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RESEARCH ARTICLE

Anaesthetic Management of congenital Paraoesophageal hernia in an infant: Rare Case

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Abstract

Primary paraesophageal hiatal hernias are uncommon in childhood. These hernias can be present at birth and are most likely caused by anatomical predispositions. The embryologic basis is persistence of one of the two pneumoenteric recesses. Persistence of right recess creates mesothelial lined space within esophageal hiatus. They are usually symptomatic because mobile components of stomach have migrated cephalad into posterior mediastinum through a large sacculated hiatal defect. Organoaxial rotation of stomach may cause partial or complete obstruction. A 6 days old female child presented with complaints of vomiting after feeding.
Chest radiograph showed herniated contents .Diagnosis was confirmed by contrast studies. Contrast filled stomach was seen in posterior mediastinum. Naso gastric tube was seen coiled in the stomach. After all routine investigations baby was taken for surgery. After premedication, baby was induced with propofol and sevoflurane. She was intubated with uncuffed ET tube no 3 by Miller blade no 1after giving 4 mg of succinylcholine chloride. Air entry was bilaterally equal, tube fixed at 8 cm. Anaesthesia was maintained on O_2 +N_2O+Sevo+ Vecuronium and IPPV with JR circuit.Baby was accessed by upper midline incision.Hernia was reduced and Thal fundoplication was done. Diaphragmatic crure were approximated. Paracetamol suppository given for post operative analgesia. Patient reversed and extubated uneventfully and shifted to PICU for post operative monitoring

INTRODUCTION

Paraesophageal hernia consists of displacement of the stomach into the thoracic cavity alongside the esophagus, which remains in its normal position. This is an anatomical defect of the hiatus without any derangement of the gastroesophageal sphincter, which clearly distinguishes it from other types of hiatal hernia.[1] Paraesophageal hernias whether congenital or acquired are rarely seen in infancy and childhood. Congenital paraesophageal hernias are usually secondary to developmental defect in the right crus of diaphragm usually anterior and to the right of the esophagus.[2] Patient can be asymptomatic and present with variety of symptoms like recurrent attacks of vomiting after feeding and repeated attacks of chest infection.

CASE REPORT

A 8 days old female child with birth weight 2.4kg presented with the history of vomiting following breast feeding. She was delivered vaginally and gestational period was 41 weeks. There was no history of cyanotic spells at birth. She had a history of not accepting breast feeds since 5 days.

- On general examination, baby was afebrile with a heart rate of 110 bpm and respiratory rate of 35/min. Neck movements were normal.

- Systemic examination and preoperative routine investigations were normal

INVESTIGATIONS

- Blood urea, serum creatinine, Serum Electrolytes and liver function tests all were within normal limits. Hemoglobin-16.9 gms/dl

- Chest X-ray (PA view) showed (Fig 1)

  - Congenital paraoesophageal hernia of the stomach in the posterior mediastinum.
  - Infant feeding tube appears curled in the herniated stomach.
  - Stomach appears rotated on itself.
  - Minimal infection seen in the right base - ? minimal aspiration.

- 2D ECHO showed tiny mid muscular VSD with left to right shunt.

She was posted for reduction of paraoesophageal hernia.

- Baby was NBM for last six days was on IV fluid 10% Dextrose.

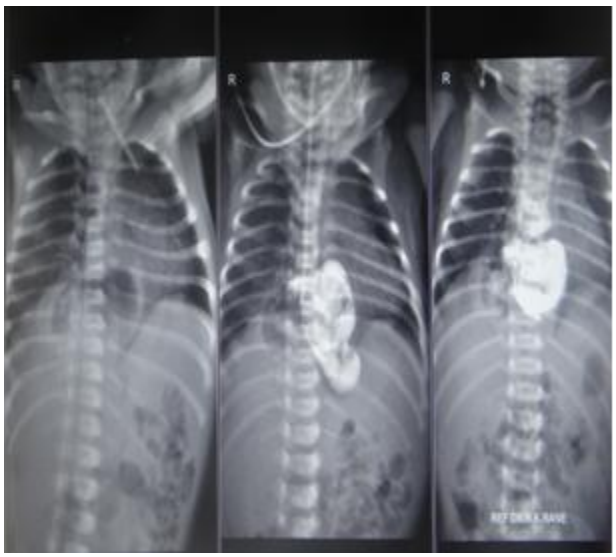

Fig 1: Paraesophageal hearnia of the stomach in the mediastinum

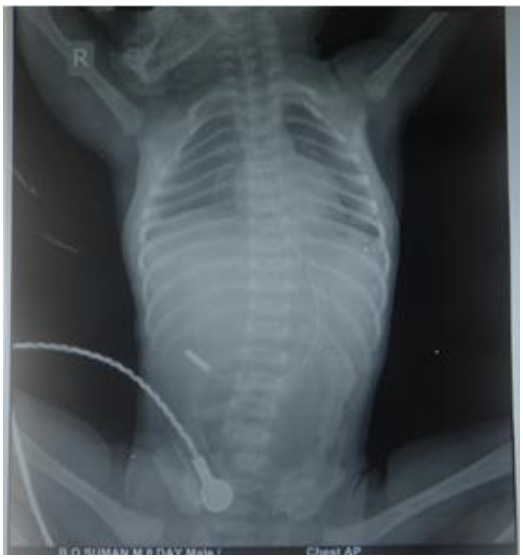

Fig2: Post Op X-ray Showing Nasogastric tube in abdominal cavity

ANAESTHETIC MANAGEMENT

On the day of surgery another intra venous line was secured by 24G cannula in the left hand.ECG, SPO_2, NIBP, precordial stethoscope were attached after shifting the patient inside operation theatre.

Baby was premedicated with Inj. Glycopyrrolate 0.01 mg IV. Inj. Midazolam 0.048 mg IV, Inj. Ondensetron 0.25mg IV, Inj. Fentanyl 5mcg IV. The patient was

pre-oxygenated with 100% oxygen for 3 minutes by facemask. Induction with O_2+N_2O+Sevoflurane 2-4%., Inj. Propofol (2mg/kg)total of 4 mg IV given. Inj. Suxamethonium (2mg/kg) IV given. Laryngoscopy done with Miller blade no 1. Trachea was intubated with uncuffed ET tube No 3. Bilateral Air entry was equal, Tube fixed at 8 cm at the angle of mouth. Temperature monitoring done by rectal probe. Anaesthesia maintained on O_2 (50%) +N_2O(50%)+Sevo(1%) via JR circuit. Inj. Vecuronium 0.3mg IV given and top ups of (0.1mg) given as and when required . Paracetamol suppository 40mg given per rectally for post operative analgesia.

SURGICAL PROCEDURE

Baby was accessed via upper midline incision. Hernial sac was identified and resection of the sac was done. Hernial sac contained fundus of the stomach which was in posterior mediastinum. Stomch was brought down in abdomen and Thal Fundoplication was done i.e, 270degree wrap up of fundus to oesophagus. Crure approximated.

RECOVERY

At the conclusion of the sugery, after checking all vital parameters and on return of spontaneous respiration baby was reversed with Inj. neostigmin and Inj. glycopyrrolate and was extubated. Baby was fully awake, good cry, SPO_2 100%, RS – clear. Baby was shifted to NICU for observation.

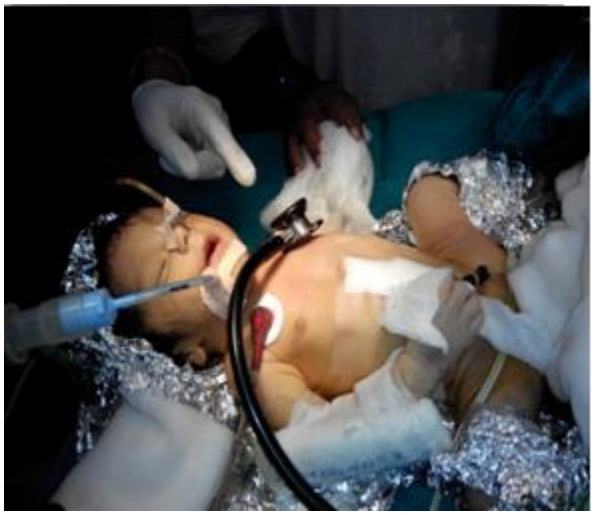

Fig 3: Baby before extubation

Fig 4: Site of operation

Fig 5: Post op baby in NICU

DISCUSSION

Paraoesophageal hernias constitute approximately five percent of all diaphragmatic hernias with a female preponderance (M:F 1:4).[1]Hiatus hernia is herniation of abdominal viscera into the thoracic cavity through oesophageal hiatus.[3]

The precise cause of PEH is unknown and is most likely multifactorial. Three main theories have been proposed to explain the pathogenesis of a hiatal hernia: 1) an increase in intra-abdominal pressure forces the GEJ upward into the thorax, 2) esophageal shortening secondary to fibrosis or excessive vagal nerve stimulation displaces the GEJ superiorly into the thorax, or 3) a widening of the diaphragmatic hiatus due to age-related or congenital changes in muscle or connective tissue facilitates migration of the GEJ into the thoracic cavity.[4]

Hiatus hernia is a rare condition in paediatric age group more so in infants. Patients may be asymptomatic or present with variety of symptoms.[5]

There are four types of hiatus hernias. The most common is Type I (sliding) hernia, in which the gastooesophagealjunction with a portion of stomach herniates into the thoracic cavity. In a Type II (para-oesophageal)hernia, the gasto-oesophageal junction remains at or below the level of
diaphragm and the gastric fundus herniates superiorly in a para-oesophageal location. Type III hernia is more common than Type II and has features of both Type I (sliding) and Type II (para-oesophageal) hernias. In Type IV hernias, all or part of the stomach herniates into the thorax, usually with organoaxial rotation of the stomach.[6]

The symptoms are because of migration of mobile component of the stomach into the posterior mediatinum. Organoaxial rotation of the stomach may cause partial or complete gastric obstruction leading to vomiting. Dye study, coiled nasogastric tube in the stomach and cystic mass in the mediastinum are the diagnostic features.[7]

Paraoesophageal hernias in childhood are thought to be caused by a congenital abnormality that can be explained on an embryologic basis. During the development of the human diaphragm, 2 small coelomic spaces, called pneumoenteric recess, develop on either side of the midline in the mediastinum. With the fusion of the sides of the pleuroperitoneal canals, the larger recess becomes isolated as the infracardiac bursa.[8] The recess on the left side is transitory. Persistence of the recess on the right creates a flattened and elongated mesothelial lined space within the oesophgeal hiatus.[9] (i.e, the postulated congenital predisposition for development of a paraoesophageal hernia).

Physicians caring for these patients should be aware of such a presentation and complication and paraoesophageal hernia should be included in the differential diagnosis of children with repeated attacks of chest infection and / or vomiting.

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