

## **Heart as an Early Site of Metastasis from Squamous Cell Carcinoma of Occult Primary: Rare Case Report**

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**Abstract:** Cardiac involvement by primary and secondary tumors is one of the least investigated subjects in oncology. Metastasis of squamous cell carcinoma (SCC) is rare and so is the bilateral ventricular involvement. We report a case of a 72 years old man presenting with complaints of chest pain and supraclavicular lymphadenopathy, who died within 24 hrs of admission to the hospital. A clinical autopsy revealed metastasis of SCC involving both left and right ventricles and also infiltrating the myocardium, with occult primary despite extensive examination.

**Keywords:** Squamous cell carcinoma, Metastasis, Heart, Autopsy.

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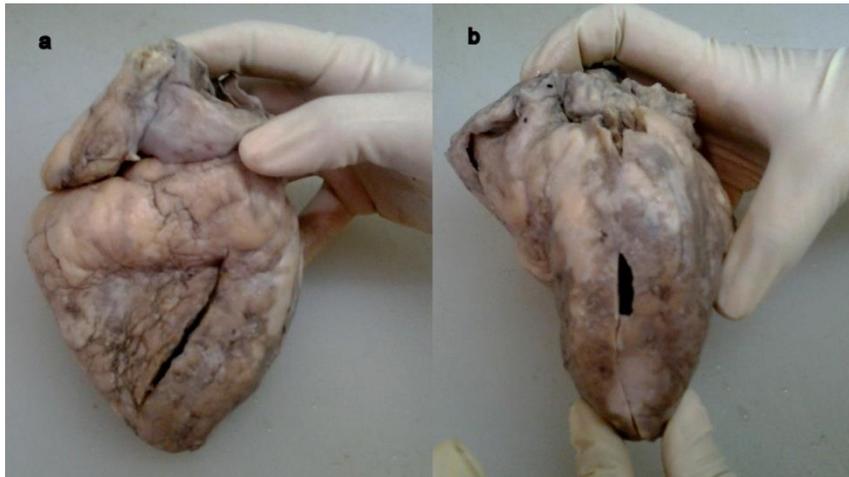
### **INTRODUCTION**

In cancer patients, metastases to the heart are rare. They are usually difficult to diagnose unless they cause symptoms [1]. Although cardiac dissemination of malignant disease is common during an autopsy, the clinical symptoms are rare [2]. Metastasis of squamous cell carcinoma to the heart is rare occurrence but it has been encountered more frequently in recent biopsies because of increased survival of cancer patients. It usually comes to light in the setting of an already evident primary carcinoma. The right side of heart is the most common site for metastatic malignancies due to the pattern of venous return. The involvement of both sides of heart is a rare clinical event [3]. Cardiac metastases have been found to occur predominantly in patients in sixth and seventh decade of life without sex preference. The frequency of cardiac metastases is generally underestimated. It was found in up to 25% patients who had died of malignancies [4].

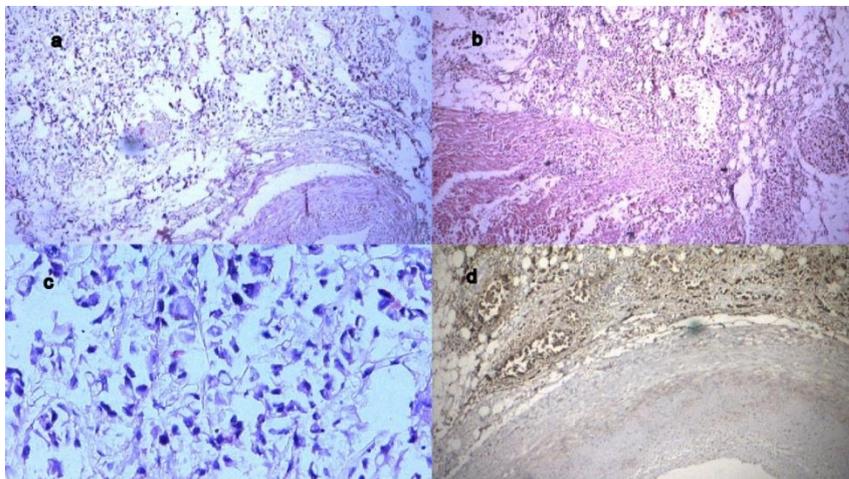
### **CASE REPORT**

A 72 yrs old man was admitted in our hospital with left sided chest pain, hypotension (96/60 mmHg), tachycardia (100bpm) and right supraclavicular swelling. The pain was constant, excruciating type and non-migratory. The heart sounds were normal with no murmur. An electrocardiogram showed sinus tachycardia with inverted T waves in the Infero-lateral

leads. Investigation revealed normal haematological profiles, serum electrolytes. Liver and kidney function tests were unremarkable. The enzyme assay for heart was normal. There was no associated fever or weight loss. On chest X ray, lungs were normal with mild cardiomegaly. FNAC done from 2x2 cm right sided supraclavicular swelling revealed metastatic deposits from poorly differentiated squamous cell carcinoma. The patient died within 24 hrs, so further investigations regarding the nature of primary could not be carried out. A clinical autopsy was performed. On opening the chest cavity, lungs were grossly unremarkable except for mild blackening. Heart show thickened pericardium with grey white nodular deposits (Fig. 1a and b). On cutting open these grey white plaques seem to involve myocardium at places. Head and neck and abdominal cavity dissection did not reveal any significant abnormality except for fatty liver. Visceras were sent to pathology department. Representative sections from heart revealed highly pleomorphic cells with increased N/C ratio in the pericardium and surrounding fat, infiltrating the myocardium and major blood vessels (Fig. 2). Immunohistochemical staining was positive strongly for CK and EMA and negative for calretinin, chromogranin, neuron specific enolase, desmin, myogenin and actin. On histopathology, a diagnosis of metastatic deposits from poorly differentiated SCC of unknown primary was made.



**Fig. 1 a & b: Gross photographs of heart showing multiple nodular grey white deposits involving both the ventricles**



**Fig. 2 : (a) Photomicrograph revealing isolates of tumor cells around the coronary artery (H&E; x40)  
 (b) Photomicrograph revealing tumor cells infiltrating the fat and myocardial muscles (H&E; x40)  
 (c) Photomicrograph revealing high power view of the tumor cells (H&E; x200)  
 (d) Photomicrograph revealing tumor cells showing strong cytoplasmic positivity (CK; x40)**

## DISCUSSION

Metastatic cancer to heart assumes greater diagnostic and therapeutic importance as the incidence of cancer rises. The condition evidently was first described by Boneti in 1700 [5]. Neoplasms involving the heart or pericardium are far more likely to be secondary (metastatic) than primary. Secondary cardiac tumors are not uncommon. They are found at autopsy in 10-15% of patients with generalized cancer and in 1-3% of the general population [2, 6].

Tumours having high tendency of metastasis to the heart include malignant melanoma, leukaemia, malignant germ cell tumors, and malignant thymoma. Although lung and breast carcinoma do not metastasize to the heart frequently, they account for the greatest numbers of cardiac metastases due to their high incidence [1].

Cates *et al.* reported that 10% of the cases with cardiac metastasis had new ECG changes that are suggestive of myocardial ischaemia or injury, including either diffuse or segmental T wave inversion or ST elevation [7].

Lam *et al.* had performed 12485 autopsies over a period of 20-years. They had reported to found 7 cases of primary and 154 cases of secondary cardiac tumors from the autopsies with the incidence of 0.056 and 1.23% respectively. For secondary tumours involving the heart, the common malignant primary tumors encountered were carcinoma of the lung, oesophageal carcinoma, lymphoma, breast carcinoma, pancreatic carcinoma, carcinoma of the liver, leukemia and gastric carcinoma [6].

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Thus, the two most common primary neoplasms invading the heart are lung and breast because of their high prevalence [8].

The pericardium is found to be the most common site of metastasis, and involvement of endocardium is rare. Mukai *et al.* had reported 19% of pericardial involvement, 33% of epicardial involvement, 42% of myocardial involvement and only 6% of endocardial involvement in 407 autopsies with cardiac tumors [9]. Here, in this patient both pericardium and myocardium were involved.

With the help of echocardiography, computed tomography and magnetic resonance imaging metastatic carcinoma can be clinically diagnosed so that lifesaving surgical removal is sometimes possible [2, 10]. Nevertheless, neoplastic disease of the heart, whether primary or secondary, is usually diagnosed at autopsy. The diagnosis of cardiac tumors whether primary or secondary can be difficult because of their rare occurrence and the paucity of symptomatology [1]. Intracavitary growth of secondary heart tumors is unusual. Therefore, despite their frequency, metastatic tumor rarely gains attention. Sometime, it may imitate valvular heart disease or cause cardiac failure, ventricular or supraventricular heart rhythm disturbances, conduction defects, syncope, embolism, or, quite often, pericardial effusion or even may cause death [4]. Pathologically, heart metastases are usually small, firm and nodular. Microscopically, they resemble the primary lesion. Necrosis is uncommon. Metastatic cancer to the heart is usually a late manifestation of cancer and accompanied by foci elsewhere, although in rare cases, the heart is the sole metastatic site [5].

Heart metastases are not usually discovered except at autopsy [11]. They are often not clinically apparent but have much impact on a patient's survival. Echocardiography, particularly two-dimensional imaging, is the most sensitive tool for detecting metastatic disease to the heart, has increased the rate of diagnosis [1, 12].

The histopathological finding of carcinoma of squamous cell origin initiated further investigations to find the primary tumor. But even a thorough search during clinical autopsy also could not identify the primary lesion. Our patient presented with heart as the only site of organ metastasis apart from right supraclavicular lymph node involvement with an occult unknown primary. Both the ventricles were involved and infiltrated myocardium also along with pericardial involvement.

## CONCLUSION

This case emphasizes the fact that rarely, heart may be one of the early sites of metastasis and a

thorough cardiac workup is essential to improve the prognosis. Even though the best treatment for such patients has not been agreed to, we hope that an optimal treatment will be realized.

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