LARYNGEAL MASK ANESTHESIA IN CHILDREN: A CASE REPORT

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The laryngeal mask airway has become one of the major tools of modern anesthesia airway management. Despite the fact that no time limit has been recommended regarding its safe use in spontaneously breathing children, or adults, there is still reluctance to use the laryngeal mask airway in operations of long duration. We report the case of an uneventful 5-hour long laryngeal mask anesthesia in a spontaneously breathing 11-year-old boy undergoing lower limb surgery.

Key words: Laryngeal mask airway; operation, duration; pediatric anesthesia; spontaneous ventilation.

Since its first description by its inventor, Archie Brain, in 1983,1 the laryngeal mask airway has become one of the major adjuncts in modern anesthesia airway management. While studies about the laryngeal mask airway in adults are numerous, the safe use of the laryngeal mask airway in pediatric anesthesia has not been established to the same degree.2(p245) We report the case of a 5-hour lower limb operation in an 11-year-old boy, during which the boy breathed spontaneously through the laryngeal mask airway without any associated complications.

Case summary
An 11-year-old boy, 155 cm tall, weighing 45 kg, having a body mass index (kg/m²) of 18.7, and a history of Ewing sarcoma in the right leg, presented for exchange of rodding in the right leg and iliac crest bone graft. Previous general anesthetics had been uneventful, and the preoperative assessment revealed an otherwise healthy boy. The boy was fasted from the night before surgery. After intravenous access was obtained, routine monitoring was established, which consisted of electrocardiograph, pulse oximeter, non-invasive blood pressure monitor, and capnograph. General anesthesia was induced with propofol, and a size 3 classic laryngeal mask airway (LMA), lubricated with lubricating jelly, was inserted easily and inflated to minimal occlusive volume.

Anesthesia was maintained with the boy spontaneously breathing a mixture of isoflurane and medical oxygen, and analgesia was provided with intravenous morphine injections. Perioperative monitoring consisted of heart rate, noninvasive blood pressure, Spo₂, ETCO₂, FiO₂, inspiratory and expiratory isoflurane concentration, and spontaneous respiration frequency, all of which were recorded every 5 minutes. Urine output and core body temperature were measured through an indwelling urinary catheter with temperature sensor. Throughout the 5-hour operation, the boy's spontaneous respiration via LMA remained effortless and free of inspiratory stridor, with a ventilation rate 20 to 25 breaths per minute, normal thoracoabdominal movement, and tidal volume. All other physiological parameters remained within normal limits during the procedure: heart rate, 85 to 110 beats per minute; sinus rhythm electrocardiograph; mean noninvasive blood pressure, 50 to 90 mm Hg; SaO₂, 99% to 100%; ETCO₂, 43 to 54 mm Hg. No arterial blood gas sample was taken because there was no apparent indication, and laryngeal mask cuff pressures were not measured.

After the operation was finished and the patient had regained his airway reflexes, the LMA was removed inflated under anesthesia. Inspection of the laryngeal mask did not show bloodstains or signs of regurgitation. Direct laryngoscopy revealed no sign of mucosal edema or trauma to the throat. After the boy had fully recovered, he denied any discomfort or unusual sensations from the throat. Discomfort from the throat was denied on the first postoperative day as well.

Discussion
The correctly inserted LMA should be positioned behind the cricoid cartilage at the level of the sixth or seventh cervical vertebra. Due to its shorter length and larger diameter, the LMA imposes less airway resistance and therefore requires less inspiratory work for the patient spontaneously breathing under anesthesia than corresponding-sized endotracheal tubes.3 The
successful use of the laryngeal mask airway in spontaneously breathing adult patients for prolonged anesthesia lasting 3 hours, 4 to 5 hours, 5, 6 7 hours, and even 8 hours, 8 has been reported. In pediatric anesthesia, however, prolonged anesthesia is still regarded as the domain for endotracheal intubation in order to achieve a secure airway and to prevent respiratory fatigue. Only few publications report time durations for the safe use of the LMA for spontaneous ventilation under anesthesia in children, ranging from 90 minutes 9 to 220 minutes. 10 Unfortunately, these studies failed to provide the exact age of the children involved. To date, the LMA use in operations of long duration remains a controversial issue among anesthesia providers in general. Some regard the LMA as suitable for shorter procedures only, 11(p47), 12(p72), 13 while others argue that it can be used safely in procedures lasting for more than 2 hours as well. 14 The upper time limit for safe duration of LMA use in spontaneously breathing children, or adults, has yet to be delineated.

The absence of perioperative respiratory fatigue, soiling, and bloodstains on the LMA after its removal, along with no evidence of mucosal edema or throat trauma under direct laryngoscopy at the end of the operation, supports the assumption that with sensible patient selection prolonged LMA use in spontaneously breathing children is safe. However, more studies in this field have to be conducted before a more detailed analysis will be possible.

REFERENCES

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