



REVISTA BRASILEIRA DE ANESTESIOLOGIA

Official Publication of the Brazilian Society of Anesthesiology
www.sba.com.br



CLINICAL INFORMATION

Pressure support ventilation with the I-gel in intensive care unit: case report

Belgin Akan*, Deniz Erdem, Mahinur Demet Albayrak, Esra Aksoy, Fatma Akdur, Nermin Gogus

Department of Anaesthesiology and Reanimation, Numune Training and Research Hospital, Ankara, Turkey

Received 13 September 2013; accepted 16 October 2013

Available online 11 November 2013

KEYWORDS

I-Gel;
LMA;
Difficult airway;
Pressure-controlled ventilation;
Intensive care unit

PALAVRAS-CHAVE

I-Gel;
Máscaras laringeas;
Manuseio das vias aéreas;
Ventilação com pressão positiva intermitente;
Unidade de terapia intensiva

Abstract

Background and objectives: The I-gel supraglottic airway has a non-inflatable cuff made from a gel-like thermoplastic elastomer. The use of the I-gel during anesthesia for spontaneously breathing patients or intermittent positive pressure ventilation has been reported. But there are a few published reports about the use of the I-gel with pressure-controlled ventilation.

Contents and conclusions: In this case report we described the use of the I-gel supraglottic airway along 48 h in intensive care unit for the management of ventilation in a patient needed mechanic ventilation but in whom tracheal intubation could not be performed.

© 2013 Sociedade Brasileira de Anestesiologia. Published by Elsevier Editora Ltda. All rights reserved.

Ventilação controlada por pressão com I-gel em unidade de terapia intensiva: relato de caso

Resumo

Justificativa e objetivos: O dispositivo supraglótico I-gel para o manejo das vias aéreas tem um manguito não insuflável feito de um elastômero termoplástico semelhante ao gel. Há relato sobre o uso do I-gel em pacientes sob anestesia para a ventilação, espontânea ou com pressão positiva intermitente. Porém, há poucos relatos publicados sobre o uso do I-gel com ventilação controlada por pressão.

Conteúdo e conclusões: Descrevemos neste relato de caso o uso do dispositivo supraglótico I-gel durante 48 horas em unidade de terapia intensiva para o manejo das vias aéreas em paciente que precisou de ventilação mecânica, mas no qual a intubação traqueal não pôde ser feita.

© 2013 Sociedade Brasileira de Anestesiologia. Publicado por Elsevier Editora Ltda. Todos os direitos reservados.

* Corresponding author.

E-mail: belginakan@yahoo.com (B. Akan).

Introduction

The I-gel is a new, non-inflatable supraglottic airway designed for spontaneous or intermittent positive pressure ventilation. It was introduced into clinical practice in the United Kingdom in 2007.¹ It has potential advantages including easier insertion and use, minimal risk of tissue compression and no position change after insertion. The difficult airway society guidelines recommend to use of laryngeal mask airway (LMA) to secure ventilation and oxygenation after failed optimized attempts at direct laryngoscopy.² The use of the I-gel during anesthesia for spontaneously breathing patients was also reported.³ There are several published reports on the use of the I-gel during pressure controlled ventilation (PCV) in operating room.⁴ However, there are limited number of reports regarding the use of the I-gel in intensive care unit (ICU).

In this case report, we described the use of the I-gel supraglottic airway along 48 h in ICU for the management of ventilation in a patient needing mechanical ventilation.

Case report

A 49 year old female, weighed 40 kg, hospitalized in ICU because of fever and respiratory distress lasting for one week. She had been on a homecare program after several operations because of having end stage glioblastome multiforme. When she was admitted to the hospital, hemodynamic monitorization including heart rate, systemic blood pressure, continuous oxygen saturation, and end tidal CO₂ monitorization were obtained. Tracheal intubation was necessary for respiratory insufficiency. She had an adequate mouth opening, but when laryngoscopy was performed, a Mallampati score of 4 was assigned.⁵ Three attempts at tracheal intubation with a gum elastic bougie failed. A size 3 I-gel (Intersurgical Ltd., Wokingham, Berkshire, UK) was inserted with ease on the first attempt, and then the patient's lung ventilated mechanically with Drager Evita 4 ventilator. Satisfactory oxygenation and ventilation were confirmed with continuous pulse oximetry and capnography. The capnography monitor showed a square capnogram and stable arterial oxygen saturation above 95%. Because there was visible chest movement with no leakage around the device, the insertion was defined as successful. After spontaneous respiration was returned, the lungs were ventilated mechanically at maximum 25 cmH₂O using PCV at a rate of 12 bpm and inspiratory-to-expiratory ratio of 1:2 with no positive end expiratory pressure. The gastric tube was passed using the special channel of the device with ease and then the stomach was decompressed. Arterial blood gas analysis was established every 2 h. Tracheostomy was not necessary because of sufficient ventilation with the I-gel. The patient was followed up in ICU along 48 h with the I-gel until she died of a septic shock.

Discussion

The LMA and similar supraglottic airway devices with an inflatable cuff can be used for mechanical ventilation. One

of the most frequent undesired events when using these devices is the movement of the device during inflation arising from the forcing of distal wedge of the mask out of the upper esophagus. The I-gel airway made up of a gel-like thermoplastic elastomer. It has potential advantages including easier insertion and use, minimal risk of tissue compression and stability after insertion.³ Richez et al. carried out one of the first studies to evaluate the I-gel. They found that insertion success rate was 97%. Insertion was easy and performed at the first attempt in all of the patients.⁶ There are studies to support its use as a potential resuscitative device⁷ and as a rescue device for difficult airways.⁸ Emmerich and Dummler reported an airway management during induction of general anesthesia in a patient with known difficulties with intubation. After failed optimized attempts at direct laryngoscopy, ventilation was secured with the I-gel successfully.⁹ In the present case, tracheal intubation was tried 3 times by an experienced anesthesiologist. It was considered as grade 4 difficult airway according to the Mallampati classification. An I-gel supraglottic airway was placed easily at the first time. It is used in the ambulatory or day case surgery setting and as a primary airway device for short procedures under general anesthesia. Helmy et al. compared the LMA and the I-gel regarding easiness of insertion of the device, leak pressure, gastric insufflations, end tidal CO₂, oxygen saturation and hemodynamic and postoperative complications in anesthetized spontaneously ventilated adult patients. They reported that insertion of the I-gel is significantly easier and more rapid than insertion of LMA. Leak pressure was significantly higher with the I-gel than with LMA, thus incidence of gastric insufflations was significantly lower with the I-gel.¹⁰ Bordes et al. compared PCV and volume-controlled ventilation (VCV) in children with LMA. They reported that PCV is more efficient than VCV for controlled ventilation with LMA.¹¹ Uppal et al. compared the I-gel with the conventional tracheal tube using PCV in the same patient group. They compared the devices by the means of gas leaks and reported that the I-gel was as efficient and safe as tracheal tube in PCV mode.⁴ In the present case PCV mode was used after returning of spontaneous breathing. Because of the adequacy of the tidal volume, the lower leak volume, the normal capnogram and the normal peripheric oxygen saturation, it was continued to maintain ventilation by the I-gel.

The I-gel has also been designed to separate the gastrointestinal and the respiratory tracts. It allows a gastric tube to pass into the stomach, thereby possibly avoiding the problems of regurgitation and potential aspiration.¹² We benefited from this easiness in the present case for decompression of the stomach.

To our knowledge there is no report on the long time use of the I-gel in ICU. We did not encounter any problem in mechanical ventilation lasting for 48 h in PCV mode. Our findings show that the I-gel can be used in order to obtain airway control and thereafter maintaining mechanical ventilation in difficult tracheal intubation cases in ICUs.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. De Lloyd L, Hodzovic I, Voisey S, et al. Comparison of fiberscope guided intubation via the classic laryngeal mask airway and I-gel in a manikin. *Anaesthesia*. 2010;65:36–43.
2. Henderson J, Popat M, Latto IP, et al. Difficult Airway Society guidelines for management of the unanticipated difficult intubation. *Anaesthesia*. 2004;59:675–94.
3. Gatward JJ, Cook TM, Seller C, et al. Evaluation of the size 4 I-gel trade mark airway in one hundred non-paralysed patients. *Anaesthesia*. 2008;63:1124–30.
4. Uppal V, Fletcher G, Kinsella J. Comparison of the I-gel with cuffed tracheal tube during pressure-controlled ventilation. *Br J Anaesth*. 2009;102:264–8.
5. Mallampati SR, Gatt SP, Gugino LD, et al. A clinical sign to predict difficult laryngoscopy: a prospective study. *Can Anesth Soc J*. 1985;32:487–90.
6. Richez B, Saltel L, Banchereau F. A new single use supraglottic device with a noninflatable cuff and an esophageal vent: an observational study of the I-gel. *Anesth Analg*. 2008;106:1137–9.
7. Gabbott D, Beringer R. The I-gel supraglottic airway: a potential role for resuscitation? *Resuscitation*. 2007;73:161–2.
8. Frova G, Sorbello M. Algorithms for difficult airway management: a review. *Minerva Anesthesiol*. 2009;75:201–9.
9. Emmerich M, Dummler R. Use of the I-gel laryngeal mask for management of a difficult airway. *Anaesthesist*. 2008;57:779–81.
10. Helmy AM, Atef HM, El-Taher EM, et al. Comparative study between Igel, a new supraglottic airway device, and classical laryngeal mask airway in anesthetized spontaneously ventilated patients. *Saudi J Anesth*. 2010;3:131–6.
11. Bordes M, Semjen F, Degryse C, et al. Pressure-controlled ventilation is superior to volume-controlled ventilation with a laryngeal mask airway in children. *Acta Anaesthesiol Scand*. 2007;51:82–5.
12. Gibbison B, Cook TM, Seller C. Case series: protection from aspiration and failure of protection from aspiration with the I-gel airway. *Br J Anaesth*. 2008;100:415–7.