Case Report

A case of right atrial tumor diagnosed by cardiac computed tomography

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Summary A 60-year-old woman was admitted with chief complaints of dyspnea for the previous 3 weeks. Transthoracic echocardiography (TTE) showed the amount of pericardial effusion and signs of cardiac tamponade. However, a tumor was not detected by TTE in any view. Multidetector computed tomography (MDCT) showed that the tumor protruded into the right atrium, invading to the outside of the heart. Transesophageal echocardiography (TEE) also showed the mobile tumor in the right atrium. In conclusion, this report may demonstrate that MDCT and TEE are required as complementary methods in the detection of cardiac tumors.

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Introduction Transthoracic echocardiography (TTE) is recognized as the primary imaging modality for the diagnosis of cardiac tumors [1]. However, previous studies have reported the difficulty of identifying right atrial (RA) tumors by TTE [2,3]. We present a case in which RA tumor failed to be detected by TTE. The tumor was detected by recently developed ECG-gated 64-slice multidetector computed tomography (MDCT) and transesophageal echocardiography (TEE).

Case report

A 60-year-old woman was admitted with chief complaints of dyspnea for the previous 3 weeks. At physical examination, a heart rate of 110 bpm and arterial systolic blood pressure of 90 mmHg with pulsus paradoxus were found. Chest radiography showed increased heart size, and electrocardiography presented sinus rhythm and a low voltage complex. The value of CA-125 was 1366 U/ml in the blood examination. TTE showed the amount of pericardial effusion and signs
Figure 1  TTE images after pericardial drainage. The tumor was not detected in apical 4 chamber (left), parasternal short axis (middle), and RV inflow views (right). Middle picture is modified parasternal short-axis view at the level of aortic valve, tilting and sliding to visualize RA and RV. LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle; TTE, transthoracic echocardiography.

Figure 2  MDCT images. The tumor (arrows) invaded to the outside of the heart (left), and protruded into the RA (right). Ao, aorta; LA, left atrium; LV, left ventricle; MDCT, multidetector computed tomography; RA, right atrium.

Figure 3  TEE images at systole (left) and diastole (right). Mobile tumor was protruded into RA (arrows). LA, left atrium; RA, right atrium; TEE, transesophageal echocardiography.
MDCT and TTE were performed 8 and 10 days after latest TTE examination, respectively. A surgical approach did not completely remove the tumor. Histological examination showed a vascular structure with malignant neoplasia, being defined as angiosarcoma. One month later, the patient had sudden cardiac death because of cardiac tamponade. Electrocardiographic monitoring did not show fatal arrhythmia, and there was the amount of pericardial effusion and no thrombus in pulmonary artery at autopsy.

**Discussion**

Cardiac angiosarcoma is the most common primary malignant cardiac tumor and may occur in any part of the heart, being more common in the right heart chambers. Previous studies demonstrated the rapid growth of angiosarcoma, resulting in poor prognosis [4,5]. Rapid and accurate assessment of tumor location and its relationship to adjacent structures is therefore essential to consider the indication of medical or invasive care. Engberding et al. reported that TTE accurately diagnosed left-sided myxoma, although 25% of RA myxoma was missed [3]. In this case, TTE failed to detect the RA tumor, but was detected by MDCT and TEE. This report may claim that MDCT and TEE are required as complementary methods in the detection of cardiac tumors, especially when the tumor is not detected by TTE in patients with bloody pericardial effusion. Considering the rapid growth of angiosarcoma, the size of tumor might be different among TTE, TEE, and MDCT examinations (approximately 2 weeks). The tumor may be missed at early stage of clinical manifestation, even with TTE, MDCT, or TEE [6,7]. Second imaging tests, using less-invasive modality (cardiac MRI, TEE, or TTE with contrast media), may be useful after some interval, when the first imaging test missed the tumor.

**Conflict of interest**

There is no conflict of interest or financial disclosure for our article.

**References**


