A Rare Variant of Diaphragmatic Hernia through the Central Tendon: A Case Report

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Abstract Diaphragmatic hernia through the central tendon is a very rare entity. We report on a case that developed to acute intestinal obstruction, secondary to herniation of the small intestine through a small defect in the central tendon of the diaphragm. The patient never had any trauma to his chest or abdomen and had no history suggestive of congenital nature of the diaphragmatic hernia. However, he had coronary artery bypass grafting with saphenous vein used as a graft, done almost 17 years back; hence, we suspect it to be an iatrogenic hernia. A laparoscopic herniorrhaphy of the diaphragmatic defect was carried out after reducing the herniated organ. The postoperative course was uneventful. Iatrogenic diaphragmatic hernias are a very rare entity. We are reporting on a central tendon hernial defect in the diaphragm after coronary artery bypass with saphenous vein as a graft material. There are reported cases with post coronary artery bypass graft diaphragmatic hernia in which the right gastroepiploic artery was taken as the graft material. Late diagnosis of iatrogenic diaphragmatic hernias is frequent. CT scan is helpful for diagnosis. Surgery is the treatment of diaphragmatic hernia at the time of diagnosis, even with asymptomatic patients.

Keywords Diaphragm injury · Iatrogenic diaphragmatic hernia · Central tendon of the diaphragm · Intrapericardial diaphragmatic hernia · Laparoscopic repair

Abbreviation

CABG Coronary artery bypass graft

Introduction

Diaphragmatic hernias are broadly classified to congenital and acquired categories. Acquired diaphragmatic hernias are generally the result of blunt or penetrating thoracoabdominal trauma or iatrogenic injury [1]. Postoperative iatrogenic diaphragmatic hernia is very rare. We describe a case of acute intestinal obstruction secondary to herniation of the small intestine and omentum through a defect in the central tendon of the diaphragm which appears to be an iatrogenic hernia after coronary artery bypass grafting (CABG) with saphenous vein as graft material. The hernia was reduced, and the defect was repaired laparoscopically.

Case Report

A 65 years aged gentleman presented to us with a 7-day history of severe upper abdominal and chest pain with persistent vomiting and constipation. He was being treated conservatively elsewhere, as the patient and the treating physician had a suspicion of cardiac pathology responsible for his symptoms. He had CABG done 17 years ago. His vitals were stable with distended and nontender abdomen. His ECG had changes consistent with previous cardiac event. His abdominal sonography and esophagogastroduodenoscopy were normal, but X-ray evaluation of the chest showed abnormal air–fluid level in the region of the cardiac silhouette. He was further evaluated by CT scan of the abdomen. CT scan revealed herniated bowel loops in the middle mediastinum (Fig. 1). Laparoscopy was done, and it showed herniating small bowel loops which were distended along with the omentum. The herniating small bowel was reduced back into the abdominal cavity with subsequent reduction of the omentum. Once the viscera were reduced back, approximately 3 cm of diameter defect in the central tendon of the diaphragm was evident on the left side of the falciform ligament (Fig. 2).

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Fig. 1 CT scan film showing herniated bowel in the middle mediastinum

Through the defect, bare heart was visible, which suggests herniation into the pericardium. The defect was closed with polypropylene 1-0 running sutures. The dusky omentum was resected, and viability of the small intestine was confirmed. His postoperative period was uneventful; he started on liquid diet 24 h after surgery and was discharged on the third postoperative day. On follow-up visit, he was asymptomatic.

Discussion

Diaphragmatic hernia is a herniation of abdominal structures within the thoracic cavity. It can be either congenital or acquired. Diaphragmatically acquired defects are most commonly traumatic in origin, followed by iatrogenic lesions and spontaneous defects [1]. These are usually on the left side, attributed to the cushioning effect of the liver protecting the right hemidiaphragm. Retrospective history evaluation of the index case could not reveal the cause of the hernia as there was neither history of trauma nor any other history that could suggest the congenital nature of the hernia; moreover, history of cardiac surgery

itself rules out any congenital diaphragmatic hernia into the pericardium through a defect in the central diaphragm. As the only likely possibility is hernia associated with CABG, we presume it to be an iatrogenic diaphragmatic hernia in the region of the central tendon.

Iatrogenic diaphragmatic hernias have been reported after laparoscopic cholecystectomy, laparoscopic hepatectomy, splenectomy, laparoscopic gastric banding, splenopancreatectomy, gastrectomy, and after living donor liver transplant [2]. Mostly, this complication has been known to develop after esophagectomy and nephrectomy [3]. The occurrences of hernia through the central tendon of the diaphragm as a delayed complication of CABG have been reported, but they were the cases of diaphragmatic hernia after CABG when gastroepiploic artery was used as a graft [4]. Our patient had CABG done with long saphenous venous graft. Diaphragmatic hernia after CABG in which the saphenous vein and not the gastroepiploic artery has been used as a graft has not yet been reported.

A late presentation of an iatrogenic diaphragmatic hernia was reported in 5–62 % of cases in different series, with the longest reported delay of 35 years [5]. The clinical features are usually chronic symptoms such as upper abdominal and lower chest pain, nausea, dyspnea, and reflux after meals, which may develop into an acute presentation with severe epigastric pain, vomiting, and intestinal obstruction [6, 7]. Chest radiograph is a good screening tool, but only 50 % of patients show abnormality [5, 7]. CT scan is the best imaging modality to diagnose diaphragmatic hernias. Surgery is the treatment of diaphragmatic hernia, even in asymptomatic patients. Surgery is described as through thoracic as well as abdominal approach. Treatment by laparoscopy is feasible with a shorter length of stay and least pain. This approach is especially used in left diaphragmatic hernia repair. The majority of these defects can be repaired safely with nonabsorbable sutures without the need for a prosthetic mesh as in the index case [8].

Fig. 2 Laparoscopic view showing defect in the central tendon of the diaphragm

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