Current discussions about laryngeal masks in clinical use

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Ever since the invention of the laryngeal mask, doctors around the world have been eager to use this airway management tool for an increasingly broad variety of procedures, while keeping the safety of the patient in focus. In the clinical community the discussion about blind intubation versus optical guided intubation in the acute situation has been more or less concluded based on extensive clinical evidence. However, recent 2nd generation laryngeal masks underline the importance of continued focus and discussion of the laryngeal mask and the boundaries of its use.

Laryngeal masks, as conduits for intubation
Clinical studies have confirmed that 1st generation laryngeal masks can be used in the CI - CV situation, getting control of the airway followed by optical intubation through the mask.

When difficult airway algorithms started to place the laryngeal mask as an alternative device for intubation, the ILMA was developed as a choice for the CI – CV situation and quickly became part of the difficult airway trolley and strategy.

Blind intubation versus optical intubation became a topic to discuss and thereby a subject to evaluate. Today, the clinical evidence is clear. 1st time intubation success rates are between 58% and 67.9% in a blind intubation setting depending on the device and on the user versus 95% with optical intubation techniques. 1, 2, 3

Blind intubation techniques expose patients to a higher risk of hypoxemia, oesophageal intubation, bradycardia and regurgitation/aspiration than optical techniques4. When the laryngeal mask is in place and clinicians are able to ventilate, there is time to get full control over the airway, depth of anaesthesia, stabilize the patient and to perform optical guided intubation in the first attempt.

Ref. 1, 2, 3

There are several laryngeal masks marketed today with intubation capability, however the technique and the required accessories varies substantially. Finding the right device for your department can be difficult and also requires careful consideration about any extra accessories needed.

It is possible to find laryngeal masks with a wider inner diameter facilitating larger ET tube sizes than with the 1st generation laryngeal masks and a laryngeal mask with a shorter airway-tube that makes it possible to intubate with a standard ET tube.

Laryngeal masks with intubation capacity are also relevant to consider as everyday devices. This provides clinicians with day-to-day use and placement experience of the device that can be used also in acute cases and as part of the rescue strategy.
What does 2nd generation mean?
There is still some level of confusion when talking about 2nd generation laryngeal masks. Questions like: "What is the 2nd generation laryngeal mask exactly?" and "What can it be used for and why?" are often heard. And the Industry has contributed to the confusion by using the term before it was defined.

When looking through studies, guides and reports. The only published definition is found in the NAP 4 report.3

The NAP 4 definition helps in defining the 2nd generation laryngeal mask.

Improved pharyngeal seal enabling ventilation at higher airway pressure
Higher ventilation pressure is discussed among clinicians and not everyone agrees on what this means. Some clinicians suggest higher than 20 cmH2O while others consider just below 30 cmH2O and are concerned about avoiding barotrauma. Every department and clinician should form an opinion about this.

With the improved seal definition a 2nd generation laryngeal mask should have been tested to seal in the range of 20cmH2O < ventilation pressure > 30 cmH2O. The higher seal pressure it has been tested for, the better safety when moving into a wider categories of anaesthesia procedures. Procedures like anesthetising ASA II-III, bariatric patients with higher BMI and surgical procedures known as giving higher ventilation pressures (laparoscopy, back surgery and more).

Increased oesophageal seal & a drain tube
When moving into laparoscopic procedures where the Trendelenburg position is used, the importance of having a device that stays in place, not sliding out during use and thereby creating an increased oesophageal seal is very important.

Furthermore, the gastric fluid from the stomach can be drained via the gastric tube. Gastric fluid has been seen even in fasting patients when moved into Trendelenburg position. Gastric fluid can also built up over time during the surgical procedure. With a 2nd generation laryngeal masks, you now have the possibility of removing the fluid.

The NAP 4 definition does not discuss size of drain tube recommended for those procedures or patient categories. The catheter size able to pass through the gastric access on laryngeal masks differ a lot from brand to brand. The ease of insertion of gastric drain tubes presents another key factor that you should be aware of when choosing your 2nd generation laryngeal mask.

Not mentioned as a requirement in the definition but discussed as being an extra benefit when using 2nd generation laryngeal masks, is the intubation capability.

Some laparoscopic procedures ends up being “open surgery” due to surgical difficulties. In these cases, an ET tube is often required. Having a 2nd generation laryngeal mask in place, which include intubation capability, gives you the possibility to intubate not leaving the airway unsecured because of removal of the laryngeal mask before intubation. Other situations can also occur especially when moving into the broader patient category for laryngeal mask use.

What is your strategy?
The laryngeal mask airway continues to develop and the boundaries of use are expanding. This on-going evolution demands clinicians to have a continued focus on this airway management tool in order to make informed choices, where patient, procedure and product factors are carefully balanced.

Reference list:
1) Success of tracheal intubation with intubating laryngeal mask airway. Liv E H et al., Anesthesiology 2008; 108: 621-6
5) NAP 4. Cook T et al., 2011, p.86.