

LMA® Supreme™ Airway for Prolonged Resuscitation of a Severely Asphyxiated Newborn

Arturo Giustardi¹, Marco Benigni¹, Matteo Parotto², Vincenzo Zanardo^{3*}

¹Department of Pediatrics, Cavalese Hospital, Cavalese, Italy; ²Department of Anesthesiology, Toronto University, Canada; ³Division of Perinatal Medicine, Policlinico Abano Terme, Abano Terme, Italy

ABSTRACT

American Academy of Pediatrics AAP has included the LMA in their 2015 neonatal resuscitation Guidelines. However, limited studies have evaluated LMA efficacy in severely depressed newborns. In this case report, we present the successful resuscitation a severely asphyxiated (pH 6.89, ABE-15.4) vacuum extracted neonate who required prolonged positive pressure ventilation (15 minutes) via a Supreme Laryngeal Mask Airway™. In the current case, a neonatal LMA Supreme use, allowing prolonged ventilation and ultimately stabilization, contributed to successful resuscitation.

Keywords: Airway; Neonatal resuscitation; The supreme laryngeal mask airway™

INTRODUCTION

The American Academy of Pediatrics AAP has included the LMA in their recent 2015 neonatal resuscitation guidelines because effective ventilation can be achieved quickly during an airway emergency [1]. However, to date, there are limited studies that have evaluated LMA efficacy during the resuscitation of severely depressed newborns. [2]. In this case report, we present a successful prolonged resuscitation performed with LMA® Supreme™ Airway (Medical Europe Ltd., Dublin Road, Athlone, Co Westmeath, Ireland) in a severely acidotic vacuum extracted neonate. LMA® Supreme™ is a single use, second generation, gastric access device which forms an effective first seal with the oropharynx (oropharyngeal seal) and an innovative second seal™ with the upper esophageal sphincter (the esophageal seal), which can minimize gastric insufflation and reduce the risk of aspiration

KEY POINTS

- AAP has included the LMA in their 2015 neonatal resuscitation Guidelines.
- Limited studies have evaluated LMA efficacy in severely depressed newborns.
- We present the successful resuscitation of a severely asphyxiated neonate via a Supreme Laryngeal Mask Airway™.

CASE REPORT

A 3.4 kg male born after normal gestation at 39 weeks, via instrumental (kiwi) vaginal delivery for worsening abnormal cardiotocography (CTG). At birth, the infant was apneic, hyporeactive and cyanotic with a heart rate >100 bpm. He was dried, stimulated, the airway was cleared and, due to lack of improvement, positive pressure ventilation was started with LMA Supreme and bag, following the AHA and AAP Guidelines for Neonatal Resuscitation. 1 Apgar score was 2 (heart rate >100 bpm) at 1st minute. Arterial cord blood gas analysis at birth revealed severe acidosis: pH-6.91, PaO₂-22.7, PaCO₂-78.9, HCO₃-13.4, ABE-15.3.

Nevertheless, at the 5th and 10th minute the neonate persisted apneic and hyporeactive with Apgar score 3 (heart rate >100 and acrocyanotic) and 4 (heart rate >100 and completely pink), respectively.

After the 10th minute of life the patient started to present active motion and weak hypoventilation.

At the 15th minute the spontaneous respiration was effectively recovered and concurrently, arterial blood gas analysis improved: pH-7.23, PaO₂-62.7, PaCO₂-28.9, HCO₃-15.4, ABE-13.3. The neonate was then transitioned from spontaneous ventilation via LMA to CPAP (FiO₂ 25%). Simultaneously, passive cooling to initiate hypothermia was initiated, and systemic cooling maintained for 72 hours after transfer to a level III NICU.

Correspondence to: Zanardo V, Division of Perinatal Medicine, Policlinico Abano Terme, Abano Terme, Italy, Tel: + 0497290027; E-mail: vincenzo.zanardo@libero.it

Received: December 27, 2019, **Accepted:** July 23, 2020, **Published:** July 30, 2020

Citation: Giustardi A, Benigni M, Parotto M, Zanardo V (2020) LMA® Supreme™ Airway for Prolonged Resuscitation of a Severely Asphyxiated Newborn. J Neonatal Biol. 9:276. doi: 10.35248/2167-0897.20.9.276

Copyright: © 2020 Giustardi A, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Subsequently, there was tolerance of enteral feeding after 72 hours of life, with the suspension of nasal CPAP and of oxygen on the 2nd day of life and cooling procedure on the 3rd day.

The following exams showed no alterations: CFM (1st to 3rd day of life), echocardiogram (1st day of life), transfontanellar ultrasound (1st, 3rd and 5th, days of life) and otoacoustic emission test (7th day of life). A brain magnetic resonance (5th day of life) was normal. The newborn was discharged with the breastfeeding mother on the 7th day of life.

Neurodevelopmental follow up (3rd, 6th, 12th, and 24th month of life) was normal.

DISCUSSION

We report a severe neonatal asphyxia case resolved without sequel at two years neurodevelopmental follow up, effectively treated with prolonged LMA ventilation and therapeutic systemic hypothermia. At birth the neonate's pH was 6.91, with a significant respiratory component (PaCO_2 79.8 mmHg), but conversely his heart rate was >100 bpm.

In this case-report, some clinical circumstances contributed to a favorable outcome with exclusive use of a LMA Supreme. All phases of the procedure were well tolerated by the neonate (perhaps in part as a result of the advantages provided by a second generation supraglottic device) [3,4]. In addition, intratracheal cardiokinetic drugs were not indicated with reassuring heart rate >100 bpm. Finally, systemic therapeutic hypothermia, currently the only recognized beneficial therapy for children with neonatal HIE, has the potential to improve development at 18 to 24 months for term and late preterm newborn babies at risk of brain damage [5].

CONCLUSION

In conclusion, in the current case, characterized by severe cord blood acidosis but sustained neonate's heart rate at birth, a neonatal LMA Supreme use proved to have an effective seal, allowing prolonged

ventilation and ultimately stabilization that contributed to prevent the neonate's brain damage and unfavorable developmental outcome together with systemic therapeutic hypothermia.

DISCLOSURE

The authors report no conflict of interest.

ETHICAL APPROVAL

The study was approved by the institutional review board of Cavalese Hospital.

ACKNOWLEDGMENTS

No disclosures or acknowledgments.

REFERENCES

- Perlman JM, Wyllie J, Kattwinkel J. Neonatal Resuscitation Chapter Collaborators. Part 7: Neonatal Resuscitation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. *Circulation*. 2015;132:204-241.
- Bansal, SC, Cauci S, Dempsey E, Trevisanuto D, Roehr CC. The Laryngeal Mask Airway and Its Use in Neonatal Resuscitation: A Critical Review of Where We Are in 2017/2018 Neonatology. 2018;113:152-161.
- Van Zundert A, Brimacombe J. The LMA Supreme™-a pilot study. *Anaesthesia*. 2008;63:209-210.
- Trevisanuto D, Parotto M, Doglioni N, Ori C, Zanardo V, Micaglio M. The Supreme Laryngeal Mask Airway™ (LMA): A new neonatal supraglottic device: comparison with Classic and ProSeal LMA in a manikin. *Resuscitation*. 2012;83:97-100.
- Guillet R, Edwards AD, Thoresen M, Ferriero DM, Gluckman PD, Whitelaw A, et al. Seven-to eight-year follow-up of the CoolCap trial of head cooling for neonatal encephalopathy. *Pediatric Research*. 2012; 71:205-209.