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Case Report

Phantom Tumor of the Lung: A Radiological Masquerader of Pulmonary Mass Lesion

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Abstract

Background: Phantom tumor, also referred to as a vanishing tumor or pseudotumor, is a rare radiological entity characterized by localized transudative pleural fluid accumulation within a pulmonary fissure, most often associated with congestive heart failure. Its mass-like appearance on chest radiographs can closely mimic pulmonary neoplasms, potentially leading to unnecessary diagnostic procedures if unrecognized.

Case Presentation: We describe a 68-year-old male with a history of ischemic heart disease who presented with acute-onset breathlessness, orthopnea, and bilateral pedal edema. Chest radiography revealed a well-defined, homogeneous opacity in the right mid-zone, raising suspicion of encysted pleural effusion within the horizontal fissure. Electrocardiography demonstrated tachycardia with a right bundle branch block, while echocardiography revealed severe left ventricular systolic dysfunction. Following initiation of intravenous diuretic therapy for decompensated heart failure, repeat chest radiography subsequently showed complete resolution of the opacity, confirming the diagnosis of a phantom tumor.

Conclusion: Phantom tumor should be considered in elderly patients with congestive heart failure presenting with fissural opacities on chest radiographs. Rapid radiological resolution after diuretic therapy is pathognomonic and aids in avoiding unnecessary investigations and interventions.

Keywords: Phantom tumor, Interlobar effusion, Congestive heart failure.

Introduction

Phantom tumor or vanishing tumor refers to the localized accumulation of pleural fluid that is typically located within a pulmonary fissure and is most commonly seen in patients with congestive heart failure (CHF)[1]. These radiographic opacities can mimic pulmonary masses but typically resolve rapidly with diuretic therapy. Early identification is important to prevent unnecessary investigations. The present report describes such a case in an elderly male.

Case Presentation

A 68-year-old male presented to the emergency department with complaints of breathlessness and mild chest discomfort for one day. He was then referred to our department for abnormal opacity in the right lung field. His breathlessness was acute in onset, aggravated on lying down and accompanied by bilateral pitting edema. There was no history of fever, cough with expectoration, hemoptysis, or weight loss, etc. Past history was significant for ischemic heart disease with a documented myocardial infarction in 2009. He was a farmer by occupation, a smoker for the last 25 years, with a past history of adequate treatment for pulmonary tuberculosis 15 years back.

Vital signs revealed elevated blood pressure (144/88 mmHg), tachycardia (136 bpm), and oxygen saturation of 65% on room air with use of accessory muscles. On clinical examination, bibasilar crepitations were noted on auscultation. An ECG revealed tachycardia with a right bundle branch block

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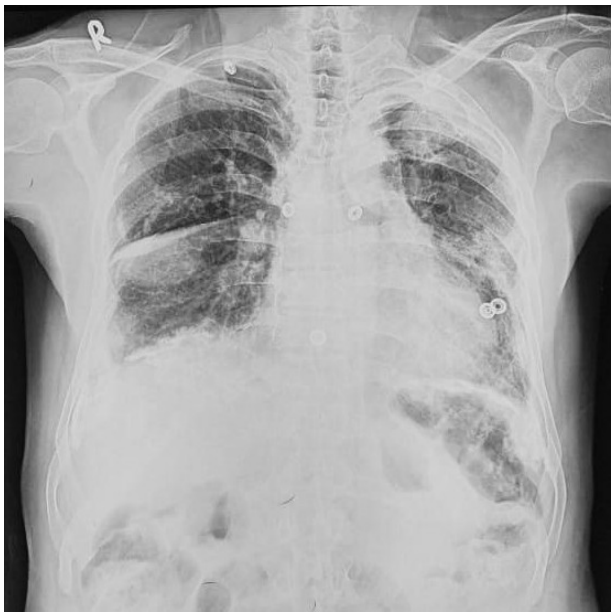

Figure 1: X-ray chest PA view showing a lenticular opacity in right lung field

(RBBB) pattern. 2D echocardiography showed grade-1 left ventricular diastolic dysfunction (LVDD), left ventricular ejection fraction (LVEF) of 35 to 40%, global left ventricular hypokinesia, left atrial enlargement, moderate left ventricular systolic dysfunction, and a dilated inferior vena cava (IVC) with >50% collapse. He was already on cardiologist treatment.

His initial chest X-ray (PA view) revealed a well-defined homogeneous lenticular opacity in the right mid zone along with bilateral patchy pleural calcifications. The right costophrenic angle was blunted. (Figure 1). On the subsequent day, the abnormal right lung opacity further increases in size with new reticular shadows in both lung fields (Figure 2). The appearance raised suspicion of encysted pleural fluid in the oblique fissure. Following initiation of parenteral diuretic

Figure 2: X-ray chest showing increase in size of opacity to a rounded shape in comparison to previous x-ray image

Figure 3: X-ray chest PA view showing complete resolution of the same opacity after diuretic therapy

therapy for heart failure, his subsequent chest radiograph demonstrated complete resolution of opacity, confirming the diagnosis of phantom tumor of the lung (Figure 3).

Discussion

Phantom tumors, also called vanishing tumors or pseudotumors, are rare but classic radiological findings that are most commonly seen in elderly male patients with CHF.[1] These are not true tumors but rather transudative fluid collections within the interlobar fissures, which appear mass-like on imaging. The diagnosis is clinched when the opacity disappears following administration of diuretics, confirming its fluid nature.

First reported by Stewart[2] in 1928 and called 'Interlobar Hydrothorax' by him, the exact incidence of phantom tumor is not known in view of only a few reports published in the literature. These are mostly seen in CHF, but may also be associated with fluid overload or other non-cardiac causes of right-sided heart failure, such as chronic renal failure, hypoproteinemia, etc. The exact mechanism of fluid collection in the fissure is not known, but possibly due to increased hydrostatic pressure on the right side lung interfering with venous and lymphatic drainage, resulting in right-sided transudative effusion. The previous pleuritis, causing obliteration of space around the fissure edges, prevents the spread of fluid and results in a collection within the fissure and giving rise to a rounded/lenticular/drop/oval-shaped opacity. Another mechanism proposed is the 'suction cup effect', i.e., increased elastic recoil of the lung with underlying atelectasis causing generation of retraction force, leading to fluid accumulation within the fissure.[3,4] Rarely, an exudative collection in the fissure due to underlying tuberculosis is also reported to result in a pseudotumor of the lung.[5]

The fluid collection in phantom tumors is mostly seen in the horizontal fissure, but may also be seen in the oblique fissure or rarely in both fissures. These are mostly single opacity seen on chest radiograph, but multiple phantom tumors are also reported.[6] A phantom tumor may also show relapse in cases with recurrent decompensated heart failure.

Differential diagnoses include pulmonary consolidation, loculated pleural effusion, and neoplasms (primary or metastatic), lung collapse, cyst, arterio-venous malformation, abscess etc.[7,8] However, the rapid resolution of the opacity with diuretics is pathognomonic for a phantom tumor.

Conclusion

This case underscores the importance of recognizing phantom tumors on chest imaging to avoid misdiagnosis, unwanted prolonged antibiotic treatment and unnecessary invasive interventions. A simple triad consisting of clinical background of heart failure, rounded opacity in relation to fissure on chest radiograph and disappearance of radiographic abnormality with diuretics on follow-up imaging is sufficient to confirm the diagnosis and avoid unnecessary treatment, investigations and interventions in this condition that is benign and reversible.

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