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Review Article

LARYNGEAL MASK AIRWAYS IN EMERGENCY AIRWAY MANAGEMENT

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ABSTRACT

LMA are capable of providing ventilation, oxygenation and administration of anesthetic gases. It is useful in emergencies as a rescue airways in difficult intubation. LMA has an advantages of higher ease and speed of insertion, lower autonomic impact and less post-operative discomfort compared to endotracheal intubation.

INTRODUCTION

LMA devices are introduced to provide ventilation, oxygenation and administration of anesthetic gases. They are used as an alternative to facemask and ET tube. Use of LMA has been growing rapidly, especially popular for outpatient procedures, avoiding tracheal intubation[1]. It has less impact on ANS, resulting in fewer cardiovascular events [2-4]. A meta-analysis has revealed that they have more reliable performance under positive-pressure ventilation, better oxygen saturation and less hand fatigue by the operator as compared to face mask[3]. Advanced Cardiovascular Life Support guideline has considered that LMAs should be used when face mask ventilation is not successful and after 2 or more failed attempt to place an ET tube[5]. The main drawback of LMA is the risk of pulmonary aspiration, which is due to lower seal pressure compared to ET tube [3]. LMA are intrinsically more invasive than facemask, but less invasive than tracheal intubation. Some of the LMA are designed to assist in tracheal intubation, e.g. LMA Fastrash^TM (Intubating LMA).

Classic LMA.

LMA ProSeal.

Intubating LMA (Fastrach).

i-Gel

LMAs	Location of sealing	Sealing mechanism	Aspiration protection	Single-use	Conduit for intubation
cLMA	Perilaryngeal	Inflatable cuff	No specific feature	No	No
LMA Unique	Perilaryngeal	Inflatable cuff	No specific feature	Yes	No
LMA Flexible	Perilaryngeal	Inflatable cuff	No specific feature	Yes	No
Intubating LMA	Perilaryngeal	Inflatable cuff	No specific feature	Yes	Yes
LMA ProSeal	Perilaryngeal	Inflatable cuff	Drainage channel	No	No
LMA Supreme	Perilaryngeal	Inflatable cuff	Drainage channel	Yes	No
i-Gel	Perilaryngeal	Pre-shaped	Drainage channel	Yes	Yes

Table 1: Some features of the LMAs presented.

Role Emergency Airway Management:

According to Brimacombe [6], there are 5 major benefits that highlight the role of LMA in the management of the difficult airway:

1) The anatomical and/ or technical factors making facemask ventilation and laryngoscope guided tracheal intubation difficult do not usually influence LMA insertion and function. Thus, LMA has high succeeding rate in situations where face mask ventilation and endotracheal intubation fails.
2) LMA can be used as a ventilator device as well as for intubation of airways.

3) Tracheal intubation via LMA can be done in an unhurried fashion while the patient is being oxygenated and his/her lungs ventilated.
4) LMA insertion is atraumatic and does not reduce the chance of other techniques subsequently succeeding.
5) LMA is readily available for its widespread use and most anesthesiologists reasonably skilled in its use.

Therefore, the use of LMA is included in many difficult airway guidelines nowadays. ASA includes the LMA as a ventilatory device at two points in the algorithm:

First: in the anesthetized patient whose trachea cannot be intubated (anesthetized non-emergency limb).

Second: in the anesthetized patient whose trachea cannot be intubated and whose lungs cannot be conventionally ventilated (anesthetized emergency limb) [7]. A similar strategy is described in the algorithm of the Difficult Airway Society in the UK [7]. This algorithm recommends the use of a classical LMA:

a) During an unanticipated difficult tracheal intubation (with the ILMA as an alternative).

b) During failed intubation in the setting of rapid sequence induction as a method of airway rescue (with the PLMA as an alternative).

c) As a rescue device in the event of a 'cannot intubate cannot ventilate' situation.

WEISS and Engelhard has recently published a proposal for management of difficult pediatric airway [8]. In the situation of failed face mask ventilation and failed tracheal intubation, they recommended the use of LMA or ILMA first for ventilation and also as a conduit for tracheal intubation. LMA is included as the plan B after failed tracheal intubation in the recommendations of the working group on pediatric anesthesia of the German Society of Anesthesia and Intensive Care Medicine [6].Therefore, LMA especially ILMA has become an integral part of each algorithm, especially in the management of unanticipated difficult airway. Nowadays LMA is also used in the airway management in pre-hospital setting. There are 3 main reasons for this:

a) Emergency tracheal intubation outside the hospital is more likely to fail then during elective anesthesia in the hospital.
b) Equipments and strategies to manage the difficult airway is limited outside the hospital.
c) Direct Laryngoscopy is frequently performed by paramedics or emergency medicine physician who do not practice tracheal intubation on a daily basis [9].

Use of LMA is included in guidelines for out of hospital airway management, not only for management of difficult intubation but as a primary approach for those who do not perform tracheal intubation regularly [6, 10, 11]. Compared to tracheal intubation, LMA have a higher success rate and are quicker to insert [12, 13]. There is an evidence of use of LMA as a means of emergency airway management

during surgery in prone position [14].

CONCLUSION

LMA devices are the instrument of choice during difficult to manage airways both in and out of hospital. They are included in many guidelines. LMA devices are used in difficult ventilation and failed intubation situations. They can be used as a conduit for tracheal intubation. Success rate of LMA is high compared to intubation. The most serious disadvantages of the LMA is the possibility of aspiration of gastric contents.

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