

Oval-Shaped Radiographic Opacity Mimicking a Lung Mass

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Abstract

Phantom tumor of the lung is an infrequent presentation of volume overload in congestive heart failure. This finding is often mistaken for a lung mass that leads to extensive workup and unnecessary treatments. A 75-year-old male was evaluated for a right lower lobe rounded opacity. A transthoracic echocardiogram showed normal left ventricular function. Biopsy of the mass was unremarkable. Patient was managed with diuretics, and subsequent lung imaging revealed resolution of the opacity.

Keywords

Dyspnea, Lung Mass, Interlobar Effusion, Diuresis, Heart Failure

1. Background

Localized lung effusion is an infrequent presentation of volume overload related to decompensated congestive heart failure (CHF). Radiographically, it may appear in the form of an opacity that resolves with CHF treatment. It has been described as vanishing tumor, pseudotumor or phantom tumor of the lung [1]-[9].

Fluid collection in the pulmonary fissure or interlobar region may cause a tumor-like appearance on the chest imaging hence the misnomer phantom tumor. This finding is often mistaken for a lung tumor that leads to extensive workup and unnecessary treatments. Apart from HF, other conditions including cirrhosis, hypoalbuminemia and renal failure may also present in the form of a mass-like effusion.

We report our experience of an interesting case of localized effusion, related clinical details, diagnostic workup, and management.

2. Case Report

A 75-year-old male presented to our hospital with two weeks of worsening exertional dyspnea. He did not have fever, chest pain, weight loss or night sweats. He had medical history of stage 3 chronic kidney disease, type 2 diabetes mellitus and hypertension. On physical examination, his vital signs were within limits. There were crackles over right lung lower lobe on auscultation. Heart sounds were normal and there was no jugular venous distension. Pitting edema of the legs was noted.

A 12-lead EKG revealed normal sinus rhythm with no notable abnormalities. A chest x-ray (CXR) showed right lower lobe (RLL) rounded opacity appearing like a lung mass. **Figure 1** a chest computed tomography (CT) showed a large 8 × 6 × 6.5 cm, rounded mass-like density in the RLL. **Figure 2** a transthoracic echocardiogram showed normal left ventricular ejection fraction (LVEF) of 60% - 65%, and mildly impaired LV relaxation. Pulmonology service was consulted for what appeared to look like a lung mass with suspicion of primary lung malignancy. Endobronchial ultrasound-guided bronchoscopic (EBUS) biopsy was performed for RLL mass.

He was treated with IV diuretics for possible HF with preserved EF. Patient's dyspnea and leg swelling resolved. N-Terminal pro-brain natriuretic peptide (proBNP) was elevated to 1100 pg/mL (<900 pg/mL for age 50 - 75). Pathology was negative for malignancy. A follow-up chest CT for 6 weeks later showed clearing of previously seen mass-like opacity suggesting resolution of the localized effusion (**Figure 3**).

3. Discussion

Our patient developed interlobar effusion that appeared like a mass on chest imaging prompting its biopsy. However, the same mass-like opacity resolved completely after diuresis. This has been reported as phantom or vanishing tumor in literature. Phantom tumor is a rare localized interlobar effusion observed in decompensated heart failure patients.

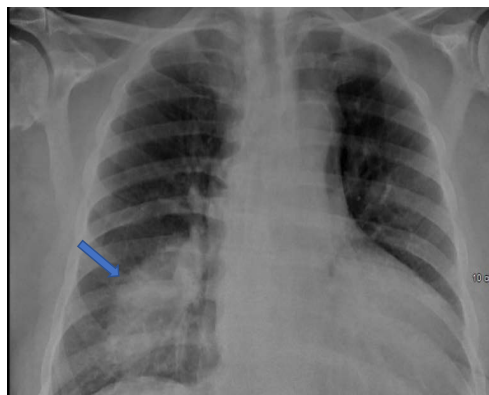


Figure 1. Chest x-ray reveals rounded opacity in right lower lobe (blue arrow) and cardiomegaly.



Figure 2. CT chest shows a nodule in the right lower lung on the first scan (a & b).

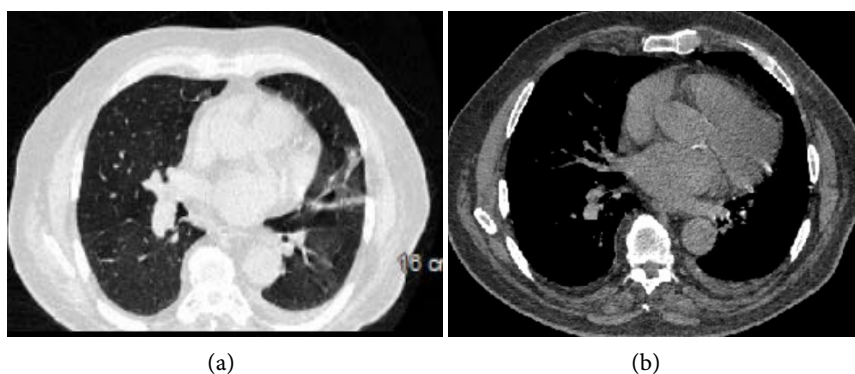


Figure 3. CT chest shows clearing of right lower lobe rounded opacity within 6 weeks (a & b).

Possible pathophysiologic mechanism for this presentation involves a local increase in elastic recoil of the atelectatic lung resulting in retraction force with subsequent fluid collection in the interlobar, interlobular or fissural areas [10] [11]. Pleural fluid accumulates faster when it exceeds the resorptive capacity of the pleural lymphatic drainage. Some reports have suggested pleuritis with adhesions and obliteration of the pleural space playing an important role in the pathogenesis.

Localized effusion most commonly involves minor and major fissures of the right lung. These patients present with heart failure symptoms including dyspnea, cough and sometimes leg edema [1] [2] [4]-[9]. A CXR or CT chest may reveal a rounded or oval-shaped opacity appearing like a mass. This may be mistaken for a lung tumor prompting invasive testing such as lung biopsies. However, diuretics can completely resolve these opacities within three days to six months as reported in literature [5] [6] [10]. A repeat imaging after diuresis shows clearing of the radiographic opacity.

Over the last 1 - 2 centuries, a few observational studies reported localized pleural effusion in decompensated HF patients. It was first described by Stewart in 1928 as mentioned in the report by D. Evan Bedford and J. L. Lovibond [12]. In the early observations, it was described as a sharply defined lemon-shaped

opacity on the radiograph particularly involving the right lung [12]. Very recent report observed it in the form of a localized encysted pleural effusion [13]. In another report, multiple tumor-like opacities were noted on chest imaging in a patient with HF, and all of these opacities disappeared within days of diuretic therapy [7].

In our patient, who primarily presented with HF symptoms, a single tumor-like oval shaped density was initially noted in the RLL on chest radiograph, this was confirmed on CT chest. However, due to its appearance highly suggestive of lung mass, pulmonology evaluation was obtained. EBUS biopsy was unremarkable for malignancy. For HF symptoms, patient was treated with diuretics that resulted in resolution of dyspnea and complete clearing of the tumor-like density on subsequent imaging.

In right clinical setting, aggressive diuresis and repeating a chest X-ray may be considered before proceeding with further invasive testing if Phantom tumor is suspected.

Although our report has significant inherent limitations by design, we ponder that our experience will help the readers in clinical and diagnostic assessment of this interesting presentation.

4. Conclusion

Phantom tumor may be considered in a patient with localized interlobar opacity and heart failure symptoms. A rapid disappearance of this opacity after diuresis may confirm the diagnosis. Therefore, prompt recognition will enable physicians to avoid unnecessary invasive interventions and treatments.

Informed Consent

The case was reviewed by the Institutional Review Board and informed consent was obtained from the patient.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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