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Anaesthetic Management of a Case of Meningomyelocele in a 3 Day Old Neonate

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Abstract: ***In this case report, the anaesthetic management of a newborn male with meningomyelocele—a prevalent neural tube defect marked by spinal cord and meningeal herniation through a vertebral gap is thoughtfully examined. Born at 38 weeks via caesarean section, the neonate presented a 3 cm × 3 cm lumbosacral swelling, prompting urgent surgical intervention to mitigate infection risks and restore spinal alignment. It is evident that the perioperative approach demanded meticulous attention to airway security, normothermia, and precise positioning to safeguard the delicate meningomyelocele sac, all while navigating the complexities of neonatal physiology. In my view, the success of this case hinges on the team's careful orchestration of general anaesthesia, using agents like Sevoflurane and Fentanyl, alongside vigilant postoperative monitoring in the neonatal intensive care unit. This suggests that tailored anaesthetic strategies, rooted in a deep understanding of neurosurgical demands, can meaningfully influence outcomes in such high - stakes scenarios. Beyond the technical triumph, this report underscores the nuanced balance between risk and recovery, offering a compelling glimpse into the challenges of neonatal neurosurgery.***

Keywords: Meningomyelocele, neonatal anaesthesia, perioperative management, lumbosacral defect, hemodynamic stability and positioning

1. Introduction

Meningomyelocele or myelomeningocele commonly known as open spina bifida is the most common congenital malformation which can involve any part of the vertebral column and is associated with significant morbidity and mortality. It is characterised by failure of the neural tube to close in the lumbosacral region during embryogenic development leading to herniation of the meninges and spinal cord through a vertebral defect.[1]

The cranial and caudal ends of the neural tube close in the last, thus, any interruptions in neural crest cell migration lead to variable defects. Cranial closure failure leads to exencephaly or anencephaly which is a fatal condition. Caudal neuropore closure failure results in open defects such as meningocele and meningomyelocele or spina bifida cystica. Meningomyelocele is the most common NTD which is compatible with life (incidence of 0.44–1 /1000 live births). Around 80% of meningomyelocele defects arise in lumbosacral area.[2]

2. Methodology / Case Report

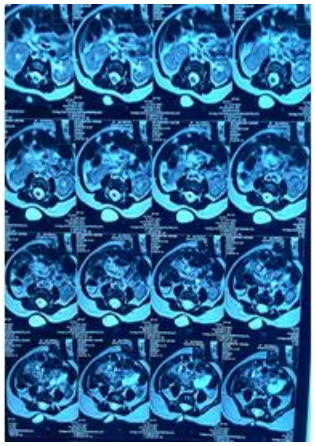
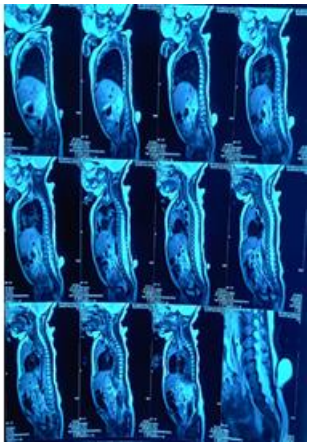
A newborn male baby, weighing 3.38kg born to a 35-year-old G3P2L2 mother at 38weeks of gestation via LSCS under SAB. Birth history uneventful. The baby noted to have spinal dysraphism and shifted to the neonatal intensive care unit for further management. During general physical examination of spine - A swelling (3 cm × 3 cm) noted at lumbosacral region with no neural elements visible on naked eye examination. Preanaesthetic evaluation done and case accepted under ASA - II under general anaesthesia.

Intraoperatively patient was induced with oxygen, Sevoflurane, Fentanyl, Propofol and relaxed with Atracurium. Intubated with uncuffed ETT size 3.0mm and fixed at 8.5cm on the right angle of the mouth, and a throat pack was inserted for stabilizing the ETT. Neonate was put on prone position with rolls under chest and pelvis and eye padding applied. All endeavors were carried out to maintain normothermia. Anesthesia was maintained with inhalationals, Fentanyl 2 mug IV, Atracurium 1.5 mg IV in divided doses and Propofol 5 mg. After the completion of surgery, neonate was transported to NICU. The neonate was monitored in NICU and extubated after noticing adequate respiratory efforts and neonate was actively moving all four limbs. After extubation neonate was monitored for neurological status for next 7 days intensively.

3. Discussion

Anaesthetic management of a neonate with meningomyelocele presents unique challenges that require meticulous planning and execution. To reestablish normal alignment of spine an early surgery is advisable, and risk of infection also decreases. The primary anaesthetic considerations in the perioperative period includes thorough evaluation of the airway, neurological status, and associated anomalies, managing potential airway difficulties, ensuring adequate ventilation, and monitoring of vital sign, maintenance of normothermia, fluid and electrolyte balance, and glucose levels is vital. Precise Positioning during induction and surgery is critical to prevent further neural damage and to avoid pressure on the meningomyelocele sac. Postoperatively, the neonate should be monitored in a specialized unit for potential complications. Adequate pain management, prevention of

infection, and careful neurological assessment are paramount to ensure optimal recovery.[3]

4. Conclusion

Anesthesia for a pediatric population undergoing neurosurgery requires knowledge of cerebral physiology and deep understanding of pharmacokinetics and dynamics of anesthetic agents.

This case report shows a successful anaesthetic management of a 3-day old neonate with meningomyelocele by cautious positioning, eye care, airway management, titrated fluid and opioid administration, blood conservation, maintenance of normothermia, pain relief and adequate recovery without any perioperative complications.

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