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Iatrogenic gastric perforation in a misdiagnosed case of late presenting congenital diaphragmatic hernia: Report of an avoidable complication

Pradeep Kajal [a,*], Namita Bhutani [b], Mohit Goyal [c], Poonam Kamboj [c]

[a] Deptt. of Pediatric Surgery, PGIMS, Rohtak, Haryana, India
[b] Deptt. of Pathology, PGIMS, Rohtak, Haryana, India
[c] Deptt. of Pediatrics, PGIMS, Rohtak, Haryana, India

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ABSTRACT

INTRODUCTION: Congenital diaphragmatic hernia (CDH) is a defect in diaphragm which usually presents with severe respiratory distress in neonatal period.
PRESENTATION OF CASE: We present a case of congenital diaphragmatic hernia presenting at an age of 2.5 years in a male child. It was misdiagnosed as a case of pyothorax for which chest tube was attempted on left side resulting in iatrogenic gastric perforation. The patient was managed by early and prompt surgery.
DISCUSSION: Late presentation is usually rare with vast array of respiratory and gastrointestinal symptoms. It often leads to clinical and radiological misdiagnosis.
CONCLUSION: Surgical intervention in misdiagnosed cases can lead to catastrophic iatrogenic complications.

1. Introduction

Congenital diaphragmatic hernia (CDH) is the herniation of contents of abdomen in thoracic cavity through a defect in diaphragm. About 70–95% cases are diagnosed in the neonatal period and 5–45.5% cases are diagnosed later in life either incidentally in asymptomatic patients or clinically from respiratory and gastrointestinal symptoms requiring specific investigations [1–4]. It can mimic and be misdiagnosed as congenital lung cyst and bullae, pyothorax, pneumothorax, gastric volvulus [5]. While treating a misdiagnosed case, there are high chances of injuring the herniating content [6,7]. A high index of clinical suspicion is the key to prevent the catastrophic iatrogenic complications.

2. Case report

A 2.5-years-old male child was brought to paediatric casualty with chief complaints of respiratory distress and pain abdomen for previous 2 days. There was history of similar multiple episodes in the past as well for which the patient's family pursued treatment by tribal healers. His symptoms used to get relieved to some extent but not completely. There was history of fever off and on. On examination, the child was having gross respiratory distress with all the accessory muscles of respiration at work and respiratory rate above 60 per minute. On auscultation, there was no air entry on left side and much decreased air entry on right side of the chest. The child was investigated after prompt resuscitation. On chest X-Ray, there was an obvious large rounded homogenous opacity along with air filled gut loops in left hemi-thorax compressing the left lung to left apical region. There was very significant mediastinal shift to contralateral side resulting in a compressed right lung (Fig. 1). These findings on chest X-ray were missed completely by the resident on duty and a chest tube was inserted under local anesthesia on left side considering it to be a case of pyothorax. The child got a bit relieved as well. He was shifted to pediatric intensive care unit and was started on oral feeds the next day. The pediatric resident on duty was surprised on seeing milk and fruit juice in the chest tube which was given him orally. So, she called the pediatric surgeon on duty. He examined the patient thoroughly and evaluated the X-Ray. The homogenous opacity and air in the herniated gut loops was in continuity with that in the abdomen. Therefore, a clinical diagnosis of left sided congenital diaphragmatic hernia with iatrogenic gastric perforation was made and the patient was taken up for urgent surgery. Exploratory laparotomy was done with left subcostal Kocher's incision. Per-operatively, there was a defect

* Corresponding author at: 23/8 FM, Medical Campus, Rohtak, Haryana 124001, India.
E-mail addresses: drpradeepkajal@gmail.com, pkajalsurg@gmail.com (P. Kajal), namitabhutani89@gmail.com (N. Bhutani), mohitgoyal1996@gmail.com (M. Goyal), impoonamkamboj@gmail.com (P. Kamboj).

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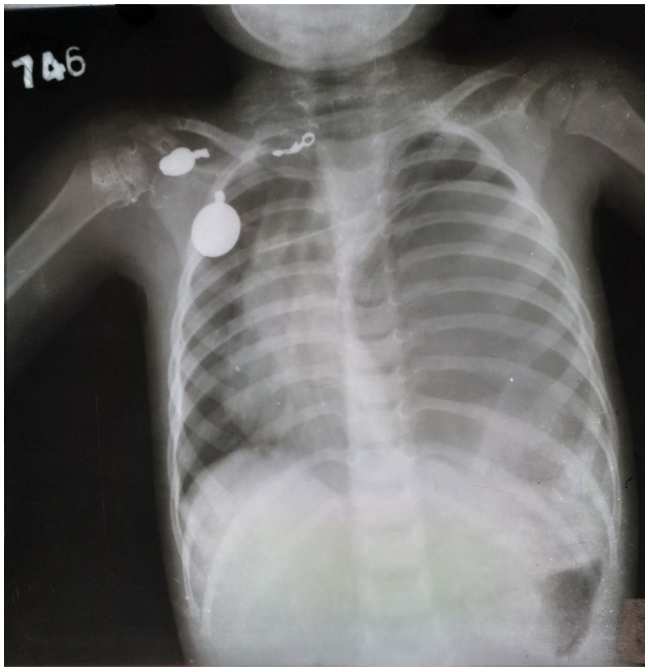

Fig. 1. Chest X-Ray showing large rounded homogenous opacity along with air filled gut loops in left hemi-thorax compressing the left lung to left apical region and mediastinal shift to contralateral side resulting in a compressed right lung.

of around 3.5 × 2.5 cm in posterior part of left hemi-diaphragm (Bochdalek hernia). The manual reduction of the herniated contents was attempted but was not successful owing to the small size of the defect. So, the defect was extended by 1.5 cm medially with the help of electrocautery. It was evident that stomach, spleen, transverse colon and left lobe of liver were herniating in left hemi-thorax with massive dilatation of stomach. The stomach was full of brownish black thick fluid coming out from iatrogenic perforation of about 1.5 × 1.5 cm on the greater curvature. (Fig. 2). It was decompressed completely with suction and all the herniated viscera pulled back in the abdominal cavity. The posterior lip of the diaphragm was deficient. So, a part of renal fascia from anterior surface of the left kidney was mobilized superiorly and utilized for the reconstruction of diaphragm with 3-0 proline continuous suture. The gastric perforation was closed with silk 3-0 interrupted sutures and abdominal wound was closed in layers. Check chest X-ray was done on 5th post-operative day which showed a satisfactory shape and function of diaphragm with left lung expanded significantly. The right lung was fully expanded with the mediastinum shifting back to its normal midline position (Fig. 3). The post-operative period was uneventful with the child receiving chest physiotherapy and made to do respiratory exercises with a mediciser. The child was discharged in fair health on 6th post-operative day.

3. Discussion

Congenital diaphragmatic hernia (CDH) is described as (1) failure of diaphragmatic closure at development, (2) presence of herniated abdominal contents into chest and (3) pulmonary hypoplasia. It occurs in about 1 in 3000 live births and results from the failure of different parts of diaphragm to fuse resulting in patent pleuroperitoneal canal in embryonic life [7]. Another conjecture is that if the development of lung bud is disturbed, there is an impaired development of a post hepatic mesenchymal plate (PHMP) that is closely related to the development of lung, resulting in a defective diaphragm [8]. In diaphragm, the defects are usually present in posterolateral part (Bochdalek hernias, 70–75%)

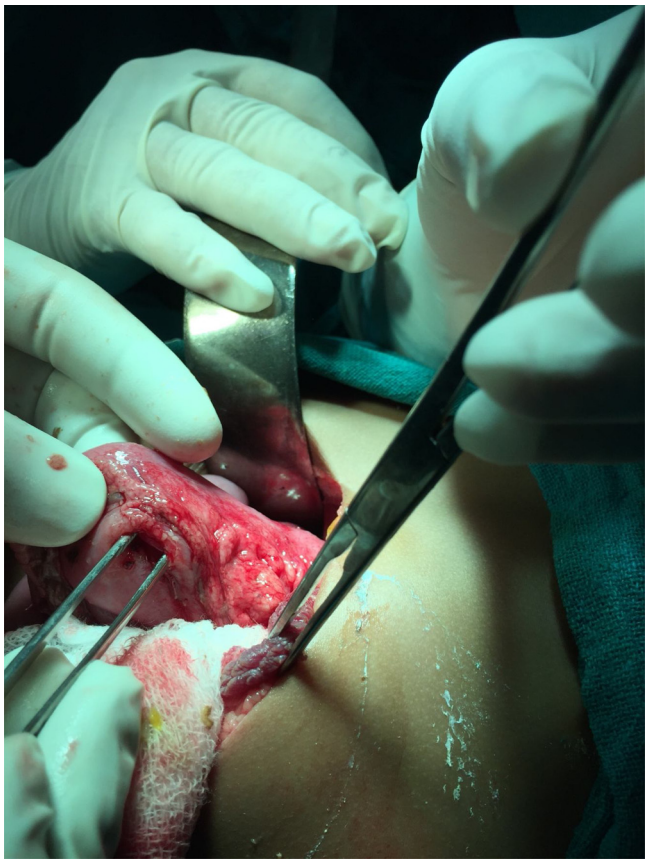

Fig. 2. Per-operative photograph showing an iatrogenic perforation of about 1.5 × 1.5 cm on the greater curvature of the stomach (the tip of forceps in the perforation).

followed by anterior aspect (Morgagni hernias, 23–28%) and central part(2–7%) [7–9]. So, ours was a case of late presenting Bochdalek hernia. In neonatal period, a patient with CDH presents with severe respiratory distress which was considered a surgical emergency but with recent understanding, the first step is to stabilize the patient haemodynamically followed by surgical intervention [10]. When a patient presents late, symptoms vary according to the organ affected. On a chest X-Ray, there may be large rounded homogenous opacity because of herniated stoamch along with air-filled gut loops in left hemi-thorax compressing the left lung to left apical region and even mediastinal shift to contralateral side resulting in a compressed right lung as in our case. It can mimic and be misdiagnosed as congenital lung cyst and bullae, pyothorax, pneumothorax, and gastric volvulus.

In our case, the patient was having respiratory distress due to compression of the left lung to left apical region by the herniating stomach, spleen, transverse colon and left lobe of liver through posterolateral defect. This led to contralateral shift of the mediastinum resulting in significant compression of the right lung as well. The presenting symptoms can be vague and non-specific most of the times as in our case. Also, the chest X-ray findings were misinterpreted by the resident on duty as pyothorax for which chest tube was inserted causing gastric perforation. The inappropriate insertion of a chest drain, although relieves the symptoms temporarily as in our case as well, may result in serious consequences by damaging intrathoracic abdominal viscera. There is also the risk of spillage of the gastric or intestinal contents into the thoracic cavity leading to mediastinitis. Damage to the spleen or blood vessels in cases of left sided CDH could result in life threatening haemorrhage. In cases of right sided CDH, an intrathoracic liver may be damaged