Case Report

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Adult left-sided Bochdalek hernia with multivisceral herniation: A case report and systematic review of literature

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Abstract

Bochdalek hernia is a congenital posterolateral diaphragmatic defect that typically presents during the neonatal period with severe respiratory compromise. Adult presentation is rare and often manifests with vague respiratory or gastrointestinal symptoms, making diagnosis challenging and frequently delayed. A 65-year-old female presented with progressively worsening shortness of breath and severe orthopnea for 20 days. She also reported a longstanding history of mild exertional dyspnea over 4–5 years. There was no history of thoracoabdominal trauma or prior surgery. Chest radiography demonstrated abnormal soft tissue shadows within the left hemithorax. Contrast-enhanced computed tomography of the thorax and abdomen confirmed a 5 cm × 5 cm left posterolateral diaphragmatic defect with multivisceral herniation including the stomach, spleen with splenic artery, omentum, transverse colon, and upper pole of the left kidney, consistent with an adult left-sided Bochdalek hernia. The patient underwent exploratory laparotomy through an L-shaped incision. The herniated abdominal viscera were carefully reduced into the abdominal cavity, and the diaphragmatic defect was repaired primarily using nonabsorbable sutures. The postoperative course was uneventful. The patient experienced immediate improvement in respiratory symptoms with complete resolution of orthopnea and was discharged in stable condition without complications. Adult Bochdalek hernia should be considered in elderly patients presenting with unexplained respiratory symptoms, even in the absence of a history of trauma. Cross-sectional imaging plays a crucial role in diagnosis and operative planning. Early surgical repair is essential to prevent life-threatening complications such as strangulation and visceral ischemia.

Keywords

Bochdalek hernia, L-shaped incision, multivisceral herniation

Introduction

Bochdalek hernia results from the failure of the posterolateral pleuroperitoneal membrane to fuse properly during embryonic development, typically around the 8th to 10th week of gestation.[1-3] This defect occurs far more frequently on the left side, primarily because the left pleuroperitoneal canal closes later than the right, and the liver provides a protective barrier on the right side.[4,5]

While the majority of these defects are diagnosed and treated in newborns due to severe life-threatening pulmonary hypoplasia and respiratory distress, adult presentation accounts for < 5% of all cases.[1,5,6] In adults, the herniation of abdominal viscera into the thoracic cavity is often gradual. Increased intra-abdominal pressure over time, such as from multiple pregnancies, can slowly enlarge a silent congenital defect until it becomes symptomatic later in life.[3,7] Here, we present a rare case of a multivisceral left-sided Bochdalek hernia in an elderly female,

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who was successfully managed surgically. Nevertheless, recent literature has increasingly focused on advances in cross-sectional imaging, minimally invasive surgical repair, and perioperative outcomes in adult patients. In addition to presenting this rare case of extensive multivisceral herniation, this report also reviews the contemporary literature regarding epidemiology, clinical presentation, diagnostic evaluation, surgical management strategies, and postoperative outcomes of adult Bochdalek hernia.

Case Description

Patient information

A 65-year-old female (height: 143 cm, weight: 52 kg, and body mass index: 25.4 kg/m^2) presented to our tertiary care hospital in January 2026 with a chief complaint of shortness of breath lasting 20 days. The dyspnea was intermittent, present even at rest and severely exacerbated by recumbency (orthopnea).

Upon detailed history taking, the patient noted a baseline, mild exertional dyspnea (grade 1–2) spanning the past 4–5 years, which had acutely worsened to grade 4 over the preceding 3 weeks. The reported dyspnea grade was based on the Modified Medical Research Council Dyspnea Scale.[8] She also reported a mild unintentional weight loss of approximately 2 kg over the past 3 months. She denied any history of gastroesophageal reflux disease, vomiting, dysphagia, hematemesis, chest pain, or chronic cough. Crucially, there was no history of blunt or penetrating thoracoabdominal trauma, nor any prior abdominal or thoracic surgeries. The patient had no significant past medical comorbidities and no known family history of congenital diaphragmatic disorders or other hereditary illnesses. She was independent in activities of daily living and had no significant psychosocial stressors. There was no history of smoking, alcohol consumption, or substance abuse. Her obstetric history was significant for two uncomplicated vaginal deliveries.

Clinical findings

On physical examination, the patient was hemodynamically stable, but mildly tachypneic at rest. Respiratory examination revealed diminished breath sounds over the left lower lung zone.

Diagnostic assessment

Routine laboratory investigations, including a complete blood count, metabolic profile, and coagulation studies, were within normal physiological limits.

An initial screening chest X-ray revealed an abnormal silhouette and soft tissue shadows in the left hemithorax, as in Figure 1, prompting further evaluation with cross-sectional imaging. A contrast-enhanced computed tomography (CECT) scan of the thorax and abdomen was performed. The CECT demonstrated a well-defined 5 cm × 5 cm defect in the posterolateral aspect of the left hemidiaphragm.

The imaging revealed massive multivisceral herniation into the left thoracic cavity containing the stomach,



Figure 1: Chest X-ray posteroanterior view demonstrating heterogeneous opacities occupying the left lower hemithorax with loss of normal diaphragmatic contour suggestive of herniated abdominal viscera



Figure 2: Computed tomography (CT) coronal view of chest, abdomen, and pelvis showing a loop of bowel. The image is digitally enhanced to improve contrast and clarity and to remove the patient demographics

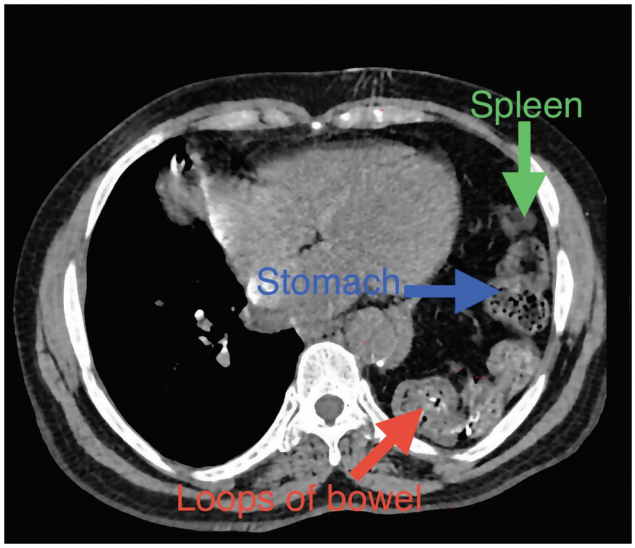


Figure 3: Computed tomography (CT) axial view of lower chest and upper abdomen displaying herniated content on the left side marked with arrows (green = spleen, blue = stomach, and red = loops of bowel). The image is digitally enhanced to improve contrast and clarity and to remove the patient demographics

spleen along with the splenic artery, greater omentum, a portion of the transverse colon, and the upper pole of the left kidney, as shown in Figures 2 and 3.

Notably, despite the extensive displacement of these organs, there was no radiological evidence of bowel obstruction, mechanical strangulation, or visceral ischemia. The findings were consistent with a long-standing congenital left-sided Bochdalek hernia presenting in late adulthood.

Therapeutic intervention

Given the severe progression of respiratory symptoms and significant risk of further strangulation or incarceration of the herniated viscera, surgical intervention was planned.

The patient was taken to the operating room in January 2026, and an exploratory laparotomy was performed using an L-shaped incision. Intraoperatively, the 5 cm × 5 cm defect in the posterolateral left hemidiaphragm was identified [Figure 4]. The herniated contents, including the stomach, spleen with splenic vessels, omentum, transverse colon, and the upper pole of the left kidney, were carefully inspected. All organs appeared viable, healthy, and completely free of ischemic changes or adhesions, matching the preoperative computed tomography findings.

The abdominal viscera were gently reduced back into the peritoneal cavity. The diaphragmatic defect was primarily repaired using strong, nonabsorbable sutures to ensure a tension-free closure. The total operative time was approximately 300 min, with minimal intraoperative blood loss.

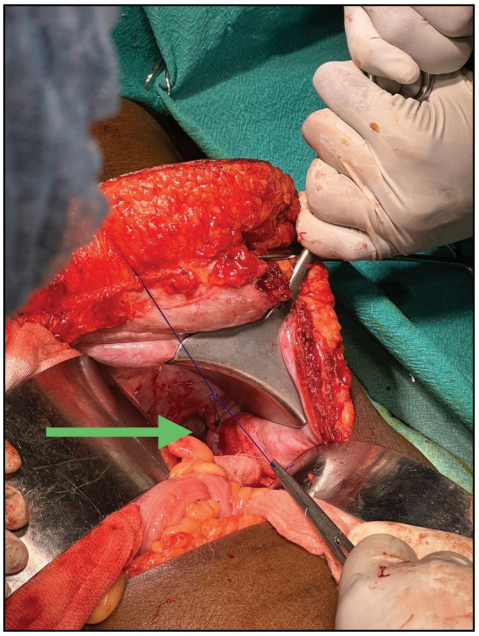


Figure 4: Intraoperative image showing a defect in the left hemidiaphragm (marked with a green arrow)

Follow-up and outcomes

The patient's postoperative course was entirely uneventful. Her respiratory status improved immediately following the reduction of herniated contents and the restoration of normal diaphragmatic mechanics. Her orthopnea completely resolved. She tolerated a progressive oral diet and was ambulating well by the time of discharge. She was sent home in stable condition with no intraoperative or postoperative complications. At her subsequent follow-up visits, she reported complete resolution of her longstanding symptoms. The patient remained asymptomatic during follow-up over the subsequent few months, with the last follow-up being in May 2026, with complete resolution of dyspnea and no evidence of recurrence or postoperative complications at the last clinical review.

Literature Review Methodology

A focused review of contemporary literature on adult Bochdalek hernia was performed using PubMed, Scopus, and Google Scholar databases. English-language studies published between 2010 and 2025 were screened using combinations of the keywords "adult Bochdalek hernia," "congenital diaphragmatic hernia in adults," "multivisceral herniation," "laparoscopic diaphragmatic hernia repair," and "adult diaphragmatic hernia." Relevant case reports, retrospective studies, review articles, and systematic reviews discussing clinical presentation, radiological findings, operative strategies, and postoperative outcomes were evaluated and integrated into the discussion to contextualize this case within current surgical literature.

Discussion

Bochdalek hernia in adults remains a clinical anomaly that frequently puzzles clinicians due to its variable and nonspecific presentation. While the defect itself is congenital, it can remain clinically silent for decades, particularly when the defect is small or when abdominal viscera temporarily occlude the diaphragmatic defect without migrating completely into the chest.[7,9,10]

In this patient, the gradual manifestation over 4–5 years, turning into acute grade 4 dyspnea, highlights how a congenital defect can acquire an acute clinical presentation in old age. A major strength of this case was the timely use of CECT, which enabled precise anatomical delineation of the diaphragmatic defect, identification of the multivisceral herniated contents, and accurate preoperative surgical planning. The open abdominal approach provided excellent exposure, allowing safe reduction of the herniated organs and secure primary repair of the defect with favorable postoperative recovery. Additionally, the absence of ischemia or strangulation permitted definitive repair without bowel resection. Factors that chronically elevate intra-abdominal pressure, such as the patient's history of multiparity (two vaginal deliveries), likely contributed to the progressive migration of the contents into the thorax.[11,12] The sudden exacerbation of dyspnea and orthopnea was likely mechanical in nature, caused by the mass effect from the stomach, spleen, colon, and kidney, compressing the left lung parenchyma and causing mediastinal shift.

This case report underscores the diagnostic pitfalls associated with adult diaphragmatic hernia. Because symptoms simulate common cardiopulmonary conditions, such as asthma, chronic obstructive pulmonary disease, or heart failure, misdiagnosis is common. While standard chest radiography may demonstrate abnormalities, CECT remains the gold standard for definitive diagnosis. It provides exceptional multiplanar visualization of the exact margins of the diaphragmatic defect and allows accurate characterization of the herniated contents and the vascular supply, such as the splenic artery noted in this case report, which is an important factor in preventing intraoperative injury.[13–15]

Published literature on adult Bochdalek hernia largely consists of isolated case reports and small case series because of the rarity of the condition. Most adult cases occur on the left side and commonly contain a herniated stomach, colon, spleen, or omentum, whereas renal herniation remains particularly uncommon.[16–18] Clinical presentation is highly variable, ranging from incidental asymptomatic findings to acute respiratory distress, bowel obstruction, strangulation, or visceral perforation requiring emergency surgery.[19,20] Recent literature demonstrates an increasing preference for minimally invasive approaches, especially laparoscopic repair, in hemodynamically stable patients with limited herniation.[21–23] However, open laparotomy continues to be frequently utilized in patients with large defects, multivisceral herniation, uncertain anatomy, or suspected ischemic complications because it provides rapid access and excellent operative exposure.[21,24] Reported postoperative outcomes are generally favorable following timely surgical repair, with low recurrence rates when adequate diaphragmatic closure is achieved.[1,25]

Surgical correction is indicated in all diagnosed adult Bochdalek hernias, even in asymptomatic patients, due to the high risk of catastrophic complications such as gastrointestinal strangulation, necrosis, or perforation. Repair can be approached laparoscopically, thoracoscopically, or open via laparotomy or thoracotomy.[24,26,27] In this case report, an open abdominal approach with an L-shaped incision allowed safe visualization, easy reduction of extensive multivisceral contents, and a robust primary closure of the 5 cm × 5 cm defect, resulting in an excellent clinical outcome.

Among the various surgical approaches described for adult Bochdalek hernia repair, no universally accepted gold-standard technique exists, and the choice largely depends on the patient's clinical presentation, size of the defect, extent of herniation, surgeon expertise, and presence of complications such as strangulation or perforation. Minimally invasive techniques, including laparoscopic and thoracoscopic repair, have gained popularity because they are associated with reduced postoperative pain, shorter hospital stay, faster recovery, and improved cosmetic outcomes.[27–29] Laparoscopy is particularly advantageous for evaluating abdominal viscera viability and reducing herniated contents, whereas thoracoscopy may provide superior visualization in cases with significant intrathoracic adhesions.[26,27] However, open surgical approaches remain highly relevant in complex cases involving extensive multivisceral herniation, uncertain anatomy, large defects, hemodynamic instability, or suspected ischemia. In this case report, an open transabdominal approach using an L-shaped incision was preferred because it provided excellent exposure for safe reduction of the stomach, spleen, colon, omentum, and kidney, while allowing careful inspection for occult ischemia and secure primary diaphragmatic repair. The absence of strangulation or tissue necrosis permitted tension-free primary closure without prosthetic mesh reinforcement. This case report highlights that although minimally invasive surgery is increasingly favored, open laparotomy continues to play a crucial role in selected complex adult Bochdalek hernias.

Published postoperative outcomes following adult Bochdalek hernia repair are generally favorable when early diagnosis and timely surgical intervention are achieved.[15] Recurrence rates remain low after adequate repair, although larger defects may occasionally require mesh reinforcement to reduce tension and prevent recurrence.[24,30] Delayed presentation and emergency surgery are associated with increased morbidity, particularly in cases complicated by bowel ischemia, perforation, or respiratory failure.[19,20] This case report further highlights that even elderly patients with longstanding symptoms can experience excellent postoperative recovery following definitive surgical correction.

The principal limitation of this report is its single-patient design, which inherently limits generalizability. Although a focused contemporary literature review was incorporated to contextualize the case within current evidence, the available literature on adult Bochdalek hernia largely consists of case reports and retrospective studies, with limited prospective comparative data. Long-term postoperative imaging follow-up was also limited, restricting assessment of delayed recurrence.

Conclusion

Adult Bochdalek hernia is a rare condition that should remain on the differential diagnosis for elderly patients presenting with unexplained progressive respiratory or gastrointestinal symptoms, irrespective of trauma history. CECT is the diagnostic modality of choice. Timely surgical reduction and diaphragmatic repair yield an excellent prognosis and effectively eliminate the risk of life-threatening visceral strangulation.

Author contributions

KRB: Conceptualization, literature review, manuscript drafting, and final approval. RSY: Manuscript drafting and revision, supervision, and ethical responsibilities. SP: Data collection, manuscript review, and surgical management. MFIC: Radiological interpretation and manuscript editing.

Ethical policy and Institutional Review Board statement

The study was conducted at Apollo Institute of Medical Sciences and Research (AIMSR), Hyderabad, India. The relevant ethics oversight body is the Central Ethics Committee, Apollo Hospitals Group, Apollo Health City, Jubilee Hills, Hyderabad 500096. According to the established practice of our Institutional Ethics Committee, individual case reports describing a single patient's clinical course, without research intervention and with written informed consent for publication, do not require prior ethics committee approval. Therefore, formal ethics approval was not required for this case report. At our institution, there is no publicly available written policy or article number specifically addressing ethics review exemption for case reports. Written informed consent for publication of the patient's clinical information and accompanying images was obtained from the patient.

Declaration of patient consent

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. According to institutional policy, ethical review and Institutional Review Board approval were not required for this single-patient case report. Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Data availability statement

All data generated or analyzed during this study are included in this published article. Additional details are available from the corresponding author upon reasonable request.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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