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## MISCELLANEOUS

### Can supreme™ laryngeal mask airway be an alternative to endotracheal intubation in laparoscopic surgery?

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#### Abstract

**Background and objectives:** In laparoscopic surgical procedures, experts recommend tracheal intubation for airway management. Laryngeal mask airway (LMA) can be a good alternative to intubation. In this case series, we aimed to examine the use of the Supreme™ LMA (SLMA) in laparoscopic surgical practice.

**Methods:** We planned the study for sixty patients between the ages of 18 and 60, who would undergo laparoscopic surgery. We recorded one, 15, 30, 45, and 60-minute peripheral O<sub>2</sub> saturation (SpO<sub>2</sub>) and end-tidal carbon dioxide (EtCO<sub>2</sub>) values, heart rate and mean arterial blood pressure (MAP). We observed the duration of SLMA insertion, the rate of gastric tube applicability, whether nausea, vomiting, and coughing developed, and whether there was postoperative 1-hour sore throat.

**Results:** The initial EtCO<sub>2</sub> mean was lower than the EtCO<sub>2</sub> means of 15, 30, 45, and 60 minutes ( $p < 0.0001$ ) and the 15-minute EtCO<sub>2</sub> mean was lower than other measured EtCO<sub>2</sub> means. We observed the initial heart rate mean to be higher than the ones following the SLMA insertion, prior to the SLMA removal, and after the SLMA removal. The heart rate mean after the SLMA insertion was remarkably lower than the heart rate mean prior to the SLMA removal ( $p = 0.013$ ). The MAP after the SLMA insertion was lower than the initial MAP means, as well as the MAP averages prior to after the removal of SLMA ( $p = 0.0001$ ).

**Conclusion:** SLMA can be a suitable alternative to intubation in laparoscopic surgical procedures in a group of selected patients.

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## Introduction

For patients at risk of aspiration, endotracheal intubation is still accepted as the gold standard. In recent years, however, alternative airway devices like laryngeal mask airway (LMA) have been used in this patient group, both in routine proce-

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dures and in the presence of airway problems.<sup>1</sup> Endotracheal intubation is also suggested to open up the airway in laparoscopic surgical procedures. In addition, in some prospective and retrospective studies, it is recommended that classic LMA can be used as an alternative.<sup>2</sup>

LMA has been used successfully in anticipated and unanticipated difficult airway management since 1981.<sup>3,4</sup> Following the first classic LMA model, researchers have developed sub-models.<sup>5</sup> The ProSeal laryngeal mask (PLMA), unlike the classic LMA model, has a drainage tube which provides a gastric tube passage. Supreme™ LMA (SLMA) has been designed to combine the desired features of fast-track (ILMA) and PLMA. The fact that SLMA is elliptical and has an anatomically shaped semi-hard airway tube enables it to be inserted quickly. Moreover, it has got a gastric channel for the gastric tube passage. When placed accurately, it provides protection against regurgitation and prevents gastric distension.<sup>2,6,7</sup> In this study, we aimed to share our experiences related to the use of SLMA in laparoscopic surgery.

## Methods

After approval from the local ethics committee and written informed consent of the patients, we completed this study in a 6-month period. We selected sixty patients of the ASA I group who were 18 to 40 years old and were scheduled to undergo laparoscopic surgery. Patients who had abnormal airway, a history of reactive airway, severe heart and respiratory tract diseases, gastro-esophageal reflux, a history of hiatal hernia, and who had recovered from respiratory tract infections in the last 6 weeks were excluded from the study. Patients had to fast for an 8-hour period prior to the study. For premedication, standard intravenous 0.05 mg.kg<sup>-1</sup> of midazolam was applied. In the operation room, non-invasive systemic arterial pressure, cardiocscope on DII derivation, and pulse oximeter monitorization (SpO<sub>2</sub>) were performed. We gave patients a standard induction with 2 mg.kg<sup>-1</sup> of propofol, 1 µg.kg<sup>-1</sup> of fentanyl, and 0.5 mg.kg<sup>-1</sup> of rocuronium. A lubricated SLMA (Laryngeal Mask Company Limited, Le Rocher, Victoria, Mahe, Seychelles) with a size of either 3 or 4 was inserted by an anesthesiologist with more than five years of experience. No digital manipulation or other apparatus was used while the SLMA was being inserted. The SLMA cuff was inflated to the maximum volume and it was confirmed that there was no gas leakage. We determined the size of the SLMA to be inserted depending on the gender and weight of the patient. After the SLMA was inserted, we assessed ventilation by observing the patient's chest expansion and listening to both lungs bilaterally with a stethoscope. We recorded the SpO<sub>2</sub> value one, 15, 30, 45 and 60-minutes after SLMA insertion. We monitored the end tidal carbon dioxide (EtCO<sub>2</sub>) value throughout the operation period recorded at one, 15, 30, 45, 60-minutes after SLMA application. A gastric tube was inserted in all patients. We carried on the anesthesia with the mixture of 2% sevoflurane and 40% air/O<sub>2</sub>. We gave additional boluses of rocuronium (0.1 mg.kg<sup>-1</sup>) when required. We did not use nitrous oxide. We performed controlled ventilation on the patients to obtain 8 mL.kg<sup>-1</sup> tidal volume, 12.min<sup>-1</sup> respiration rate, and 1:2 inspiratory:expiratory rate. We kept SLMA cuff pressure below 60 cmH<sub>2</sub>O using a digital manometer. We

**Table 1** Patients age, weight, operation duration and Laryngeal Mask Airway insertion duration.

	Min	Max	Mean±SD
Age (yr)	18	37	25.9 ± 5.8
Weight (kg)	45	77	60 ± 8.73
Operation duration (min.)	35	90	53.17 ± 12.11
Insertion duration (min.)	8	16	11.93 ± 1.67

SD, standard deviation.

**Table 2** Operational procedure.

	n	%
Laparoscopic cholecystectomy	20	33.3
Laparoscopic appendectomy	18	30
Laparoscopic inguinal herniorrhaphy	22	36.7

recorded the heart rate and mean arterial blood pressure (MAP) of the patients upon entry, following the SLMA insertion, prior to the SLMA removal, and after the SLMA removal. For analgesia, we gave the patients preoperative 30 mg.kg<sup>-1</sup> intravenous paracetamol. After the patients' spontaneous breathing resumed, they have reversal of neuromuscular block with 0.01 mg.kg<sup>-1</sup> of atropine and 0.03 mg.kg<sup>-1</sup> of neostigmine. When breathing normalized, we removed SLMA. We recorded the duration of SLMA insertion. We recorded the rate of gastric tube applicability, whether nausea, vomiting, aspiration, coughing developed, and whether patients had a sore throat 1-hour postoperatively.

## Statistical evaluation

We used the descriptive statistical methods (mean, standard deviation, frequency distribution) in the evaluation of the data. In the repetitive measurements of multiple groups we used one-way variant analysis and in the comparison of subgroups we used the Newman-Keuls multiple comparison test. We considered p < 0.05 value as statistically significant.

## Results

The average age of the patients enrolled in the study was 25.9 ± 5.8 years, the average weight was 60 ± 8 kg, the average operation period was 53.17 ± 12 minutes, the duration of SLMA insertion was 11.93 ± 1.67 seconds (Table 1). We list operational procedures in Table 2. Table 3 displays the dis-

**Table 3** The range of patients according to the gender and the size of Laryngeal Mask Airway size.

	n	%
Sex		
Male	29	48.3
Female	31	51.7
Laryngeal Mask Airway size		
3	28	46.7
4	32	53.3

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