



**CLINICAL CASE:**

M. Carrio Font a, \* , R. Garcia - Aguado b and b Pascual J. Ubeda

Anesthesia Service , University Hospital San Juan de Alicante , Alicante, Espana~ b Service Anesthesia, Resuscitation and Pain Unit , University General Hospital Consortium of Valencia , Valencia, Espana~ Received November 25, 2015 ; accepted March 31, 2016

KEYWORDS LMA ; Surgery laparoscopic ; fundoplication Nissen ; Baska Mask®

**Laparoscopic Nissen fundoplication mask Laryngeal Baska Mask®**

Anesthesia Service , University Hospital San Juan de Alicante , Alicante, Espana~ b Service Anesthesia, Resuscitation and Pain Unit , University General Hospital Consortium of Valencia , Valencia, Espana~ Received November 25, 2015 ; accepted March 31, 2016

Summary Tracheal intubation has historically been considered the ideal technique in the airway management in laparoscopic surgical procedures. The introduction of this type circuits interventions in outpatient surgery requires the use of techniques Anesthetic offering optimal early postoperative recovery and high under a strict security conditions.

The LMA is proposed as suitable option to tracheal intubation, even in higher risk patients thanks to new models with modifications aimed at improving its characteristics, which make them great projection devices within the management Total airway.

We report the first case of laparoscopic Nissen fundoplication performed with mask Laryngeal Baska Mask® in a patient at high risk of regurgitation reflux Gastroesophageal.

© 2016 Society of Anesthesiology ~ Spanish, Resuscitation and Pain Therapy. Published by Elsevier Spain, S.L.U. All rights reserved.



Laparoscopic Nissen fundoplication with Baska Mask® laryngeal mask Abstract  
Tracheal intubation has historically been considered the ideal technique to handle the airway in laparoscopic surgical procedures. The introduction of such procedures in ambulatory surgery requires the use of anesthetic techniques that offer optimal and early postoperative recovery under strict security conditions. Laryngeal mask is proposed as a suitable alternative to tracheal intubation, even in high risk patients due to new devices which have been modified to improve their characteristics, becoming great alternatives in the overall management of the airway

ARTICLE IN PRESS:

We report the first case of laparoscopic Nissen fundoplication performed with a laryngeal Baska Mask in patient with high risk of regurgitation due to its gastroesophageal reflux. © 2016 Sociedad Española ~ de Anestesiología, Reanimación y Terapéutica del Dolor. Published by Elsevier España, S.L.U. All rights reserved.

Introduction Using supraglottic devices major surgery Outpatient is becoming more common in patients require general anesthesia to perform procedures surgical forming part of these circuits, thus facilitating good operation<sup>1</sup>. The introduction new surgical techniques such as laparoscopy, promote the anesthetic plan suits offer quality requirements as an outpatient demands. Therefore, the development of new generations of masks Laryngeal aims to offer the features necessary for the management of the airway can avoid orotracheal intubation, assuming a real innovation in airway management and especially in outpatient without affecting the security the patient<sup>2</sup>. The Baska Mask® (Logikal Health Products PTY Ltd., Morisset, NSW, Australia) is made of silicone malleable enough to change form according to the pressure so no precise inflation and gives greater adaptability to the anatomy pharyngeal during the use of positive pressure decreasing morbidity and airway. has also 2 gastric drainage channels on the sides of through the airway opening in the distal region, back, on each side of the bowl to be prolonged the tip of the



device intended to abocar esophagus, and greater suction capacity drainage keep going. The idea is to provide a drain port conventional and one for pharyngeal aspiration by connection in the proximal part of increasing safety patient against regurgitation and also allowing the insertion of a nasogastric tube if the needs of the I need surgery. This device thus becomes in a suitable alternative for surgeries in which despite abdominal high pressure, it has to protect airway and, on the other hand, it appears as a effective option in clinical situations where there is high possibility of aspiration thanks to its powerful channels drainage and suction, as may be the disease gastroesophageal reflux. The case presented was conducted by an anesthesiologist expert with a great routine training with Baska Mask® in patients ASA 1 and after demonstrating appropriate handling device due to the specific maneuvers It presents for correct insertion.

### **Clinical case**

We describe the case of a male patient of 48 years, ~ 67 kg and 165 cm, ASA 2. It has a history of bronchial asthma without recent exacerbations, treated with occasional, besides being intolerant antiinflammatory inhalers nonsteroidal with clinical manifestations bronchoconstriction and edema of glottis. Is found in monitored by the Department of Gastroenterology for over ~ 20 years to present gastroesophageal reflux disease of cal with heartburn totally dependent antisecretory without referring clinic regurgitation though need I sleep lightly built. The endoscopic study It shows a hiatal hernia pequena~ 3-4 cm possible grade B esophagitis normal manometry. It refers therefore to serve General and Digestive Surgery I antireflux surgical laparoscopic approach in major outpatient surgery. The day of surgery, the patient came fasting and He confirmed the absence of recent clinical worsening reflux. peripherally it was channeled and under monitoring standard, administered midazolam 2 mg, prophylaxis antibiotic amoxicillin-clavulanate 2 g, antiemetic prophylaxis with primperan 10 mg and droperidol 2.5 mg, ranitidine Nolotil 50 mg and 2 g.

The patient was placed on the operating table in Fowler of 45°. After successful denitrogenation, induction began with propofol infusion pumps controlled for a target 6.0g / ml concentration and remifentanil 3 ng / ml. Once achieved



plasma levels induction proceeded to the placement of the mask Baska laryngeal Mask® which was incorporated in the channel right lateral suction port continuous suction. After the maneuver, the appearance was checked curve CO<sub>2</sub> capnography and proper sealing device (42 mmHg pressure seal, tidal volume 800 ml). in any time gastric contents was evident through the suction probe. As maintenance of anesthesia Generally, the rate dropped to Propofol 2.0g / ml and He was subsequently administered rocuronium and fentanyl 20mg 100 g. The total of the intervention was 60 min, 40 min the duration of pneumoperitoneum performed using flow CO<sub>2</sub> maintaining constant pressure intraabdominal 14 mmHg. We proceeded to the infiltration of ports laparoscopic entry. The patient was disconnected from the mechanical ventilation, without reversal of blocking neuromuscular, with proper mechanical ventilation and a verbal pain according to the analgesic scale of 0-1. After 3 h under anesthesia recovery unit, was given High without incident.

### **Discussion**

Ambulatory surgery continues to expand between patients with greater comorbidity and will be Document downloaded from <http://www.elsevier.es> the 06/10/2016. Copy for personal use, the transmission of this document is prohibited by any media or format. How to cite this article: Carrio Font M, et al. Laparoscopic Nissen fundoplication with LMA Baska Mask®. Rev Esp Anesthesiol Reanim. 2016 <http://dx.doi.org/10.1016/j.redar.2016.03.010>

### **ARTICLE IN PRESS** + Model REDAR-704; No. of Pages 5

Laparoscopic Nissen fundoplication with LMA Baska Mask® 3 undergoing surgical procedures more complex. Is essential to provide adequate postoperative recovery to facilitate early discharge and the early resumption of normal<sup>3</sup> daily activity. To do this, using techniques surgical anesthetic that optimize conditions ensuring minimum unwanted effects. Avoid the tracheal intubation has advantages and avoid manipulation Direct from the lower airway, side effects and stress response associated with laryngoscopy, avoid neuromusculares<sup>4</sup> use of relaxant drugs or appearance postintubation sore throat trachea. It is about of factors which in certain patients can pose a risk in



## **Spanish Journal of Anesthesiology and Resuscitation**

the development of complications and in which use of supraglottic devices can offer clear benefit.

Also, in recent years, laparoscopic techniques ~ They have increased their number of indications in surgery abdominal. These techniques considered minimally Invasive offer decreased surgical time, the morbidity, postoperative pain and days of stay hospital. Currently, surgery election patients with gastroesophageal reflux is fundoplication laparoscopia<sup>5</sup> Nissen. This intervention is surround the abdominal esophagus through the esophageal hiatus with a fold of about 3 cm of gastric fundus, creating a valve mechanism that restores the function of the sphincter lower esophageal.

Surgery esophagogastric union already represents a risk of gastric aspiration is higher because of the very patología<sup>6</sup>, but will determine the degree of symptoms the patient has previamente<sup>7</sup>. The risk suction can be higher depending on factors Predisposing during surgery such as the position Trendelenburg, peritoneal stimulation during surgery and resulting increased intraabdominal pressure insufflation gas on the abdominal wall by neumoperitoneo<sup>8</sup>. However, arranged muscle groups in the hypopharynx will be useful during this proceso<sup>9</sup>. The most important mechanism antireflux lies in the tone of the upper esophageal sphincter (UES), It is 38 mm Hg in the patient awake but decreasing abruptly by the action of the relaxing muscle and other drugs used during anesthesia. The cricopharyngeal muscle and constrictor muscle lower pharyngeal make the EES and patients healthy helps prevent the flow of esophageal contents to pharynx and aspiration through a mechanism closing limiting the passage of any liquid, thus providing essential to the protection of airway protection.

The combined rapid sequence intubation pressure of cricoid on esophagus (Sellick maneuver) and awake intubation patient presentadas anesthetic techniques for handling election of patients at risk for aspiration of gastric contents or esophageal, always considering tracheal intubation as technical gold standard because it provides the maximum insulation and protection of the airway against the passage of pulmones<sup>10</sup> made the gastric content. But



## **Spanish Journal of Anesthesiology and Resuscitation**

during the anesthetic induction there is a critical period of maximum risk of regurgitation prior to intubation. It's the moment in which the patient is deprotected with airway to cause a complete loss of tone in the musculature forming the esophageal junction region despite performing Sellick maneuver has been repeatedly questioned by his false eficacia<sup>11</sup>. By Therefore, any measure to maintain proper tone muscle in the region, such as avoiding administration muscle relaxants, will decrease significantly the risk of regurgitation in the period prior to placement control device airway. Is by why the LMA becomes an alternative interesting for the anesthetic management of these patients.

The rapid sequence intubation Laryngeal Mask has been used successfully since 1981 and then the emergence of the first classical model, They have been developing new models with modifications projected to improve its characteristics. One of the main challenges supraglottic devices has focused to ensure complete draining of the contents of stomachs magician through aspiración<sup>11</sup> channel. The biggest problem It arises from the pequeño~ diameter usually present and thus the rapid collapsibility if required a quick and acceptable amount drawn in case Unexpected presence reflux. Furthermore, use laparoscopic surgery has also been recently described in the literature. Specifically, the LMA Baska Mask<sup>®12</sup>. It is a third generation device that presents conceptual improvements over models previous mask. Being totally silicone It is completely adapted to the anatomy. It presents a no inflatable cuff that is continuous with the central canal ventilation and provides sealing with increasing pressure with mechanical ventilation: the soft diaphragm cuff is inflated during the inspiratory phase of the ventilation and retracts to atmospheric levels during passive exhalation, thus avoiding possible damage as a result ~ of an envelope cuff inflation and allowing high sealing pressures. It is also characterized by 2 channel drain (both gauge 18F, superior the other devices) that reduces the risk pulmonary aspiration. When we breathe through a single port may become clogged with gastric wall due to suction, so the presence of a second drain avoids this effect by allowing balance pressures establishing an air flow (Venturi effect). However, It has a failure rate positioning greater than other masks because of their difficulty insertion, reducing its eficacia<sup>13</sup> ..





For the anesthetic approach of the case exposed, several factors were decisive. It was a patient with bronchial hyperreactivity in which intubation could trigger more often an episode of bronchospasm due to irritation or catecholamine response, so a supraglottic device could largely avoid this risk. After the anamnesis, we made sure we had minimal clinical symptoms of regurgitation, without previous episodes of gastric contents output. And finally, the extensive experience in the ambulatory surgery unit in the use of the LMA in laparoscópicos<sup>14,15</sup> procedures, including the Baska Mask<sup>®</sup> as the ideal tool to address all conflicts exposed. The main objective of our strategy was to avoid loss of muscle tone during anesthetic induction. Document downloaded from <http://www.elsevier.es> the 06/10/2016. Copy for personal use, the transmission of this document is prohibited by any media or format.

How to cite this article: Carrio Font M, et al. Laparoscopic Nissen fundoplication with LMA Baska Mask<sup>®</sup>. Rev Esp Anestesiología Reanim. 2016 <http://dx.doi.org/10.1016/j.redar.2016.03.010>

**ARTICLE IN PRESS** + Model REDAR-704; No. of Pages 5 4 M.

Font Carrio et al. by not requiring the administration muscle relaxants prior to isolation of the airway, so the patient benefited from its main antireflux barrier which is made up of striated muscle Union Gastroesophageal, the EES and hugging muscle group hypopharynx. Also, the mask provided Mask<sup>®</sup> Baska tolerate the properties required for laparoscopic surgery, tolerating pressures due to pneumoperitoneum without being altered ventilatory function and offering quality patient anesthesia without complications you added. ~ The patient could be discharged, following the circuit outpatient surgery under optimal conditions and maximum security

Conclusions Mask<sup>®</sup> Baska is a promising alternative to laparoscopic surgery for tracheal tube, ensuring ventilation with the same safety and efficacy as endotracheal intubation without major adverse events. And surgeries in patients with increased risk of aspiration of gastric contents, the mask Mask<sup>®</sup> Baska offers clear advantages over other devices, because of their diseno~ and better sealing characteristics at high pressures and the ability to better control drainage for suction, thus avoiding the use of neuromuscular relaxants during



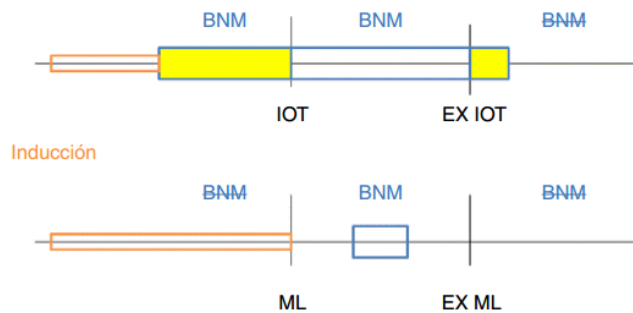
anesthesia induction (as required tracheal intubation), without exposing the patient to the critical period of maximum regurgitation in which the airway is not yet isolated and lack of muscle tone in that period physiological causes loss of protection against possible aspiration of contents from the stomach in patients at high risk. We present a case in which we consider that the patient benefited from the use of Baska Mask<sup>®</sup>, without implying an increased risk due to the properties that this device offers for surgery at high risk of regurgitation, being carried out both technical surgical and anesthetic maneuvers by highly prepared and trained for this purpose (Figs. 1 and 2).



Figure 1 LMA prepared for Baska Mask<sup>®</sup> insertion conventional drain hole for drainage and another connected to continuous pharyngeal aspiration.

Figure 1 LMA prepared for Baska Mask<sup>®</sup> insertion conventional drain hole for drainage and another connected to continuous pharyngeal aspiration.





Comparative Figure 2 ML scheme according IOT or alteration regarding the EES and maximum of regurgitation during performance of a laparoscopic procedure. The period critical occurs after blocking the defense mechanisms during neuromuscular blockade prior to the isolation of the airway during intubation. While the airway is protected no risk, appearing another critic of half-relaxation period after extubation does not occur with the use of ML at obviated the use of relaxant drugs (there is a possibility that are required in minute doses because the surgery is taking place, but its effect should not involve handling periods airway during insertion or removal of the ML). Ethical responsibilities Protection of people and animals. The authors state that for this investigation have not been performed experiments on humans or animals. Confidentiality of data. The authors declare that they have followed the protocols of the workplace on the publication of patient data. Right to privacy and informed consent. The authors declare that this article does not appear patient data. Competing interests The authors declare no conflict of interest.

Bibliografía 1. White PF, Kehlet H, Neal JM. The role of the anesthesiologist in fast-track surgery: From multimodal analgesia to perioperative medical care. *Anesth Analg.* 2007;104:1380---96. 2. Garcia-Aguado R, Charco MP, Cortinas DJ. Recomendaciones para el manejo de la vía aérea difícil mediante dispositivos extraglótricos en el paciente adulto sometido a cirugía ambulatoria. *Rev Esp Anestesiología y Reanimación.* 2010;57:439---53. 3. Gertler R, Joshi GP. Is one general anesthetic technique associated with faster recovery? Evidence-based



practice of anesthesiology. Edited by Fleisher LA. Philadelphia: Elsevier. Science; 2004; p. 236-240. 4. Murphy GS, Brull SJ. Residual neuromuscular block: lessons unlearned. Part I: Definitions, incidence, and adverse physiologic effects of residual neuromuscular block. *Anesth Analg*. 2010;111:120---8.

5. Robertson AG, Patel RN, Couper GW. Long-term outcomes following laparoscopic anterior and Nissen fundoplication. *ANZ J Surg*. 2015. 6. Klauser A, Schindlbeck N, Muller-Lissner S. Symptoms in gastroesophageal reflux disease. *Lancet*. 1990;335:205---8. 7. Lee AL, Goldstein RS. Gastroesophageal reflux disease in COPD: Links and risks. *Int J Chron Obstruct Pulmon Dis*. 2015;10:1935---49. 8. Ng A, Smith G. Gastroesophageal reflux and aspiration of gastric contents in anaesthetic practice. *Anesth Analg*. 2001;93:494---513. 9. Hershcovici T, Mashimo H, Fass R. The lower esophageal sphincter. *Neurogastroenterol Motil*. 2011;23:819---30. 10. Algie CM, Mahar RK, Tan HB. Effectiveness and risks of cricoid pressure during rapid sequence induction for endotracheal intubation. *Cochrane Database Syst Rev*. 2015;11: CD011656. 11. (a) Bhatia N, Bhagat H, Sen I. Cricoid pressure: Where do we stand. *J Anaesthesiol Clin Pharmacol*. 2014;30:3---6; (b) Hernandez MR, Klock PA, Ovassapian A. Evolution of the extraglottic airway: A review of its history, applications, and practical tips for success. *Anesth Analg*. 2012;114:349---68. 12. Van Zundert T, Gatt S. The Baska Mask<sup>®</sup>----A new concept in self-sealing membrane cuff extraglottic airway devices, using a sump and two gastric drains: A critical evaluation. *J Obstet Anaesth Crit Care*. 2012;2:23---30. 13. López A, Muñoz-Rojas G, Fontanalsa M. Evaluación clínica de la mascarilla laríngea Baska Mask<sup>®</sup> en pacientes adultos en cirugía mayor ambulatoria. *Rev Esp Anesthesiol Reanim*. 2015;62:551---6. 14. Lu PP, Brimacombe J, Yang C. ProSeal versus the classic laryngeal mask airway for positive pressure ventilation during laparoscopic cholecystectomy. *Br J Anaesth*. 2002;88:824---7. 15. Viira D, Myles PS. The use of the laryngeal mask in gynaecological laparoscopy. *Anaesth Intensive Care*. 2004;32:560---3.