CASE REPORT

i-gel: a new supraglottic device for effective resuscitation of a very low birthweight infant with Cornelia de Lange syndrome

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SUMMARY

Laryngeal Mask Airway (LMA) has been indicated as an effective device for airway management when face-mask ventilation and intubation have both failed in infants weighing >2000 g or delivered ≥34 weeks of gestation. All previous studies used a classic LMA. The current report describes the first case of a very low birthweight infant (1470 g, <3rd centile; 36⁺3 gestational weeks) with micrognathia and palate cleft with Cornelia De Lange syndrome, resuscitated at birth with a new supraglottic airway device, i-gel size-1, positioned by a trainee paediatrician at first attempt. The procedure allowed reaching prompt effective ventilation and oxygenation of the patient, who was stabilised and intubated through i-gel.

BACKGROUND

Laryngeal Mask Airway (LMA) has been indicated as an effective device for airway management if face-mask ventilation and intubation have both failed or are expected to be unfeasible due to airway malformations¹ or to the specific work-setting (eg, neonatal transport).² It has been demonstrated to be easily placed by medic and paramedic staff, or by trainee physicians in adult patients.³ Current guidelines for neonatal resuscitation¹ consider LMA as a 'rescue' device for neonatal resuscitation in cases of unsuccessful ventilation with face-mask, or unfeasible tracheal intubation for newborns weighing >2000 g or delivered ≥34 weeks of gestation. All previous studies have been conducted with classic LMA (cLMA), and only a few of them enrolled newborns weighing less than 2000 g.⁴

We report our experience using a new supraglottic device (i-gel) after ineffective face-mask ventilation in a very low birth infant with a prenatal diagnosis of micrognathia.

CASE PRESENTATION

We present a case of a male infant born at 36 +3 weeks of gestation through caesarean section performed because of intrauterine growth retardation (birthweight 1470 g, <3rd centile) and oligohydramnios. He had a prenatal diagnosis of micrognathia; no other congenital malformations were detected; karyotype was normal 46, XY. At birth, the infant was apnoeic, hyporeactive and cyanotic with a heart rate <100 bpm. He was dried, stimulated and, due to the lack of improvement, neonatal resuscitation was started. A trainee

paediatrician started face-mask ventilation, but it was ineffective despite adequate corrective manoeuvres. At 2 min of life, an i-gel size 1 was placed by the trainee paediatrician with prompt recovery of heart rate (from 70 to 143 bpm) and transcutaneous saturation. At 5 min of life a 3.0 mm endotracheal tube was electively positioned through the i-gel under endoscopic guidance (figure 1). All phases of the procedure were well tolerated by the patient, maintaining transcutaneous saturation in the range of 83–96%. After the placement of i-gel, we decreased FiO₂ from 0.45 to 0.21. The physical examination demonstrated synophrys, micrognathia and cleft palate, low-set ears, syndactyly of second, third and fourth fingers of the left hand. These findings suggested the diagnosis of Cornelia de Lange syndrome.⁵

DISCUSSION

Neonatal upper airway abnormalities represent one of the main causes of difficult/ineffective intubation, especially for personnel with limited expertise in airway management.⁶ The use of cLMA for neonatal resuscitation in Pierre Robin syndrome⁷ or in other 'difficult intubations', such as Treacher Collins syndrome,⁸ as a rescue device for maintenance of a patent airway, has been previously reported. Several models of supraglottic airway devices are available, but studies reporting their use in neonatal patients are lacking.^{6,9}

The use of LMA is recommended as a 'rescue' approach for neonatal resuscitation if ventilation with face-mask or tracheal intubation is unfeasible or unsuccessful, but it is restricted to newborns weighing >2000 g or aged ≥34 weeks of gestation.¹

Figure 1 Endoscopic-guided intubation through i-gel.

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Neonatal i-gel has been observed, in the current case, to be an effective tool to warrant adequate ventilation, even for a trainee paediatrician. The i-gel is an easy to insert, uncuffed supraglottic device. A recent meta-analysis¹⁰ showed that i-gel provides a higher leak pressure than cLMA and LMA ProSeal in paediatric patients, suggesting that it provides an efficient seal.

We did not record any complications during insertion. The device provided us with an adequate tool for airway ventilation allowing an 'elective' intubation with endoscopic guide after patient stabilisation.

The endoscopic-guided intubation is not routinely available in our delivery room, it has been organised due to the expected birth of a child with an upper airway malformation. However, an upper airway device, such as LMA or i-gel, is always available in our delivery rooms because they may be life-saving tools when ventilation with face-mask or tracheal intubation are unfeasible or unsuccessful.

Learning points

- ▶ The Laryngeal Mask Airway is a life-saving device in patients with congenital upper airway malformations needing neonatal resuscitation.
- ▶ This report describes, for the first time, the use of i-gel for neonatal resuscitation of a very low birthweight infant with Cornelia de Lange syndrome.
- ▶ The resuscitation manoeuvres with i-gel can be effectively conducted by an inexperienced trainee paediatrician.
- ▶ Neonatal i-gel can be used as a conduit for endoscopic intubation.

In case of 'difficult' neonatal upper airway, i-gel may represent a life-saving device in case of failure of face-mask ventilation or tracheal intubation.

Competing interests None.

Patient consent Obtained.

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