A Case of Right Ventricular Mass Presenting with Right Ventricular Outflow Tract Ventricular Tachycardia

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PRESENTATION OF CASE

Cardiac metastasis due to primary lung lesion is a rare entity. The involvement of endocardium is very unusual. Moreover, cardiac metastasis may present in different ways. Here we present a case of a male in his sixth decade who presented with right ventricular outflow tract ventricular tachycardia. On examination, cardiac metastasis in endocardium of primary lung origin was observed.

A 62-year-old male was admitted with history of recurrent episodes of palpitation, perspiration and chest pain since 2 months. On admission, electrocardiogram was done which showed monomorphic ventricular tachycardia with LBBB and inferior axis was suggestive of right ventricular outflow tract ventricular tachycardia (RVOT-VT) (Figure 1). Immediately synchronised DC shock was used to cardiovert to normal sinus rhythm. He had no family history of QT prolongation, arrhythmia or sudden cardiac death. He was evaluated with 2D-Echocardiography which showed large echogenic mass on right ventricular wall extending up to RVOT. It was adherent to myocardium, sessile with rough borders. It raised a suspicion of tumour or metastasis of right ventricle. In view of RVOT-VT we started metoprolol 25 mg twice daily. Chest X-ray and ultrasonography was normal. Coronary angiography was normal.

Cardiac MRI showed a 62 x 26 mm well defined lesion with central necrosis involving anterior wall of right ventricle with post contrast enhancement which was suggestive of neoplastic mass (Figure 2). There was an ill-defined soft tissue lesion with post contrast enhancement in left lower lobe of lung which was likely to be primary or secondary neoplastic lesion. As RV free wall mass was easily approachable to endomyocardial biopsy, we planned the same and took multiple endomyocardial biopsies which were sent for histopathology and immunohistochemistry. Histopathological report showed intermediate grade fibrosarcoma or malignant fibrohistiocytic tumour. When the patient was informed about his condition, he denied treatment for metastasis and subsequently he succumbed after one month of diagnosis.

CLINICAL DIAGNOSIS

Right ventricular mass with right ventricular outflow tract ventricular tachycardia.

Figure 1. ECG
DISCUSSION

Heart is a rare site of metastasis. Cardiac metastasis occurs mostly in patients after sixth decade and is incident equally among both sexes. Studies report that renal cell carcinoma, adenocarcinoma of colon, melanoma, hepatocellular carcinoma and bronchogenic carcinoma are commonly metastasised in endocardium of heart. However, carcinoma of lung being metastasised into heart is rarely stated. Pericardium is the most commonly effected site of cardiac metastasis, followed by epicardium, myocardium and the rarely effected sites are endocardium, great vessels and valve. Malignant cells most commonly spread via lymphatic route. Other routes are direct invasion or via blood stream. Direct invasion from mediastinum or surrounding structures is mainly in epicardium. In a study conducted in University of Trieste, Italy the incidence of cardiac metastasis was found in 9.1% of all autopsies conducted over a period of 10 years. Out of which incidence of primary tumour was 46% in males and 31.7% in females. Moreover, the incidence of endocardial metastasis was least, accounting for only 5% of total patients. Similarly, on investigating a series of 407 autopsies with metastasis in heart, Mukai et al. reported that 6% patients had endocardial growth and 1.7% had intracavitary growth. Clinical features of cardiac metastasis are non-specific and depend on tumour location. Sometimes cardiac manifestations may be the only presentation in an undiagnosed malignancy or may be even diagnosed during post-mortem. The most common signs are dyspnoea, palpitations, atrial flutter or fibrillation, lower-extremity oedema, and chest pain. Other important manifestation of cardiac malignancy is haemorrhagic pericardial effusion which may be massive enough to produce cardiac tamponade requiring pericardiocentesis. In our case the patient presented with recurrent episodes of palpitation, perspiration and chest pain. On performing ECG, RVOT-VT was observed to be present. Parallel to our case, one study reported tachyarrhythmias in 13% of children with cardiac fibromas, of which VT and ventricular fibrillation were most common.

Imaging investigation mostly begins with echocardiography. As echocardiography is the most common cross-sectional cardiac imaging modality. However, it is accompanied by some limitations at times, like at the apex and base of heart where foreshortening and poor acoustic windows might limit visualization of complete wall. However, apical tumours and fibromas, cardiac MRI is superior than 2D-echo. Cardiac MRI evaluates the extent of myocardial involvement by metastasis. In this case also the MRI shows characteristic heterogeneous enhancement on post contrast study with central necrosis. Endomyocardial biopsy remains the gold standard investigation for diagnosing many cardiac diseases including cardiac tumours. Biopsy is taken by “biotome” which is a biopsy catheter via a trans vascular approach under fluoroscopic guidance. It is mainly taken from interventricular septum because of its thickness as compared to right ventricular free wall. Carcinoma of lung mainly spreads via lymphatic route. In a study by Atsuhita et al. in 74 autopsied cases of lung cancer, 23 had cardiac involvement. Of which, 14 patients had lymphatic metastatic pathway, 8 cases had arrhythmia. Arrhythmias in cardiac metastasis are usually due to factors like involvement of tumour cells in autonomic fibres and in coronaries, hypoxemia, and altered electrolytes. Moreover, Nakamura et al. reported high evidence of abnormal electrocardiogram in cases of cardiac metastasis. Hence as per reports, cardiac metastasis mostly presents with atrial or ventricular arrhythmias, pericardial effusion, congestive heart failure and rarely myocardial infarction. In our case, patient presented with ventricular tachycardia without any other past history which led to the diagnosis of cardiac metastasis from primary lesion in lungs.

Cardiac metastasis get presented in a myriad ways. However, optimal diagnosis of metastasis using proper modalities can be helpful.

REFERENCES


