Overview of Supraglottic Airways

Donald Miller (Consultant Anaesthetist, Guy's Hospital, London)

Simplified classification: Based upon sealing site

- Peri-laryngeal sealing
    - Simple – e.g LMA, i-gel, iLMA
        - Extended e.g.LMA supreme
    - Directional e.g. ProSeal
- Base of tongue sealing
    - With oesophageal cuffs e.g. Combitube, LT, SLT.
    - Without oesophageal cuff e.g.CobraPLA™
    - SLIPA™

Aspiration protection mechanisms:

- *Obstruction*

o Lower in oesophagus more effective than at entrance.
o Inflatable more effective than fixed volume
o Combitube, LTS > ProSeal, LMA > igel, SLIPA

- *Drainage*

o Effectiveness is dependent upon effective obstruction mechanism
o Combitube, LTS > ProSeal > igel

- *Storage*

o Effectiveness dependent upon storage capacity – independent of obstruction effect
o SLIPA> > Combitube, LTS > ProSeal, LMA, igel

Access to the trachea:

Good	**Fairly good**	**Poor**
iLMA	ProSeal	Combitube
Air Q	LMA supreme	LT, LTS
LMA, igel	Cobra	SLIPA™

Strategy to achieve adequate ventilation when there is limited seal pressure

- Pressure support ventilation
- Pressure controlled ventilation
- Choice of optimal I:E ratio is 1:1

Avoiding complications in use of SLAs with particular reference to SLIPA™ safety features.

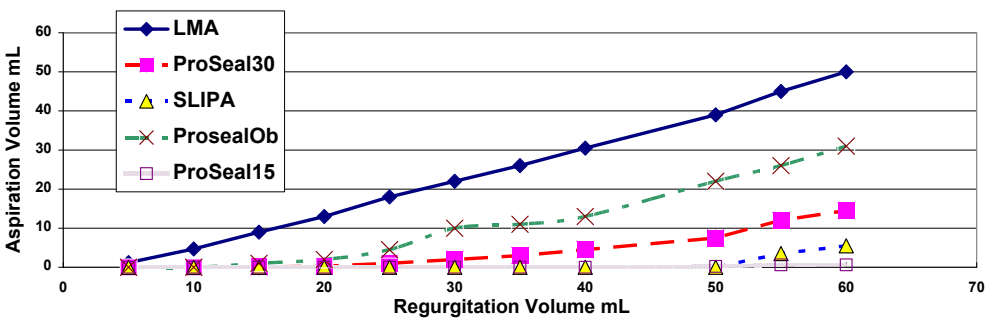
Trauma to the airway

Wrong insertion techniques in relation to different SLA designs
Combitube – better to use laryngoscope.
Repositioning of pharyngeal cuff inflation airways.
Opposing insertion techniques of LMA and SLIPA

Aspiration protection mechanisms

Obstruction; Drainage tubes; Storage – effectiveness?

Storage for aspiration protection



Results of aspiration model lung with LMA (♦), ProSeal with drainage tube obstructed (×), ProSeal with 30 ml sec^{-1} (■) and 15 ml sec^{-1}( ) and SLIPA (Δ) airway.

Neuropraxias mechanisms

Hypoglossal nerve: is 1 mm from tip of hyoid bone.
Recurrent laryngeal nerve at entrance to oesophagus
Lingual nerve

Preventive strategies (more relevant to design than clinical application):

Use smaller sizes (?practicality as there is already a limited seal pressure)
Avoid high cuff inflation pressure with indiscriminate constant pressure
Avoid local pressure at vulnerable sites

Future improvements if SLAs are to advance:

- Higher seal pressures
  - Limited by gastro-esophageal insufflation with higher seal pressures
  - Neuropraxia risk increases with high cuff pressures
- Epiglottic downfolding
  - Affects airflow and tracheal tube access
- Improved comfort and tolerance for application in the ICU?
- Suitability for wider application of instrumentation