



Surgery for a Giant Incarcerated Para-esophageal Hiatal Hernia Causing Dysrhythmia: Case Report

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Abstract

Paraesophageal hernias is seldom founds which presenting symptoms challenging in a spectrum from non-specific symptoms such as heartburn and regurgitation to life threatening gastric volvulus or necrosis. These patients were often diagnosed by imaging investigations or endoscopy for unrelated reasons. Treatment of giant para-esophageal hernias is challenging. Debates continuous in selection of the treatment options whether these hernias require a surgical intervention -particularly- in asymptomatic patients. We are presenting a case with an incarcerated Type IV giant para-esophageal hernia having severe sleep-apnea, dysrhythmias and heartburn.

Keywords: Paraesophageal hernia; Esophageal hiatus; Laparoscopic repair; Open repair; Mesh application

Introduction

None-traumatic hiatal hernias can occur due to a congenital defect or opening of the esophageal hiatus; acquired vulnerability of the connective tissue in relation with aging or obesity or increased abdominal pressure. Hiatal hernias are classified in four types. Type I is a sliding (or axial) hiatal hernia in which the gastroesophageal junction is migrated in cephalic direction through the hiatus into the thorax; Type II is a para-esophageal hernia where the gastric fundus is herniated into the thorax while the gastroesophageal junction remains in the abdomen; Type III para-esophageal hernia is the combination of Type I and Type II; and Type IV is Type III with additional herniation of other organ or organs (colon ± spleen, etc.) [1].

Treatment of giant para-esophageal hernias is challenging. Debates continuous in selection of the treatment options whether these hernias require surgical intervention -particularly- in asymptomatic patients [2]. If yes, which procedure (only primary hernia repair/repair with mesh hiatoplasty and/or adding anti-reflux procedure)? And which approach (open/laparoscopic)? [3]. Here we present the handling of a case with an incarcerated Type IV giant para-esophageal hernia having severe sleep-apnea, dysrhythmias and heartburn.

Case Presentation

A 66-year-old female was admitted to the Gastroenterological Surgery Clinic with complains of sleep-apnea, heartburn, dyspnea and dysrhythmia. Her chest X-ray showed colonic gas in the upper diaphragm (Figure 1). Thoracic-abdominal computerized tomography demonstrated a giant para-esophageal diaphragmatic hernia which compressed the lungs and the pericardium. The stomach was nearly complete and the transverse colon partially herniated from a narrowed hiatal defect suggesting Type IV hiatal para-esophageal hernia (Figure 2A,2B).

The patient was not suitable for a laparoscopic procedure due to her severe kyphos-scoliosis and chronic obstructive lung disease. Her pulmonary breath functions were limited secondary to restrictive and hypo-plastic lungs in relation with her non-traumatic para-esophageal hernia. The giant hernia was primary repaired through transabdominal open approach. After reduction of the herniated stomach and transverse colon to their anatomical position and excision of the hernia sac; the diaphragmatic hernia defect (4 cm (axial) × 2 cm (radial)) was closed by approximation of the diaphragmatic cruras with interrupted 1/0 silk sutures. The surgical procedure was terminated following placement of an external drain to the mediastinal cavity. Patient's postoperative course was uneventful; oral intake began on the second postoperative day, and she was discharged on the fifth postoperative day after removal of the drain. Chest X-ray and tomography performed on the fourth postoperative day showed a hypo-attenuated and slightly elevated hemi-diaphragm without fluid collection (Figure 3A). Intra-abdominal organs were located under the diaphragm in their

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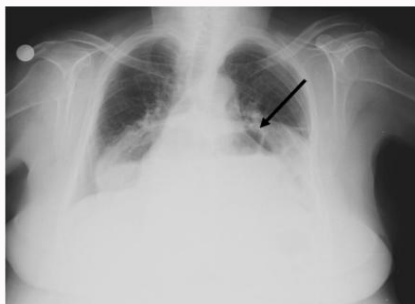


Figure 1: Preoperative chest X-ray. The arrow shows intra thoracic colonic gas.

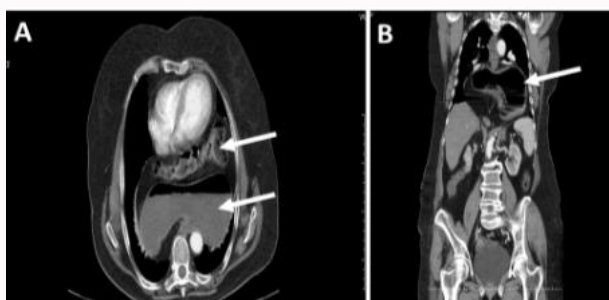


Figure 2: Preoperative thoracic-abdominal computerized tomography images: A) transverse; B) sagittal planes. The arrows show intrathoracic herniation of the stomach and transverse colon.

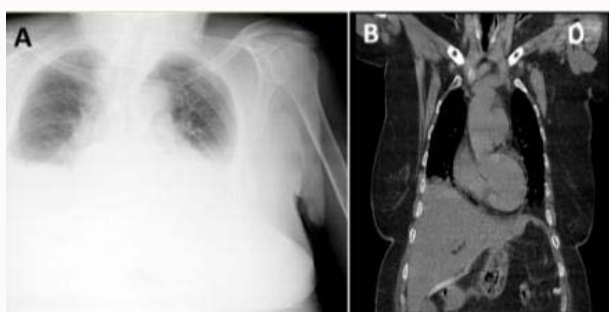


Figure 3: Postoperative images: A) Chest X-ray, B) Sagittal image of thoracic-abdominal computerized tomography.

anatomical location (Figure3-B). Complaints such as heartburn and dysrhythmia markedly improved after surgery.

Discussion

Presenting symptoms of giant hiatal hernias are challenging in a spectrum from non-specific symptoms such as heartburn and regurgitation to life threatening gastric volvulus or necrosis. These patients were often diagnosed by imaging investigations or endoscopy for unrelated reasons. Although controversies exist for the surgical treatment of patients (particularly elderly and frail patients) with minimal symptoms, elective surgery is advised in general due to comorbidities and increased operative risk in acute settings. For example, the mortality of para-esophageal hernia raised in elective surgery from less than 1% to 3.2% in the presence emergent situations such as gastric bleeding, volvulus, perforation or necrosis [4].

Despite various techniques for hiatal para-esophageal hernia repair, basic tenets and steps are reduction of the herniated organ

(stomach) or organs (\pm colon, spleen) to the abdominal cavity, excision of the hernia sac, and closure of the hiatal defect. An anti-reflux procedure is usually added but is not a final rule [5]. Whether existing preoperative gastroesophageal reflux (GERD) or not, a fundoplication (Nissen or Toupet) is performed with the aim of preventing hernia recurrence and reducing potential GERD development after extensive hiatal dissection. However, data is lacking regarding preventing recurrence with anti-reflux procedure. A small study reported that adding fundoplication does not affect the recurrence rate. Further, patients in this study experienced dysphagia after fundoplication whereas those without fundoplication developed reflux esophagitis [6]. On the other hand, another study stated that fundoplication is essential in reducing recurrence and treating underlying GERD without significant bloating and dysphagia symptoms [7]. Notable, fundoplication may avoid in the case of preexisting esophageal dysmotility, or instability during the emergent operation. The present case hadn't preexisting GERD symptoms. Thus, fundoplication was not added and neither dysphagia nor GERD occurred in the postoperative period.

Another point is assessment and reduction diaphragmatic tension during hiatal hernia repair. There are two vectors of hiatal tension; axial and radial. Axial tension is associated with shortened esophagus (intraabdominal length of esophagus <2 cm). In this situation, esophageal lengthening with Collis gastroplasty (or stapled gastroplasty) should be considered to reduce axial tension and subsequent potential recurrence [8]. In the present case, the esophagus was not shortened and the gastroesophageal junction could be positioned tension-free to the intra-abdominal cavity. Thus, a Collis gastroplasty was not required. The distance between the diaphragmatic crural pillars which creates the hiatus is associated with radial tension. As the distance between the cruras increases, radial tension rises. If the hiatal defect is large which couldn't be closed without tension, right crural relaxing incisions may prefer over the left side while the liver can potentially prevent future diaphragmatic herniation. Further, mesh reinforcement is another method for crural closure to reduce recurrence. In contrast to short term, a multi-center study showed that long-term recurrence rates were similar either with mesh reinforcement or only primary repair [9]. It should be kept in mind that mesh reinforcement has the potential of causing irritation, erosion and fistulation when contact with esophagus or stomach. Whether a standard indication for the use of prosthetic mesh or a recommended mesh type does not exist at this time. Polypropylene (PP) and Poly-Tetra-Fluoro-Ethylene (PTFE) meshes are usually preferred [10,11]. In the present case, a mesh application was not performed, because approximation of the diaphragmatic cruras were reasonable without a marked tension.

Today, laparoscopic repair is favored over open repair in terms of decreased perioperative morbidity, shortened length of hospitalization, and improve in quality of life. The majority of hiatal hernias are Type I (axial), and the success of laparoscopic repair in this group patients has been proven. Although rare (less $<10\%$ of all hiatal hernias), the rest of paraesophageal hernias (Type II-IV) are more common in elderly patients with concomitant co-morbidities. Laparoscopic repair of type II, III and IV paraesophageal hiatal hernias has a significantly higher risk of intraoperative organ injury and postoperative complication related reoperations. Therefore, laparoscopic repair of these patients (types II-IV) should be undertaken by experienced surgeons [12].

In conclusion, giant para-esophageal hernias in elderly is a rare but fatal condition with high complication rates. Timing and selection of the operative procedure is critical in reducing complications. Thus, handling on patient based status is mandatory.

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