



BIBLIOGRAPHY

Published studies, case reports and correspondence



Introduction

Welcome to the second edition of the Intersurgical® i-gel® bibliography, which now features even more studies, case reports and correspondence relating to this innovative airway management device, up to March 2013.

The i-gel® is a second generation supraglottic airway, made of a medical grade thermoplastic elastomer, designed to create a non-inflatable anatomical seal of the pharyngeal, laryngeal and perilaryngeal structures. An integrated gastric channel provides an early warning of regurgitation, facilitates venting of gas from the stomach and allows for the passing of a suction tube to empty the stomach contents. The device also includes a buccal cavity stabiliser to provide vertical strength during insertion and eliminate the potential for rotation.

The first study on i-gel® was conducted by Richard Levitan and his team at the University of Maryland Medical Center in Baltimore, USA. This landmark study on the positioning and mechanics of i-gel® in 65 non-embalmed cadavers was initially presented as a free paper at the UK Difficult Airway Society meeting in Leicester in November 2004 and accepted for publication in *Anaesthesia* in April 2005. i-gel® was subsequently launched in January 2007 at the Association of Anaesthetists of Great Britain and Ireland Winter Meeting in London, UK.

The first independent clinical data on patients was a letter to the editor of *Resuscitation* from David Gabbott and Richard Beringer at Gloucester Royal Hospital in the UK. This correspondence, entitled, 'The i-gel® supraglottic airway: A potential role for resuscitation?' reported initial findings on the use of i-gel® in 100 patients presenting for elective surgery under general anaesthesia.

Since the publication of this letter, i-gel® has been the subject of numerous, peer reviewed clinical studies, case reports and correspondence. The objective of this bibliography is to provide a comprehensive list of all known published data on i-gel®.

Each study listed includes a brief summary description. These summaries are not intended to provide a comprehensive overview of the study concerned, only to assist the reader in deciding whether a particular paper is relevant to their area of interest, prior to obtaining a copy of the full document for review. The bibliography also provides an index by first author and journal title.

Every attempt has been made to include all known data, irrespective of outcome, so as to allow the reader every opportunity to obtain a balanced overview of the clinical data that exists for i-gel®.

Titles are taken from the articles as they appear in their original form, spelling variations included, allowing the reader to make a perfectly accurate internet search should they wish to find out more.

Whilst every attempt has been made to provide accurate information, we apologise in advance for any errors or omissions and will be pleased to make any corrections brought to our notice in any following edition. We hope you find this bibliography interesting and useful.

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Clinical Studies

Anatomical and Cadaver

Initial anatomic investigations of the i-gel® airway: a novel supraglottic airway without inflatable cuff

Levitan RM, Kinkle WC. *Anaesthesia* 2005; 60(10): 1022-1026

The first ever published study examined the positioning and mechanics of the i-gel® in 65 non-embalmed cadavers, with 73 endoscopies, 16 neck dissections and six neck radiographs. The mean percentage of glottic opening score for the 73 insertions was 82%. In each of the neck dissections and radiographs the bowl of the device covered the laryngeal inlet. In their summary, the authors concluded that the i-gel® was consistently positioned over the laryngeal inlet and that the unique gel-like material of the device performed as intended, conforming to the perilaryngeal anatomy.

Cadaver study of oesophageal insufflation with supraglottic airway devices during positive pressure ventilation in an obstructed airway

Schmidbauer W, Genzwürker H, Ahlers O, Proquitte H, Kerner T. *Br J Anaesth* 2012; 109(3): 454-8

This, the first data collection study on the extent of oesophageal insufflation when oropharyngeal leak pressures are exceeded, used the i-gel® inserted into cadavers. Compared alongside LMA Supreme®, LMA ProSeal®, LTS-D™, LTS II™ and Combitube®, performance was measured in a surgically-closed trachea to replicate total airway obstruction. Volume of insufflation from controlled ventilation was measured at inspirator pressures of 20, 40 and 60 mbar, with the former producing no insufflation with any device.

A Comparison of Successful Eschmann Introducer Placement Through Four Supraglottic Airway Devices

Mitchell CA, Riddle ML, Pearson NM, Tauferner DH, Carl R. *Annals Of Emergency Medicine* 2010; 56(3): S25

Study to determine if a bougie could be successfully placed in a cadaver by emergency medicine providers using four supraglottic airway devices: LMA Supreme®, i-gel®, LMA® and KingLT®. Time to placement, confidence in the procedure and correct placement via direct laryngoscopy post-removal were recorded. No great significant differences in most areas, however i-gel® was much quicker than KingLT® to successfully insert, and generally outperformed it. LMA Supreme® and i-gel® considered the better devices for such a procedure, although the authors concede that using a cadaver did inhibit the study.

Oesophageal seal of the novel supralaryngeal airway device i-gel® in comparison with the laryngeal mask airways Classic and ProSeal™ using a cadaver model

Schmidbauer W, Bercker S, Volk T, Bogusch G, Mager G, Kerner T. *Br J Anaesth* 2009; 102(1): 135-139

The three supraglottic devices were inserted into eight unfixed cadaver models with exposed oesophagi, connected to a water column producing both a slow and fast oesophageal pressure increase. During a fast increase of oesophageal pressure (simulated vomiting procedure) with the oesophageal lumen of the i-gel® and pLMA open, the authors reported that 'the entire oesophageal liquid was drained to the outside without any tracheal aspiration occurring.'

Observational and Comparative

i-gel® supraglottic airway in clinical practice: a prospective observational multicentre study

Theiler L, Gutzmann M, Kleine-Brueggemy M, Urwyler N, Kaempfen B, Greif R. *Br J Anaesth* 2012; 109(6): 990-995

Over a period of 24 months, 2049 uses of the i-gel® were measured across five independent hospitals in Switzerland to evaluate insertion success rates, leak pressures, adverse events, and risk factors for failure. Patients' mean age was 47 years. The authors concluded that the i-gel® is a reliable device, failing in less than 5% of patients and providing high leak pressures. Serious adverse events are rare.

Comparison of clinical performance of the I-gel® with LMA Proseal®

Chauhan G, Nayar P, Seth A, Gupta K, Panwar M, Agrawal N. *J Anaesth Clin Pharmacol* 2013; 29(1): 56-60

Prospective, randomised study conducted in 80 fasted patients, split equally between i-gel® and PLMA, of ASA grades I/II. Ease and speed of insertions were primary outcomes measured, with i-gel® significantly quicker and easier than PLMA. Post-operative complications also lower in i-gel® group.

Failed tracheal intubation in obstetric anaesthesia: 2 yr national case-control study in the UK

Quinn AC, Milne D, Columb M, Gorton H and Knight M. *Br J Anaesth* 2012; 110(1): 74-80

The purpose of this UK-wide study was to further evaluate the predetermined rate that one in 250 obstetric patients suffer failed intubation whilst undergoing general anaesthesia. Due to the lack of national figures, the study used the UK Obstetric Surveillance System (UKOSS) of data collection in centres across the UK to record incidence, risk factors and any reports of failed intubations. All contacted centres responded, equalling 57 completed reports, giving a unit-based estimation of one case in every 224 patients. Univariate analyses also recorded in detail in this report.

Randomized comparison of the i-gel®, the LMA Supreme®, and the Laryngeal Tube Suction-D using clinical and fiberoptic assessments in elective patients

Russo SG, Cremer S, Galli T, Eich C, Bräuer A, Crozier TA, Bauer M, Strack M. *BMC Anesthesiol* 2012; 12: 18

Three groups of 40 elective patients each were assigned to i-gel®, LMA Supreme® and Laryngeal Tube Suction-D for a prospective, randomised and comparative study of position (fibre optic) and clinical performance data during surgery. Speed of insertion and success rates, leak pressure, dynamic airway compliance, and signs of postoperative airway morbidity were recorded, with i-gel® registering a 95% insertion success rate and the highest airway compliance. In conclusion, all devices were considered suitable for ventilation in elective surgery.

LMA Supreme® vs i-gel®--a comparison of insertion success in novices

Ragazzi R, Finessi L, Farinelli I, Alvisi R, Volta CA. *Anaesthesia* 2012; 67(4): 384-8

Following a short lecture and manikin training, novice airway users were randomly selected to insert either the LMA Supreme® or i-gel® into 80 patients undergoing breast surgery, to measure insertion success rate and ventilation profile.

The effects of prewarming the I-gel® on fitting to laryngeal structure

Nishiyama T, Kobno Y, Kim HJ, Shin WJ, Yang HS. *The American Journal Of Emergency Medicine* 2012; 30(9): 1756-1759

180 patients were randomised into two equal groups, one for insertion of i-gel® at room temperature, the other at 37 degrees centigrade. Insertion time, number of insertion attempts, inspiratory and leak pressures, and leak fraction were compared. Report found no significant difference between the two groups.

Comparison of the Proseal LMA® and intersurgical I-gel® during gynecological laparoscopy

Jeon WJ, Cho SY, Baek SJ, Kim KH. *Korean J Anesthesiol*. 2012; 63(6): 510-4

Adult patients undergoing gynaecological laparoscopy were split into two groups of 30 and randomly assigned to either PLMA or i-gel®. Insertion time and number of attempts were recorded. After successful insertion in all patients in both groups, on first attempt, airway leak pressure was also measured. No significant difference in insertion time or leak pressure. Authors conclude that i-gel® is a reasonable alternative to PLMA in this scenario.

Similar oropharyngeal leak pressures during anaesthesia with i-gel®, LMA-ProSeal® and LMA-Supreme® Laryngeal Masks

Van Zundert TC, Brimacombe JR. *Acta Anaesthesiol Belg*. 2012; 63(1): 35-41

Random allocation of 150 patients to either i-gel®, LMA ProSeal® or LMA Supreme® to compare, primarily, oropharyngeal leak pressure and changes in pressure between 30 and 60 minutes after insertion. Results in this case showed that there were no significant differences in leak pressure.

New single use supraglottic airway device with non-inflatable cuff and gastric tube channel

Siddiqui AS, Ahmed J, Siddiqui SZ, Haider S, Raza SA. *J Coll Physicians Surg Pak*. 2012; 22(7): 419-23

An experimental study using i-gel® on 100 female patients undergoing elective gynaecologic surgery was performance-measured on ease of insertion, time to insert, peak airway pressure and leak pressure. A gastric tube was placed in each patient. Pharyngolaryngeal morbidities were also recorded. In 92% of patients, i-gel® was inserted successfully first time and there were no instances of blood on the device post-procedure. Authors confirm the i-gel® is a simple and easy to use device.

i-gel® vs AuraOnce™ laryngeal mask for general anaesthesia with controlled ventilation in paralyzed patients

Donaldson W, Abraham A, Deighan M, Michalek P. *Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub*. 2011; 155(2): 155-164

Devices were generally comparable with high overall and first-attempt success rates. The i-gel® had a significantly higher seal pressure (30.4 compared to 27.8cm H₂O) and a lower incidence of postoperative complications.

A comparison of the i-gel® and classic LMA® insertion in manikins by experienced and novice physicians

Stroumpoulis K, Isaia C, Bassiakou E, Pantazopoulos I, Troupis G, Mazarakis A, Demestihia T, Xanthos T. *Eur J Emerg Med* 2011; 19(1): 24-7

116 volunteer doctors were assigned to either a novice or experienced group depending on their level of LMA® insertion experience. After a brief training session the volunteers were randomly allocated to insertion of the cLMA and i-gel® in a manikin. Success rate, insertion time and perceived ease of use were recorded. Success rate on the first attempt was significantly higher with the i-gel® in both user groups. The i-gel® produced similar success rates for novices and experienced users, but the cLMA had a lower success rate amongst novices. All insertions were successful by the second attempt. Insertion time was significantly shorter with the i-gel®, although the authors note that this may be due to the lack of an inflatable cuff.

Comparison of the i-gel® and the LMA Unique® laryngeal mask airway in patients with mild to moderate obesity during elective short-term surgery

Weber U, Oguz R, Potura LA, Kimberger O, Kober A, Tschernko E. *Anaesthesia* 2011; 66(6): 481-487

In this crossover study, 50 adult patients with BMI 25-35kg/m² were assigned to ventilation with the i-gel® and the LMA Unique® in random order. Insertion attempts, difficulty (on a scale of 1-4), time to insertion and leak pressure were measured with each device. Leak pressure was higher with the i-gel®, with a mean value of 23.7cm H₂O compared to 17.4cm H₂O with the LMA Unique®. Within the study population, there was a bigger difference in leak pressures amongst patients with BMI >30. Insertion was generally comparable, although the i-gel® had a significantly shorter insertion time.

The i-gel[®], a new supraglottic airway

Asai T, Liu EH. Masui 2010; 59(6): 794-797

In this study, the i-gel[®] was used to ventilate 20 spontaneously breathing adult patients during anaesthesia. Insertion time, success rate, ability to insert a gastric tube and complications (including the presence of blood on the device) were recorded. The i-gel[®] was inserted on the first attempt in 19 of 20 patients and had a mean insertion time of 12 seconds. Gastric tube insertion was possible in all cases. Removal was uneventful for all patients and did not result in any complications. The authors believe that the i-gel[®] is a useful device for maintaining the patient airway during general anaesthesia.

Comparison of the Intersurgical[®] Solus[®] laryngeal mask airway and the i-gel[®] supralaryngeal device

Amini S, Khoshfetrat M. Anaesthesia 2010; 65(8): 805-809

120 healthy adult patients were assigned to either the Solus[®] or i-gel[®] device for general anaesthesia. Airway quality measures, leak pressure, insertion time and complications were recorded. Both devices performed well and had low incidences of complications. The Solus[®] laryngeal mask required less airway manipulation, and provided better leak pressures and views of the vocal cords. i-gel[®] was quicker to insert.

Comparative study between i-gel[®], a new supraglottic airway device, and classical laryngeal mask airway in anaesthetised spontaneously ventilated patients

Helmy AM, Atef HM, El-Taber EM, Henidak AM. Saudi J Anaesth 2010; 4(3): 131-136

This study compared the cLMA and i-gel[®] in 80 healthy adult patients. The patients were randomly assigned to two groups for insertion of one of the devices during surgery. Haemodynamic data, oxygen saturation and end-tidal CO₂ were similar in both groups. Leak pressure was significantly higher with the i-gel[®], which also had a shorter insertion time. Postoperative complications were generally comparable, however there was a higher incidence of nausea and vomiting in the cLMA group due to gastric insufflation.

Comparison of guided insertion of the LMA ProSeal[®] vs. the i-gel[®]

Gasteiger L, Brimacombe J, Perkhofe D, Kaufmann M, Keller C. Anaesthesia 2010; 65(9): 913-916

This study compared the use of the LMA ProSeal[®] and the i-gel[®] in 152 adult female patients. A duodenal tube guided insertion technique was used for both devices. There was no significant difference between insertion success rates and insertion times of the two devices. Leak pressure was 7cm H₂O higher with the ProSeal[®], providing a better seal for ventilation.

Comparison of the LMA Supreme[®] vs. the i-gel[®] in paralysed patients undergoing gynaecological laparoscopic surgery with controlled ventilation

Teoh WH, Lee KM, Subitharan T, Yahaya Z, Teo MM, Sia AT. Anaesthesia 2010; 65(12): 1173-1179

This study compared the i-gel[®] to the LMA Supreme[®] for the seal pressure during gynaecological laparoscopic surgery in the Trendelenburg position in 100 female patients. There was no difference in the oropharyngeal leak pressure with similar success rates for first time insertion and times to first capnograph trace. Both devices proved to be equally effective for gynaecological laparoscopic procedures.

Comparison of i-gel[®] supraglottic with laryngeal mask airway

Ali A, Sheikh NA, Ali L, Siddique SA. Professional Med J 2010; 17(4): 643-647

100 patients received ventilation via the i-gel[®] or cLMA during elective surgery. The devices were compared for ease of insertion, insertion time, number of airway manipulations needed and post-operative complications. The devices were generally comparable. More airway manipulations were required with the i-gel[®], however this was not a statistically significant increase compared to the cLMA. The incidence of complications was very low, with one case of blood on an i-gel[®] and one incident of laryngospasm with each device.

Performance of supraglottic airway devices and 12 month skill retention: a randomised controlled study with manikins

Fischer H, Hochbrugger E, Fast A, Hager H, Steinlechner B, Koinig H, Eisenburger P, Frantal S, Greif R. Resuscitation 2010; 82(3): 326-31

This study compared the use of the i-gel[®], LMA Supreme[®], LMA Unique[®] and LMA ProSeal[®] supraglottic airways and bag-valve mask ventilation. 267 third-year medical students were given standardised training before using all devices in random order on an airway training manikin. The number of attempts needed to secure the device, time to successful ventilation, tidal volume, ease of use and incidence of gastric inflation were all recorded. After 12 months, participants used the devices again without further training. In both assessments, the i-gel[®] and the Supreme were the most likely to be inserted successfully on the first attempt. These devices were rated as the easiest to use. The i-gel[®] and bag-valve mask had the quickest time to successful ventilation, however the rate of gastric inflation was much higher with the bag-valve mask.

PLMA vs. I-gel[®] : a comparative evaluation of respiratory mechanics in laparoscopic cholecystectomy

Sharma B, Sehgal R, Sahai C, Sood J. Journal Of Anaesthesia And Clinical Pharmacology 2010; 26 (4): 451-457

In this study, the performance of the LMA ProSeal[®] and i-gel[®] was compared during laparoscopic surgery. 60 patients were randomised into two groups and had the supraglottic airway inserted by an experienced anaesthesiologist (defined as >500 and >50 insertions for ProSeal[™] and i-gel[®] respectively).

Placement of a bronchial blocker through the i-gel[®] supraglottic airway device for single lung ventilation: preliminary study

Arévalo Ludeña J, Arcas Bellas JJ, López Pérez V, Cuarental García A, Alvarez-Rementería Carbonell R. Rev Esp Anesthesiol Reanim 2010; 57(8): 532-535

In 25 patients, a bronchial blocker was inserted under direct vision with a fiberoptic bronchoscope through an i-gel[®]. The i-gel[®] provided a reliable, safe seal of the airway. The authors concluded that such a technique, for anaesthetists with the appropriate experience using a flexible fiberoptic scope, can facilitate safe, effective management of selected patients who are to undergo certain thoracic procedures.

Supreme[™] laryngeal mask airway vs. the i-gel[®] supraglottic airway in patients under general anaesthesia and mechanical ventilation with no neuromuscular block: a randomised clinical trial

Fernández Díez A, Prez Villafane A, Bermejo González JC, Marcos Vidal JM. Rev Esp Anesthesiol Reanim 2009; 56: 474-478

In this study, 85 patients were randomised into two groups for ventilation via LMA Supreme[®] or i-gel[®] supraglottic airways. Ease of insertion, seal pressure, ventilatory parameters and insertion of a gastric tube were all recorded. Both devices were easy to insert, with the Supreme[™] and i-gel[®] being inserted on the first attempt in 95.2 and 86% of cases respectively. Performance was generally comparable.

A comparison of correct i-gel[®] placement with and without the aid of a bougie

Gosalía N, Khan RM, Kaul N, Sumant A. J Anaesth Clin Pharmacol 2009; 25(3): 345-347

In this study, the i-gel[®]'s placement and performance were studied for insertions carried out with and without the use of a gum elastic bougie. 50 patients were randomised into two groups. In the first group, the i-gel[®] was inserted using the standard method. In the second group, a bougie was used to insert the device via the gastric channel. The time taken for insertion and the number of attempts needed were similar for both methods. Leakage and patient discomfort were less common when the bougie was used. The authors conclude that using a bougie improves i-gel[®] placement without increasing insertion time or adverse effects.

A preliminary study of i-gel[®]: a new supraglottic airway device

Kannaujia A, Srivastava U, Saraswat N, Mishra A, Kumar A, Saxena S. Indian J Anaesth 2009; 53(1): 52-56

50 patients had the i-gel[®] inserted for ventilation during surgery. The number of insertion attempts, insertion time, manipulations required for an effective airway and seal pressure were recorded. Gastric tube placement and adverse events were also noted where they occurred. Before removal of the device, stability was tested by measuring the expiratory tidal volume with the patient's head in standard, rotated, chin lift and no-pillow positions. Success rate was 90% at the first attempt and 100% at the second. Median insertion time was 11 seconds. Insertion depth was increased in four patients and a jaw thrust was required in two more. All gastric tubes were placed successfully. Mild cough or postoperative sore throat was seen in a total of four patients. Seal pressure was approximately 20cm H₂O. The i-gel[®] was also found to be stable during head and neck movement.

Comparison of the i-gel[®] with the cuffed tracheal tube during pressure-controlled ventilation

Uppal V, Fletcher G, Kinsella J. Br J Anaesth 2009; 102(2): 264-8

In this study, published in the BJA, twenty-five patients were given a standard anaesthetic, followed by insertion of an i-gel[®]. The lungs were ventilated at three different pressures and the difference between the inspired and expired tidal volumes used to calculate the leak volume and leak fraction. The i-gel[®] was then removed and replaced with a conventional tracheal tube, for which similar readings were taken. The results were then compared. From the data taken, the authors concluded that, 'compared with a tracheal tube there is no significant difference in the gas leak when using an i-gel[®] during PCV with moderate airway pressures'.

A randomised crossover trial comparing the i-gel[®] supraglottic airway and classic laryngeal mask airway

Janakiraman C, Chethan DB, Wilkes AR, Stacey MR, Goodwin, N. Anaesthesia 2009; 64(6): 674-678

This study compared the performance of i-gel[®] and cLMA airways in 50 healthy adult patients. The success rate on the first insertion attempt was significantly lower in the i-gel[®] group. Overall success after two attempts did not show a significant difference, although a change of device size was allowed. Leak pressures and fiberoptic view of the vocal cords were significantly better with the i-gel[®], with the two devices producing leak pressures of 20 (i-gel[®]) and 17cm H₂O (cLMA). 14 patients needed a change in i-gel[®] size.

Comparison of clinical performance of i-gel® with LMA Proseal® in elective surgeries

Singh I, Gupta M, Tandon M. Indian J Anaesth 2009; 53(3): 302-305

This clinical investigation into performance of i-gel® compared to another supraglottic airway with gastric access, concluded that i-gel® was easier to insert, required less attempts at insertion, had easier gastric tube placement and was less traumatic than the other device tested. Sixty patients were randomly assigned into two groups: Group 1 (n=30) for i-gel® and Group P (n=30). Assessment was made of sealing pressure, ease of insertion, success rate of insertion, ease of gastric tube placement, airway trauma by post operative blood staining of the device, tongue, lip and dental trauma, hoarseness, regurgitation/aspiration and cost effectiveness.

Evaluation of the new supraglottic airway devices Ambu® Aura Once™ and Intersurgical i-gel®. Positioning, sealing, patient comfort and airway morbidity

Heuer JF, Stiller M, Rathgeber J, Eich C, Züchner K, Bauer M, Timmermann A. Anaesthesist 2009; 58(8): 813-820

In this study, the i-gel® was compared to the cLMA, ProSeal and Ambu Aura Once™ supraglottic airways. 40 patients were assigned to each of the four groups for insertion of one of the airways during surgery. Ease of insertion and insertion time were comparable for all devices. The ProSeal and Aura Once™ airways had significantly better placement and seal pressures. Airway morbidity did not occur in any of the groups. The cLMA was significantly more likely to cause postoperative sore throat.

A comparison of postoperative throat and neck complaints after the use of the i-gel® and the La Premiere® disposable laryngeal mask: A double-blinded, randomized, controlled trial

Keijzer C, Buitelaar DR, Efthymiou KM, Sramek M, Ten Cate J, Runday M, Stoppa T, Huitink JM, Schutte PF. Anesth Analg. 2009; 109(4): 1092-1095

This study from the department of Anesthesiology and Intensive Care at the Netherlands Cancer Institute - Antoni van Leeuwenhoek Hospital and the VU University Medical Center in Amsterdam compared the rate of postoperative sore throat and neck complaints with i-gel® to a well known brand of laryngeal mask. Patients were interviewed postoperatively at 1hr, 24hrs and 48 hrs. The authors found significantly lower levels of sore throat with i-gel®, as well as lower levels of dysphagia.

A comparison of the i-gel® with the LMA-Unique® in non-paralysed anaesthetised adult patients

Francksen H, Renner J, Hanss R, Scholz J, Doerges V, Bein B. Anaesthesia 2009; 64(10): 1118-1124

In this study, 80 patients were randomly allocated to either i-gel® or LMA-Unique® insertion before minor surgery. Ventilation, insertion time, airway pressure, leak pressure and postoperative sore throat were all measured. Results were similar for all parameters other than airway leak pressure, which was significantly higher in the i-gel® (mean pressure 29cm H₂O compared to 18cm H₂O). Both devices are acceptable for use in securing an airway, however the increased leak pressure is an advantage for the i-gel®.

Randomised crossover comparison between the i-gel® and the LMA Unique® in anaesthetised, paralysed adults

Uppal V, Gangaiah S, Fletcher G, Kinsella J. Br J Anaesth 2009; 103(6): 882-885

In this study, the i-gel® and LMA Unique® were both used in 39 patients. Leak pressure, insertion attempts, number of airway manipulations and leak volumes were similar for both devices. Insertion time was significantly less for the i-gel® at 12.2s compared to 15.2s for the LMA Unique®. It can be concluded that the i-gel® is a reasonable alternative to the LMA Unique® during controlled ventilation.

The Supraglottic Airway i-gel® in Comparison with Proseal Laryngeal Mask Airway and Classic Laryngeal Mask Airway in Anaesthetized Patients

Shin W, Cheong Y, Yang H, Nishiyama T. European Journal Of Anaesthesiology 2009; 26: 000-000

167 patients were randomly assigned to device groups. Haemodynamic data, airway leak pressure, leak volume, success rates and postoperative complications were assessed.

Is i-gel® a new revolution among supraglottic airway devices? - a comparative evaluation

Jindal P, Rizvi A, Sharma JP. Middle East J Anesthesiol. 2009; 20(1): 53-58

This study compared i-gel® to two other supraglottic airways in respect of haemodynamic changes, including heart rate, systolic and diastolic blood pressure, mean arterial pressure and rate pressure product. The authors concluded that 'i-gel® effectively conforms to the perilaryngeal anatomy despite the lack of an inflatable cuff, it consistently achieves proper positioning for supraglottic ventilation and causes less haemodynamic changes as compared to other supraglottic airway devices.'

A new single use supraglottic airway with a noninflatable cuff and an esophageal vent: An observational study of the i-gel®

Richez B, Saltel L, Banchereau F, Torrielli R, Cros AM. Anesth Analg. 2008; 106(4): 1137-9

This study on 71 ASA I-II women scheduled for gynaecological surgery, reported a 97% insertion success rate with i-gel®. Mean seal pressure was 30cm H₂O. A gastric tube was inserted in 100% of cases. Only one case of coughing and sore throat occurred. The authors concluded that 'the i-gel® is a reliable, easily inserted airway device that provides an adequate seal with a low morbidity rate.'

Evaluation of the size 4 i-gel® airway in one hundred non-paralysed patients

Gatward JJ, Cook TM, Seller C, Handel J, Simpson T, Vanek V, Kelly F. Anaesthesia 2008; 63(10):1124-1130

A study of i-gel® in 100 elective, anaesthetized patients. Parameters assessed included ease of use, positioning, airway quality, seal pressure and complications. First time insertion success was 86%. Median airway leak pressure was 24cm H₂O. On fiberoptic examination via the device, the vocal cords were visible in 91% of patients. The incidence of airway obstruction, airway irritation, oropharyngeal trauma and other complications was low. Insertion of the device into the correct position was rapid and easy. The authors concluded that, 'these attributes would suggest potential roles in anaesthesia, management of the difficult airway and airway management during CPR'. Further studies are now indicated against i-gel®'s likely clinical competitors.

Resuscitation and Emergency Medicine

A comparison of three supraglottic airway devices used by healthcare professionals during paediatric resuscitation simulation

Schunk D, Ritzka M, Graf B, Trabold B. Emerg Med J 2012; 0: 1-4

66 healthcare professionals of differing experience in paediatric airway management participated in a study comparing laryngeal masks, i-gel® and laryngeal tube. Separated into three groups and after brief training in each, the participants were asked to place the device. Positioning and time to insert were recorded. Results show that i-gel® is superior to both laryngeal mask and laryngeal tube under these circumstances.

Hands-off time during insertion of six airway devices during cardiopulmonary resuscitation: A randomised manikin trial

Ruetzler K, Gruber C, Nabecker S, Wohlfarth P, Priemayr A, Frass M, Kimberger O, Sessler D, Roessler B. Resuscitation 2011; 82(8): 1060-1063

After an audio-visual lecture and practical demonstration, 40 voluntary emergency medical technicians with limited airway management experience were recruited to perform airway management with six devices, including the i-gel®, during sustained compressions on manikins. Hands-off time was significantly longer when inserting a traditional endotracheal tube, whereas the supraglottic devices were inserted successfully on each occasion.

Performance and skill retention of intubation by paramedics using seven different airway devices – a manikin study

Ruetzler K, Roessler B, Potura L, Priemayr A, Robak O, Schuster E, Frass M. Resuscitation 2011; 82 (5): 593-597

41 paramedics with no previous experience watched a lecture and demonstration. They then attempted to insert each of six supraglottic airways and an ET tube into a manikin in random order. After three months, all participants were assessed again without receiving further training. All supraglottic airways except ProSeal™ were more successful than the ET tube. i-gel®, Unique® and LT-D™ had significantly faster times to insertion and ventilation than the other devices. There was no significant difference in success rates for supraglottic airways after three months, however, ET tube insertion rates decreased from 78% to 58% in that time.

Insertion of six different supraglottic airway devices whilst wearing chemical, biological, radiation, nuclear-personal protective equipment: a manikin study

Castle N, Pillay Y, Spencer N. Anaesthesia 2011; 66(11): 983-8

Six different supraglottic airway devices, including i-gel®, were tested by 58 paramedics for speed and ease of insertion in a manikin, whilst wearing either a standard uniform or chemical, biological, radiation, nuclear-person protective equipment (CBRN-PPE). During the latter test, i-gel® was the fastest of the six to insert with a mean insertion time of 19 seconds. Overall, the wearing of CBRN-PPE has a detrimental effect on insertion time of supraglottic airways.

Assessment of the speed and ease of insertion of three supraglottic airway devices by paramedics: a manikin study

Castle N, Owen R, Hann M, Naidoo R, Reeves D. Emerg Med J 2010; 27(11): 860-863

In this study, 36 final-year paramedic students were randomised into one of six groups, each of which inserted three airway devices into a manikin in a different order. The devices used were the i-gel®, the laryngeal mask airway and the Laryngeal Tube airway. The students were timed while performing each insertion and interviewed afterwards to determine which device they preferred and why. All insertions were successful on the first attempt. The i-gel® was significantly faster than its competitors with a mean insertion time of 12.3s. Due to the speed and ease of insertion, 63% of students named the i-gel® as their preferred airway.

Randomised comparison of the effectiveness of the laryngeal mask airway supreme, i-gel and current practice in the initial airway management of prehospital cardiac arrest (REVIVE-Airways): a feasibility study research protocol

Benger J, Voss S, Coates D, Greenwood R, Nolan J, Rawstorne S, Rhys M, Thomas M. BMJ Open 2013; 3: e002467

An investigative study into the proposal by JRCALC that supraglottic airway devices are safe and effective devices for use in OHCA. In the form of a cluster, randomised trial design, comparisons of LMA Supreme and the i-gel will be carried out against each other and current practices. Objectives will be success during initial airway management, ventilation success, whether other interventions are required, airway integrity on arrival at hospital, and numerous stages of patient survival.

Influence of airway management strategy on 'no-flow-time' in a standardized single rescuer manikin scenario - a comparison between LTS-D and i-gel®

Wiese CHR, Bahr J, Popov AF, Hinz JM, Graf BM. Resuscitation 2009; 80(1): 100-103

This paper compared i-gel® to another supraglottic airway in a manikin cardiac arrest scenario. The study evaluated the affect use of these devices had on No-Flow Time (NFT). The authors stated that 'an ideal supraglottic airway should be inserted rapidly with minimal training and it should enable controlled ventilation'. i-gel® met those criteria during resuscitation in a manikin and NFT was kept as low as possible, consistent with ERC guidelines.

Effect of chest compressions on the time taken to insert airway devices in a manikin

Gatward JJ, Thomas MJC, Nolan JP, Cook TM. Br J Anaesth 2008; 100(3): 351-356

In this study, 40 volunteer doctors regularly involved in CPR, were timed inserting four different airway devices, including i-gel® and a tracheal tube, with and without stopping chest compressions. Comparison of the speed of insertion of the different devices during CPR allowed ranking of the devices. The i-gel® was inserted approximately 50% faster than the other devices tested.

i-gel® insertion by novices in manikins and patients

Wharton NM, Gibbison B, Gabbott DA, Haslam GM, Muchatuta N, Cook TM. Anaesthesia 2008; 63(9): 991-995

This study evaluated the performance of i-gel® in manikins and anaesthetised patients when used by novices. The i-gel® was deployed with minimal evidence of patient trauma and 100% insertion success. In their summary, the authors concluded that, 'i-gel® is rapidly inserted in both manikins and patients by novice users and compares favourably to other supraglottic airways available. Further work determining safety and efficacy during cardio-pulmonary resuscitation is required.'

Difficult Airways

The influence of head and neck position on ventilation with the i-gel® airway in paralysed, anaesthetised patients

Sanuki T, Uda R, Sugioka S, Daigo E, Son H, Akatsuka M, Kotani J. Eur J Anaesth 2011; 28(8):597-9

20 adult patients scheduled for oral surgery were ventilated using the i-gel®. Leak pressure, ventilation score and fiberoptic view were measured with the patient's head and neck in neutral position, extended position, flexion and rotated to the right. Leak pressure was higher during flexion, lower during extension and comparable to neutral position during rotation. Ventilation score was significantly worse during flexion. Fiberoptic view was not affected by head and neck position. The authors recommend that the i-gel® is not used in cases where head and neck flexion is likely, but they state that it is otherwise suitable for surgery where the head is moved.

Randomized crossover comparison of the laryngeal mask airway classic with i-gel® laryngeal mask airway in the management of difficult airway in post burn neck contracture patients

Singh J, Yadav MK, Marahatta SB, Shrestha BL. Indian J Anaesth 2012; 56(4): 348-52

Prospective, crossover, randomised trial of i-gel® against cLMA on 48 post-burn neck contracture patients with reduced neck movement and mouth opening. Primary outcome was overall success rate, with other measurements taken in time to ventilation, leak pressure, fiberoptic view and visualisation of square wave pattern. Success rate for i-gel® was 91.7%, against 79.2% for cLMA. i-gel® outperformed cLMA in all measurements. Authors conclude their study has 'better clinical performance in the difficult airway management of the airway in the post burn contracture of the neck'.

Crossover comparison of the Laryngeal Mask Supreme and the i-gel® in simulated difficult airway scenario in anesthetized patients

Theiler LG, Kleine-Brueggeney M, Kaiser D, Urwyler MD, Luyet C, Vogt A, Greig R, Unibe MME. Anesthesiology 2009; 111(1): 55-62

This study looked at a simulated difficult airway scenario by using a neck collar to limit both mouth opening and neck movement. Both devices were placed in random order in each of 60 patients. The primary outcome was overall success rate. Other measurements included time to successful ventilation, seal pressure, fiberoptic view and adverse events. The authors concluded the two devices tested had a 'similar insertion success and clinical performance in the simulated difficult airway situation'. The i-gel® enabled better fiberoptic laryngeal view and less epiglottic downfolding.

Conduit for Intubation

Tracheal intubation with a camera embedded in the tube tip (Vivasight™)

Huitink JM, Koopman EM, Bouwman RA, Craenen A, Verwoert M, Krage R, Visser IE, Erwteman M, van Groeningen D, Tijink R and Schauer A. *Anaesthesia* 2012; 1: 74-78

Study on tracheal intubation in manikins and patients with a camera embedded in the tip of the tracheal tube Vivasight™ pre-loaded in a size 5 i-gel®. All attempted intubations were successful, with a mean time of 1.4 seconds, and was faster when compared to intubation via LMA®.

Tracheal intubation through the i-gel® Supraglottic airway versus the LMA Fastrach®: A randomized controlled trial

Halgawi A, Massicotte N, Lallo A, Gauthier A, Boudreault D, Ruel M, Girard F. *Anesth Analg*. 2012; 114(1): 152-156

160 patients were randomised for blind intubation via i-gel® or LMA Fastrach®. First attempt and overall success rates were recorded and time to intubation was measured.

Randomized clinical trial of the i-gel® and Magill tracheal tube or single-use ILMA® and ILMA® tracheal tube for blind intubation in anaesthetized patients with a predicted difficult airway.

Theiler L, Kleine-Brueggeny M, Uruwiler N, Graf T, Luyet C, Greif R. *Br J Anaesth* 2011; 107(2): 243-250

A prospective, randomised, controlled trial comparing the success rate of blind tracheal intubation with a Magill PVC tube through i-gel®. Corresponding tracheal tube was introduced under fibre optic visualization, but without guidance. Primary outcome was intubation success rate.

Randomized trial comparing the i-gel® and Magill tracheal tube with the single-use ILMA® and ILMA® tracheal tube for fiberoptic-guided intubation in anaesthetized patients with a predicted difficult airway

Kleine-Brueggeny M, Theiler L, Uruwiler B, Vogt A, Greif R. *Br J Anaesth* 2011; 107(2): 251-7

A prospective, randomised, controlled trial comparing the success rate of fiberoptic-guided tracheal intubation using Rüsch® PVC tracheal tube through i-gel® with sILMA™ tracheal tube through sILMA™. First-attempt success rate was primary outcome. 96% of 76 patients were successful using i-gel®, compared to 90% of 71 in the sILMA™ group.

Comparison of fibroscope guided intubation via the classic laryngeal mask airway and i-gel® in a manikin

De Lloyd L, Hodzovic I, Voisey S, Wilkes AR, Latto IP. *Anaesthesia* 2010; 65(1): 36-43

This randomised crossover study compared the cLMA® to the i-gel® during endotracheal intubation of a manikin. 32 anaesthetists took part in the study. For each device, two intubations took place with the tracheal tube directly over the fibroscope and two used an Aintree Intubation Catheter. Intubation took significantly less time with the i-gel® using both methods. Five oesophageal intubations occurred with the cLMA. Anaesthetists stated a preference for the i-gel® due to the ease of use. The authors conclude that the i-gel® is a more appropriate choice for intubation than the cLMA.

A comparison of the i-gel® supraglottic airway as a conduit for tracheal intubation with the intubating laryngeal mask airway: a manikin study

Michalek P, Donaldson W, Graham C, Hinds JD. *Resuscitation* 2010; 81(1): 74-77

In this study 25 anaesthetists carried out blind and fiberoptic intubations through the ILMA® and i-gel® devices. The study took place with three different airway training manikins. There was no difference in the success rate of fiberoptic intubations between the two airways. During blind intubation, the i-gel® was significantly less successful. The i-gel® is therefore recommended for fiberoptic intubation only.

MRI and Extreme Environments

Magnetic resonance imaging study of the in vivo position of the extraglottic airway devices i-gel® and LMA-Supreme® in anaesthetized human volunteers

Russo SG, Cremer S, Eich C, Jipp M, Cohnen J, Strack M, Quintel M & Mohr A. *BR J Anaesth* 2012; 109(6): 996-1004

This randomized cross-over study of 12 volunteer patients was conducted primarily to measure the in situ position of the LMA Supreme® and i-gel® via MRI scan. Position was also assessed functionally and optically by fibroscope. Results showed that the devices differed significantly: the LMA Supreme® protruded deeper into the oesophageal sphincter, whilst i-gel® caused greater compression of the tongue. Glottic aperture reduction and hyoid bone displacement were also measured. Authors deem the results relevant to the risk of aspiration, glottic narrowing, airway resistance and soft-tissue morbidity.

Paediatric i-gel evaluation under nuclear magnetic resonance (NMR)

Monclus E, Garces A, Vassileva I, Sanchez A, Banchs R. *Eur J Anaesthesiol* 2010; 27(47): 155

70 children who were already scheduled for a cranial MRI scan took part in this study. The epiglottis was found to be in the bowl of the i-gel® in all patients, however the device still performed well.

In vitro study of magnetic resonance imaging artefacts of six supraglottic airway devices

Zaballos M, Bastida E, del Castillo T, de Villoria JG, Jiménez C. *Anaesthesia* 2010; 65(6): 569-572

In this study, the artefacts created during MRI by six supraglottic airways, the Classic LMA®, the ProSeal LMA®, the LMA Unique®, the LMA Supreme®, the Ambu® disposable laryngeal mask and the i-gel® were investigated. There were no artefacts with the i-gel® or Ambu® devices.

Extraglottic airway devices for use in diving medicine - part 3: the i-gel®

Acott CJ. Diving and Hyperbaric Medicine 2008; 38(3): 124-127

This study looked at the use of i-gel® in airway management of a patient in a diving bell or deck decompression chamber. The study highlighted the potential limitations of some supraglottic airways used in Hyperbaric Medicine, such as possible cuff expansion with a decrease in pressure on decompression and change in cuff volume due to gas diffusion as the gas mixtures change, problems not associated with i-gel®. It showed that, subjectively, there was no change in the consistency of the i-gel® at 203 and 283kPa pressure and that no bubbles were detected following decompression from 203, 283 or 608kPa. The i-gel® was also preferred by the Diver Medical Technicians (DMTs) to the alternative device included in the manikin section of the study because it 'lacked a cuff and was easier to insert from any position'.

Paediatric

A cohort evaluation of the paediatric i-gel® airway during anaesthesia in 120 children

Beringer R, Kelly F, Cook T, Nolan J, Hardy R, Simpson T, White M. Anaesthesia 2012; 66(12): 1121-1126

120 children up to 13 years of age were studied using the paediatric i-gel® during general anaesthesia to assess efficacy and usability. Insertion success and number of attempts, ventilation, leak pressure and fiberoptic view were all recorded. Airway manipulations and complications were also noted. In 94% of children the i-gel® was inserted and a clear airway maintained without complication.

LMA ProSeal® vs. i-Gel® in ventilated children: A randomised, crossover study using the size 2 mask

Gasteiger L, Brimacombe J, Oswald E, Perkhofers D, Tonin A, Keller C, Tiefenthaler W. Acta Anaesthesiol Scand 2012; 56(10): 1321-1324

Fifty-one children aged 1.5-6 years, weighing 10-25kg, were studied randomly using either the size 2 LMA ProSeal® or i-gel®. The hypothesis tested was that oropharyngeal leak pressure and fiberoptic position of the airway tube differ between the two devices, with results proving similar.

Comparison of size 2.5 i-gel™ with proseal LMA™ in anaesthetised, paralyzed children undergoing elective surgery

Mitra S, Das B, Jamil SN. North American Journal Of Medical Sciences 2012; 4(10): 453-7

Investigation on the usefulness of paediatric i-gel® size 2.5 against the PLMA equivalent in 60 randomly assigned patients due for anaesthetised elective surgery. Leak pressure was the primary outcome recorded, with further results for ease of insertion, hemodynamic data and postoperative complications also measured. Most areas offered no significant difference, although i-gel® proved easier to insert and recorded a higher leak pressure. Due to author-defined parameters such as cost-effectiveness, they deduce that i-gel® 'must be more frequently used'.

The effect of i-gel® airway on intraocular pressure in pediatric patients who received sevoflurane or desflurane during strabismus surgery

Sabin A, Tüfek A, Cingü AK, Çaça I, Tokgöz O, Balsak S. Pediatr Anesth 2012; 22(8): 772-775

47 children due for eye surgery were administered with sevoflurane or desflurane randomly for anaesthesia. Intraocular pressure was then measured prior to i-gel® insertion, at two and five minutes after insertion, and immediately after removal. Sustained pressure decrease present during procedure, but no significant difference between pre- and post-operative pressure.

A randomised trial comparing the i-gel® with the LMA Classic® in children

Lee JR, Kim MS, Kim JT, Byon HJ, Park YH, Kim HS, Kim CS. Anaesthesia 2012; 67(6): 606-611

99 children underwent general anaesthesia randomly via either i-gel® or cLMA. Leak pressure, ease of insertion, time taken to insert, fiberoptic examination and complications were all measured. There was no significant difference in leak pressure, however the i-gel® displayed a shorter insertion time and improved glottic view.

A clinical evaluation of the I-gel™ supraglottic airway device in children

Hughes C, Place K, Berg S, Mason D. Pediatr Anaesth 2012; 22(8): 765-71

Over a 12-month period, 154 children were studied using i-gel® sizes ranging from 1 to 2.5 to assess the device based on successful rates of insertion, airway leak pressure, position confirmed by fibre optic laryngoscopy, gastric tube placement, manipulations required, and complications. First insertion attempt was 93.5%, and complications arose in 20% of cases. Most were minor, however reports suggest there were cases of displacement and flexion compromising airway quality. Authors confirm 'vigilance' had to be used to secure the device, and that a decision on whether the higher cost for i-gel® is worth it depends on further studies of this kind.

A randomized comparison of the i-gel and the ProSeal laryngeal mask airway in pediatric patients: performance and fiberoptic findings

Fukuhara A, Okutani R, Oda Y. J Anesth. 2012; 27(1): 1-6

A prospective, randomised and controlled test of 134 children, aged three months to 15 years old, undergoing general anaesthesia were inserted with either i-gel® size 1.5-3 or ProSeal™ equivalent to gauge insertion performance. Outcome variables included leak pressure, ease of insertion, success rate and fiberoptic view. Most outcomes were very similar, however fiberoptic view was significantly better with i-gel®.

Initial experience of the i-gel® supraglottic airway by the residents in pediatric patients

Abukawa Y, Hiroki K, Ozaki M. J Anesth. 2012; 26(3): 357-61.

This study investigated the use of paediatric i-gel® by residents on a total of 70 children of ASA score I-II undergoing surgery, split into three groups. Group 1: size 1.5; group 2: size 2; group 3: size 2.5. Seven characteristics were evaluated, including ease of i-gel® and gastric tube insertion, leak pressure and hypoxia rate. Overall insertion success rate and first-attempt success rate were 99% and 94% respectively, with gastric tube insertions easy in all cases. Results show that the i-gel® is a safe and effective device for use by residents with limited experience of paediatric airway devices. The authors warn that special attention should be given when using size 1.5 that the airway is protected.

A randomized equivalence trial comparing the i-gel® and laryngeal mask airway Supreme in children

Jagannathan N, Sommers K, Sohn LE, Sawardekar A, Shah RD, Mukherji II, Miller S, Voronov P, Seraphin S. Paediatr Anaesth.; 23(2): 127-33

Total of 170 children were assigned to either the i-gel® or LMA Supreme®, with leak pressure the primary outcome measured. Secondary evaluations included insertion time, insertion success rate, fiberoptic view and complications, to name a few. Resulting median leak pressure was higher with i-gel® and the authors conclude it could be a 'useful alternative to the Supreme®'.

The i-gel®, a single-use supraglottic airway device with a non-inflatable cuff and an esophageal vent: An observational study in children

Beylacq L, Bordes M, Semjen F, Cros AM. Acta Anaesthesiol Scand 2009; 53(3): 376-379

This study evaluated the i-gel® in 50 children above 30kg undergoing short-duration surgery. The parameters measured included: ease of insertion, seal pressure, ease of inserting a gastric tube and post operative complications. The first time insertion success rate was 100%. No laryngeal leak occurred. The mean seal pressure was 24.9cm H₂O. The authors concluded that i-gel® was very easy to insert and that 'no learning curve is needed before a high success insertion rate is obtained. The i-gel® appears to be safe for paediatric management'.

Case Reports and Correspondence

Resuscitation and Emergency Medicine

iGel supraglottic airway use during hospital cardiopulmonary resuscitation

Larkin CB, d'Agapeyeff A, King BP, Gabbott DA.

Resuscitation 2012; 83(6): E141

100 size 4 i-gel® airways were inserted in patients by a mixture of nurses, junior doctors and Resuscitation Officers, either before or after bag valve mask ventilation. 83/100 insertions were considered 'Easy' and 82/100 were inserted at the first attempt, with only one attempt resulting in complete failure. Presence of an audible leak and visible chest movement via synchronous and asynchronous ventilation were measured. 99% of users confirmed they would prefer to use i-gel® instead of an oropharyngeal airway. Authors confirm that, as a result of this test, i-gel® is their preferred supraglottic airway device of choice during the initial phase of CPR whilst the Resuscitation Team is summoned.

Pre-hospital transient airway management using the I-gel with sustained spontaneous breathing in different emergency situations

Tiesmeier J, Emmerich M. Minerva Anesthesiol 2010; 79(2): 212-3

Three case studies where an i-gel® was used in an emergency situation are presented on the back of the authors' previous knowledge that this SAD has 'advantageous characteristics', including quick insertion time, good seal pressures and high success rates. Cases were: a 'violent' but sedated male patient; a 69-year-old patient suffering a cerebral seizure; and an unconscious and intoxicated patient found at home. Regurgitation and aspiration were not seen in any case. Authors conclude that, alongside other pre-clinical emergency situations, i-gel® can be used in cases of sustained spontaneous breathing, and 'could be considered for extended use outside the hospital'.

The i-gel® supraglottic airway and resuscitation - some initial thoughts

Soar J. Resuscitation 2007; 74(1): 197

This case report detailed use of a size four i-gel® during a cardiac arrest. The i-gel® was inserted in <10 seconds from opening the packet. The author was able to ventilate the patients lungs easily using a self-inflating bag-valve device connected to the i-gel®. The patients lungs were ventilated asynchronously during chest compressions with no leak. There was no evidence of aspiration. In addition, this case report confirmed the training of five non-anaesthetic trainee doctors to insert the i-gel® and ventilate an anaesthetised patient after minimal instruction. All these trainees rated i-gel® easier to insert than a laryngeal mask airway.

Pre-hospital resuscitation using the i-gel®

Thomas M, Bengner J. Resuscitation 2009; 80(12): 1437

This correspondence article describes 12 attempts to ventilate patients in cardiac arrest using the i-gel®. The device could usually be inserted on the first attempt; however, on seven out of 12 occasions ventilation was then found to be inadequate. The i-gel®s were correctly positioned, but there were large leaks. The authors state that the reason for this is unclear, but that the device may be harder to position correctly when patients are not in the most appropriate position for insertion. An alternative explanation is that higher pressure is needed to ventilate the lungs after cardiac arrest, in which case other supraglottic airways should have the same problem.

The i-gel® supraglottic airway: A potential role for resuscitation?

Gabbott DA, Beringer R. Resuscitation 2007; 73(1): 161-162

A letter on initial findings following clinical use of i-gel® in 100 patients. In order to evaluate its potential use in a resuscitation setting, the investigators confined their use to a size four device. They used i-gel® on 100 patients undergoing elective surgery under general anaesthesia. The device was used in patients with a weight range of 40-100kg. In 98/100 cases, the i-gel® was adequately positioned on the first or second attempt. The mean and median leak on sustained pressure was 24cmH₂O. Airway trauma, demonstrated by visible blood on the device on removal, was only detected on one occasion. There was one case of regurgitation. The gastric fluid was successfully vented through the oesophageal drainage port without any evidence of aspiration.

Failure to ventilate with supraglottic airways after drowning

Baker P, Webber J. Anaesth Intensive Care 2011; 39(4): 675-7

Reported failure of an i-gel® and an Ambu® AuraOnce™ to ventilate a drowning victim due to changes in lung physiology following inhalation of water requiring ventilation pressures up to 40cmH₂O. Authors say that supraglottic airways, thanks to rapid insertion, are recommended for resuscitation as they facilitate the continuation of cardiac compression, however low leak pressures may cause inadequate ventilation and entrainment of air into the stomach of drowning victims.

Difficult Airways

Reverse technique for i-gel® supraglottic airway insertion

Sen I, Bhardwaj N, Latha YS. *J Anaesth Clin Pharmacol* 2013; 29: 128-9

Case reported of tongue folding during procedure on a 30-year-old woman. Usual insertion technique did not provide a patent airway, so the authors confirm they used a reverse technique - proving successful. Authors conclude the technique was atraumatic and may be a suitable back-up.

The i-gel® in failed obstetric tracheal intubation

Berger M, Corso RM, Piraccini E, Agnoletti VA, Valtancoli E, Gambale G. *Anaesth Intensive Care* 2011; 39(1): 136

A 36-year-old morbidly obese pregnant woman presented for emergency caesarian was anaesthetised using RSI. To limit insertion attempts an i-gel® was used, successfully inserted at the first attempt and a healthy baby was delivered with no further complication to the mother. Concluded that i-gel® is likely to be the better airway management device when speed is of the essence, compared to other laryngeal masks.

Successful use of i-gel in three patients with difficult intubation and difficult ventilation

Asai T. *Masui*. 2011; 60(7): 850-2

Three cases of successful ventilation using the size three i-gel® on female patients with a mix of predicted and unpredicted difficult intubation, and where both facemask ventilation and tracheal intubation were difficult. Author concludes that i-gel 'has a potential role as a rescue device, by allowing ventilation and tracheal intubation in patients with difficult airways.'

The use of the i-gel® in a developing country

Piraccini E, Bartolini A, Agnoletti V, Corso R, Gambale G, Vicini C. *Am J Emerg Med* 2010; 28(7): 840-41

This case report describes the successful use of an i-gel® for a 24-year-old ENT patient in a Columbian hospital. An initial attempt at direct laryngoscopy failed because of a lack of the necessary tools; a size two Miller blade was the only adult blade available. A size three i-gel® was subsequently inserted and immediately established airway patency to facilitate intubation.

Use of an i-gel® in a 'can't intubate/can't ventilate' situation

Corso RM, Piraccini E, Agnoletti V, Gambale G. *Anaesth Intensive Care* 2010; 38(1): 211

This report details the use of an i-gel® to provide an airway for a 63-year-old male with severe subglottic swelling. Two prior attempts at insertion of a gum elastic bougie failed and facemask ventilation was ineffective. A well-known brand of laryngeal mask was inserted, but ventilation was impossible, so it was removed and replaced with an i-gel®. Subsequent intubation through the i-gel® was performed successfully with a flexible fibroscope.

The use of an i-gel® supraglottic airway for the airway management of a patient with subglottic stenosis: a case report

Donaldson W, Michalek P. *Minerva Anesthesiol* 2010; 76(5): 369-372

This report details the case of a 47-year-old woman with subglottic stenosis. During preoperative screening she stated that there had been difficulty inserting an endotracheal tube during an earlier procedure. During anaesthesia, a size four i-gel® was inserted on the first attempt. A fibroscope was passed down the i-gel® and into the trachea, where subglottic stenosis could be seen. The i-gel® showed no signs of leaking and did not cause any trauma. The authors note that this is the first case report where an i-gel® has been used in a patient with subglottic stenosis, and state that preoperative tests should be carried out before choosing to use the device in this situation.

Airway management using i-gel® in two patients for awake craniotomy

Tsuruta S, Yamada M, Shimizu T, Satsumae T, Tanaka M, Mizutani T. *Masui* 2010; 59 (11): 1411-1414

This paper describes the use of an i-gel® for ventilation during two craniotomy procedures. Both patients were anaesthetised and operated on using the asleep-awake-asleep technique. The i-gel® was inserted successfully and removed for the first time as the patients were able to respond to their own names being called. After the 'awake' period of surgery was complete, the i-gel® was reinserted easily in both cases despite a 30° rotation of the neck. There were no adverse incidents. The authors conclude that the i-gel® is appropriate for use during asleep-awake-asleep surgery due to the ease of insertion when the neck is rotated.

i-gel® supraglottic airway for rescue airway management and as a conduit for intubation in a patient with acute respiratory failure

Campbell J, Michalek P, Deighan M. *Resuscitation* 2009; 80(8): 963

This case report details the case of a 54-year-old man with acute respiratory failure, who had a grade four view at laryngoscopy. He was difficult to bag-mask ventilate and a laryngeal mask was inserted as an airway rescue technique. As ventilation was not possible with this device, it was removed and a size four i-gel® inserted. This allowed good ventilation. A fibroscope was passed down the airway channel and a 7.0mm endotracheal tube passed over the fibroscope and through the i-gel®. The i-gel® was then removed, leaving the airway secure.

Use of the i-gel® laryngeal mask for management of a difficult airway

Emmerich M, Dummler R. *Anaesthesist* 2008; 57(8): 779-781

In this case report, the i-gel® was used as a conduit for intubation in a patient who was known to have problems with intubation. Direct laryngoscopy was not possible, but ventilation and a good fiberoptic view of the glottis were achieved by using the i-gel®. Intubation via the device was completed successfully using a 6.0mm cuffed endotracheal tube.

Use of an i-gel® for airway rescue

Joshi NA, Baird M, Cook TM. Anaesthesia 2008; 63(9): 1010-1026

A middle-aged female patient was scheduled for an elective operation on her hand. She had undergone several general anaesthetics in the past when a cLMA had been used without documented problems. She had a Mallampati score of three and a thyromental distance of 6cm. Face mask ventilation with an oropharyngeal airway was extremely difficult. A pLMA was inserted, but ventilation was not possible. A size four cLMA was also tried with the same result. A size four i-gel® was then inserted. This immediately provided unobstructed ventilation and stable oxygenation saturation of 98%. The authors commented that 'the i-gel®'s role in difficult airway management remains to be established, but its ease of insertion, short wide airway tube and good airway leak pressures make it a potentially useful airway device in cases of difficult mask ventilation.'

The i-gel® airway for ventilation and rescue ventilation

Sharma S, Rogers R, Popat M. Anaesthesia 2007; 62(4): 412-423

This case report concerns use of an i-gel® on a teenage patient scheduled for closure of colostomy. Two years previously he had a grade 3 (Cormack & Lehane) view at laryngoscopy. On this occasion there were no clinical features to predict difficult intubation. Laryngoscopy revealed a grade 4 view. Two attempts at tracheal intubation with a gum elastic bougie failed. A cLMA® was inserted. Despite providing satisfactory ventilation, two attempts at fiberoptic intubation through the device failed. A size 4 i-gel® was inserted and satisfactory ventilation achieved. After fiberoptic confirmation of a good view of the vocal cords, a size 6.5mm cuffed tracheal tube was successfully passed through the i-gel® blindly into the trachea at the first attempt. The i-gel® was left in place until extubation.

Conduit for Intubation

General anesthesia in a case of right-sided aortic arch with Kommerell's diverticulum diagnosed on preoperative examination

Nakano S, Uda R, Nakajima O, Yamamoto N, Akatsuka M. Masui 2012; 61(7): 765-8

Case of the use of i-gel as preferred airway device and vehicle for tracheal intubation in a 59-year-old male with known Kommerell's diverticulum, scheduled for repair of a tibial fracture under general anaesthesia. The i-gel® resulted in an uneventful operation with both controlled and spontaneous respiration, and the authors' conclude that i-gel® is a useful device in such specific cases.

The i-gel® supraglottic airway- a useful tool in case of difficult fiberoptic intubation

Emmerich M, Tiesmeier J. Minerva Anesthesiol 2012; 78(10): 1169-70

A 69-year-old man with a history of difficult intubation could not be intubated via conventional bronchoscopy. Different ETT sizes and airway manoeuvres were tried without success, until the bronchoscope was properly placed through a size 5 i-gel. Operation was completed without complication and the patient reported no neck discomfort or difficulty breathing.

Tracheal intubation through i-gel® conduit in a child with post-burn contracture

Gupta Richa, Gupta Ruchi, Wadhawan S, Bhadoria P. J Anaesth Clin Pharmacol 2012; 28(3): 397-398

Report of i-gel® (size 2.5) used as a conduit for intubation on a nine-year-old girl scheduled for post-burn contracture with limited neck extension. Spontaneous ventilation and depth of anaesthesia were maintained, even after removal of the i-gel®. Authors conclude that fiberoptic ventilation through i-gel® is a 'highly successful technique'.

Comparison of the i-gel® supraglottic airway as a conduit for tracheal intubation with the intubating laryngeal mask airway

Xue, FS, Wang, Q, Yuan, YJ, Xiong, J, Liao, X. Resuscitation 2010; 81(7): 910

This letter points out some issues with the manikin intubation study carried out by Michalek et al (2010). The study claimed to compare fiberoptic and blind intubations in the i-gel® and ILMA®, however only the blind intubation was fully assessed. It may have been more useful to compare a wider range of intubation aids. The authors warn that endotracheal tubes are often a similar length to the intubating airway, and that removal should be studied. It is stated that the results of the study only apply to manikins, not clinical practice.

Reply to letter: Comparison of the i-gel® supraglottic airway as a conduit for tracheal intubation with the intubating laryngeal mask airway

Michalek, P, Donaldson, W. Resuscitation 2010; 81(7): 911

This article is a response to Xue et al (2010). The authors generally agree that there are limitations to this study. However, the tracheal tubes used were noticeably longer than the body of the i-gel®. Although the results of manikin studies cannot be extrapolated to clinical practice, they are an important part of the testing needed before a product is used on patients.

Fiberoptic intubation through an i-gel® supraglottic airway in two patients with predicted difficult airway and intellectual disability

Michalek P, Hodgkinson P, Donaldson W. Anesth Analg 2008; 106(5): 1501-1504

This case study describes successful fibre-optic guided tracheal intubation through the i-gel® in two uncooperative adult patients with learning disability and predicted difficult airway. The i-gel® maintained the airway immediately after induction, allowing oxygenation and ventilation. Fiberoptic identification of the laryngeal inlet was successful on the first attempt and a tracheal tube inserted into the trachea, without complication, in both patients.

Other

The i-gel™ - A promising airway device for magnetic resonance imaging suite

Taxak S, Bhardwaj M, Gopinath A. J Anaesth Clin Pharmacol 2012; 28(2): 263–264

Two successful cases of paediatric i-gel® used to manage the airway during brain MRI under general anaesthesia. The first, a three-month-old, was maintained using size one; whilst a size two was used on the second case, a boy aged three-and-a-half with a Mallampati score of two. Usual capnography readings taken to ensure secure placement, and in both cases there was no evidence of desaturation. Compared to other laryngeal mask airways, the authors conclude that i-gel® suffers no risk of displacement, meaning intubation does not have to be repeated on known sensitive patients. They also deduce that i-gel® has other advantages, including ease of insertion and minimum adverse effects on removal of the device. Large studies are required, however, to 'confirm its usefulness'.

Tracheal compression caused by oversized i-gel® in children

Agnoletti V, Piraccini E, Corso RM, Cittadini A, Maitan S, Della Rocca G, Gambale G. Minerva Anestesiol 2012; 79(1):107-8

Unlike other supraglottic airway devices, paediatric i-gel® does not cause artifacts when used for MRI. The authors of this study found, after evaluation, that the patient weight grading could be an inadequate criteria for i-gel® selection for MRI due to the potential for partial or even complete airway obstruction. This study does not rule out the use of a paediatric i-gel® entirely, merely pointing to the importance of size selection. The authors deduce that further studies in this area should be conducted to substantiate the evidence.

The use of i-gel® extraglottic airway during percutaneous dilatational tracheostomy: a case series

Corso RM, Piraccini E, Agnoletti V, Baccanelli M, Coffa A, Gambale G. Minerva Anaestesiol 2011; 77(8): 852-3

The i-gel® was used in eight patients for tracheostomy. Patients were extubated and the ET tube was replaced with the i-gel®. A percutaneous tracheostomy kit was then advanced to the second tracheal ring and the procedure was performed. Arterial pressure, PaO₂/FiO₂, minute ventilation and airway pressure were measured before, during and after tracheostomy. There were no significant differences in ventilatory and haemodynamic parameters. Use of the i-gel® was successful in seven of eight patients. The i-gel® provided better views of the glottis compared to the cLMA and ventilation was comparable to the ET tube. Large trials must take place to determine whether a one in eight failure rate remains.

Lubrication of the i-gel® supraglottic airway and the classic laryngeal mask airway

Chapman D. Anaesthesia 2010; 65(1): 89

This letter is a response to the 2009 study by Janakiraman (see page 7) et al. which compared the i-gel® to the LMA Classic®. In that study, the authors stated that the devices were lubricated along the tip and the posterior surface. However, the correct lubrication procedure for the i-gel® is different; the thermoplastic material used to make the device is tacky until lubricated and requires lubrication on all four sides of the cuff.

Insertion of the i-gel® airway in prone position

Taxak S, Gopinath A. Minerva Anestesiol 2010; 76(5): 381

This case study describes the use of the i-gel® while the patient was in a prone position for surgery. A 45kg 16-year-old boy laid in a prone position with his head turned laterally. After induction of anaesthesia, a size three i-gel® was inserted on the first attempt. There were no adverse events either during or after surgery and the i-gel® was removed while the patient was still prone. Previous research has shown that the cLMA and ProSeal™ airways can be inserted in the prone position, and i-gel®s have successfully ventilated prone patients who were turned over after insertion. However, this is the first reported case of i-gel® insertion while the patient is already prone. Routine use of this technique should only occur after further research has taken place.

Insertion of the i-gel® airway obstructed by the tongue

Taxak S, Gopinath A. Anaesthesiology 2010; 112(2): 500-501

This correspondence article responds to Theiler et al's comments on the design of the i-gel® and subsequent effects of tongue size. The authors state that they have noticed a similar issue where the patient's tongue is carried towards the back of the mouth by the i-gel®, which then cannot be inserted fully. The i-gel® had to be removed and re-inserted. The authors recommend stabilising the tongue before attempting to insert the device. A reply from the authors of the original report says that a tongue retractor should be used for this rather than fingers. This response also points out that although the tongue may also get caught between the teeth and the i-gel® bite block, this could happen with any supraglottic airway.

Successful use of the i-gel® airway in prone position surgery

Senthil Kumar M, Pandey R, Khanna P. Pediatr Anaesth 2009; 19(2): 176-7

This report highlighted the case of a 10-year-old child, weighing 30kg, scheduled for an elective pyeloplasty. A size three i-gel® was inserted and secured after confirming correct placement and a suction catheter inserted down the gastric channel. The child was positioned prone and the correct positioning of i-gel® reconfirmed by appropriate CO₂ wave form, absence of audible leak and chest auscultation. At the end of the procedure, the child was returned to a supine position and i-gel® removed after reversal. The patient recovered without any complications.

i-gel® and lightening of anaesthesia?

Ghai A, Saini S, Hooda S. Anaesthesia 2009; 64(10): 1151

This letter is a response to Baxter's 2008 report of lightened anaesthesia due to a leak from the gastric channel of the i-gel®. The authors found that they experienced similar problems with the LMA Supreme®. No glottic structures were visualised on fibroscopy through the airway channel, and through the gastric channel, it revealed the tip in front of the glottis rather than the oesophagus.

Tongue trauma associated with the i-gel® supraglottic airway

Michalek P, Donaldson WJ, Hinds JD. Anaesthesia 2009; 64(6): 692-693

This article includes three cases of patient injury caused by the i-gel®. In the first case, a paramedic had difficulty inserting the device. It was removed immediately and it was found that the patient was bleeding from the frenulum. The second patient's tongue was caught in the bowl of the i-gel® during insertion. Although the i-gel® was repositioned successfully, there was minor swelling and bleeding upon removal. This patient reported soreness for three days. The final case involved an insertion which appeared successful, however the patient reported a sore tongue and loss of taste lasting three weeks. The authors recommend two alternative insertion techniques to avoid mouth injuries – sliding the i-gel® over the thumb into the mouth or rotating the device so the tongue cannot get caught.

Supreme! Or is it?

Kushakovsky V, Ahmad I. Anaesthesia 2009; 64(11): 1262

This letter is a response to a small LMA Supreme® study. The authors say that they have been using the device in patients having nasopharyngeal surgery as it protects the airway from any bleeding and has a gastric channel to remove any blood in the stomach. However, they have reviewed recent research and believe that their current practice may change. In previous studies, the i-gel® has performed as well as the LMA Supreme® even when all i-gel® patients have been given a size 4 device and the LMA Supreme® has been sized correctly. Gastric tube placement in the two devices and the LMA ProSeal® is also comparable. The authors are considering the use of the i-gel® or ProSeal™ instead of the Supreme™.

Supreme! Or is it? A reply

Cook TM, Gatward JJ. Anaesthesia 2009; 64(11): 1262-1263

This letter is a response to Kushakovsky and Ahmad (2009 - see above) regarding the performance of the LMA Supreme®, LMA ProSeal™ and i-gel® devices. The letter states that the i-gel® and ProSeal® have both been shown to vent gastric contents when they have good placement and oesophageal seal, but that this has not been studied in the LMA Supreme®. Only small studies comparing the LMA Supreme®, ProSeal and i-gel® are available, although these generally show comparable performance. The authors recommend further research with larger study populations.

Case series: protection from aspiration and failure of protection from aspiration with the i-gel® airway

Gibbison B, Cook TM, Sellar C. Br J Anaesth 2008; 100(3): 415-417

Regurgitation of gastric contents was seen in three low-risk patients during anaesthesia. In two patients where only low volumes of gastric fluid were seen flowing from the i-gel®, there was no sign of aspiration. An 85kg male patient regurgitated large amounts of liquid, and although this was mostly expelled from the i-gel®'s gastric channel there were signs of minor aspiration. The i-gel® allowed early identification of regurgitation in these cases.

Nerve damage following the use of an i-gel® supraglottic airway device

Theron AD, Loyden C. Anaesthesia 2008; 63(4): 441-442

This article describes a post-operative complication after i-gel® use. The patient was successfully ventilated with a size four i-gel®, which was in line with the recommendation for the patient's weight (85kg). After surgery, the patient reported numbness in the lower lip. An examination shows swelling and an ulcer on the inside of the lip. There are two possible explanations for this injury – the patient's lip may have been caught in the tape used to secure the i-gel® or it may have been caught in between the i-gel® and the patient's teeth. The authors warn that this could occur with any airway device, but that extra care should be taken with the i-gel® due to the bulkier design.

Aspiration recognition with an i-gel® airway

Liew G, John B, Ahmed S. Anaesthesia 2008; 63(7): 786

A report on a case of a young male patient undergoing surgery where i-gel® helped with the recognition and management of regurgitation. During this case, gastric contents were noticed to be coming out of the gastric channel. No secretions were evident in the airway channel. As regurgitation continued, surgery was paused and the patient's airway secured following rapid sequence induction. 'Laryngoscopy revealed a clear view of the trachea (Cormack & Lehane grade 1) with no evidence of gastric contents', the patient remained stable throughout the remainder of the operation. There was no clinical evidence of aspiration and a post-op chest X-ray revealed clear lung fields. It transpired the patient had consumed a can of Coca-Cola® a few hours prior to the operation, something he failed to mention during a pre-operative visit.

Phenomenon with i-gel® airway?

Baxter, S. Anaesthesia 2008; 63(11): 1265

This correspondence article reports a problem that occurred in two patients ventilated with an i-gel® during anaesthesia. In the first case, anaesthesia started to lighten and end-tidal sevoflurane fell. The user suspected air entrainment through the suction port. In the second case, anaesthesia remained stable but end-tidal sevoflurane still dropped. The user placed a finger over the suction port and sevoflurane levels returned to normal. In both cases, the i-gel® was replaced with a laryngeal mask airway.

Phenomenon with i-gel® airway: a reply

Chapman D. Anaesthesia 2009; 64(2): 228

This letter is a reply to Baxter (2008). Baxter described two incidents where air was 'entrained through the suction port' leading to decreased end-tidal sevoflurane and lightened anaesthesia. This response suggests that the devices in question may not have been inserted fully, meaning that the airway and gastric channels were not isolated from each other. To ensure full insertion takes place, users should make sure that the level of anaesthesia, patient position and insertion method are correct.

Early experiences with the i-gel®

Dinsmore J, Maxwell W, Ickeringill M. J Resuscitation 2007; 5(4): 574-575

In the study described in this letter, 39 anaesthetists completed ease of use surveys for 227 i-gel® devices. Compared with their experience of the cLMA®, the anaesthetists considered the i-gel® quick and easy to insert. Insertion and ventilation on the first attempt were successful in the majority of cases. There were 18 unsatisfactory airways, six of which were caused by incorrect sizing. The i-gel® was comparable to the cLMA® in terms of adverse effects such as visible blood and sore throat.

Evaluation of the i-gel® airway in 300 patients

Bamgbade OA, Macnab WR, Khalaf WM. Eur J Anaesthesiol 2008; 25(10): 865-866

This letter reported that first time insertion with i-gel® was achieved in <5 seconds in 290/300 patients. Three patients with difficult airway underwent successful fiberoptic endotracheal intubation through i-gel® and all patients underwent adequate pressure mode ventilation with airway pressures of 10-30cm H₂O initially and spontaneous breathing subsequently. In addition, lubricated gastric tubes were easily inserted through the gastric channel at the first attempt in all 80 cases where this was performed. The authors concluded that 'i-gel® is very suitable for peri-operative airway management, positive pressure ventilation and weaning from ventilation. It is also useful as an intubation aid and has a potential role in airway management during resuscitation. It is very easy to use, highly reliable and associated with minimal morbidity. The gastric channel separates the oesophagus from the larynx and provides protection from aspiration. Further studies are required to compare i-gel® with other supraglottic devices.'

Reviews and Editorials

Resuscitation and Emergency Medicine

Airway management for out-of-hospital cardiac arrest – more data required

Nolan JP, Lockey D. Resuscitation 2009; 80(12): 1333-1334

This editorial discusses the options that are available for airway management when cardiac arrest occurs outside an hospital environment. It is stated that supraglottic airways are easier to insert than endotracheal tubes and have the added benefit of allowing chest compressions to continue while they are inserted. The article references i-gel® studies with both positive and negative outcomes. Overall, insertion time was quicker but ventilation was sometimes found to be inadequate. One study showed that the i-gel® had a higher leak pressure than the cLMA, however a German study found that the i-gel® produced a tight seal at 20cm H₂O in only around half of the patients involved. Most of the available i-gel® data comes from small studies. Randomised controlled trials are needed to confirm the performance of the i-gel® and other supraglottic airways during CPR.

Other

Pulmonary aspiration associated with supraglottic airways: Proseal laryngeal mask airway and I-gel

Kim YH. Korean J Anesthesiol 2012; 63(6): 489-490

Review assessing the use of SGAs in patients with increased risk of aspiration, focusing on five devices and the evidence to date. Provides a review of the common features of SGAs, including i-gel®, and the benefits they may bring. Author appears critical of the practice of using these devices, however later states that pulmonary aspiration may occur more through user error rather than device failure.

National census of airway management techniques used for anaesthesia in the UK: first phase of the Fourth National Audit Project at the Royal College of Anaesthetists

Woodall NM, Cook TM. Br J Anaesth 2011; 106 (2): 266-271

There are 309 NHS hospitals that carry out surgery. In this study, a volunteer from each of these hospitals reported the main airway management technique used in every general anaesthetic within a specified two-week period. This data was then used to estimate the annual use of various airway devices. The total number of procedures was 114,904, leading to an annual estimate of 2.9 million. Supraglottic airways were used in 56.2% of cases. The i-gel® was the second most popular choice of supraglottic airway with 4574 cases. This equates to 7.1% of supraglottic airways and 4% of all devices used.

What's new in supraglottic airways? Three decades of evolution to tract separation

Viernes DC, Joffe AM, Goldman AJ. Anaesthesiology News Guide to Airway Management 2010; 9-14

This paper describes the history of the gastric channel in supraglottic airways, providing case reports and performance comparisons between devices. The section on the i-gel® states that the device has inferior seal pressure compared to the LMA Proseal®, but that drainage through the gastric channel was comparable. The i-gel® is quicker and easier to place than standard LMAs. A case report is included which describes the successful use of a size five i-gel® in a 63-year-old man with a difficult airway.

Supraglottic airway devices: recent advances

Cook T, Howes B. CEACCP 2010; 11 (2): 56-61

This review article looks at the evidence for the efficacy of supraglottic airway devices. The authors use the cLMA as a standard for comparison. The ProSeal™, i-gel®, LMA Supreme® and LTS Mk. IITM are all discussed. Most of the i-gel® literature is positive and shows a high level of successful use. However, more clinical trials need to take place in order to confirm these findings.

Supraglottic airways and pulmonary aspiration: the role of the drain tube

Drolet P. Can J Anesth 2009; 56(10): 715-720

This article discusses the gastric channel or drain tube as a safety feature provided in supraglottic airways. Although pulmonary aspiration of gastric contents is a relatively rare event, it can be made rarer with the use of devices that include a gastric channel, particularly if they are inserted using a bougie. i-gel® is discussed.

Airway techniques and ventilation strategies

Nolan JP, Soar J. Curr Opin Crit Care 2008; 14(3): 279-286

This review by Jerry Nolan and Jasmeet Soar discusses the advantages and disadvantages of various methods of airway management during cardiopulmonary resuscitation, and the role of ventilation during out-of-hospital CPR. In the section on supraglottic airways, i-gel® was one of a number of devices mentioned. It confirmed that the ease of insertion of the i-gel® and its favourable leak pressure make it 'theoretically very attractive as a resuscitation device for those inexperienced in tracheal intubation'. It also confirmed further study was required.

Use of the epiglottic airway i-gel® during anaesthetic maintenance: first clinical impressions

Mustafaeva MN, Mizikov VM, Kochneva ZV, Vashchinskaia TV, Sarkisova NG, Rusakov MA, Levitskaia NN. Anesteziol Reanimatol 2008; (5): 55-58

This paper describes the development of supraglottic airways and the i-gel® in particular. A review of the available i-gel® literature showed that there are considerable benefits to using the device during general anaesthesia. The experiences of the authors during the use of i-gel® in 34 patients are also described. The authors believe that the i-gel® is suitable for use during anaesthesia and potentially resuscitation. However, more research should be carried out, especially in terms of comparison with other supraglottic airways.

Airway management in the outpatient setting: new devices and techniques

Jolliffe L, Jackson I. Curr Opin Anaesthesiol. 2008; 21(6): 719-722

This review highlighted the potential benefits of the current supraglottic airway devices available and their suitability for ambulatory surgery. With regard to i-gel®, it was commented that it was designed to 'anatomically fit the perilaryngeal and hypolaryngeal structures without the need for an inflatable cuff. This offers the potential for easier insertion, reduced tissue compression and increased stability after insertion.' They further reported that 'Higher mean seal pressures help to facilitate ventilation in laparoscopic work'.

Are supraglottic airways a safe alternative to tracheal intubation for laparoscopic surgery?

Thompson J, O'Neill S. Br J Hosp Med 2008; 69(5): 303

This review article compares supraglottic airways to tracheal intubation for laparoscopic surgery. Evidence gathered so far indicates that supraglottic airways such as the i-gel® produce adequate ventilation and pressures with a reduced risk of complications such as aspiration. The authors state that further investigation should take place to determine whether these devices can be used in obese patients during laparoscopic procedures.

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