

## • 临床病理讨论 •

## Clinicopathological Conference

## Primary cardiac tumor mimicking acute myocardial infarction

(The 18th case)

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## Case presentation

In May 2005, a 52-year-old woman was admitted to our emergency room with chest discomfort. The symptom had started about 1 hour before admission. She denied any history of hypertension or diabetes mellitus. A detailed medical history did not reveal any previous cardiac symptoms or risk factors for coronary artery disease. Electrocardiography(ECG) was normal about 4 months prior to the current admission (Fig 1). Physical examination did not reveal any abnormal finding. There was no jugular vein engorgement. The lungs were normal on auscultation, and no cardiac murmur or gallop rhythm was noted. The results of laboratory biochemical analysis were within normal limits. The patient's hematologic data were as follows: white blood cell count  $6.6 \times 10^9/L$ , hemoglobin 115 g/L, hematocrit 38.5% and erythrocyte sedimentation rate 40 mm/h. ECG showed normal sinus rhythm with ST-segment elevation in leads II, III and aVF, ST-segment depression and T-wave inversion in the precordial leads, consistent with acute inferior myocardial infarction (Fig 2). The results of CK-MB and TnI were

normal. On the basis of the patient's clinical and ECG findings, aspirin, heparin, and thrombolytic therapies were initiated. Two hours later, the chest discomfort did not subside, and another ECG recording showed that the ST-segment elevation was persisting. Meanwhile her myocardial-specific enzyme values were found to be still within the normal ranges. In view of the clinical suspicion of coronary artery disease, cardiac catheterization and coronary angiography were performed, which revealed a normal-appearing coronary angiogram (Fig 3, 4). Transthoracic echocardiographic investigation showed a mass on the lateral right ventricular wall in the pericardial sac (Fig 5). Therefore, the patient underwent magnetic resonance imaging of the chest, which revealed a  $9.4\text{cm} \times 4.7\text{cm}$  tumor in the right ventricle. The inferior wall of left ventricle, right atrium and interventricular septum were also involved (Fig 6). Pathohistological examination revealed angiosarcoma (Fig 7). Positron emission tomography revealed that the tumor had metastasized to the liver, spine and bladder. She died 2 months later.

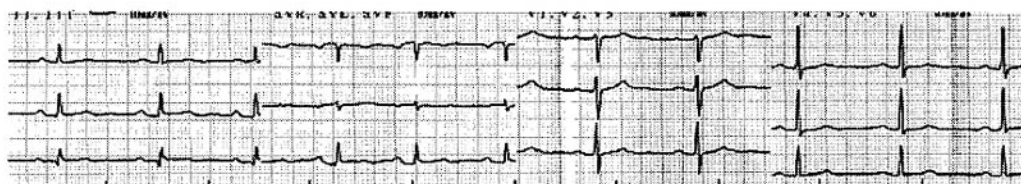
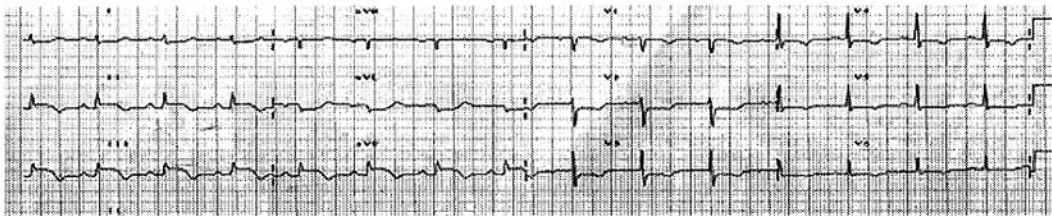


Fig 1 Electrocardiography 4 months prior to the current admission was normal

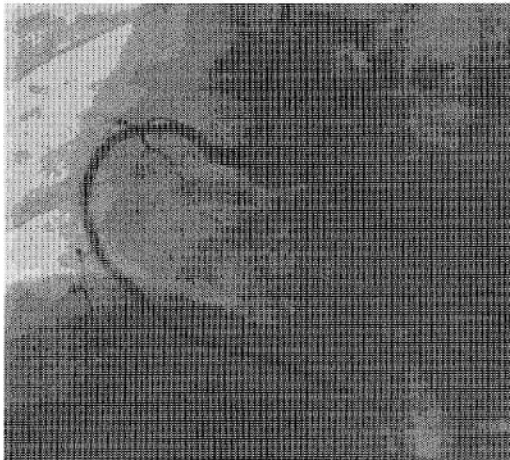
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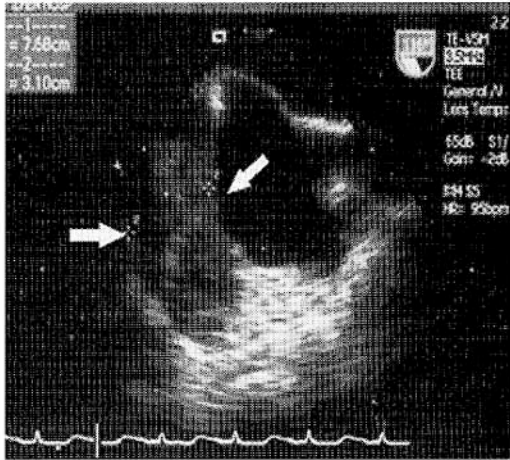
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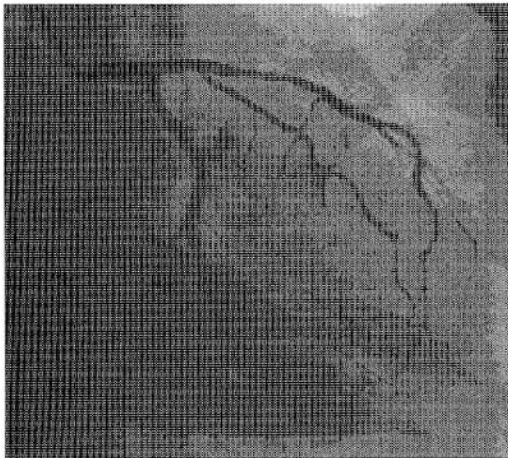
**Fig 2** Electrocardiographic recording during the episode of chest discomfort shows ST-segment elevation in leads II , III and aVF ,ST-segment depression and T-wave inversion in the precordial leads



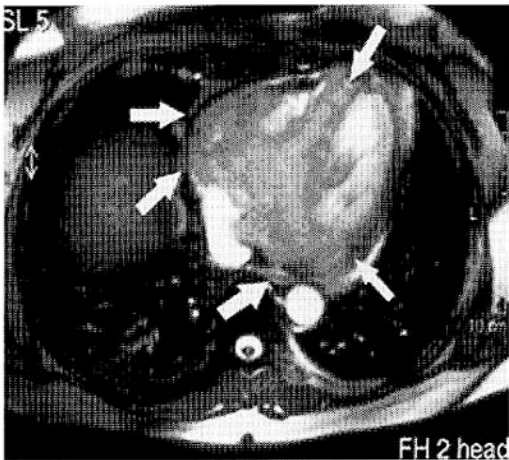
**Fig 3** Angiogram shows the right coronary artery in the left anterior oblique view



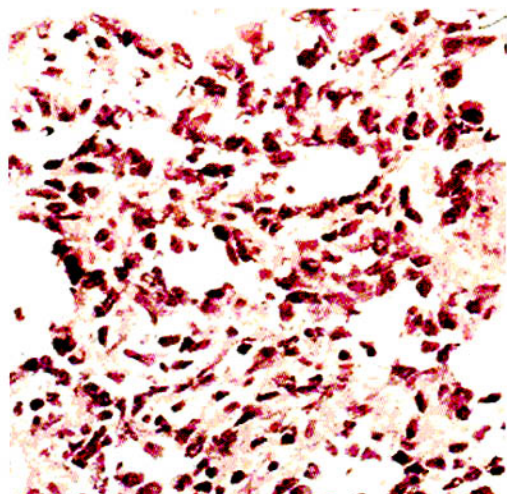
**Fig 5** Transthoracic echocardiogram shows a tumor on the right ventricular wall in the pericardial sac



**Fig 4** Angiogram shows the left coronary artery in the right anterior oblique view



**Fig 6** MRI appearance of cardiac tumor



**Fig 7** Light microscopic study of the biopsy specimen showing vascular structures with spindle-shaped cells and oval nuclei ( $\times 400$ )

## Clinical and pathological discussion

*Dr. Liu Xiaohui:* The patient's initial symptom was chest pain. In addition to clinical symptoms and signs of relatively short duration, there were ECG changes that mimicked acute myocardial infarction. In particular, she had a normal ECG 4 months prior to the admission. Therefore, coronary artery disease seemed likely. On the basis of the patient's clinical and ECG findings, we began antiplatelet, anticoagulant and thrombolytic therapy. However, serial testing revealed no evolution of ECG or enzyme changes. In this patient, the clinical findings seemed to indicate stenosis of the left circumflex artery or right coronary artery, but the patient had a normal-appearing coronary angiogram. To gain more information, we ordered an echocardiographic examination. Two-dimensional echocardiography showed a mass on the lateral right ventricular wall in the pericardial sac. Echocardiography was not sufficient even for a differential diagnosis in this case. Therefore, we ordered magnetic resonance imaging of the chest. This revealed a 9.4cm  $\times$  4.7cm tumor in the right ventricle. The tumor also involved the left ventricle, right atrium and interventricular septum. A few reports in the literature described cardiac

tumor with the initial diagnosis of acute myocardial infarction. In patients with cardiac tumor, the most frequent causes of chest pain are the compression of coronary vessels and adjacent organs and tissue. The clinical presentation—chest pain together with ECG features mimicking acute myocardial ischemia—is all the interesting and rare information. Therefore, cardiac tumor should be considered in the differential diagnosis of patients who present acute myocardial infarction.

*Dr. Ma Changsheng:* ST-T wave changes seem to be a specific sign of myocardial ischemia. It is observed not only in patients with myocardial ischemia, but also in patients with pericarditis, hypertensive heart disease and as a result of some drug treatment. Myocardial infarction-like ECG changes due to cardiac tumor are rare finding. Following conventional ECG theory, abnormal ST-segment changes implies myocardial injury. We consider that ECG "injury" occurs because the affected cells are unable to maintain their normal polarization during diastole. Because the tumor involved inferior wall of the heart, a "current of injury" flows between the tumor and the normal region. The ST-segment vector is directed toward lead II, III and aVF, resulting in ST-segment depression in the precordial leads.

*Dr. Chen Zhan:* Primary cardiac tumors are rare with an incidence ranging from 0.0017% to 0.033% in reported or collected autopsy series. Twenty-five percent of all primary cardiac tumors are malignant and almost all of them are sarcomas. Angiosarcoma accounts for 30% of all primary cardiac tumors. The most common symptoms of cardiac sarcoma are dyspnea and chest pain. Previously, most of cardiac tumors were not diagnosed during life, but advances in echocardiography, computed tomography and magnetic resonance imaging have made it possible to diagnose these diseases in living patients. The angiosarcoma shows rapid growth, local invasion and distant metastasis. Surgical resection is essentially palliative. Therefore, the prognosis for the tumors is very poor and most patients die within 1 year after diagnosis. Complete

excision is associated with increased survival. But positron emission tomography showed the tumor had metastasized to others organs, so surgical resection could not be carried out.

### Summary

Primary cardiac tumors are uncommon, and the majority are benign. Malignant tumors account for 25% and most are vascular in origin, particularly angiosarcoma. Owing to different affected locations, it can mimic various cardiac diseases. It calls for cardiologist to intensify the knowledge about it. In this case, there were no history of cardiac symptoms and no risk factors for coronary ar-

tery disease. The patient presented chest discomfort, ST-segment elevation in leads II, III and aVF and ST-segment depression in the precordial leads, strongly suggesting the diagnosis of acute myocardial infarction. But the myocardial-specific enzyme values were within the normal range and cardiac catheterization revealed a normal-appearing coronary angiogram, so the diagnosis was excluded. UCG and MRI showed cardiac tumor, the biopsy further supported the diagnosis. Cardiac tumor should be considered in the differential diagnosis of patients who present acute myocardial infarction.

(Translator: LIU Xinmin)

## 心脏肿瘤误诊为急性心肌梗死一例

### 病例摘要

患者女性, 52岁, 既往无高血压、糖尿病史, 2005年1月体检时心电图结果正常。2005年5月5日因“突发胸闷1h”就诊于急诊, 体检双肺呼吸音清, 未闻及干湿啰音; 心脏听诊心律齐, 未闻及杂音。血常规: 白细胞  $6.6 \times 10^9/L$ , 血红蛋白 115 g/L; 血沉: 40 mm/h, 血液各项生化检查、CK-MB、TnI 均在正常范围。心电图提示: II、III 和 aVF 导联 ST 段弓背样抬高、胸前导联 ST 段压低、T 波倒置。根据患者症状和心电图检查, 诊断为“急性下壁心肌梗死”, 予抗凝、抗血小板和静脉溶栓治疗。2h 后患者

胸闷症状无明显缓解, 心电图无动态变化, 复查心肌酶仍在正常范围。行冠状动脉造影检查: 冠状动脉未见明显异常。后经超声心动图发现患者右侧心包内占位性病变, 约  $8.2\text{cm} \times 4.0\text{cm}$ 。心脏核磁共振检查提示肿瘤位于右心室, 大小约  $9.4\text{cm} \times 4.7\text{cm}$ , 并且已经侵犯左心室下壁、右心房和室间隔。心肌活检示血管肉瘤, PET 检查提示肿瘤已经转移至肝脏、脊柱和膀胱。患者拒绝继续治疗, 并于2个月后去世。

(参加讨论医师: 刘晓惠, 马长生, 陈湛 等)

(刘新民, 杜昕 整理)