofol, and boluses of inj. atracurium 10 mg as required. The FiO₂ was kept around 0.3 throughout procedure to minimize risk of airway fire and patient was ventilated on volume-controlled mode with tidal volume of 400 ml keeping peak airway pressure up to 30 cm H₂O. The flexible bronchoscope sized 4.2 mm outer diameter was placed through ETT and bronchial thermoplasty catheter 1.9 mm working channel was placed through bronchoscope to perform thermoplasty of upper lobes of both lungs. Few minutes after introduction of flexible bronchoscope, resistance to passage of bronchoscope and thermoplasty catheter was encountered by pulmonologist. The adequate depth of anesthesia was ensured and on examination of airway through flexible bronchoscope, we found that there was no kinking, biting, or malpositioning of ETT. However, as resistance was continuously encountered, we decided to shorten the length of ETT by cutting it 2 cm above pilot balloon mark which was at 24 cm [Figure 1]. After shortening length of ETT, flexible bronchoscope was passed easily and procedure was completed in 90 min. After completion of the procedure, patient was reversed and was shifted to ICU on O₂ face mask (FiO₂: 40%) maintaining SPO₂ 100% for monitoring of any post-procedural complications.

Thus, we would like to conclude that among different choices available in anesthesiologist's armamentarium, general anesthesia using ETT is a safe and feasible technique for patients undergoing BT. ETT can be used effectively and if required, its length can be shortened to provide optimal procedural conditions for pulmonologists. However, more randomized controlled trials are required to identify most suitable anesthesia technique and safest airway equipment for anesthetic management of BT cases.

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.

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Conflicts of interest

There are no conflicts of interest.

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