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Case Report

Acquired Traumatic Diaphragmatic Hernia with Delayed Presentation in a Child

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Abstract

A congenital diaphragmatic hernia occurs because of embryologic defects in the diaphragm. Most patients with congenital diaphragmatic hernias present early rather than late in life, however, adults may present with a congenital hernia that was undetected during childhood. Acquired diaphragmatic hernias result from all types of trauma with blunt forces accounting for the majority [1]. The author reports a case of acquired diaphragmatic hernia in a three-year-old boy with a prolonged history of recurrent attacks of vomiting and abdominal pain associated with cough. After taking in to account the full history and investigation, it was proved to be a case of acquired diaphragmatic hernia.

Keywords: congenital diaphragmatic hernia, acquired diaphragmatic hernia, trauma

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1. Introduction

The vast majority of diaphragmatic hernias encountered by pediatric surgeons are congenital, with a reported prevalence rate of 1 to 3000–5000 live births. Acquired or iatrogenic diaphragmatic hernias are probably under-reported in the pediatric population [2].

Traumatic diaphragmatic herniation is rare in children. Motor vehicle accidents are the most common cause of diaphragmatic herniation in children. As it is rare and overshadowed by associated injuries, the diagnosis of post-traumatic diaphragmatic rupture if often delayed [3].

Diaphragmatic hernia requires a high level of suspicion to detect. Patients can be asymptomatic in as many as 53% of hernias from blunt trauma and 44% of those from penetrating trauma. Routine chest X-ray detects only 33% of hernia when interpreted by the trauma team [4]. Missed injuries are associated with significant morbidity and mortality [5].

2. Case Report

A three-year-old male Saudi child was admitted to a governmental general tertiary hospital at KSA as he had recurrent episodes of vomiting over 12–18 months. The last attack was two days prior to admission. The vomiting was initially yellow in color which later became coffee ground. The vomiting was not projectile but associated with diffuse abdominal pain. He had a history of mild nonproductive cough with no signs of respiratory distress. He had no fever, alteration in his bowels, or other systemic symptoms.

His past medical history was only remarkable for admission to the surgical ward at the age of 18 months following an accidental pistol shot by his brother while they were playing with their father's pistol. An inlet injury wound on the left side of the chest with an entry site to the left anterior sixth intercostal space and an exit to the left posterior ninth intercostal space. Investigations showed left-side hemothorax and CT chest did not show other complications. The hemothorax was drained and the patient was sent home shortly afterward. Since discharge, he had recurrent attacks of unexplained abdominal pain and vomiting. No definite cause was found despite repeated investigations.

3. On Examination

The patient looked unwell with some signs of respiratory distress. His weight was 13.5 kg (50 centiles), and his observations were within normal.

Chest examination revealed a small scar at the lower side of the chest wall anteriorly and posteriorly and decreased air entry on the left side of the chest. Systemic examination was otherwise unremarkable.

4. Investigations

Hb 11.5 gm/dl (N 11.5 – 15.5 g/dL), WBC $10.2x10^9$ (N 5 – 8x 10^9 cells/L), with normal differential, platelet $137x10^9$ (N 150 – 400 x 10^9). BUN 25 mg/dl (N 20 –40 mg/dl), creatinine 0.8 mg/dl (N 0.3 – 1 mg/dl), sodium 138 mmol/l (N 135 – 145), potassium 3.9 mmol/l (N 3.5 – 4.5), RBS 130 mg/dl, calcium 9.1 mg/dl (N8.5 –10 mg/dl), magnesium 2.0 mg/dl (N 1.5 – 2.3 mg/dl), ABG : PH 7.458(N 7.350 –7.450), pco_2 33.1, po_2 50.1, HCO3 24.3, oxygen saturation 96%.

Plain Chest X-ray and with contrast suggest the diagnosis of left-side diaphragmatic hernia (Figures 1 and 2), which was confirmed by the CT scan of the chest that showed a large portion of the stomach in the left side of the chest (Figure 3).

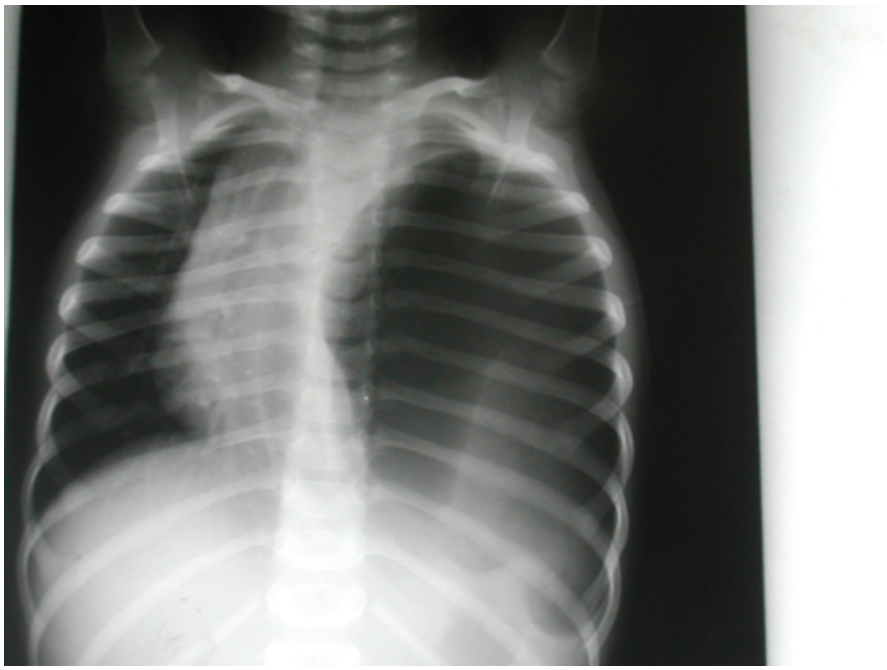

Figure 1: CXR on presentation before operation.

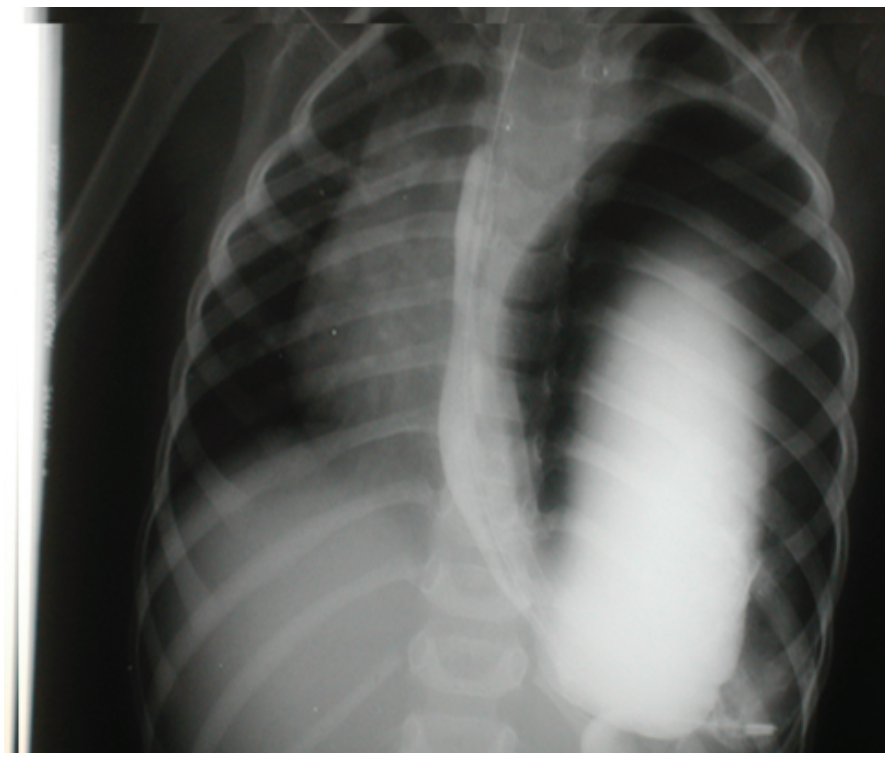

Figure 2: CXR with contrast before operation.

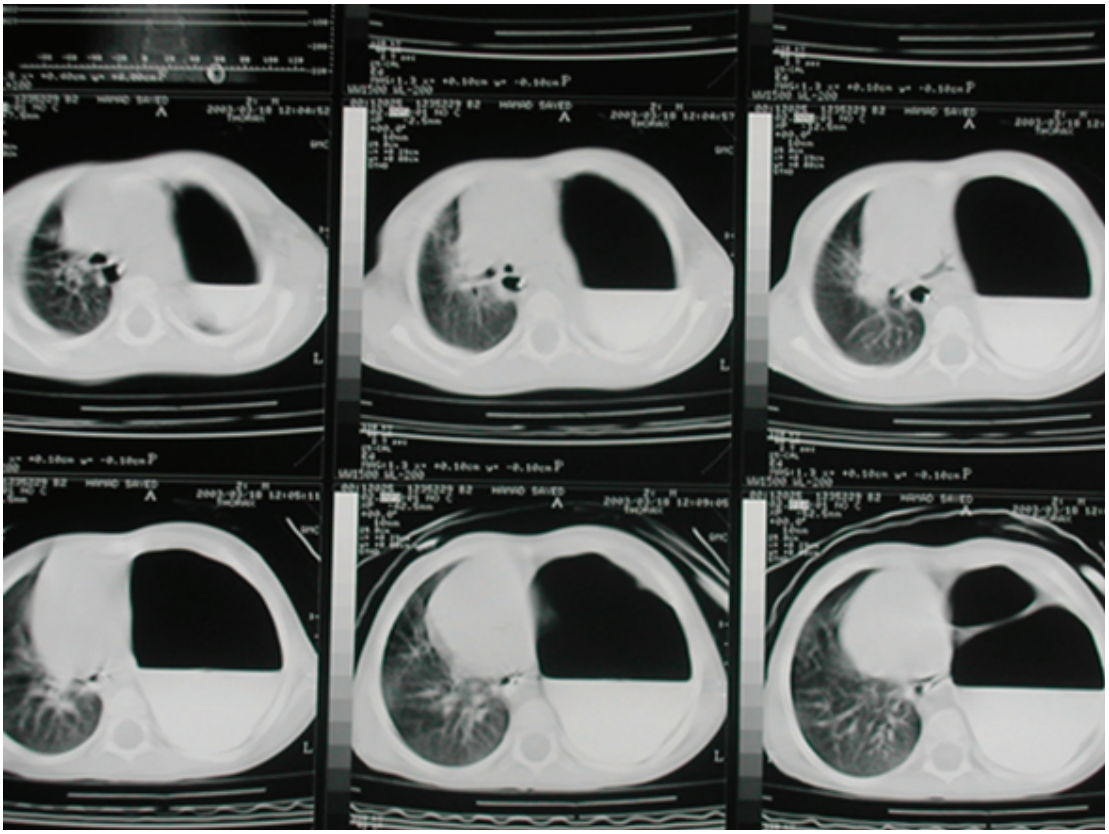

Figure 3: CT scan chest with contrast before operation.

5. Hospital Course

The patient underwent a surgical operation for repairing the defect of diaphragmatic hernia, and a rounded defect was seen in the posterior surface of the left side of the diaphragm, measuring around 5x4 cm. The stomach, splenic flexure of the colon, and omentum have herniated to the left side of the chest which was complicated with adhesions. His post-operative chest X-ray was normal (Figure 4). The patient remained at the hospital after the operation for two weeks and was discharged home in good condition with no adverse events. His follow-up at the referred clinic showed no more complains or complications.

6. Discussion

The vast majority of diaphragmatic hernias are congenital and is rarely associated with a number of different syndromes including Beckwith–Weidman, Goltz Syndrome, and Denys–Drash Syndrome. Acquired diaphragmatic hernia is a rare occurrence. It can

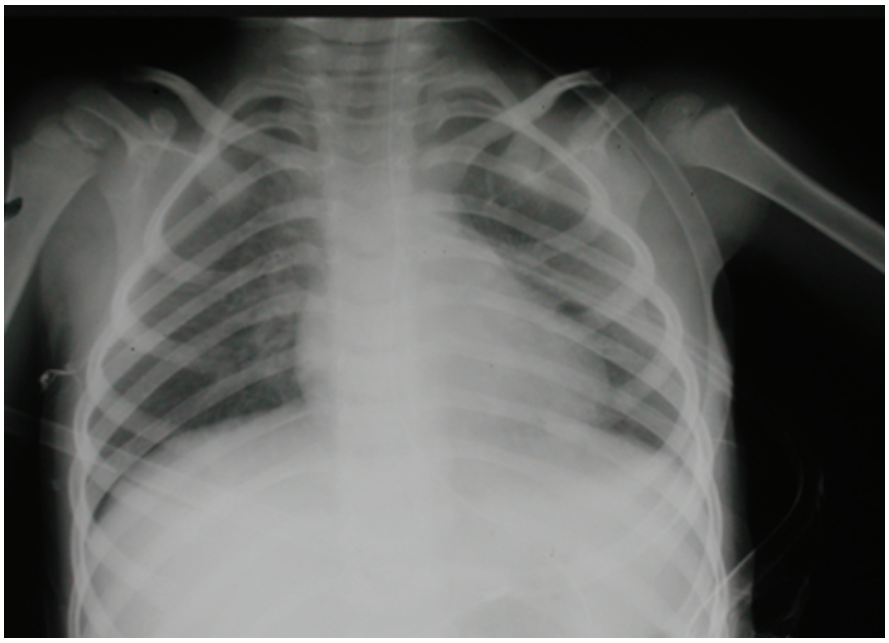

Figure 4: CXR after operation.

result from blunt, penetrating or inadvertent iatrogenic injury. When overlooked, it can potentially be catastrophic [2].

Approximately 10% of blunt traumatic injuries in children involved the thorax. Among these cases, a traumatic diaphragmatic hernia is a relatively uncommon injury. Acute respiratory distress has been reported, and hypoxemia is a common feature in most cases. Ventilator support can often be required because of associated pulmonary contusion [4].

Despite the fact that chest X-ray can be highly suspicious, delay in diagnosis can occur. It is essential to combine diagnostic tests whenever there is a high index of suspicion [5]. About 30–50% of traumatic diaphragmatic ruptures are missed on initial presentation. Only 25–50% of cases will be detected by initial chest radiograph, with an additional 25% with subsequent chest X-ray findings including distortion of diaphragmatic margin, elevated hemidiaphragm (> 4 cm higher on the left rather than the right), and bowel loops in the lung space [5]. Conventional CT scan has been reported to have a sensitivity of 14–82% with a specificity of 87%. Consistent CT findings include the 'collar sign', which is a focal constriction of abdominal viscera (most common), intrathoracic herniation of abdominal contents, and discontinuity in the diaphragm [5].

7. Conclusion

Acquired diaphragmatic hernia is extremely rare in children. However, a high index of suspicion is needed to diagnose this condition particularly if there is a history of trauma. It is therefore recommended that all tools of investigation should be used to detect the diagnosis.

References

[1] El-Gohary, Y., Schuster, I., Scriven, R. J., et al. (2014). Iatrogenic diaphragmatic hernia in infants: potentially catastrophic when overlooked. *Journal of Pediatric Surgery Case Reports*, vol. 2, no. 11, pp. 515–518.

[2] Rattan, K. N., Magu, S., and Agrawal, K. (2005). Traumatic diaphragmatic herniation. *Indian Journal of Paediatrics*, vol. November, no. 72, pp. 985–986.

[3] West, K., Weber, T., and Grosfeld, J. (1981). Traumatic diaphragmatic hernia in childhood. *Journal of Paediatric Surgery*, vol. 3, no. 16, pp. 392–395.

[4] Kumar, K. and Kumar, M. G. (2013). Delayed presentation in traumatic diaphragmatic hernia. *Indian Paediatrics*, vol. 50, pp. 709–710.