Malignant Cardiac Tamponade: A Case Report on Rare Initial Presentation of Non-small Cell Lung Adenocarcinoma In a 59-year-old Filipino Smoker

Maria Karina Pe, MD [1], Aura Kay Gonzales, MD[1,2], Erwin Dizon, MD[1], Jamie Lynn Co, MD[1,2]

Abstract

Introduction. Most cancer-related deaths globally are caused by lung cancer. The diagnosis is typically made following the evaluation of respiratory symptoms such as chronic cough or incidental finding of pulmonary lesions such as nodules and mass. Cardiac metastasis occurs in 2-18% of lung cancers, but cardiac tamponade complicating malignant pericardial effusion is an extremely rare and life-threatening initial presentation of non-small cell lung carcinoma.

Case report. A 59-year-old-male with a smoking history of 72 pack-year presented at the emergency room with severe dyspnea and was assessed to be in cardiac tamponade. The patient arrested for 16 minutes but returned to spontaneous circulation after 650mL of serosanguinous fluid was removed by pericardiocentesis. The work-up for infectious and immunologic causes was negative. Chest CT scan with contrast did not reveal any pulmonary mass. However, the pericardial fluid cytology immunohistochemical stains pointed to a primary lung adenocarcinoma. PET scan was requested which confirmed hypermetabolic focus in the left lung base.

included patients admitted at East Avenue Medical Center for DFU. The primary endpoint was major amputation of the lower extremities. Data were analyzed using Receiver Operating Characteristic (ROC) analysis and logistic regression.

Conclusion. This case showed an extremely rare situation where life-threatening cardiac tamponade was the initial presentation of non-small cell lung adenocarcinoma, which highlights the need for vigilance in atypical presentation. Comprehensive diagnostic approach, including PET scans and cytologic analysis, must be done when standard imaging is inconclusive.

Keywords. Cardiac tamponade, lung adenocarcinoma, malignant pericardial effusion, case report

Introduction

Cancer is the second leading cause of mortality in the Philippines and lung cancer tops the list of the cancer-attributable mortality [1]. Primary lung cancer is classified into small cell lung carcinoma (SCLC) and non-small cell lung carcinoma (NSCLC), which can be further categorized into adenocarcinoma, squamous cell carcinoma or large cell carcinoma

The most common initial presenting symptoms include cough (8-75%), weight loss (0-68%), and dyspnea (0-60%) [2]. On the other hand, Kocher et al (2016) showed that as much as 10% of lung cancer was diagnosed in asymptomatic patients when a chest radiograph was performed for other reasons that incidentally revealed the disease [4].

This case report is about a 59-year-old-Filipino male who initially presented at the emergency room with cardiac tamponade who arrested and was revived after pericardiocentesis. Immunohistochemical staining of the pericardial fluid was consistent with primary adenocarcinoma of the lungs.

Case Presentation

The patient is a 59-year-old Filipino male, known case of chronic obstructive pulmonary disease and coronary artery disease, with a history of treatment for pulmonary tuberculosis. He was apparently well and stable until 2 weeks prior to admission when he experienced dyspnea, cough, and chest discomfort. He was seen at a different institution and was treated

[1] Department of Internal Medicine
[2]Center for Thoracic and Critical Care Medicine, Cardinal Santos Medical Center.
corresponding author: Maria Karina V. Pe, MD, E-mail: karinavpe@gmail.com

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as a case of community acquired pneumonia – moderate risk. Due to worsening shortness of breath now associated with orthopnea, the patient was brought to the emergency department.

Figure 1: 12 ECG showing electrical alternans (blue arrow), indicating cardiac tamponade

At the emergency room, the patient was seen with distended neck veins, muffled heart sounds, and hypotension with a palpatory blood pressure of 60/40mmHg. 12-lead electrocardiogram showed electrical alternans consistent with cardiac tamponade (see Figure 1), hence emergency pericardiocentesis was done. While ongoing pericardiocentesis, the patient was noted to have progression of labored breathing, became cyanotic and unresponsive. A code blue was called. The patient was intubated with return of spontaneous circulation after 16 minutes of resuscitation and 650cc of serosanguinous fluid was removed by blind pericardiocentesis via subxiphoid approach.

The routine pericardial fluid cytology showed approximately 5mL of bloody red, turbid fluid with pellicle formation with the following indices: RBC of 8, 472, WBC 983 (Lymphocytes 12, Segmenters 81) with total cell count of 9, 455. In addition, pericardial fluid was negative for TB GeneXpert and Adenosine Deaminase (ADA) but the Lactate Dehydrogenase (LDH) was markedly elevated. Numerous atypical cells were also present, hence malignancy was strongly considered. Immunohistochemical staining was thus requested for a more definitive diagnosis. The results were positive for TTF-1 (see Figure 2), MOC 31, Ber-Ep4 and negative for Calretinin and CDX-2, consistent with primary adenocarcinoma of the lung. Chest CT scan with IV contrast did not reveal any pulmonary mass, which was incompatible with the cytologic studies. PET scan was thus requested which showed a large hypermetabolic focus in the left lung base, confirming the primary malignancy (see Figure 3). These were obscured on Chest CT scan by the consolidation with pleural effusion and compressive atelectasis in both lungs. In addition, PET scan also showed hypermetabolic pericardium, left supraclavicular and mediastinal lymphadenopathies, L5 vertebra and left ischium that were all worrisome for metastasis. The patient was thus referred to medical oncology service and was diagnosed as a case of Lung Adenocarcinoma Stage IV. Molecular testing was done which showed no detected mutation on EGFR. He received the 1st cycle of chemotherapy, Pemetrexed and Carboplatin, prior discharge

Arrested with ROSC after 650mL of serosanguinous fluid was removed by pericardiocentesis	Pericardial fluid studies showed normal ADA, elevated LDH, and numerous atypical cells, suspicious for malignancy	IHC stains pointing to Adenocarcinoma of the lungs but no pulmonary mass detected on CT with IV contrast
PET scan confirmed hypermetabolic lesion at left lung base	Recieved the first cyle of Pemetrexed and Carboplatin	Discharged

Table 1: Visual timeline

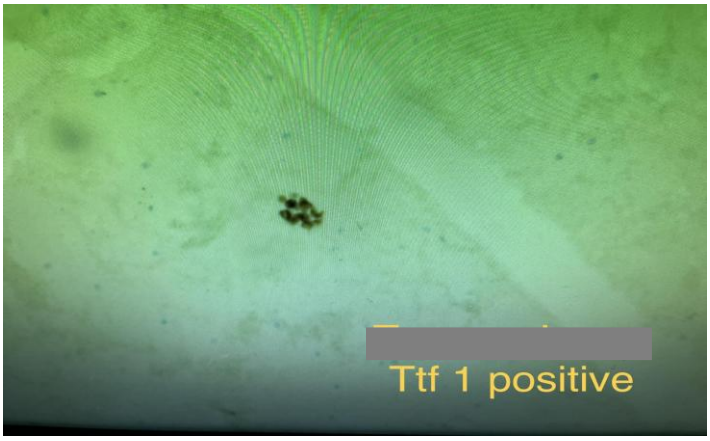

Figure 2: Immunohistochemical stain of pericardial effusion showing TFT 1 positive, which was also positive for MOC 31 and Ber-Ep4, but negative for Calretinin and CDX-2, pointing to a Primary Lung Adenocarcinoma

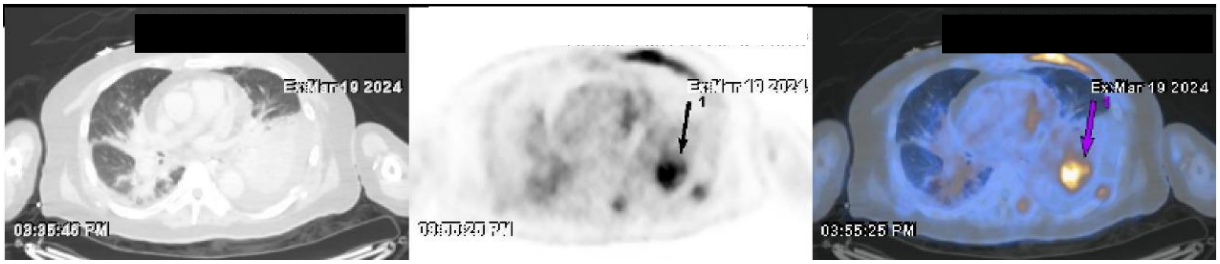

Figure 3: Large FDG-avid focus in the left lung (SUVmax 12.1) and smaller foci (SUVmax 4.4) in the pleura near the left lung base, confirming the primary malignancy. These were obscured on CT by the consolidation with pleural effusion and compressive atelectasis in both lungs

Discussion

Among the 4 major histologic types of lung cancer, adenocarcinoma has become the most frequent subtype of lung cancer attributed to the decline in cigarette consumption. Specifically, in lifetime never smokers or former light smokers (<10 pack-year history), women, and younger adults (<60 years), adenocarcinoma tends to be the most common form of lung cancer [7]. Lung adenocarcinoma usually occurs in the lung periphery [5]. Our patient was atypical in this regard since he had a strong smoking history with lung mass located at the left lung base. However, the main risk factor for any lung cancer, including adenocarcinoma, is still smoking tobacco, highlighting the strong link between smoking and lung cancer. Given that the patient had a strong smoking history, it would have been prudent to have screened the patient with low dose CT scan at age 50.

The diagnosis of Lung cancer is typically made following the evaluation of respiratory symptoms such as chronic cough or incidental finding of pulmonary lesions such as nodules and mass. Our case was atypical in this regard because his initial presentation was life-threatening cardiac tamponade. On imaging, the mass at the left lung base was obscured by pleural effusion which was only detected on PET scan (See figure above).

In addition, pericardial effusion was initially thought to be tuberculous in origin due to the history of pulmonary tuberculosis. However, pericardial fluid cytology was suggestive of malignancy which was confirmed by the immunohistochemical stains. The patient was classified as Stage IV Lung Adenocarcinoma due to the presence of malignant pericardial effusion, which is also contraindication to potential curative resection hence the patient was started on Carboplatin and Pemetrexed. Unfortunately, the prognosis for lung adenocarcinoma with distant metastasis is very poor. Approximately less than 5% survive in 5 years [4]. In fact, it is associated with a median survival of 3 months or less [1].

Conclusion

In conclusion, this case highlights that most cases of lung cancer are still caused by cigarette smoking. Furthermore, this case reiterates the importance of early screening and prevention. WHO recommends low-dose computed tomography (LDCT) for patients with a 20 pack-year or more smoking history, and smoke now or have quit within the past 15 years and are between 50 and 80 years old [3]. Moreover, this case emphasizes that life-threatening cardiac tamponade, although rare, may also be the initial presenting symptom of lung cancer, which highlights the need for vigilance in atypical presentation. Comprehensive diagnostic approaches, including PET scans and cytologic analysis, must be done when standard imaging is inconclusive.

Patient Perspective

Unfortunately, in the process of paper publication, the patient passed away last April 27, 2024, a week after receiving the 2nd cycle of chemotherapy – approximately 3 months after being diagnosed with Stage IV Lung cancer. It was signed out as a case of Acute Respiratory Failure Type II secondary to Community Acquired Pneumonia - High Risk. For that reason, the perspective of the patient's daughter, who was with him throughout the entire process, was considered.

According to the daughter, the journey was distressing as a family member so she can just imagine how much more exhausting it must have been for the patient who had to endure the physical burden of the disease. Their experience highlights the immense emotional and financial strain faced by the family managing a terminal illness in a third-world country, amplifying the feelings of helplessness and frustration. Ultimately, this case underscores the urgent need for improved lung cancer screening programs to allow early detection and reduction in mortality.

Informed Consent

Informed consent was obtained from the participant of the study (See Appendix).

Conflict of Interest

The author declares no conflict of interest regarding the publication of this paper.

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