



## RIGHT SIDED DIAPHRAGMATIC EVENTRATION: A RARE CASE REPORT

## Respiratory Medicine

**Dr. Pardeep Kumar**

Senior Resident, Department of Respiratory Medicine, Kalpana Chawala Govt. Med. College, Karnal-132001.

**Dr. Rekha**

Consultant Radiologist, Oscar Superspeciality Hospital and Trauma Centre, Sonapat, Haryana, 131001.

**Dr. Gopal Purohit**

Sr. Prof, Department of Respiratory Medicine, Dr. S.N Medical college, Shastri Nagar, Jodhpur, 342001.

## ABSTRACT

**Introduction:** Eventration of hemidiaphragm is defined as the permanent elevation of all or part of the diaphragm, without defects of continuity in which the involved muscles of the diaphragm are being replaced partly or in full by a fibro membranous sheet. Incidence of congenital eventration is 1 in 10,000. Complete and partial eventration both can occur. Complete eventration of the right hemidiaphragm with asthma in an adult female, as presented in this patient, is rarely seen.

**Case Presentation:** A middle aged female presented with complaints of dyspnea and dry cough. Chest examination revealed decreased movements and breath sounds on right side in inframammary, infraaxillary, and infrascapular areas along with bilateral wheeze. Plain Chest radiograph followed by CT thorax was done which revealed an elevated right hemidiaphragm. Possibility of diaphragmatic eventration and paralysis was made. Later on, fluoroscopic sniff test was performed.

**Discussion:** Patients are generally asymptomatic however obese patients are usually symptomatic. Conventional chest radiography has been found to be a useful modality for assessment of the functional status of an elevated diaphragm as the evaluation of the shape of an elevated diaphragm may preclude the need for fluoroscopic sniff test. However, fluoroscopy is necessary to confirm between diaphragmatic paralysis and eventration.

**Conclusion:** It is difficult to distinguish diaphragmatic eventration from paralysis clinically. In our case, diagnosis was made based on radiological findings and confirmed by nerve conduction study. Patients are managed conservatively but symptomatic patients require surgery.

## KEYWORDS

## INTRODUCTION:

Eventration of the diaphragm is defined as the permanent elevation of all or part of the diaphragm, without defects of continuity in which the involved muscles of the diaphragm are being replaced partly or in full by a fibro membranous sheet.

Pathogenetically, it can be either congenital or acquired<sup>1</sup>. Congenital eventration results from an abnormal embryogenic development of the muscle and in the acquired form the diaphragm is normally developed but the muscle is atrophic; caused by an injury to the phrenic nerve which is most commonly seen during instrumentation for delivery, abdominal surgery, or as a consequence of compression or tissue infiltrative injury due to neoplastic etiology.

Incidence is reported to be 1 in 10,000 live births.

It is usually unilateral, may present at any age, and is more common in male. It can be of two types, partial and complete. Partial eventration is more common on the right side and the complete variety is common on the left side.<sup>2</sup>

Eventration of diaphragm is generally asymptomatic in adults. However, if symptomatic, dyspnea, with gastrointestinal (GI) symptoms may be noted if there is a migration of the abdominal viscera into the thoracic cavity.

The liver is an easily moulded structure. If, therefore, an area of diaphragm is fibrous, weak and stretched, the liver will have on it a bump in relation to that part of the diaphragm.

Chest radiograph is the screening modality of choice, but occasionally more complex investigative procedures like CT, USG, Fluoroscopy and may be necessary.

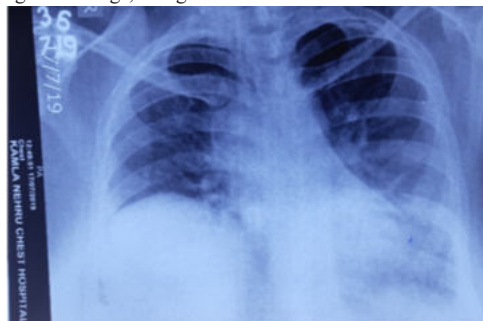
## CASE HISTORY:

A 30-year-old female presented to respiratory OPD with complaints of shortness of breath, cough without expectoration since 20 days.

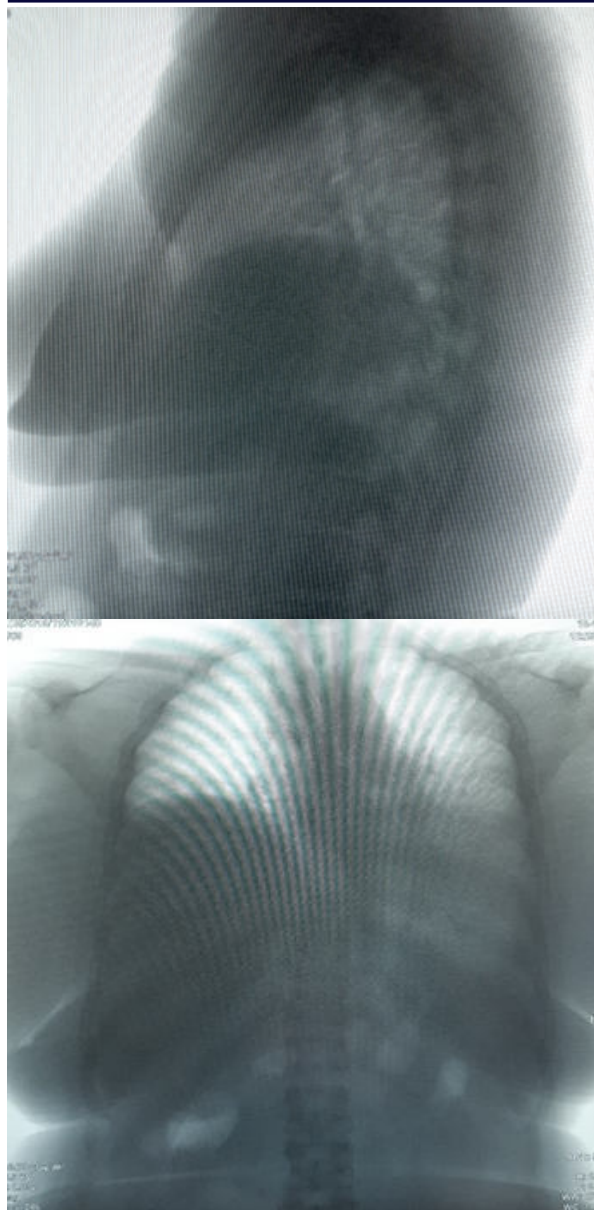
General physical examination was normal. The patient was afebrile during her stay in the hospital. The patient was obese and adequately nourished, with no significant history of any infection, trauma, or malignancy in the past. The patient had no history of tobacco chewing,

smoking, alcohol intake, or drug use. Nothing significant was noted in the family history. Chest examination revealed decreased movements on right side in inframammary, infra-axillary, and infra scapular areas. Tactile vocal fremitus was decreased and note was impaired on the right side. Breath sounds were decreased in the right inframammary, infra-axillary, and infra scapular areas. Bilateral wheeze was present.

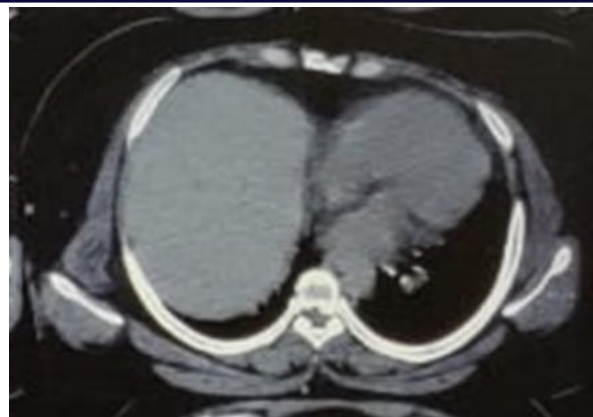
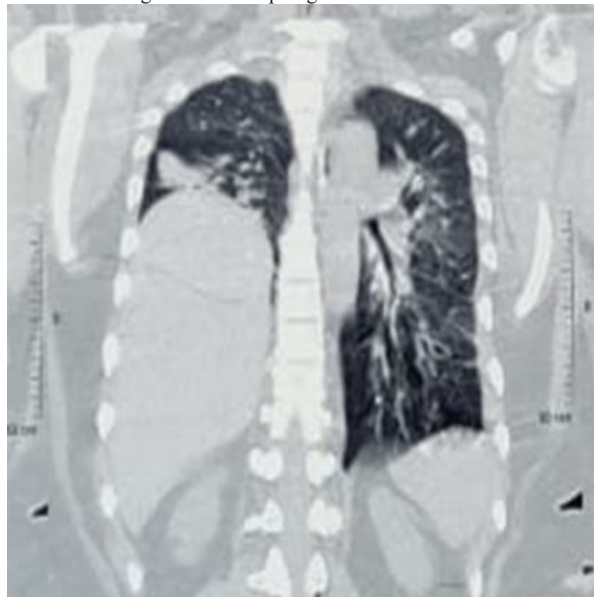
Laboratory investigations were within normal limits. Wbc's counts were slightly raised to 12560 cells per cubic millimeter of blood. Patient could not perform spirometry. Chest X-ray showed a homogenous opacity in the right lower zone. The upper margin of the opacity was sharp and had a contour of a diaphragm on posterior-anterior (PA) view which was further confirmed with a right lateral view. This increased our suspicion of raised dome of diaphragm. Fluoroscopy was performed with the patient in erect and supine position. There was no paradoxical movements of the right diaphragm which was confirmed on sniff test. In Ultrasonography, the diaphragm was seen as a continuous thin layer above the elevated abdominal viscera and there was no pleural effusion and movements of the right diaphragm were normal but lagging during respiration. CT scan of the chest revealed that right hemidiaphragm was raised as compared to the left side with a smooth contour. There was no herniation of abdominal contents into the thoracic cavity. The rest of the lung parenchyma was normal, with no evidence of altered attenuation, mediastinal lymph node enlargement, or interstitial diaphragm lung disease. With these radiological findings, a diagnosis of eventration of was made.



**Fig 1:** Chest X- ray postero-anterior view showing eventration of right dome of diaphragm.



**Fig 2:** Fluoroscopy right lateral and postero-lateral views showing eventration of right dome of diaphragm



**Fig 3:** CT scan of chest coronal and axial views showing complete eventration of right dome of diaphragm

#### DISCUSSION AND CONCLUSION:

Eventration of the diaphragm is defined as the permanent elevation of all or part of the diaphragm, without defects of continuity in which the involved muscles of the diaphragm are being replaced partly or in full by a fibro membranous sheet<sup>1</sup>. In adults it is very difficult or impossible to distinguish it from diaphragmatic paralysis. These entities can be distinguished radiologically. In adults the diagnosis of diaphragmatic eventration can usually be made on standard PA and lateral chest films<sup>3</sup>. In the PA projection, the elevated diaphragm forms a round unbroken line arching from the mediastinum to the costal arch. Conventional chest radiography has been found to be a useful modality for assessment of the functional status of an elevated diaphragm as the evaluation of the shape of an elevated diaphragm may preclude the need for fluoroscopic sniff test<sup>6</sup>. Fluoroscopic sniff test is considered the most reliable way to document diaphragmatic eventration<sup>5</sup>. Ultrasonography can help in establishing the diagnosis of diaphragmatic eventration and in distinguishing it from diaphragmatic paralysis. The diaphragm can be seen as a continuous thin layer above the elevated abdominal viscera and on real-time ultrasound the abnormal region can be seen to move downward with the normal portion although it may show a slight lag in its inspiratory excursion. In our case, diagnosis was made based on radiological findings and confirmed by nerve conduction study. Patients are managed conservatively but symptomatic patients require surgery.

#### REFERENCES:

1. Prasad R, Nath J, Mukerji PK. Eventration of diaphragm. *J Indian Med* 1986;84:187.
2. Seaton A. Abnormalities and Diseases of the Diaphragm. In: Seaton A, Seaton D, Leitch AG, editors. *Crofton and Douglas's Respiratory Diseases*. 5th ed. Blackwell Science, Oxford. 2000. p. 1234-49.
3. Deslauries J. Eventration of the diaphragm. *Chest Surg Clin North Am* 1998;8:315-30.
4. Laxdale OE, McDougall H, Mellin GW. Congenital eventration of the diaphragm. *N Engl Med* 1954;250:401.
5. Gierada DS, Slone RM, Fleishman MJ. Imaging evaluation of the diaphragm. *Chest Surg Clin North Am* 1998;8:237-80.
6. Verhey PT, Gosselin MV, Primack SL, Kraemmer AC. Differentiating diaphragmatic paralysis and eventration. *Acta Radiol* 2007;14:420-5.