Interventional Pulmonology

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KEYWORDS

- Bronchoscopy • Jet ventilation • Total intravenous anesthesia
- Interventional pulmonology

KEY POINTS

- Advances in interventional pulmonology techniques allow for the care of patients of significantly higher acuity. These patients can be best cared for in a well-planned multidisciplinary fashion.
- Airway access in interventional pulmonology patients is often a shared responsibility between the pulmonologist and anesthesiologist. Commonly, airways are managed with advanced airway devices such as laryngeal masks or endotracheal tubes.
- Anesthetic techniques vary widely depending on the length and nature of the procedure and the acuity of the patient. Most commonly, these patients are anesthetized with a total intravenous anesthetic technique.
- Management of these patients is commonly complicated by issues such as central airway obstruction, tracheal stenosis, and the need for jet ventilation or rigid bronchoscopy.

Bronchoscopy presents a unique challenge and need for collaboration between anesthesia providers and bronchoscopists. The approach to topical anesthesia, analgesia, and sedation needs to be customized based on the complexity, duration, and setting of the procedure.[1] Although many straightforward bronchoscopies can be performed with topical anesthesia and moderate sedation, recent advances in diagnostic and therapeutic bronchoscopy have increased procedural complexity and length. Consequently, increasing numbers of institutions prefer to perform interventional pulmonary procedures using the combination of topical anesthesia and total intravenous anesthesia (TIVA) in the operating room. This approach may maximize both patient satisfaction and procedural conditions.[2,3] In addition, cultivation of a team of anesthesia

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providers with expertise and interest in complex bronchoscopy and airway procedures can foster team work and collaboration, as well as maximize quality and procedural outcomes.

The bronchoscopy team must work together in each phase of the procedure to ensure patient safety and to allow completion of a quality bronchoscopy. Airway access may change depending on the type of procedure planned and must be discussed before each case. Intraprocedural difficulties with ventilation, airway pressure, and sedation may arise that need to be addressed as a team. Additionally, although outside the scope of this review, patients with lung disease are often compromised after bronchoscopy and need multidisciplinary recovery care. The goal of this review is to highlight an approach to these common challenges faced by anesthesiologists and interventional pulmonologists during advanced bronchoscopy.

AIRWAY ACCESS

Before each procedure, an airway plan should be discussed between the anesthesia providers and interventional pulmonary team. A morning huddle to review all cases planned for the day can allow both the bronchoscopy and anesthesia teams to anticipate and to prepare for potentially complex cases requiring special airway management considerations.

Supraglottic Airway Devices

Many advanced bronchoscopy programs have defaulted to supraglottic airway devices, typically a laryngeal mask, as the standard approach to allow full airway access and to provide ventilator support. By convention, a size 4, 4.5, or 5 laryngeal mask is used in men and a size 3, 3.5, or 4 in women provided there was a normal physical examination. This approach has been reported as a safe option in many contexts in the interventional pulmonary literature that includes complex airway interventions.[2–7] This is especially relevant with endobronchial ultrasound-guided transbronchial needle aspiration in which the laryngeal mask allows full bronchoscope access to image and to sample the paratracheal lymph nodes.

Proper laryngeal mask placement can be confirmed by direct bronchoscopic visualization, and adjustments to its position or interventions to treat other causes of hypoventilation (eg, laryngospasm) can be undertaken before the procedure fully commences.

Endotracheal Tube

Traditional endotracheal tube (ETT) placement is always an option to facilitate bronchoscopy for patients with predictably difficult mask ventilation, who fail laryngeal mask, or who have a history of inability to ventilate with a laryngeal mask. ETT intubation should be considered in a patient who presents for bronchoscopy with traditional contraindications to a supraglottic airway, such as oropharyngeal or proximal esophageal disease, large hiatal hernia, esophageal motility disorder, significant or untreated gastroesophageal reflux disease, or complex supraglottic airway anatomy from malignancy, prior surgery, and/or radiation. In addition, relative complications to laryngeal mask may also lead to endotracheal intubation. These include anticipation of a prolonged procedure, significant obesity, or comorbid conditions in which hypoventilation would have significant risk (eg, severe pulmonary arterial hypertension). However, because laryngeal mask utilization has been slowly liberalizing and safety is being demonstrated in more varied patient populations, the final decision regarding