AIRWAY MANAGEMENT IN AN INFANT WITH A LARGE OCCIPITAL CYSTIC SWELLING

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INTRODUCTION [1,2]

The pediatric anesthesia is a challenging speciality especially when it comes to airway.

- The variations in pediatric anatomy and physiology makes the anesthetic management unique.
- Respiration in pediatric patients, especially neonates and young infants, is considerably different from that of older children and adults.
- In children, there are many conditions or syndromes associated with difficult airway. One such condition is Dandy-Walker malformation (DWM), which occurs during embryonic development of cerebellum and 4th ventricle.

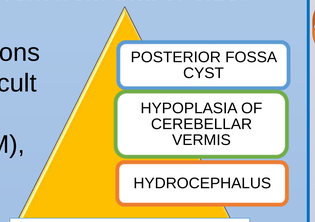

Fig 1: Dandy & Blackfan Triad

- It is characterized by underdevelopment of the middle part of the cerebellum known as the cerebellar vermis, cystic enlargement of the 4th ventricle and enlargement of the posterior fossa.
- Clinical presentation include developmental delay, hypotonia, spasticity, ataxia, seizures.
- 20-80% of the cases are associated with hydrocephalus presenting with abnormally high intracranial pressure, increase in head circumference and neurological impairment.

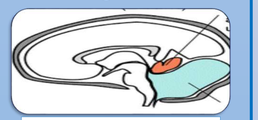
Fig 2: Dandy Walker cyst*

OUR PLAN:

A. Direct laryngoscopy and endotracheal intubation (maximum 2 attempts)
B. Place SAD and attempt fiberoptic intubation
C. Wake the patient up or surgical airway

REFERENCES:

1. Moodleya AW, Nelac S, Oosthuizenac E, Lundgrenbc C. Anaesthetic management for ventriculoperitoneal shunt insertion in an infant with Dandy–Walker Syndrome. South Afr J Anaesth Analg 2017; 23(1):17–20.
2. Krovvidi H, Flint G, Williams AV. Perioperative management of hydrocephalus. BJA Education.2018,18(5):140e,146.
3. Cote CJ.The difficult paediatric airway. South Afr J Anaesth Analg.2012;18(5):230-239.

CASE REPORT

A 3 months old female baby weighing 5kgs, diagnosed to have *Dandy-Walker syndrome* with hydrocephalus was scheduled for Ventriculoperitoneal shunt.

- Baby was born at term gestation by normal vaginal delivery with birth weight of 2.5kgs. She cried immediately after birth and was active.
- She gradually developed swelling over the back of the head. It was not associated with fever/convulsions/any other abnormal movements. No history of feeding difficulties. Immunized till date. No history of any other comorbidity or previous hospital admission.
- On examination, baby was active, vitals were stable. Sunset sign was noted. Head circumference was 50cms.
- CT Brain showed enlarged posterior fossa with cystic mass of 5.3x8x4.6cms, communicating with 4th ventricle, cerebellar hemispheres-hypoplastic.
- Echocardiography showed small Patent Ductus Arteriosus (left to right shunt) with right ventricular hypertrophy.

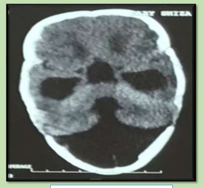
Fig 3: CT Head

- After confirming NPO, baby was shifted to operating room. Standard monitors were connected. Baby was premedicated with i.v. Fentanyl 10mcg using 24 Gauge intravenous cannula. Induction was done in *lateral position* with Sevoflurane 8% and after confirming ventilation, i.v. Atracurium 2.5mg was given.
- Before intubation, patient was turned supine and the torso was raised above the operating table by folding two surgical drapes.The head and neck were supported and extended with gamgee pads.
- Intubation was attempted under direct laryngoscopy using size 1 Miller straight blade. The occipital swelling was protected by soft doughnut roll to avoid any pressure on it during intubation attempt.
- At 1st intubation attempt, only epiglottis was seen, so we decided to attempt again after repositioning. In between the attempts, mask ventilation was done.
- At 2nd attempt, with leftward upward external laryngeal manipulation, posterior third of the vocal cords was visible and patient was successfully intubated with 3.5mm endotracheal tube.
- Anaesthesia was maintained with Sevoflurane 2% and Oxygen: Air 1:1. Procedure was uneventful. Patient was extubated after reversal with Neostigmine 0.25mg and Atropine 0.1mg and shifted to post-operative ICU with stable vitals for observation and monitoring.
- Post procedure head circumference was 46cms.

DISCUSSION [2,3]

DWM is often associated with other congenital anomalies, therefore thorough pre-anaesthetic evaluation should be done.

- Most of the patients present with the symptoms within first year of life which adds to the risks as pediatric anaesthesia itself is a challenge to the anesthetist.
- An infant airway has following characteristics:

Large occiput
Large tongue-to-mouth ratio
} Cause neck flexion. Makes the upper airway prone to obstruction

Cephalad trachea
Omega-shaped 'floppy' epiglottis
Anteriorly angled vocal cords
} Straight blade is preferable for intubation

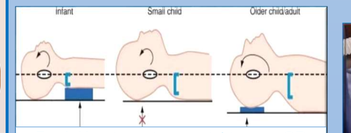

Fig 4: Head position in children on OR table*

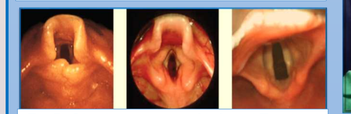
Fig 5: Glottic aperture of infant / Toddler/ Adult*


Fig 6: Our patient on operating table

- Difficult airway in pediatrics is often anticipated and thus demands for pre-emptive planning which includes selection of proper anesthesia technique, equipments for monitoring and airway management with readiness to deal with airway related emergencies/ complications.

*Image source: anesthesiologynews.com

CONCLUSION [1,3]

- Considering the complexity of disease and associated anomalies, difficult airway should be anticipated in pediatric patients.
- Preparedness for the same along with optimal positioning reduces the number of intubation attempts.