Case Report

An unusual presentation of cardiac metastasis in breast cancer

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ABSTRACT

Metastatic disease to the heart is a rare phenomenon. In this case report, we describe an unusual case of metastasis of breast cancer to the left side of the heart in an elderly lady, with its intracardiac location detected by means of transthoracic echocardiography. This is one of the few described case reports of breast cancer metastasizing to the left ventricle of the heart.

Key words: Breast cancer, cardiac mass, cardiac metastases, echocardiography

INTRODUCTION

Cardiac metastases are usually detected late and rarely seen as the first site of metastases. Cardiac metastases have been found in 6–20% of autopsies of patients with malignant neoplasms.[1] The most common neoplasms that metastasize to the heart are malignant melanoma, lymphoma, leukemia, breast, and lung cancers.[2] The epicardium, myocardium, and endocardium are the layers of the heart affected by metastatic neoplasms in order of frequency.[3] The right side of the heart is more commonly involved by metastasis. Metastasis to the left side of the heart has been rarely reported, dating back to as early as in 1954.[4] The factors postulated for the infrequency of cardiac metastasis are the strong action of the myocardium, metabolic peculiarities of striated muscle, rapid blood flow through the heart, and lymph flow moving away from the heart.[5]

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In principle, every malignant tumor can metastasize to the heart. To date, only tumors of the central nervous system have not been proven to develop cardiac metastases. Neoplasms can metastasize to the heart by four different pathways lymphatic, hematogenous, direct extension, and transvenous extension via the superior or inferior venacava.[6] Lymphatic spread often gives rise to pericardial metastases. The hematogenous spread has a propensity to migrate to the myocardium. Malignant melanoma, lymphoma, leukemia, soft tissue sarcoma spread via the hematogenous route. Tumors in close proximity to the heart, such as bronchial, breast, and esophagus, most often spread by direct extension and give rise to pericardial disease. The inferior vena cava is a common path of extension to the right atrium from subdiaphragmatic organs such as the kidney, liver, and adrenals. It is reported that in 1% of patients with renal cell carcinoma, metastasis is via the renal vein into the right atrium.[7]

Carcinomas of the breast spread through mediastinal lymph nodes, tumor cells invade at first the epicardial, and then the myocardial lymphatic system. Owing to their

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more frequent occurrence and prevalence, carcinomas of lung and breast are the most common tumors causing cardiac metastases.[2]

The paper aims to present an unusual case of cardiac metastases in the left side of the heart in an elderly lady with breast carcinoma.

CASE REPORT

A 61-year-old female with a history of diabetes presented with complaints of abdominal pain, abdominal distension and significant weight loss over 1 month. She reported a history of a lump in the left breast 2 years ago, for which lumpectomy was done. There was no history of altered bowel habits or hematochezia. On clinical examination, Eastern Cooperative Oncology Group performance status was found to be 2 and vitals were stable. Local examination revealed a lump in the infra-areolar region, measuring 3 cm × 2 cm in the left breast, mobile and hard in consistency. The right breast and both axillae were normal. Per abdominal examination revealed gross ascites. Ascitic fluid was found positive for malignant cells. Chest X-ray revealed mild left pleural effusion. Computed tomography abdomen showed gross ascites with an irregular heterogeneously enhancing papillary growth from parietal peritoneum with nodular thickening of greater omentum suggestive of a neoplastic lesion. Serum CA-125 was elevated. Oesophagogastroduodenoscopy showed gastroesophageal reflux disease with antral hemorrhagic gastritis. Colonoscopy showed multiple colonic strictures and biopsy showed nonspecific chronic inflammatory cells. Fine needle aspiration cytology from the left breast lump showed few atypical cells, suspicious of duct carcinoma. Tru-cut biopsy showed invasive ductal carcinoma. Immunohistochemistry showed few cytokeratin 7 positive, E-cadherin negative, estrogen receptor positive, and HER2 negative cells. Bone scan showed multiple skeletal metastases. Baseline two-dimensional (2D) echo showed sclerotic aortic valve with normal chambers, normal left ventricular (LV) systolic function. A final diagnosis of carcinoma left breast-invasive ductal carcinoma with ovarian and skeletal metastasis was arrived at. The patient was given palliative chemotherapy with weekly paclitaxel at 80 mg/m^2 and monthly bisphosphonates. After receiving three cycles of weekly chemotherapy, she developed fresh symptoms of a dry cough and breathlessness. Clinical examination revealed fine crepitations in bilateral basal lung fields. Cardiac evaluation was done to rule out acute pulmonary edema. 2D echo showed an LV echogenic mass attached to the apical septal region of LV measuring 2.6 cm × 2.0 cm [Figure 1]. Following a discussion with the treating cardiologist, she was given low molecular weight heparin for 2 weeks, maintaining an international normalized ratio of 2–2.5. She improved symptomatically with treatment, and there was a clinical reduction of the ascites. She was, therefore, continued on the same chemotherapy regimen and anticoagulation. Subsequent serial 2D echocardiography showed a further increase in the LV echogenic mass [Figure 2] and no regression in size with anticoagulants. Hence, in discussion with the cardiologists, it was concluded that the mass was unlikely to be a thrombus and more likely to be a metastatic deposit in the left ventricle. The patient was further treated with low molecular weight heparin in addition to the chemotherapy. Over the subsequent 2 weeks, however, her condition worsened, and she ultimately succumbed to the disease.

DISCUSSION

In this case study, it was found that the patient had secondaries in the left ventricle. In the present era of advanced diagnostics, 2D echocardiography makes the detection of cardiac involvement in neoplastic diseases easier. Cardiac metastases predominantly occur in patients in the sixth and seventh decade of life. There is no gender preference. Cardiac metastases mostly appear in patients with disseminated tumor disease, and solitary metastases to the heart are very rare.[1]

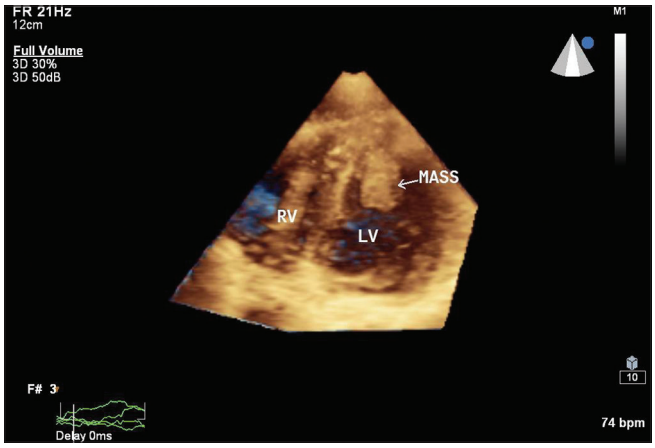

Figure 1: Two-dimensional echo showing intracardiac tumor deposit

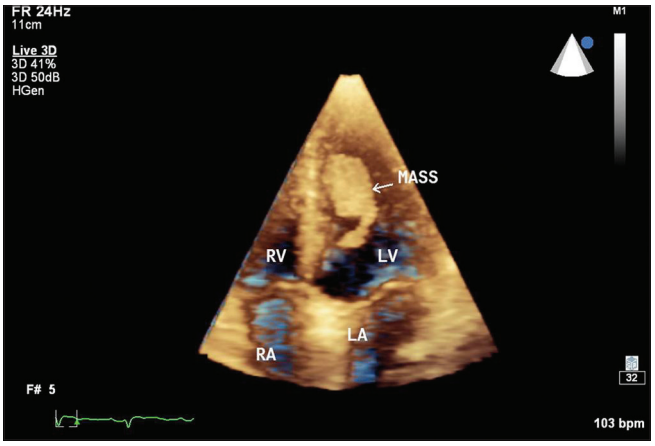

Figure 2: Subsequent two-dimensional echo showing increase in the tumor deposit

Histologically, three-quarters of primary heart tumors are benign and almost half of them being myxomas.[8] Whether benign or malignant, the majority of primary cardiac tumors are intracavitary and preferentially develop in the left atrium, thereby leading to LV inflow obstruction. An embolism is also common. Secondary or metastatic heart tumors occur comparatively more frequently, with an incidence at least 100 times higher than primary tumors of the heart.[9] Though the right side of the heart is more frequently involved than the left,[6] there are cases where left sided involvement has been found as seen in this case.[4,5,7,9] Rarely, bronchial carcinoma spreads through the pulmonary veins into the left side heart cavities.[5]

Heralds of metastases to the heart are a rapid increase in heart size by pericardial effusion, new signs of heart failure or valve disease, conduction defects, and atrial or ventricular heart rhythm disturbances.[3,5,10-13] Symptoms like dyspnea or tachypnea and clinical findings such as systolic heart murmur, peripheral edema, pleural or pericardial effusion, or ascites may also be the result of tumor-associated anemia and hypoproteinemia. It is usually, the histological type than the localization of metastases that determines the symptomatology. Pericardial involvement can lead to pericarditis with pericardial effusion, which can be a serosanguineous or hemorrhagic metastasis.

In general, no physical or laboratory examinations can specifically detect cardiac metastases in diffuse tumor disease. Intracavitary tumors usually appear as filling defects under radionuclide or contrast medium angiography.[14] However, probing of the tumor-bearing heart chamber should be avoided, since tumor fragments or tumor adherent thrombotic material may be embolized. Sometimes in individual cases, diagnosis of intracardiac metastasis can be established by catheter biopsy, usually under fluoroscopic guidance.[15] Biopsy of intracardiac lesions has also been performed with the help of transthoracic or transesophageal echocardiography.[16] In this case, however, a biopsy was not attempted given the poor patient condition at the time of the finding.

The method of choice to detect cardiac metastases and their complications is 2D echocardiography.[17] Echocardiography shows dense pericardial bands reflecting the pericardium being thickened by inflammation or tumor infiltration as seen in our case.[17]

CONCLUSION

It is necessary to suspect and recognize cardiac metastases in a patient with advanced breast cancer when the patient develops sudden clinical deterioration hemodynamically. A multidisciplinary team would be needed to develop the best treatment options in such circumstances.

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Conflicts of interest

There are no conflicts of interest.

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