

Right-sided Diaphragmatic Eventration: A Case Report

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Abstract

Background: Diaphragmatic eventration is a rare congenital developmental defect of the muscular portion of diaphragm resulting diaphragmatic elevation. Eventration can be unilateral or bilateral, partial or complete. It is more common in males, and involves more often the left hemidiaphragm.

Case Report: A 62-year-old man presented with complaints of chronic abdominal pain and dyspnea. In recent months, he suffered from an exertional dyspnea. With the radiological investigations, a diagnosis of eventration of right diaphragm was made and the diaphragmatic plication was done.

Conclusions: Complete eventration of diaphragm invariably occurs on the left side; but partial eventration of diaphragm occurs virtually on the right side, and is diagnosed based on different radiologic findings. In this case, complete eventration of diaphragm was seen on the right side which is a rarity.

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Introduction

Diaphragmatic eventration is a rare congenital developmental defect of the muscular portion of diaphragm (1). It has been attributed to abnormal myoblast migration to the septum transversum and the pleuroperitoneal membrane (2). On the other hand, it can be a result of paralysis, aplasia, or atrophy of varying degrees of muscle fibers. In some cases, it may be difficult or impossible to distinguish from diaphragmatic paralysis (3).

Eventration can be unilateral or bilateral, partial or complete. It is more common in males, and involves more often the left hemidiaphragm. Eventration results in diaphragmatic elevation (4). Most adults are asymptomatic and the diagnosis is incidentally made by chest radiography. The most common symptom in adults is dyspnea, while orthopnea, mild hypoxemia, tachypnea, respiratory alkalosis, palpitations, and nonspecific gastrointestinal symptoms may be present. Surgery is indicated only in the presence of symptoms (4). The established surgical treatment is diaphragmatic plication. Various techniques and approaches have been employed (5).

We report a case of 62-year-old man with right-sided eventration referring with abdominal pain and new-onset dyspnea.

Case Report

A 62-year-old man presented with complaints of

abdominal pain and dyspnea. About 8 month before, he had undergone a right-sided inguinal hernia repair and after that, he had a chronic abdominal pain in right side of the abdomen, especially in the right upper quadrant; and occasionally, used nonsteroidal anti-inflammatory drugs (NSAIDs) for suppressing the pain. He did not have nausea or vomiting, but had complained of chronic constipation. In recent months, he suffered from an exertional dyspnea without cough, fever, or sputum.

General physical examination was normal. Chest examination revealed decreased movements on right side in inframammary, infra-axillary, and infrascapular areas. Tactile vocal fremitus was decreased on the right side. Breath sounds were decreased in the right inframammary, infra-axillary, and infrascapular areas.

Laboratory investigations were within normal limits. 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 posteroanterior (PA) view (Figure 1) which was further confirmed with a right lateral view (Figure 2). This increased our suspicion of raised dome of diaphragm.

Computerized tomography (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. There was no evidence of any mediastinal lymph node enlargement (Figures 3 and 4). In addition, contrast study (barium enema) radiographies showed the colon hepatic curve in the

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right hemithorax below the diaphragm (Figure 5).



Figure 1. Chest X-ray on posteroanterior (PA) view showing eventration of right dome of diaphragm

With these radiological findings, a diagnosis of eventration of right diaphragm was made.

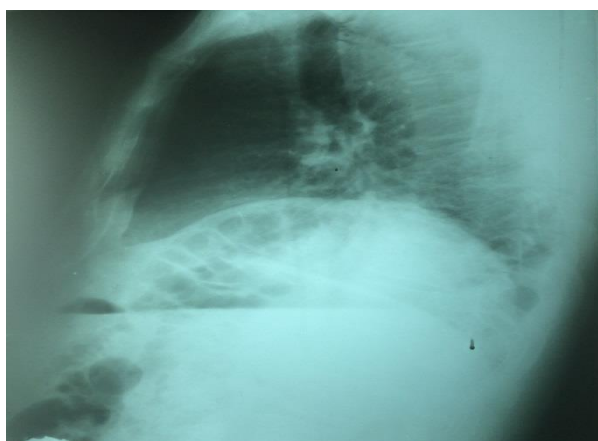


Figure 2. Chest X-ray on right-lateral view showing eventration of right dome of diaphragm

Then, the patient went under right hemidiaphragm plication and discharged with good general condition.

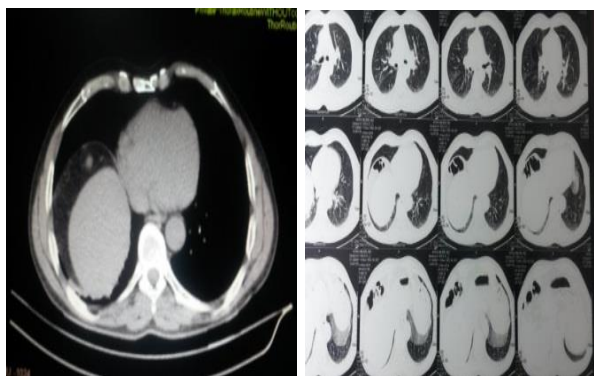


Figure 3. Chest computerized tomography (CT) scan on transverse view showing eventration of right dome of diaphragm



Figure 4. Chest computerized tomography (CT) scan on coronal view showing eventration of right dome of diaphragm

Discussion

Diaphragmatic eventration is a condition in which all or part of the diaphragm is largely composed of fibrous tissue with only a few or no interspersed muscle fibers. It is usually congenital but may be acquired (2).



Figure 5. Contrast study (barium enema) radiographies

Complete eventration of diaphragm invariably occurs on the left side but partial eventration occurs virtually on the right side (6). In this case, complete eventration of diaphragm was seen on the right side which is a rarity. Eventration of diaphragm is generally asymptomatic in adults and is discovered incidentally on normal screening of chest X-ray; but in the present case, the patient was referred with abdominal pain and dyspnea. Symptoms may be present in obese patients as a result of raised intra-abdominal pressure. These symptoms, related to gastrointestinal tract, respiratory embarrassment, and rarely cardiac dysfunction, have been attributed to the anomaly (4).

Elevation of diaphragm can also be attributed to interruption of phrenic nerve by neoplasm or surgical

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resection. 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. In the PA projection, the elevated diaphragm forms a round unbroken line arching from the mediastinum to the costal arch (7).

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 to determine diaphragmatic paralysis. CT scan and contrast study are also helpful for diagnosis. In the present case, a diagnosis of eventration of diaphragm was made based on radiological findings (8).

Ultrasonography can help in establishing the diagnosis of partial eventration and in distinguishing it from diaphragmatic nerve interruption. 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 (7).

Asymptomatic patients are managed conservatively; but patients with symptoms require surgery, as in the present case. Paradoxical movements suggest complete paralysis, and if symptomatic, is a strong indication of surgery (9).

Conflict of Interests

Authors have no conflict of interests.

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