Laryngeal Mask Airways in Ear, Nose, and Throat Procedures

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KEYWORDS

• Laryngeal masks • Otorhinolaryngology • Tracheostomy
• Thyroidectomy • Adenotonsillectomy
• Endoscopic sinus surgery • Laryngeal framework surgery

The laryngeal mask airway (LMA) was developed by Archie Brain and introduced into clinical practice in 1988. Numerous variants of the LMA have been developed by Brain and others over the ensuing years. Important differences can be found among these devices, and although the term *LMA* is a trademark of the Laryngeal Mask Company, many of the techniques described herein are likely applicable to competitors of the LMA. The makers of these devices have shown substantial equivalence to the LMA for the U.S. Food and Drug Administration. Individual readers must decide whether these products are adequate substitutes for the techniques described with the predicate device.

The LMA has developed a considerable following because of its lack of tracheal stimulation, which can be a considerable advantage in ear, nose, and throat (ENT) procedures. The incidence of coughing on emergence has been shown to be lower with the LMA than with the endotracheal tube (ETT).[1] Although other approaches to smooth emergence have been described, few would argue that it is as easy to achieve a smooth emergence with an ETT as with an LMA.

Another advantage of the LMA is the ability to insert the device without the use of neuromuscular blocking agents (NMBs). Although many practitioners routinely intubate without NMBs, the practice is not without critics, and few would argue that NMBs should be routinely used in placing the LMA. Avoidance of muscle relaxants in ENT procedures may be advantageous, particularly in outpatient settings.

A frequent comorbidity in ENT surgery is recurrent upper respiratory infections (URIs), particularly in children undergoing adenotonsillectomy. Tait and colleagues[2] reported a prospective comparison of ETT and LMA in 82 children undergoing a range of procedures who presented with an active URI. Children anesthetized through LMA

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were significantly less likely to experience bronchospasm, coughing, and oxygen desaturation. Although in a retrospective review of 831 children managed with LMA von Ungern-Sternberg and colleagues[3] found that recent URIs doubled the risk of these complications, this risk was significantly less than the 11-fold increase associated with ETT.

ENT procedures often cause bleeding in the pharynx. Endotracheal intubation is associated with prolonged diminution of laryngeal protective reflexes.[4] In a prospective study comparing laryngeal responses during general anesthesia in 20 patients randomized to either ETT or LMA, Tanaka and colleagues[5] found a greater attenuation in the laryngeal response and a greater narrowing of the vocal cord opening in patients with the ETT.

Another advantage of the LMA is its utility in airway rescue. Although LMA is certainly contraindicated in some patients with laryngeal pathology, the LMA is often the airway of first resort when dealing with patients with pharyngeal pathology.

Indications for LMA that apply to specific situations in ENT surgery can be divided into several areas:

A conduit for surgical access to the glottis and trachea
An aid to neurologic monitoring
A means to isolate the glottis from bleeding from pharyngeal sources.

When considering the range of procedures in ENT surgery, the advantages of the LMA in appropriate settings will become increasingly apparent.

LMA FOR OTOLOGY

Otologic procedures present several challenges for anesthetists. Access to the airway is often limited, and head movement from mask ventilation may interfere with the procedure. Although some procedures may be performed with sedation, airway obstruction may be difficult to manage. Coughing and straining on emergence may place patients at risk for complications, such as hematoma and cerebrospinal fluid otorrhea. The LMA offers an attractive alternative for airway management.

Duff[6] reviewed 100 consecutive cases in which the LMA was used for otologic procedures. All procedures were performed with the table turned 180° away from the anesthetist. Patients included 49 children and 51 adults. Children were anesthetized with nitrous oxide and isoflurane; adults with propofol, fentanyl, and inhalational anesthesia. In one patient, surgery was interrupted for 3 minutes because of patient movement. In the 73 patients in whom the head was moved for application of a head dressing, no coughing was observed.

Ayala and colleagues[7] reviewed 484 cases over a 3-year period, of which 35% were managed with LMA and 65% with ETT. Induction and emergence times in the LMA group were shorter by 2.6 and 2.2 minutes, respectively. Three patients in the LMA group were converted to ETT because of excessive leak.

In the author's experience when using the LMA in otology, spontaneous ventilation may result in a rocky respiratory pattern from abdominal breathing, and phonation from adduction of the vocal cords during early inspiration. These factors may be overcome by using pressure-cycled ventilation and total intravenous anesthesia, providing surgeons with a more tranquil field while permitting emergence without coughing or straining.

LMA FOR RHINOLOGY

Use of the LMA in functional endoscopic sinus surgery (FESS) may seem counterintuitive to the uninitiated. Limited access to the airway and the potential for blood in the