

Refractory Seizures Following Encephalocele Surgery

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Abstract: Encephalocele, midline defect of cranial bone fusion, occurs most frequently in the occipital region. Airway management in pediatric patients poses many challenges to the anesthesiologist. The purpose of this study is to describe the airway problems encountered for such cases, how these problems were managed and also to bring into light a rare encountered unreported problem of perioperative refractory seizures. Comprehensive care during perioperative period is essential for successful outcome.

Keywords: Anesthesia, difficult intubation, refractory seizures, occipital encephalocele

INTRODUCTION

An encephalocele is cystic congenital malformation in which central nervous system structures herniate through a defect in the cranium in communication with cerebrospinal fluid pathways [1]. Incidence of congenital encephalocele is estimated at 1:3,000 to 10,000 live births, favouring females 2.3:1 [2]. Etiology of encephalocele is still unknown [3].

Difficult or failed tracheal intubation, feared by all anesthesiologists still remains the nightmare for an anaesthesiologist due to limited means to predict it [4]. The occurrence of associated congenital abnormalities might be a clue for potential difficulty of intubation.

The two major aims of the anesthesiologists while caring for children with occipital encephalocele intraoperatively are to avoid premature rupture of the encephalocele and to manage a possible difficult airway due to restricted neck movement and inability to achieve optimal position for intubation of the trachea.

CASE REPORT

A two months male child presented to the hospital with large swelling over back of head since birth. He was diagnosed as a case of occipital encephalocele (Fig. 1) and planned for excision. Preoperative investigations and examination were normal. Inside operation theatre, monitoring was done using oesophageal stethoscope, blood pressure cuff, pulse oximeter, ECG and temperature probe. Using an overhead infra-red heating lamp during the preparatory

stages and heating blankets during the operation help to maintain body temperature. Thereafter, child was premedicated and thence induced with Injection Propofol 2 mg/kg. Intubation was an anaesthetic challenge considering the large encephalocele limiting head extension. In this method, we lifted the baby off the operation table with the help of two residents (Fig. 2). One resident stabilized the child's head, and the other supported the pelvis. The neonate was put in the supine position with the body on the platform while a resident temporarily supported the head. He was intubated with Injection Atracurium 0.5 mg/kg and maintained with Oxygen, Nitrous oxide and Halothane. Post intubation, he was turned prone. Surgery was intraoperatively uneventful. Post surgery he was turned supine. On turning supine just before extubation, we noticed twitching of upper and lower limbs which was diagnosed as generalized seizure. Immediately we switched to 100% oxygen and Halothane being already cut off. Immediately, we administered Injection Midazolam 0.5 mg i.v stat, but seizures were not controlled. Injection Phosphenytoin 20mg/kg loading dose was administered but seizures persisted. Arterial blood sample was taken and all parameters including electrolytes and sugar were normal. Pediatrician was called for. Meanwhile, Injection Lorazepam 0.4 mg i.v. was given, but seizures were refractory. We gave a bolus of Injection Thiopentone @5 mg/kg and the frequency and intensity of seizures dampened. Slowly and slowly, the seizures abated. We planned to go for elective ventilation in view of unknown cause of refractory seizure. Child was shifted to PICU under pediatrician cover and placed on Pressure control mode.

Pediatric intensivist decided to continue with injection Thiopentone bolus 4mg/kg 8 hourly and tapered to 3 mg/kg next day. No seizure episodes were reported till next day in PICU. The child was placed on maintenance dose of Injection Phosphenytoin and

extubated on 3rd postoperative day. Breast feeding was commenced on 4th postoperative day and child was shifted to the pediatric ward the very next day. He was subsequently discharged later.



Fig 1: Diagnosed as a case of occipital encephalocele



Fig. 2: Alternative Method



Fig. 3: Mowafi Method

DISCUSSION

The problems we faced during the case were two fold. First being difficult airway, which was managed according to the standard protocol as described above.

Occipital encephaloceles are known to cause to restriction of head movement. This can lead to difficulty in positioning for laryngoscopy and in visualizing the glottic opening. Two commonly used techniques for airway management are Mowafi and alternative method (Fig. 2). Platform method described by Mowafi *et al.* [5] (Fig. 3) utilizes placement of silicone supports under the neonate body until the height matches that of the encephalocele sac. This method is very useful for anesthesiologists, especially in cases of large occipital encephalocele. The advantages of this method are less requirement of manpower and preventing pressure on encephalocele sac leading to possible rupture. Alternative approach is to lift the baby off the table [6, 7]. This method is helpful for patients with small occipital encephalocele. We utilized the second approach. We lifted the baby off the operation table with the help of two residents (Figure 2), wherein one person stabilized the child's head and the other supported the pelvis. Laryngoscopy in this position improved visualization of the cords. We intubated the trachea with a 3.5-mm uncuffed, endotracheal tube and proceeded uneventfully.

Second hurdle was refractory seizures just before extubation. This incident has not been reported earlier in literature. However cases of temporal lobe encephaloceles [8] have been reported but they present with seizures preoperatively also. Since all the reversible causes were excluded, the consensus agreed upon by the team comprising of anaesthesiologist, neurosurgeon and pediatrician was that some inadvertent iatrogenic stimulation of brain parenchyma during excision of sac occurred intraoperatively. Since the child did not show any seizure activity prior to surgery, the possibility of intraoperative seizure due to congenital malformations inside the sac was minimal.

Apart from problems of intubation, there are also other concerns that might need the anesthesiologist's attention in patients with occipital encephalocele. Jagger *et al.* have reported multiple episodes of raised intracranial pressures and low cerebral perfusion pressures in patients with occipital encephalocele [9]. Creighton *et al.* in a series of 31 patients with occipital encephalocele have observed

disturbances in central autonomic control and defective temperature regulation in these children [10].

To summarize, airway management in occipital encephalocele remains a challenge. However we encountered a yet another unreported problem of refractory seizures, which could have compromised the safety of the child. Anesthesiologists will have to find pragmatic solutions in individual cases, keeping in view the basic tenets of not losing control on the airway in all the cases.

REFERENCES

1. Shimizu T, Kitamura S, Kinouchi K, Fukumitsu K; A rare case of upper airway obstruction in an infant caused by basal encephalocele complicating facial midline deformity. *Paediatr Anaesth.*1999; 9(1): 73–76.
2. Lalwani A; Temporal bone encephalocele, *Neurology*. St Louis,Mo: Mosby-Year Book Inc,1994:1149-1155.
3. Padmanabhan R; Etiology, pathogenesis and prevention of neural tube defects. *Congenit Anom.*, 2006; 46(2): 55–67.
4. Yentis SM; Predicting difficult intubation-Worthwhile exercise or pointless ritual? *Anaesthesia*, 2002; 57(2):105–109.
5. Mowafi HA, Sheikh BY, Al-Ghamdi AA; Positioning for anesthetic induction of neonates with encephalocele? *The Internet Journal of Anesthesiology*, 2001;5(3).
6. Manhas Y, Chinnan NK, Singh AK; Neonatal airway management in occipital encephalocele. *Anesth Analg.*, 2006; 103:1632.
7. Dey N, Gombar KK, Khanna AK, Khandelwal P; Airway management in neonates with occipital encephalocele – adjustments and modifications. *Pediatric Anesth.*, 2007;17:1111–1121.
8. Yang E, Yeo SB, Tan TY; Temporal Lobe Encephalocele Presenting with Seizures and Hearing Loss. *Singapore Med J.*, 2004; 45(1): 40-42.
9. Jagger KS, Ramkrishna V, Jagtap S, Pantvaitya SH, Modha P; Anaesthesia for excision of occipital encephalocele. *Ind J Anaesth.*, 1986; 34(4): 211–215.
10. Creighton RE, Relton JE, Meridy HW; Anaesthesia for occipital encephalocele. *Can Anaesth Soc J.*, 1974; 21(4): 403–406.