



A Case Report of the Cardiac Primary Tumors of Melanoma Originating

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Abstract

Background: Cardiac tumor is a rare heart condition with complex clinical manifestations and a lack of specificity. A lot of studies have been conducted on cardiac metastases. Cardiac tumors can be categorized as primary or secondary depending on the origins of tumors. Secondary tumors from 20- to 40-fold are more common than primary tumors. Although primary cardiac tumor has been extensively studied for decades, there's a lack of in-depth researches on primary melanoma of the heart in academic domain. This medical report focuses on cardiac primary melanoma and further illustrates the association between cardiac tumors and melanoma.

Case Report: A 60-year-old female patient was admitted to emergency room of our hospital. She featured central nervous system embolism with stroke as the primary symptom accompanied with multiple systemic lymph node and bone metastases. The neurosomatic symptoms stems doubtedly from tumor embolus loss in the left ventricular after examination by systematic lymph node ultrasound, head MRI, cardiac MRI, echocardiography, and systemic PET-CT. Besides, no previous cardiac diseases were reported. Finally, it was pathologically confirmed as primary malignant melanoma of the heart.

Conclusion: Since tumors in the heart often shows symptoms reminiscent of many other heart diseases such as heart failure, arrhythmia and other nonspecific symptoms. It is rather challenging to differentiate cardiac tumors in clinic diagnosis. A multidisciplinary team of specialists from neurology, hematology, cardiology, oncology, and dermatology participated and coordinated in researching this case. This report is expected to add additional value to existing literature.

Keywords: Cardiac tumors; Neurologic symptoms; Primary tumors; Melanoma; Malignant

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Case Presentation

A female patient of 60 years of age was admitted to the neurology department of our hospital with symptoms of sudden aphasia and immobility in her left side limbs. Those symptoms have been existing for over 24 h.

Clinic examination indicated that:

1. Multiple enlarged lymph nodes on right side of neck, among which the largest one in size was roughly 2 cm in diameter.
2. Motor aphasia.
3. Shallower Nasolabial folds on left compared with those on right.
4. Visible extension on left tongue.
5. The rest of the physical examination showed no positive signs.

In addition, the limbs also showed various degrees of strength (Table 1):

Other examination suggested low muscle tone on the left side, and normal muscle tone on the right. Left finger-nose test and alternating test cannot be performed accurately. Pathological reflex and meningeal stimulation sign were negative.

Laboratory tests revealed that hemoglobin level has dropped to 63 g/L under the lower limit. While blood cells, platelets, folic acid, vitamin and serum ferritin levels stay within standard range. Albumin decreases to 30.9 g/L. C-reactive protein shows at level of 80.44 mg/L. Erythrocyte sedimentation rate (118 mm/h) and neuron specific enolase (122.50 ng/ml) indicates a slight increase instead.

Table 1: The limbs show various degrees of strength.

Grade	Distal muscle	Proximal muscle
left upper limb	0	3
left lower limb	5-	4
right upper limb	5	5
right lower limb	5	5

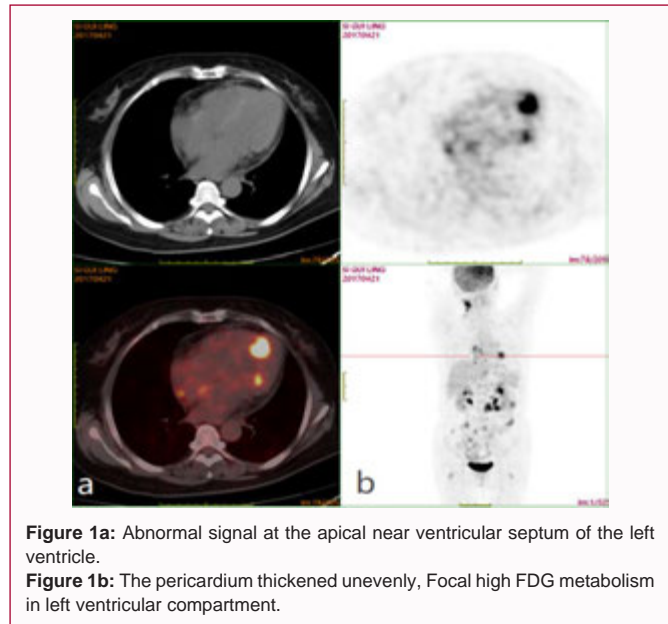


Figure 1a: Abnormal signal at the apical near ventricular septum of the left ventricle.

Figure 1b: The pericardium thickened unevenly, Focal high FDG metabolism in left ventricular compartment.

Ultrasonography pointed out multiple lymphadenopathy in the abdomen and neck. Cranial MRI suggested that right frontoparietal temporal insula, right basal ganglia area, caudate nucleus head, left temporal lobe, and some lesions in the left cerebellar hemisphere was considered as acute and subacute infarction MR performance.

According to the MRI findings, neurologists considered that the patient probably suffered from cerebral embolism. Doppler echocardiography was carried out. A low-medium echo mass measured approximately 2.82 cm × 1.69 cm was detected in the cardiac cavity at the apex of the left ventricle. A cardiac MRI was performed, and the results suggested a tumor presentation.

Further whole-body PET-CT suggested enlarged lymph nodes in the right neck (SUV 8.2), abdomen and pelvis (SUV 7.5) with high

FDG metabolism; inhomogeneous thickening of the pericardium with high FDG metabolism (SUV 5.0); focal high FDG metabolism of the left ventricle (SUV 7.7, cross-section 1.7 cm × 1.9 cm) (Figure 1a); two foci of FDG hyper-metabolism in erector spinae muscle (SUV 3.5); bilateral hyper-metabolism of FDG in the upper femur and L5 vertebrae (SUV 3.3); consistent with malignancy and metastasis at the above sites (Figure 1b), and the left ventricular lesions were more likely to be the primary tumor. According to the patient's wishes and physical condition, lymph node biopsy was carried out instead of cardiac mass biopsy, and right submandibular lymph node biopsy was diagnosed as malignant melanoma (Figure 1c, 1d).

Discussion

The rare cases of cardiac tumors with complex and non-specific clinical presentations are easily confused with other cardiac diseases [1]. Cardiac tumors can be divided into primary and secondary (metastatic) tumors, and primary cardiac tumor is a rare disease, with an incidence ranging from 0.001% to 0.03%. Eighty percent of them are benign tumors, and among which 70% are myxomas. The others are: Fibroelastoma, rhabdomyoma, fibroma, angioma and lipoma. The 95% of primary malignant tumors of heart cases are sarcomas. And the other 5% are lymphomas. Malignancy is more common in right atrial sarcoma [2]. The symptoms of cardiac melanoma are often insidious with a lack of clinic examination, which can cause delay in early diagnosis and surgical management. Symptoms mainly include dyspnea, atrial or ventricular arrhythmias, chest pain etc. In this case, the patient with cerebral embolism as the first symptom is normally followed by the discovery of a cardiac occupancy. It is suspected that thrombus formation on or near the surface of the ventricular occupancy leads to embolism. Malignant Melanoma is a clinically common highly malignant skin mucosa and uvea tumors. A study based on 70 autopsies of patients who died of cardiac melanoma found that cardiac metastasis contributes to death of up to 64% of patients. But only 10% to 16% patients diagnosed with cardiac metastases showed clinical manifestations associated with cardiac involvement [3]. Another study reported that 23 (1.8%) of 1,254 patients with metastatic melanoma were diagnosed with cardiac metastasis. Cardiac metastases were reported in the right ventricle (65%), left ventricle (35%), and right atrium (35%). A total of 11 patients (48%) developed at least one cardiovascular complication after diagnosis of cardiac metastasis, the most common types among which are arrhythmia (30%), heart failure (22%), and pericardial effusion (17%), while patients with metastatic melanoma were found

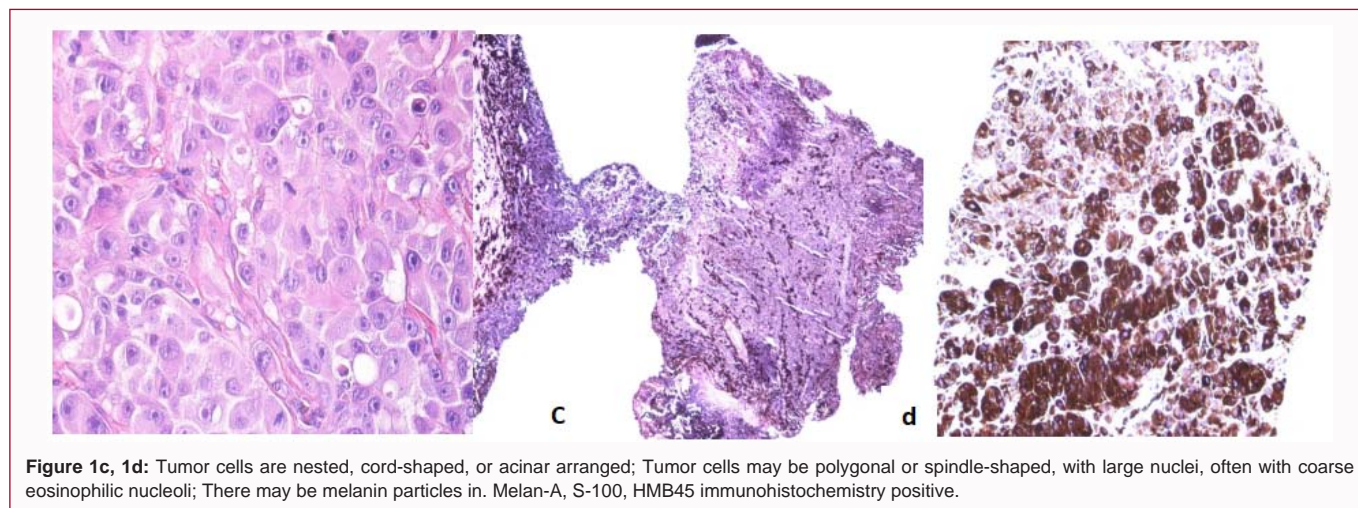


Figure 1c, 1d: Tumor cells are nested, cord-shaped, or acinar arranged; Tumor cells may be polygonal or spindle-shaped, with large nuclei, often with coarse eosinophilic nucleoli; There may be melanin particles in. Melan-A, S-100, HMB45 immunohistochemistry positive.

to have a poorer prognosis [4]. In 2014, Andriana Villa emphasized the importance of Morden diagnostic techniques, not only for the detection of cardiac masses, but also for a better anatomic definition and tissue characterization [5]. Additionally, Paraskevaïdis IA also mentioned in his report that the prevalence of primary cardiac tumors is 0.001% to 0.03% in autopsy series. 75% of primary tumors are benign originally, and the remaining 25% of malignant cardiac tumors are cardiac sarcomas [6].

Conclusion

Although cardiac metastases from malignant melanoma are not uncommon. Melanoma originating in the heart has rarely been reported. The current determination of primary cardiac tumor can be defined as a lesion confined to the heart and/or pericardium, or a large mass with the primary lesion site in the heart, unlikely to be metastasis from other primary lesions. In our case, PET-CT did not show any confidence of other origin.

In addition, the patient had no clinical manifestations of skin or eye abnormalities. No abnormalities could be obtained from the electrocardiogram either. Other relevant disorders taken into account such as hypertension, diabetes mellitus, heart valve disease, cardiomyopathy, atrial fibrillation, trauma or fracture, myocardial infarction, infective endocarditis, left atrial mucinous tumor, precordial heart disease or surgery were not recorded in patient's medical history. Atherosclerotic thromboembolic, fat emboli, air emboli, and amniotic fluid emboli are unlikely to be the root cause of embolism after ruling out multiple factors. The embolus in the patient's cerebral embolism was considered to originate from a tumor in the apical portion of the left ventricle of the heart. Multidisciplinary consultation with specialists in oncology, hematology, dermatology, cardiology, neurology basically ruled out the possibility of a primary other than cardiac melanoma.

Primary cardiac melanoma maintains a high degree of malignancy without adequate representative cases. Surgery may be considered for localized lesions. Nevertheless, large lesions require chemotherapy. But the treatment is proved to be less effective in practice. The patient's family finally abandoned the treatment, and out-of-hospital follow-up was conducted. After one month, the patient passed away.

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