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ANAESTHETIC CONSIDERATIONS IN OESOPHAGEAL REPLACEMENT SURGERY IN A CHILD WITH THORACOLUMBAR SCOLIOSIS: A CASE REPORT

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ABSTRACT We report a case of 3.5 year old child with tracheoesophageal fistula- type A with scoliosis for oesophageal replacement surgery . Despite multidisciplinary and enhanced recovery pathways showing promising results , morbidity and mortality is high for such surgeries. The anaesthetic challenges are to minimise unnecessary fluid administration, avoid hypotension and hypothermia , to maintain adequate ventilation and to provide appropriate analgesia.

KEYWORDS : Tracheoesophageal Fistula, Scoliosis, Caudal Block, Analgesia

INTRODUCTION-

Tracheoesophageal fistula and associated oesophageal atresia in the neonate present during first week of life . This congenital defect can be complicated with aspiration, respiratory distress, and other congenital anomalies. Scoliosis on the other hand may also have associated cardiorespiratory dysfunction . The knowledge and the ability of the anaesthesiologist to anticipate the challenges in managing such patients plays an important role in their treatment and survival. Careful preoperative risk assessment with optimal perioperative and postoperative care is hence important.

Case Report-

3.5 year old child , weighing 8 kg , with congenital tracheoesophageal fistula – type A (oesophageal atresia) , underwent oesophagostomy and gastrostomy on second day of life. Procedure planned was oesophageal replacement surgery with transverse colon.

In preanaesthetic evaluation , the child was active and alert with secretions drooling from the oesophagostomy. The child was evaluated to have retrognathia and thoracolumbar scoliosis with no other associated congenital anomalies and normal development (Figure 1) . Routine preoperative investigations were within normal limits. Cardiac evaluation was done including an echocardiogram which was found to be normal.

We planned for general anaesthesia with controlled ventilation with caudal epidural for intraoperative and postoperative analgesia. The child was shifted to the operating room , all the routine monitors including the ECG, NIBP, SPO2 and temperature probe was attached.

A 20G and a 24G intravenous cannula were secured. Proper oropharyngeal and oesophagostomy suction was done. After premedication with iv midazolam 0.01mg/kg and glycopyrrolate 0.004mg/kg , fentanyl 1µg/kg iv was given. The child was induced with propofol 2mg/kg and after proper muscle relaxation with atracurium 0.5mg/kg , direct laryngoscopy was attempted which showed a Cormack Lehane of grade III-b, an uncuffed endotracheal tube of size 4mm ID was railroaded through bougie. Caudal epidural was given with Inj. bupivacaine 0.125% (1.25ml/kg) with dexmedetomidine 0.5µg/kg as an additive. To prevent hypothermia , warm bed was used and also the lower limbs of the child were covered with a plastic wrap. Anaesthesia was maintained with isoflurane, atracurium and morphine. The child was placed supine with a shoulder roll and head in maximum extension and turned to left. Surgical technique involved two incisions , one over the abdomen and one in neck, colon was mobilised , the main colonic vessels and collaterals were identified and a prolonged clamping test was done to ensure the permeability of the chosen nourishing pedicle then followed by a retrosternal transposition. Careful attention was given for bradycardia and hypotension during retrosternal tunnelling. Airway pressures and tidal volume were also monitored. The proximal anastomosis was done between the cervical oesophagus and the colon in the neck and a distal colo-gastric and a colocolic anastomosis was also established (Figure 2). Intraoperatively child was managed with warm fluids of 40ml/kg and blood loss was replaced with PRBC. Blood glucose and urine output was monitored hourly. A nasocolic tube was placed in the interposed colon for postoperative graft decompression. After the surgery, which lasted for about 5 hours, a repeat caudal of bupivacaine 0.125% (1.25 ml/kg) with dexmedetomidine 0.5µg/kg was given. Thorough oral suctioning was given and after reversal with neostigmine 0.05mg/kg with atropine 0.02mg/kg, the child was extubated, once fully awake. The child was stable postoperatively with supplemental O2 maintained for 24 hours.

Figure -1 Image showing secretions drooling through oesophagostomy

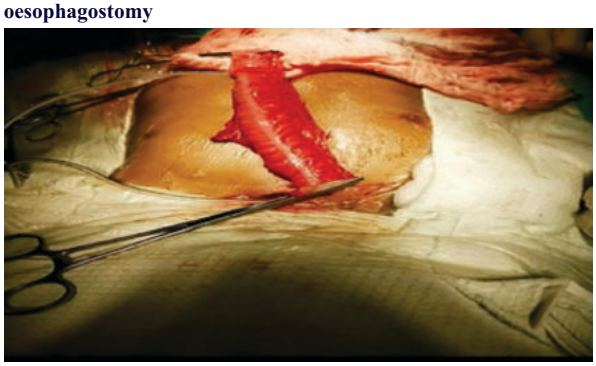

Figure 2- Transverse colon being anastomosed with cervical oesophagus

DISCUSSION-

Oesophageal atresia (EA), with or without tracheoesophageal fistula(TEF) , is one of the most challenging conditions with which the anaesthesiologist has to deal during the perioperative period. These patients present with a multitude of other congenital anomalies that may have a bearing on the oxygen cascade.

Oesophageal atresia (EA) encompasses a group of congenital anomalies in which there is interruption of the continuity of oesophagus . In 86% of cases, this coexists with a distal tracheoesophageal fistula (TEF), while in 7% there is no fistulous connection[1]. Approximately 20% to 25%, but as many as 50%, of neonates with TEF and EA frequently have associated congenital

anomalies described by the acronym VACTERL (vertebral, anorectal, cardiac, tracheoesophageal, renal and limb)[2]. Advancements in paediatric anaesthetic techniques and monitoring, neonatology and paediatric surgery have reduced the mortality figures and survival is now higher than 90%[3]. Although mortality has significantly reduced with the establishment of advanced surgical expertise, the postoperative complications are still high.

Scoliosis is a complex deformity of the spine resulting in lateral curvature and rotation of the vertebrae as well as deformity of the rib cage[4]. There is usually secondary involvement of the respiratory , cardiovascular and neurologic symptoms.

The anaesthetic concerns mainly include the paediatric age group and the associated anomalies with the TEF, the major blood loss and fluid shifts due to the prolonged surgery and the pain management. Hence utmost vigilance to detect intraoperative arrythmias , hypoxia, hypercarbia and atelectasis is required along with maintenance of cardiovascular stability.

Retrosternal tunnelling involves blunt dissection with fingers in the retrosternal region for the graft pull up. This dissection may affect the cardiac filling and further the vagal stimulation resulting in hypotension and arrythmias.

A goal directed fluid therapy is advised and blood transfusion is done once maximum allowable blood loss has exceeded. Hideki et al ., 2012: suggested preoperative fasting limited to ensure minimal changes in total body water [5] .Less fluid replacement will lead to hypovolemia whereas excess fluid will eventually increase the extracellular fluid in lung tissue and result in postoperative respiratory failure. Kita et al., 2002 suggested that positive fluid balance has poor surgical outcomes. Postoperative analgesia is also important [6]. Multimodal analgesia with intravenously administered opioids or NSAIDS along with thoracic epidural catheter is effective. But in this case, a thoracic epidural was avoided because of thoracolumbar scoliosis posing a challenge for the postoperative analgesia.

According to the study by Lazar et al.,2003 thoracic epidural is known to be associated with decreased risk of anastomotic leak and improved microcirculation of anastomotic area [7].

CONCLUSION-

A thorough preoperative preparation , maintenance of cardiovascular stability and a goal directed fluid therapy with multimodal analgesia plays a crucial role in achieving a favourable outcome in oesophageal replacement surgery. A good communication between the anaesthetist and the surgical team will also contribute to a safe and successful surgery.

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Conflict Of Interest

There are no conflict of interest.

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