



Anaesthetic management of a newborn with occipital meningoencephalocele excision

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Abstract

Meningoencephalocele is herniation of CSF and meninges along with brain tissue through a defect in the skull. It is challenging to the anaesthesiologist because of the presence of huge swelling over the posterior aspect of the neck resulting in inadequate extension of the neck and inability to lay down the neonate in supine position. The authors report a case of a 18 day old neonate weighing 2.4kg with a huge occipital meningoencephalocele (80x76mm), scheduled for excision. There were no signs of meningeal irritation, convulsion, no other signs of raised intracranial pressure and no neurological deficit. CVS and RS examinations were normal. The airway management was challenging as expected, hence before intubation pre oxygenation was done for 5 minutes in lateral position using a donut ring to support and stabilize the swelling and intubation was done in lateral position, the modified Cromack-Lenke score was found to be 2b, hence Burp manoeuvre was used to aid in intubation. Intra operatively patient was managed successfully and extubated on table. Postoperative stay in NICU was uneventful and discharged on post-operative day12.

Keywords: Meningoencephaloceles, anaesthesiologist, position

1. Introduction

Meningo encephalocele is a defect in the skull that includes herniation of CSF and meninges along with brain tissue. Incidence in South East Asia is 1:5000 live births. Occipital meningoencephalocele poses challenges to the anaesthesiologist because of inadequate extension of the neck, inability to lay down in supine position and for difficult intubation of the neonate. Perioperative management may be challenging for both anaesthesiologist and surgeon, hence a multidisciplinary approach is essential in this patient.

2. Case report

A 18 day old male child weighing 2.4kg with occipital meningoencephalocele was scheduled for excision and repair. The neonate had been delivered by normal vaginal delivery at term with birth weight of 3kg. There were no signs of raised intracranial pressure, meningeal irritation or convulsion and there were no neurological deficit. No other congenital anomaly was associated. Cardiovascular and respiratory system examinations were normal. The swelling was present since birth, stagnant in size with MRI suggestive of occipital meningoencephalocele.



Fig 1

3. Investigations

His routine blood investigations including CBC (Hb- 10.4gm/dl, WBC 40900 cells/cumm, platelet count – 631000 lacs/cumm) and RBS, RFT, Electrolytes, Coagulation profile were within normal limit. Blood grouping and crossmatching was done.

MRI Brain of this patient show 21mm gap defect noted in the posterior occipital region through which there was herniation of occipital lobe along with subarachnoid space and meninges. There was posterior elongation and compression of the midbrain and thalami with effacement of quadrigeminal cistern, cistern

Magna and B/L lateral ventricles (Lt>Rt), 3rd and 4th Ventricles. There was downward displacement of left temporo-parietal lobe causing compression over ipsilateral cerebellum.

CT Angiography of brain with Venography show focal defect of 20mm with herniation of 80 mm x76mm of brain parenchyma. Posterior stretching of both posterior cerebellar artery was noted. Multiple dilated tortuous venous channels were noted within the encephalocele.

4. Anaesthetic management

During preoperative checkup the vitals of baby were temperature -100.4F, pulse rate- 146/min, BP-78/52 mmhg, Spo₂ -98% on air. The baby was put on antibiotics –inj piperacillin/tazobactam (4g / 0.5)100mg/kg 8hrly and inj amikacin -15 mg/ kg 12hrly.

On the day of surgery the baby was kept NPO for 4 hours. The vitals were temp.-100.5F, Pulse rate -130/min, BP - 76/50 mmhg, Spo₂ - 98% on air. We had planned for intubation in the lateral position as the meningoencephalocele was bigger in size, hence the positioning of the head was anticipated to be difficult. After positioning the patient over the warming mattress the face was tilted to right side to give a lateral tilt. ECG, Noninvasive BP, Spo₂, EtCO₂, surface temperature probes on axilla and precordial stethoscope were attached to the patient and all the baseline values were recorded. Two 22G ic cath taken in both hands. The patient was pre oxygenated in lateral position with 100% O₂ for 5 minutes, premedicated with Inj. glycopyrolate 4 mcg/kg iv, Inj. Paracetamol 10 mg/kg iv, Inj Fentanyl 2mcg/kg iv and Inj. Dexona 0.1mg/kg iv.. The patient was induced in lateral position with head positioned in doughnut ring with Inj. sodium thiopentone 8mg/kg iv and sevoflurane 5%

Laryngoscopy was done in right lateral position and the patient was intubated with micro cuffed ET with inner diameter 3.0 mm and fixed at 9cm after confirming bilaterally equal air entry. Patient received a loading dose of 0.5mg/kg of atracurium after proper tube fixation and positioning of the patient. Anaesthesia was maintained with O₂, sevoflurane, intermittent Inj atracurium 0.1mg/kg iv. Under all aseptic and antiseptic precautions painting and draping was done. Complete resection of sac was done without any complication. Subdural pus was found intra operatively. The duration of surgery was approximately 4 hours. Intraoperative period was uneventful. Intraoperative fluid management includes 15cc Isolyte P, 40cc Ringer lactate (RL), 5cc Dextrose 25 (D25), 15cc Packed cell volume (pcv), inj calcium gluconate 1cc in first hour; 17cc RL, 3cc D25, 15cc Normal saline, 10CC PCV, inj calcium gluconate 1cc in second hour; 17 cc RL, 3 cc D25, 10 cc PCV, inj calcium gluconate 0.5cc in third hour and 20cc RL given i.v. in fourth hour. After the completion of the procedure, reversal of muscular blockade was done with Inj. glyco 8mcg/kg iv and Inj. Neostigmine 0.05mg/kg iv. patient was extubated after regaining all protective reflexes, spontaneous respiration with adequate tidal volume, active movements of all limbs. the baby was put on O₂ @ 4litres/min using nasal prongs. the post op vitals-temp- 98.4F, Pulse rate - 130 /min, Bp-72/50 mmhg, Spo₂-98% on O₂ @ 4 L/min with nasal prongs. After 30 min of observation neonate was stable vitally and shifted to NICU with nasal prongs. The post-operative blood investigations include CBC (hb - 8.4 gm/dl, WBC - 20,000 cells/cumm, platelet - 601000 Lacs/cumm).The antibiotics were continued for 10 days. Inj meropenem 40 mg/kg 8hourly was

added. On second day 35 cc of pcv, syp pcm 1mg 6hourly, formula feed 30 cc 2hrly was started. the baby was put on air from 3rd day. No complication was found on post-operative period and baby was discharged after 12 days.

5. Discussion

The management of occipital meningoencephalocele is challenging to anaesthesiologists. To secure adequate positioning of the baby on the operation theatre table, anticipate difficult intubation along with the fluid management and replacement of blood loss during surgery are major challenges. Approximately 75%- 85% of the encephaloceles are found in the occipital region. Children are likely to have varying degrees of sensory and motor deficits. Associated congenital defects include congenital cardiac defects, club foot, hydrocephalus, exostrophy of bladder (ectopia vesicae), Klippel Feil syndrome. Once the decision to operate has been made, a perioperative plan must be formulated. Paediatric patients have a low functional reserve volume, and are prone to rapid desaturation; and failure to intubate the trachea may result in hypoxaemia, bradycardia and even cardiac arrest. Improper positioning and limited neck extension can make endotracheal intubation difficult or impossible. Mask ventilation and tracheal intubation can be performed in the lateral position or in supine position with sac protected by elevating it, traditionally on a donut ring. Alternative approaches such as Mowafi's method (building a platform with drapes and put under the baby until the height from ot table matched that of the encephalocele) can be used. Alternatively intubation can be done by supporting the child's head beyond the edge of the table with an assistant while another assistant stabilizing the baby's body. Quezado, *et al.* described simple foam-cushion devices. In this approach, only one person is needed to manage the airway. Removal of large quantity of CSF and blood loss causes volume and electrolyte disturbances which need to be corrected Perioperatively with IV fluids and pcv.

6. Conclusion

The management of patients with giant meningoencephalocele needs multidisciplinary approach and post-operative NICU care. The challenges faced by anaesthesiologists include difficult positioning, difficult intubation, maintaining body temperature and managing fluid loss and blood loss replacement.

7. References

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