



Laparoscopic double mesh repair of a large Morgagni hernia: a video vignette

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Morgagni hernia (MH) is a rare congenital diaphragmatic hernia (CDH) that accounts for less than 2% of surgically repaired CDH in adulthood. Even if this condition is often asymptomatic, surgery is advised due to the risk of life-threatening complications such as volvulus or bowel strangulation. Surgery for MH repair can be performed by transthoracic, transabdominal, laparoscopic, or thoracoscopic approaches. Though laparoscopy has recently improved surgical outcomes, the use of prosthetic meshes and the need for reduction of the hernia sac are still the most debated issues. We present the video of a laparoscopic repair of a large MH with the use of a double mesh technique and no resection of the hernia sac.

Keywords: Congenital diaphragmatic hernia, Mesh repair, Laparoscopic repair

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INTRODUCTION

Morgagni hernia (MH) is a rare anterior defect of the diaphragm which is associated with a congenital incomplete fusion of the transverse septum with its costal insertion in the embryo. This congenital diaphragmatic hernia (CDH) is also known as parasternal hernia to distinguish it from the posterolateral CDH or Bochdalek hernia. In adults, MH represents less than 2% of surgically repaired diaphragmatic defects. Most common complaints are non-specific abdominal or chest pain, dyspnea, and obstructive symptoms, though it is asymptomatic in almost

30% of cases [1].

Traditionally, the indication for surgery is either the presence of invalidating symptoms or the high risk of life-threatening complications such as bowel obstruction, volvulus, or strangulation. The current consensus is to consider surgical repair even in asymptomatic cases. Several surgical techniques have been described [2–4], but no gold standard has been identified yet. The most debated issues regard the route of access (abdominal vs. thoracic), the resection of hernia sac, and the defect closure by primary suture or mesh repair. In recent years, minimally invasive surgery has been increasingly employed, both for pri-

mary and mesh repair, improving postoperative outcomes and reducing hospital stay [2,5].

CASE

We present the case of a 58-year-old male with a 6-month history of heartburn and epigastric pain which did not improve after empirical therapy with proton pump inhibitors. Endoscopic examination diagnosed chronic gastritis with biopsies negative for *Helicobacter pylori*. A computed tomography (CT) of the chest and abdomen showed an 8-cm anteromedial diaphragmatic defect with massive omental and small bowel herniation. Laparoscopic repair was planned. The camera port was placed at the umbilicus and two working ports were placed laterally at the mid-clavicular line, one at the right and one at the left. Intraoperative view confirmed the presence of MH with an 8 cm × 6 cm defect with herniation of omentum and multiple bowel loops. After the reduction of the hernia content, a polypropylene mesh (Prolene; Ethicon) was sling fashioned (1 cm × 10 cm) and anchored to the lower border of the defect through transparietal interrupted sutures of non-absorbable monofilament (Prolene 0.0). For a safer tying of the sutures a 5-cm transverse epigastric incision of cutaneous and subcutaneous tissue with fascial exposure was performed. Finally, a 25 cm × 15 cm macroporous, composite three-layer mesh (PROCEED) trimmed to a 15 cm × 12 cm size was used to cover the defect with adequate overlaps. The mesh was then fixed with a nonabsorbable tackler covered with a smooth polyetheretherketone cap (CapSure; Bard Davol Inc.) with double crown on the abdominal wall and on the anterior part of the diaphragm and with fibrin glue (Tissucol; Baxter Healthcare) on the central tendon (Supplementary Video 1).

The postoperative course was characterized by elevated Numeric Rating Scale pain scores and a restrictive pattern of lung dysventilation until postoperative day 2. The symptoms were treated with opioid analgesics and respiratory physical therapy. The patient was discharged on postoperative day 6. A 1-month CT scan proved the adequate hernia repair and the presence of a seroma that did not cause any symptoms. The CT scan was hence repeated at 1 year and showed the resolution of the seroma and confirmed the optimal hernia repair.

DISCUSSION

MH is a rare indication for surgical repair in adulthood. It is often asymptomatic and incidentally diagnosed at chest X-ray

or thoracoabdominal CT performed for other reasons. Clinical presentation varies from chest or abdominal pain to respiratory or obstructive symptoms with vomiting and bowel obstruction. Traditionally, MH has been treated surgically in case of invalidating symptoms or in the presence of risk of complications due to massive thoracic herniation of stomach and small bowel [6]. The introduction of minimally invasive surgery with its low impact on the postoperative course allowed for a more extensive treatment of MH. The current consensus is to treat MH by surgical repair even in asymptomatic cases. Several surgical techniques have been described but no gold standard has been identified yet [3,7]. In particular, both open and minimally invasive surgery can be performed both with abdominal and thoracic approach, though the good results of laparoscopy in terms of postoperative outcomes and recurrence seem to favor the abdominal route [2,5,6]. On the other hand, several issues are still debated: in particular, the need for the resection of hernia sac and the use of a mesh for hernia repair. When large defects are treated, as in our case, sac resection could be unsafe due to the close relationships with the mediastinal structures. Nevertheless, when feasible and safe, hernia sac reduction should be considered in order to reduce the risk of postoperative seroma. In the present case, an asymptomatic seroma was demonstrated at a 1-month CT scan, but it was no more evident after 1 year. In this paper, we adopted the use of a double mesh technique for a large diaphragmatic defect. Mesh repair for MH should be considered a stronghold for surgical interventions. Laparoscopic approach for anterior congenital diaphragmatic defect repair is feasible and safe since allows an optimal view for the reduction of herniated content and for mesh positioning. When treating a large MH, a double mesh technique should be considered to increase safety of the procedure. In fact, the use of a double mesh allows for an even distribution of tension between the diaphragmatic dash and the abdominal wall, permitting a tension-free closure, and avoiding tissue disruption from the stitches. The use of a composite mesh allows its intra-peritoneal placement. Moreover, the tailored shaping of the mesh allowed to effectively cover the defect with an adequate overlap. In our case, the postoperative course was characterized by high NRS pain scores and lung dysventilation that slowed down the discharge from hospital. This points out the importance of an adequate postoperative analgesic regimen and respiratory therapy that are mandatory to reduce pain and dysventilation after large defects closure.

NOTES

Ethical statements

Ethics approval was not required for case reports deemed not to constitute research at our institution. The authors declare that the patient has given written consent for data and image collection and publication of them.

Authors' contributions

Conceptualization: MR, GT, CP

Data curation: MR, CC, AV, CP

Writing—original draft: MR, GT, CC

Writing—review & editing: AV, CP

All authors read and approved the final manuscript.

Conflict of interest

All authors have no conflicts of interest to declare.

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Supplementary materials

Supplementary Video 1 can be found via <https://doi.org/10.7602/jmis.2023.26.2.93>.

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