

# Cough-induced Diaphragmatic and Abdominal Hernia in an Asthma Patient – A Case Report

Somnath Das<sup>1\*</sup>, Biplab Debbarma<sup>2</sup>, Ankita Debnath<sup>3</sup>, Pritha Das<sup>4</sup>, Sumitra Basuthakur<sup>5</sup>, Sukanta Sen<sup>6</sup>

## ABSTRACT

The list of complications of coughing is very long. Chronic cough as in asthma can affect every system in our body such as cardiovascular, gastrointestinal, neurological, musculoskeletal, and diaphragm. We report a case of 46-year-old male patient who was suffering from asthma for the past 15 years with occasional violent coughing. The X-ray of that patient was suggestive of pleural effusion which was misleading. A computed tomography scan of the thorax and the abdomen revealed the presence of diaphragmatic and abdominal hernia. The patient had no other history which can contribute to diaphragmatic injury except chronic cough. We found a chronic uncontrolled cough complicated with diaphragmatic and abdominal wall hernia.

**Keywords:** Cough, Hernia, Asthma

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## CASE REPORT

A 46-year-old male patient was referred from a peripheral hospital after a failed pleural tapping. The patient was complaining of cough and shortness of breath for the past 15 years. Cough was non-productive, persistent, more at night, associated with chest tightness, running nose, progressive with seasonal variation. Cough aggravated on cold and dust, smoke exposure. Cough was not associated with hemoptysis, hoarseness of voice, or fever. There is a history of occasional bouts of violent coughing at night. Cough was associated with shortness of breath for the same duration. Shortness of breath was insidious onset gradually progressive, increases with exertion, and relieved by taking medication. Shortness of breath is associated with wheeze. The patient also complained of recurrent episodes of running nose and nasal blockade. There was no history of trauma to the chest or abdomen or any major operation in the past.

On general examination, the patient is alert, conscious, and cooperative. There were no pallor, icterus, or cyanosis. Parameters recorded were pulse 92/min, blood pressure 148/92 mmHg, respiratory rate 24/min, SpO<sub>2</sub> 96% at room air, and temperature 99°F. Respiratory system examination found bilateral wheeze. In head to toe examination, the patient was found to have a swelling below the left scapula, in the lumbar region [Figure 1]. The swelling measured 5 × 5 cm, globular, soft, regular margin, non-tender, compressible, skin over the swelling appears normal without any dilated vein or redness, not fixed to the overlying skin, expansile impulse on coughing was present. X-ray shows homogenous opacity in the left side of lung, highest point toward axilla, blunting of the left costophrenic and cardiophrenic angle, suggested a pleural effusion [Figure 2]. The patient had a history of dry tap, so he was sent for CT scan of thorax.

CT thorax revealed a defect in the left-sided diaphragm. Through this defect, the abdominal content was herniating to the intrapleural space in the left side. The content of the hernia is omental fat [Figure 3]. CT abdomen revealed a hernia through the abdominal wall in the lumbar region [Figure 4]. On ultrasonography, the abdominal wall defect was visualized. A narrow neck found through which the hernia was communicating with the internal abdominal content [Figure 5]. The hernia was adjacent to the left kidney. A spirometry

<sup>1</sup>Associate Professor, Department of Pulmonary Medicine, IQ City Medical College, IQ City Road, Durgapur, West Bengal, India, <sup>2</sup>Associate Professor, Department of Radiodiagnosis, Tripura Medical College and Dr BRAM Teaching Hospital, Hapania, PO- ONGC, Agartala, Tripura, India, <sup>3</sup>Junior Resident, Department of Pulmonary Medicine, IQ City Medical College, IQ City Road, Durgapur, West Bengal, India, <sup>4</sup>PhD Scholar, Department of Human Physiology, Tripura University, Suryamaninagar, Agartala, Tripura, India, <sup>5</sup>Professor and Head, Department of Pulmonary Medicine, Medical College Kolkata, 88, College St, College Square, Kolkata, West Bengal, India, <sup>6</sup>Professor and Head, Department of Pharmacology, ICARE Institute of Medical Sciences and Research, Banbishnupur, Purba Medinipur, Haldia, West Bengal, India

**Corresponding Author:** Dr. Somnath Das, Department of Pulmonary Medicine, IQ City Medical College, IQ City Road, Durgapur - 713 206, West Bengal, India. E-mail: somnathpulmo@gmail.com

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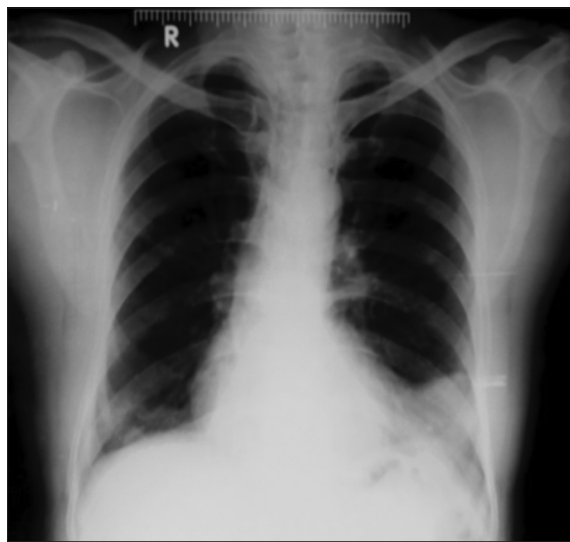
with bronchodilator reversibility test is done, which confirmed the presence of asthma. Hence, the patient was finally diagnosed as a case of asthma with allergic rhinitis, hypertension complicated with diaphragmatic and abdominal hernia.

## DISCUSSION

Although cough is a protective reflex, excessive coughing can affect adversely almost any system of our body such as cardiovascular, gastrointestinal, genitourinary, musculoskeletal, neurologic, ophthalmologic, psychosocial, and skin complications.<sup>[1]</sup> Musculoskeletal complication of cough includes rupture of rectus abdominis muscles,<sup>[2]</sup> rib fractures,<sup>[3]</sup> sternal wound dehiscence,<sup>[4]</sup> and diaphragmatic rupture.<sup>[5,6]</sup> During the process of cough, there

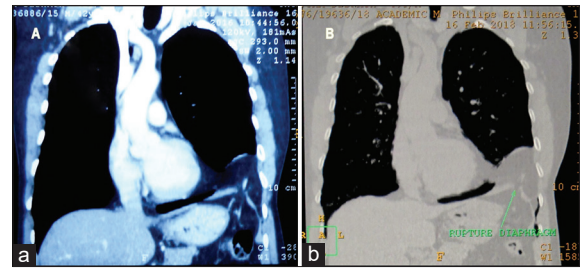


**Figure 1:** Swelling over the lumbar area, size of 5 x 5 cm

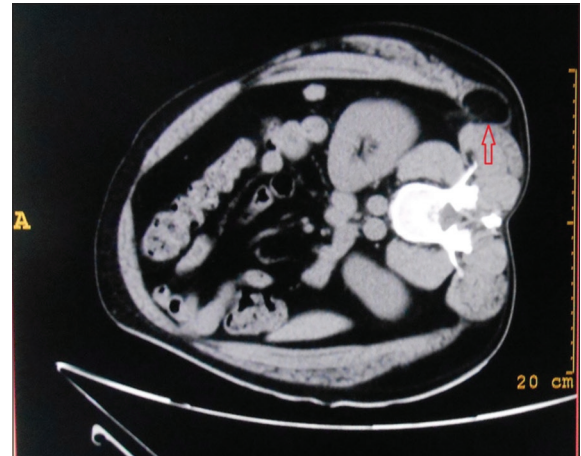


**Figure 2:** Chest X-ray posteroanterior view digital shows homogenous opacity in the left side of the lung in the lower zone. The costophrenic and the cardiophrenic angles are obliterated. The highest point of the opacity directed toward the axilla

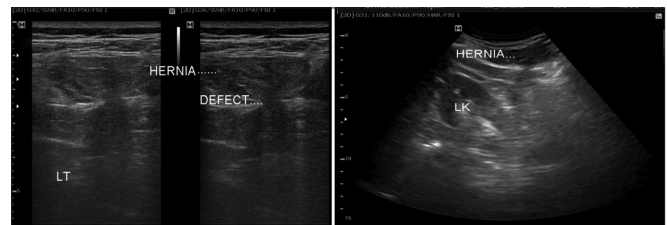
is increase in the intra-abdominal pressure. The intercostal muscles contracts such a way that the ribs move inward and downward. During cough, there is coordinated movement between the diaphragm, abdominal wall, and chest wall. It has been proved that sudden Valsalva maneuver during forceful expiration can cause lack of coordination between diaphragm and chest wall which contribute to the diaphragmatic rupture.<sup>[6-8]</sup> When there is a defect in the diaphragm, the abdominal content tries to escape through the defect and herniate to the thoracic cavity. In our patient, there is a history of chronic cough due to asthma and occasional violent coughing was also present. This contributed to the spontaneous diaphragmatic injury and followed by hernia. According to the literature, trauma is the most common cause of diaphragmatic rupture. The left-sided rupture is 5 times more common than the right.<sup>[6]</sup> Both blunt and penetrating injuries of the abdomen can cause diaphragmatic hernia. Among the rare causes of diaphragmatic hernia, cough has been reported in the literature.<sup>[9]</sup> In this case, the patient also has abdominal hernia.



**Figure 3:** a – Contrast-enhanced computed tomography (CT) thorax. b – Non-contrast CT showing defect in the left-sided diaphragm and herniation of the omental fat through the diaphragm



**Figure 4:** Computed tomography abdomen in the right lateral decubitus position showing herniation of abdominal content



**Figure 5:** Ultrasonogram abdomen shows the presence of hernia, a narrow neck found through which the hernia is communicating with the internal abdominal content. The hernia is adjacent to the left kidney

The patient often experiences pain over the site. The abdominal content herniated through a weakness in the abdominal wall. There is no history of previous injury or major surgery in this patient. This type of hernia more commonly seen in inguinal and femoral or umbilical region.<sup>[10,11]</sup> However, in this case, the patient had hernia in the lumbar region. As seen in ultrasonogram (USG), the hernia sac passed through a narrow neck. There is a chance of obstruction or strangulation. Chronic cough and frequent increase in the intra-abdominal pressure may contribute for the abdominal hernia.

### CONCLUSION

Few things to learn from this case are, to take a good clinical history and physical examination. Not to get biased by chest

X-ray mimicking a pleural effusion. Before putting a needle into the pleural space, it is wiser to confirm the fluid either by doing USG thorax or a CT scan where facilities are available. Finally, treatment of chronic cough should be done promptly to avoid the complication related to it. Diaphragmatic rupture is present, so it should be treated surgically. In acute case, a laparotomy should be done, while in old case, a thoracoabdominal approach may be necessary to prevent the complication of hernia.

## CONFLICTS OF INTEREST

There are no conflicts of interest.

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