

Case report: Eventration of Left Hemidiaphragm in a Preterm Neonate Managed with Diaphragmatic Plication

Dr. Puneet Srivastava¹, Dr. Richa Jaiman², Dr. Renu Singh³

¹Professor, Department of General Surgery, Sarojini Naidu Medical College, Agra, Uttar Pradesh, India

² Professor, Department of General Surgery, Sarojini Naidu Medical College, Agra, Uttar Pradesh, India

³ Post Graduate student, Department of General Surgery, Sarojini Naidu Medical College, Agra, Uttar Pradesh, India

*Corresponding Author:

Dr. Renu Singh,

Post Graduate student, Department of General Surgery, Sarojini Naidu Medical College, Agra, Uttar Pradesh, India

Cite this paper as: Dr. Puneet Srivastava, Dr. Richa Jaiman, Dr. Renu Singh (2025) Case report: Eventration of Left Hemidiaphragm in a Preterm Neonate Managed with Diaphragmatic Plication. Journal of Neonatal Surgery, 14, (6s) 944-946

1. INTRODUCTION

Diaphragmatic eventration is defined as an abnormal elevation of an intact hemidiaphragm due to partial or complete replacement of diaphragmatic muscle fibres by fibroelastic tissue and accounts for approximately 5% of all diaphragmatic malformations¹. The condition may be congenital or acquired².

Congenital diaphragmatic eventration (CDE) is rare, usually unilateral, and has an estimated prevalence of 1 in 10,000 live births, with a male predominance^{2, 4}. It may also occur secondary to congenital viral infections such as rubella or cytomegalovirus, which cause destruction of diaphragmatic muscle tissue and its replacement by a membranous diaphragm³.

The left hemidiaphragm is more commonly affected. Cutler and Cooper attributed this predominance to embryological factors, including protection of the right hemidiaphragm by the liver and greater vascularity on the right side, while the left hemidiaphragm is weakened due to atrophy of the left common cardinal vein⁷.

Although many patients remain asymptomatic and are diagnosed incidentally on chest radiography, severely affected neonates may present with respiratory distress, apnoea, or poor cry requiring ventilatory support^{1, 4}. Antenatal diagnosis is challenging, as CDE is frequently misdiagnosed as congenital diaphragmatic hernia (CDH)².

Case Description

Patient Profile

A preterm male neonate was delivered by lower segment cesarean section (LSCS) and developed respiratory distress immediately after birth.

Clinical Course and Investigations

The neonate exhibited progressive respiratory distress necessitating endotracheal intubation and mechanical ventilation.

A chest radiograph (posteroanterior view) revealed elevation of the left hemidiaphragm with herniation of the stomach and bowel loops into the left thoracic cavity, resulting in compression of the left lung and mediastinal shift to the right, suggestive of a left-sided diaphragmatic abnormality.

Management

Following hemodynamic stabilization, the neonate underwent surgical intervention. Diaphragmatic plication of the left hemidiaphragm was performed under general anaesthesia, which is the recommended treatment for symptomatic neonates with diaphragmatic eventration^{5, 6}.

Intraoperative Findings

Intraoperatively, eventration of the left hemidiaphragm was confirmed. The diaphragm was thin, redundant, and elevated, allowing upward displacement of abdominal viscera into the thoracic cavity. No diaphragmatic defect was identified.



Figure 1. Elevated left hemidiaphragm seen via abdominal approach.

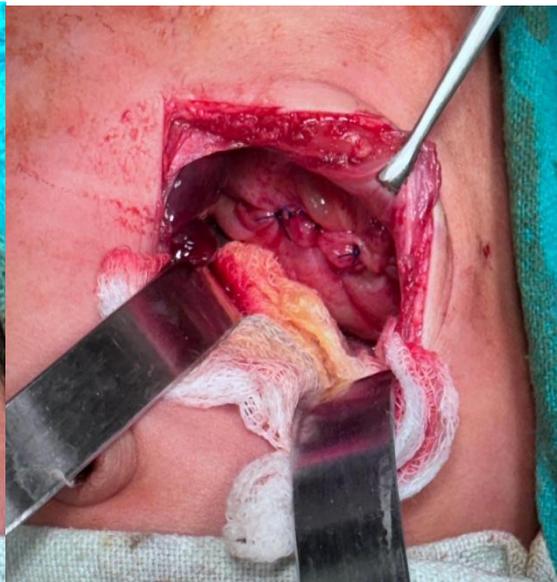


Figure 2. Plication of left hemidiaphragm done with prolene 2-0 suture

Postoperative Course

Postoperatively, the neonate showed gradual improvement in respiratory parameters and was successfully weaned off ventilatory support.

A chest X-ray obtained on postoperative day 4 demonstrated significant re-expansion of the left lung compared to the preoperative radiograph. The patient received supportive care, including broad-spectrum antibiotics, respiratory support, and nutritional management.

The postoperative course was uneventful, and the neonate was discharged on postoperative day 28 in stable condition, with improved respiratory effort and normal vital parameters.

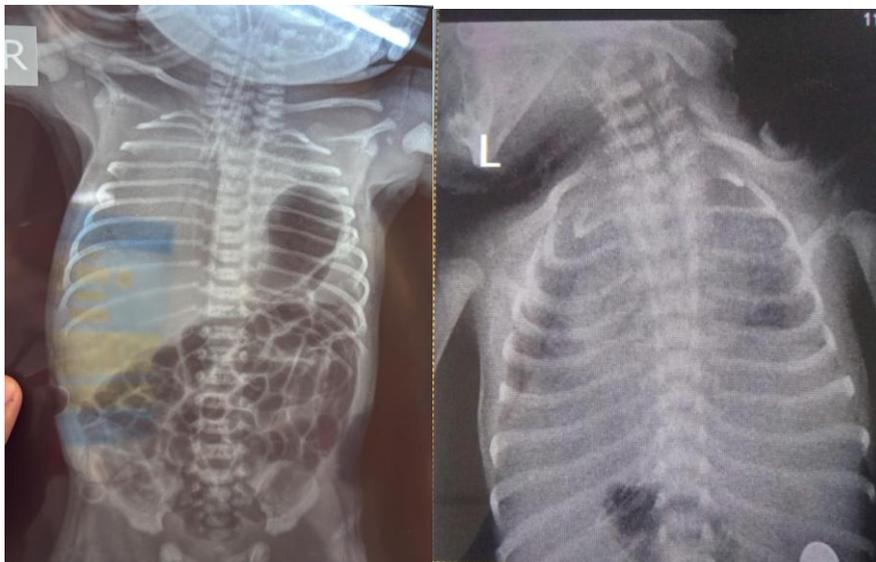


Figure 3. preop chest radiograph (PA view) showing elevation of left hemidiaphragm

Figure 4. Post op chest radiograph (PA view)

2. DISCUSSION

Diaphragmatic eventration results from congenital muscular aplasia or phrenic nerve dysfunction, leading to abnormal elevation of the diaphragm⁵. In neonates, it commonly presents with respiratory distress and may radiologically mimic congenital diaphragmatic hernia².

Chest radiography is usually diagnostic; however, ultrasonography is helpful in differentiating an intact but elevated diaphragm from a true diaphragmatic hernia².

Surgical plication remains the treatment of choice in symptomatic neonates as it flattens and stabilizes the diaphragm, restores thoracic volume, and improves lung expansion and ventilation^{5, 6}. Early surgical intervention is associated with improved survival and better respiratory outcomes, particularly in preterm infants¹.

3. CONCLUSION

Eventration of the diaphragm should be considered in neonates presenting with respiratory distress and an elevated hemidiaphragm on imaging^{1, 4}. Diaphragmatic plication is a safe and effective treatment modality, resulting in lung re-expansion and favourable postoperative recovery. With advances in minimally invasive surgery, selected cases may also be managed using video-assisted thoracoscopic or robotic techniques^{5, 6}.

REFERENCES

- [1] Kocakusak A, Arikian S, Senturk O, Yucel AF. Diaphragmatic eventration: A rare cause of respiratory distress in the newborn. *J Pediatr Surg*. 2004;39(5): E11–E13.
- [2] Ramesh JC, Ramachandran P, Sabitha S, Kumar VK. Congenital diaphragmatic eventration: Spectrum of presentation and management. *Indian J Pediatr*. 2013;80(6):491–495.
- [3] Cogo PE, Simonato M, Verlato G, Ori C. Congenital diaphragmatic eventration associated with congenital cytomegalovirus infection. *Pediatr Pulmonol*. 1997;24(1):52–54.
- [4] Dutta S, Gupta DK. Congenital diaphragmatic eventration: An uncommon cause of neonatal respiratory distress. *J Neonatal Surg*. 2014;3(2):23.
- [5] Gasior AC, St Peter SD, Knott EM, Ostlie DJ. Eventration of the diaphragm. *Semin Pediatr Surg*. 2013;22(4):204–208.
- [6] Brown SR, Horton JD, Trivette E, Hofmann LJ, Johnson JM. Congenital diaphragmatic eventration: A case series and review of the literature. *Int J Surg*. 2011;9(7):593–596.
- [7] Cutler GG, Cooper R. Eventration of the diaphragm. *Ann Surg*. 1923;77(4):443–458.

..