

## Case Report

# Vacuum suction biopsy of myocardial metastases from lung squamous cell carcinoma: a case report

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**Abstract:** Metastatic cancers to the heart are more frequently occur than primary tumors of the heart. Myocardial metastases from lung squamous cell carcinoma are uncommon and may go unrecognized until autopsy due to there are no specific symptoms or signs. In this report, we present one case of a 61-year-old man with lung squamous carcinoma and metastatic tumor of the heart. The diagnosis of myocardial metastases was made on the basis of a new method of vacuum suction biopsy, which required operators with great skills. Pathological specimen of myocardial metastases cloud obtained through needle aspiration histology examination, and it was conducive to the further diagnosis of patient, which would provide objective reliable basis for stage and treatment of tumor.

**Keywords:** Heart, lung carcinoma, myocardial metastases, vacuum suction biopsy

### Introduction

As early as 1700, Bonetii firstly reported myocardial metastases. Lung cancer, breast cancer, lymphoma are the most frequent primary tumors with symptomatic metastases to the heart [1, 2]. Combining with domestic and foreign literature, lung cancer occupies primacy in all cancers [3, 4], 10%-25% of patients with advanced malignant tumor were cardiac metastases, but the clinical diagnosis remains more difficult [5, 6]. In this report, we present one case of a 61-year-old man with lung squamous carcinoma and a metastatic tumor of the heart, and diagnosed the patient with myocardial metastases on the basis of a new method of vacuum suction biopsy, which required operators with great skills.

### Case report

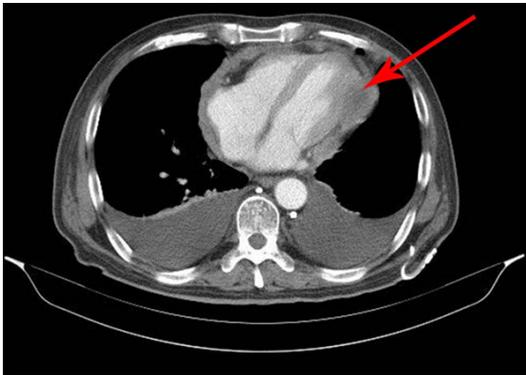
A 61-year-old man complaining of 1 month of shortness of breath after activity and back pain was admitted to our hospital (Hangzhou First People's Hospital, Hangzhou, China) on July 29, 2016. The patient was diagnosed with lung squamous carcinoma 8 months ago at the Second Affiliated Hospital of Zhejiang University on December 5, 2015. Contrast-enhanced

computed tomography (CT) scan of the chest showed central type lung cancer of left hilum associated with mediastinal and left hilar lymph node metastasis and left pulmonary artery stenosis. Bronchoscopy showed obviously stenosis at the opening of the left upper lung lobe, the infiltrating-like appearance of surrounding mucosa, and involvement of the lateral wall of the inferior segment of left main bronchus. Subsequent biopsy of this part showed no obvious abnormality in the bronchus of each lobe segments. Pathological results showed poorly differentiated carcinoma at inferior segment of left main bronchus and squamous cell carcinoma, small number of cancer cells at 4 L lymph node and no occurrence of cancer cells at 7 lymph node of mediastinal. Epidermal growth factor receptor (EGFR) mutation was negative. Cranial MRI showed no obvious intracranial metastatic focus. Bone emission computed tomography (ECT) showed no obvious abnormalities in the whole body bone imaging (StageT4N2M0, III B). After that diagnosis, the patient was admitted to our hospital (Hangzhou First People's Hospital, Hangzhou, China) on December 14, 2015. A radiochemotherapy was considered. After admission, exclusion of lung cancer radiotherapy taboo, concurrent chemo-

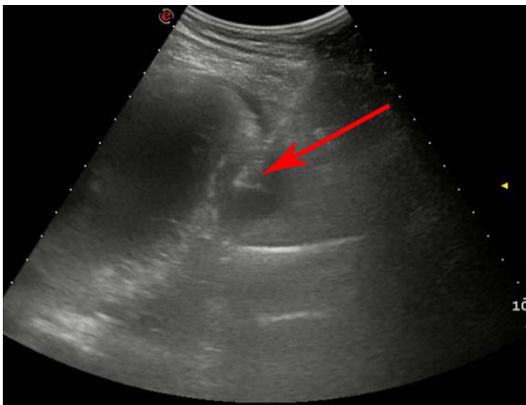
## A case of myocardial metastases



**Figure 1.** Echocardiogram showed myocardial hypoechoic mass on the cardiac apex.

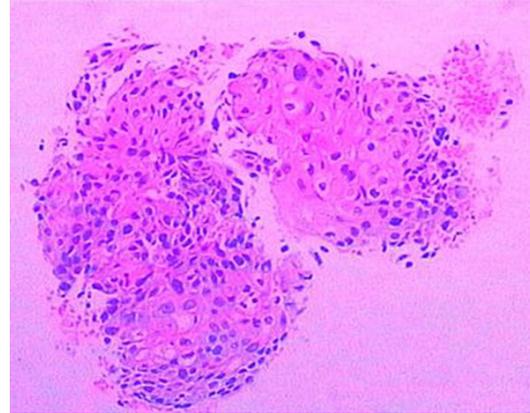


**Figure 2.** CT showed low-density myocardial lesions on the cardiac apex.



**Figure 3.** Ultrasound image showed that the needle was successfully punctured into the myocardial lump.

therapy was also administered. Radiotherapy was discontinued for 1 week due to severe pharyngalgia from radiation esophagitis after 20 cycles of radiotherapy. Concurrent chemotherapy was cancelled. Radiotherapy was continued



**Figure 4.** Pathological examination showed squamous cell carcinoma lesions (Original magnification, 100 × H&E).

after system improvements treated with local mucosa protection.

One month ago, the patient was admitted to our hospital (Hangzhou First People's Hospital, Hangzhou, China) on June 25, 2016 due to the complaint of shortness of breath. Cardiac ultrasound examination showed pericardial effusion (medium-a lot), mitral regurgitation (mild), tricuspid regurgitation (mild), left ventricular myocardium occupying lesions (**Figure 1**), thus further examinations are required. Electrocardiogram (ECG) showed rapid ventricular rate and atrial fibrillation. About 1500 ml thick bloody fluid was achieved after pericardiopuncture and catheter drainage. CT reexamination showed pericardium metastasis and the heart was involved (**Figure 2**). Further pathological diagnosis was advised.

Then the patient was admitted to our hospital (Hangzhou First People's Hospital, Hangzhou, China) with suspicious lung cancer on July 29, 2016. He was preliminary diagnosed as left lung squamous carcinoma (T4N2M1), pericardial metastasis (stage IV), and atrial fibrillation after physical examination. Under the guidance of ultrasound, aspiration biopsy needle (C1, 21 G × 100 mm, Eight light, Japan) was punctured into myocardial lump (**Figure 3**). Then the needle was lifted and thrust repeatedly and finally thin pale tissue was obtained. The procedure was uneventfully. Subsequently, immediate postoperative contrast-enhanced ultrasonography showed no echogenicity of ultrasound contrast agent in pericardial cavity suggestive of no active bleeding. The pathology of the

biopsy specimens showed a small amount of squamous cell carcinoma tissue on the cardiac apex (Figure 4).

### Discussion

Cardiac metastases are most common in pericardial metastasis. The diagnosis of pericardial metastasis was almost with pericardial effusion, which is guided by ultrasound. However, if there was lump in myocardial, the clinical diagnosis of metastases was difficult. Although, it has been reported the iconography could identify myocardial or intracardiac metastasis [7, 8], it has not been reported the pathological diagnosis of tumors identified by vacuum suction biopsy. It was very important to diagnose the pathological characteristics of suspicious myocardial metastases by vacuum suction biopsy to further treatment for patient, when iconography was not work or patients were with two kinds of tumor diseases at the same time. Due to the great risk of myocardial puncture and core needle biopsy was undesirable, we obtain tumor tissue specimens by the method of vacuum suction. Because of the fine puncture needle could directly puncture to tumor and did not damage the myocardium, the method could reduce the risk of bleeding and cardiac arrhythmia. Contrast-enhanced ultrasound showed no signs of active bleeding in the pericardial cavity immediately after the puncture. In this case, the tissue samples were obtained successfully by once puncture and diagnosed as squamous carcinoma by histopathology.

Although, there is no report about myocardial puncture, according to this case, under the safety of inserting needle, we believe it was advisable to obtain suspicious myocardial tissue specimens by vacuum suction needle, as well as pathologic diagnosis. However, because of the risk of myocardial infarction, it is difficult to operate. The operators need lots of experience of lump and pericardial puncture under the guidance of ultrasound. It is better to take once puncture to success, especially not repeatedly puncture, to reduce myocardial injury and the risk of bleeding. Contrast-enhanced ultrasound was immediately performed to determine whether there was active bleeding after the puncture, if there was, the pericardial drainage was required.

### Disclosure of conflict of interest

None.

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