

*Prikaz slučaja /  
Case report*

LUNG PSEUDOTUMOR, A RARE AND  
CONFUSING, VARIOUS RADIOLOGICAL  
AND CLINICAL PHENOMENON –  
*Case reports and review of literature*

PSEUDO TUMOR PLUĆA, REDAK I  
ZBUNJUJUĆI, RAZLIČITI RADIOLOŠKI I  
KLINIČKI FENOMEN -

*Prikazi slučajeva i pregled literature*

Biljana Lazović<sup>1</sup>, Ivana Blažić<sup>1</sup>, Jelena Kovač<sup>2</sup>, Radmila  
Dmitrović<sup>1</sup>, Rade Milić<sup>3</sup>, Sanja Šarac<sup>3</sup>, Vladimir Žugić<sup>4</sup>

<sup>1</sup> University clinical center “Zemun”, Belgrade, Serbia

<sup>2</sup> Clinical center of Serbia, Radiology Clinic, Belgrade, Serbia, University  
of Belgrade, Serbia

<sup>3</sup> Military Medical Academy, Clinic for pulmonology, Belgrade

<sup>4</sup> Clinic for lung diseases, Clinical center of Serbia, Belgrade, Serbia,  
University of Belgrade, Serbia

**Correspondence to:**

**Biljana Lazović**

University Clinical Center “Zemun”,  
Belgrade, Serbia

Vukova 9, Zemun, 11080 Belgrade  
Self-phone +381 62212040

e-mail: lazovic.biljana@gmail.com

**Key words**

congestive heart failure, pleural effusion;  
radiography; chest X ray, diuretics

**Ključne reči**

kongestivna srčana insuficijencija, pleu-  
ralni izliv, radiografija, rentgen grudnog  
koša, diuretici

**Abstract**

The term phantom tumor may be used to describe a well-demarcated nodule in lung, lacking transparency due to pleural effusion. Phantom tumors are generally associated with congestive heart failure that cause transudative pleural effusion within pulmonary fissures. Disappearance of the mass on the chest radiography following intensive diuretic therapy and heart failure regression reinforces the diagnosis of the lung pseudotumor. Appearances of phantom tumor of the lung may vary. Here, we present 4 cases with different manifestations.

**INTRODUCTION**

Pseudotumors commonly show up as incidental radiographic findings in patients with disorders associated with pleural effusions, particularly congestive heart failure. On chest X ray it resembles tumor, but its tendency to vanish rapidly after diuretic therapy, qualifies it as vanishing lung tumor or pseudotumor [1,2]. Typically, it is accidental finding, with no, small, or distinct symptoms by patient, depending on degree of heart failure [1,2,3].

The real incidence of this clinical manifestation is difficult to assess because of the small number of reported cases [3]. Here, we report four cases with different radiological occurrences.

**Case report one:** A 65-year-old male patient was admitted to the Emergency Department complaining to dyspnea, orthopnea and paroxysmal nocturnal dyspnea. He experienced shortness of breath progressing over the past two weeks. He denied cough and chest pain, but in last two days he had high body temperature, up to 38°C. The

patient's medical history included left ventricular failure with an ejection fraction of 30-35% (measured by echocardiography). He was subjected to bypass surgery 7 years prior, chronically using ASA, ramipril, furosemide and spironolactone. He was a lifelong smoker, using long acting muscarin antagonist, fixed combination of inhaled corticosteroid/beta agonist and short acting beta agonist as necessary.

During physical examination, his temperature was 37,5°C and he was mildly dyspneic. The chest examination showed dull auscultatory sound at the right side. The blood pressure was 110/70mmHg and heart rate was 85 beats/min. The peripheral blood leukocyte count was 23x 10<sup>9</sup>/L, with relative neutrophilia 89%. C reactive protein was 276 mg/L, while other parameters were within reference range. The posteroanterior (PA) chest radiogram showed pleural effusion on the right side and inflammatory changes on rest right lung apically [Figure 1A]. Patient was admitted to the hospital and received two antibiotics - ciprofloxacin and ceftriaxone along with his chronic cardiac therapy. We performed

pleural puncture and biochemical analysis showed transudate. We evacuated 2 liters of serous fluid. After 3 days, we conducted control chest radiogram [Figure 1B] and laboratory findings. Chest radiogram showed significant improvement in lung parenchyma as well as reduction of pleural effusion. Laboratory blood findings showed declining in leukocyte count  $12,7 \times 10^9/L$ , relative neutrophils 80% and C reactive protein was 123 mg/L. The patient felt better. Echocardiography was performed and showed left heart chamber enlargement, systolic dysfunction, ejection fraction of 25%, moderate mitral and aortic regurgitation, elevated pulmonary mean systolic artery pressure (42mmHg). Next, intensive intravenous (IV) loop diuretic therapy was started. After 48 hours a significant decrease in the pleural effusion was observed [Figure 1C]. We thus continued with intensive IV loop diuretics. Complete radiological regression occurred after 6 days of diuretics therapy [Figure 1D].

**Case report two:** An 80-year-old female patient was admitted to Emergency room with anamnesis of progressive dyspnea over the previous three months, with progressive worsening of symptoms and at admission productive cough with yellow sputum for 5-7 days and dyspnea at rest. The patient's medical history included hypertension, regulary using ACE inhibitors (lisinopril) and earlier pacemaker implantation due to bradycardia.

Patient's blood pressure on arrival was 160/95 mmHg, pulse was 96 bpm, respiratory rate was 20/min, oxygen saturation was 94% and body temperature was 37.5°C. Auscultatory finding showed reduced vesicular murmur in the right lung and normal sound on left side. Physical examination of cardiovascular system was normal and ECG record were unremarkable. The patient was a non-smoker. However, a PA radiography showed an enlarged heart shadow, calcified aortic arch, bilateral small pleural effusion, and two rounded 4×3 cm (tumor-like) opacity in the middle and lower zone of the right lung (Figure 2-A). She was admitted to the hospital for the evaluation of chest X-ray described changes. Laboratory findings, showed elevated tumor markers CEA and CA-125. Gynecologist was consulted and he excluded any kind of genital disease. On the third day of hospitalization, she was complaining about irregular heartbeats, ECG showed atrial fibrillation with chamber response of 140bpm. Cardiologist included Amiodarone infusion 900mg in 5% Glucose, after which she continued using Amiodarone per os three times per day, with ACE inhibitors, digoxin, loop diuretics and beta blockers. Echocardiography was performed and showed mild-to-moderate concentric hypertrophy of the left ventricle with diastolic dysfunction and ejection fraction of around 65–70%. The patient was introduced to intensive IV loop diuretic therapy. After two days, chest X-ray was done and exposed a homogeneous triangle of shadow in the middle pulmonary field on the right lung-significant decrease in the opacity (Figure 2B). We continued with intensive diuretic therapy and repeated chest X ray 5 days later, and it now presented homogeneous shadow-effusion in little incisura (Figure 2 C). In order to confirm the presence of fluid in little incisura, CT was performed, and reaffirmed phantom or vanishing tumor of the lung (Figure 2 D).

**Case report three:** A male patient aged 52 years, chronic passionate smoker at average 80 cigarettes/day, complaining about cough, shortness of breath and oedematous legs. He complained about progressive orthopnea and paroxysmal nocturnal dyspnea, which had started two weeks before admission. The patient had a history of untreated chronic obstructive pulmonary lung disease. Occasionally, he was taking diuretics for high blood pressure and he felt better afterwards. Apart from this, he had no other comorbidities.

His vital signs were in the reference range, and the only relevant finding in physical examination were basal mid-tone inspiratory crackles in the lower half of both lungs, as well as the third heart sound and bilateral leg oedema. Laboratory findings showed normal results. Electrocardiogram revealed sinus rhythm, heart rate 60/min, normal axis and a prominent P wave in standard leads D2 and D3.

On admission, chest radiogram showed an enlarged heart and a round tumour-like image in the right middle lobe. In addition, small bilateral pleural effusions were noted (Figure 3A). Computed tomography showed sharply circumscribed tumor shadow 4cm in diameter (Figure 3B).

The patient was treated with furosemide and ramiprile. After two days, his condition gradually improved. When medical therapy had been completed 5 days later, a control radiogram showed complete resolution of the opacity (Figure 3C). After the treatment, the 2-D transthoracic echocardiography was performed. It demonstrated left ventricular hypertrophy with moderately impaired left ventricular ejection fraction (LVEF 35%).

**Case report four:** A 70 years old male patient was admitted to Emergency Department due to extreme dyspnea. He suffered from diabetes mellitus type 2. Physical exam was within reference range, except crackles on right side. Laboratory findings were also within reference range. We performed chest X ray and it has showed lung pseudotumor in formation. We started with loop diuretic (40mg) intravenous and after two hours pseudotumor disappeared. Echocardiography showed concentric hypertrophic left chamber with EF 55%. (Figure 4 A, B). Patient was discharged on the same day.

## DISCUSSION

Effusions into the pleural cavity are frequent in different conditions but they may appear on radiographs during recurrent episodes of heart failure [4]. We have reported four different cases, which were resolved with loop diuretics. Phantom tumors are commonly found within the transverse fissure, less frequently within the oblique fissure, and at times within both [6]. Usually, finding is a sharply demarcated density (often in the right middle lung field, due to interlobar effusion) possibly interpreted as a malignant tumor of the lung [4,5]. It is more frequent in males and on right lung side with three quarters of the right transverse fissure and sporadically in oblique [7,8,9]. Attention to this form of pleural effusion is significant in the differential diagnosis of a pulmonary mass on radiography.

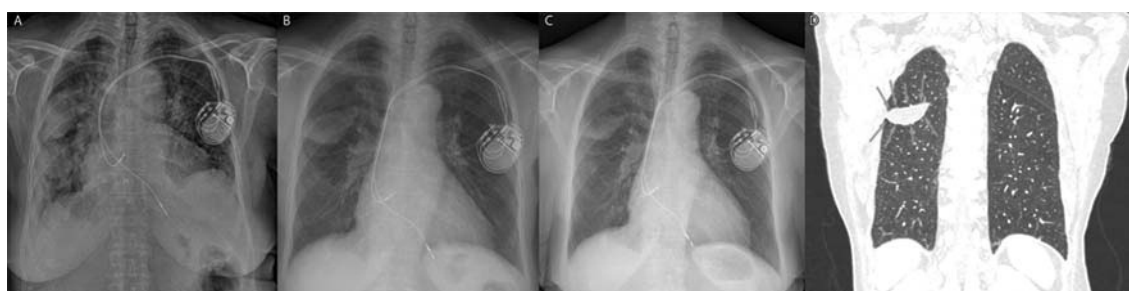
It is not obligatory that phantom tumor must be locular with sharp edges. The radiological instances of the phantom tumor are inconsistent, depending on the volume of septated liquid and its location and condition of heart. Sometimes,

phantom tumor (when it's small) is the first sign of heart failure [9]. It is important and one should bear in mind that in patients with left sided radiological change in transverse or oblique fissures and anamnesis of heart failure the applica-

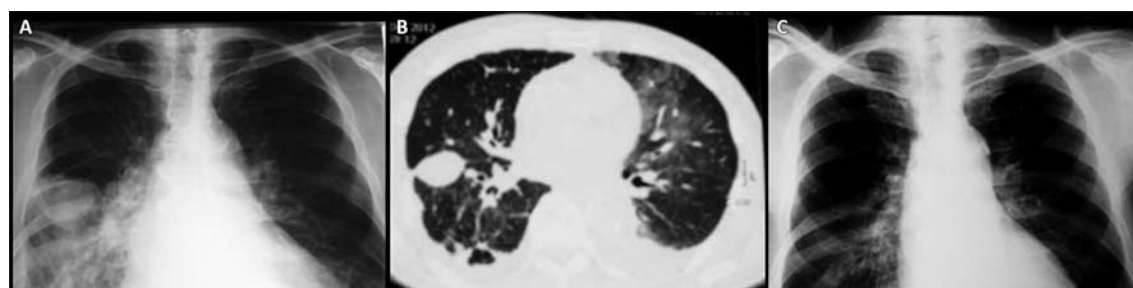
tion of diuretics may contribute to avoid unnecessary diagnostic procedures that could be committed in investigation of pulmonary nodule.



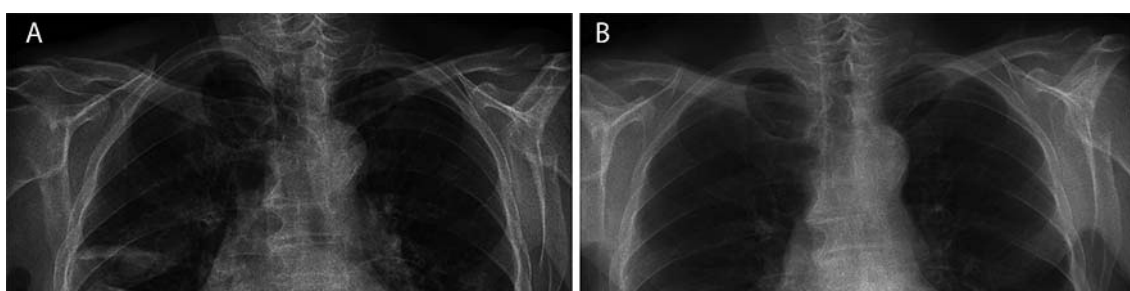
**Figure 1.** A: PA chest X-rays show at admission showing a massive pleural effusion, enlarged cardiac silhouette and inflammatory changes in upper parts of right lung; B: PA chest X-rays show resolving pleural effusion and inflammation; C: PA chest X-rays show a well-delineated phantom tumor of the lung and complete resolution of inflammations; D: Complete radiological resolution after six days of treatment for congestive heart failure



**Figure 2.** A. Chest radiograph posteroanterior view showing rounded two 4×3 cm opacity in middle and lower right lung and pace maker in left lung; B. a homogeneous triangle of shadow in the middle pulmonary field on the right lung; C. homogeneous shadow-effusion in little incisura; D) verified effusion in the lung incisura on computed tomography



**Figure 3.** A. PA chest radiography showed sharply marginated opacity in the right middle fissure; B. CT described dense rounded silhouette in right mid zone 4,5cm in diameter; C. normal chest X ray after intensive diuretic therapy



**Figure 4.** A. Pleural effusion in little incisura of the lung (phantom tumor in forming); B. Complete resolution of effusion

### Sažetak

Termin fantom tumor se može iskoristiti da opiše dobro ograničen čvor u plućima u odsustvu transparentnosti prema pleuralnom izlivu. Fantom tumori su uglavnom udruženi sa kongestivnom srčanom insuficijencijom koja prouzrokuje transudativni pleuralni izliv unutar plućnih fisura. Nestanak ove mase na radiografiji grudnog koša usled intenzivne terapije diureticima i povlačenja srčane insuficijencije čvrsto dokazuje dijagnozu pseudo (lažnog) tumora pluća. Pojava fantom tumora u plućima može biti različito radiografski i klinički predstavljena. U ovom radu ćemo prikazati četiri slučaja sa različitim manifestacijama bolesti.

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