

Case Report: Eventration of Diaphragm of Unknown Cause

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Abstract: *This case of diaphragmatic eventration sheds light on how a seemingly silent anatomical anomaly can evolve into a critical respiratory concern when combined with lifestyle factors such as chronic tobacco use. It is evident that while most patients remain asymptomatic for years, the condition can suddenly manifest through severe dyspnea once pulmonary mechanics are compromised. This report of a 67-year-old man with left-sided diaphragmatic eventration illustrates the importance of timely radiological evaluation and tailored surgical management. The patient's progression-from subtle discomfort to significant breathlessness-demonstrates how diaphragmatic dysfunction can mimic restrictive lung disease. The surgical intervention through laparoscopic plication not only improved respiratory capacity but also highlighted the advantages of minimally invasive procedures in elderly patients. This suggests that early recognition, coupled with individualized surgical decision-making, can significantly enhance postoperative outcomes and quality of life. That said, it also calls for greater awareness among clinicians to consider diaphragmatic eventration as a differential diagnosis in unexplained respiratory distress, particularly in long-term smokers.*

Keywords: Diaphragmatic eventration, laparoscopic plication, restrictive lung disorder, respiratory dysfunction, case study

1. Introduction

Diaphragmatic eventration is a congenital or acquired abnormality in the muscle of diaphragm which gets loosen so that the abdominal content gets to the thoracic cavity by bulging but the continuity of the diaphragm is maintained. Most of the patients are asymptomatic but if symptoms present then also the diagnosis is made after elimination of all the other differentials. The investigations used are USG, CXR and CECT of the abdomen. The treatment of the DE is usually wait and watch but if the patient is symptomatic then the operative options are VATS, laparoscopic or robotic surgery.

2. Case

A 67 years old patient presented with a complaint of severe breathlessness for 2 months. He was asymptomatic 2 months back then patient developed breathlessness which was associated with tachypnea and tachycardia with no associated history of weight loss, constipation, burning micturition, vomiting, diarrhea.

Pt has no p/h/o major surgery or trauma. Patient has no significant family history. Personal history of smoking bidi for 40 years and consuming Tobacco for 40 years.

On examination the patient has mild tenderness and decreased chest movement over left side. Over auscultation the patient had decreased air entry in the left lung.

Further radiological investigation, chest x-ray revealed the abnormal bulge under the left diaphragm. USG thorax and abdomen reveal left sided CP angle blunting with underlying left lung atelectasis. CECT scan (thorax and abdomen) shows eventration of left hemi-diaphragm with stomach, tail of pancreas, splenic flexure noted within thoracic cavity atelectatic changes noted involving left lobe, but no definitive evidence of diaphragmatic defect is noted. The patient has

undergone the spirometry test that revealed the restrictive pattern of lung disorder.



After optimization by spirometry exercise and chest physiotherapy, chest up position, nebulization and oral antibiotics.

Patient was undergone laparoscopic surgery which was diaphragmatic plication using stratifix no.1 & no.1 chest tube was inserted over left.



The chest tube was removed on day-3rd (as the discharge has been significantly low and patient has been recovering well since the surgery) then the patient was discharged on 6th post op day with 4 days of oral antibiotic course.



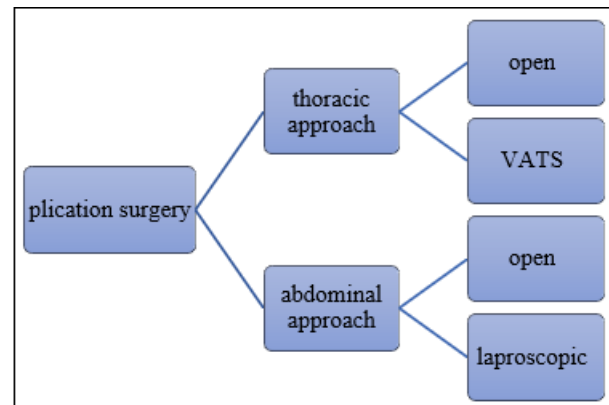
3. Discussion

Diaphragmatic eventration is a pathological condition defined by a permanent elevation of a immobile hemi-diaphragm that cannot participate in active respiration (Fischer's). The defect can be unilateral, localized or bilateral. It can be congenital (10 in 100,000 live births), as failure of muscularization of hemi-diaphragm or acquired (1 in 10,000 or 1 in 13,000), as trauma to the phrenic nerve causing the neuromuscular degeneration to diaphragm. DE is more common in males with mean age of 41.86 yrs and affects the left hemi-diaphragm more frequently. Moreover, 88-97% of the cases with hemi-diaphragm agenesis involves the left sided agenesis. Our patient here is classical of left sided hemi-diaphragmatic eventration.

Most of the patients remains asymptomatic for long time, however, symptomatic patients usually have the chest pain, dyspnea, orthopnea, or recurrent pneumonia. Additionally, the patients may also complaint of non-specific GI symptoms such as nausea, vomiting, blenching dyspepsia, and epigastric discomfort. In our case, the patient is symptomatic with dyspnea-like symptoms as he is chain smoker for 40 years and along with the diaphragmatic eventration causing the pulmonary collapse, breathlessness exaggerated and became symptomatic.

Chest radiology is the most common initial radiological investigation in which the continuous diaphragm differentiates it from the diaphragmatic herniation. In our case, the patient had abnormal elevation of left hemi-diaphragm, which was then differentiated and confirmed using the CECT. The etiology of the eventration of the diaphragm either congenital or acquired, couldn't be known as there is no history of any trauma or past surgery causing injury to the phrenic nerve.

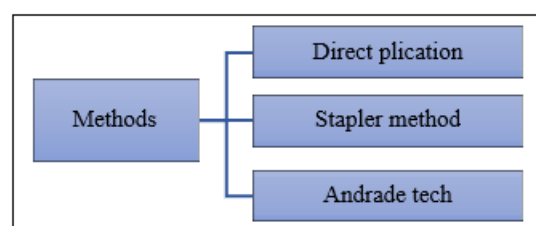
Usually, the patients are asymptomatic so there is no requirement of surgical management and symptomatic and definitive treatment of eventration of diaphragm is surgical plication of diaphragm. The available options are:



Abdominal approach to plication is

- Ability to utilize dual lung ventilation
- The avoidance of injury to the lung parenchyma from retraction tech.
- Larger operative space in which to work
- Less risk of the abdominal viscera which are not visible in thoracotomy approach
- Larger freedom of the trocar movement than of the thoracoscopy.

Laparoscopic plication of DE can be achieved using the single lumen ET tube with the patient supine in reverse Trendelenburg position (typically with the 4 ports). According to the Andrade tech., hook electrocautery is used to make the small hole in the affected diaphragm, inducing an ipsilateral pneumothorax, this equalizes the pressure in the pleura and the peritoneum that pushes the diaphragm in the peritoneum away from the lung parenchyma. After invagination or retractions, the diaphragm plication performed using non-absorbable sutures. In case of suture retraction, no further interventions or pleural tube is required. If the hole in the diaphragm is created prior to plication, the plication is done in such a way that, as to incorporate the hole in the repair and a small thoracostomy tube is added for 24 to 48 hrs.



4. Conclusion

Any patient with severe unexplained breathlessness and deterioration of the lung function especially of restrictive pattern then the evaluation of diaphragmatic eventration should be made and should be treated according to the patient and surgeon's choice of approach and tech. so that to avoid the further deterioration in the lung function.

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