Some providers advocate using laryngeal mask airways (LMAs) for procedures performed in the prone position to meet the demands of quicker operating room turnover time requirements, staffing reductions and the desire to expedite patient recovery in the postoperative period. We provide an update to a 2010 systemic review examining the use of LMAs in patients in the prone position.

Six peer-reviewed articles described the use of LMAs in prone patients: a randomized controlled trial, 2 description studies, a case series, and 2 case reports. The risk of publication bias was possibly high. This evidence, mostly from lower level sources, supports the use of the LMA in this setting, with risks comparable to when LMAs are used in patients in the supine position. Experienced providers should carefully select patients and procedures when considering using LMAs for patients in the prone position. There must be a plan to control the airway if problems are encountered with the LMA. These devices might be considered as a bridge device when a prone patient is accidentally extubated. Additional rigorous studies are needed before use of LMAs in this manner can be widely recommended.

Keywords: Adult, laryngeal mask airway, LMA, prone.

There are many types of laryngeal mask airway devices (collectively referred to as LMAs), and their use has become popular over the last 30 years. Since their introduction in the United Kingdom in 1988 and subsequent use worldwide, the use of LMAs has rivaled that of the endotracheal (ET) tube as a method of securing the airway. The LMA is suggested to be safe and effective during spontaneous and intermittent positive pressure ventilation for certain patients receiving general anesthesia. The device is also used in cases in which it previously was considered contraindicated, including those with the patient in the prone position. The reluctance of providers to use the LMA in this manner may in part be due to the view that these devices are best used with patients receiving general anesthesia who can be managed with a face mask.

The authors of a 2010 systematic review examined the evidence for using LMAs for airway rescue in subjects in the prone position. They concluded that elective use of LMAs in subjects positioned prone is feasible. However, they found that evidence was lacking supporting the use of these devices for airway rescue in patients in the prone position.

This update reviews the findings of this systematic review and examines subsequently published evidence regarding the use of LMAs in patients positioned prone.

History and Review of the Literature

The process of positioning a patient prone requires extra staff, careful positioning, and padding of the patient to prevent injuries. There is also the risk of hypotension, displacement of the ET tube, and impairment of ventilation. To reposition a patient whose ET tube was placed while the patient was supine is physically demanding of the staff and time-consuming, may delay operating room turnover, and may prolong the stay in the postanesthesia care unit. If the patient positioned himself or herself prone before induction of general anesthesia and placement of the LMA (Figure), this would alleviate many of these concerns.

Figure. Method of Inserting a Laryngeal Mask Airway

When the Patient Is Prone

Note: Patient’s head is on a pillow and a pillow is placed transversely under thorax. While extending the neck using pressure on the forehead can be effective, often upward pressure on the head while slightly extending the neck will facilitate mouth opening. The mouth can also be scissored open using the fingers of the hand not holding the laryngeal mask airway. All parts of the patient’s body must be carefully padded.
If a patient is unintentionally extubated while in the prone position, reintubation is difficult. Although it is possible to intubate the trachea while the patient is prone, this intubation usually requires the patient to be positioned supine. Use of the LMA can provide a bridge until the patient can be repositioned and intubated or can aid reintubation while the patient remains prone.

The previously published systematic review (Table 1) analyzed 12 studies or reports but contained no randomized controlled trials (RCTs). The investigators of these 12 studies or reports examined the use of the following devices in subjects positioned prone: LMA Classic, used in 47% of subjects; LMA ProSeal, used in 52.8% of subjects; and LMA Fastrach ET Tube (intubating LMA, or ILMA), used in less than 1% of subjects. All these devices are distributed by LMA North America Inc (now part of Teleflex). The outcomes examined were successful placement and ventilation. Complications related to insertion were also summarized. The authors described the use of a comprehensive search strategy and appraisal method.

Excluding control subjects, the LMA was placed in 466 subjects positioned prone. In all but 3 of these cases the LMA was inserted electively. In the remaining 3 cases the LMA was placed after the patient was unintentionally extubated. Insertion of the LMA was successful in all cases, with a first-attempt insertion rate of 87.5% to 100%. Ventilation was adequately maintained in 83.3% to 100% of the subjects. Hypoventilation was successfully managed by instituting positive pressure ventilation or reinsertion of the device with the subject remaining in the prone position. Complications included LMA malposition requiring repositioning (0.4%-12.5% of subjects), hypoventilation (0.9%-16.6% of subjects), laryngospasm (1.3% of subjects), partial obstruction of the airway (1.2% of subjects), bleeding (1.6%-2.7% of subjects), bradycardia (0.9%-6.8% of subjects), and sore throat (8.2%-20% of subjects). The authors concluded that this technique is feasible in the elective setting but that there was a lack of evidence for placing an LMA to manage the airway in a patient who has been unintentionally extubated in the prone position.

### Materials and Methods

**The PICO Question.** A PICO (patient or population, intervention, comparison, and outcome) question guided the search for evidence for this update. The PICO question was as follows: In adults with ASA physical status 1 to 3, body mass index less than 35 kg/m², and no history of difficult intubation or ventilation who are having anesthesia for surgical procedures in the prone position, is the use of the various LMAs in the prone position a safe practice? The outcome “safe practice” centered on respiratory-related events.

**Search Strategy.** The search for evidence (2010-2013) included the following online sources and search engines: The Cochrane Database, PubMed, SUMSearch, and Google Scholar. The following sources were included: systematic reviews with or without meta-analysis, human interventional and observational clinical trials, case reports, and clinical practice guidelines not included in the systematic review. Low-level evidence was included because of a suspected paucity of high-quality evidence.

The inclusion/exclusion criteria included full-text, English-language articles or clinical practice guidelines published in peer-reviewed journals or on the websites of specialty organizations. The query was performed using the keywords (used alone and in combination): prone, laryngeal mask airway, outpatient, and surgeries. Evidence sources involving LMA use in positions other than prone were excluded. The evidence was appraised and leveled according to the method proposed by Melnyk and Fineout-Overholt.

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**Table 1. Summary of a Systematic Review** Describing Use of Laryngeal Mask Airways for Airway Rescue in Patients in the Prone Position

<table>
<thead>
<tr>
<th>Types of evidence</th>
<th>Evidence sources examining elective use of LMA in prone position (subjects)</th>
<th>Total No. of subjects</th>
<th>Evidence sources examining LMA for airway rescue of patients in prone position</th>
<th>Type of LMA</th>
<th>Successful insertion rate (%)</th>
<th>Successful ventilation rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 prospective cohort study, 1 noncontrolled cohort study, 4 retrospective studies, 6 case studies</td>
<td>9</td>
<td>526&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3 case reports describing 3 separate patients</td>
<td>LMA Classic (n = 279)</td>
<td>First attempt: 87.5-100</td>
<td>83.3-100&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LMA ProSeal (n = 246)</td>
<td>Second attempt: 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LMA Fastrach ET Tube (n = 1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: ET, endotracheal; LMA, laryngeal mask airway.

<sup>a</sup> A total of 466 LMA insertions with subject prone and 60 control subjects in which the LMA was placed with the subject supine.

<sup>b</sup> One group reported successful ventilation at 83.3% because of rotation of flexible LMA during an endoscopic retrograde cholangiopancreatography procedure. All reports less than 100% successful ventilation indicated that the problem was remedied by positive pressure ventilation or repositioning of the LMA.

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<ref>Table 1. Summary of a Systematic Review Describing Use of Laryngeal Mask Airways for Airway Rescue in Patients in the Prone Position</ref>
Results

• Appraisal of the Evidence. The search resulted in 51 potential evidence sources with 6 sources12-17 involving 441 subjects meeting the inclusion criteria. The evidence consisted of an RCT,14 2 descriptive studies,12,13 a case series,17 and 2 case studies15,16 (Table 2). None of these sources12-17 appeared to share subjects, and the LMA was placed with the subject in the prone position in all cases. All evidence was from investigators practicing outside the United States.

The RCT14 compared the use of the LMA ProSeal and the LMA Supreme (LMA North America Inc) in subjects in the prone position for general surgery. The sample was 120 subjects undergoing various procedures, including pilonidal cyst excision, melanoma excision, or microdiskectomy, and was calculated using the results from a previous study.13 This sample size was required to detect a 12% incidence of the need for manipulation of the LMA Supreme for optimal placement to provide effective ventilation in the prone position (α = .05, β = 0.2). There were no significant differences between groups in age, gender, body mass index, and type and duration of surgery. Subjects were blinded to the type of LMA. Postoperative observations were recorded by blinded observers, with intraoperative observations recorded by nonblinded observers. The subjects in this RCT accounted for about 30% of all subjects in the evidence12-17 appraised for this update.

The authors of 2 prospective descriptive studies12,13 examined the use of the LMA Supreme in subjects in the prone position. The first study12 evaluated the LMA Supreme in 205 subjects undergoing spinal surgery. This accounted for nearly 50% of all subjects in the evidence12-17 appraised for this update. The second study13 evaluated the LMA Supreme in 40 subjects undergoing pilonidal sinus or melanoma excision, bone marrow aspiration, or diskectomy. Neither of these studies12,13 mentioned a method for determining sample size. These studies used convenience samples meeting their inclusion criteria. The LMA Supreme devices were inserted by both trainees12 and experienced practitioners.12,13 There was no blinding. One of the authors (C. Verghese)12 reportedly received an annual honorarium from the LMA company, and an author from the other study (J. Brimacombe)13 worked as a consultant for the same company. The LMAs were supplied free of charge by a distributor for one investigation.

The case series17 was reported as a letter to a journal. The authors described the use of the LMA Supreme in 74 subjects undergoing liposculpting surgery. There was no mention of the method of sample size determination, and there was no blinding. The level of experience of the providers was not indicated. Outcomes reported included successful placement, successful ventilation, regurgitation, and sore throat.

One case report16 described the use of the ILMA for a patient in the prone position who was stabbed in the lower back, with the knife remaining in the patient. Anesthesia was induced with the patient in the prone position; an ILMA was placed for ventilation, and the intubation was accomplished via the ILMA. Another case report15 described a dislodgment of a decayed premolar associated with the insertion of the LMA in a patient with inadequate epidural anesthesia undergoing hemorrhoidectomy in the prone position.

• Successful Placement of the Laryngeal Mask Airway. The results of the evidence12-17 are summarized in Table 3. The findings of the RCT14 indicated that the LMA ProSeal and LMA Supreme were successfully placed in all subjects, with the first-attempt success ranging from 98% to 100%. There was no significant difference in the mean time to place either device, ranging between 16 and 17 seconds.

A LMA Supreme was successfully placed in all subjects in the descriptive studies12,13 and the case series.17 It was placed successfully on the first attempt in 82.5%13 to 93.2%17 of subjects. The LMA was also successfully placed in both case reports15,16 but required 3 attempts in 1 subject.15

• Successful Ventilation. In the RCT,14 successful ventilation was attained in all subjects with the LMA ProSeal and LMA Supreme. Optimal ventilation was attained in 58 of 60 subjects in the LMA ProSeal group and 51 of 60 subjects in the LMA Supreme group (P < .05). Nonoptimal ventilation was defined as an air leak or abnormal airway pressure requiring interventions such as adjustment of the insertion depth, cuff volume, and/or head-neck position. Mean seal pressure was slightly higher with the LMA ProSeal compared with the LMA Supreme (31 cm H2O compared with 27 cm H2O).

Positive pressure ventilation was maintained in all patients in both descriptive studies,12,13 with an air leak or high airway pressures in 5 of 40 subjects in the second study.13 Positive pressure ventilation was also delivered successfully in all subjects in the case series17 and the 2 case studies.15,16

• Complications. None of the authors12-17 described having to turn the subject supine to manage the airway. No problems were reported with face-mask ventilation. The authors of the RCT14 described a single subject requiring 2-handed ventilation. Laryngospasm occurred in 7 subjects in the RCT14 and in 1 subject in one of the descriptive studies.12 All occurrences were successfully treated in each case by deepening the anesthetic level or administering a neuromuscular blocker. Regurgitation via the drain tube of the LMA occurred in a subject in the RCT14 and a subject in a descriptive study12 with no evidence of aspiration. Blood was noted on the LMA in 9 of 120 subjects in the RCT14 and 3 of 40 subjects in a descriptive study.13 The incidence of sore throat was 4.2% in the RCT14 7.5% in a descriptive study,13 and 1.4% in the case series.17
<table>
<thead>
<tr>
<th>Study</th>
<th>Evidence type and level</th>
<th>No. of subjects</th>
<th>BMI (kg/m²)</th>
<th>Surgery types</th>
<th>Mean duration of surgery (min)</th>
<th>Type of LMA</th>
<th>Inserter and No. of subjects (%)</th>
<th>Outcome measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharma et al,12 2010</td>
<td>Descriptive study</td>
<td>205</td>
<td>Median, 27-28 (IQR 25-31)</td>
<td>Microdiskectomy, multiple-level spinal decompression, spinal fusion</td>
<td>102 (SD 150-300)</td>
<td>LMA Supreme</td>
<td>Experienced provider: 163 (79.5)</td>
<td>Successful placement; regurgitation; complications</td>
</tr>
<tr>
<td>López et al,13 2010</td>
<td>Descriptive study</td>
<td>40</td>
<td>Mean, 24-25 (SD 4)</td>
<td>Pilonidal sinus excision; melanoma excision; bone marrow aspiration; diskectomy</td>
<td>36-132 (SD 12-78)</td>
<td>LMA Supreme</td>
<td>Experienced provider: 40 (100)</td>
<td>Ease of insertion; No. of attempts; time to insert; efficacy of ventilation; airway seal pressure; mean airway pressure; gastric tube insertion; fiberoptic view of vocal cords; blood staining on LMA Supreme; sore throat</td>
</tr>
<tr>
<td>López et al,14 2011</td>
<td>Randomized controlled trial</td>
<td>120</td>
<td>Mean, 25-26 (SD 3-4)</td>
<td>Pilonidal cyst excision; lumbar microdiskectomy; melanoma excision; varicose vein excision; bone marrow aspiration; Achilles tendon repair; liposuction; gluteus tumor excision</td>
<td>25-124 (SD 8-27)</td>
<td>LMA Supreme LMA ProSeal</td>
<td>Experienced provider: 120 (100)</td>
<td>Successful insertion; ease of insertion; initial quality of ventilation; gastric access; fiberoptic bronchoscope manipulation; fiberoptic bronchoscope view of vocal cords; laryngospasm; leakage; displacement; hiccup; regurgitation; visible blood on LMA; dysphonia; sore throat</td>
</tr>
<tr>
<td>Chau et al,15 2011</td>
<td>Case study</td>
<td>1</td>
<td>19.5</td>
<td>Hemorrhoidectomy</td>
<td>NA</td>
<td>LMA Classic</td>
<td>NA</td>
<td>Placement attempts; dental injury</td>
</tr>
<tr>
<td>Samantaray,16 2011</td>
<td>Case study</td>
<td>1</td>
<td>NA</td>
<td>Removal of knife impaled in lower back</td>
<td>NA</td>
<td>LMA Fastrach ET Tube</td>
<td>NA</td>
<td>Insertion success; adequacy of ventilation</td>
</tr>
<tr>
<td>Thomas et al,17 2012</td>
<td>Case study</td>
<td>74</td>
<td>NA</td>
<td>Liposculpting</td>
<td>NA</td>
<td>LMA Supreme</td>
<td>NA</td>
<td>Successful insertion; delivery of intermittent positive pressure ventilation; peak airway pressure; regurgitation; sore throat</td>
</tr>
</tbody>
</table>

**Table 2. Summary of Additional Evidence Regarding Placement and Ventilation Using a Laryngeal Mask Device in the Prone Position**

Abbreviations: BMI, body mass index; ET, endotracheal; IQR, interquartile range; LMA, laryngeal mask airway device; NA, not available; SD, standard deviation.

Evidence appraised and leveled using the method described by Melnyk and Fineout-Overholt,11 ranging from level I evidence encompassing systematic reviews to level VII evidence that includes expert opinion.
<table>
<thead>
<tr>
<th>Study</th>
<th>Evidence type/No. of subjects/LMA type</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| Sharma et al,12 2010 | Descriptive study/205 subjects/LMA Supreme | Successful placement  
First attempt: 184 subjects (89.8%)  
Second attempt: 19 subjects (9.2%)  
> 2 attempts: 2 subjects (1%)  
Successful maintenance of ventilation: 205 subjects (100%)  
Regurgitation via drainage tube: 1 subject (0.5%)  
Laryngospasm: 1 subject (0.5%); resolved with NMBA; no further problems |
| López et al,13 2010 | Descriptive study/40 subjects/LMA Supreme | Ease of insertions  
First attempt, no additional maneuvers: 33 subjects (82.5%)  
First attempt, additional maneuvers: 4 subjects (10%)  
Second or third attempt: 3 subjects (7.5%)  
Number of attempts  
First attempt: 37 subjects (92.5%)  
Second attempt: 3 subjects (7.5%)  
Time to insert (s): 21 (SD 15)  
Efficacy of ventilation  
Normal ventilation without air leak: 35 subjects (87.5%)  
Air leak or high airway pressures: 5 subjects (12.5%)  
Airway seal pressure (cm H2O): 27 (SD 5)  
Mean airway pressure (cm H2O): 17 (SD 3)  
Gastric tube insertion  
Easy: 39 subjects (97.5%)  
Maneuvers required: 1 subject (2.5%)  
Blood staining on LMA Supreme  
Mild: 3 subjects (7.5%)  
Moderate: 0  
Severe: 0  
Sore throat 1 hour after surgery  
Mild: 3 subjects (7.5%)  
Moderate: 0 subjects  
Severe: 0 subjects |
| López et al,14 2011 | RCT/120 subjects/LMA Supreme: 60 subjects; LMA ProSeal: 60 subjects | No difference between devices in the following outcomes (combined data from LMA Supreme and LMA ProSeal groups):  
Successful insertion: 100% (first time success: LMA ProSeal, 100%; LMA Supreme, 98%)  
Time to insert (s): 16-17 (SD 5-6)  
Ease of insertion  
No resistance: 104 subjects (86.7%)  
Maneuvers needed: 15 subjects (12.5%)  
Reinsertion needed: 1 subject (0.8%)  
Airway pressure (cm H2O): 16-18 (SD 3)  
Complications  
Laryngospasm: 7 subjects (5.8%)  
Leakage, displacement: 5 subjects (4.2%)  
Hiccup: 2 subjects (1.7%)  
Regurgitation via drain tube of LMA 1 subject (0.8%)  
Visible blood on LMA: 9 subjects (7.5%)  
Dysphonia: 1 subject (0.8%)  
Sore throat 1 hour after arrival in postanesthesia care unit: 5 subjects (4.3%)  
There were differences (P < .05) in the following outcomes:  
Initial quality of ventilation:  
Optimal: LMA ProSeal, 58 subjects (97%); LMA Supreme, 51 subjects (85%)  
Readjustment needed: LMA ProSeal, 2 subjects (3%); LMA Supreme, 9 subjects (15%)  
Mean seal pressure (cm H2O):  
LMA ProSeal, 31 (SD 4); LMA Supreme, 27 (SD 4) |
| Chau et al,15 2011 | Case study/1 subject LMA Classic | Insertion success: 100%  
Placement attempts: 3  
Dental injury: Dislodged premolar; recovered when LMA removed |
| Samantaray,16 2011 | Case study/1 subject/LMA Fastrach ET Tube | Insertion success: 100%  
Adequacy of ventilation: 100% |
| Thomas et al,17 2012 | Case series/74 subjects/LMA Supreme | Successful insertion: 100%  
First attempt: 69 subjects (93.2%)  
Second attempt: 5 subjects (6.8%)  
Successful delivery of intermittent positive pressure ventilation: 74 subjects (100%)  
Mean peak airway pressure (cm H2O): 12-27  
Regurgitation: 0  
Sore throat 1 hour postoperatively: 1 subject (1.4%) |

Table 3. Results of Evidence Regarding Placement and Ventilation Using a Laryngeal Mask Device in the Prone Position
Abbreviations: ET, endotracheal; IQR, interquartile range; LMA, laryngeal mask airway; NMBA, neuromuscular blocking agents; SD, standard deviation.

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Discussion

The rates of successful insertion, ventilation, and complications described in the current evidence were similar to the rates reported by the authors of the previous systematic review. The most notable difference between the systematic review and this update is the type of LMA examined by the study investigators. In the current update, about 94% of the subjects were managed with an LMA Supreme; about 5%, with an LMA ProSeal; and less than 1%, with an LMA Classic. In the systematic review slightly less than 50% of the subjects had a LMA Classic placed while they were in the prone position, and slightly more than 50% had an LMA ProSeal placed while prone. Just one case report mentioned placing an ILMA in a prone patient. In addition, no RCTs were included in the systematic review, whereas 1 RCT was located for this update.

Because of the heterogeneity of the study methods, the results of the evidence sources are reported and a meta-analysis was not done. Examples of this heterogeneity include that the definition of laryngospasm was not consistently supplied across the evidence sources. In addition, the authors of one study defined a decrease in oxygenation as an oxygen saturation measured by pulse oximetry (SpO₂) of less than 90%, whereas others defined this as less than 95%.

With only one higher level source located, the evidence used in this update must be cautiously considered. The LMA Supreme was used in 95% of the subjects. The outcomes reported when using this device suggested that use of the LMA Supreme in patients undergoing procedures in the prone position was feasible. The incidence of successful insertion, ventilation, and complications was not markedly different across this evidence. These outcomes were also similar to those reported in the 2012 review of the LMA Supreme, which included 19 studies (12 RCTs and 7 single-device prospective studies) totaling approximately 1,524 subjects. In that study, 84% of the subjects had the LMA Supreme placed while they were in the supine position. These authors reported that the insertion success rate, insertion time, and complications were comparable when using the LMA Supreme or the LMA ProSeal, but a higher oropharyngeal leak pressure was observed with the LMA ProSeal.

The results of the single RCT are noteworthy because this source provides a higher level of evidence compared with the other sources reviewed for this update. This RCT compared use of the LMA Supreme and the LMA ProSeal in subjects positioned prone. The investigators concluded that management of subjects in the prone position was effective using both devices but that the LMA ProSeal attained a higher seal pressure and required fewer adjustments to attain optimal ventilation. A modified technique was used to place the LMA ProSeal, in which a suction catheter was first placed through the drain tube and extended beyond the distal end. The suction catheter entered the esophagus first and allowed it to guide the tip of the LMA ProSeal. The performance of the LMA ProSeal was similar to that reported in the earlier systematic review and to when it was used with patients in the supine position.

The ILMA and the LMA Classic were used successfully in each case study, and the outcomes were comparable to the results of the prior systematic review. The small number of LMA Classic devices seen in the current evidence compared with the prior systematic review probably is due to the current availability of the LMA ProSeal and LMA Supreme. These devices offer advantages over the LMA Classic, including the presence of a drain tube and a posterior cuff on the LMA ProSeal, and the design of the ILMA facilitates endotracheal intubation while ventilating the patient using the device. Placement of the LMA Classic in a patient in the prone position may have contributed to the avulsion of a decayed premolar in a patient with very poor oral health. The case report described the use of the ILMA to successfully ventilate and intubate a patient who had a large knife protruding from his lower back. A similar use was also reported in a case study included in the prior systematic review. These case reports may be subject to higher levels of publication bias compared with higher level evidence, and the results must be cautiously considered.

Clinicians must carefully consider this evidence when contemplating managing the patient’s airway in the prone position. An important advantage of placing the LMA while the patient is prone is the time saved positioning the patient. This has implications for ambulatory surgery settings, where cases may be short and turnover time between cases must be optimized for efficiency. Although LMAs were successfully used in patients undergoing procedures up to 5 hours, this practice must be carefully considered, because the time savings in case turnover is diminished with long cases. Additionally, there is little evidence to support the safety of this practice. Successful LMA use with prone, obese subjects was also reported in the same descriptive study, with about 40% of the subjects having a body mass index of 30 kg/m² or higher. Providers must very carefully consider all risks, benefits, and options before managing the airway of an obese patient in the prone position with an LMA.

Summary

Both the results of the previously published systematic review and the current evidence suggest that using an LMA with a prone patient may be an acceptable alternative to endotracheal intubation for select patients. The reduced requirement of extra staff for positioning, reduction in induction to incision time, successful placement and ventilation, and low rate of complications support considering the LMA in the prone patient. The LMA ProSeal may offer advantages.
over other types of LMAs, and the drain tube built into the LMA Supreme may offer advantages over the LMA Classic.

Clinicians practicing in the United States may be hesitant to adopt practices described by authors practicing abroad and may view use of an LMA to be safe in those patients who can be managed using a face mask. Clinicians should consider a number of factors if contemplating using an LMA in this manner. Only providers experienced with LMAs should consider using an LMA with a prone patient. It seems prudent to have skilled assistance available. A plan must be in place to immediately turn the patient supine if problems are encountered during insertion. A plan must also be discussed with the operative team to reposition the patient intraoperatively in case it is necessary to use other means to manage the airway. Patients should be carefully selected for prone LMA use. Patients should not be obese, should have normal airway anatomy, and should be at minimal risk for aspiration. Finally, this practice should be considered only for short procedures.

There is a distinct possibility that the complication rate is higher when using the LMA in patients positioned prone but that providers are not reporting these complications. There may be publication bias in favor of publishing the successful use of the device in patients positioned prone. Future high-quality multicenter RCTs should be conducted before this practice can be widely recommended. These studies should examine the outcomes of subjects undergoing surgery in the prone position when managed with an LMA compared with an ET tube.

Using an LMA as a bridge for a patient unintentionally extubated in the prone position seems reasonable, but the provider must have a backup plan in case of failure. Because of the rare nature of the problem, it is doubtful there will be RCTs conducted examining this practice. Transfer of knowledge gained from elective placement of LMAs in prone patients may be problematic because of the difference in conditions between emergency and elective situations.

REFERENCES


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