



Clinical Evaluation and Surgical Management of Diaphragmatic Eventration Mimicking Traumatic Hernia: A Case Report

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► ABSTRACT

Objective: Diaphragmatic eventration (DE) is a rare condition that can mimic a traumatic diaphragmatic hernia, particularly in trauma cases. We present a case of DE initially misdiagnosed as a diaphragmatic hernia following a road traffic accident, highlighting diagnostic challenges and surgical management.

Case Presentation: A 50-year-old man presented to the hospital after a road traffic accident with chest discomfort and decreased air entry on the left side. Chest X-ray revealed a left paracardiac opacity. Contrast-enhanced CT (CECT) of the thorax suggested a central diaphragmatic defect with herniation of the transverse colon and mesocolon. An exploratory laparotomy, however, revealed no diaphragmatic rupture but instead a central eventration measuring 10×5×7 cm containing bowel loops. The contents were reduced, and diaphragmatic plication was performed using non-absorbable polypropylene sutures. The patient's postoperative recovery was uneventful, and he was discharged on the eighth day. At follow-up, he remained asymptomatic.

Conclusion: This case underscored the importance of considering DE as a differential diagnosis in trauma patients. Surgical exploration is crucial for definitive diagnosis, and plication could provide an effective and durable management strategy.

Keywords: Diaphragmatic eventration; Traumatic diaphragmatic hernia; Plication; Trauma surgery; Case report.

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Introduction

Diaphragmatic Eventration (DE) is a rare condition, with an incidence as low as 1 in 10000 cases and a predominance in men and on the left side of the diaphragm [1]. It can be congenital or acquired.

Congenital DE results from the abnormal muscular development of the diaphragm, which

may be located in the anterior, anteromedial, or posterior position. Acquired causes include phrenic nerve injury from penetrating or blunt thoracic trauma, elective thoracic surgery, or birth injuries. Other etiologies, such as multiple sclerosis, Guillain-Barré syndrome, nerve compression, radiation therapy, and connective tissue diseases, can also lead to partial or complete phrenic nerve injury [1, 2].

Most patients with DE are asymptomatic [3], and the condition is often an incidental finding on imaging performed for some other reasons [4]. Symptomatic patients may present with tachypnoea, chest pain, arrhythmia, or bowel sounds within the chest. Management involves laparoscopic or open surgical plication of the diaphragm [5].

Case Presentation

A 50-year-old man was admitted to our Emergency Department (ED) following a road traffic accident. The patient, who was a non-helmeted two-wheeler rider, had experienced a skid and fall. He was referred from a primary health center. During the primary survey, his airway was patent. Vital signs were as follows: heart rate: 110/min, blood pressure: 136/84 mmHg, and respiratory rate: 16/min. Air entry was present bilaterally but decreased on the left side. The secondary survey confirmed decreased air entry on the left side with a tympanic sound on percussion. A chest X-ray revealed a left paracardiac opacity (Figure 1). A contrast-enhanced CT (CECT) scan of the thorax suggested a central diaphragmatic defect with herniation of the transverse colon and mesocolon, accompanied by fractures of the left fifth and sixth ribs (Figure 2).

Following initial optimization in the ED, the

patient was scheduled for elective exploratory laparotomy for reduction of the suspected hernia and diaphragmatic repair. The abdomen was explored through a midline incision. Upon exploration, no diaphragmatic defect was identified. Instead, a central diaphragmatic eventration was found, presenting as a hollow space measuring 10×5×7 cm anterior to the pericardium (Figure 3). This sac of lax diaphragm contained the transverse colon and mesocolon.

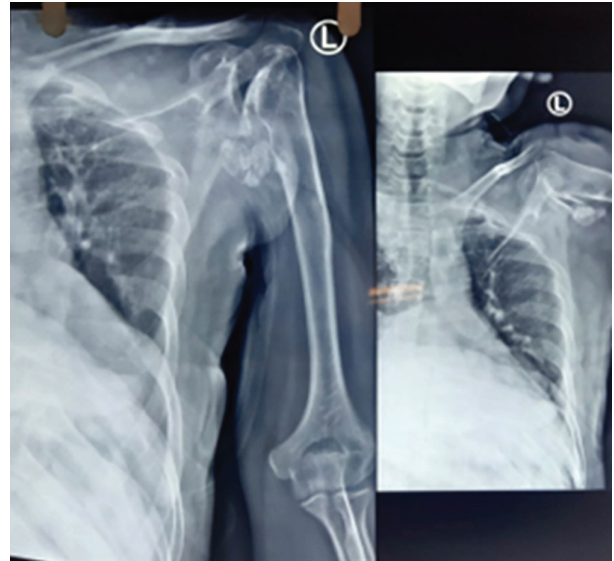


Fig 1. Chest X-ray showing left-sided para-cardiac opacity.

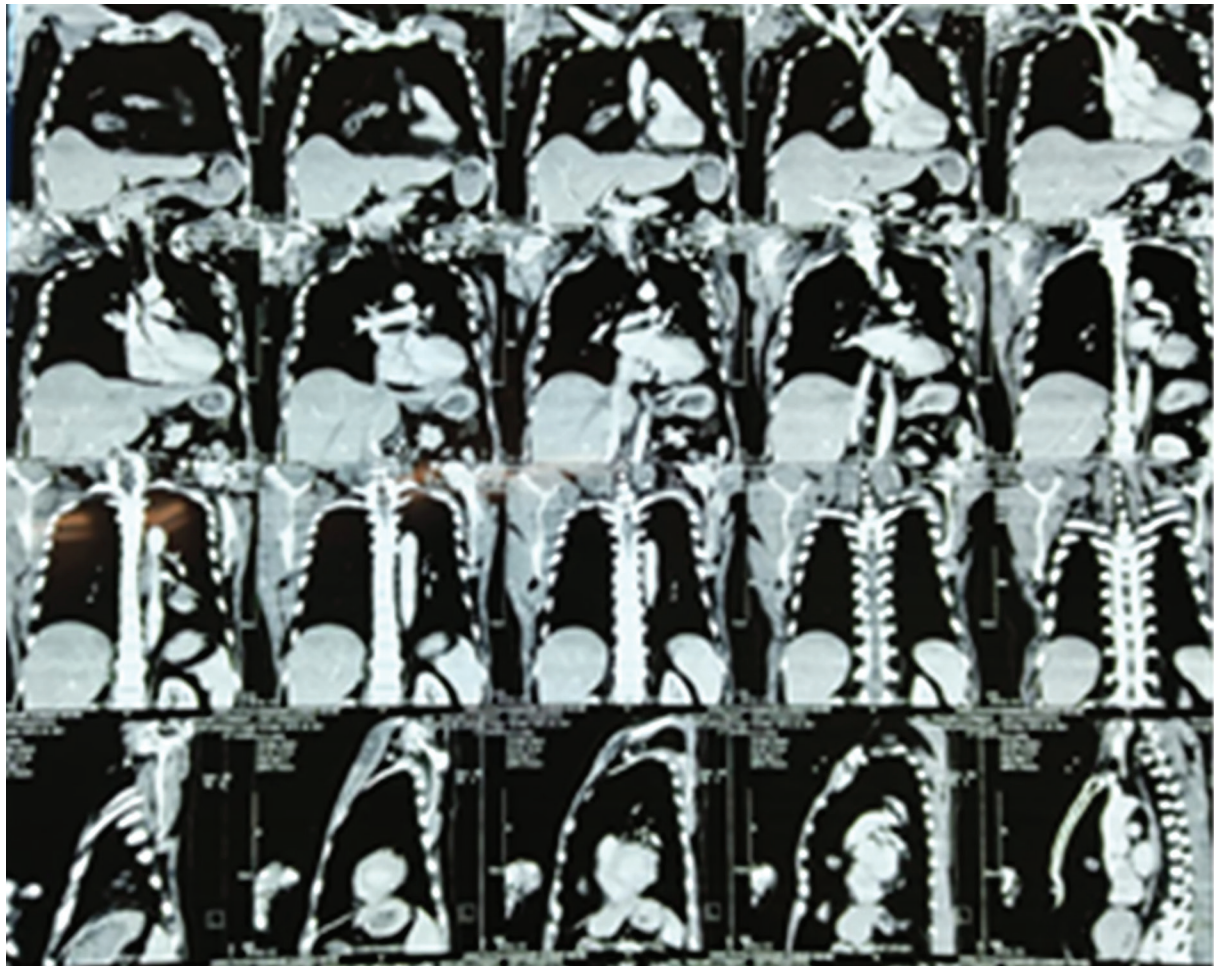


Fig 2. CECT thorax showing transverse colon content seen in the thoracic cavity.



Fig 3. Intraoperative image showing Eventration of central tendon of diaphragm.

The contents were easily reduced. Plication of the central diaphragm was performed, and it was sutured to the anterior abdominal wall using non-absorbable polypropylene suture in a continuous fashion (Figure 4). A pelvic drain was placed, and the abdominal wound was closed in layers.

The patient was initially transferred to the intensive care unit (ICU) for two days for monitoring and then moved to the general ward, where his recovery was uneventful. He was discharged on the eighth postoperative day. At follow-up visits, the patient remains asymptomatic.

Discussion

The DE was first described in an autopsy case by Louis Petit in 1774 [6]. It is a condition in which part or all of the diaphragm is replaced by fibrous tissue. Most patients are asymptomatic, and the diagnosis is usually incidental [1]. The distinction between eventration and hernia was defined by Bisgard in 1947, who described eventration as an abnormally elevated position of one leaf of the diaphragm due to paralysis or atrophy of muscle fibers, with its unbroken continuity differentiating it from a diaphragmatic hernia [7].

The present case presented with chest trauma, including a fracture of the fifth-sixth ribs and thinning of the left diaphragm. Initial radiological investigation could not differentiate between eventration and a diaphragmatic hernia. Furthermore, the history of chest trauma was more consistent with a diaphragmatic hernia.

Traumatic diaphragmatic injuries are rare but potentially life-threatening conditions that require prompt diagnosis and management [8]. This case

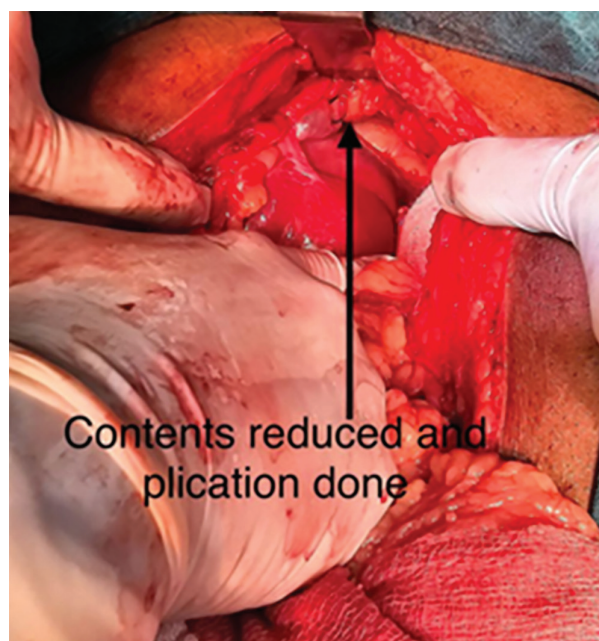


Fig 4. Intraoperative image after content reduction and plication of the diaphragm.

report highlighted an unusual presentation of a diaphragmatic eventration that mimicked a traumatic diaphragmatic hernia following a road traffic accident (RTA).

Diaphragmatic injuries are often missed during the initial assessment of trauma patients, with diagnostic delays reported in up to 30% of cases [9]. In the present case, the initial clinical findings—such as decreased left-sided air entry with tympanic percussion—suggested a possible diaphragmatic hernia. However, intraoperative exploration revealed an eventration rather than a true defect. This case emphasized the limitations of imaging modalities such as chest X-rays and CECT in differentiating between diaphragmatic rupture and eventration [10].

Diaphragmatic eventration, whether congenital or acquired, is characterized by abnormal elevation of the diaphragm due to muscle weakness or paralysis. In trauma settings, a pre-existing eventration could be mistaken for an acute hernia, potentially leading to surgical exploration [11]. In this case, the laxity of the central diaphragm formed a sac-like space containing the transverse colon and mesocolon, which closely mimicked a true hernia.

The standard approach for traumatic diaphragmatic injuries is surgical repair via laparotomy or thoracotomy [12]. In our case, exploratory laparotomy revealed no true diaphragmatic defect, and plication of the eventrated segment was performed. Plication is the preferred surgical technique for symptomatic eventration, as it restores diaphragmatic function and prevents visceral herniation [6]. Using non-absorbable polypropylene sutures ensured long-term stability and reduced the risk of recurrence.

The patient's uneventful recovery and asymptomatic status at follow-up validate the chosen surgical

approach. This case underscored the importance of considering diaphragmatic eventration in trauma patients with ambiguous imaging findings. A high index of suspicion and flexibility in intraoperative decision-making is crucial to avoid misdiagnosis and unnecessary interventions.

In conclusion, this case highlighted a rare presentation of diaphragmatic eventration mimicking a traumatic hernia. While imaging plays a crucial role in trauma assessment, surgical exploration remains the gold standard for definitive diagnosis and management. Plication of the eventrated diaphragm could provide an effective solution, ensuring a successful outcome.

Declaration

Ethical approval and participation consent: The study protocol received approval from the Ethics Committee of AIIMS Patna (code: 170/AIIMS/Pat/1542). Written informed consent was obtained from the patient.

Consent for publication: Written informed consent was obtained from the patient and could be provided

upon request.

Conflict of Interest: The authors declare that they have no conflicts of interest.

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