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### Literature search results

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#### Search details

Is there a place for ProSeal LMA, Supreme LMA and Air-Q self-pressurising masked laryngeal airway for obese patients in day surgery?

#### Resources searched

NHS Evidence; TRIP Database; Cochrane Library; AMED; BNI; CINAHL; EMBASE; HMIC; Health Business Elite; MEDLINE; PsychINFO; Google Scholar; Google Advanced Search

#### Database search terms: ProSeal LMA, Supreme LMA, laryngeal masks, obese patients(s), airway management, day surgery

#### Evidence search string(s):

#### Google search string(s):

#### Summary

I have not been able to find any one document which includes all of the details required - obese surgery, day patients AND ProSeal or Supreme LMA and A-Q. I hope that the documents found will help.

#### Guidelines and Policy

1. Day case and short stay surgery, AAGBI, 2011
2. Peri-operative management of the morbidly obese patient
Evidence-based reviews

1. Nicholson A, Cook TM, Smith AS et al
   Supraglottic airway devices vs tracheal intubation for airway management during general anaesthetic in obese patients.
   Cochrane Review, 2013

2. Brief review: The LMA SupremeTM supraglottic airway.
   Citation: Canadian Journal of Anaesthesia, May 2012, vol./is. 59/5(483-93), 0832-610X;1496-8975 (2012 May)
   Author(s): Wong DT; Yang JJ; Jagannathan N
   Abstract: PURPOSE: This article is a review of the efficacy and safety of the Laryngeal Mask Airway (LMA) SupremeTM as a stand-alone supraglottic airway during general anesthesia and as a conduit for tracheal intubation. Relevant articles were obtained using MEDLINE (1948-July 2011) and EMBASE (1980-July 2011). Only original studies with adult human patients and published in English were selected. PRINCIPAL FINDINGS: The LMA Supreme was found to be comparable with the LMA ProSealTM with regard to success rate, insertion time, and complications. However, in three studies, oropharyngeal leak pressure was higher with the LMA Proseal than with the LMA Supreme. The LMA Supreme was superior to the LMA ClassicTM with regard to insertion time and oropharyngeal seal pressure. The LMA Supreme was also used successfully in two difficult airway cases, and it has been used as a conduit for tracheal intubation by utilizing an intubation introducer (gum elastic bougie) and subsequently railroading an endotracheal tube over the bougie into the trachea. Techniques for achieving tracheal intubation include the use of the Aintree Intubation Catheter, a guidewire-exchange catheter, a gum elastic bougie, and a small (<6.0mm internal diameter) endotracheal tube. CONCLUSION: The LMA Supreme has been shown to be a safe and efficacious device as a stand-alone supraglottic airway and may also be used as a conduit for tracheal intubation. Further trials are needed to determine the efficacy of the LMA Supreme compared with other supraglottic airways in both elective and emergent airway management situations.
   Publication Type: Journal Article; Research Support, Non-U.S. Gov't; Review Source: MEDLINE

3. The ProSeal laryngeal mask airway: a review of the literature.
   Citation: Canadian Journal of Anaesthesia, August 2005, vol./is. 52/7(739-60), 0832-610X;0832-610X (2005 Aug-Sep)
   Author(s): Cook TM; Lee G; Nolan JP
   Abstract: PURPOSE: To analyze and summarize the published literature relating to the ProSeal LMA (PLMA): a modification of the “classic LMA” (cLMA) with an esophageal drain tube (DT), designed to improve controlled ventilation, airway protection and diagnosis of misplacement. SOURCE: Articles identified through Medline and EMBASE searches using keywords "Proseal", "ProSeal" and "PLMA". Hand searches of these articles and major anesthetic journals from January 1998 to March 2005. PRINCIPAL FINDINGS: Searches identified 59 randomized controlled trials or clinical studies and 79 other publications. Compared to the cLMA, PLMA insertion takes a few seconds longer. First attempt insertion success for the PLMA is lower, but overall success is equivalent. Airway seal is improved by 50%. The DT enables early diagnosis of mask misplacement, allows gastric drainage, reduces gastric inflation and may vent regurgitated stomach contents. Evidence suggests, but does not prove, that the correctly placed PLMA reduces aspiration risk compared with the cLMA. PLMA use is associated with less coughing and less hemodynamic disturbance than use of a tracheal tube (TT). Comparative trials of the PLMA with other supraglottic airways favour the PLMA. Clinicians have extended the use of the PLMA inside and outside the operating theatre including use for difficult
airway management and airway rescue. CONCLUSIONS: The PLMA has similar insertion characteristics and complications to other laryngeal masks. The DT enables rapid diagnosis of misplacement. The PLMA offers significant benefits over both the cLMA and TT in some clinical circumstances. These and clinical experience with the PLMA are discussed.

Publication Type: Journal Article; Review
Source: MEDLINE
Full Text: Available from Canadian Journal of Anaesthesia in Lincoln County Hospital Professional Library;

Citation: Current Opinion in Anaesthesiology, December 2008, vol./is. 21/6(719-22), 0952-7907;1473-6500 (2008 Dec)
Author(s): Jolliffe L; Jackson I
Abstract: PURPOSE OF REVIEW: There are an ever-increasing number of supraglottic airway devices available on the market, many being suitable for ambulatory surgery and the specific demands it creates. These include constraints of time, high turnover and the need for early and effective discharge. This article hopes to highlight the potential benefits of the current devices available.RECENT FINDINGS: Laryngeal masks are still undoubtedly the most popular supraglottic devices available but there are an increasing number of other airways on offer. Advantages of these include higher seal pressures, ease of insertion and the ability to drain gastric fluids.SUMMARY: Some of the unique advantages offered by certain devices lend themselves well to anaesthesia in ambulatory surgery. The laryngeal mask airway has a proven track record but newer airway devices are becoming more popular and may offer advantages. Further research is needed in this fast-moving field to assess these benefits, especially in specific cohorts of patients (such as the obese), who are appearing with increasing regularity on outpatient surgery lists.

Publication Type: Journal Article; Review
Source: MEDLINE
Full Text: Available from East Midlands Ovid Archive Collection in Current Opinion in Anaesthesiology

5. Elliott RA, Payne K, Moore JK et al
Which anaesthetic agents are cost-effective in day surgery? Literature review, national survey of practice and randomised controlled trial
Health Technology Assesessment, 2002, 6, (30)
http://www.journalslibrary.nihr.ac.uk_data/assets/pdf_file/0007/64924/FullReport-
hta6300.pdf (273 pages)

6. Hoda M Q, Samad K, Ullah H
ProSeal vs Classic laryngeal mask airway for positive pressure ventilation in adult patients undergoing elective surgery.
Cochrane Review, 2011

Published research – Databases

Citation: Anaesthesia, June 2012, vol./is. 67/6(632-9), 0003-2409;1365-2044 (2012 Jun)
Author(s): Jagannathan N; Sohn LE; Sawardekar A; Gordon J; Langen KE; Anderson K
Abstract: We conducted a randomised trial comparing the size-2 LMA SupremeTM with the LMA ProSealTM in 60 children undergoing surgery. The outcomes measured were airway leak pressure, ease and time for insertion, fibreoptic examination, incidence of gastric insufflation, ease of gastric tube placement, quality of the airway during anaesthetic maintenance and complications. There were no statistically significant differences between the LMA Supreme and LMA ProSeal in median (IQR [range]) insertion time (12 (10-15 [7-18]) s vs 12 (10-13 [8-25]) s; p = 0.90), airway leak pressures (19 (16-21 [12-30]) cmH(2) O vs 18 (16-24 [10-34]) cmH(2) O; p = 0.55), fibreoptic position of the airway or drain tube, ease of gastric access and complications. Both devices provided
effective ventilation requiring minimal airway manipulation. The LMA Supreme can be a useful alternative to the LMA ProSeal when single-use supraglottic devices with gastric access capabilities are required. Anaesthesia 2012 The Association of Anaesthetists of Great Britain and Ireland.

**Publication Type:** Comparative Study; Journal Article; Randomized Controlled Trial

**Source:** MEDLINE

**Full Text:** Available from EBSCOhost in Anaesthesia

8. Safety and efficacy of laryngeal mask airway Supreme versus laryngeal mask airway ProSeal: a randomized controlled trial.

**Citation:** European Journal of Anaesthesiology, July 2010, vol./is. 27/7(602-7), 0265-0215;1365-2346 (2010 Jul)

**Author(s):** Seet E; Rajeev S; Firoz T; Yousaf F; Wong J; Wong DT; Chung F

**Abstract:** BACKGROUND AND OBJECTIVE: The Supreme laryngeal mask airway (LMA) is a new single-use polyvinyl chloride supraglottic device that combines the functionality of the ProSeal and Fastrach airways. High oropharyngeal leak pressures are important as they indicate airway protection, feasibility of positive pressure ventilation and likelihood of successful LMA placement. The oropharyngeal leak pressure of the LMA Supreme is not well established versus the LMA ProSeal. This study was designed to compare the safety and efficacy of the LMA Supreme versus the LMA ProSeal in elective ambulatory procedures. METHOD: Hospital ethics board approval was obtained. One hundred and five patients were consented and randomly allocated to LMA Supreme or ProSeal groups. Anaesthesia was induced with intravenous propofol 2-3 mg kg(-1) and fentanyl 1-2 microg kg(-1) and maintained with desflurane in an air-oxygen mixture. Anaesthesiologists with more than 5 years of experience performed all of the LMA insertions. Manometry was used to standardize intracuff pressure at 60 cmH2O. The primary outcome was the oropharyngeal leak pressure. Secondary outcomes were the time and number of attempts for insertion, ease of insertion and the anaesthesiologist's satisfaction score of the airway device. The success on first attempt insertion was measured. Patients were interviewed postoperatively for any pharyngolaryngeal adverse events. RESULTS: A total of 99 patients were analysed for the primary outcome. The mean oropharyngeal leak pressure with the LMA Supreme was 21 +/- 5 cmH2O (95% confidence interval 20-22). This was significantly lower than that of the LMA ProSeal, 25 +/- 6 cmH2O (95% confidence interval 23-27; P<0.001). The success rate of the first attempt insertion was higher for the LMA Supreme than for the LMA ProSeal (98 and 88%, respectively; P=0.04). There was no difference in the median time taken for insertion with the LMA Supreme versus the LMA ProSeal: 26 s (interquartile range 23-45) versus 30 s (interquartile range 20-38), respectively (P=0.16). The ease of insertion, postoperative pharyngolaryngeal adverse events, patient satisfaction scores and anaesthesiologist's satisfaction scores were comparable in both groups. There were no complications of aspiration or nerve injuries. CONCLUSION: The LMA Supreme has lower oropharyngeal leak pressures than the LMA ProSeal. The success of the first attempt insertion was higher for the LMA Supreme. The LMA Supreme is a safe, efficacious and easy-to-use disposable supraglottic airway device in elective ambulatory procedures. The higher rate of success on first attempt insertion may make it more suitable as an airway rescue device.

**Publication Type:** Comparative Study; Journal Article; Randomized Controlled Trial

**Source:** MEDLINE

9. An evaluation of the laryngeal mask airway supreme' in 100 patients.

**Citation:** Anaesthesia & Intensive Care, May 2010, vol./is. 38/3(550-4), 0310-057X;0310-057X (2010 May)

**Author(s):** Tan BH; Chen EG; Liu EH

**Abstract:** The Laryngeal Mask Airway (LMA) Supreme is a new supraglottic airway incorporating features of the LMA Proseal, LMA Fastrach and LMA Unique. We evaluated the LMA Supreme in 100 patients with normal airways having elective surgery. Our success rates of insertion and ventilation were 96% at the first attempt and 100% after two attempts. The median time to successful placement was 15 seconds (interquartile range 12 to 18 seconds). Forty-five patients breathed spontaneously and 55 patients had controlled
ventilation. The incidence of blood staining on removal was 7% and 7% of patients had mild sore throat one hour postoperatively. One patient who had been placed in the left lateral position during surgery had left lingual nerve palsy postoperatively, which recovered completely after one month. Our findings suggest that in patients with normal airways, the LMA Supreme is easy to insert and provides a satisfactory airway with adequate seal pressures for ventilation.

**Publication Type:** Evaluation Studies; Journal Article  
**Source:** MEDLINE  
**Full Text:** Available from EBSCOhost in Anaesthesia and Intensive Care

10. A new supraglottic airway device: LMA-supreme, comparison with LMA-Proseal.  
**Citation:** Acta Anaesthesiologica Scandinavica, August 2009, vol./is. 53/7(852-7), 0001-5172;1399-6576 (2009 Aug)  
**Author(s):** Hosten T; Gurkan Y; Ozdamar D; Tekin M; Toker K; Solak M  
**Abstract:** BACKGROUND AND OBJECTIVE: The LMA-Supreme() (S-LMA()) is a new supraglottic airway device that presents combined features of flexibility, curved structure and single use and a different cuff structure. The purpose of this study was to compare the oropharyngeal leak pressures (OLP) of LMA-Proseal() (P-LMA()) and S-LMA().METHODS: Sixty adult patients were prospectively and randomly allocated to undergo insertion of P-LMA() (n=30) or S-LMA() (n=30). The cuffs were inflated until the intracuff pressure (ICP) reached 60 cm H(2)O. Orogastric leak pressures, insertion times, first attempt success rates, fiberoptical assessment of position, cuff pressures, orogastric tube (OGT) placement and OGT insertion times were compared. Unblinded observers collected intraoperative data and blinded observers collected post-operative data.RESULTS: The first insertion attempts and time taken to provide an effective airway were similar between the groups. Two patients (P-LMA(), n=1; S-LMA(), n=1) were intubated due to excessive oropharyngeal leak and in one patient (P-LMA(), n=1) due to failed OGT placement. OLPs were similar (P-LMA(); 26.9+/-6.6 S-LMA(); 26.1+/-5.2). ICP increased significantly in the P-LMA() at the 30 and 60 min during anesthesia (P-LMA(); 80.1+/-12.8, 92.9+/-14.4, S-LMA(); 68.3+/-10.9, 73.7+/-15.6). OGT placement was successful in all patients in the S-LMA(), but failed in five patients in the P-LMA() (P=0.02). Fiberoptically determined anatomic position was better with the P-LMA() (P=0.03).CONCLUSION: Our findings suggest that S-LMA() had leak pressures similar to the P-LMA(), and this new airway device proved to be successful during both spontaneous and positive pressure ventilation.  
**Publication Type:** Comparative Study; Journal Article; Randomized Controlled Trial  
**Source:** MEDLINE  
**Full Text:** Available from EBSCOhost in Acta Anaesthesiologica Scandinavica

11. The LMA Supreme and LMA ProSeal.  
**Citation:** Anaesthesia, June 2009, vol./is. 64/6(691), 0003-2409;1365-2044 (2009 Jun)  
**Author(s):** Strube PJ  
**Publication Type:** Comment; Letter  
**Source:** MEDLINE  
**Full Text:** Available from EBSCOhost in Anaesthesia

12. Prospective clinical and fiberoptic evaluation of the Supreme laryngeal mask airway.  
**Citation:** Anesthesiology, February 2009, vol./is. 110/2(262-5), 0003-3022;1528-1175 (2009 Feb)  
**Author(s):** Timmermann A; Cremer S; Eich C; Kazmaier S; Brauer A; Graf BM; Russo SG  
**Language:** English  
**Abstract:** BACKGROUND: In March 2007, a new disposable laryngeal mask airway (LMA) became available. The LMA Supreme (The Laryngeal Mask Company Limited, St. Helier, Jersey, Channel Islands) aims to combine the LMA Fastrach feature of easy insertion with the gastric access and high oropharyngeal leak pressures of the LMA ProSeal.METHODS: The authors performed an evaluative study with the LMA Supreme, size 4, on 100 women to measure the ease of insertion, determinate the laryngeal fit by fiberoptic classification, evaluate the oropharyngeal leak pressure, and report adverse events.RESULTS: Insertion of the LMA Supreme was possible in 94 patients (94%) during the first attempt, and in 5 patients (5%) during the second attempt. In one small patient, the LMA Supreme could not be inserted because of limited pharyngeal space. This patient was excluded from further analysis. Insertion of a gastric tube was possible in all patients at the first attempt. The median time for LMA Supreme insertion was 10.0 s
Laryngeal fit, evaluated by fibrescopic view, was rated as optimal in all patients, both immediately after insertion of the LMA Supreme and at the end of surgery. After equalization to room pressure, the mean cuff volume needed to achieve 60 cm H2O cuff pressure was 18.4 ml (+/-3.8 ml; range, 8-31 ml). The mean oropharyngeal leak pressure at the level of 60 cm H2O cuff pressure was 28.1 cm H2O (+/-3.8 cm H2O, range, 21-35 cm H2O). Eight patients (8.1%) complained of a mild sore throat. No patient reported dysphagia or dysphonia. CONCLUSIONS: Clinical evaluation of the LMA Supreme showed easy insertion, optimal laryngeal fit, and low airway morbidity. Oropharyngeal leak pressure results were comparable to earlier data from the LMA ProSeal.

**Publication Type:** Evaluation Studies; Journal Article  
**Source:** MEDLINE  
**Full Text:** Available from the ULHT Library and Knowledge Services' eJournal collection in Anaesthesiology

13. **The laryngeal mask airway Supreme--a single use laryngeal mask airway with an oesophageal vent. A randomised, cross-over study with the laryngeal mask airway ProSeal in paralysed, anaesthetised patients.**  
**Citation:** Anaesthesia, January 2009, vol./is. 64/1(79-83), 0003-2409;1365-2044 (2009 Jan)  
**Author(s):** Eschertzhuber S; Brimacombe J; Hohlrieder M; Keller C  
**Abstract:** The LMA Supreme is a new extraglottic airway device which brings together features of the LMA ProSeal, Fastrach and Unique. We test the hypothesis that ease of insertion, oropharyngeal leak pressure, fiberoptic position and ease of gastric tube placement differ between the LMA ProSeal and the LMA Supreme in paralysed anaesthetised patients. Ninety-three females aged 19-71 years were studied. Both devices were inserted into each patient in random order. Two attempts were allowed. Digital insertion was used for the first attempt and guided insertion for the second attempt. Oropharyngeal leak pressure and fiberoptic position were determined during cuff inflation from 0 to 40 ml in 10 ml increments. Gastric tube insertion was attempted if there was no gas leak from the drain tube. First attempt and overall insertion success were similar (LMA ProSeal, 92% and 100%; LMA Supreme 95% and 100%). Guided insertion was always successful following failed digital insertion. Oropharyngeal leak pressure was 4-8 ml higher for the LMA ProSeal over the inflation range (p < 0.001). Intracuff pressure was 16-35 cm higher for the LMA ProSeal when the cuff volume was 20-40 ml (p < 0.001). There was an increase in oropharyngeal leak pressure with increasing cuff volume from 10 to 30 ml for both devices, but no change from 0 to 10 ml and 30-40 ml. There were no differences in the fiberoptic position of the airway or drain tube. The first attempt and overall insertion success for the gastric tube was similar (LMA ProSeal 91% and 100%; LMA Supreme 92% and 100%). We conclude that ease of insertion, gastric tube placement and fiberoptic position are similar for the LMA ProSeal and LMA Supreme in paralysed, anaesthetised females, but oropharyngeal leak pressure and intracuff pressure are higher for the LMA ProSeal.  
**Publication Type:** Journal Article; Randomized Controlled Trial; Research Support, Non-U.S. Gov't  
**Source:** MEDLINE  
**Full Text:** Available from EBSCOhost in Anaesthesia

14. **LMA-Supreme--a new single-use LMA with gastric access: a report on its clinical efficacy.**  
**Citation:** British Journal of Anaesthesia, September 2008, vol./is. 101/3(405-10), 0007-0912;1471-6771 (2008 Sep)  
**Author(s):** Verghese C; Ramaswamy B  
**Abstract:** BACKGROUND: LMA-Supreme (SLMA) is a new, single-use, latex-free, laryngeal mask airway with gastric access. The anatomically shaped airway tube permits easy insertion without placing fingers in the patient's mouth. The cuff is designed to provide higher seal pressures than the LMA-Classic or Unique. METHODS: A prospective, randomized, cross-over study of LMA-Proseal (PLMA) and SLMA in 36 fasted, adult, female patients with general anaesthesia, neuromuscular block (NMB) and positive pressure ventilation (PPV) is presented. RESULTS: First attempt insertion in 35/36 patients in each group (two attempts in one PLMA and three in one SLMA patient) with successful PPV in all. Median insertion time (15 s) and glottic seal pressure (28 cm
were inserted at the first attempt. In nine animals gastric fluid was drained through the
possibly airway during anesthesia. Bronchoscopy was performed to determine the position of the LMA
was secured in all pigs within 39 +/− 5 seconds (27 +/− 5). Adequate ventilation was
variable and the leak airway pressure (P(peak)) were measured. An arterial blood gas sample
were similar in SLMA and PLMA. 

**CONCLUSIONS:** Insertion success, glottic seal pressure and gastric access
authors concluded that the pig model could be used to gain basic knowledge about long
The P-LMA was used for airway maintenance under general anaesthesia and PPV in 15
and 390 minutes, respectively. Arterial blood gas measurements were used to determine adequacy of ventilation. Airway leak pressure (P(leak)) and maximum tidal volume (TV)
were measured in the supine, lateral and prone positions. A bronchoscopic examination
was performed to detect signs of aspiration. RESULTS: Adequate ventilation was demonstrated both after 120 min (4.7 +/− 0.4 kPa) and 360 min (4.7 +/− 0.5 kPa). The

**METHODS:** Lungs of pigs were mechanically ventilated under general anaesthesia using the LMA-ProSeal. The ease of insertion, number of attempts and total time until placement of the LMA-ProSeal and gastric tube were recorded. Bronchoscopy was performed to determine the position of the LMA-ProSeal and to detect signs of aspiration. Ventilation variables and the leak airway pressure (P(leak)) were measured. An arterial blood gas sample was taken to determine the adequacy of ventilation.

**RESULTS:** The airway was secured in all pigs within 39 +/− 19 seconds (27-51). Different sizes of LMA-ProSeal were used; up to 30 kg: size 3, up to 43 kg: size 4; and above 43 kg: size 5. In all but one animal the P-LMA and gastric tube were inserted at the first attempt. In nine animals gastric fluid was drained through the

**CONCLUSIONS:** It was possible to ensure positive pressure ventilation (PPV) with the P-LMA in the pig. The PPV in the pig model could be used to gain basic knowledge about long-term use of the LMA can be carried out in a pig model.

**Overall,** the LMA-ProSeal was found to be useful for ventilation and gastric access in pigs. However, further studies are needed to evaluate its safety and effectiveness for extended periods of time.

**References:**

Goldmann K; Kalinowski M; Dieterich J; Wulf H. Evaluation of the LMA-ProSeal (P-LMA) it seems desirable to consider the P-LMA for prolonged surgical cases or post-operative ventilation. Long-term use could carry the risk of serious complications. An experimental pig model could be used to gain basic knowledge about long-term use before conducting clinical trails. In this randomized controlled study we tested the hypothesis if prolonged positive pressure ventilation (PPV) with the P-LMA in the pig is possible.

The P-LMA was used for airway maintenance under general anaesthesia and PPV in 15 German country pigs. Randomised into 3 groups, the animals were ventilated for 90, 150 and 390 minutes, respectively. Arterial blood gas measurements were used to determine adequacy of ventilation. Airway leak pressure (P(leak)) and maximum tidal volume (TV) were measured in the supine, lateral and prone positions. A bronchoscopic examination was performed to detect signs of aspiration.

RESULTS: Adequate ventilation was demonstrated both after 120 min (4.7 +/- 0.4 kPa) and 360 min (4.7 +/- 0.5 kPa). The corresponding PaO(2) at FiO(2) = 1.0 was 59 +/- 5 kPa and 64 +/- 10 kPa, respectively. The mean P (leak) was 34 +/- 7 cm H(2)O. Change of position did not result in any significant change in P(leak) or maximum TV kg (1). There was no bronchoscopic evidence of aspiration in any pig.

CONCLUSION: It was possible to ensure sufficient PPV with the P-LMA in the pig over different periods of time and in different body positions without any complications of airway management. The P-LMA can be used for PPV in the pig for durations of up to 390 minutes. We conclude that investigations into the long-term use of the LMA can be carried out in a pig model.


**Citation:** Veterinary Anaesthesia & Analgesia, September 2005, vol./is. 32/5(308-13), 1467-2987;1467-2987 (2005 Sep)

**Author(s):** Goldmann K; Kalinowski M; Kraft S

**Language:** English

**Abstract:** OBJECTIVE: Evaluation of the LMA-ProSeal for positive pressure ventilation (PPV) in the pig. STUDY DESIGN: Prospective observational study. ANIMALS: Twelve German country pigs, weighing 25-62 kg. METHOD: Lungs of pigs were mechanically ventilated under general anaesthesia using the LMA-ProSeal. The ease of insertion, number of attempts and total time until placement of the LMA-ProSeal and gastric tube were recorded. Bronchoscopy was performed to determine the position of the LMA-ProSeal and to detect signs of aspiration. Ventilation variables and the leak airway pressure (P(leak)) were measured. An arterial blood gas sample was taken to determine the adequacy of ventilation.

RESULTS: The airway was secured in all pigs within 39 +/- 19 seconds (27-51). Different sizes of LMA-ProSeal were used; up to 30 kg: size 3, up to 43 kg: size 4; and above 43 kg: size 5. In all but one animal the P-LMA and gastric tube were inserted at the first attempt. In nine animals gastric fluid was drained through the
gastric tube. There was no evidence of aspiration in any animal. The mean [±/−SD (95%CI)]P(leak) was 28.8 ±/− 7.5 cm H(2)O (24.06-33.60) and normal ventilation was achieved in all animals.

Conclusions: The results of this study indicate that the airway of pigs weighing 25-62 kg can be secured safely and reliably with the sizes 3, 4 and 5 LMA-ProSeal.

Clinical Relevance: Endotracheal intubation in pigs can be difficult so there is a risk of hypoxemia in the apnoeic animal. With the LMA-ProSeal the airway can be secured rapidly, safely and reliably. Use of the Standard-LMA under PPV can be associated with gas leakage into the stomach and the subsequent risk of gastric distension and regurgitation. Both the ability to drain the stomach and the high P(leak) of the LMA-ProSeal could contribute to improved protection against aspiration under PPV.

Publication Type: Evaluation Studies; Journal Article; Research Support, Non-U.S. Gov't

Source: MEDLINE

Full Text: Available from EBSCOhost in Veterinary Anaesthesia and Analgesia

17. Outpatient parathyroid surgery and the differences seen in the morbidly obese.

Citation: Otolaryngology - Head & Neck Surgery, February 2007, vol./is. 136/2(282-6), 0194-5998:0194-5998 (2007 Feb)

Author(s): Norman J; Aronson K

Abstract: OBJECTIVE: This prospective study examined rapid patient discharge after routine parathyroidectomy to identify differences between morbidly obese and non-morbidly obese patients. The efficacy of supplemental calcium in preventing postoperative hypocalcemia was also assessed.

METHODS: Between March 2003 and June 2004, 842 patients with primary hyperparathyroidism underwent outpatient parathyroid surgery. Morbid obesity was defined as 100 pounds above ideal body weight and/or body mass index greater than 39.

RESULTS: Fifty-one (6.1%) patients were morbidly obese (mean, 261 lbs; body mass index=45) compared with 791 non-morbidly obese patients (mean, 172 lbs; body mass index=28, P<.001). Morbidly obese patients were more likely to require conversion of laryngeal masked airway to endotracheal intubation (P<.05). Incision length, total operative times, and the total time spent in the post-anesthesia care unit were longer for morbidly obese patients (all, P<.05). Of the 842 patients, only four, all non-morbidly obese, spent the night after their operation. No postoperative untoward events occurred in either group.

CONCLUSIONS: Immediate discharge after routine parathyroid surgery is extremely safe for nearly all patients although morbid obesity is associated with a longer operation, a more difficult airway, and a longer stay in the recovery room.

Publication Type: Journal Article

Source: MEDLINE

18. The LMA Supreme--a pilot study.

Citation: Anaesthesia, February 2008, vol./is. 63/2(209-10), 0003-2409:1365-2044 (2008 Feb)

Author(s): van Zundert A; Brimacombe J

Publication Type: Evaluation Studies; Letter

Source: MEDLINE

Full Text: Available from EBSCOhost in Anaesthesia

19. ProSealTM LMA increases safe apnea period in morbidly obese patients undergoing surgery under general anesthesia.

Citation: Obesity Surgery, April 2013, vol./is. 23/4(580-4), 0960-8923;1708-0428 (2013 Apr)

Author(s): Sinha A; Jayaraman L; Punhani D

Abstract: BACKGROUND: Morbidly obese patients are at risk of hypoxemia at the time of induction of anesthesia. The aim of this study was to assess the possible increase in the safe apnea time with the use of ProSeal laryngeal mask airway (PLMA) as a conduit prior to laryngoscope-guided intubation in morbidly obese patients undergoing surgery under general anesthesia.

METHODS: Hundred patients with BMI greater than 35 kg/m2, undergoing surgery under general anesthesia, were randomly divided to receive either PLMA or facemask with oropharyngeal airway (FM) as the airway device. Following preoxygenation with 100% oxygen with continuous positive airway pressure of 10 cm H2O, in ramp position for 5 min the patients were made apneic. From start of apnea to the time to reach SpO2 to 92% was recorded as safe apnea time. Ventilation was initiated and time to reach SpO2 of 100% was recorded as recovery time.

RESULTS: The mean safe...
apnea time was 205 (96-320)s in FM vs. 337 (176-456) s in PLMA (P = 0.0000). The mean recovery period was 49 (36-68)s in FM vs. 42(30-56)s in PLMA groups (P = 0.0000). Arterial blood gas analysis showed significant difference in pO2 between the two groups.

CONCLUSION: The use of ProSeal laryngeal mask airway prior to laryngoscope-guided intubation is beneficial in increasing safe apnea period and achieving faster recovery from hypoxemia in morbidly obese patients.

Publication Type: Journal Article
Source: MEDLINE

20. Use of the Aintree intubation and airway exchange catheters through LMA-ProSeal for double-lumen tube placement in a morbidly obese patient with right main stem bronchus tumour.

Citation: British Journal of Anaesthesia, June 2012, vol./is. 108/6(1038-9), 0007-0912;1471-6771 (2012 Jun)
Author(s): Abdulatif M; Ismail E
Publication Type: Case Reports; Letter
Source: MEDLINE
Full Text: Available from Highwire Press in British Journal of Anaesthesia

21. The air-Q() intubating laryngeal airway vs the LMA-ProSeal(TM) : a prospective, randomised trial of airway seal pressure.

Citation: Anaesthesia, December 2011, vol./is. 66/12(1093-100), 0003-2409;1365-2044 (2011 Dec)
Author(s): Galgon RE; Schroeder KM; Han S; Andrei A; Joffe AM
Abstract: We performed a prospective, open-label, randomised controlled trial comparing the air-Q() against the LMA-ProSealTM in adults undergoing general anaesthesia. One hundred subjects (American Society of Anesthesiologists physical status 1-3) presenting for elective, outpatient surgery were randomly assigned to 52 air-Q() and 48 ProSeal devices. The primary study endpoint was airway seal pressure. Oropharyngolaryngeal morbidity was assessed secondarily. Mean (SD) airway seal pressures for the air-Q() and ProSeal were 30 (7) cmH(2) O and 30 (6) cmH(2) O, respectively (p = 0.47). Postoperative sore throat was more common with the air-Q() (46% vs 38%, p = 0.03) as was pain on swallowing (30% vs 5%, p = 0.01). In conclusion, the air-Q() performs well as a primary airway during the maintenance of general anaesthesia with an airway seal pressure similar to that of the ProSeal, but with a higher incidence of postoperative oropharyngolaryngeal complaints. 2011 The Authors. Anaesthesia 2011 The Association of Anaesthetists of Great Britain and Ireland.
Publication Type: Comparative Study; Journal Article; Randomized Controlled Trial; Research Support, N.I.H., Extramural
Source: MEDLINE
Full Text: Available from EBSCOhost in Anaesthesia

22. ProSeal LMA: a potentially dangerous modification.

Citation: European Journal of Anaesthesiology, November 2007, vol./is. 24/11(980-1), 0265-0215;0265-0215 (2007 Nov)
Author(s): Bansal S; Jones MJ
Publication Type: Letter
Source: MEDLINE
Full Text: Available from EBSCOhost in European Journal of Anaesthesiology


Citation: Journal of Clinical Anesthesia, August 2007, vol./is. 19/5(367-9), 0952-8180;0952-8180 (2007 Aug)
Author(s): Doyle DJ; Zura A; Ramachandran M; Lin J; Cywinski JB; Parker B; Marks T; Feldman M; Lorenz RR
Abstract: We report a 22-year-old, 980-lb (445 kg) man with a body mass index of 163 kg/m(2), who needed intubation for tracheotomy surgery, as he was profoundly hypercarbic and reliant on a tight-fitting continuous positive airway pressure mask. Attempts at oral and nasal fiberoptic intubation during topical anesthesia were unsuccessful because of poor patient cooperation and epistaxis. Thus, after awake placement of a size 5 Laryngeal
Mask Airway ProSeal LMA; (LMA North America, San Diego, CA), we induced anesthesia using sevoflurane. Then we placed an Aintree stylet (Cook Critical Care, Bloomington, IN) over a fiberoptic bronchoscope, and both were introduced through the LMA into the trachea. We then removed the fiberoptic bronchoscope followed by the LMA. A Parker size 7.5 endotracheal tube was then "railroaded" over the Aintree catheter into the trachea.

**Publication Type:** Case Reports; Journal Article

**Source:** MEDLINE

**24. Comparison of the standard laryngeal mask airway and the ProSeal laryngeal mask airway in obese patients.**

**Citation:** British Journal of Anaesthesia, March 2003, vol./is. 90/3(323-6), 0007-0912;0007-0912 (2003 Mar)

**Author(s):** Natalini G; Franceschetti ME; Pantelidi MT; Rosano A; Lanza G; Bernardini A

**Language:** English

**Abstract:** BACKGROUND: The ProSeal laryngeal mask airway (PLMA) may have advantages over the laryngeal mask airway (LMA) in obese patients. We tested this hypothesis in a clinical setting.

**METHODS:** Sixty obese patients (BMI >30) were randomized to receive mechanical ventilation (tidal volume 7 ml kg\(^{-1}\), PEEP 10 cm H\(^2\)O), through either the PLMA or the LMA. A gastric tube was used in all patients. Cuff pressure was set at 60 cm H\(^2\)O and increased progressively until excessive leak occurred. The incidence of sore throat was assessed at recovery and after 1 week.

**RESULTS:** The mean leak fraction was 6.1 (SD 2.9)% with the LMA and 6.4 (3.5)% with the PLMA (P=0.721). With the PLMA, with no sign of ventilation problems, the drainage tube was not patent in three patients. The cuff pressure was >100 cm H\(^2\)O in 38% of the LMA group and 7% of the PLMA group (P=0.05). The incidence of sore throat was similar in both groups and it was similarly scored in the recovery room and 1 week after surgery.

**CONCLUSIONS:** Both the PLMA and the LMA can be used for mechanical ventilation of obese patients. The patency of the PLMA drainage tube needs to be checked constantly even when an optimal airtight seal is present. In obese patients the LMA requires a greater cuff pressure than the PLMA, but sore throat is not related to the cuff pressure. Sore throat assessment in the recovery room appears as reliable as assessment later.

**Publication Type:** Clinical Trial; Comparative Study; Journal Article; Randomized Controlled Trial

**Source:** MEDLINE

**Full Text:** Available from Highwire Press in *British Journal of Anaesthesia*

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LMA Supreme versus face-mask ventilation preformed by novices: a comparative study in morbid obese patients showing difficult ventilation predictors
Obes Surg 2009, 19 (12), 1624 – 1630

Intubating laryngeal mask airway in morbidly obese and lean patients: a comparative study
Anesthesiology, 2005, 102 (6) 1106 – 1109

27. Mort, Thomas
The supraglottic airway device in the emergency setting: its changing role outside the operating room
Anesthesiology News, 2011

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