

# Urgent laparoscopic repair of coexisting incarcerated giant Morgagni and hiatal hernias in an elderly patient: a case-based technical note from a high-volume surgical center

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## KEY WORDS

diaphragmatic hernia,  
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## ABSTRACT

The co-occurrence of a giant Morgagni hernia (MH) and a large hiatal hernia (HH) is exceedingly rare. We describe key operative steps of simultaneous surgical treatment of a large MH and HH, including surgical qualification, operating room setting, instrumentation, port placement, reduction of herniated viscera, methods of defect closure, and postoperative care. We present an unusual case of a 77-year-old woman with chronic constipation, abdominal pain, and loss of appetite, who was referred to a tertiary gastrointestinal surgery center after initial evaluation due to acute symptoms of gastrointestinal obstruction. Computed tomography showed a giant MH containing an incarcerated transverse colon and greater omentum, causing a considerable mediastinal shift toward the left. The examination also demonstrated a giant type III HH with most of the stomach displaced into the posterior mediastinum. The patient subsequently underwent a successful urgent minimally-invasive surgical repair. This technical note outlines the diagnostic challenges and details the laparoscopic approach used for the simultaneous repair of both complex diaphragmatic defects. This case highlights that even large, combined diaphragmatic hernias can be safely and effectively managed using advanced laparoscopic techniques, also in elderly patients.

**INTRODUCTION** Morgagni hernia (MH), an anterior diaphragmatic hernia occurring through the sternocostal triangle, is a relatively rare congenital anomaly accounting for only 3%–5% of all surgically corrected diaphragmatic hernias.<sup>1</sup> The first report of this condition dates back to 1958, and only a few such cases have been described in the English-language literature since then.<sup>2</sup> Although MH is often asymptomatic, large defects may contain abdominal viscera, resulting in compressive or obstructive symptoms.<sup>3,4</sup> Hiatal hernias (HHs) are relatively more common, but cases involving substantial herniation of the stomach into the mediastinum remain particularly challenging to manage.<sup>5</sup>

The coexistence of a symptomatic, large MH and a sizable HH is extremely rare, with only a few cases reported in the literature.<sup>6</sup> This combination presents a unique challenge for both diagnosis and treatment, particularly in terms of surgical

planning. While minimally-invasive approaches offer meaningful advantages, they require precise technical execution to ensure adequate management of both defects in a single procedure.

**AIM** The aim of this technical note was to present the diagnostic findings and detail the minimally-invasive surgical technique used for the simultaneous repair of a giant MH and a large HH in a 77-year-old woman.

**MATERIAL AND METHODS** **Materials** The patient was a 77-year-old woman referred to our center via medical transport from a secondary care facility. On admission, her general condition was good; she was hemodynamically and respiratory stable and afebrile. Laboratory test results showed elevated inflammatory markers, with a C-reactive protein level of 155 mg/l (reference range [RR] <5 mg/l) and white blood cell count of 13.83 G/l

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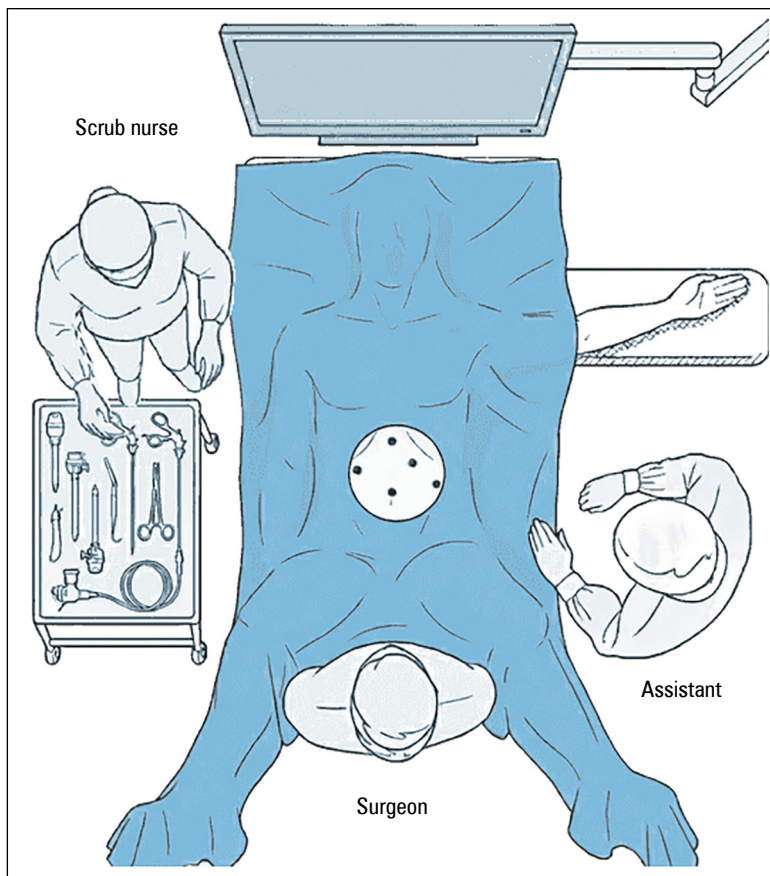
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**FIGURE 1** Operating room layout

(RR, 4–10 g/l). Her medical history was significant for bilateral total hip arthroplasty and arterial hypertension managed pharmacologically.

The patient had initially presented to the referring hospital with progressive abdominal pain lasting several days, symptoms of gastrointestinal obstruction, and clinical signs of internal hernia incarceration. During hospitalization, diagnostic workup, including abdominal ultrasound, endoscopy, and computed tomography (CT) of the abdomen and pelvis was performed. Imaging studies confirmed the presence of 2 distinct large diaphragmatic hernias (*Video 1*).

The first one was a significant anterior retrosternal MH with an estimated defect of approximately 6 cm in diameter, containing the transverse colon and a substantial amount of omental fat tissue. The hernia exerted a considerable mass effect, causing leftward displacement of the heart and mediastinum. The second defect was a large type III HH, with the majority of the stomach herniated into the posterior mediastinum.

Due to the failure of conservative management and development of clinical signs of subileus, the patient was transferred to our reference center. She was qualified for urgent surgical intervention. After a thorough discussion of the risks and benefits, informed consent was obtained.

The patient was immediately prepared for emergency surgical treatment. The decision was made to proceed with a minimally-invasive

approach. Although open repair remains a viable option, particularly in unstable patients, laparoscopy was selected for several strategic reasons. Firstly, it offered superior visualization of the anterior diaphragmatic defect and mediastinal structures, as compared with the transabdominal open view. Secondly, the induction of pneumoperitoneum facilitated reduction of the incarcerated transverse colon and omentum by counteracting the negative intrathoracic pressure.

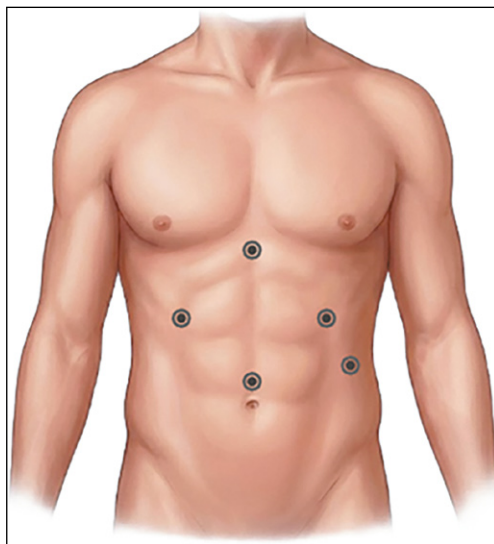
Furthermore, considering the patient's history of bilateral hip replacement and elevated levels of inflammatory markers, minimizing surgical trauma was prioritized. The minimally-invasive approach was aimed at reducing the risk of wound complications and enabling early postoperative mobilization, which was critical for thromboembolism prophylaxis in this patient. While the potential for hemodynamic instability due to the mediastinal mass effect was acknowledged, the patient's stable preoperative condition allowed for a safe laparoscopic attempt.

**Methods** Preoperative phase The patient fasted before the surgery. A nasogastric tube was inserted to decompress the stomach and reduce the risk of aspiration pneumonia. During the induction of general anesthesia, the head of the bed was elevated 30° until the airway was secured, and a rapid sequence induction was used. After safe endotracheal intubation, the patient was placed in the Fowler position over an inflated beanbag, with the lower extremities extended on stirrups. This particular positioning allows for good exposure of the diaphragm during surgery.

Operating room setting Proper arrangement of the team and equipment in the operating room has a significant impact on the timing and course of laparoscopic surgery. We believe there is no single optimal arrangement—a well-thought-out and repeatable arrangement, which allows for smooth teamwork under given conditions, is more important. For upper gastrointestinal procedures, we routinely use a Nathanson liver retractor (KARL STORZ SE & Co. KG, Tuttlingen, Germany) mounted to the operating table. This allows for the procedure to be performed by a surgeon and just 1 assistant. The surgeon stands between the patient's legs, and the assistant stands on the left side of the operating table. The assistant moves the laparoscope while maintaining adequate tissue traction using a bowel clamp. This makes the assistant's role more challenging and requires both training and experience. The anesthesia team is positioned to the right side of the patient's head, leaving room for a screen placed behind the patient's head in the midline. The scrub nurse with a Mayo table takes up a position next to the assistant (**FIGURE 1**).

Port placement After the abdominal insufflation to 12 mm Hg, 4 trocars were introduced. A 10-mm trocar for the 30-degree laparoscope was placed in

**FIGURE 2** Trocar placement



the midline, approximately 12 cm below the sternum. A 12-mm trocar for the surgeon's right-hand instrument was positioned in the left midclavicular line, just below the costal margin. The larger size allowed for the use of suturing devices, staplers, or specimen retrieval bags as needed. A 5-mm trocar for the surgeon's left-hand instrument was placed in the right midclavicular line, also just below the costal margin. An additional 5-mm trocar for the assistant's instrument was inserted on the left side, at the level of the umbilicus. A Nathanson liver retractor, introduced through a small subxiphoid incision, was used to elevate the left lobe of the liver, providing exposure of the hiatus and the anterior diaphragm (FIGURE 2).

**Procedures** Morgagni hernia repair Initial laparoscopic exploration confirmed the CT findings. The operative plan was to first repair the MH to restore normal cardiomeastinal anatomy, getting better exposure before proceeding with HH closure. The transverse colon and omental fat were carefully identified and gently reduced from the anterior mediastinum into the abdominal cavity, using atraumatic graspers (FIGURE 3). No signs of ischemia were noted. A large hernia sac was then identified and excised after releasing multiple adhesions to the parietal pleura and pericardium, using a harmonic scalpel.

After complete reduction of the herniated contents, the large anterior diaphragmatic defect was clearly visualized (Video 2). Primary repair was performed using a double-layer, continuous 2-0 non-absorbable polyester sutures. In addition, a pedicled flap of the round ligament of the liver was used to reinforce the repair. No mesh reinforcement was required.

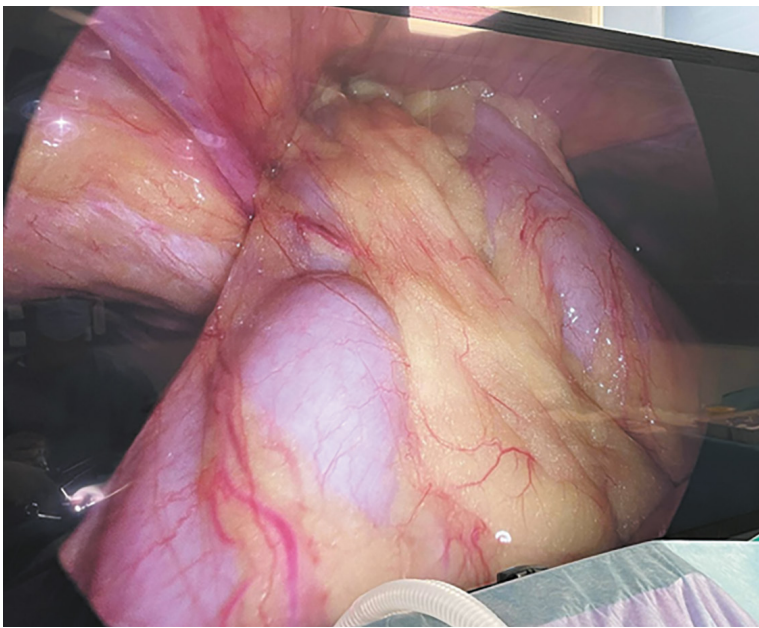
**Hiatal hernia repair** After completing the MH repair, attention was directed to the esophageal hiatus. The herniated stomach was fully reduced into the abdominal cavity (FIGURE 4). The hernia sac was dissected and excised. The hiatal defect was then closed posteriorly with a primary cruroplasty using 4 interrupted 2-0 nonabsorbable braided

sutures. Given the patient's age, comorbidities, and evidence of significant gastric wall inflammation, fundoplication was omitted. To prevent reherniation, gastropexy was performed instead. The gastric antrum was secured to the right diaphragmatic crus, and the fundus was fixed to the diaphragmatic dome, each with interrupted 2-0 braided absorbable sutures. After reduction of the pneumoperitoneum pressure to 10 mm Hg, the stomach was aligned with the anterior abdominal wall at the predetermined gastropexy site. Definitive fixation of the gastric wall to the parietal peritoneum was achieved using a continuous knotless, self-anchoring absorbable V-Loc suture (Medtronic, Minneapolis, Minnesota, United States).

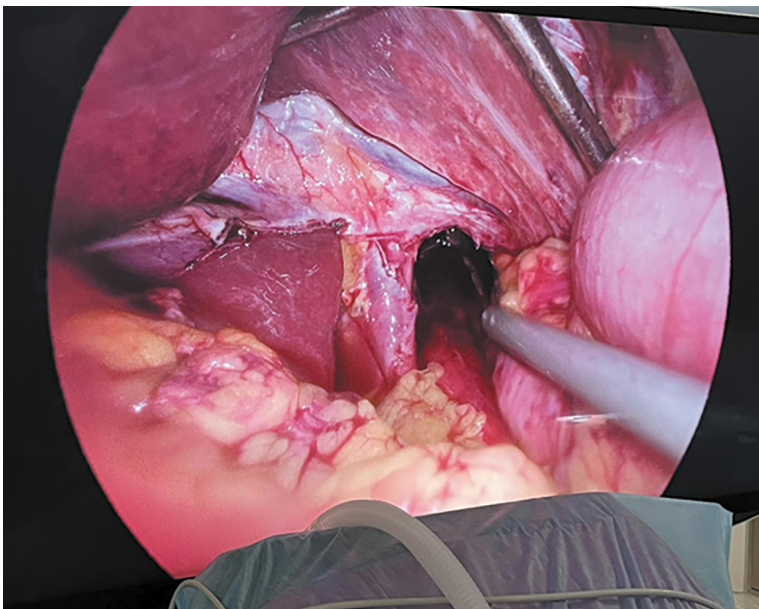
**RESULTS** The total operative time was 2 hours and 15 minutes, with minimal blood loss. On postoperative day (POD) 1, the patient reported moderate abdominal pain, which was effectively managed with standard analgesics, and required transient supplemental oxygen therapy. Early physical rehabilitation and mobilization protocols were initiated immediately. Monitoring of the abdominal drains showed expected serosanguinous output. On POD 3, the patient reported moderate pain and chest discomfort. A targeted cardiac evaluation was promptly performed, effectively ruling out acute coronary etiology. Oral intake was cautiously reintroduced with a liquid diet. Functional recovery of the gastrointestinal tract, evidenced by the passage of stool, was noted on POD 4; consequently, the remaining abdominal drain was removed on the same day. The diet was successfully advanced to soft solids on POD 6, which was well-tolerated without adverse events. The patient reported resolution of her preoperative symptoms, including abdominal pain and constipation. She was discharged on POD 7. During the 6-month postoperative period from surgery to manuscript submission, the patient returned for a follow-up visit to a surgery department 2 months after the procedure, and a telephone follow-up was performed 5 months postsurgery. No postoperative complications were observed. Wound healing was progressing normally. The patient reported significant improvement in quality of life due to the resolution of chronic constipation. No symptoms of dysphagia or postoperative gastroesophageal reflux disease were observed.

**DISCUSSION** The simultaneous presence of a large MH and a large HH is exceptionally rare, posing a significant diagnostic and therapeutic challenge.<sup>6</sup> This technical note contributes to the limited available evidence by demonstrating a successful minimally-invasive approach.

The primary challenge in this case was managing 2 large defects in a single-stage procedure, particularly in the setting of the marked cardiomeastinal shift caused by the MH. Our strategy to repair the MH first was based on the rationale of restoring normal thoracic anatomy and cardiac function before addressing the HH.



**FIGURE 3** Intra-abdominal view of the transverse colon before its repositioning



**FIGURE 4** Hiatal defect

The decision to perform a primary suture repair of the MH without mesh reinforcement was based on several aspects. First of all, the diaphragmatic defect was relatively small despite the large size of the hernia sac. Secondly, during the suture repair, no tension was observed. Current evidence suggests that routine application of mesh reinforcement in giant diaphragmatic hernia repairs remains a subject of controversy. Criticism primarily focuses on prosthetic-related morbidity, including infection, implant migration or shrinkage, hollow viscus erosion, and hiatal stenosis.<sup>7,8</sup> Although mesh reinforcement is generally recommended for larger defects, primary repair remains a viable option.<sup>9,10</sup>

For the HH, a standard hiatal repair and cruroplasty were performed. Several factors influenced

the decision to avoid fundoplication and proceed with gastropexy instead. Laparoscopic gastropexy performed without concomitant fundoplication serves as a viable therapeutic alternative, relying on the fixation of the stomach to the anterior abdominal wall to provide prophylaxis against hernia recurrence. This technique is typically reserved as a salvage intervention in scenarios where standard anatomical repair of a paraesophageal HH is deemed unsafe, particularly in high-risk candidates presenting significant multimorbidity. The deliberate omission of fundoplication in this setting was intended to mitigate surgical trauma and eliminate the risk of postoperative dysphagia. Cruroplasty combined with gastropexy has been described as an appropriate approach for patients with giant HHs.<sup>11-13</sup> The patient's advanced age raised concerns about an increased risk of postoperative dysphagia. In addition, the gastric wall showed significant inflammatory lesions. This case demonstrates that, even in complex scenarios involving 2 major diaphragmatic hernias, a standard laparoscopic procedure can be performed safely and effectively when the operative strategy is tailored to the patient's unique anatomy and clinical circumstances. Subject to technical feasibility and surgeon expertise, the procedure could be also successfully performed via a robotic-assisted approach.<sup>14</sup>

**CONCLUSIONS** The concurrent occurrence of large MH and HH is a rare clinical entity. A single-stage, minimally-invasive repair is both feasible and safe. This technical note demonstrates that a tailored laparoscopic approach, incorporating primary defect closures and gastropexy, can achieve an excellent clinical outcome.

#### ARTICLE INFORMATION

**VIDEO** The video files are available online at <https://dx.doi.org/10.20452/wiitm.2026.18018>.

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**AI STATEMENT** Artificial intelligence was not used in the preparation of this article.

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#### JOURNAL INFORMATION

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