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Case Study

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CONGENITAL DIAPHRAGMATIC HERNIA DIAGNOSED IN AN INFANT

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ABSTRACT

Congenital diaphragmatic hernia (CDH) is the herniation of the abdominal contents through congenital diaphragmatic defect. It is of variable severity and may be associated with high mortality due to pulmonary hypoplasia and pulmonary vascular changes. It can be diagnosed antenatally with improved diagnostic methods. However, undiagnosed cases may present with the cough and failure to thrive in postnatal period. These cases are evaluated with the help of chest x ray supplemented with cross sectional imaging methods. The surgical repair of the defect in the neonatal period has improved the prognosis in these patients. In this report we illustrate the imaging features of congenital diaphragmatic hernia of Bochdalek type in an infant.

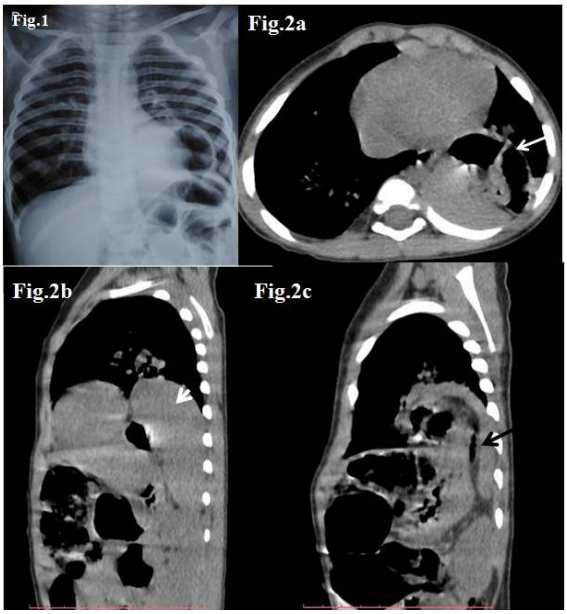
KEYWORDS: Congenital diaphragmatic hernia, Bochdalek type, pulmonary hypoplasia, infant.

INTRODUCTION

Congenital diaphragmatic hernia (CDH) is the outcome of congenital defect during the development of the diaphragm. Through this defect the abdominal contents herniate into the thoracic cavity. The incidence of CDH is approximately 2–4 per 10,000 live births.[1] It is associated with high mortality however, with improvement in early detection and perinatal management the overall survival rates has reached upto 70%.[2-4] Antenatal imaging methods like ultrasonography and fetal MRI help in the early and accurate diagnosis of CDH that further helps the clinicians in the treatment planning. Similiarly, the postoperative management is vital to improving patient outcomes and quality of life. In this way, the medical imaging methods play a significant and essential role in reducing the long term morbidity.[5]

CASE STUDY

11 months old male infant was brought by his mother to the pediatrics department with the complaints of cough and decreased acceptance of feed for one month. Clinically respiratory infection was suspected and chest x ray was advised. Chest x ray showed the radiopacity in the left lower zone with lucent areas and non visualized left hemidiaphragm (fig1). For further work up non contrast CT thorax was done. On CT scan there was posterolateral defect of size ~2cm in the left hemidiaphragm through which the stomach, small bowel and spleen were herniating into the left hemithorax and caused collapse of the adjoining lung parenchyma (fig2a,b & c). Based on these features the diagnosis of congenital diaphragmatic hernia of Bochdalek type was made and patient was referred to the pediatric surgery department. The surgical repair of the defect was done and patient had improved symptomatically afterwards.



Frontal chest Xray (Fig.1) shows the radiopacity in left lower zone with multiple lucent areas. The left hemidiaphram is indistinct. Non contrast axial (fig 2a) and sagittal (fig 2b & c) CT images showing the left posterolateral diaphragmatic defect with herniation of stomach (white arrow), spleen (arrowhead) and small bowel (black arrow).

DISCUSSION

Congenital diaphragmatic hernia is complex and life-threatening sequla to congenital developmental diaphragmatic defect that represent a complex set of physiologic derangements of the lung, the pulmonary vasculature, and related structures. Imaging plays an important role in the treatment and care of these infants. Diaphragm develops during 4–12 weeks of gestation. The four major embryologic precursors of the diaphragm are septum transversum, pleuroperitoneal membrane, dorsal mesentery of the esophagus and the muscular body wall. The pleuro-peritoneal canal is separated with a pleuro-peritoneal membrane. It has two lateral segments namely left and right. The incomplete fusion of these structures results into diaphragmatic hernia. The congenital diaphragmatic hernias are most commonly classified into two types i.e, Bochdalek or Morgagni hernia. Bochdalek hernias are seen in posterolateral region of the chest and result in contralateral mediastinal shift and pulmonary hypoplasia of the ipsilateral lung. It commonly occurs on the left side and may contain the bowel, stomach and spleen. Right-sided Bochdalek hernia are uncommon and may contain the liver and bowel. Morgagni hernias are less frequently encountered than Bochdalek and are anteriorly located, usually to the right of midline. They usually conain liver and bowel; and cause left mediastinal shift.[6] The diaphragmatic defect occurs on the left side in 90% of cases, on the right side seen in ~ 10%.[7] and rarely, bilaterally.[8]

The role of ultrasound for prenatal diagnosis and assessment of prognostic features of CDH is well established nowadays.[9-11] Prenatal sonography and MRI allowed early and accurate detection of diaphragmatic defect and associated anomalies. However, at times it can be very difficult to diagnose CDH before 24 weeks.[12] and approximately 11% of cases are missed during the antenatal scan and diagnosed postnatally.[13]

In the postnatal period, chest x rays supplemented by cross-sectional imaging in some cases are helpful in sorting out the differential diagnosis of intrathoracic masses, the detection of associated anomalies, and in the management of complications as seen in the present case. Knowledge of the pathogenesis of diaphragmatic defects, the understanding of physiologic disturbances, and the strengths and limitations of current imaging methods is essential to the effective management of these patients.

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