

Ketamine and propofol infusion for therapeutic rigid bronchoscopy in a patient with central airway obstruction

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Central airway obstruction (CAO) is a late and potentially life-threatening presentation of lung tumors and may require emergency diagnostic and therapeutic rigid bronchoscopic interventions.^[1] Anesthetic management of such patients with CAO obstruction is challenging as the airway patency may be

lost with use of neuromuscular blocking drugs due to loss of muscle tone. The choice of anesthetic technique used depends on the severity of the obstruction, urgency of the procedure, and skills of the physicians.^[1-3]

We report the successful anesthetic management for rigid bronchoscopy and bronchial stenting of a 55-year-old male patient with an obstructing lung mass presenting with CAO. At the time of presentation the patient had a pulse rate of 106/min, respiratory rate of 32/min, and a SpO₂ of 95% on venturi mask with 10 L/min oxygen flow. His arterial blood gases (ABGs) on room showed a pH 7.35, PaO₂ 68 mmHg, PaCO₂ 40 mmHg, bicarbonate 22 mmHg, and arterial oxygen saturation of 90% on room

air. Chest X-ray showed a tracheal deviation to left side. A CT chest revealed a malignant large right upper lobe mass (37 mm × 34 × 36 mm) encasing right subclavian artery superiorly, abutting arch of aorta and compressing right upper lobe bronchus. A heterogeneously enhancing right hilar and subcarinal lymph node (33 mm × 23 mm) visualized on CT was confirmed endoscopic bronchial ultrasound [Figure 1]. The patient was shifted to the bronchoscopy suite and positioned in a 45° supine position after applying routine monitors.

Anesthesia induced was achieved with intravenous fentanyl 50 µg and ketofol (a mixture 15 ml of 1% propofol [150 mg] and 5 ml of 15 mg/ml ketamine [75 mg] in a 20-ml syringe so that each ml of solution contained 7.5 mg of propofol and 3.75 mg of ketamine) in titrated aliquots of 2 ml. After ensuring adequate depth of anesthesia, a rigid bronchoscope was inserted. Anesthesia was maintained with infusion of ketofol mixture (propofol @ 50 µg/kg/min and the patient was ventilated with oxygen-air mixture with the anesthesia circuit attached to the ventilating port of the RB. During RB, a fracture of tracheal cartilage was seen that distorted anatomy around the carina. A “Y” stent was placed and after the procedure, a size 4 I-gel was placed to ventilate the patient till he was awake. The procedure took 60 min, following which the patient was shifted to the ICU for monitoring.

We avoided the use of muscle relaxants as it could abolish muscle tone and lead to complete CAO.^[3,4] Inhalation induction could be difficult to maintain during rigid bronchoscopy due to agent leak and may require supplementation with intravenous agents.^[4] Topical anesthesia with spontaneous breathing was an option but our patient was not cooperative.^[4]

Hence, we chose to manage his airway with titrating dose of a 2:1 mixture of propofol and ketamine. Both propofol and ketamine if used alone will not be ideal for giving total intravenous anesthesia for rigid bronchoscopy because the associated side effects at the required doses will limit their usefulness. However, a combination of the two not only reduces the dose required for but also complements each other. The side effects of propofol (respiratory depression and hypotension) are counteracted by simultaneous use of ketamine (respiratory stimulant and sympathomimetic effect leading to hypertension). So, in effect the combination is near ideal drug combination for rigid bronchoscopy.^[5,6] A combination of ketamine and propofol has been used for endometrial biopsy, procedural

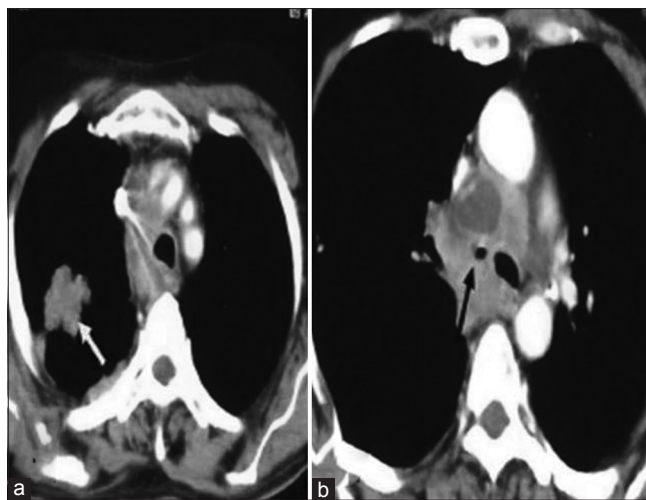


Figure 1: CT scan of 55-year male patient of carcinoma lung. (a) Axial CT image showing lobulated mass (white arrow) in upper lobe of right lung. (b) Axial CT image revealing the enlarged mediastinal nodes, some showing necrosis. Nodal mass in compressing right main bronchus causing luminal narrowing (black arrow)

sedation in emergency department, and electroconvulsive therapy.^[5,6]

CAO due to fractured tracheal cartilage can be anesthetically challenging. A combination of ketamine and propofol can be used for therapeutic rigid bronchoscopy in patients with CAO. Preoperative discussion with the pulmonologist, good communication discussing degree of airway compromise, plans for rigid or flexible bronchoscopy and its associated risks, and expected outcome is utmost important for a successful outcome.

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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References

1. Sohrab S, Mathur PN. Management of central airway obstruction. *Clin Lung Cancer* 2007;8:305-12.
2. Seijo LM, Sterman DH. Interventional pulmonology. *N Engl J Med* 2001;344:740-9.
3. Pawlowski J. Anesthetic considerations for interventional pulmonary procedures *Curr Opin Anesthesiol* 2013;26:6-12.
4. Conacher ID. Anaesthesia and tracheobronchial stenting for central airway obstruction in adults. *Br J Anaesth* 2003;90:367-74.
5. Morse Z, Sano K, Kanri T. Effects of a propofol—ketamine admixture in human volunteers. *Pac Health Dialog* 2003;10:51-4.
6. Arora S. Combining Ketamine and propofol (“ketofol”) for emergency department procedural sedation and analgesia: A review. *West J Emerg Med* 2008;9:20-3.

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