



A CASE REPORT ON LEFT DIAPHRAGMATIC EVENTRATION

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ABSTRACT:

Diaphragmatic eventration is a rare congenital developmental defect of the muscular portion of the diaphragm. It results in abnormal myoblast migration to the septum transversum and the pleuroperitoneal membrane. Diaphragmatic eventration can be unilateral or bilateral, partial or complete. It is commonly seen in males, and involves more often the left hemidiaphragm. It results in cephalad displacement. Most adults are asymptomatic and the diagnosis is incidentally made by chest x-ray and ultrasound. The common symptoms in the adults are dyspnea, orthopnea, mild hypoxemia, respiratory alkalosis, palpitations, and some gastrointestinal symptoms. Surgery is only performed if the patient having severe symptoms. The choice of surgical treatment is diaphragmatic plication.

KEY WORDS: Diaphragm; Diaphragmatic eventration; diaphragmatic plication.

BACKGROUND:

The dome-shaped muscle known as the diaphragm divides the abdomen from the chest. It also acts as a mechanical partition between the thoracic and abdominal chambers. Diaphragmatic eventration is the term used to describe an irregular shape of the diaphragmatic dome without a break in the continuity of the diaphragm. In diaphragmatic eventration, fibroelastic tissue replaces muscle in a section or the entire diaphragm. Diaphragmatic eventration, which sustains the "unbroken continuity" of the diaphragm and its usual attachments to the dorsolumbar spine, the lower ribs, and the sternum, is a congenital developmental anomaly of the muscular part of the

diaphragm. The abnormal myoblast migration to the pleuroperitoneal membrane and septum transversum has been implicated for it. ⁽¹⁾

CASE DESCRIPTION:

A 37 years old female was apparently normal 6 months back, after which she developed diffuse abdominal pain, sudden in onset, progressive, intermittent with no aggravating and relieving factors, loss of appetite, loss of weight and constipation. She was brought to casualty and got admitted to female surgery ward for further management. On examination, the patient having the following impressions – umbilicus central and inverted, presence of LSCS scar, presence of mild tenderness over the left hypochondrium and bowel sounds present. Following investigations were performed to rule out the diagnosis and cause, such as Computed Tomography – Abdomen (MRI) and USG abdomen. The CT – Abdomen report shows that multiple hepatic lesions, hepatic hemangiomas, eventration of left hemidiaphragm with contralateral mediastinal shift and passive consolidation of left lower lobe and the patient was diagnosed with left diaphragmatic eventration. The patient was advised for surgical management. Patient underwent the surgical procedure of laparoscopic left hemidiaphragmatic plication under spinal anesthesia and left side ICD was placed at 5th intercostal space at anterior axillary line. The patient was hospitalized for 1 month. Nursing care were provided to the patient.

DIAPHRAGMATIC EVENTRATION:

Diaphragmatic eventration is also known as diaphragmatic paralysis. Diaphragmatic eventration is the abnormal elevation and protrusion of a portion or entire hemidiaphragm due to a lack of nerve or muscle function while maintaining its anatomical attachments. It can be congenital or acquired, both the pediatric and adult populations are commonly affected. Diaphragmatic hernia and diaphragmatic eventration are not same. Diaphragmatic hernia is due to a defect in the diaphragm. An eventration is due to a thinned diaphragm with no central muscle. It results due to abnormalities of the neuromuscular axis between the spinal cord and the diaphragm. It has two types – unilateral eventration and bilateral eventration. ⁽²⁾

INCIDENCE:

- ❖ Diaphragmatic eventration is rare, being more common in males.
- ❖ It can be unilateral or bilateral, but it usually involves the left hemidiaphragm.
- ❖ It can be congenital or acquired, and commonly affect both the pediatrics and adults.
- ❖ 7–35 people per 100,000 people have asymptomatic congenital diaphragmatic eventration. ⁽¹⁾

RISK FACTORS:

The risk factors are lung consolidation, diaphragmatic hernia and phrenic nerve palsy, pleural effusion in the subpulmonic, pulmonary mass, traction damage and iatrogenic harm brought on by thoracic surgery. ⁽²⁾

CAUSES:

Diaphragmatic eventration can be caused by congenital and acquired causative factors. In congenital causes – may be phrenic nerve agenesis is present from birth, aberrant muscularization results from the diaphragm's myotomes failing to migrate to a certain region. In acquired causes are phrenic nerve paralysis caused by trauma, surgery, or birth trauma (most common cause). ⁽²⁾

LOCATION:

While acquired eventration is usually found in the left hemidiaphragm, congenital eventration is frequently detected in the anteromedial region of the right hemidiaphragm. The left hemidiaphragm is where total eventration is most frequently observed. ⁽³⁾

CLINICAL MANIFESTATIONS:

- Breathing problems - Mild exertional dyspnea (Particularly after physical activity or when resting down coughing)
- Chest pain
- Recurrent pneumonias
- Cardiac arrhythmias
- Generalized muscle fatigue

DIAGNOSIS:

- **History collection:** Collect history regarding previous surgical history, personal history, etc.
- **Physical examination:** Respiratory muscle strength can also be assessed by the sniff test, where the velocity of muscle contraction correlates with muscle strength.
- **Chest X-rays / Chest CT scan:** The diaphragm will be seen in its entirety on a chest CT scan, with the muscle on one side (either the left or right) being inflated. (FIG.1)



FIG.1: Chest X-Ray report of Left diaphragmatic eventration

- **Fluoroscopy:** To observe the diaphragm's motion.
- **Computed Tomography:** To rule out the internal tumors or cancer as the source of the paralysed diaphragm.
- **Pulmonary Function Test:** To evaluate the functioning capacity of the lungs. Pulmonary Function Testing along with maximum inspiratory pressure (MIP), maximum expiratory pressure (MEP).⁽³⁾

TREATMENT:

There is no medication that can treat eventration. When the issue is problematic, surgery is usually performed. Although surgery is the primary method of treatment for this diaphragm eventration, the surgical management are dialectical plication and hemidiaphragmatic plication. ^(8, 9, 10)

NURSING CARE:

- The patient must be carefully observed and observe the patient's vital signs.
- To assess cardiac arrhythmia, it is required to note changes in the ECG pattern.
- Keep an eye out for symptoms and signs of diaphragmatic eventration.
- Assist the patient with correct respiratory care as needed.
- Promote spirometry and breathing exercises - it include deep breathing exercise, this helps to **strengthen the diaphragm** and helps the respiratory muscles to function efficiently.
- Discard the possibility of diaphragmatic eventration-related problems.
- Patients should be monitored postoperatively, and the frequency of follow-up is variable depending on symptoms or complications. Follow-up tests may include PA/LAT chest X-rays and pulmonary function testing.

COMPLICATIONS:

- Severe respiratory distress
- Heart failure
- Respiratory failure

PROGNOSIS:

After surgical procedure, the long-term prognosis was better. For severe symptomatic patients who are in mechanical ventilator support before surgical procedure, diaphragmatic plication can help to weaning off from the mechanical ventilator support.

CONCLUSION:

Diaphragmatic eventration is a condition in which the diaphragm is positioned in an abnormally high position due to lack of muscle or nerve dysfunction. The muscle does not contract and causes abnormal placement that results in breathing difficulty. The treatment option is diaphragm plication involves surgically repositioning the diaphragm so that there is sufficient space for the lungs to breath normally. Adequate nursing care helps the patients to regain their normal health status.

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