

Management of predicted difficult airway in a 6 days old neonate with burns over scalp and face

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Key points

A newborn requires constant monitoring during operation and anaesthetic management of a newborn depends upon the type of surgical emergency and condition of the newborn. Patient in this report was a neonate with burn over scalp and face, required skin grafting. Child was a case of predicted difficult airway, case was planned and done uneventfully, under general anaesthesia

Abstract

Difficult airway in a small child of 1.5 kg weight is a challenge for the anaesthesiologist. Problem are more compounded to handle newborn baby, who require proper airway, monitoring, drug dosages, intravenous fluids, temperature control and post operative pain relief. Advancement in neonatology has improved post operative survival of newborn babies in last few decades. Postoperative set up for respiratory care including IPPV is necessary for child's survival.

Keywords: Neonate, burn injury, scalp, face, skin grafting, classic LMA, endotracheal tube

Introduction

Burn injuries are a leading cause of paediatric morbidity and mortality. Facial burns have devastating effects on the affected child including fluid loss, pain, progressive stenosis and deformity. The anticipated difficult mask ventilation and difficult intubation requires skilful and experienced handling. Constant monitoring, temperature control and immediate intervention during anaesthesia are main key points required for the anaesthesiologist.

Always take a detailed history, adequate preparations, formulation of a detailed anaesthetic plan, checking of available anaesthetic equipment and availability of two experienced anaesthesiologists are absolutely essential.

Case report

A 3 day old neonate, delivered normally at Primary Health Centre, weighing 1.5 kg was brought to the burn casualty with scalp and facial burns. The history of burns developed over the scalp and face was due to the unnoticed temperature of the incubator, when baby was placed in it to maintain body temperature in view of very low birth weight. Baby was full term, normal vaginal delivery, cried immediately after birth. Her vital parameters and urine output were normal at the time of admission. At the 6th day of life, patient was posted for elective surgery for debridement and skin grafting of scalp. On examination, baby was ill-looking, dehydrated, lethargic with no fever, pallor, cyanosis and icterus. Heart rate was 120/min, temperature 37°C, RR 22/min, SpO₂ 98% on room air, ECG-WNL, CVS-NAD, respiratory system-NAD. Airway examination revealed bilateral constricted external nares and mouth opening of one

and half fingers only. Due to the unavailability of neonatal fiberoptic bronchoscope and PLMA size 1, it was planned to get the case done with classic LMA size 1. Intravenous line was secured with 24G intracath over dorsum of right foot and ringer lactate was started using paediatric burette set. Paediatric warming blanket was positioned and operating temperature was set around 28°C. Monitors were applied included SpO₂, ECG BP And temperature. Investigations are described in Table 1.

Investigation	Patient Values
Hemoglobin	14 gm/%
TLC	WNL
DLC	4000/C L
Platelet count	4 LACS
PT	10 sec
S.Na+	143 mmol/l
S.K+	4.5 mmol/l
B.Urea	28 mg %
S. Creatinin	0.8 mg/dl
S. Bilirubin	1.2 mg %

Table 1. Investigations

Small gauge piece was applied on the face for mask ventilation. Induction was started with sevoflurane (2%) and oxygen which was administered using Jackson Rees circuit. Injection glycopyrrolate 4 mcg/kg and injection fentanyl 1 mcg/kg were administered intravenously. Classic LMA was introduced faced upward and then rotated to 180 degree. Cuff was inflated with 6ml of air and LMA was secured after confirming bilateral equal air entry on auscultation. HR, BP, SPO₂, ETCO₂ were well maintained. Intravenous vecuronium bromide 0.1 mg was administered. Plain endotracheal tube size 3 was tried and was inserted through the CLMA into the trachea. Check ventilation was performed, showed bilateral equal air entry with SpO₂ of 100%. And EtCO₂ value of 35 with good graph was observed.

Full assembly of both LMA and tube were fixed and airway was secured without removing the LMA. Maintenance of anesthesia was done with O₂:N₂O (50:50) and sevoflurane 0.4 MAC, with controlled ventilation. Hypoxia, hypotension, hypothermia were avoided. Ringer lactate 50 ml with 10 ml of 5% dextrose were given as intravenous fluids. Later on 30 ml of blood was also transfused (Figures 1, 2, 3).



Figure 1. Burn on scalp and face showing difficult airway



Figure 2. LMA fixation



Figure 3. LMA and size 3 endotracheal tube

Total duration of surgery was one hour and the perioperative period was uneventful. Patient was reversed with injection glycopyrrolate 0.01 mg/kg and injection neostigmine 0.06 mg/kg, after gentle suctioning of oral cavity, endotracheal tube was removed but LMA was left in situ, which was removed later on, after 5 minutes when the neonate was fully awake. Baby was shifted to burn ICU for further observation.

Discussion

Severe facial burns can alter a child's sense of identity and place the child at high risk for future emotional and psychological disturbances.^[1] It is a challenge for the parents and doctors as they require long term care of baby by multidisciplinary systems.^[1,2] Neonates with difficult airway especially with burns are more susceptible to mucosal damage by intubation. LMA was useful tool in our setting, being safe and efficacious.^[2] Tracheal intubation through a LMA is an option for securing airway in neonate with a difficult airway.^[3]

Studies show LMA has a lower risk of airway related complications than those with endotracheal intubation.^[4] Predicting the difficult airway in a child involves adequate history, examination, reviewing relevant investigations.^[5]

Important features of paediatric airway are tongue being larger to mandible hence chances of easy obstruction are there. Higher metabolic rate (7-8 ml/kg/min) leads to quick desaturation, diaphragmatic breathing, decreased FRC, require early assisted controlled ventilation.^[5]

Inhalational induction is well tolerated in babies particularly with difficult airway.^[5]

Conclusion

In case with anticipated difficult airway, always select appropriate anaesthetic equipments prior to start of anaesthesia and formulate a clear anaesthetic plan for successful outcome. A word of caution: scalp and face surgeries necessitate the anaesthetist to be away from the endotracheal tube and the operative site, thus requires extra precautions for securing a safe airway and essential monitoring.

References

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