Case Report

Massive diaphragmatic eventration: plication

Ashok S. Gajbhiye, Lalit V. Tamgadge, Sarita Durge, Ayyappa Sai Kumar Kolasani*

INTRODUCTION

Diaphragmatic eventration (DE) is an abnormal condition in which a portion or the entire hemidiaphragm elevates due to insufficient muscle or nerve function while maintaining its anatomical attachments.\(^1\) Any disruption in the integrity of the diaphragm can lead to functional impairment and subsequent respiratory distress. Eventrations of the diaphragm are further divided on an anatomical basis as complete, partial, or bilateral. On embryological bases, congenital eventration could be anterior, posterolateral, and medial.\(^2\) DE is a rare entity, incidence being reported less than 0.05% and has male predominance. Incidence of congenital DE is about 1 in 10,000 and has male predominance.\(^3\) Adult DE is usually incidental diagnosis on chest X-ray as most of the cases are asymptomatic depending on the extent of eventration.\(^4\)

CASE REPORT

A 50-year-old female presented with complaint of shortness of breath, worsened in supine position. Initial saturation was 85% on room air, improving to 97% with 4 L of oxygen. Vitals were stable, but on auscultation, absent breath sounds were noted in the left lower chest. Chest X-ray revealed low oxygen saturation, absent breath sounds on the left chest, and bowel sounds in that region. Chest and HRCT indicated bowel loops in the left chest due to eventration of the left hemidiaphragm. Surgical intervention involved thoracotomy, identifying a lax left hemidiaphragm, mobilising abdominal contents, and performing plication with prolene 1-0. Closure was completed with an intercostal drainage (ICD) in the left thoracic cavity. Postoperative period was uneventful. This case emphasises the significance of prompt diagnosis and surgical intervention in managing DE, showcasing the effectiveness of thoracotomy, hemidiaphragm plication, and ICD placement.

Keywords: Thoracotomy, Eventration, Plication

ABSTRACT

Diaphragmatic eventration (DE) is a distinctive condition characterised by the abnormal elevation or displacement of a portion of the diaphragm, often leading to a protrusion of abdominal contents into the thoracic cavity. Unlike diaphragmatic hernias, eventrations involve a congenital or acquired weakness of the diaphragmatic muscle itself rather than a structural defect. Congenital eventrations typically arise from the incomplete development or muscular hypoplasia of the diaphragm, while acquired forms may result from trauma, surgery, or neurological disorders affecting the phrenic nerve. Clinical manifestations vary widely, with some individuals remaining asymptomatic, while others may experience respiratory difficulties, especially when lying down. The case involves a 65-year-old female with a history of breathlessness exacerbated in the lying position, improved when upright. Examination revealed low oxygen saturation, absent breath sounds on the left chest, and bowel sounds in that region. Chest X-ray and HRCT indicated bowel loops in the left chest due to eventration of the left hemidiaphragm. Surgical intervention involved thoracotomy, identifying a lax left hemidiaphragm, mobilising abdominal contents, and performing plication with prolene 1-0. Closure was completed with an intercostal drainage (ICD) in the left thoracic cavity. Postoperative period was uneventful. This case emphasises the significance of prompt diagnosis and surgical intervention in managing DE, showcasing the effectiveness of thoracotomy, hemidiaphragm plication, and ICD placement.

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Elective posterolateral thoracotomy was performed, confirming massive eventration. There was no evidence of any herniation through diaphragm. Plication of the left hemidiaphragm was done using prolene 1-0. A 28 French size ICD tube was placed in the left thorax, followed by closure.

On post operative day one, chest X-ray displayed expanded left lung, with no tracheal or mediastinal shift. Post-operative course was uneventful.

**DISCUSSION**

DE poses diagnostic challenges, often masquerading as other conditions like diaphragmatic hernia. Eventration of diaphragm is a rare pathology usually asymptomatic because the defect is usually small, with some muscle function being preserved and with no compromise of the contralateral diaphragm. In cases of serious and persistent respiratory distress or who need mechanical

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**Figure 1:** Chest radiograph showing left hemi-DE with mediastinal shift to right.

**Figure 2:** High resolution computed topography chest showing massive left DE.

**Figure 3:** (A) Weak diaphragmatic muscle; (B) plication of left hemi-diaphragm; (C) fully expanded left lung after plication of left hemi-diaphragm; and (D) placement of intercoastal drainage and closure.

**Figure 4:** Plain radiograph taken on post-operative day one showing expanded left lung and no mediastinal shift.
ventilation, you must do the surgical fixation of the diaphragm, which is surgical procedure of choice in cases of DE. Diaphragmatic plication is a well-known method used to treat patients with DE in order to allow lung re-expansion on the affected side. Final diagnosis can be confirmed intra-operatively. There are two main techniques to manage diaphragmatic elevation due to eventration or paralysis in open surgery through a thoracotomy access: central imbrication technique and radial plication technique. As reported in references surgical intervention, as performed in this case, involving plication and securing abdominal contents provides symptomatic relief.

CONCLUSION

Surgical approach for massive DE leading to respiratory symptoms and hypoxia should be considered in the management plan. Diaphragmatic plication can relieve the respiratory symptoms and improve the quality of life of the patient.

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REFERENCES
