Successful Use of the LMA to Manage an Airway Emergency in the GI Suite

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Introduction
Providing anesthesia in the endoscopy suite can be challenging, because the gastroenterologist and the anesthesiologist share access to the airway during the procedure. Propofol is used almost exclusively as part of total intravenous anesthesia (TIVA) in most patients because it provides adequate relaxation of the upper airway, easy titration, and faster recovery with fewer side effects. However, propofol use in patients with comorbidities such as obstructive sleep apnea (OSA) and morbid obesity is associated with increased complications such as airway obstruction (McVay et al., 2016). Also, patients with a history of reactive airways are at a higher risk for respiratory complications during or following endoscopy (Acquaviva et al., 2014). Elective and emergency airway management utilizing the use of the laryngeal mask airway (LMA) has been described in very few studies involving the pediatric population, but none with adults. We describe the use of the LMA in an adult with a potentially difficult-to-manage airway, who developed severe laryngospasm during upper endoscopy.

Case Report
A 30-year-old male with a history of obstructive sleep apnea (OSA), chronic obstructive pulmonary disease (COPD), type II diabetes mellitus, and hypertension was scheduled for an elective upper endoscopy under TIVA with propofol. His height and weight were 201 cm and 145 kg, respectively, and a BMI of 35. Airway examination revealed a Mallampati score of 3 and short muscular neck; in addition the patient had a beard. The patient was brought to the endoscopy suite and placed in a semi-lateral left decubitus position. Standard monitors included EKG, blood pressure cuff, pulse oximetry, and capnography. The patient was induced with 120 mg of propofol, followed by infusion at 200 mcg/kg/min. Spontaneous respirations were maintained. Immediately after the insertion of a gastroscope, the patient developed acute laryngospasm. The endoscope was removed and a face mask was applied. Despite attempts at positive pressure ventilation with the face mask, the saturation as measured by pulse oximetry decreased from 99% to 59% within two minutes. A size 5 LMA Unique was inserted successfully and with positive pressure ventilation, laryngospasms subsided. Saturation improved from 57% to 95% within two minutes. With guidance from the anesthesiologist, the gastroenterologist was able to pass the scope behind the cuff of the laryngeal
mask successfully by following the path of the LMA’s shaft. To facilitate the passage of the endoscope, the cuff of the LMA was deflated by 50% volume without compromising spontaneous respirations. A large amount of thick secretions were observed in the hypopharynx that might have contributed to the laryngospams. In response, 0.4 mg glycopyrrolate was administered intravenously. Small amounts of frothy secretions were noted in the shaft of the LMA; therefore, pressure support with PEEP of 10 cm of H2O was instituted. Saturation was maintained at 96-98% throughout the procedure. Upon completion of the endoscopy, the patient was awakened and the LMA was removed without complications. The patient was then transferred to the PACU. When fully awake, the patient was informed about the event and was observed for one hour. He was discharged in stable condition and was instructed to notify the attending physicians and seek emergency department admission in case of any respiratory difficulties. During a follow up phone call later that same day and the following day, the patient did not complain of any respiratory difficulties.

Discussion

Most endoscopies under TIVA with propofol do not require airway instrumentation, with the exception of patients with a high BMI, OSA, and reactive airways. Additionally, many patients with high BMI, OSA, and dense beards pose challenges during mask ventilation and endotracheal intubation. They frequently require specialized equipment such as a fiberoptic bronchoscope or video laryngoscope. The availability and assembly of specialized equipment requires time, which may not be available during emergency situations. In contrast, supraglottic airway devices are readily available on anesthesia carts and the insertion can be performed quickly and efficiently in the endoscopy suite.

Author’s prior experience in using LMA for prolonged transesophageal echocardiographic examinations (TEE) demonstrated that a continuous airway can be achieved successfully and reliably during co-instrumentation of the hypopharynx with a large endoscope. During TEE, the probe should be inserted prior to LMA placement because of the bulky and rigid end portion of the scope that is needed to mount the TEE sensor. However, during upper GI endoscopy, the scope can be inserted with the LMA already situated. The advancement of the scope follows the path of LMA’s shaft and then posteriorly to the LMA’s cuff (Figures 1-6). To facilitate the passage of the endoscope behind the LMA’s cuff into the hypopharynx, the cuff can be partially deflated (about 50% of its volume), usually without compromising the ability to ventilate the patient. Once the endoscope reaches the esophagus, the cuff can be re-inflated. The entire procedure can be performed while the patient is continuously ventilated with the LMA. More studies are needed to fully evaluate the role of the LMA and other supraglottic airways in patients undergoing upper endoscopy with TIVA. To our knowledge, this is the first report of the successful use of the LMA for emergency management of a severe laryngospasm during upper endoscopy in an adult patient with a potentially difficult-to-manage airway.

References


