## **Case Report**

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# Diaphragmatic hernia into the pericardium: case report

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#### **ABSTRACT**

Laparoscopic approach for diaphragmatic hernias has proven to be superior to open surgery, however debate between thoracoscopy versus transperineal laparoscopy continues. Author report the case of a 66 years old man with a rare congenital larrey hernia that protrudes into the pericardium. Abdominal laparoscopic surgery was performed with successful reduction of content and repair of defect, placing a composite mesh and drain. Follow-up was uneventful. The review of literature revealed this as a rare atraumatic peritoneal-pericardium hernia. Author demonstrate an abdominal laparoscopic approach as a safe and adequate technique in such case.

Keywords: Diaphragmatic hernia, Laparoscopic surgery, Pericardium, Thoracic hernia

### INTRODUCTION

Diaphragmatic hernias are well described, differentiating between the most common posterolateral (Bochdalek), and the rarer central, right anterior (Morgagni), and left anterior (Larrey) hernias. These are primarily associated to congenital malformations in newborn, and in adults as undiagnosed congenital malformations or traumatic hernias. These may be present with herniation of liver, spleen, stomach, small intestine, colon, and omentum. The second structure of the second structure of the second structure.

Laparoscopic approach has proven to have a superior advantage over open surgery due to minimally invasive techniques, providing a faster recovery and lower incidence of complications. However, debate between thoracoscopy versus transperineal laparoscopy continues. 1,3,5,7,8 Nakashima et al state the thoracic approach as a better technique in adults due to the severe adhesions formed by a chronic hernia. The allows for better dissection when using a double-lumen endotracheal tube for unilateral pulmonary collapse. Contrary to children or new born in whom transperineal may be a

better option. Other authors oppose the thoracic approach, stating the distinct advantages of abdominal laparoscopy, allowing for better management of the hernia sac and a broader choice of repair options, including suture repair or the use of prosthesis. 1,3,6

Author report the case of a patient with a rare larrey hernia that protrudes into the pericardium. The review of literature revealed this as a rare case report of an atraumatic thoracic hernia that penetrates and occupies the middle mediastinum.

#### **METHODS**

A 66 years old Mexican man presented himself with chronic constipation. He denied any relevant medical history.

Chest radiograph showed a broadened heart silhouette and a normal electrocardiogram (EKG). Diaphragmatic hernia was suspected. Barrium enema and thoracic/abdominal CT were performed, confirming the diagnosis.

Patient agreed and signed informed consent for surgical treatment. Abdominal laparoscopic surgery performed under general anesthesia and endotracheal intubation. Patient was positioned supine with legs apart (French position) and a 30° reverse Trendelenburg inclination after trocar placement. Three trocars were placed: an 11mm in the umbilical area for visualization, and two 5mm operative trocars for the surgeon, in the left and right hypocondriac regions respectively. Successful reduction of the hernia content (transverse colon and omentum) into the abdomen was obtained, using atraumatic graspers and a gentle "hand-over-hand" traction technique. The hernia opening was identified cephalic to the liver, left to the falciform ligament, into the thoracic cavity, approximately 10cm in diameter. Closer view with direct telescopic visualization (30° laparoscope) clearly revealed the heart and great vessels (Figure 1).

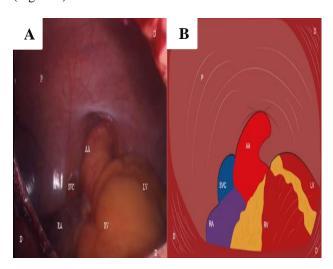


Figure 1. Peritoneal pericardium hernia. A) Image from a transabdominal, 30° laparoscope view of the hernia defect with visualization of the middle mediastinum content. B) Digital drawing representative of findings in image A. RA: Right atrium; SVC: Superior vena cava; AA: Ascending aorta; RV: Right ventricle; LV: Left ventricle; P: Pericardium; D: Diaphragm.

The atria, ventricles, epicardial fat as well as coronary sulci were detailed with rhythmic movement. Fibrous pericardium was not evident on the heart but identified as a distended hernia sac; the pleural cavities were undisturbed. The hernia was confirmed as a protrusion into the mediastinum, more specifically the pericardial cavity. Once the content was completely reduced, absence of any active bleeding was confirmed. A sac membrane was not identified nor was there an attempt to separate this from intra-thoracic structures. A 15 x 15 cm round one sided siliconized composite mesh was introduced, overlaid on the hernia defect, and fixed with tacks to the inferior side of the diaphragm. A Blake drain was placed in the area adjacent, and the procedure was concluded (Figure 2).

The patient had an uneventful recovery, tolerating oral liquids the next day and progressed to a soft diet. Discharge was indicated after the second post-operative day. Drain was removed one week later. Follow-up during the next 6 months was without relapse or symptoms of importance. He was introduced back to his daily routine and activities. Follow-up imaging studies showed no sign of complications. Patient continues with routine scheduled appointments.

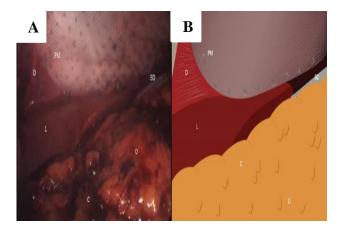


Figure 2. Hernia repair. A) Image from a transabdominal, 30° laparoscope view of the hernia defect repaired with a composite prosthetic mesh and drain placement. B) Digital drawing representative of findings in image A. D: Diaphragm; FL: Falciform ligament; L: Liver (left lobe); O: Omentum; BD: Blake drain; PM: Prosthetic Mesh; C: Colon (transverse colon).

#### **DISCUSSION**

Thoracic hernias are a rare diaphragmatic abnormality, present in 1.7 to 5.7 per 10,000 births.<sup>6</sup> Although half of the adults with this pathology are asymptomatic, it is recommended that anterior hernias be corrected due to the risk of incarceration and strangulation.<sup>6</sup> In large hernia defects, the use of a synthetic mesh is recommended; however, these may cause adhesions, granulation, deformity, and other complications after surgery.<sup>1-3,6</sup> Prosthetic material selection is important.

The treating surgeons evaluated the case patient, and due to the characteristics of the patient, pathology, and personal experience and training, decided for elective repair through an abdominal laparoscopic approach. Although evidence comparing transthoracic vs. transabdominal techniques demonstrate both are equally safe and effective, most authors agree the approach is safer, easier, and complication managed better through a transabdominal laporoscopy. 1,3,6,7

The trans-surgical findings of the case patient were of a peritoneal-pericardium hernia. Reports of congenital or atraumatic findings in adults are rare, and most reported before the use of laparoscopy. In the current case, a

thoracoscopy would have resulted in an unnecessary procedure due to its location. Thoracic hernias usually include a communication between the peritoneal and pleural cavity; however, the hernia sack in this case would have not been identified due to its intrapericardium location, requiring a dissection of such.<sup>6</sup> An attempt to reduce it would have placed the vital heart structures at risk.<sup>1</sup> The thoracoscopy would have needed a conversion to an abdominal laparoscopy, increasing surgical time, general risk, morbidity, mortality, and need for a chest tube.

The abdominal laparoscopic approach proved to be a safe and adequate technique to reduce the content. Mesh fixation and drain placement were effective for correction of the hernia defect.

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