

Diaphragmatic Hernia after Thoracoabdominal Trauma - Laparoscopic Surgical Repair with Mesh

José Pedro V Sousa^{1,2*}, Vítor Lopes^{1,2}, Ana Luísa Martins³, Elisabete Barbosa^{1,2}, José Barbosa^{1,2}

***Corresponding author:**

José Pedro V Sousa, MD
General Surgery Department
Centro Hospitalar Universitário São João
Alameda Prof. Hernâni Monteiro
4200-319 Porto, Portugal
Email: viera.sousa10@gmail.com
<https://orcid.org/0000-0003-4202-3000>

¹General Surgery Department, Centro Hospitalar Universitário São João (CHUSJ), Porto, Portugal

²Faculdade de Medicina da Universidade do Porto (FMUP), Portugal

³Instituto Português de Oncologia de Coimbra Francisco Gentil, E.P.E. (IPOCFG, E.P.E.)

ABSTRACT

Traumatic diaphragmatic hernia (TDH) is an uncommon disease, with an incidence of about 0.5% and is usually associated with penetrating or blunt thoracoabdominal trauma (1). It is often associated with other thoracoabdominal, brain and musculoskeletal injuries, being a diagnostic and therapeutic challenge (2). These injuries worsen the prognosis, with a mortality of up to 31% (2, 3). Chest X-rays with bowel contrast studies and CT scans of the chest and the abdomen are a useful diagnostic tool for detecting TDH, being the latter more specific (4). The treatment involves repair of the diaphragmatic defect with or without a mesh, using a transthoracic and/or transabdominal approach (1). The recurrence of diaphragmatic hernia can occur due to primary hernia repair without tension-free suture, incorrect attachment of the mesh without the necessary overlap or failure in the host-prosthesis interface (5). Hanna WC et al. demonstrated that recurrence may also be related to the use of absorbable suture to close the defect (4). The aim of this video is to illustrate the key steps for the surgical technique of a recurrent diaphragmatic hernia repair with mesh through laparoscopic approach. We present a 20-year-old male with a history of hereditary hyperferritinemia and hypertension. In 2019, due to a car accident, he suffered multiple traumas including rib fractures, descending aortic dissection, hemothorax, hemoperitoneum, and diaphragmatic laceration with the migration of the stomach to an intrathoracic position. The patient underwent thoracotomy, replacing the descending aorta isthmus with a graft, suture of the diaphragm defect, and chest drainage. Later, due to complications, he was hospitalized with a post-pericardiotomy syndrome – Dressler's syndrome - with pericardial and pleural effusion. He had a recurrence of the diaphragmatic hernia in 2021, initially small and asymptomatic, later increasing in size and becoming symptomatic. The thoracoabdominal CT scan and the upper gastrointestinal series confirmed the diagnosis and revealed a diaphragmatic hernia containing the fundus and body of the stomach, transverse colon, and greater omentum. In 2022, he underwent laparoscopic repair of the diaphragmatic hernia without complications. The intervention had the following steps: 1) Establishment of pneumoperitoneum using a Veress needle placed in the Palmer point with target pressure at 14 mmHg; 2) Introduction of 4 trocars, 2 of 10 mm and 2 of 5 mm; 3) Identification of the diaphragmatic hernia; 4) Reduction of the hernia sac and its contents into the abdomen; 5) Creation space beyond the edge of the diaphragmatic defect to support the mesh; 6) Application of a polypropylene/PTFE mesh and attachment with 00 slowly absorbable monofilament suture stitches; 7) review of the hemostasis and 8) closure of the trocar sites. Postoperatively, a simple chest X-ray was performed, which showed good lung expansion and no evidence of the hernia. The patient evolved uneventfully and was discharged 36 hours

Received: 17.10.2022

Accepted: 29.11.2022

after the procedure. The laparoscopy is surgically safe and effective for correction of recurrent diaphragmatic hernias, offering the patient the advantages of a minimally invasive approach. This allows adequate tissue exposure, reduced blood loss, an uneventful postoperative period and rapid recovery after surgery.

Keywords: trauma, diaphragmatic hernia, recurrence, mesh, laparoscopy

Conflicts of interest

The authors declare no conflicts of interests.

Ethics approval

For this case ethical approval was obtained.

REFERENCES

1. McDonald AA, Robinson BRH, Alarcon L, Bosarge PL, Dorion H, Haut ER, et al. Evaluation and management of traumatic diaphragmatic injuries: A Practice Management Guideline from the Eastern Association for the Surgery of Trauma. *J Trauma Acute Care Surg.* 2018;85(1):198-207.
2. Gu P, Lu Y, Li X, Lin X. Acute and chronic traumatic diaphragmatic hernia: 10 years' experience. *PLoS One.* 2019;14(12):e0226364.
3. Lu J, Wang B, Che X, Li X, Qiu G, He S, et al. Delayed traumatic diaphragmatic hernia: A case-series report and literature review. *Medicine (Baltimore).* 2016;95(32):e4362.
4. Bosanquet D, Farboud A, Luckraz H. A review diaphragmatic injury. *Respir Med CME.* 2009;2(1):1-6.
5. Sathyanarayana N, Rao RM, Rai SB. An adult recurrent diaphragmatic hernia with a near complete defect: a rare scenario. *J Clin Diagn Res.* 2012;6(9):1574-6.