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Original Research Paper

Anaesthesiology

ANAESTHETIC CHALLENGES IN A CASE OF MASSIVE HYDROCEPHALUS OF A 3 MONTHS OLD INFANT POSTED FOR EMERGENCY VP SHUNT.

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ABSTRACT

Introduction- Hydrocephalus is an abnormal increase in the amount of cerebrospinal fluid resulting from a disturbance of formation,flow or absorption of csf thus resulting in enlarged cerebral ventricles. **Case Report-** A 3 Months old,5kg female infant who is a known case of ARNOLD CHIARI TYPE 2 and an operated case of meningomyelocoele on day 15 was brought by her parents with chief complaints of gradual enlargement of head over a period of 2 months with h/o multiple convulsions(last episode 2 days back) and paraplegia for emergency VP SHUNT. Difficult airway trolley was made ready.Incremental inhalation of sevoflurane was started and after the patient went deep under anaesthesia,22G iv was taken on the right upper limb.Induced with 2u/kg of fentanyl and propofol 2u/kg.Intubated after 3 mins of inj atracurium 0.5mg/kg with 3.5mm uncuffed et tube under C-MAC guidance in first attempt by senior anaesthetist. Normothermia was maintained.After thorough oropharyngeal suctioning,spontaneous adequate respiratory efforts,clinical evidence of reversal of NM blockade,patient was extubated.Patient was observed for 1 hour post extubation and was shifted to icu for further management.Right sided medium pressure chhabra's ventriculoperitoneal shunt through right frasier's point was done. **Results-** A basic knowledge of this emergency condition amongst all team members is necessary in providing safe anaesthesia. **Conclusion-** A well prepared difficult airway trolley,emergency medications and good team work can tackle this case of massive hydrocephalus.

KEYWORDS :

Case Report

INTRODUCTION

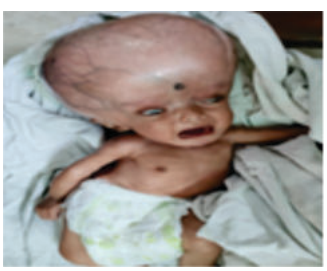
Hydrocephalus is an abnormal increase in the amount of cerebrospinal fluid resulting from a disturbance of formation, flow or absorption of csf thus resulting in enlarged cerebral ventricles.This may be congenital or acquired.They usually present with an increase of intracranial pressure. Incidence of congenital hydrocephalus is 3 per 1000 live births.

Etilogy can be as follows,
Overproduction of csf
Blockage of normal flow of csf

- Communicating hydrocephalus-Inflammatory,Impaired csf absorption.
- Non communicating hydrcephalus-cysts,tumous,infection and hemorrhage ,congenital malformations,aquedectal stenosis.

Csf accumulation->ventricular enlargement->Rise in ICP->enlargement of head in infants with open fontannelles->rapid deterioration.

Common syndromes and anomalies Meningomelocele, aqueduct stenosis,Arnold chiari syndrome and Dandy walker syndrome



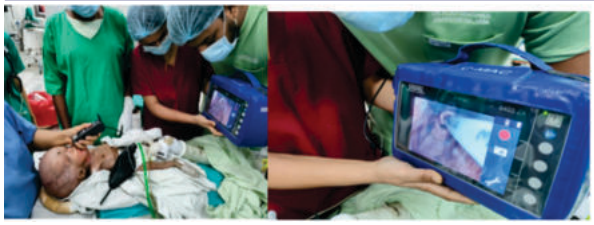
A 3 Months old,5kg female infant who is a known case of ARNOLD CHIARI TYPE 2 and an operated case of meningomyelocoele on day 15 was brought by her parents with chief complaints of gradual enlargement of head over a period of 2 months with h/o multiple convulsions(last episode 2 days back) and paraplegia for emergency VP SHUNT.

She presented with Enlargement of cranium > facial growth,Fontanelles full and bulging,lethargy,enlargement and engorgement of scalp veins,irritable and crying.
SETTING SUN SIGN +
Vitals
GC-Poor
HR-140bpm BP-60/40mmhg SPO2-100 % on RA RR-42CPM
Systemic examination
RS-AEBE,Clear
CVS-S1S2 +
CNS-Conscious,Lethargic,minimal activity,Irritable,crying no sensory and motor actions of bilateral lower limbs.
Head circumference-56 CM.

MRI Brain shows-Small posterior fossa with herniation of cerebellar tonsils-kinking of cervicomedullary junction.Gross hydrocephalus of Right lateral ventricle,Left lateral ventricle, Third ventricle and fourth ventricle with severe cortical atrophy.

Corpus callosum is not visualized.Adhesions at aqeuduct of sylvius. Multiple septations in sellar, suprasellar and posterior third ventricle.

After preanaesthetic evaluation was done,informed written consent was taken.ICU and VENTI standby was asked. Difficult airway trolley was made ready including covention allaryngoscopes,videolaryngoscope,frova intubating introducer and ettubes ranging from 2.5mm to 4mm.Bolster was kept under the shoulders to provide adequate head extension.



Premedicative sedation was avoided as it may depress ventillation resulting in raised ICP.

Patient was taken on OT table,Standard ASA monitors were attached.Preoxygenation was done with 100 % oxygen using JR circuit.Incremental inhalation of sevoflurane was started and after the patient went deep under anaesthesia,22G iv was taken on the right upper limb.

Induced with 2u/kg of fentanyl and propofol 2u/kg.Check ventillation was done. Check scopy was done after ensuring deeper plane of anaesthesia under C-MAC guidance.CL grade 1 view of vocal cords were visualized.Intubated after 3 mins of inj atracurium 0.5mg/kg with 3.5mm uncuffed et tube under C-MAC guidance in first attempt by senior anaesthetist and maintained with 100% oxygen and sevoflurane to maintain a mac of 0.7 to 0.8.

Etco2 of 32 to 35 mmhg was maintained.Head was rotated away from the surgeon with a bolster below the operative site.Normothermia was maintained.warmers and warming blankets were used to prevent hypothermia.Head up position, Maintanence of MAP>gestational age(38 weeks),0.5mg/kg of mannitol to reduce ICP and to maintain CPP.Prophlactic Anticonvulsant dose of levetiracetam was given as per weight.Analgesic dose of paracetamol 15mg/kg and ondansetron 0.1mg/kg was given 30mins before extubation.

After thorough oropharyngeal suctioning, spontaneous adequate respiratory efforts,clinical evidence of reversal of NM blockade,patient was extubated.

Patient was observed for 1 hour post extubation and was shifted to icu for further management. Right sided medium pressure chhabra's ventriculoperitoneal shunt through right frasier's point was done.

DISCUSSION

In this case,we preferred C-MAC guided intubation.fibreoptic intubation can be tried as a first go procedure in such cases.Invasive procedures like intubation and extubation should be done under deep plane of anaesthesia to prevent rise in ICP.Reduce ICP and ensure adequate MAP to maintain CPP>60-70mmhg with fluid resuscitation and vasopessor support.Hyperthermia increases ICP and should be prevented.Hypothermia can cause shivering and raise ICP.

Pain and agitation increases ICP and adequate analgesia should be provided intraop.Excessive sedation and analgesia can mask examination findings and can prolong the duration of mechanical ventillation.Osmotic diuresis with mannitol can be used to reduce ICP.Nitrous oxide, inhalational agents with MAC more than 1,IV ketamine are not indicated as they increase CBF and CMRO2.

Etco2 of 32-35 mmhg is preferred.Hypercarbia causes cerebral vasodilation and increases CBF,Hyperventillation causes hypocarbia and cerebral vasoconstriction and ischaemia.both are avoided.

CONCLUSION

hydrocephalus in an infant poses quite a challenge to the anaesthesiologist.A basic understanding of the challenges presented in this condition and the possible complications will help in providing a safe and effective anaestghesia.

Conflict of interest- nil

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