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EC ANAESTHESIA
Commentary

Airway Management in Children: Keep Your Head Up!

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General anaesthesia has a high degree of safety these days due to significant advancement in techniques and equipment. However, when problems do occur, airway/ventilation incidents form an important part of the critical incidents relevant to paediatric anaesthesia [1,2]. Invented in 1981 [3], laryngeal mask airways are now often used for children over one year of age coming for elective surgery [4]. They are also part of algorithms for difficult airway management [5]. Compared with tracheal intubation, supraglottic airway devices may decrease the risks of respiratory complications during recovery from anaesthesia after urological or general surgery (desaturation, laryngospasm and cough) [6]. Compared with the classic laryngeal mask airway, newer models of supraglottic airways may improve oropharyngeal leak pressure (i-gel™: 3.6 (95% confidence interval (CI) 1.9 to 5.8) cmH_2O), Cobra perilaryngeal airway™: 4.6 (95% CI 1.7 to 7.6 cmH_2O) and Proseal laryngeal mask airway: 3.4 (95% CI 2.0 to 4.8) cmH_2O) [7]. They may, however, have an increased device failure risk (i-gel™ and PRO-Breathe) [7]. Therefore, the classic laryngeal mask airway remains a popular model [8].

Intraoperative displacement and difficulty in correct placement have been identified as common problems associated with the use of laryngeal mask airways in children [8]. Azad AK compared two groups of children aged 2 to 7 years in an open randomized controlled trial [9]. In the intervention group, a classic laryngeal mask airway was inserted with a 180° rotation after a "triple airway manoeuvre". The "triple airway manoeuvre" consisted in head extension, mouth opening and jaw thrust [9]. For comparison, the classic laryngeal mask airway was inserted according to the standard technique using a "sniffing manoeuvre". It is to note that due to the prominence of the occiput in this age group, some children may not need a pillow under the head to align the external auditory meatus with the sternal notch [10,11]. Results reported by Azad AK [9] are in favour of the rotation technique. Although all laryngeal mask airways could be inserted within three attempts for all participants, the rotation technique coupled with the "triple manoeuvre" allowed placement at first attempt in almost every child (48/50 versus 30/50).

The rotation technique to insert laryngeal mask airways in children has been studied before (Table).

Study [reference]	Comparisons	Population	Findings/Conclusions
Classic laryngeal mask airway			
Soh 2001 [12]	Standard Rotation (180°)	67 children aged from 1 to 15 years	The success rate was higher (although not statistically significant) with the rotation technique
Nakayama 2002 [13]	Standard (partial inflation) Rotation (180°, partial inflation)	145 children aged 10 months to 7 years	The success rate of insertion at first attempt was higher with the rotation technique
Ghai 2008 [14]	Standard Lateral (45°, partial inflation) Rotation (180°, partial inflation)	100 ASA 1 or 2 children aged 6 months to 6 years	A rotation technique with partially inflated cuff is associated with the highest success rate of insertion
Ghai 2011 [15]	Standard Rotation (180°, partial inflation)	78 ASA 1 or 2 children aged from 2.5 months to 10 years	First-attempt success rate was significantly higher with a rotation technique compared with the standard technique
Azad 2017 [9]	Standard Rotation (180°, partial inflation) plus head extension, mouth opening and jaw thrust	100 ASA 1 or 2 children aged from 2 to 7 years	The adopted technique and maneuver maximized the overall success rate at first attempt
Proseal laryngeal mask airway			
Watanabe 2006 [16]	Standard (partial inflation) Rotation (180°, partial inflation)	80 ASA 1 or 2 children (mean age 3 years)	The rotation technique of insertion offers no advantage over the standard insertion technique in children
Yun 2011 [17]	Standard Rotation (90°)	126 children aged from 3 to 9 years	The success rate of insertion at first attempt was higher with the rotation technique than with the standard technique

Table: *Randomized controlled trials evaluating the rotation technique to facilitate laryngeal mask airway insertion in children.*

Although the technique varied slightly from one study to another (cuff partially inflated or not, addition of an extra manoeuvre or not), a 180° rotation facilitates the insertion of a classic laryngeal mask airway in children (Figure).

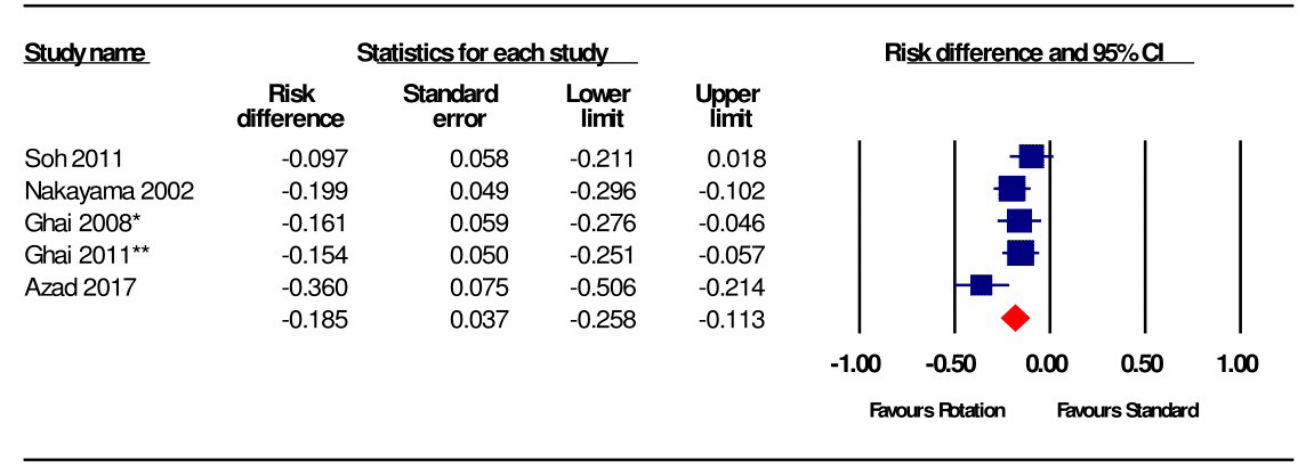

Figure: *Risk difference for failure on first attempt between rotation at 180° and standard techniques for insertion of a classic laryngeal mask airway in children.*

**: This study [14] contains a third group not included in the analysis; ** For this study [15], the laryngeal mask airway was placed with the two techniques. Failure rate is entered for 156 attempts on 78 participants; CI: confidence interval.*

For the Proseal however, a 180 ◦ rotation might be too much [16] (Table). One trial reported that a 90 ◦ rotation might be more appropriate for this particular model [17] (Table).

In conclusion, a 180 ◦ rotation should probably by selected preferentially for insertion of a classic laryngeal mask airway in children.

Key Sentence

A 180 ◦ rotation should probably by selected preferentially for insertion of a classic laryngeal mask airway in children.

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Conflict of Interest

Both the authors declare no conflict of interest.

Bibliography

1. Kupersztych-Hagege E., *et al*. "Critical incidents in a French department of paediatric anaesthesia". *Anaesthesia, Critical Care and Pain Medicine* 36.2 (2017): 103-107.

2. Mir Ghassemi A., *et al*. "A systematic review and meta-analysis of acute severe complications of pediatric anesthesia". *Paediatric Anaesthesia* 25.11 (2015): 1093-1102.

3. Hernandez MR., *et al*. "Evolution of the extraglottic airway: a review of its history, applications, and practical tips for success". *Anesthesia and Analgesia* 114.2 (2012): 349-368.

4. Patel A., *et al*. "A survey of practice patterns in the use of laryngeal mask by pediatric anesthesiologists". *Paediatric Anaesthesia* 25.11 (2015): 1127-1131.

5. Weiss M and Engelhardt T. "Proposal for the management of the unexpected difficult pediatric airway". *Paediatric Anaesthesia* 20.5 (2010): 454-464.

6. Luce V., *et al*. "Supraglottic airway devices vs tracheal intubation in children: a quantitative meta-analysis of respiratory complications". *Paediatric Anaesthesia* 24.10 (2014): 1088-1098.

7. Mihara T., *et al*. "A network meta-analysis of the clinical properties of various types of supraglottic airway device in children". *Anaesthesia* 72.10 (2017): 1251-1264.

8. Kaniyil S., *et al*. "A Survey of Current Practice of Supraglottic Airway Devices in Pediatric Anesthesia from India". *Anesthesia, Essays and Researches* 11.3 (2017): 578-582.

9. Azad AK. "Combining reverse rotational technique with triple airway maneuver vs standard classical laryngeal mask airway insertion technique in children". *EC Anaesthesia* 3.3 (2017): 86-90.

10. Kim EH., *et al*. "Simple method for obtaining the optimal laryngoscopic view in children: A prospective observational study". *The American Journal of Emergency Medicine* 35.6 (2017): 867-870.

11. El-Orbany M., *et al*. "Head and neck position for direct laryngoscopy". *Anesthesia and Analgesia* 113.1 (2011): 103-109.

12. Soh CR and Ng AS. "Laryngeal mask airway insertion in paediatric anaesthesia: comparison between the reverse and standard techniques". *Anaesthesia and Intensive Care* 29.5 (2001): 515-519.

13. Nakayama S., *et al*. "The rotational technique with a partially inflated laryngeal mask airway improves the ease of insertion in children". *Paediatric Anaesthesia* 12.5 (2002): 416-419.

14. Ghai B., *et al*. "Laryngeal mask airway insertion in children: comparison between rotational, lateral and standard technique". *Paediatric Anaesthesia* 18.4 (2008): 308-312.

15. Ghai B., *et al*. "Fiber-optic assessment of LMA position in children: a randomized crossover comparison of two techniques". *Paediatric Anaesthesia* 21.1 (2011): 1142-1147.

16. Watanabe K., *et al*. "The rotational technique with ProSeal laryngeal mask airway does not improve the ease of insertion in children". *Paediatric Anaesthesia* 16.5 (2006): 598-599.

17. Yun MJ., *et al*. "The 90 degrees rotation technique improves the ease of insertion of the ProSeal laryngeal mask airway in children". *Canadian Journal of Anaesthesia = Journal Canadien D'anesthesie* 58.4 (2011): 379-383.

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