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CASE REPORT

Cough-Induced Syncope: Unexpected Result of Malignant Pericardial Effusion

Zeynab Haidara[1] **Gültekin Kadı**[1] **Ahmet Demircan**[1]

1 Gazi University, Faculty of Medicine, Department of Emergency Medicine, Ankara, Türkiye

Abstract

Background: Cough, shortness of breath, chest pain, and pleural and pericardial effusion are common symptoms in patients with lung cancer. We report a case of a 39-year-old male with a history of lung adenocarcinoma who initially presented with chest pain followed by recurrent episodes of cough-induced syncope. Echocardiographic assessment confirmed the presence and severity factor of pericardial effusion established. This case highlights the importance of suspecting pericardial effusion and potential cardiac tamponade in patients with known malignancies or rheumatological conditions presenting to the emergency department with cough or hypotensive episodes, particularly those reporting syncope. To minimize mortality risk, it is critical to implement a thorough diagnostic algorithm when such symptoms are observed.

Keywords: Cough-induced syncope, Pleural effusion, Pericardial effusion, Pericardiocentesis.

Corresponding Author:
Zeynab Haidara MD, Gazi University, Faculty of Medicine, Department of Emergency Medicine, Ankara, Türkiye
E-mail: zeynab.haidara@gazi.edu.tr

INTRODUCTION

Pericardial effusion refers to the accumulation of fluid between the layers of the pericardium.

These effusions can have various origins, including extrapulmonary causes such as idiopathic factors, neoplasms, iatrogenic events, and autoimmune conditions. Notably, the occurrence of malignant pericardial effusion resulting from lung cancer is not uncommon (1, 2). Malignant pericardial involvement is observed in 20 % of cancer patients during post-mortem examinations, with up to 50% exhibiting a pericardial effusion (1,2, 3). One crucial determinant of the severity of pericardial effusion is the underlying cause. If it arises due to heart injuries, circulatory issues, or any other factors that can prompt rapid effusion development, prompt treatment is necessary to prevent potentially dangerous complications such as dyspnea, chest pain, palpitations, and syncope. Coughing causes a considerable increase in intrathoracic and intra-abdominal pressures, resulting in a decrease in cardiac output and a decrease in cerebral perfusion, which in turn causes a loss of consciousness; intrathoracic pressures could get as high as 300 mm Hg during cough spells (4). Syncope is more likely to occur during the acute hypotension that occurs after coughing spell, with peripheral blood flow recordings indicating vasoconstriction.

CASE REPORT

A 39-year-old male with a documented history of lung adenocarcinoma diagnosed in September 2023 following complaints of back pain, cough, and hemoptysis, presented with symptoms of weakness, dizziness, headache, and hypotension over the past two days. Our patient normally has a normal blood pressure range, which subsequently drops after the coughing spells. The patient's blood pressure was measured at 80/50 at home, accompanied by increased shortness of breath, chest pain, with severe non-productive coughing, and subsequent drops in blood pressure leading to syncope. Two brief episodes of these symptoms occurred prior to hospitalization, with complete recovery thereafter. No neurological deficit was observed. Notably, the patient's syncope did not coincide with any other precipitating factors or reflexes.

The patient's vital signs were as follows: blood pressure of 100/75 mmHg, pulse rate of 97, and oxygen saturation of 95 at emergency department admission. The patient's general appearance included occasional coughing, with no signs of cyanosis or worsening shortness of breath. Further examination revealed slightly diminished breath sounds at the lung bases. Given the patient's medical history and presenting symptoms, pericardial effusion was immediately considered as a potential diagnosis upon admission and later confirmed through imaging studies. The patient's hemogram revealed mild anemia (10.9 g/dL), while all other hemato-biochemical parameters were within normal range. An electrocardiogram showed sinus tachycardia (103 bpm) with low-amplitude QRS were observed (Figure 1).

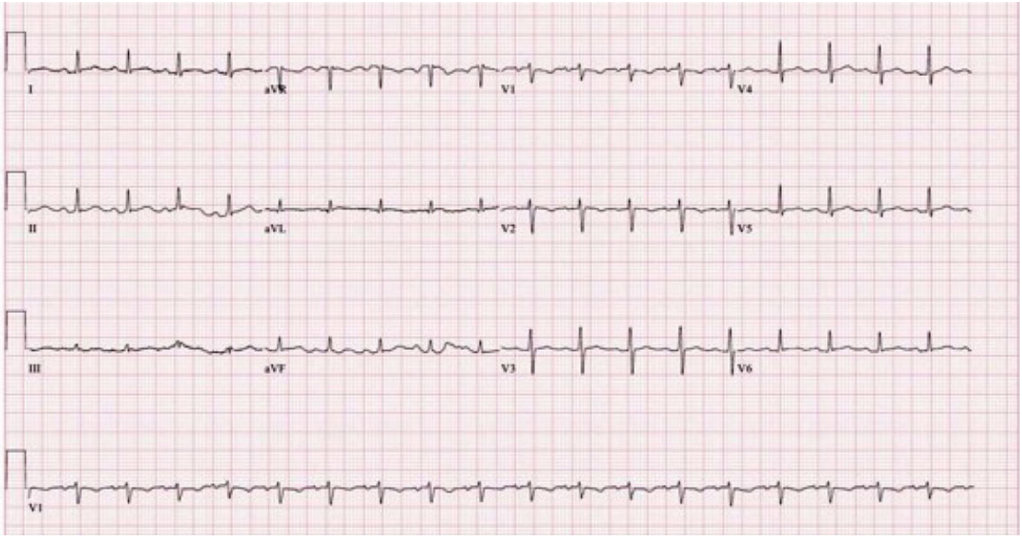

Figure 1: An electrocardiogram showed sinus tachycardia (103 bpm) with low-amplitude QRS

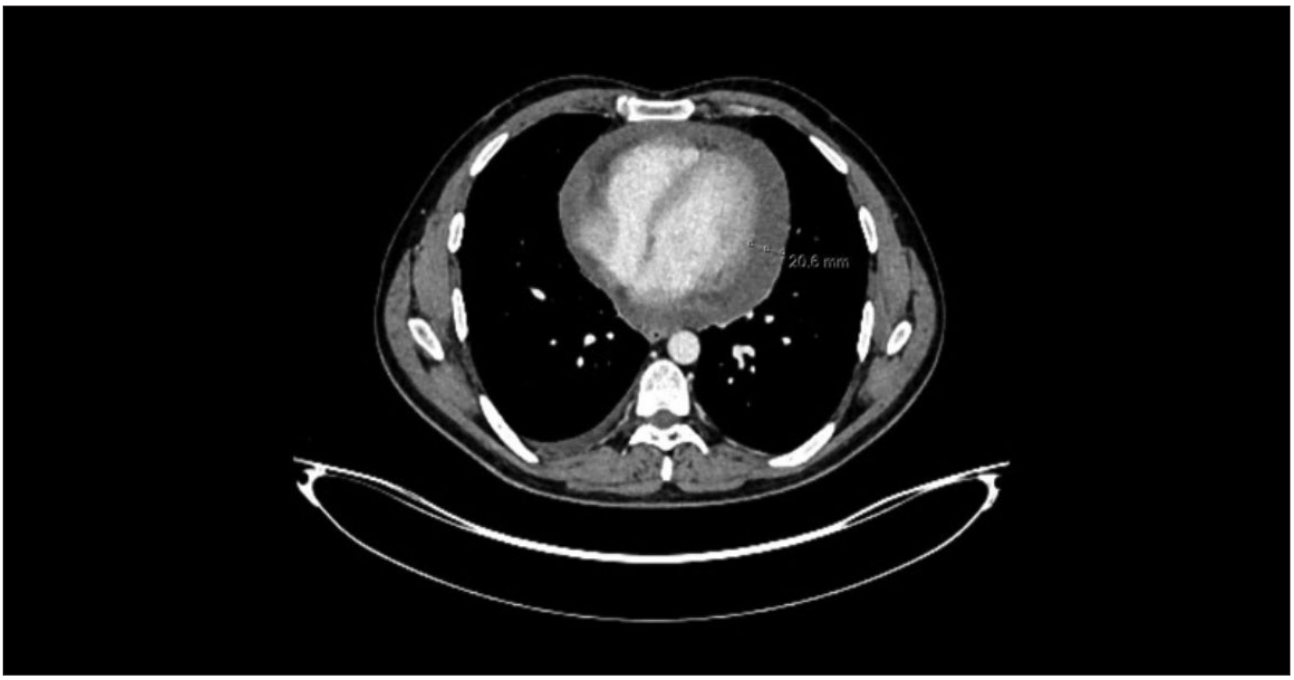

Figure 2: Computed tomography of the chest revealed a pericardial effusion with a maximal thickness of 20.6 mm.

Recent chest computed tomography confirmed worsening pericardial effusion (Figure 2), although no pulmonary embolism was detected. Transthoracic echocardiography revealed a large pericardial effusion. (https://osf.io/t5jsq/)

Based on these imaging results, pericardiocentesis was performed, resulting in the improvement of dyspnea and the eventual resolution of syncope. Analysis of the pericardial fluid confirmed the presence of metastatic adenocarcinoma, with findings consistent with ESA (epithelial-specific antigen) cells (BER-EP4) and Claudin-4 positivity. This intervention alleviated the patient's symptoms and provided critical diagnostic information to guide ongoing management. During follow-up, a pericardial biopsy was performed to exclude the possibility of a primary cardiac malignancy. The biopsy results further confirmed the diagnosis of metastatic adenocarcinoma, consistent with the patient's known history of lung cancer.

DISCUSSION

In our case, the patient was admitted to the emergency department with the uncommon combination of cough and syncope. Lung cancer patients may develop a pericardial effusion leading to cardiac tamponade. Malignant pericardial effusion should be considered as a potential differential diagnosis in lung cancer patients experiencing cough-induced syncope (2, 5). Although it may initially remain asymptomatic, upon reaching critical levels of intracardiac pressure, individuals present with symptoms such as elevated filling pressures, reduced cardiac output, and syncopal episodes. Thus, in any instance involving cough-induced syncope, it is imperative to rule out either cardiac tamponade or pericardial effusion. When reaching critical levels of intracardiac pressure, individuals present with symptoms such as elevated filling pressures, reduced cardiac output, and syncopal episodes. In any patient diagnosed with a malignancy or rheumatological medical conditions, presenting to the emergency department with cough or coughing spells, especially those describing hypotensive episodes or syncope, pericardial effusion and tamponade should be suspected. An appropriate examination algorithm must be applied (5).

Patients with malignancies or rheumatological medical conditions, presenting to the emergency department with cough or hypotensive episodes, particularly those

accompanied by syncope, should be evaluated for pericardial effusion and cardiac tamponade as high priority diagnoses, especially those describing hypotensive episodes or syncope, pericardial effusion and tamponade should be suspected. Implementing an appropriate diagnostic algorithm is essential to mitigate mortality risk.

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Abbreviations list

No abbreviations were used

Ethics approval and consent to participate

As this is a case report, no approval or consent to participate was required.

Consent for publication

The consent for publication has been attached to the submitted file.

Availability of data and materials

None

Competing interests

None

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Authors' contributions

Idea/Concept: ZH, GK. Control/Supervısıon: ZH, GK. Literature Revıew: ZH, GK, AD. Writing The Article: ZH, GK, AD.

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