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Case Report

Anesthetic Management in Ventriculoperitoneal Shunt Insertion in Preterm Congenital Hydrocephalus

Sanum Kashif

Department of Anesthesia, Frontier Corps Hospital, Quetta Pakistan

ABSTRACT

Neonatal hydrocephalus is a multifactorial disorder and is a common cause of death among preterm babies. Prematurity is a challenge for anesthetists as far as major surgery is concerned. In the development of neonatal brain, maintenance of normal intracranial pressure is essential by timely intervention in neonatal hydrocephalus. We share the case of a 20-day-old premature baby, delivered at 32 weeks of gestation as twins with congenital hydrocephalus, presented with fever and lethargy and after made diagnosis, treated on the lines of neonatal sepsis and due to gross hydrocephalus, ventriculoperitoneal shunt insertion was planned under general anesthesia.

Keywords: Hydrocephalus, Premature, Ventriculoperitoneal Shunt.

How to Cite This Article: *Kashif S. Anesthetic Management in Ventriculoperitoneal Shunt Insertion in Preterm Congenital Hydrocephalus. Pak Armed Forces Med J 2025; 75(1): 217-218. DOI: https://doi.org/10.51253/pafmj.v75i1.3915*

INTRODUCTION

Premature neonates have poorly developed systemic functions, which worsen with the effect of hydrocephalus, leading to severe physiological derangement in the perioperative period. However, proper optimization and preparation before surgery and continuous monitoring can decrease the morbidity and mortality in the post-operative period.[1,2] This case report describes the successful anesthetic management of a preterm neonate with gross hydrocephalus admitted for ventriculoperitoneal shunt insertion.

CASE REPORT

A 20-day-old hydrocephalic baby, weighing 1.2kg, delivered as twin via normal vaginal delivery at 32 weeks of gestation, presented with fever, lethargy and poor sucking, and after work-up was diagnosed with neonatal sepsis. This was managed accordingly and after proper optimization, ventriculoperitoneal shunt insertion was done under general anesthesia. Due to deranged coagulation profile, the patient also had a history of fresh frozen plasma transfusion in the pre-operative period. On examination, baby was found to be emaciated with dehydrated appearance, vitals showed heart rate of 145 beats per minute, SPO2 was 95% without oxygen, normothermic. CT-Brain showed moderately dilated lateral, third and fourth ventricle, compressing brain parenchyma. Other laboratory investigations are listed below:

Table: Laboratory Investigations of Patient

Hemoglobin	**15.5mg/dl**
Total leucocyte count	9.3x103/ul
Platelets	130x103/ul
Serum sodium	137mmols/l
Serum potassium	3.9mmols/l
C-reactive protein	Not reactive

Figure 1(a): Tunneling FROM Cranium to Abdomen Figure 1(b): Catheter Placement in Peritoneum

After inhalational induction with 8% sevoflurane and 100% oxygen at 4 liters, two 24G intravenous cannulas were secured, followed by 0.5mg of intravenous atracurium. After 3 minutes of manual ventilation, endotracheal tube of 3.0mmID was passed and bilateral air entry checked. In the maintenance phase, 1mg of intravenous ketamine was given followed by 1% isoflurane as an inhalational agent. For intravenous fluids infusion, 30ml pediatric solution and 20ml fresh frozen plasma was given. Tunneling and placement of catheter in peritoneum, as

Correspondence: Dr Sanum Kashif, Department of Anesthesia, Frontier Corps Hospital, Quetta Pakistan

Received: 28 Feb 2020; revision received: 02 Feb 2021; accepted: 23 Feb 2021

shown in Figures 1(a) and (b), was done. On completion of surgery, baby was successfully extubated after administration of 0.06mg intravenous neo-pyrolate. Monitoring continued in recovery room and patients was later shifted to Neonatal Intensive Care Unit (NICU) in stable condition.

DISCUSSION

The most common etiology of hydrocephalus is congenital hydrocephalus with ventriculoperitoneal (VP) shunt insertion being the mainstay of treatment among pediatric population.[3] Although VP shunt insertion is a low-risk procedure, prematurity aggravates its risk.[4] According to one study, reported incidence of complications due to VP shunt insertion is 24-47%, of which abdominal complications incidence is 25%[5] but with detailed preoperative anesthesia assessment and teamwork, successful management of premature babies is possible.[6] As many preterm neonates are critically ill and prone to hypothermia, hypovolemia, hypoglycemia, apnea and coagulopathy,[7] anesthesiologists can play a vital role by integrating their knowledge of the developmental physiology and pharmacology with constant and strict vigilance, rapid recognition of any abnormal event and its prompt intervention[8] especially as ventriculoperitoneal (VP) shunt surgery is the main mode of therapy in neonatal hydrocephalus.[9] Thus, complete evaluation of risks relating to surgery and anesthesia is critical, especially in preterm neonates.[10]

CONCLUSION

Anesthetic management of premature neonate can be challenging so a complete evaluation, along with preparedness and continued vigilance, is the key for successful results.

Conflict of Interest: None.

Funding Source: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

SK: Data acquisition, data analysis, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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