Cleveland Clinic

AZ Airway

A Novel Airway Device to Exchange Supraglottic & Endotracheal Ventilation Interchangeably

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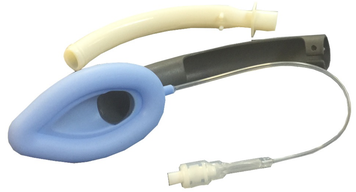
BACKGROUND The Laryngeal Mask Airway revolutionized the field of Airway Management; placing a device in the patient's supraglottis allowing either spontaneous or controlled ventilation **instead** of traditional endotracheal ventilation was disruptive. Interestingly, this focus on intraoperative ventilation may have delayed its other potential uses including use as rescue device.

INNOVATION We introduce a **novel device** allowing easy conversion from a SGA to an ETT interchangeably and safely with uninterrupted ventilation. Prototypes are currently being tested of a supraglottic airway device incorporating a coaxial telescoping subglottic component (i.e., endotracheal tube). Ventilation in supraglottic fashion is started immediately after placement of device. If necessary, the endotracheal tube may be advanced to intubate and continue ventilation. Endotracheal tube can be retracted back as desired, resuming supraglottic ventilation.

AZ Airway shown with ventilator adapter installed



Ventilator adapter is easily removed to enable use of ETT

AZ Airway shown with ETT

DISCUSSION The current mindset is that airway management can **either** be endotracheal (ETT) **or** supraglottic (SGA). Clearly there is a value in each with respective advantages and disadvantages [1]. (Table 1). An ideal supraglottic device would allow easy conversion from SGA to ETT and using them **interchangeably**. This can allow optimized care by easily matching the risk profile according to patient's situational need.

REFERENCES

1) Strengths and limitations of airway techniques. Cooper RM Anesthesiol Clin. 2015 Jun;33(2):241-55.

2) Use of the laryngeal mask for airway maintenance following tracheal extubation. Nair I, Bailey PM. Anaesthesia. 1995 Feb;50(2):174-5.

3) Airway challenges in critical care. Nolan JP1, Kelly FE. Anaesthesia. 2011 Dec;66 Suppl 2:81-92.

ENDOTRACHEAL INTUBATION	SUPRAGLOTTIC AIRWAY
Needs higher level of experience	Can be learned by less experienced personnel
Inflation of the endotracheal tube cuff will secure the airway against aspiration	Higher chance of aspiration
Higher hemodynamic shifts during induction and emergence	Improved hemodynamic stability at induction and during emergence
Needs deeper anesthesia and muscle relaxation	Reduced anesthetic requirements for airway tolerance
Able to do positive pressure ventilation in higher pressures	May not be able to ventilate with high inspiratory pressures
Higher incidence of coughing during emergence	Lower frequency of coughing during emergence
Can be used in lung isolation	Not able to use in certain cases including lung isolation

Table 1: Comparison of Endotracheal and Supraglottic Intubations

Numerous techniques have been described for converting a patient from SGA to ETT. They all pose some risk as well as the necessity to stop ventilation. Much fewer have been described for converting from ETT to SGA in a controlled fashion. None have been described to allow conversion from SGA to ETT and back to SGA alternatively. There are multiple scenarios where the AZ Airway is beneficial since both a SGA and ETT may be necessary (Table 2).

When is an Airway that combines the benefits of both an LMA and an ETT required?	
During failed intubation rescue with need for intubation.	During intraoperative change from subglottic to supraglottic ventilation or vice versa.
When there is an unclear need for intubation.	While performing a staged extubation.
Need for smooth intubation or extubation.	When an unstable cervical spine is present.
During a retrograde intubation	During intubation by low trained emergency field personnel

Table 2: Scenarios of AZ airway Use

Airway Management in Intensive Care Unit (ICU) setting could be more difficult than operating room [3]. This is also true for failed extubation attempts in the ICU setting. This ability to alternate could allow for a controlled "staged" extubation method from ETT to SGA to independence of airway control. This could be an alternative method for deep extubation described as the Bailey Maneuver [2] and could be extremely valuable in the ICU setting, in patients that we anticipate a possibility of a need for re-intubation.