

## Cardiac Micrometastasis of Maxillary Squamous Cell Carcinoma: A Rare Postmortem Finding

### Abstract

Secondary cardiac tumors are rare with an incidence of 2.3%. Common tumors metastasizing to the heart are lung, esophagus, breast, stomach, pancreas, melanoma, and colon. Only few case reports of oral squamous cell carcinoma metastasizing to the heart have been reported. Herein, we are presenting a case of a 17-year-old deceased male previously diagnosed with maxillary squamous cell carcinoma, found having multiple micrometastatic foci to the heart and lung in histopathological examination of tissues received after conducting autopsy. The involvement was limited to the myocardium with a normal pericardium and endocardium, which is not common. The case details and relevant clinical discussion are described to highlight asymptomatic, grossly inappreciable, micrometastatic foci of oral squamous cell carcinoma to myocardium.

**Keywords:** Cardiac metastasis, secondary cardiac tumors, squamous cell carcinoma

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### Introduction

Primary cardiac tumors are rare tumors with an incidence ranging from 0.001% to 0.28%.<sup>[1]</sup> The incidence of secondary cardiac tumors has been found to be approximately 2.3% in previous autopsy studies, approximately 132 times more than primary cardiac tumors.<sup>[2]</sup> The heart is one of the least favored sites for metastasis of patients diagnosed with carcinoma anywhere in the body, only 1.23% have identifiable cardiac metastasis at autopsy.<sup>[3]</sup> This is probably the reason, why cardiac tumors – both primary and metastatic – are least investigated subjects in oncology. Common tumors metastasizing to the heart are lung, esophagus, lymphoma, breast, stomach, pancreas, melanoma, and colon.<sup>[3,4]</sup>

There are few case reports highlighting cardiac metastasis from oral cancers, most of such cases are from squamous cell carcinoma of the tongue and retromolar trigone.<sup>[5,6]</sup> Case reports of squamous cell carcinoma, maxillary sinus metastasizing to the heart are still rarer.<sup>[7,8]</sup> We hereby report a case of squamous cell carcinoma of the maxilla that metastasized to the heart and lung without any appreciable mass lesions on gross autopsy examination and

diagnosed on microscopic examination as multiple micrometastasis.

### Case Report

A 17-year-old deceased male with previously known history of malignancy involving maxillary sinus and mentally retarded was brought to the hospital for autopsy. Six years back, the patient had presented with complains of swelling and pain over the right side of the face and was diagnosed with squamous cell carcinoma of the right maxilla in a different hospital. The complete treatment records of the patient were not available, but he was treated with radiotherapy and hospitalized multiple times over the past 6 years. The patient's condition had been worsening for the past 3 months, the details of which were not available and he was brought dead to the hospital. An autopsy was performed, and external examination revealed a large wound over the right mandible with multiple hard nodules over the right side of face and neck. On opening the thoracic cavity, the left lung was adherent to the overlying pleura and chest wall at multiple places. Multiple foci of consolidation were present involving both the lungs. Cut section of these foci exuded purulent material.

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Gross examination of all other organs including liver and heart was unremarkable; there were no mass lesions indicative of metastatic foci.

Microscopic examination of random sections from heart and hard skin nodules on face and neck revealed nests of squamous cells with features of moderately differentiated squamous cell carcinoma [Figures 1 and 2]. Sections from gross lesions in the lung showed pulmonary edema, congestion, interstitial inflammation, and presence of nests of squamous cells consistent with metastatic moderately differentiated squamous cell carcinoma [Figure 3]. Microscopic examination of all other organs including liver was unremarkable. It was concluded that the possible cause of death was widespread dissemination of the tumor leading to failure of vital organs including heart and lungs.

## Discussion

Distant metastasis of oral squamous cell carcinoma is not an uncommon event and is widely studied. Various studies have reported lung (55%), bone (12%–37%), and liver (3%–9%) as the most common site of metastasis from oral squamous cell carcinoma.<sup>[9,10]</sup> Brain, soft tissues, and skin have also been reported as metastatic sites with lower incidence rates.<sup>[9,10]</sup> Individual case reports of cardiac metastasis from oral cancer are available, most of which are postmortem.<sup>[2,3]</sup>

The most common location of cardiac involvement by secondary tumors is pericardium (69.4%), followed by myocardium (31.8%), and endocardium (5%).<sup>[3,4]</sup> This is possibly because of the fact that the most common tumors metastasizing to the heart are intrathoracic, which involve the heart by direct extension and therefore invade the pericardium at first. The present case had metastasis in the myocardium with an unremarkable pericardium and endocardium, which is not so commonly reported. When present, metastatic tumors limited to the myocardium are usually melanomas and lymphoproliferative in nature.<sup>[1]</sup>

Spread of the tumor to the heart either occurs by direct extension or through bloodstream or lymphatic system. Metastasis to the myocardium, as was found in the present case, could have occurred as a result of retrograde spread through tracheal or bronchomediastinal lymphatics, and is usually secondary to prior diffusion of the tumor to pericardium, as discussed by Bussani *et al.* in his study.<sup>[4]</sup> In the present case, the pericardium was not involved on gross and microscopic examination, and the myocardial involvement was probably through the retrograde tracheal and bronchomediastinal lymphatic channels.

Cardiac metastasis is usually an indicator of widespread dissemination of cancer and occurs in advanced disease. An autopsy case series that studied more than 18,000 deaths reported the presence of cardiac metastasis in 9.1% of all malignancy-related deaths but found that the heart was the sole target of metastasis in only 1.5% of such cases.<sup>[4]</sup>

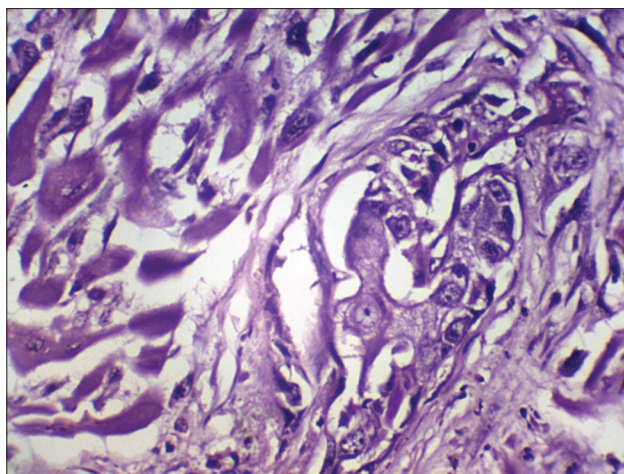


Figure 1: Nests of malignant squamous cells infiltrating the myocardial fiber bundles (H and E, ×400)

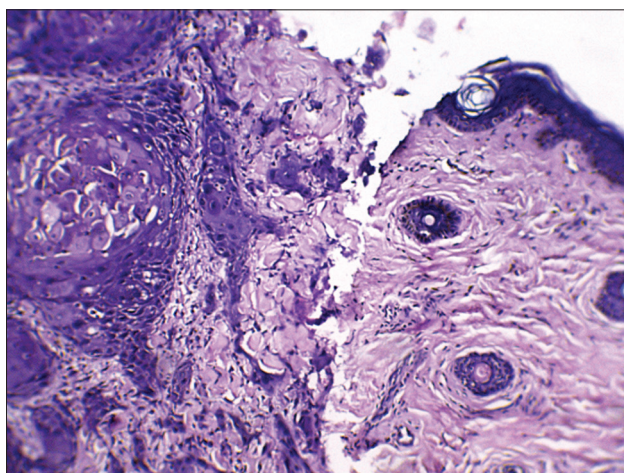


Figure 2: Sections from hard skin nodules over face and neck show moderately differentiated squamous cell carcinoma (H and E, ×100)

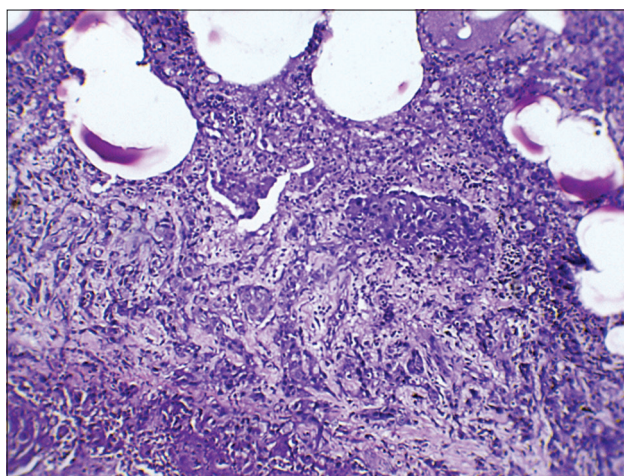


Figure 3: Microscopic examination of lung lesions showed infiltration of malignant squamous cells in the subpleural lung parenchyma (H and E, ×100)

Cardiac metastasis is known to remain clinically silent, possibly because of its small size and the fact that the

overall clinical picture is dominated by generalized tumor spread. In fact, most of the cardiac metastasis has been reported on postmortem studies. However, when present, the clinical symptomatology may be extremely variable depending on the focus of involvement. The involvement of the myocardium may present clinically as arrhythmias and conduction disturbances, depending on the site and size of infiltration within the myocardium. The sudden cardiac death due to massive infiltration of the myocardium has been reported.<sup>[7]</sup> The present case had been treated at a different hospital in the past and no records suggesting any symptomatology or investigations pointing towards known cardiac involvement by the tumor were available.

The prognosis of patients with cardiac metastasis is generally poor, mainly because most of the times it is a part of the widespread dissemination of advanced tumor and treatment options are limited.

### Conclusion

The present case has been put forth, to highlight the fact that in cases of disseminated malignancies, multiple widespread micrometastatic foci of tumor may be present even in the absence of grossly appreciable lesions in frequently involved organs such as liver and lungs and rarely involved organs like heart, leading to mortality as happened in this case.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and

due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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