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A NOVEL APPROACH OF INTUBATION IN A CHILD HAVING LARGE LUMBOSACRAL MENINGOMYELOCOELE AND HYDROCEPHALUS

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ABSTRACT Arnold Chiari malformations are deformities of posterior fossa. These are usually associated with intracranial or extracranial defects such as hydrocephalus, meningomyelocoele, syrinx etc. Proper positioning and airway management are the anaesthetic challenges in these patients. We here by report anaesthetic management of case of an eight months old baby having Arnold chiari type 2 malformation with associated large hydrocephalus and large lumbosacral meningomyelocoele, posted for lumbosacral meningomyelocele repair and V-P shunting .

KEYWORDS : Anaesthesia, meningomyelocoele, hydrocephalus

INTRODUCTION

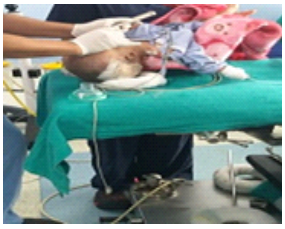
Arnold Chiari malformations are a group of deformities of the hindbrain i.e. cerebellum, pons and medulla oblongata. Chiari malformations are of four types based on radiological findings. There is either herniation of the posterior fossa contents outside of the cranial cavity or absence of the cerebellum. Associated intracranial or extracranial defects are hydrocephalus, syrinx or spinal dysraphism.[1,2] Meningomyelocele is a congenital spinal anomaly in which herniation of neural elements and CSF occurs. It results from failure of neural tube to fuse in fetus.3 Anaesthetic challenges in meningomyelocele surgery include intubation while avoiding rupture of swelling and CSF leak by proper positioning of child during intubation, intraoperative prone positioning and its associated complications.4 Intubation is usually performed in either lateral position or in supine position with sac protected by cushioned ring. Associated hydrocephalus makes intubation difficult. Here is a case report of anaesthetic management of an 8 months old baby having Arnold chiari type 2 malformation with associated large hydrocephalus and large lumbosacral meningomyelocoele, posted for lumbosacral meningomyelocele repair and V-P shunting.

Anaesthetic Management

An eight month old male baby, weighing 8 kgs presented with a large cystic swelling in the lumbosacral region and increasing size of head. MRI scan of the baby revealed Arnold chiari type 2 malformation with associated hydrocephalus and meningomyelocoele. Patient was posted for repair of swelling and V-P shunt for hydrocephalus.

Baby was delievered by caeserean section at full term in view of fetal distress. Baby cried immediately after birth and apgar score at 1 min. & 5 mins. was good. Except a small cystic swelling in lumbosacral region otherwise baby was normal. This swelling increased in size progressively since birth, head size also increased. No other congenital abnormalities were present. On preoperative examination baby was active, heart rate 110/min., respiratory rate 30/min., chest was bilateral clear, heart sound normal, size of meningomyelocoele was 10 x 8cm. All routine investigations were normal. We decided to give general anaesthesia using intravenous agents. In the operation theatre (o.t.) standard monitors attached while patient was hold by technesian on shoulder. Then patient's head was placed on a ring on o.t. table while rest of body was hold by technesian in air (figure 1), to avoid rupture of meningomyelocoele and leak of CSF. Preoxygenation was done for 3 mins. Induction was done using intravenous agents through 24G cannula which was already secured previous day in ward. Inj. thiopentone 35mg, inj. fentanyl 8µg was given intravenously (i.v.). After assessing proper ventilation, inj. atracuium 4mg given i.v. Baby was intubated in same position using uncuffed endotracheal tube of ID 3.5mm under direct laryngoscopy. After securing of airway, patient was placed in prone position with padding of pressure areas and eyes. Endotracheal tube with circuit was passed from gap between head end and foot end of the table to avoid kinking or compression of endotracheal tube (figure 2). Maintainence of anesthesia was done using sevoflurane and nitrous oxide. After repair of meningmyelocoele, patient was placed in supine position for V-P shunting. Surgery went uneventful. Patient was extubated successfully on completion of surgery and sent to ward after monitoring for 2 hours in recovery room.

Figure 1



Induction and intubating position

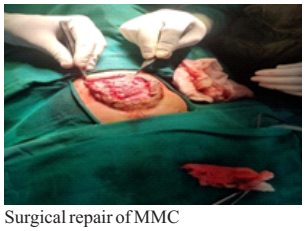
Figure 2

Circuit and endotracheal tube in table gap

Figure 3

Patient in prone position

Figure 4



Surgical repair of MMC

DISCUSSION

Meningomyelocoele (MMC) occurs due to deficit of neural tube closure in the initial phases of intrauterine development.5 It exposes meninges along with neural tissue. MMC is most commonly seen in lumbar region of spinal column. The annual incidence is 0.4-1 per 1000 live births.6,7. MMC is often associated with Arnold chiari malformation, hydrocephalus and other congenital abnormalities.8 Arnold Chiari malformations are a group of deformities of the hindbrain i.e. cerebellum, pons and medulla oblongata. These are of 4 types. There is usually downward displacement of the cerebellar tonsils through the foramen magnum in chiari malformations, which can cause obstruction of CSF flow leading to non-communicating hydrocephalus.1,2 Surgical repair of meningomyelocoele should be done as early as possible to avoid neurological complications.9 While there is increase in head size in hydrocephalus due to obstruction of CSF outflow or increase in CSF production. V-P shunting is done to avoid rise in intracranial pressure for hydrocephalus.

Anaesthetic plan in pediatric patients is challenging and differ from that of adults. Pediatric airway management is difficult due to large tongue size, large head, small mouth opening, anterior larynx etc. Also there are more chances of hypothermia due to less subcutaneous fat. Pediatric anesthetic plan includes airway management, fluid management, management of hypothermia and proper positioning of the baby to avoid injuries. There are chances of difficult intubation in hydrocephalus patient, as head size is large, so difficult airway cart should be kept ready. General anaesthesia is anaesthesia of choice in

these patients using intravenous agents like inj. thiopentone or propofol to avoid rising of ICP. Positioning is important in MMC patient, as there are chances of rupture of swelling, leakage of CSF and neurological complications.4 Our patient was posted for both MMC repair and V-P shunting. Our main concern was positioning of the baby during induction and intubation as there was a risk of rupture of MMC in supine position. In MMC repair surgery, intubation is usually performed in either lateral position or in supine position, swelling is placed in doughnet shaped ring in supine position while induction. But our patient had large lumbosacral MMC which could not be placed the ring. So we placed head of baby in a ring put on table while rest of body was hold by technecian in air to avoid rupture of MMC. MMC surgery is done in prone position. Excessive pressure on abdomen can hamper ventilation and venacaval compression, leading to increased venous pressure of epidural system therefore increased bleeding. So we kept abdomen of the baby free. Proper padding of pressure areas and eyes were done to avoid nerve injuries. Warming blanket, warm fluids and radiant heater was used to keep the baby warm. Fluid management was done meticulously to avoid dehydration and overhydration. We arranged blood products but blood loss was not there. Surgery lasted for 2 hours. Patient was extubated successfully on completion of surgery. Patient was hemodynamically stable intraoperatively and postoperatively. Baby was discharged after 5 days in stable condition.

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