



A case of large occipital meningoencephalocele in a neonate: an alternative approach to intubation

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ABSTRACT

Anaesthetic management of occipital meningoencephaloceles poses lot of challenges starting from airway management and positioning to perioperative care and postoperative outcome. We report a successful airway management in a case of 18-day-old female baby presented with a large occipital meningoencephalocele posted for surgical excision and the newer technique of intubation followed in this case while, the routine preferred techniques were failed.

INTRODUCTION

Meningoencephalocele is a type of encephalocele characterized by the protrusion of both meninges and brain tissue through a defect in the skull. There are two main types of meningoencephaloceles, the more common occipital type is located at the occipital bone while the frontoethmoidal type is located at the frontal and ethmoid bones. Incidence is reported to be 1 in 5000 live births [1]. The condition is typically congenital but environmental factors are also thought to play a role [2]. Treatment includes surgery to repair the defect. Anaesthesia for these surgeries will have lot of complications. Here, we present a new intubation approach in a case of giant occipital meningoencephalocele and the successful anaesthetic management of the case.

Case history

A 18-day-old female baby presented with a large cystic swelling in the occipital region since birth and was posted for surgical excision of the swelling. The baby was born of non-consanguineous marriage and was delivered at Term by emergency caesarean section. The child weighed 2900g and cried vigorously after birth with the Apgar score of 7/10 and 9/10 in the 1st and 5th minute respectively. Head circumference was 33cm and the baby moved all four limbs normally. Antenatal history and

Family history was not significant. But her antenatal ultrasound at the 5th month of pregnancy revealed a cystic swelling in the occiput. Ultrasound at 7th month also confirmed the same. The baby was admitted in the ICU for routine neonatal care. The surgeons decided to excise and repair the occipital meningoencephalocele.

On preanaesthetic evaluation, Vitals were stable and the systemic examination was also normal. There was a large cystic swelling that measured 12 x 10 cm arising from the occipital region [Figure 1]. No other congenital anomaly seen. Cranial CT study showed a large meningoencephalocele through a bony defect in occipital region with contents of the encephalocele formed by the posterior fossa [Figure 2]. All Laboratory evaluations were within normal limits.

Baby was kept NPO for 4 hours before surgery and brought to the operating room (OR). Spo2, ECG, NIBP, Precordial stethoscope were the monitors used. Maintenance fluid (10ml of 5% dextrose with 40ml of RL) was infused through the 50ml syringe. After premedication with Intravenous atropine 0.02mg/kg and fentanyl 2 µg/kg, the neonate was induced with sevoflurane in 100% oxygen in lateral position [Figure 3]. After ensuring adequate mask ventilation, the baby was evaluated for proper position for intubation [Figure 4]. A appropriately sized thick foam, with a defect cut out to accommodate the occipital mass



Fig 1. Large meningoencephalocele arising from occipital region

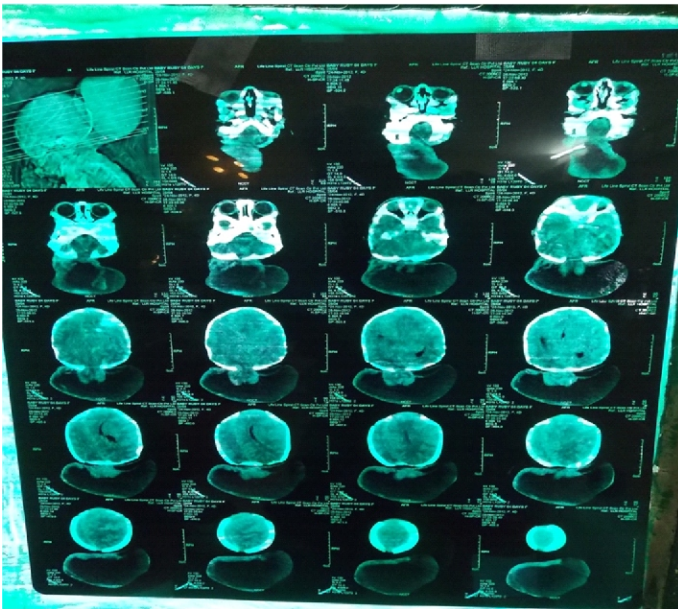


Fig 2. CT showing a large meningoencephalocele in occipital region



Fig 3. Induction in lateral decubitus position



Fig 4. Positioning for intubation

was also tried. But none of them was adequate for intubation. At last, we lifted the baby from the OR table and held in air with good support to the baby and sac and assessed for intubation [Figure 5]. The position was found to be adequate and the neonate was intubated with size 3.0 tracheal tube after achieving deep induction with sevoflurane. After confirmation of appropriate placement and tube fixation, loading dose of Inj. Atracurium 0.5 mg/kg was given to achieve adequate muscle relaxation. With careful precautions, the baby was then turned to prone position and parts draped for surgery. Anaesthesia was maintained with O₂: N₂O (50:50), sevoflurane 1-2 %, Inj. Atracurium and Inj. Fentanyl. Complete surgical resection done

with meninges excised and transfixed followed by a tight closure of dura. Blood loss was about 50ml and was adequately replaced with blood. With the establishment of spontaneous respiration, airway reflexes and stable vitals, the baby was extubated and transferred to NICU for further monitoring and care. Total duration of anaesthesia was two hours. For postoperative analgesia, local anaesthetic infiltration of the wound done and paracetamol was given per rectally. Postoperative period was uneventful and the baby did well with the movement of all four limbs with a good cry and normal feeds. The baby was then discharged and advised for further follow up in neurosurgery department.



Fig 5. Intubating the baby by lifting off from operating table

DISCUSSION

Meningoencephalocele is the protrusion of part of meninges and neural elements in a hernial sac. They may be associated with varying degrees of sensory and motor deficits like hydrocephalus, abnormalities of the eyeball and lacrimal duct, club foot, Klippel-Feil syndrome and congenital heart diseases[3][4]. Treatment is by surgical excision of the herniated meninges and brain tissue with repair of the dural defect. Repair of meningoencephaloceles poses lots of risks and challenges to the anaesthesiologists and neurosurgeons[5]. The major anaesthetic problems in management of occipital meningoencephalocele is securing the airway. Since the occipital meningoencephalocele neonates have limited neck extension and high likelihood of rupture of sac, it will be difficult to intubate in supine position. So at first we tried to intubate the neonate in lateral decubitus position[6]. Mask ventilation was adequate in lateral position, but direct laryngoscopy in the lateral position showed Cormack-Lehane Grade 3b, which made us difficult to intubate. Then, based on the previous articles, we tried for two alternative approaches by placing the child in the supine position on a platform of rolled blankets with an assistant supporting the head and by placing the child's head beyond the edge of the table with support[7]. Direct laryngoscopy with both the above techniques failed to visualise the glottis. Finally we lifted the baby off the OR table. One assistant stabilized the child's head and shoulders, and the other supported the body, pelvis, and lower limbs. Laryngoscopy in this position showed Cormack-Lehane Grade 2a, which made us to intubate the trachea with a 3-mm size, endotracheal tube in first attempt. Although mask ventilation was adequate in lateral position, we thought that this large occipital meningomyelocele would create difficulty during intubation, so we intubated the neonate with deep sevoflurane induction without muscle relaxant. Other airway management techniques in these kind of cases includes, readily available foam-cushion devices by which the neonate can be positioned supine, with only one person needed to manage the airway and by needle decompression of the encephalocele sac under sterile

conditions[7][8]. Next to airway, attention was given while shifting the neonate to prone position to avoid life threatening complications. Apart from airway and positioning, we also had strict adherence to fluid management, estimation of blood loss, maintenance of temperature using hot air warming blankets and good pain control. Since the amount of herniated brain tissue in the sac was small, surgical resection did not create much problem during emergence. All these, helped us in successful anaesthetic management and outcome of this difficult airway case.

CONCLUSION

Neonates are not like adults. Occipital meningoencephalocele neonates are more prone for anaesthetic complications. Prior understanding and analyzing the neuropathophysiology and unanticipated anaesthetic complications will help the anaesthesiologists when they land up in emergency crisis. This case report gives an alternate approach in handling the airway of neonates as a last resort, when the routine intubation techniques fail.

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