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Case report

Incidental finding and successful management of Larrey's hernia during laparoscopic cholecystectomy: Case report

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ABSTRACT

Introduction: Larrey hernias (LH) are birth defects causing abdominal viscera to protrude into the thoracic cavity. With an incidence of 2–4 %, they are exceptional in adults.

Case presentation: A 65-year-old female patient was admitted for an elective laparoscopic cholecystectomy. During history intake, besides biliary colic, no additional symptoms were reported. Physical examination yielded normal results. Chest-X ray did not reveal any anomalies. Intraoperatively, an inspection of the diaphragm revealed a 3 cm defect in the left-sided sternocostal triangle, with the omentum protruding through the thorax. After performing cholecystectomy, the content of the LH was cautiously reduced. The hernia sac was not resected, to prevent potential injury to the neighboring anatomical structures. The defect was closed using non-resorbable interrupted sutures. The postoperative course was uneventful. No recurrence was detected during follow-up.

Clinical discussion: LH diagnosis is challenging due to its unspecific symptoms. Only 10 % of patients are asymptomatic. CT imaging establishes a positive diagnosis and identifies acute complications requiring emergency management.

Conclusion: Asymptomatic LH cases mandate surgery. Laparoscopic management is safe and efficient. The transabdominal approach offers easier access to hernia content. Hernia sac resection is still debatable. The selection of defect closure technique hinges on the quality and elasticity of the tissue, as well as the size of the defect, all under the unwavering banner of the tension-free principle. Literature remains conflicting on mesh use.

1. Introduction

LH, commonly referred to as Morgagni-Larrey hernias, is a diaphragmatic birth defect in the left central part of the diaphragm, that causes protrusion of the abdominal viscera into the thoracic cavity [1]. As the evidence on LH primarily stems from case reports and retrospective studies, reliance on these low evidence and biased sources impacts incidence findings [2]. Most published papers report an incidence of just 2 to 4 % of all congenital diaphragmatic hernias, emphasizing the rarity of this entity in adults [2]. Due to the restricted number of adult patients with LH, our understanding of this condition's symptoms, optimal diagnostic approach, and effective management options is rather limited.

In our paper, we highlight a very rare incidental discovery of congenital LH during a routine laparoscopic cholecystectomy. We aim to underscore the significance of maintaining a heightened level of suspicion among young surgeons, even in routine laparoscopic surgeries. Additionally, we expose the surgical key steps involved in the laparoscopic management of this exceptional condition. This case report adheres to the SCARE Criteria [3].

2. Case presentation

A 65-year-old female patient, without a history of medical disease or prior abdominal surgeries, presented to our surgery ward for a planned laparoscopic cholecystectomy.

Over the past eight months, the patient has complained of typical biliary colic without fever or jaundice. Further history intake did not reveal any additional symptoms.

Abbreviations: LH, Larrey's hernia.

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On examination, the patient had a BMI of 32 kg/m^2. A comprehensive physical assessment, encompassing respiratory, hemodynamic, and abdominal examinations, revealed normal findings.

An abdominal ultrasound showed a distended, thin-walled gallbladder containing infra-centimetric gallstones. Laboratory findings and chest X-rays were within normal limits.

The surgical procedure was conducted under general anesthesia with the patient in a French position. After establishing pneumoperitoneum and introducing trocars, inspection of the diaphragm revealed a 3 cm defect in the left-sided sternocostal triangle. The greater omentum was protruding through the thorax (Fig. 1a and b).

Initially, we performed a cholecystectomy after reaching the critical view of safety. Then the falciform ligament was taken down, exposing the whole defect (Fig. 1c). After carefully reducing the content of the hernia, we opted not to resect the hernia sac due to the proximity of the inferior lobe of the left lung, and the mediastinal structures. The defect was closed via tension-free herniorrhaphy using non-resorbable sutures (Video clip 1 highlights intraoperative findings, showing the hernia defect and the inferior lobe of the left lung). The postoperative course was uneventful, and the patient was discharged three days later. Postoperative follow-up did not show signs of recurrence.

3. Discussion

LH manifests as the protrusion of abdominal viscera through the left anterior retrosternal defect in the diaphragm [4].

While congenital diaphragmatic hernias are frequently diagnosed in the pediatric population, their persistence and recognition in adults are quite rare [5]. Therefore, the entire evidence pertaining to LH is drawn only from case reports, small case series, and limited retrospective reviews [5]. This limited scientific evidence underscores the distinctive nature of this condition. The origin of this entity traces back to the unsuccessful fusion of the diaphragm and costal arches progenitors during embryological development [6]. Although there have been significant advancements in recent years, scientific knowledge is still limited about the exact insults occurring during embryonic development and how they contribute to LH [6]. Despite being a birth defect, LH was more commonly found in pregnant women, and patients with chronic constipation, chronic cough, and obesity [7]. While their exact mechanism remains unclear, these conditions have in common the increase of intra-

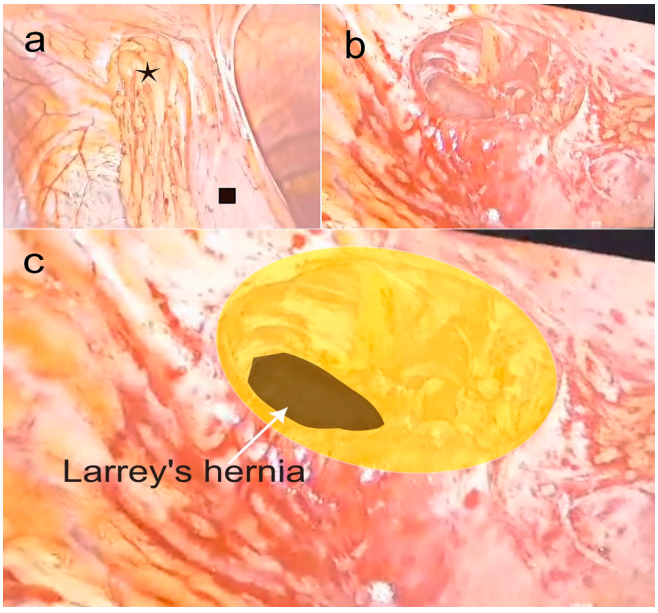

Fig. 1. Intraoperative findings. (a) showing a Larrey's hernia containing the omentum (black star) and the transverse colon (black square) exhibiting adhesion to the anterior abdominal wall. (b) and (c) showing the hernia defect.

abdominal pressure [7]. On the other hand, patients are protected from LH by the anatomical predisposition of the pericardium, as it prevents abdominal viscera from herniating through the left diaphragm [8]. LH mostly affects women in their fifth to sixth decades [9]. This entity presents with a diverse range of symptoms, making it challenging to establish clear associations. This plethora of clinical features, from respiratory to digestive symptoms, adds a layer of complexity to fully understanding this condition [9]. While retrospective studies can introduce recall bias and limit the accuracy of evaluating clinical features, Katsaros et al. [10] findings published in 2021 suggested that LH was more associated with digestive than respiratory symptoms. Recent scientific papers have reported that while most patients are symptomatic, only 10 % were asymptomatic and discovered incidentally on imagery or during surgery [11]. Even though retrospective studies severely impede accurate evaluation of clinical features, patients' symptoms are inevitably based on the hernia contents, and they outline as follows: the small or large intestine leads to bowel obstruction, the stomach leads to abdominal discomfort and reflux, and the omentum leads to abdominal pain [12]. Respiratory symptoms are mainly due to hernia size [12]. In this paper, our patient suffered from obesity. LH was discovered incidentally during laparoscopic cholecystectomy. Besides the biliary colic attached to gallstones, our patient was completely asymptomatic, with no history of abdominal pain or discomfort although the hernia sac contained the omentum. Given the diversity of the patient's symptoms, confirmation of the diagnosis relies on imaging. However, the lack of well-defined guidelines for LH diagnosis introduces variability in the diagnostic approach, subject to varying interpretations. In the era of advanced CT imaging, more incidental LH is diagnosed in adults [13]. A positive diagnosis is established by identifying a retrosternal fat-density mass or a hollow viscera [14]. Besides providing information on anatomical characteristics and hernia contents, CT imaging can confirm the presence of complications requiring emergency management [15]. The currently available literature lacks both prospective trials and large retrospective studies that can provide long-term follow-up and quality-of-life checks on patients following LH repair. As a result, no clear guidelines for management have been issued for LH, and treatment modalities are entirely based on the surgeon's past experiences [16]. Given the rarity of LH, optimal surgical management is yet to be defined. Facing the potential risk of acute incarceration, surgery is mandatory for all patients, including incidentally discovered LH [13].

While most patients in ancient retrospective studies were operated on via laparotomy or thoracotomy [17], emerging case series favor the laparoscopic approach because it is associated with shorter hospital stays, a similar recurrence rate, and lower postoperative complications [5]. The trans-abdominal approach is better suited for incarcerated LH, as it offers improved access and a better overview of the anatomy during hernia repair [18]. The trans-thoracic approach is more useful in ancient non-complicated hernias to provide a better view of pleural, mediastinal, and pulmonary structures while performing dissection [17]. The debate over hernia sac resection remains unresolved. On one hand, some authors believe that the risks of hernia sac resection outweigh the benefits, as radical sac excision is associated with a high risk of injury to anatomical structures such as the pleura, lung, pericardium, phrenic nerve, and epigastric vessels [12]. On the other hand, leaving the hernia sac unresected was associated with higher rates of seroma, hematoma, and recurrence [12]. In our reported case, due to the proximity of the left inferior pulmonary lobe, the pleura, and the pericardium, we decided to leave the sac in situ. Active drainage was placed, and no effusion or hematoma was detected in the postoperative course. Mesh use is dictated by the possibility of ensuring a tension-free repair and hernia size [19]. To this day, the literature is still conflicted between reports confirming perfect defect closure by sutures, and others insisting on mesh use where there is tissue loss in the diaphragm [19]. As for hernia size, although a literature review published in 2002 suggested that a defect larger than 2–3 cm requires mesh use [20], until today there is no high-level scientific evidence on the cutoff size of hernia defect

regarding mesh implantation [19].

To successfully manage LH, a series of technical steps must be performed with the utmost diligence. First, to fully expose the hernia defect and to provide space for eventual mesh placement, the falciform ligament must be taken down [13]. If hernia sac resection is to be performed, this step requires thorough dissection, dreading the risk of injury to the left pleural cavity, left lung, mediastinal structures, and left epigastric vessels. If defect closure without mesh application is decided, non-resorbable sutures must be employed [13].

4. Conclusion

Surgical management is the mainstay of treatment, even in cases of asymptomatic LH. Laparoscopy is a safe and feasible approach in elective cases with the appropriate expertise. The trans-abdominal approach offers easier access to hernia content with a clear view of anatomical structures. Hernia sac management is still controversial, but most authors advocate its conservation as the risk outweighs the benefit. Hernia defect closure by non-resorbable sutures vs. mesh application is still a debatable subject with no clear guidelines, depending on tissue elasticity and defect size.

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Consent of publication

A written consent was obtained from the patient to publish this case report.

Ethical approval

Published with the consent and approval of the patient.

Personal Data have been respected.

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

Ethical approval was not needed, because no study dealing with human or animal data was submitted in our case report.

Ethical Approval was waived by the Ethical Committee NAC of Menzel Bourguiba Hospital, Bizerte, Tunisia.

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Author contribution

Racem Trigui: writing-Original draft preparation. Anis Hasnaoui: Conceptualization, Writing-Reviewing and Editing. Anis Kerkeni: Data curation. Sihem Heni: Data curation. All authors read and approved the final manuscript.

Guarantor

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