

中文題目:鱗狀細胞癌併心臟轉移以胸痛及心電圖持續性 ST 節段上升表現  
英文題目:Squamous cell carcinoma with cardiac metastases presenting with chest pain and persistent ST-segment-elevation

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### **Introduction:**

The most common diagnosis of ST-segment-elevation (STE) is acute myocardial infarction (AMI). Except AMI, other differential diagnosis included coronary vasospasm, pericarditis, hyperkalemia, left ventricular hypertrophy, left bundle-branch block, ventricular aneurysm, takotsubo cardiomyopathy, Brugada syndrome and raised intracranial pressure[1]. Cardiac metastases of malignancy, although rare, could induce STE mimicking AMI. We reported a case of squamous cell carcinoma with cardiac metastases presenting with chest pain and persistent STE.

### **Case report:**

A 53-year-old man with past history of right palatal squamous cell carcinoma and right tongue squamous cell carcinoma and had received tumor wide excision and lymph node dissection three years ago. However, recurrence right buccal mucosa and gingiva squamous cell carcinoma was diagnosed one year ago and salvage surgery and concurrent chemoradiotherapy were performed six months ago.

The patient presented to our emergency department with the complaint of crescendo angina for one week. Twelve-lead electrocardiogram (ECG) demonstrated STE in leads II, III, aVF, V1-V4 with premature ventricular contractions and elevated hs-cTnT (32.7 <14 ng/L) was also detected. Transthoracic echocardiography revealed anteroseptal, inferior and inferolateral LV hypokinesis. A hypodense lesion was detected at the interventricular septum with involvement of the right ventricle.

The procedure revealed coronary artery disease with stenoses in the middle part of left anterior descending artery (LAD) and proximal part of right coronary artery (RCA). The pre-interventional flow of the left anterior descending (LAD) coronary artery was TIMI 3 grade. Percutaneous coronary intervention was performed for RCA and LAD stenosis.

After procedure, however, the patient still had persistent chest pain. Post-interventional serial ECG showed sinus rhythm with persistent STE in leads V1-V4. The chest computed tomography demonstrated a 4.6cm mass with heterogeneous enhancement in the cardiac apex with involvement of the interventricular septum and RV papillary muscles. Another nodule in the RA appendage and nodular thickening of the pericardium with minimal pericardial

effusion were also detected.

It was concluded that the persistent chest pain with persistent STE in ECG was due to squamous cell carcinoma with metastasis in the cardiac apical myocardium involving the interventricular septum and pericardium, and unlikely to be the classic STEMI due to acute coronary syndrome (ACS) with resultant occlusive thrombus. The patient was discharged ten days later after pain control with morphine and salvage chemotherapy.

### **Discussion:**

Primary cardiac neoplasms are rare. The autopsy incidence was 0.0001–0.030%. The majority are benign (75%) and myxoma is the most common cardiac tumor. Of the remaining 25 % of malignant cardiac tumor, cardiac sarcoma comprised approximately 95 % of primary malignant cardiac tumors[2].

Except primary malignant cardiac tumors, cardiac metastasis to the pericardium, myocardium, great vessels, or coronary arteries had been reported, too. At autopsy in the general population, the incidence is between 0.7% and 3.5% and up to 9.1% in patients with known malignancies[3]. Four alternative paths were proposed to explain tumor with cardiac metastasis, including direct extension; through the bloodstream; through the lymphatic system; and by intracavitary diffusion through either the inferior vena cava or the pulmonary veins. Regarding to the location of cardiac metastasis, pericardium and the epicardium are the most frequently involved regions, followed by the myocardium and least commonly by the endocardium, which usually localized to right heart and associated with tumors with endovascular growth such as liver, renal and uterine malignancies[4].

Cardiac metastases are generally asymptomatic and unrecognized, but severe complications had been reported to include severe heart failure, pericarditis, cardiac tamponade, conduction disturbances with atrial or ventricular arrhythmias, valvular disease with obstructive shock from the tumor, tumor emboli, direct invasion or compression of the coronary arteries caused acute myocardial infarction, or even sudden death[5-8].

Common neoplasms associated with cardiac metastasis included lung cancer, breast cancer, hematologic malignancies, pleural mesothelioma and melanoma. Other malignancies with high cardiac metastatic rate include ovarian, gastric, renal, and pancreatic carcinomas[3]. Head and neck malignancies with distant metastases to the heart, however, are rare with only few case reports from literature.

In our case, ECG reciprocal depression while STE presented, and typical evolutionary change of STEMI were absent. The mechanism of the STE ECG patterns remains unclear, but several hypotheses had been proposed, including metastatic

tumor infiltration of uninvolved myocardium stretched adjacent muscle fibers, inflammatory reaction caused repeated and sustained myocardial injury preventing formation of new cardiac cell membrane, injurious current resulting from transmembrane ionic gradient change by loss of intracellular potassium and an increase in intracellular sodium, and transfer of potassium ions from necrotic tissue to the adjacent myocardium with a depolarizing effect producing electric potential difference[9-11].

The presence of cardiac metastases is usually indicated widespread advanced disease and the treatment is customarily palliative with poor prognosis. The role of chemotherapy or radiation in the setting of cardiac metastasis is unclear and lack of evidence[12, 13]. Cardiac metastases of malignancy, although rare, can induce STE mimicking AMI. Therefore, careful evaluation should be taken for patients with malignancy presenting with chest pain and ECG change.

#### **Conclusion:**

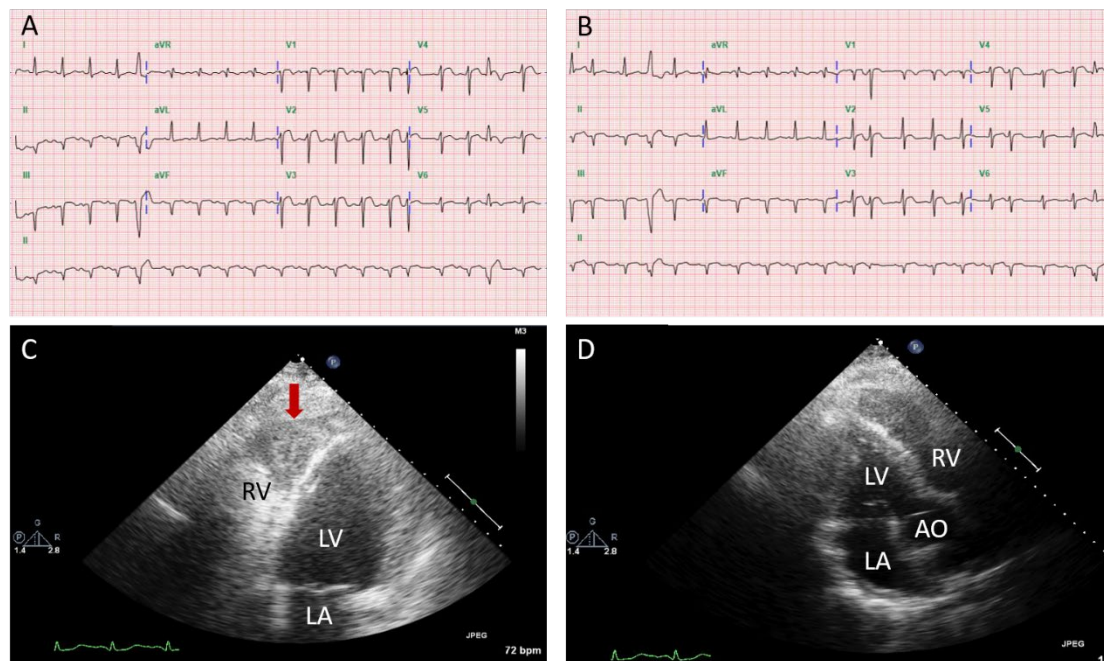
In summary, although not rare, cancer with cardiac metastasis is difficult to be diagnosed. Chest pain with STE could mimicking STEMI. For cancer patients with persistent chest pain and STE after coronary intervention, cardiac metastasis must be included in differential diagnoses and further image study should be arranged, which may play a pivotal role in the diagnosis of cardiac metastasis of malignancy.

#### **Reference:**

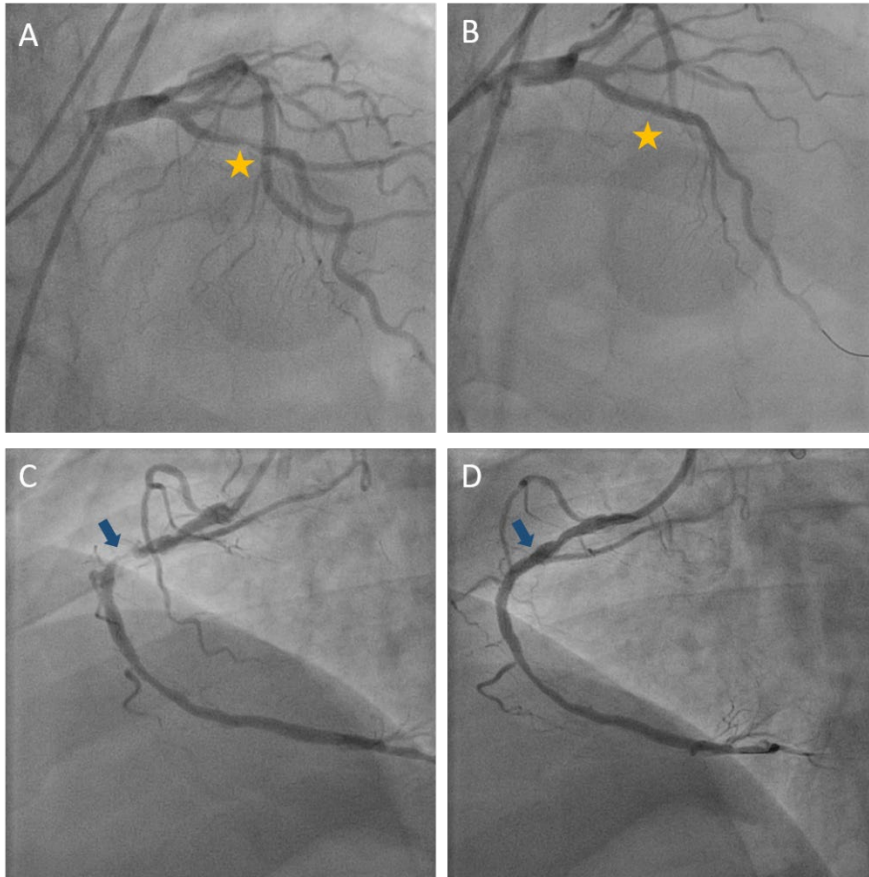
1. Wang, K., R.W. Asinger, and H.J. Marriott, *ST-segment elevation in conditions other than acute myocardial infarction*. N Engl J Med, 2003. **349**(22): p. 2128-35.
2. Patel, S.D., et al., *Primary cardiac angiosarcoma - a review*. Med Sci Monit, 2014. **20**: p. 103-9.
3. Goldberg, A.D., R. Blankstein, and R.F. Padera, *Tumors metastatic to the heart*. Circulation, 2013. **128**(16): p. 1790-4.
4. Bussani, R., et al., *Cardiac metastases*. J Clin Pathol, 2007. **60**(1): p. 27-34.
5. Brailovsky, Y., A. Darki, and V. Mathew, *Case report of a metastatic squamous cell carcinoma to the pericardium masquerading as ST elevation myocardial infarction on ECG*. Eur Heart J Case Rep, 2018. **2**(3): p. yty095.
6. Nagata, S., et al., *Cardiac metastasis of head and neck squamous cell carcinoma*. Int J Oral Maxillofac Surg, 2012. **41**(12): p. 1458-62.
7. Tsai, Y.T., S.W. Kuo, and S.P. Hao, *Cardiac tamponade: a rare presentation from a rare metastatic site in oral squamous cell carcinoma*. Eur Arch Otorhinolaryngol, 2010. **267**(9): p. 1483-5.

8. Reddy, G., et al., *Left anterior descending coronary artery occlusion secondary to metastatic squamous cell carcinoma presenting as ST-segment-elevation myocardial infarction*. *Circulation*, 2014. **129**(24): p. e652-3.
9. Chen, T., *Persistent ST-segment elevation due to cardiac metastasis*. *BMJ Case Rep*, 2017. **2017**.
10. Pan, K.L., et al., *Misdiagnosis: cardiac metastasis presented as a pseudo-infarction on electrocardiography*. *Int Heart J*, 2007. **48**(3): p. 399-405.
11. Harris, T.R., G.D. Copeland, and D.A. Brody, *PROGRESSIVE INJURY CURRENT WITH METASTATIC TUMOR OF THE HEART; CASE REPORT AND REVIEW OF THE LITERATURE*. *Am Heart J*, 1965. **69**: p. 392-400.
12. Tandon, V., et al., *Metastatic squamous cell carcinoma to the heart: an unusual cause of ST elevation-a case report*. *Eur Heart J Case Rep*, 2019. **3**(2).
13. Lu, D.Y., et al., *Tumor Invasion of Myocardium Presented with Acute Coronary Syndrome*. *Acta Cardiol Sin*, 2015. **31**(3): p. 257-60.

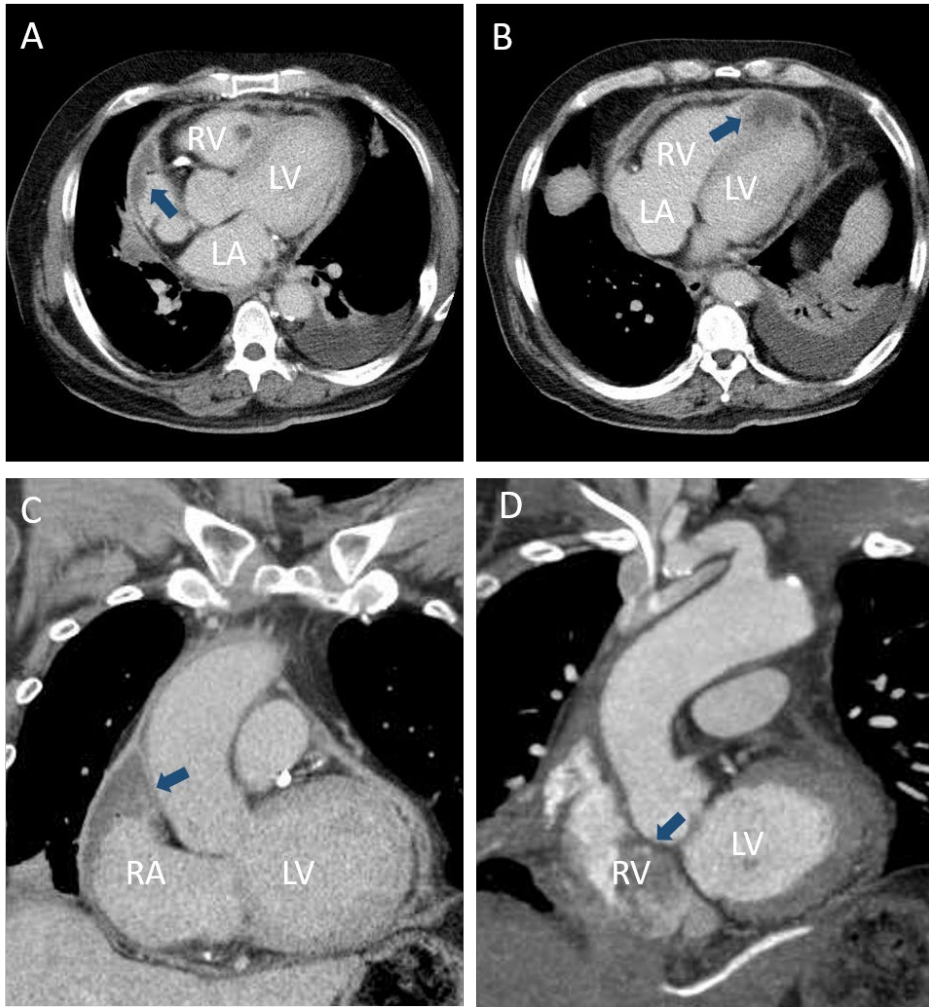
**Figures:**



**Figure 1:** The ECG showed persistent ST elevation at V1-V4 before (A) and after percutaneous coronary intervention (B). Echocardiography showed a heterogenous lesion at the interventricular septum with involvement of the right ventricle.



**Figure 2:** The coronary angiography showed a significant stenosis at the LAD proximal part and status after coronary stenting (yellow star in A and B); and right coronary artery stenosis status after coronary stenting (blue arrow in C and D).



**Figure 3:** The chest computed tomography scan showed cardiac metastasis of the squamous cell carcinoma with involvement of the interventricular septum and right atrium (blue arrow).