American Journal of Case Reports

e-ISSN 1941-5923
© Am J Case Rep, 2026; 27: e953754
DOI: 10.12659/AJCR.953754

Received: 2026.04.13
Accepted: 2026.09.25
Available online: 2026.10.28
Published: 2026.XX.XX

Laparoscopic Repair of a Large Asymptomatic Morgagni Hernia With Preservation of the Hernia Sac in a Young Adult With Obesity: A Case Report

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

BEF Wenxiao Jing
ACD Minggang Wang
ACD Yuchen Liu

Division of Hernia and Abdominal Wall Surgery, Department of General Surgery, Beijing Chao-Yang Hospital, Capital Medical University, Beijing, PR China

Corresponding Author: Yuchen Liu, Division of Hernia and Abdominal Wall Surgery, Department of General Surgery, Beijing Chao-Yang Hospital, Capital Medical University, Beijing, China
Phone: +86-10-51718435 (o), e-mail: lionkingchen@foxmail.com

Financial support: None declared
Conflict of interest: None declared

APPROVED GALLEY PROOF

Patient: Male, 18-year-old
Final Diagnosis: Large Morgagni hernia
Symptoms: Asymptomatic
Clinical Procedure: —
Specialty: Surgery

Objective: Rare disease

Background: Morgagni hernias are a rare subtype of congenital diaphragmatic hernia, representing only 2% to 4% of all cases. In adults, they are most commonly diagnosed in middle or later life and show a female predominance. Adult patients may remain asymptomatic and receive an incidental diagnosis; however, surgical repair is generally considered due to the potential risks of incarceration, obstruction, and strangulation. Laparoscopic surgery has emerged as a minimally invasive treatment option. Cases involving this combination of features, including an asymptomatic young adult man with obesity and a large defect, have rarely been reported.

Case Report: We report the case of an 18-year-old asymptomatic man with class II obesity (body mass index, 36.7 kg/m^2) who was incidentally diagnosed with a large Morgagni hernia during a routine health examination. Chest and abdominal computed tomography (CT) revealed a diaphragmatic defect measuring up to 6.9 cm in diameter; a large hernia sac protruded into the thoracic cavity. To prevent future complications, laparoscopic repair with composite mesh reinforcement and preservation of the hernia sac was successfully performed. The postoperative course was uneventful. On postoperative day 4, chest CT showed a small localized fluid collection in the region of the residual hernia sac. Because the patient remained asymptomatic, conservative observation was implemented. No recurrence was detected during 1 year of follow-up.

Conclusions: This case suggests that a large asymptomatic Morgagni hernia in a patient with class II obesity can be safely treated by laparoscopic repair with primary defect closure, composite mesh reinforcement, and preservation of the hernia sac.

Keywords: Case Reports • Hernia, Diaphragmatic • Laparoscopy • Obesity

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/953754

1823 — 4 20

Publisher's note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

APPROVED GALLEY PROOF

Introduction

Congenital diaphragmatic hernias are primarily classified according to the anatomical location of the diaphragmatic defect. Bochdalek hernias are most common; they arise from posterolateral defects, predominantly on the left side. Morgagni hernias are less common and arise from anteromedial defects, predominantly on the right side. Central hernias arise from central diaphragmatic defects, whereas bilateral diaphragmatic defects are rare and associated with a poor prognosis [1]. Morgagni hernias represent approximately 2% to 4% of all congenital diaphragmatic hernias. Adult cases are commonly diagnosed in middle or later life and show a female predominance, making presentation in young adults relatively uncommon [2]. The most common hernia contents are the omentum and colon [3]. Adult Morgagni hernias may be discovered incidentally on imaging or present with nonspecific respiratory or gastrointestinal symptoms. Given the potential risks of incarceration, obstruction, and strangulation, surgical repair is generally considered. In clinically stable patients undergoing elective treatment, a transabdominal laparoscopic approach is considered a typical minimally invasive option [4,5]. Obesity is not a direct cause of the congenital diaphragmatic defect underlying a Morgagni hernia; however, obesity-related increases in intra-abdominal pressure may facilitate the progressive herniation of abdominal viscera through a preexisting defect [6,7]. Here, we present a case that is notable in several ways: young patient age, male sex, asymptomatic presentation, class II obesity, and large defect size. Given the large defect and the presence of herniated bowel within the thoracic cavity, elective laparoscopic repair was undertaken to reduce potential future risks of incarceration, obstruction, and strangulation. This case suggests the feasibility of sac preservation with mesh repair for a large defect.

Case Report

An 18-year-old man presented with an incidental mediastinal mass that had been detected on chest radiography during a routine health examination. He was asymptomatic and had no history of surgery or trauma. His height was 173 cm, weight was 110 kg, and body mass index was 36.7 kg/m^2. On admission, his vital signs were stable. Laboratory tests showed elevated levels of total cholesterol, low-density lipoprotein cholesterol, aspartate aminotransferase, alanine aminotransferase, γ-glutamyl transferase, and serum uric acid. Complete blood count, renal function, serum electrolyte, and coagulation profile findings were unremarkable. Pulmonary function testing showed generally preserved ventilatory function and diffusing capacity, along with mildly reduced lung volumes and increased airway resistance. Transthoracic echocardiography revealed a small pericardial effusion. The patient had no previously diagnosed comorbidities and displayed American Society of Anesthesiologists physical status II. Chest and abdominal computed tomography (CT) scans revealed a right anteromedial retrosternal diaphragmatic defect measuring up to 6.9 cm in maximal diameter; a 12 × 19 cm hernia sac containing the transverse colon, omentum, and adipose tissue protruded into the thoracic cavity. The right lung was compressed, and the heart was displaced posterolaterally to the left (**Figure 1**). Given the large defect and hernia sac, along with herniation of the colon into the thoracic cavity, elective surgical repair was recommended due to potential future risks of incarceration, obstruction, and strangulation. Multidisciplinary evaluation identified no contraindications to surgery.

Under general anesthesia, the patient was placed in the reverse Trendelenburg position, and a 10-mm trocar was inserted above the umbilicus to establish pneumoperitoneum (14 mm Hg). Laparoscopic exploration revealed a right anteromedial

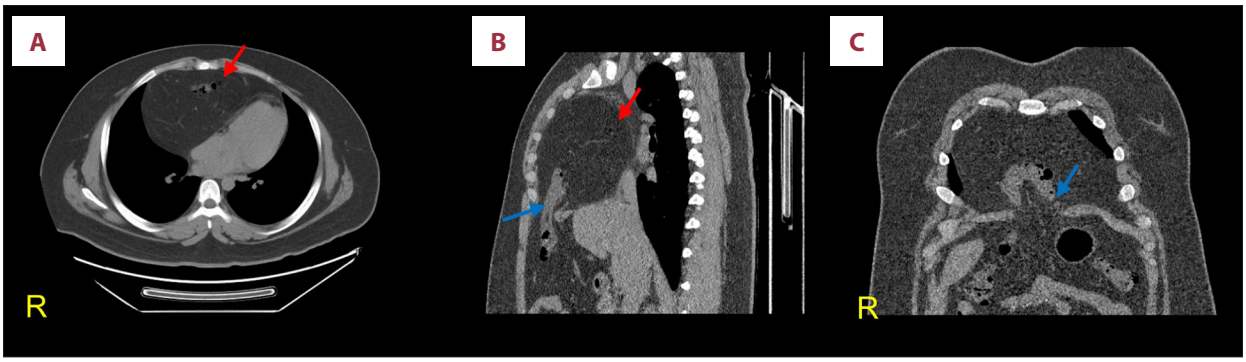


Figure 1. Preoperative computed tomography (CT) images showing a diaphragmatic hernia. (**A**) Axial CT image showing herniation of abdominal contents into the right thoracic cavity, which caused compression of the right lung and leftward displacement of the heart. (**B**) Sagittal CT image showing a right anteromedial retrosternal diaphragmatic defect that measured up to 6.9 cm, with herniated bowel and omentum. (**C**) Coronal CT image showing a large hernia sac (12 × 19 cm) that compressed the right lung and caused leftward mediastinal shift. Red arrows indicate herniated abdominal contents within the thoracic cavity, whereas blue arrows indicate the diaphragmatic defect.

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

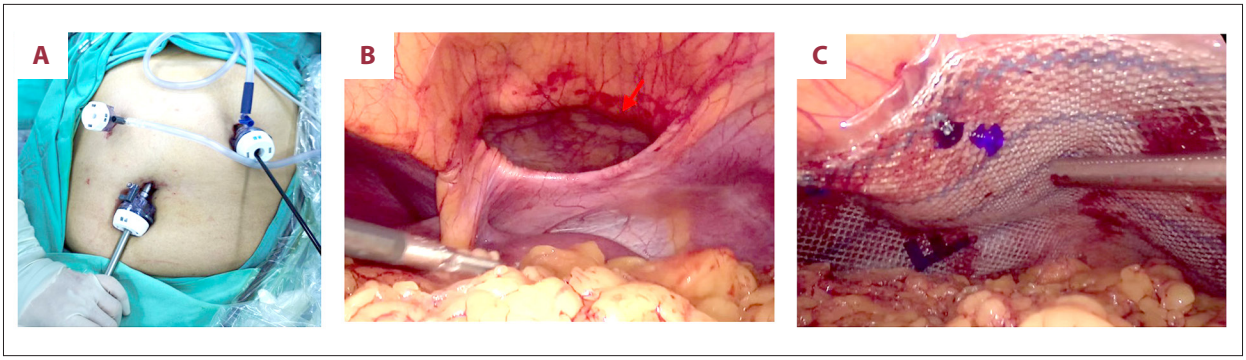


Figure 2. Laparoscopic repair of a Morgagni hernia. (**A**) Patient positioning and trocar placement using a standard 3-port laparoscopic setup. (**B**) Intraoperative view showing a large diaphragmatic defect (red arrow). (**C**) Repair of the defect using a composite mesh.

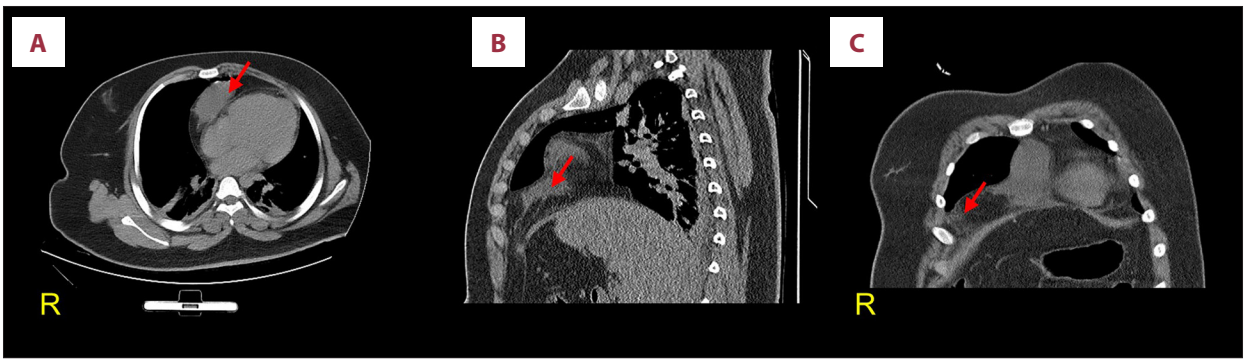


Figure 3. Computed tomography (CT) scan on postoperative day 4 showing a small localized fluid collection in the region of the residual hernia sac. (**A**) Axial CT image showing fluid collection in the right anterior paracardiac (retrosternal) region, anterior to the heart. (**B**) Sagittal CT image showing retrosternal fluid collection immediately above the anterior diaphragm. (**C**) Coronal CT image showing fluid collection in the right cardiophrenic region. Red arrows indicate localized fluid collection.

retrosternal diaphragmatic defect consistent with a right-sided Morgagni hernia. Hernia contents included the transverse colon and omentum. No evidence of diaphragmatic trauma or iatrogenic injury was identified intraoperatively, and the findings were not suggestive of an acquired diaphragmatic hernia. Additional 5-mm and 10-mm trocars were placed along the bilateral costal margins (**Figure 2A**); the hernia contents were reduced while preserving the sac. Intraoperatively, the defect measured approximately 8 × 4 cm (**Figure 2B**). The discrepancy between the intraoperative measurement and the preoperative CT measurement was attributed to pneumoperitoneum combined with reverse Trendelenburg positioning, which allowed full exposure of the true anatomical margins of the defect and overcame the limitations of static CT measurements related to obscuration by surrounding tissues. The defect was initially approximated with a continuous absorbable suture to gradually bring the diaphragmatic edges together and distribute closure tension evenly. Interrupted nonabsorbable sutures were then added to provide durable reinforcement. A 15 × 20 cm EasyPro® composite mesh (model PLRM3) was placed over the closed defect, with the antiadhesion surface facing the abdominal viscera. The mesh overlapped the defect margins by at least 5 cm. The mesh was secured to the diaphragm with interrupted nonabsorbable sutures; a limited number of absorbable tacks were used for supplementary mesh fixation to the anterior abdominal wall below the costal margin to maintain a flat configuration and prevent displacement (**Figure 2C**). The procedure lasted 45 minutes.

The patient was able to ambulate and resume oral intake on postoperative day 1; no dyspnea or gastrointestinal symptoms were evident. Given the large diaphragmatic defect, extensive intrathoracic herniation, and preservation of the hernia sac, chest CT was performed on postoperative day 4 to comprehensively assess the integrity of the repair. The repair remained intact, without recurrent herniation of abdominal viscera. Only a small localized fluid collection was observed in the region of the residual hernia sac (**Figure 3**). Because the patient remained asymptomatic, no invasive intervention was required, and conservative observation was implemented. His respiratory status, gastrointestinal function, and pain were monitored; he was discharged in good condition on postoperative day 6. After surgery, the patient received counseling regarding long-term weight management to minimize intra-abdominal

APPROVED GALLEY PROOF

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

APPROVED GALLEY PROOF

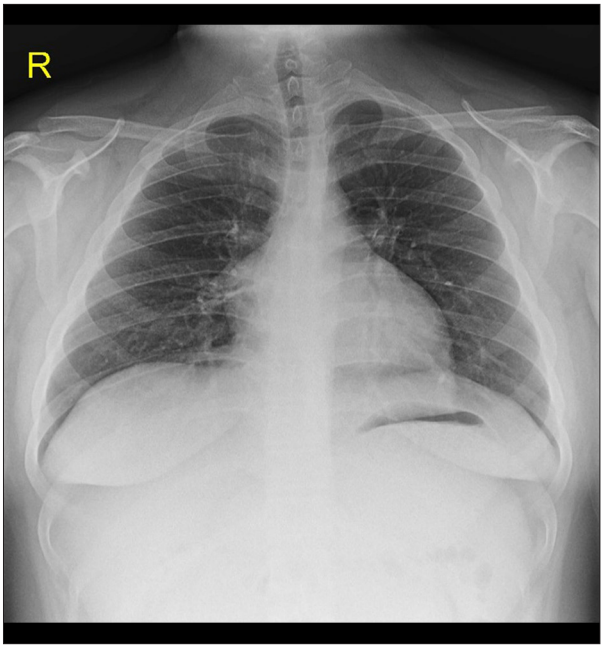


Figure 4. Chest radiograph at 6 months postoperatively showing satisfactory postoperative recovery without evidence of recurrent herniation.

pressure and reduce the risk of recurrence. At 6 months, chest radiography showed no recurrence and no residual fluid collection (**Figure 4**). Clinical follow-up at 1 year revealed no evidence of recurrence.

Discussion

Morgagni hernias, first described by Giovanni Morgagni in 1769 [8], result from embryologic failure of fusion between the diaphragm and costal arch, creating a retrosternal defect. Almost any abdominal organ can herniate through the defect; the omentum and colon are most common [3], whereas the stomach, small intestine, and liver are less common [4]. These hernias are right-sided in approximately 90% of cases. Around half of adult cases are asymptomatic. Children typically present with respiratory symptoms, whereas adults may present with dyspnea, retrosternal pain, bloating, or gastrointestinal symptoms [3]. Strangulation or torsion requires emergency surgery.

In adults, factors that increase intra-abdominal pressure, such as obesity, pregnancy, chronic cough, constipation, or trauma, may precipitate herniation. Importantly, these factors do not create the Morgagni hernia defect itself, which is congenital in origin; they act as acquired triggers that promote the protrusion of abdominal contents through the preexisting retrosternal defect [2]. Therefore, weight management and metabolic control may help reduce the risk of postoperative recurrence. Central obesity also reduces the elasticity of the abdominal wall and diaphragm, further increasing intra-abdominal pressure [9]. No significant differences in clinical presentation have been identified between male and female patients [4]. Imaging plays a key role in diagnosis [10]. Chest radiographs reveal herniated bowel in approximately 71% of cases, often as cardiophrenic angle opacities. CT is more accurate, particularly in patients with herniation of fatty omental tissue.

Early surgical repair is generally considered because of the risk of incarceration [2]. There is currently no standardized surgical approach for adult Morgagni hernias, and the choice of procedure should be individualized according to clinical context. The transabdominal approach facilitates reduction of the herniated contents under direct visualization; enables assessment of the viability of abdominal organs such as the colon, small intestine, and stomach; allows inspection of the contralateral hemidiaphragm for additional defects; and permits the identification and simultaneous treatment of other intra-abdominal conditions [11,12]. Relative to open surgery, the laparoscopic approach has been associated with fewer postoperative complications and shorter hospital stays [4,13]; no significant difference in recurrence rates has been noted [4,14]. Open abdominal surgery may be more appropriate in patients with hemodynamic instability, bowel ischemia, necrosis, or perforation; a need for intestinal resection; severe intra-abdominal adhesions; or an inability to tolerate pneumoperitoneum, as well as when laparoscopic reduction and repair cannot be completed safely [12,14]. The transthoracic approach provides direct exposure of the hernia sac and its relationship to the lung, pleura, pericardium, and other mediastinal structures. It may therefore be considered in patients with dense intrathoracic adhesions, complex involvement of mediastinal structures, or concomitant thoracic disease [11,12,15]. However, conventional thoracotomy is more invasive and may be associated with greater postoperative pain and a longer recovery period; thus, it generally is not preferred for elective repair. Evidence regarding thoracoscopic repair remains limited.

Regarding management of the hernia sac, some surgeons advocate complete excision to prevent recurrence and seroma formation, whereas others caution that complete removal carries a risk of pneumothorax or mediastinal injury [5,16]. Preservation of the hernia sac has been associated with postoperative seroma formation; however, most reported cases have been successfully managed in a conservative manner [17]. In the present case, the hernia sac was preserved. Because the sac was large, excision would have required dissection toward the mediastinum, increasing the risk of pleural or pericardial injury. In contrast, preservation of the sac simplified reduction of the herniated contents, and did not compromise repair stability when combined with mesh reinforcement. Small defects may be closed primarily, whereas mesh reinforcement is considered when primary closure is not feasible or remains under

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

tension [5,17]. No mesh material has demonstrated clear superiority. Biologic or biosynthetic meshes may be considered in contaminated fields or complex tissue defects, although supporting evidence remains limited [18]. To reduce adhesions between the mesh and abdominal viscera, the mesh may be covered with peritoneum or omentum when feasible; alternatively, a composite mesh with an antiadhesive barrier may be used [17]. Adequate overlap beyond the defect margins should be ensured. Various mesh fixation methods, including sutures, tacks, and adhesives, have been reported. Penetrating fixation devices should be used with caution on the diaphragm, given the potential risk of injury to adjacent thoracic structures. Tacks should be avoided near the pericardium and heart, and penetrating fixation above the costal margin is generally discouraged [18-20]. In the present case, the diaphragmatic defect was primarily closed with continuous absorbable and interrupted nonabsorbable sutures; only a limited number of absorbable tacks were used for supplementary mesh fixation to the anterior abdominal wall below the costal margin. Although no tack-related complications occurred, this single case should not be interpreted as support for the routine use of tacks in diaphragmatic mesh fixation. Surgical plans should be individualized.

Conclusions

This case illustrates the feasibility of managing large asymptomatic Morgagni hernias in patients with class II obesity through laparoscopic repair with primary defect closure, composite mesh reinforcement, and preservation of the hernia sac.

Department and Institution Where Work Was Done

Division of Hernia and Abdominal Wall Surgery, Department of General Surgery, Beijing Chao-Yang Hospital, Capital Medical University, Beijing, PR China.

Patient Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Declaration of Figures' Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

References:

1. Dumpa V, Chandrasekharan P. Congenital diaphragmatic hernia. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025
2. Katsaros I, Katelani S, Giannopoulos S, et al. Management of Morgagni's hernia in the adult population: A systematic review of the literature. World J Surg. 2021;45(10):3065-72
3. Okur MH, Aydogdu B, Azizoglu M, Arslan S, Basuguy E. A novel scarless laparoscopic method for Morgagni hernia repair. Niger J Clin Pract. 2022;25(9):1517-22
4. Young MC, Saddoughi SA, Aho JM, et al. Comparison of laparoscopic versus open surgical management of Morgagni hernia. Ann Thorac Surg. 2019;107(1):257-61
5. Leeflang E, Madden J, Ibele A, Glasgow R, Morrow E. Laparoscopic management of symptomatic congenital diaphragmatic hernia of Morgagni in the adult. Surg Endosc. 2022;36(1):216-21
6. Rajkumar K, Kulkarni S, Talishinskiy T. Morgagni hernia: An uncommon pathology in adults. J Surg Case Rep. 2022;2022(12):rjac597
7. Zelicha H, Bell DS, Chen D, Chen Y, Livingston EH. Obesity and abdominal hernia in ambulatory patients, 2018-2023. Hernia. 2024;28(4):1317-24
8. Morgagni GB. The seats and causes of diseases investigated by anatomy: De sedibus et causis morborum per anatomen indagatis. London: A. Millar and T. Cadell; 1769
9. Malbrain MLNG, Roberts DJ, De laet I, et al. The role of abdominal compliance, the neglected parameter in critically ill patients – A consensus review of 16. Part 1: Definitions and pathophysiology. Anaesthesiol Intensive Ther. 2014;46(5):392-405
10. Svetanoff WJ, Sharma S, Rentea RM. Morgagni hernia. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025
11. Horton JD, Hofmann LJ, Hetz SP. Presentation and management of Morgagni hernias in adults: a review of 298 cases. Surg Endosc. 2008;22(6):1413-20
12. Sanford Z, Weltz AS, Brown J, et al. Morgagni hernia repair: A review. Surg Innov. 2018;25(4):389-99
13. Santana Valenciano Á, Priego Jiménez P, Vaello Jodra V, et al. Morgagni hernia repair in adults: A single-center experience in Spanish population. J Laparoendosc Adv Surg Tech A. 2022;32(11):1161-63
14. Oppelt PU, Askevold I, Bender F, et al. Morgagni-Larrey diaphragmatic hernia repair in adult patients: A retrospective single-center experience. Hernia. 2021;25(2):479-89
15. Predescu D, Achim F, Socea B, et al. Rare diaphragmatic hernias in adults-experience of a tertiary center in esophageal surgery and narrative review of the literature. Diagnostics (Basel). 2023;14(1):85
16. Târcoveanu E, Georgescu Ş, Vasilescu A, et al. Laparoscopic management in Morgagni hernia – Short series and review of literature. Chirurgia (Bucur). 2018;113(4):551-57
17. Schembari E, Reitano E, Sofia M, et al. The surgical treatment of Morgagni hernias in adults: a systematic review for the standardization of laparoscopic surgical repair. Updates Surg. 2024;76(3):839-44
18. Giuffrida M, Perrone G, Abu-Zidan F, et al. Management of complicated diaphragmatic hernia in the acute setting: A WSES position paper. World J Emerg Surg. 2023;18(1):43
19. Köckerling F, Schug-Pass C, Bittner R. A word of caution: Never use tacks for mesh fixation to the diaphragm! Surg Endosc. 2018;32(7):3295-302
20. Bittner R, Bain K, Bansal VK, et al. Update of guidelines for laparoscopic treatment of ventral and incisional abdominal wall hernias (International Endohernia Society (IEHS))-part A. Surg Endosc. 2019;33(10):3069-139

APPROVED GALLEY PROOF

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]