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CASE REPORT

Central diaphragmatic hernia in an adult: a rare presentation

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Abstract
Introduction An adult presentation of congenital diaphragmatic hernia is very rare. Here, we present a rare case report of left-sided central diaphragmatic hernia in an adult. Laparoscopic repair of the hernia was performed with mesh placement.
Case summary A 19-year-old adult man was presented with pain in abdomen and occasional vomiting. X-ray and CT scan thorax was suggestive of diaphragmatic hernia with herniation of stomach. Laparoscopic repair were performed with mesh placement.
Discussion Central diaphragmatic hernia is rarely seen in adults. Only one such case is reported so far. Successful repair was performed with laparoscopy. Patient recovered well without any postoperative complications.

Keywords Central diaphragmatic hernia · Adult · Laparoscopy · Septum transversum defect

Introduction

Congenital diaphragmatic hernia presents in infancy and childhood. The presentation of diaphragmatic hernia in adults is very rare. Central diaphragmatic hernia is a particularly rare variety of congenital diaphragmatic hernia. It occurs due to a developmental defect in the septum transversum. The majority of the cases are reported in infancy and childhood. Here, we report a rare diagnosis of left-sided central diaphragmatic hernia in an adult.

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Case

A 19-year-old male patient presented to us with a history of pain in the upper abdomen and occasional vomiting. There was no history of retrosternal burning pain. The patient's medical history and family history was unremarkable. X-ray chest was suggestive of herniation of the stomach into the left hemithorax. Computed tomography (CT) scan of the thorax with the upper abdomen showed herniation of the stomach through the defect in the left hemidiaphragm. No e/o herniation of other organs were noted. A provisional diagnosis of diaphragmatic hernia was kept.

Laparoscopic repair of the diaphragmatic defect was planned. The patient was placed in a supine position with his legs apart and in the reverse Trendelenburg position. Four ports were used. When examined, there was an approximately 5 × 5-cm sized defect in the central left hemidiaphragm (Fig. 1). A thin sac was present. The defect was sutured with polypropylene 1–0 (Fig. 2). A 15 × 10-cm sized Parietex™ (Covidien Surgical Devices, USA) composite mesh was used to cover the defect (Fig. 3). The mesh was fixed with the diaphragm using polypropylene 3–0 interrupted stitches (Fig. 4). The total operative time was 150 min. The patient's post-operative recovery was uneventful and he was discharged on the third post-operative day.

Discussion

The diaphragm is derived from the septum transversum, pleuroperitoneal membrane, and the thoracic wall. Diaphragmatic hernias include posterolateral (Bochdalek) hernias, Morgagni and other anterior hernias, and, rarely, central hernias. About 50–60% of affected individuals have

Fig. 1 Central diaphragmatic defect on the left side

Fig. 2 The defect was sutured

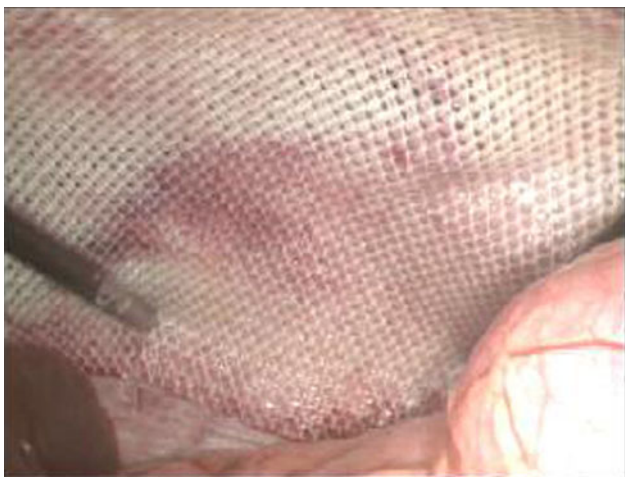

Fig. 3 The composite mesh covering the defect

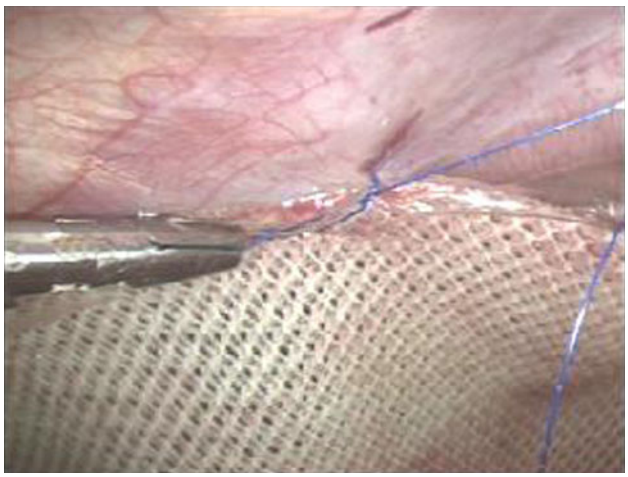

Fig. 4 The mesh was fixed to the diaphragm with sutures

isolated congenital diaphragmatic hernia; the remainder have complex congenital diaphragmatic hernia—that is, congenital diaphragmatic hernia occurring with additional malformations or as part of a single gene disorder or chromosome abnormality. The central portion and, possibly, anterior regions of the diaphragm are thought to develop from the septum transversum, which is initially fused to the liver during development and becomes the unmuscularized central tendon of the diaphragm [1].

Congenital diaphragmatic hernia has an incidence of 1:3,000–1:5,000 live births [2]. It is believed to be caused by the failure of diaphragmatic closure, and usually presents with respiratory distress and 40–50% mortality in the neonate. Adult presentation is rare. Congenital diaphragmatic hernia is usually recognized during the neonatal period with respiratory compromise and pulmonary hypoplasia. An adult with congenital diaphragmatic hernia may present with a wide range of acute or chronic respiratory or gastrointestinal symptoms or may be completely asymptomatic [3].

Central diaphragmatic hernia is a rare diaphragm defect involving the central tendinous (e.g., amuscular) portion of the diaphragm. The entire rim of the diaphragmatic musculature is present. All hernia types can present with a sac (e.g., membranous sheet of tissue) covering the herniated abdominal contents. There currently is no explanation for the development of a hernia sac. The septum transversum diaphragmatic hernia occurs in only 1–6% of congenital diaphragmatic hernias [4]. Most patients have clinical symptoms at birth or in infancy, with respiratory stress and cardiac dysfunction.

The first case of isolated central anterior diaphragmatic hernia from a defect of the septum transversum dates back to 1966 [5]. Since then, other cases, all in infancy and childhood, have been reported [4, 6]. Only one such case of central diaphragmatic hernia in an adult has been reported

so far [7]. In the reported case, there was a large defect in the left central part of the diaphragm, with communication between the pleural and pericardial cavity. There was no sac. Our patient presented with a sac and there was no direct communication with pleural or pericardial cavity. Repair of the congenital diaphragmatic hernia is essential, as it can lead to obstruction or strangulation of the herniated contents.

Repair of the congenital diaphragmatic hernia can be performed by an abdominal or thoracic approach. In neonates, diaphragmatic hernia can be repaired by simple diaphragmatic reconstruction or reconstruction with a synthetic patch. With the advancement of modern surgical techniques, less invasive means of repair are available. We performed laparoscopic repair of the hernia in this patient and this is our preferred approach. In a very large defect with difficult closure, it is better to leave the defect and cover it with a synthetic mesh [7]. As the size of the defect was approximately 25 cm^2, we prefer to use a composite mesh. Repair with polypropylene mesh should be avoided for the fear of adhesions of the abdominal contents.

In conclusion, though rare, central diaphragmatic hernia can be seen in adults. Laparoscopic repair with or without mesh is a feasible option for patients with diaphragmatic hernias.

References

1. Yuan W, Rao Y, Babiuk RP, Greer JJ, Wu JY, Ornitz DM (2003) A genetic model for a central (septum transversum) congenital diaphragmatic hernia in mice lacking Slit3. Proc Natl Acad Sci USA 100:5217–5222
2. Bösenberg AT, Brown RA (2008) Management of congenital diaphragmatic hernia. Curr Opin Anaesthesiol 21:323–331
3. Kitano Y, Lally KP, Lally PA; Congenital Diaphragmatic Hernia Study Group (2005) Late-presenting congenital diaphragmatic hernia. J Pediatr Surg 40:1839–1843
4. Clavert JM, De Geeter B, Bientz J, Sauvage P, Buck P (1983) Abdomino-pericardial hernia as a result of an anomaly of the septum transversum. Apropos of a case in a newborn infant. Chir Pediatr 24:137–139
5. Pomputius WF, Fisher ER (1966) Intrapericardial fat pads and anomalous development of the septum transversum as a cause of pseudocardiomegaly. Am J Clin Pathol 46:92–98
6. Wesselhoeft CW Jr, DeLuca FG (1984) Neonatal septum transversum diaphragmatic defects. Am J Surg 147:481–485
7. Paci M, de Franco S, Della Valle E, Ferrari G, Annessi V, Ricchetti T, Sgarbi G (2005) Septum transversum diaphragmatic hernia in an adult. J Thorac Cardiovasc Surg 129:444–445