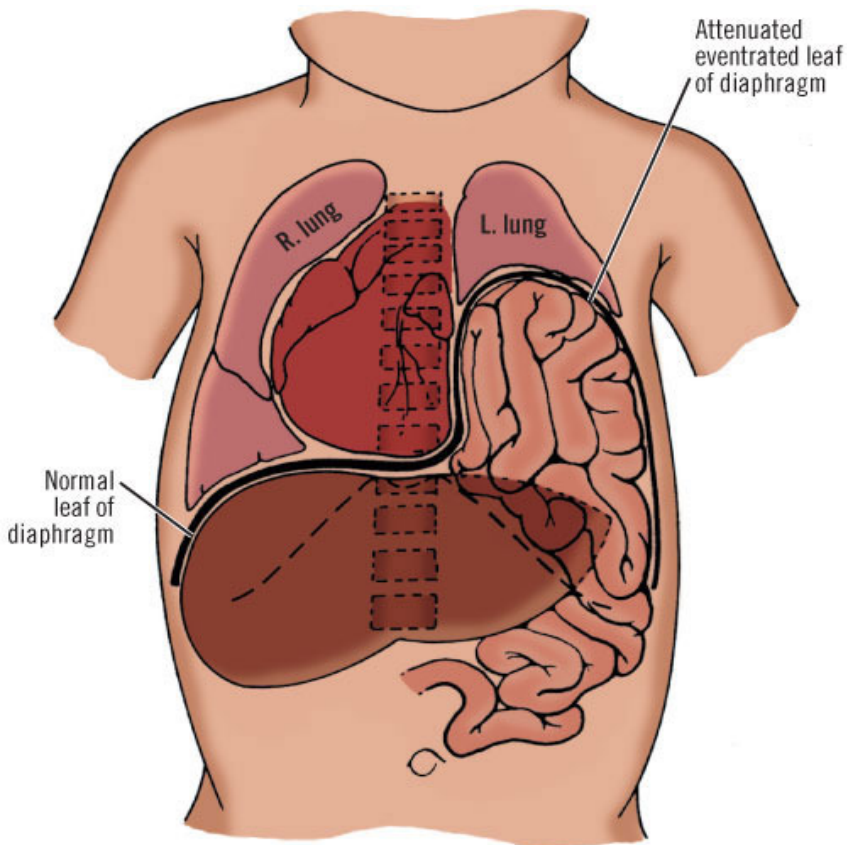


# Diaphragmatic Eventration



*Dr. Puram Srinivas*  
*PG 2<sup>nd</sup> Year.*  
*Dept. of Pediatrics.*

- Introduction
- Epidemiology
- Anatomy and Physiology of Diaphragm Muscle
- Etiology
- Pathophysiology
- Clinical Presentation
- Investigations
- Differential Diagnosis.
- Treatment options
- Conclusion

# Definition

- “The diaphragmatic eventration is the partial or total replacement of the diaphragm muscle by fibroelastic tissue causing the displacement of the hemidiaphragm.
- Despite this, the diaphragm maintains its continuity and continuity of its annexes to the costal margin”.

# Epidemiology

- It affects less than 0.05% of the population, both children and adults, and is more common in males.
- This abnormal elevation of the diaphragm can affect one or both hemidiaphragms.
- Unilateral involvement of the left hemidiaphragm is more common.

# Anatomy and Physiology of Diaphragm Muscle

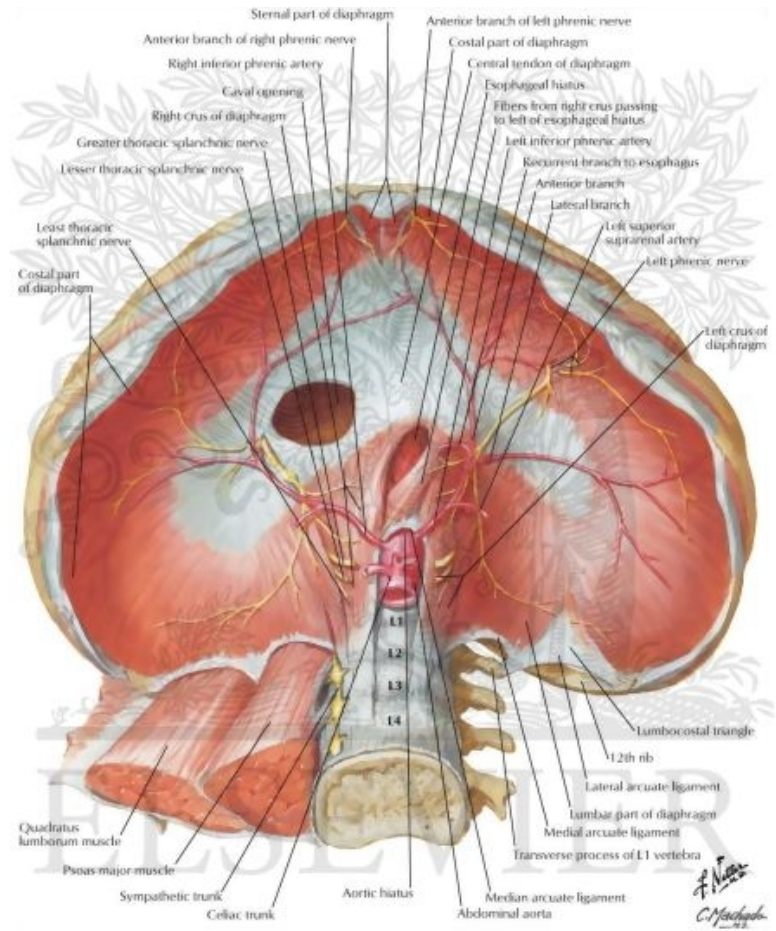
- The most important respiratory muscle is the diaphragm muscle.
- This is the boundary between the chest cavity and the abdominal cavity.
- It is essential for the normal functioning of respiratory mechanics because its contraction promotes air circulation in the lungs, through the reduction of the pleural pressure and expansion of the rib cage.

## Anatomy and Physiology of Diaphragm Muscle(cont')

- The diaphragm is made up of two components:
- The central tendon(Non contractile)
- Muscle groups(responsible for contraction).
- The muscle groups are divided in costal and crural and sternal.

# Anatomy and Physiology of Diaphragm Muscle(cont')

- The vascular supply is by the Phrenic artery a branch of abdominal aorta.
- Venous drainage to IVC.
- It is innervated by phrenic nerve that originates in the branches of C3, C4 and C5.



# **Etiology**

- Congenital defect
- Acquired



# Etiology(cont')

- Congenital defect, can be isolated or associated with other congenital anomalies.
- The defect may be in the diaphragm or due to the phrenic nerve.

# Etiology(cont')

- Acquired(Most commonly)
- It is most commonly due to nerve injury during traumatic birth or
- Thoracic surgery for the correction of congenital heart disease.

# Pathophysiology

- This will result in a very thin membrane and compliant diaphragm, which will lead to a decrease of the movements and even paradoxical movement, causing a poor lung expansion and decreased blood flow, generating a hypoxia mediated vasoconstriction.
- This elevation of the diaphragmatic dome to the chest also allows the protrusion of abdominal contents to the thoracic cavity.

# Clinical Manifestations

- The clinical presentation of diaphragmatic eventration has a variable spectrum depending on the type of eventration (whether total or partial) and the greater or lesser elevation and function of the diaphragmatic dome.
- In older children, the most common form of presentation is asymptomatic.

# Clinical Manifestations(cont')

- Respiratory distress(Most common)
- Recurrent respiratory infections
- Orthopnea
- Poor weight progression.

# Clinical Manifestations(cont')

- Newborns may present with potentially fatal respiratory difficulty, because of mediastinal deviation and pulmonary hypoplasia.
- Older children and adults may complain of digestive symptoms, such as abdominal pain, vomiting and flatulence.

# Investigations

- Chest x-ray(Confirmative).
- Ultrasonography to show diaphragmatic movement(minimal or paradoxical).
- Lung function tests.
- CT chest and other routine investigations( if required.)

- **Differential diagnosis for elevated hemidiaphragm on chest x ray**
  1. Causes above the diaphragm
  2. Causes within the diaphragm
  3. Causes below the diaphragm



# Causes above Diaphragm

- Phrenic Nerve Palsy
- Pulmonary collapse
- Subpulmonic effusion
- Inflammatory infiltrate in lungs
- Pulmonary Infarction
- Pleural disease (Haemothorax , empyema )
- Hemiplegia

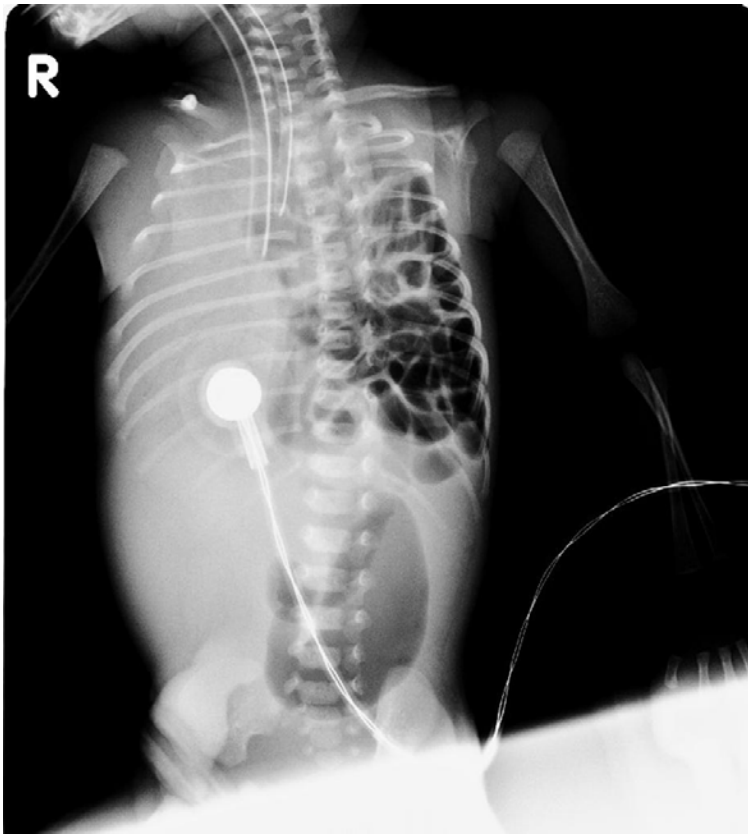
# Diaphragmatic Causes

- Eventration
- Diaphragmatic hernias
- Diaphragmatic tumors
- Diaphragmatic trauma

# Causes Below Diaphragm

- Gaseous distension of stomach and colon
- Subphrenic abscess
- Subphrenic mass
- Massive ascites

## Diaphragmatic hernia



## Diaphragmatic eventration



# Treatment options

- **Diaphragmatic plication** is a standard technique to treat diaphragmatic eventration
- Trans peritoneal approach
- Trans thoracic approach.
- Recently through minimally invasive technique, either laparoscopic or thoracoscopic.

- **Aim of this procedure is:**
- To increase the thoracic volume and vital capacity
- Reduce the paradoxical movement of the diaphragm.
- Minimizing the clinical manifestations and making more efficient ventilation.

# Conclusion

- When a child presents with recurrent respiratory tract infections differential diagnosis of eventration should be kept in mind.
- Plication of the diaphragm is the treatment of choice.
- In the present case also the left eventration of the diaphragm was successfully treated with plication.
- The child is asymptomatic and on regular follow up.

**THANK YOU**