

CASE REPORT

Normal Tumor Markers and Increased Adenosine Deaminase in Pericardial Effusion Misdiagnosed as Tuberculous Pericarditis Ultimately Proven as Lung Adenocarcinoma with Pericardial Metastasis: a Case Report and Literature Review

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SUMMARY

Background: Elevated adenosine deaminase (ADA) and normal tumor markers in pericardial or pleural effusion are usually considered to be a specific manifestation of benign pericardial or pleural effusion. Here we report a case of lung adenocarcinoma with pericardial metastasis with elevated ADA and normal tumor markers in pericardial effusion.

Methods: Pericardiocentesis and lung puncture combined laboratory indexes and pathology were performed for diagnosis.

Results: Analysis of pericardial fluid revealed a white blood cell (WBC) count of $2,000 \times 10^6/L$ (70% for lymphocytes) with an ADA level of 72.8 U/mL. Pathology of pericardial effusion found no malignant cells. Histopathology of percutaneous lung puncture showed adenocarcinoma.

Conclusions: ADA and tumor markers were not a specific index in differential diagnosis between tuberculosis and metastasis in pericardial effusion.

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KEY WORDS

adenosine deaminase, tumor markers, pericardial metastasis, tuberculosis

CASE PRESENTATION

Elevated ADA and normal tumor markers in pericardial or pleural effusion of lung cancer may mimic tuberculosis pleurisy or pericarditis due to high ADA level in effusion analysis, usually considered to be a benign index [1-3]. In this study, we report a case of lung adenocarcinoma with pericardial metastasis with elevated ADA and normal tumor markers in pericardial effusion.

A 63-year-old non-smoker woman was admitted to our respiratory department complaining of dyspnea for 2

weeks. She had associated symptoms including cough, and sputum, fatigue and night sweat, but no chest pain. Sometimes she felt fever; the temperature was 37.3 to 38.0°C and could drop to normal without any treatment. The patient was diagnosed with pulmonary tuberculosis three years prior and had been treated with antituberculous medication for 9 months. After the whole antituberculous treatment, she was told the pulmonary tuberculosis was cured but she did not receive a chest computed tomography (CT) scan again. Two weeks ago, she was admitted due to dyspnea and the chest CT scan showed multiple nodules in the right lung in the CT lung window and pericardial effusion. She had undergone pericardiocentesis on the day she was admitted (Figure 1A, B). Pericardial fluid presented as pale-yellow exudate. Analysis of the pericardial fluid revealed a white blood cell (WBC) count of $2,000 \times 10^6/L$ (70% for lymphocytes and 30% for multiple nuclear white blood cells) with an ADA level of 72.8 U/mL and lactate dehydrogenase (LDH) of 145 U/mL. Pathology of pericardial effusion found no malignant cells (Figure 1E). She received bronchoscopy and it showed normal manifestation in the bronchus (Figure 1C, D). No tumor cells were found in the samples from bronchial lavage fluid and bronchus biopsy. Test of tumor markers in pericardial effusion, including carcinoembryonic antigen (CEA), carbohydrate antigen (CA)125, CA 199, and neuron specific enolase (NSE) were normal. Erythrocyte sedimentation rate (ESR) was 74 mm/L. Plasma interferon-gamma release assay (IGRA) revealed a positive result. So, we suspected the cause of pericardial effusion was TB pericarditis. The patient had been treated with standard antituberculous medication. One month later, she still had fever, cough, and sputum combined with dyspnea. So, she received CT-guided lung puncture in the nodule of the right lung. Histopathology of percutaneous lung puncture showed adenocarcinoma (Figure 1F). Next, she underwent chemotherapy and her pericardial effusion clearly decreased after one cycle of chemotherapy treatment.

DISCUSSION

This patient had symptoms of tuberculosis poisoning, including fever, fatigue and night sweat with pericardial effusion and a history of pulmonary tuberculosis. Her pericardial effusion analysis revealed an exudate with a white blood cell (WBC) count of $2,000 \times 10^6/L$ (70% for lymphocytes) and a high ADA level of 72.8 U/mL. The most common causes for lympho-dominant exudate is considered to be the diagnosis of TB pleurisy and pericarditis [4]. At the same time, she had a positive result of plasma IGRA, as the previous studies revealed IGRA had a good negative predictive value and positive predictive value in the diagnosis of tuberculosis pleurisy [5,6]. Regarding the relationship between ADA and tuberculosis pleurisy, numerous studies have shown that ADA levels in effusion are a specific index for tuberculosis pleurisy or

pericarditis, especially when $ADA \geq 45$ U/L [7-9]. Our patient had a history of pulmonary tuberculosis with a high level of ADA and tuberculosis poisoning symptoms. At first no tumor cells were found in the samples from bronchial lavage fluid and bronchus biopsy. A test of tumor markers including CEA, CA 125, CA 199, and NSE were normal. There was no evidence of malignant effusion.

After we reviewed the literature, we found several studies that showed ADA is also associated with many diseases, including Behçet's disease, lung or liver cancer or liver cirrhosis, and so on [10,11]. ADA can be a non-specific marker of T-cell activation, when the diseases induce T-cell immune response, ADA levels can be increased [12-15]. In our patient, the serum ADA level was normal, while in pericardial effusion it was clearly increased. The reasonable explanation was that lung adenocarcinoma with pericardial metastasis influenced T-cell immune response.

Our lesson from this patient was ADA and tumor markers are not a specific index in differential diagnosis between tuberculosis and metastasis in pericardial effusion. When single pericardial effusion without pleural fluid occurs in an elderly patient, physicians should pay attention to malignant disease, especially when accompanied with multiple nodules in lungs.

CONCLUSION

Though elevated ADA and normal tumor markers in pericardial or pleural effusion are most commonly seen in tuberculosis pleurisy or pericarditis, malignant effusion can also induce an increase in ADA. So, tumor markers and ADA are not a specific index in the differential diagnosis between tuberculosis and metastasis.

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Declaration of Interest:

No conflicts of interest.

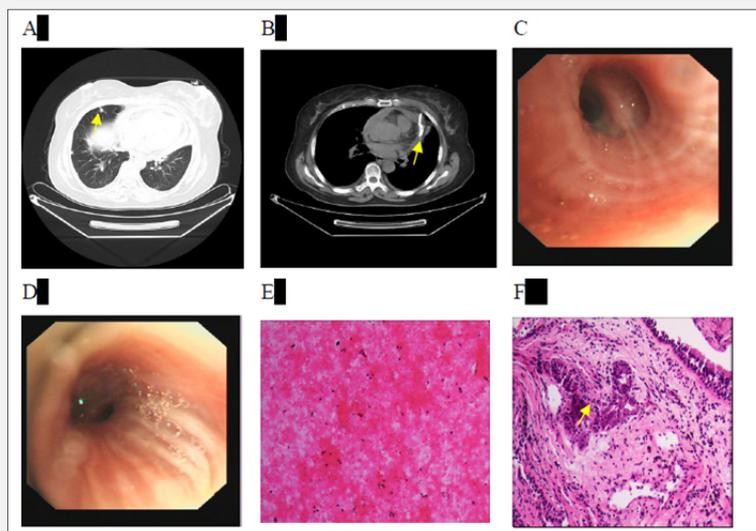


Figure 1. Patient imaging and histological results.

The chest CT scan showed multiple nodules in right lung in CT lung window and pericardial effusion after catheterization in CT mediastinum window (Figure 1A, B). Bronchoscope showed normal manifestation in bronchus (Figure 1C, D). Pathology of pericardial effusion found no malignant cells (Figure 1E). Histopathology of percutaneous lung puncture showed adenocarcinoma (Figure 1F).

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