Does position make a difference? Intubation challenges in a neonate with giant occipital meningocele and Dandy-Walker syndrome

Sir,

In neonates with Giant Occipital Meningocele (GOM) and Dandy Walker syndrome (DWS), difficult airway is often associated with increased morbidity and might result in hypoxia and brain damage. The etiopathology of DWS involves the developmental failure of the roof of the fourth ventricle during embryogenesis which results in the cystic expansion of the fourth ventricle in the posterior fossa. It is also associated with malformations like agenesis of corpus callosum, heterotopias, gyral abnormalities and cardiac defects. Association of DWS with giant occipital meningocele (GOM) is extremely rare. The sound knowledge of neonatal airway and laryngoscopy by an experienced anaesthesiologist helps in successful intubation in case of an anticipated difficult airway. We report a rare case of a 26-day-old neonate weighing 3.5 kg with GOM and DWS, posted for repair of GOM and ventriculoperitoneal shunt surgery. Pre-anaesthetic check-up suggested no history of seizure, vomiting, cyanosis, feeding difficulty or respiratory distress. All limbs were with equal power and tone. The baby had a large head with a head circumference of 46 cm and a GOM measuring 15 cm × 10 cm, [Figure 1] extending from occipital protuberance to mid-thoracic level. Magnetic resonance imaging of the brain showed agenesis of cerebellar vermis, hypoplastic cerebellar hemispheres and a very large posterior fossa cystic lesion communicating with fourth ventricle suggestive of DWS with GOM.

The baby was shifted to the operating room with the anaesthesiologist supporting the cyst. Intravenous fluid of 5% dextrose in normal saline (1:1) at the rate of 14 ml/h was started 2 hours prior to shifting the baby. Standard monitoring as suggested by American Society of Anesthesiologists (ASA) was attached. A paediatric difficult airway cart was made available to deal with any possible airway emergency. After pre-oxygenation, intravenous atropine, 0.02 mg/kg, fentanyl 2 µg/kg and midazolam 0.05 mg/kg were given which was followed by induction with propofol 3 mg/kg. As we were able to ventilate the baby with 100% oxygen through Jackson-Rees modification of Ayre’s T-piece, a trial of tracheal intubation was considered one minute after achieving muscle relaxation with 2 mg/kg of succinylcholine in supine position. As laryngoscopy in supine position with a size 1 Miller blade attached to paediatric videolaryngoscope was difficult, we switched over to the alternative plan of intubation in lateral position. A second assistant pressed over the larynx for a better laryngoscopic view and upon getting a Cormack–Lehane laryngeal view Grade 2b, intubation was attempted. In the third attempt, trachea was intubated using a 3.5 mm ID uncuffed endotracheal tube with a stylet inside and subsequently confirmed with auscultation and capnography. All attempts of laryngoscopy were very quick and no desaturation was noted during this time. Anaesthesia was maintained with O₂ + N₂O (50:50), sevoflurane (1-2%), and Inj. atracurium 2 mg bolus followed by 0.5 mg in top ups. The surgery was completed in 1 hour 15 minutes. Blood was replaced for the intra operative loss (30 ml). After surgery, keeping 80 mg paracetamol suppository for post-operative analgesia, the baby was shifted to surgery intensive care unit (ICU) for ventilation [Figure 2]. The trachea was extubated after 24 hours. The patient was discharged on the 7th postoperative day without obvious neurological sequelae.

Videolaryngoscope has advantages over fibreoptic bronchoscope in situations where blood and secretions obscure the laryngoscopic view. Moreover, expensive gadgets like fibre optic laryngoscopes are unavailable in many centres as in our case. Intubation can be attempted with one of the methods described below:

1. Lateral position[1,2]

Figure 1: Giant occipital meningocele extending from occipital protuberance to mid-thoracic level
2. Supine position after getting the head beyond the edge of the table with an assistant supporting the head and GOM[3]
3. Placing the baby on a pile of blankets and protecting the sac in a doughnut-shaped support or held by an assistant.[4]
4. Preoperative CSF drainage before intubation.[5]

Here we attempted intubation in lateral position with video laryngoscope[5] and were able to intubate in slight neck extension without the risk of cyst rupture.

In conclusion, the key to successful management in neonates with GOM in DWS is a combination of careful positioning and intubation skills, complemented with the use of novel gadgets like videolaryngoscope. Lateral position intubation with the help of videolaryngoscope is a safer approach. We might need to adopt unconventional but safe ideas for a better management with successful outcome.[6]

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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Submitted: 27-May-2020
Revised: 22-Jun-2020
Accepted: 08-Oct-2020
Published: 01-Nov-2020

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Access this article online
Quick response code
Website: www.ijaweb.org
DOI: 10.4103/ija.IJA_648_20

How to cite this article: Chandran P, Kujur R, Asha KS, Abraham TR. Does position make a difference? Intubation challenges in a neonate with giant occipital meningocele and Dandy-Walker syndrome. Indian J Anaesth 2020;64:990-1.
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Figure 2: Baby in intubated postoperative state