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LARGE OCCIPITAL MENINGOENCEPHALOCELE IN A NEONATE: ANAESTHETIC CHALLENGES

Anaesthesiology

Dr Vindhya Prasad	Senior Resident BJGMC, Pune.
Dr Deepak R	Junior Resident BJGMC , Pune.
Dr Pradnya Bhalerao	Professor and HOD , GMC Bharamati.
Dr Shital Kuttamare	Assistant Professor, BJGMC, Pune.
Dr Neha Jha	Junior Resident, BJGMC, Pune.

ABSTRACT

Introduction: Meningo-encephalocele is herniation of meninges, CSF and brain substance through the skull defect. Anaesthetic management of occipital meningo-encephalocele in a neonate is challenging due to difficult airway, restricted neck movements, fluid loss and associate congenital diseases. **Case Report:** A seven day old neonate with meningo-encephalocele (5×8mm2 skull defect with herniating posterior fossa contents) was posted for surgery under general anaesthesia. The patient was induced in supine position, a doughnut fitting the swelling was kept to prevent accidental rupture of the swelling and one anaesthesiologist supported the head by placing a hand under the shoulder while other supported the body. Inhalational induction was done with sevoflurane, after pre-oxygenation for 3 minutes with the neonates head at the edge of table well supported. Intubation was done with uncuffed 3.0mm endotracheal tube. After confirming bilateral equal air-entry, injection atracurium was given and throat packing was done. Prone position was given with extreme care to prevent accidental extubation taking care of the pressure points and abdominal compession. Anaesthesia was maintained using O2:N20 and sevoflurane. Protruding cerebellar components were reduced & defect closed. Blood loss was replaced with whole blood. **Conclusion:** A case of neonatal meningomyelocoel was thus operated under general anaesthesia with vigilant perioperative monitoring and taking care of the anaesthesia concerns

KEYWORDS

Meningo-encephalocele, neonatal , occipital swelling, difficult airway, anaesthetic challenges.

INTRODUCTION:

Incidence of meningoencephalocele may vary from 0.8 to 5.6 / 10000 live births[1,2]. Occipital bone is the most common location for encephalocele. Neurological outcome is dependent on the size of the sac, neural content, presence of hydrocephalus, infection and other accompanying congenital malformations. Anesthetic challenges include difficult intubation due to inability to place the neonate in supine position, surgery in prone position leading to accidental extubation and intraoperative blood loss.

Case Report:

Seven days old female neonate weighing 2.8 kilograms presented with swelling in posterior aspect of neck.

The baby was delivered by full term normal vaginal delivery and APGAR at 1 and 5mins were 8 and 9 respectively. Since birth, there was a swelling in the back of the head with a breached overlying skin for which baby was kept in neonatal care unit (NICU) for observation.

Local USG of the occipital swelling revealed a defect in the occipital bone with posterior fossa content herniating through it. CT scan showed 5x8 mm defect in the occipital region through which neural parenchyma was seen herniating. The contents were surrounded by large CSF density fluid measuring 3.2x3x2.9 cm. Lateral ventricle appeared prominent. Hence it was decided to operate on the neonate. There were no signs of meningeal irritation, convulsions or neurological deficits. Cardiovascular and respiratory systems were normal. There were no other congenital anomalies. Other systemic examination was within normal limits.

Preoperative counseling regarding procedure and informed consent was taken from parents. Using a syringe pump, 1% Dextrose Ringer lactate was started at 11ml/hr. As baby had an occipital swelling, a doughnut with size of the inner hole fitting the swelling was kept with cotton padding. Measures were taken to prevent compression or accidental rupture of the swelling.

ECG, NIBP, ETCO2 and precordial stethoscope were attached for monitoring. Baseline parameters were recorded. Injection Glycopyrolate 0.014 was given as premedication.

Baby was induced in lateral position with inhalational sevoflurane with 100% oyygen. Baby was intubated with 3.0mm (inner diameter) uncuffed ET tube in the first attempt and muscle relaxant Inj.Atracurium 0.14 mg was given after intubation. Endotracheal tube was fixed at mark 9 cm after confirming bilaterally equal air entry. Throat packing was done. Baby was then made prone with extreme care to prevent accidental extubation. Cotton padding was done below pressure points and air entry was reconfirmed after final positing.

Anesthesia was maintained using O2:N20 at 50:50 and sevoflurane at 1% and atracurium as muscle relaxant. Fentanyl 5 micrograms was given for analgesia. Incision was taken and gradual drainage of the CSF was done with strict monitoring of vitals. The cerebellar components were seen and were reduced and as the defect was small tight dural closure was done in 2 layers. The total blood loss was 30ml and was replaced with 30ml of whole blood. Intraoperative period was uneventful and the total duration of the surgery was approximately 3hours.

As only the contents herniating were reduced and intraoperative period was uneventful, baby was extubated after reversal of neuromuscular blockade with Inj.Glycopyrolate 0.028mg and Neostigmine 0.14mg. Post extubation, baby was moving all four limbs and crying. Baby was shifted to NICU for observation. Later baby was accepting feeds regularly and was doing well. Baby was discharged on the 21st post-operative day.

DISCUSSION:

Meningoencephalocele is one of the types of encephalocele with herniation of meninges, brain substance and CSF through a defect in the cranium. Most of them occur in the midline[1]. Depending on the location of the sac, meningoencephaloceles may be fronto-ethmoidal or occipital types. Occipital meningoencephalocele is more frequent with an incidence of 1 in 3000 to 1 in 10,000 live births and occurring more commonly in females[1]. A study conducted in Uttar Pradesh, India, showed an incidence of neural tube defects of 7.48 per 1000 live births[3]. Among them encephalocele constituted 1.57/1000 live births[3]. Patients with meningoencephalocele may have neurological deficits. It may also be associated with other congenital anomalies.

An anesthetist must plan a perioperative care taking into consideration airway management, prevention of hypothermia, appropriate fluid and electrolyte balance, maintenance of prone position and search for other

congenital anomalies like, hydrocephalus, cardiac defect and Klippel-Feil syndrome.

Presence of occipital swelling poses a challenge in accessing and maintaining the airway because of restricted neck mobility and positioning during surgery, which are compounded by the anatomic variations in infants like short neck, large tongue and large head[4]. Failure to intubate may result in hypoxia, bradycardia or even cardiac arrest. To circumvent this problem, a difficult airway cart should be kept ready.

Prevention of hypothermia is of paramount importance. For this any of the warming devices must be kept ready[5]. In this case we used baby warmer to prevent hypothermia.

Airway management in a case of occipital meningoencephlocele may vary from patient to patient depending on the size of the occipital meningoencephalocele, age of the patient and associated other congenital anomalies[6]. Various authors described different ways for intubation.

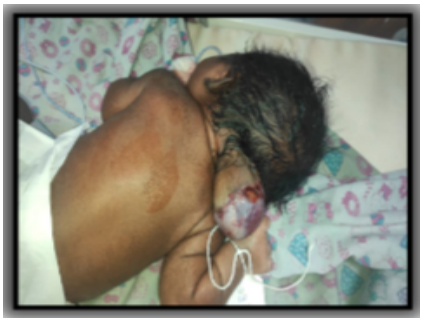
Creighton described lateral positioning[7], Cote suggested supine position with sac supported by a doughnut[8], Manhas et al took aid to lift the child (one person to support the head and shoulder and a second person to lift the torso and legs) for intubation[9]. In our case we intubated the baby in lateral position.

Blood loss was monitored and was replaced by equal amount of whole blood.

CSF drainage was done under strict monitoring, as this may be associated with hemodynamic instability. Creighton et al reported disturbances in central autonomic and temperature control in a study involving 31 patients with occipital encephalocele[7]. However, in our case we did not observe any disturbances in body temperature.

CONCLUSION:

Handling a case of neonatal meningoencephalocele is challenging for both anesthesiologist and neurosurgeon and involves an interdisciplinary approach. Managing a case of neonatal meningo encephalocele includes proper preoperative assessment especially, looking for other associated congenital anomalies, expertise in neonatal airway handling, proper positioning and vigilant intraoperative monitoring to prevent hypothermia and hypovolemia. Careful assessment and planning are essential for successful anesthetic management of cases of neonatal meningoencephalocele.



Preoperative

Postoperative

REFERENCES:

1. Markovic I, Bosnjakovic P, Milenkovic Z. Occipital Encephalocele: Cause, Incidence, Neuroimaging and Surgical Management. *CurrPediatr Rev*. 2020;16(3):200-205.
2. NORD. https://rarediseases.org/rare-diseases/encephalocele/ (accessed on 17th Aug, 2021)
3. Rai SK, Singh R, Pandey S, Singh K, Shinde N, Rai S, *et al*. High incidence of neural tube defects in Northern part of India. Asian J Neurosurg. 2016; 11(4): 352–55.
4. Kumar R, Jain S, Mehta RK, Trivedi S, Dakshayani KR. Anaesthetic Management of Giant Encephalocele. Int J Res Med Sci. 2015;3:3889-92.
5. Hackel A, Badgwell JM, Binding RR, Dahm LS, Dunbar BS, Fischer CG, et al. Guidelines for the pediatric perioperative anesthesia environment. American Academy of Pediatrics. Section on Anesthesiology. Pediatrics 1999;103:512-5.
6. Dey N, Gombar KK, Khanna AK, Khandelwal P. Airway management in neonates with occipital encephalocele – adjustments and modifications. Pediatric Anesth. 2007;17:1111–21.
7. Creighton RE, Relton JES, Meridy HW. Anaesthesia for occipital encephalocele. Can AnaesthSoc J 1974;21:403-6.
8. Cote Charles J, Miller Ronald D. Miller's Anaesthesia, 7th ed., chapter : 82, Paediatric anaesthesia, Churchill Livingstone, 2010, 2589.
9. Manhas Y, Chinnan NK, Singh AK. Neonatal airway management in occipital encephalocele. AnesthAnalg. 2006;103:1632