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# A Newly Developed Pericardial Tuberculoma During Antituberculous Therapy

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## ABSTRACT

Tuberculosis generally affects the respiratory tract. In developing nations, the pericardium is the most common location of extrapulmonary tuberculosis; however, tuberculous pericarditis rarely appears as a localized mass or tuberculoma. We present here a case of a 62-year-old woman with pericardial tuberculoma. She had a history of effusive tuberculous pericarditis and drainage. Because she had taken regular medication over a period of six months, the pericardial mass with an adjacent lung nodule newly detected on the chest radiogram was initially suspected of being invasive lung cancer. Prior to pathologic confirmation, precise information from imaging tests, including computed tomography, magnetic resonance imaging, and positron emission tomography-computed tomography are helpful when making decisions regarding which methods should be used for surgical approach and treatment. Through imaging, our case showed typical features of pericardial tuberculoma and a favorable clinical course after two months with a change in antituberculous therapy. (**Korean Circ J 2011; 41:750-753**)

**KEY WORDS:** Tuberculosis; Magnetic resonance imaging.

## Introduction

Tuberculous pericarditis is found in approximately 1% of all autopsied patients with tuberculosis and in 1-2% of cases of pulmonary tuberculosis;<sup>1)</sup> however, pericardial tuberculoma is a rare complication. During evaluation of pericardial masses, echocardiography is useful for assessment of location and hemodynamic effects. Computed tomography (CT) and magnetic resonance imaging (MRI) can provide more

accurate information regarding the location, extent, and character of the mass and its invasion into adjacent organs. Therefore, we present here a case demonstrating typical features of pericardial tuberculoma by imaging.

## Case

A 62-year-old woman was admitted for evaluation of dyspnea and chest discomfort in September of 2009. The patient had a past medical history of a mastectomy of the right breast due to abscess 35 years earlier. She had been diagnosed with effusive tuberculous pericarditis in December 2008, at which time she underwent pericardiostomy and drainage. Since then, she had taken antituberculous therapy with isoniazid, rifampin, ethambutol, and pyrazinamide. In January 2009, her regimen was changed to isoniazid, ethambutol, and levofloxacin due to development of drug-induced hepatotoxicity, after which she had no discomfort and her laboratory findings normalized. However, from May 2009, her dyspnea and chest discomfort showed a gradual increase. Upon physical examination, her blood pressure was 130/85

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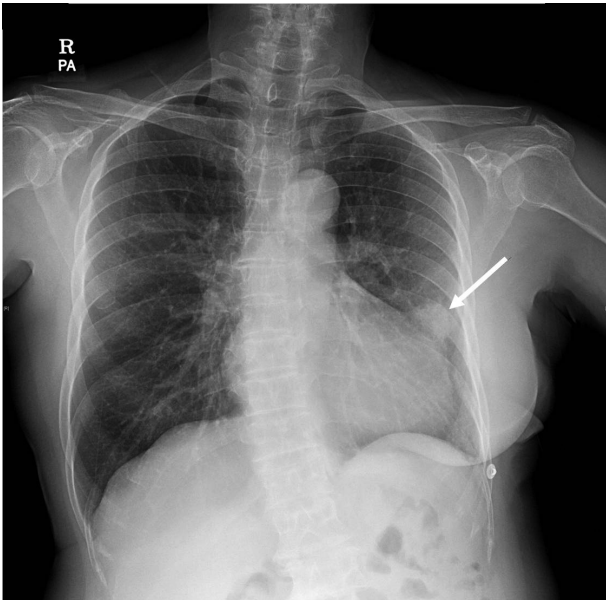
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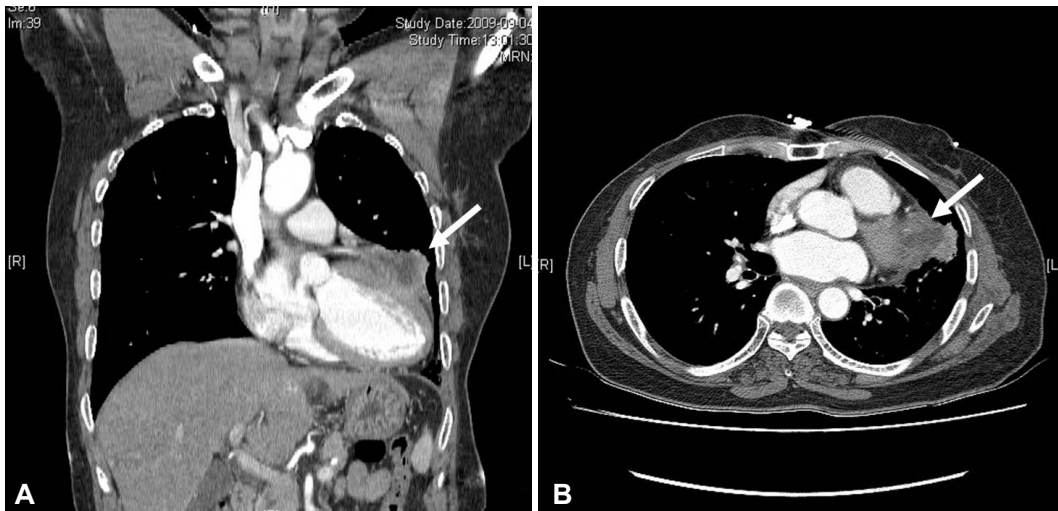
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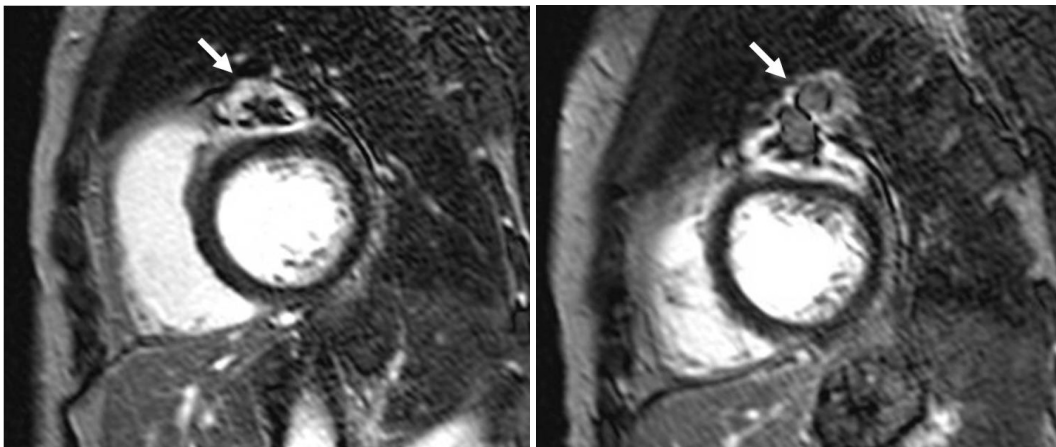
**Fig. 1.** Rounded, bulging mass in the superior cardiac border and adjacent lung nodule arrow on chest X-ray.

mm Hg, heart rate was 63 bpm, and respiratory rate was 18 bpm. No neck vein engorgement, pitting edema, or organomegaly were observed. In addition, her heart and lung sounds were normal, as were the results of her laboratory examinations.

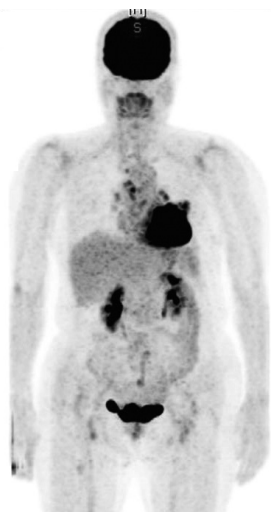
A chest radiography revealed a new rounded bulging of the superior cardiac border and an adjacent lung nodule (Fig. 1). Subsequent evaluation of her mass lesion included enhanced chest CT, and two-dimensional echocardiography. CT images confirmed a pericardial mass measuring approximately 4-5 cm protruding into the lung parenchyma. The mass was located on the superior-anterior aspect of the left ventricle and had an irregular margin with non-enhanced central necrosis. In addition, the pericardial mass was connected with the lung nodule (Fig. 2). The pericardium showed mild thickening, and a subcarinal lymph node showed significant enlargement. Echocardiography revealed a pericardial mass along the anterior wall of the left ventricle. No evidence of constrictive physiology or mass effect was noted. Because the patient had maintained her antituberculous medication, and lung



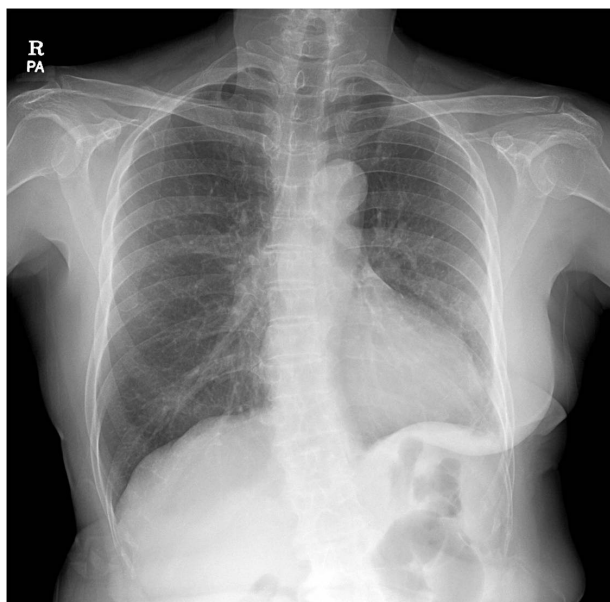
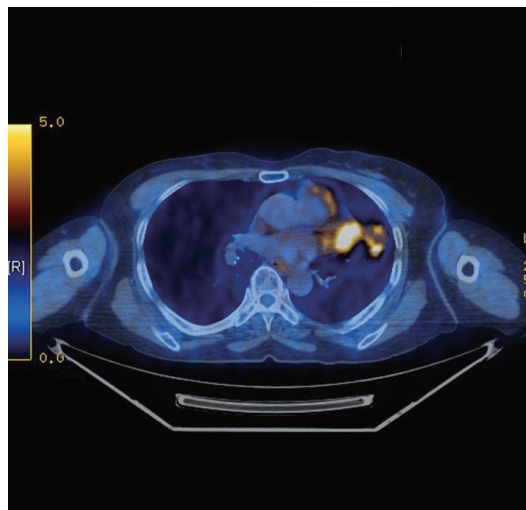
**Fig. 2.** Pericardial mass protruding into the lung parenchyma in the superior-anterior aspect of the left ventricle (A) and mass with irregular margin and non-enhanced central necrosis on chest CT (B).



**Fig. 3.** The mass with hyper-enhanced rim and mixed signal intensity central core on delayed enhancement images.



**Fig. 4.** High glucose uptake of the left ventricle, pericardium, lung mass, and subcarinal lymph node on positron emission tomography-computed tomography.



**Fig. 5.** Previous bulging mass and adjacent lung nodule was not seen on the follow up chest X-ray.

cancer is more prevalent than primary pericardial tumor or abscess, lung cancer with pericardial invasion was considered based on the CT and echocardiographic findings. Therefore, in July 2009, a video-assisted thoracotomy biopsy was conducted for confirmation of lung cancer. However, histopathology revealed chronic granulomatous inflammation with caseating necrosis, which ruled out lung cancer. The patient next underwent cardiac MRI and positron emission tomography-computed tomography (PET-CT) for evaluation of myocardial invasion and metastasis. Cardiac MRI (1.5T, Siemens, Germany) revealed a mass with hyper-enhanced rim and mixed signal intensity central core of the mass on delayed enhancement images (Fig. 3). On PET-CT, high glucose uptake of the left ventricle, pericardial and lung mass, and subcarinal lymph node were noted (Fig. 4). Although

acid-fast bacilli were not demonstrated, she was diagnosed with pericardial tuberculoma based on the histologic findings. Cycloserine and prothionamide were then added to her antituberculous medications. After 2 months, her symptoms were relieved and the size of the pericardial tuberculoma was somewhat reduced. No lung nodules were observed on a follow up chest radiography in March 2010 (Fig. 5).

## Discussion

In the case presented here, the patient had a history of tuberculous pericardial effusion and drainage. Therefore, her pericardial mass could have been considered a pericardial tuberculoma spreading into the lung parenchyma. Because the patient had regularly taken medication over a period of six months and imaging showed that the soft tissue portion was relatively large, the pericardial mass was misinterpreted as invasive lung cancer.

During evaluation of pericardial masses, echocardiography is useful for assessment of location and hemodynamic effects. However, CT and MRI can provide more accurate information regarding the location, extent, and character of the mass and its invasion into adjacent organs. Using CT and MRI, Gulati et al.<sup>2)</sup> reported the morphology of a pericardial tuberculous abscess. In that report, a smooth, thin enhancing rim and a hypodense core with heterogeneity or septa were features of the tuberculous abscess on CT. The report also showed that the presence of a hypointense core on T2-weighted MRI, as seen in our case, could be suggestive of tubercular etiology. Upon gadolinium-enhanced MRI, peripheral rim enhancement and central hypoenhancement of the mass were reported for tuberculoma.<sup>3)</sup> These MRI findings were correlated with central necrosis and prominent vascularity within the inner fibrous and outer cellular layers seen on microscopic examination.<sup>4)</sup> In this case, PET-CT showed a false-positive

result, so that exclusion of lung cancer by PET-CT was not possible. Although PET-CT is helpful for the differentiation of benign and malignant tumors, inflammatory diseases (tuberculous pleuritis and parapneumonic effusion) are included within the false positives.<sup>5)</sup>

Pericardial tuberculoma may require pathologic confirmation for exact diagnosis; however, more precise information regarding imaging tests, including CT, MRI, and PET-CT, will be helpful in making decisions regarding methods for use in tissue confirmation, surgical approach, and treatment.

### Conclusion

Our case showed typical features of pericardial tuberculoma by imaging, and pericardial tuberculoma should be considered as a differential diagnosis for a pericardial mass, de-

spite adequate antituberculous therapy.

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