



## Proposing a Novel Concept to Evaluate Safety of Supraglottic Devices Regarding Seal Pressure during Laparoscopic Surgery

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It is a fact that supraglottic airway devices (SAD) are currently present at many clinical scenarios in anesthesia and they are also a good alternative to endotracheal intubation in some routine anesthetic procedures. Nowadays, laparoscopy is one of the most common and widely established surgical techniques. This procedure increases airway pressure due to the peritoneal insufflation and consequently the risk of regurgitation and aspiration. Over the last two decades, many studies have established the safety of SADs for this purpose, reporting a very low incidence of aspiration or more serious morbidity associated with the use of these devices in laparoscopy [1]. Moreover, the introduction of SAD with a drainage channel, such as LMA Proseal, Laryngeal Tube Suction, LMA Supreme or i-gel, improved ventilation and safety due to its higher seal pressure (SP) and the possibility to use a gastric drain tube. In fact, new SADs with a drain channel are available in the market, such as the Baska Mask or the Ambu AuraGain, which may be also effective and safe devices for laparoscopy.

Our group has been studying the use of SADs for laparoscopic surgery over the last five years, specially focused on efficacy and safety aspects [2-4]. In this sense, we have always considered the SP as the most important measurement to determine how safe a SAD is when performing a laparoscopic procedure. We think it is widely accepted the fact that the SP is the most appropriate concept to delimit the safety airway pressure achieved for a SAD in order to guarantee the airway seal and therefore providing a normal ventilation and an effective protection against aspiration.

Based on these statements, it is important to take into account that the SP value always has to be higher than peak airway pressure (PAW-pk) during pneumoperitoneum, in order to keep airway under safe conditions. Once the importance of keeping PAW-pk under the SP value was recognized, we wondered how wide this margin between PAW-pk and SP is, in an anaesthetised patient using a SAD for laparoscopy.

In this sense, we considered proper to introduce a novel concept

related to the safety of SADs during laparoscopy: the “margin on SP” (MSP) or “margin on oropharyngeal leak pressure (OLP)” (MOLP). This is defined as the value for the margin of pressure between the highest PAW-pk during pneumoperitoneum and the maximum safety’s seal pressure value (SP). The purpose of this term, it is just to assess the “safety gap” on our patient’s airway (in terms of pressure) until it reaches the maximum PAW-pk permitted value under safety conditions (SP).

Naturally, every type of SAD has a different SP value, as well as every laparoscopic procedure is performed under different peritoneal insufflation pressure and changes on patient positioning. Based on our previous study performed with SAD with an inbuilt drain channel in patients undergoing laparoscopic cholecystectomy [4], we calculated the following MSP mean values: LMA Proseal =  $5 \pm 4$  cm H<sub>2</sub>O and LMA Supreme =  $3 \pm 3$  cm H<sub>2</sub>O. According to these values, we observed, that, during a laparoscopic cholecystectomy, the highest PWA-pk is usually a mean of 5 and 3 cm H<sub>2</sub>O below safety seal pressure, when using a LMA Proseal and LMA Supreme respectively. Of course this statement is only valid for our study and under these particular conditions. But we think that this concept may have some clinical relevance referred to safety conditions of airway in laparoscopic surgery, at least in terms of safety related to aspiration. In addition, although this variable has been calculated retrospectively, it is our intention to make it prospectively useful for clinical anaesthetic practice. Therefore, more studies are necessary in order to extrapolate them to the general practice.

Most of the published research regarding SADs and laparoscopy described data related to PAW-pk under peritoneum condition and SP values, but we did not find any author that takes into account the value of this margin as we did [5-7]. We think this novel term may be an interesting contribution to the ventilatory variables usually measured in this kind of clinical studies and according to this state, we are trying to assess it on our current researches about SADs and laparoscopic surgery.

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In conclusion, we proposed a novel concept to evaluate safety of SADs (with an inbuilt drain channel) regarding seal pressure during laparoscopic surgery, the “margin on SP” (MSP), defined as the value for the margin of pressure between the highest PAW-pk during pneumoperitoneum and the maximum safety’s seal pressure value (SP). We think that this concept may have some clinical relevance referred to safety conditions of airway during laparoscopy, therefore more studies must be performed in order to reinforce this idea.

## References

1. Viira D, Myles PS (2004) The use of the laryngeal mask in gynaecological laparoscopy. *Anaesth Intensive Care* 32: 560-563.
2. Beleña JM, Gracia JL, Ayala JL, Núñez M, Lorenzo JA, et al. (2011) The Laryngeal Mask Airway Supreme™ for positive pressure ventilation during laparoscopic cholecystectomy. *J Clin Anesth* 23: 456-460.
3. Beleña JM, Núñez M, Gracia JL, Pérez JL, Yuste J (2012) The Laryngeal Mask Airway Supreme™: safety and efficacy during gynaecological laparoscopic surgery. *South Afr J Anaesth Analg* 18: 143-147.
4. Beleña JM, Núñez M, Anta D, Carnero M, Gracia JL et al (2013) Comparison of LMA Supreme™ and LMA ProSeal™ with respect to oropharyngeal leak pressure in patients undergoing anaesthesia during laparoscopic cholecystectomy: a randomized controlled trial. *Eur J Anaesthesiol* 30: 119-123.
5. Lee AK, Tey JB, Lim Y, Sia AT (2009) Comparison of the single-use LMA supreme with the reusable ProSeal LMA for anaesthesia in gynaecological laparoscopic surgery. *Anaesth Intensive Care* 37: 815-819.
6. Sharma B, Sehgal R, Sahai C, Sood J (2010) PLMA vs. I-gel: A Comparative Evaluation of Respiratory Mechanics in Laparoscopic Cholecystectomy. *J Anaesthesiol Clin Pharmacol* 26: 451-457.
7. Jeon WJ, Cho SY, Baek SJ, Kim KH (2012) Comparison of the ProSeal LMA and intersurgical I-gel during gynecological laparoscopy. *Korean J Anesthesiol* 63: 510-514.