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Case report

Incarcerated Diaphragmatic Hernia – Differential Diagnoses

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A B S T R A C T

The incarceration of diaphragmatic hernia is very rare. We present a case of a four-year old girl who developed the incarceration of left-sided diaphragmatic hernia, who, until then, was completely asymptomatic. This incarceration of the hernia represented a surgical emergency presenting as obstructive ileus and a severe respiratory distress which developed from what appeared to be full health. During a brief pre-operative examination a number of differential diagnoses were suggested. Along with the laboratory blood analysis (complete blood count and acid-base balance) a plain thoracic and abdominal radiography was done (babygram). After that, through an inserted nasal-gastric tube, barium meal of the upper gastrointestinal tract was done, showing abdominal organs in the left half of the thorax and a significant shift of the mediastinum to the right. With an urgent upper medial laparotomy we accessed the abdominal cavity and made the correct diagnosis. An opening was shown in the rear part of the left hemi-diaphragm with thickened and edematous edges, approx. 6 cm in diameter with incarcerated content. The incarcerated abdominal organs (stomach, transversal colon, small intestine and spleen) gradually moved into the abdominal cavity. The opening was closed with nonresorptive sutures (TiCron) size 2-0 with a previous control and ventilated expansion of the well-developed left lung. In postoperative course the acid-base balance quickly recovered, as well as the general state of the patient and radiography showed a good expansion and lucency of the lung parenchyma and a return of the mediastinum into the middle part of the thorax.

Key words: *congenital diaphragmatic hernia, children, incarceration*

Introduction

Pleuroperitoneal diaphragmatic hernia is a rare anomaly in the development of the diaphragm with an incidence of 1: 2500–5000 births. This anomaly can be discovered in utero, but is usually discovered immediately upon birth. The clinical triad consists of: dyspnea, cyanosis and dextrocardia[1,2]. The incarceration of diaphragmatic hernia represents a first rate surgical emergency because it doesn't threaten only individual organ systems, but the life of the patient itself[3,4]. The success of the operation and postoperative recovery mostly depends on the timely diagnosis, development of the lung parenchyma and accompanying anomalies[5–7]. We present the case of a four-year old girl with incarcerated congenital left-sided pleuroperitoneal diaphragmatic hernia who, until the moment of incarceration, was completely asymptomatic.

Case Report

The four-year old girl in full health suddenly developed aggravated breathing and felt strong pain in the thorax in the heart region. She was bent and couldn't walk, had a shallow breath, was breathless, had as an impulse to vomit, and the pains spread toward the epigastrium and lower into the abdomen. History shows no trauma; occasionally in winter months she had bronchitis. The appearance of the patient gave the impression of acute, life threatening illness. The skin was pale and clammy, the mucous membranes livid, breathing accelerated and shallow, up to 52 a minute with an O_2 saturation of 96%. The pulse was irregular and accelerated to 112 a minute, the left hemithorax was hyperresonant on percussion, breathing was not heard on auscultation (Figure 1). The abdomen was soft and slightly sensitive to palpation and peri-

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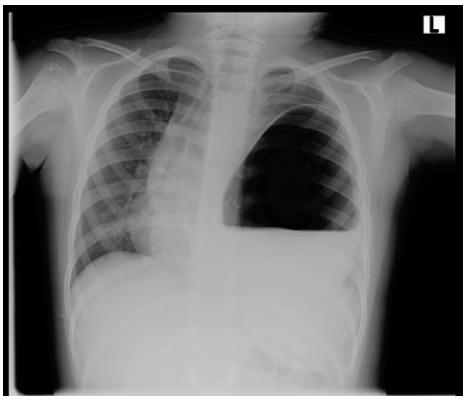

Fig. 1. X-ray of heart and lung upon admission to hospital.

stalsis subdued. The main laboratory blood findings were normal, with the exception of elevated leukocyte count (L 39.9), platelets 578 x 10^3 and C reactive protein which was 2.7. Acid-base status (ABS) showed a pH of 7.380 while BE was –3 with increased lactates up to 3.03. Other findings were in the limits of normality. Urgent X-ray of the heart and lung as well as profile radiogram suggested several differential diagnoses: strongly distended stomach? Elevation of the hemidiaphragm with atelectasis of the left lung? Atypical liquidopneumothorax? Following the injection of the contrast medium (gastrografin) through a nasogastric tube (N-G) we could see the cardia of the stomach in normal position and the stomach high up in the left hemithorax. Through the N-G tube we aspired cca 700 mL of mixed air and liquid content and achieved a significant decompression, return of the heart shadow in normal position and re-expansion of the lung. The contrast medium did not penetrate further than the stomach, which indicated an obstruction, i.e. suspicion on paraesophageal (incarcerated?) hernia (Figure 2). After the X-ray we did the ultrasound of the abdomen which showed to the left of the heart the formation which corresponds to the stomach; spleen and kidney were in the normal position. The diaphragm was clearly seen after the decompression, leaning against the spleen. The ultrasound of the parenchymal

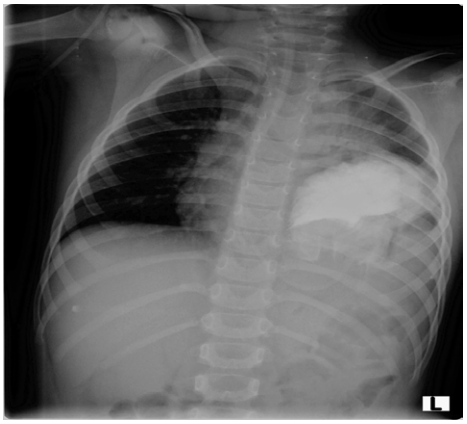

Fig. 2. X-ray of heart and lung after injection of the contrast medium through the N-G tube.

organs was normal. Due to a general bad condition and worsening of the clinical status we carried out urgent upper medial laparotomy which later extended below the left costal margin. Interoperative finding indicated an opening in posterolateral part of the left hemidiaphragm 6 cm in diameter (Bochdalek hernia), the thickened and fleshy borders which float while the incarcerated content was the entire stomach, jejunum, transversal colon with omentum, splenic flexure and spleen. The incarcerated organs were returned into the abdominal cavity, the edges of the diaphragmatic defect were trimmed and the opening in the diaphragm closed using non-resorbable sutures 2-0. Intraoperatively accompanying anomalies were not found. Postoperative X-ray of the heart and lung showed a normal expansion of the lung parenchyma, while the blood analysis showed a fall in the leukocyte count to L-18.4, but also a significant increase of the C reactive protein (CRP-238,5) (Figure 3).

The patient spent two days in the ICU sedated and on analgetics. On the second day she began drinking tea and on the third day she began eating. Antibiotic protection lasted 4 days. Postoperative recovery was normal and the patient was released to home care on the 8th day.

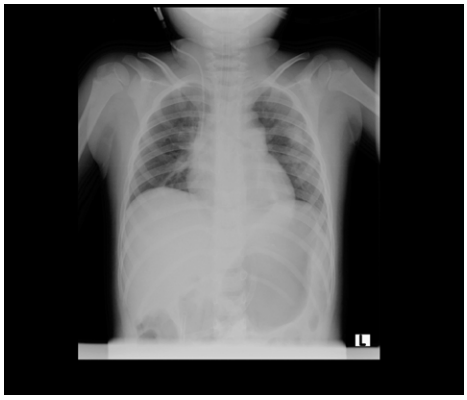

Fig. 3. X-ray of heart and lung on the first postoperative day.

Discussion

Diaphragmal pleuroperitoneal hernia is a rare anomaly while its incarceration as well as clinical presentation beyond the neonatal age is really extraordinarily rare. It appears on the left side of the diaphragm in about 80% of the cases and on the right side in about 20%[1–3]. The clinical picture of the patient with incarceration of the diaphragmatic hernia is very dramatic, seems life-threatening and represents first rate surgical emergency. The key laboratory findings are mainly within the limits of normality and do not provide anything of essential diagnostic interest, while ultrasound and X-ray examination, native and contrast can suggest a number of differential diagnoses[8–10]. The clinical picture of the child requires a quick diagnosis. This condition and adequate treatment of the pathologic finding can be correctly diagnosed only with an

urgent surgical intervention. The presentation of diaphragmatic hernia after infancy often means a well-developed lung parenchyma, as well as a significant possibility of primary closing of the opening on the diaphragm[5].

Conclusion

The incarceration of diaphragmatic pleuroperitoneal hernia is a surgical rarity with a dramatic clinical picture which requires a quick diagnosis and an urgent surgical intervention. The prognosis depends on the timely diagnosis, appropriate surgical intervention and the herniated contents.

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UKLJEŠTENA DIJAFRAGMALNA HERNIJA-DIFERENCIJALNE DIJAGNOZE

SAŽETAK

Uklještenje dijafragmalne hernije dešava se dosta rijetko. Prikazujemo slučaj četverogodišnje djevojčice kod koje je došlo do uklještenja lijevostrane dijafragmalne hernije a koja je do tada bila asimptomatska. Ovo uklještenje hernije predstavljalo je kirurško hitnoću prvog reda s prezentacijom strangulacijskog ileusa i teškog respiratornog distresa koji je nastao iz punog zdravlja. Tijekom kratke preoperacijske obrade u obzir su dolazile brojne diferencijalne dijagnoze. Uz laboratorijsku analizu krvi (CKS i ABS) učinjena je i osnovna radiološka obrada (bebigram) a nakon toga kroz uvedenu naso-gastričnu sondu, kontrastna rtg pretraga gornjeg probavnog trakta koja je pokazala abdominalne organe u lijevoj polovici grudnog koša te značajan pomak medijastinuma na desnu stranu. Hitnom se gornjom medijalnom laparotomijom pristupa u trbušnu šupljinu i postavlja se ispravna dijagnoza. Prikazan je otvor u stražnjem dijelu lijeve hemidijafragme zadebljanih i edematoznih rubova promjera oko 6 cm s uklještenim sadržajem. Uklješteni su se abdominalni organi (želudac, poprečni kolon, tanko crijevo i slezena) polako vratili u trbušnu šupljinu. Otvor je zašiven neresorptivnim šavima Ticrona veličine 2-0 uz prethodnu kontrolu i ventiliranu ekspanziju dobro razvijenog lijevog plućnog krila. U postoperacijskom tijeku dolazi do brzog oporavka ABS-a i općeg stanja bolesnice uz rtg dokazanu dobru ekspanziju i prozračnost plućnog parenhima te mediopoziciju medijastinuma