

Cardiac metastasis of breast cancer mimicking acute myocardial infarction

Akut miyokard infarktüsünü taklit eden miyokarda metastatik meme kanseri

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A 48-year-old woman was admitted to the coronary care unit because of ventricular tachycardia that developed during hospitalization for invasive ductal carcinoma of the breast. Lidocaine infusion suppressed ventricular tachycardia, and ST-segment elevations in inferior and anterior leads were noted on a subsequent electrocardiogram (ECG). She did not have angina, and serum cardiac troponin T levels were in the normal range. Computed tomography of the thorax revealed metastases involving the myocardium and the lungs. Electrocardiographic abnormalities were attributed to myocardial invasion of the malignant tumor rather than to acute coronary syndrome. Ventricular tachycardia did not recur during follow-up under amiodarone treatment. Myocardial infiltration of the tumor should be considered when ECG alterations without typical angina are found in a patient with malignancy and normal cardiac markers.

Key words: Breast neoplasms; electrocardiography; heart neoplasms/secondary; myocardial infarction; tachycardia/etiology.

Memenin invaziv duktal karsinomu tanısıyla hastanede yatmakta olan 48 yaşındaki kadın hasta, ventriküler taşikardi gelişmesi nedeniyle koroner bakım ünitesine alındı. Lidokain infüzyonu ile sinüs ritmi sağlanan hastanın kontrol elektrokardiyogramında (EKG) inferior ve anterior derivasyonlarda ST-segment yükselmesi izlendi. Hastada angina yoktu ve serum kardiyak troponin T düzeyleri normal sınırlarda idi. Toraks bilgisayarlı tomografi incelemesinde miyokard ve akciğerleri tutan metastatik lezyonlar izlendi. Hastadaki EKG değişikliklerinin nedeninin miyokarda metastaz yapmış olan meme kanseri olabileceği düşünüldü. Amiodaron tedavisiyle takip sırasında ventriküler taşikardi görülmedi. Tipik angina tanımlamayan ve kardiyak belirteçleri normal bulunan kanser hastalarında gelişen EKG değişikliklerinde tümörün miyokardiyal infiltrasyonu akılda tutulmalıdır.

Anahtar sözcükler: Meme neoplazileri; elektrokardiyografi; kalp neoplazileri/ikincil; miyokard infarktüsü; taşikardi/etiyoloji.

Autopsy studies have shown metastases to the heart in about 10% of all patients with malignancy.^[1,2] The major primary malignancies associated with cardiac metastases include cancers of the lung, breast, stomach, and liver, and lymphoma, leukemia, and melanoma.^[1] Any of the cardiac structures can be infiltrated, the myocardium and pericardium being the most common sites.^[1,2] Metastatic myocardial infiltrations are often clinically silent, and the main clinical manifestations are development of heart failure,^[3] arrhythmias,^[4] and conduction disturbances.^[5]

CASE REPORT

A 48-year-old woman was admitted to the coronary care unit because of ventricular tachycardia that developed during hospitalization for invasive ductal

carcinoma of the breast. She had been receiving palliative radiotherapy because of vertebral metastases. On admission, she appeared moderately distressed. Her blood pressure was 100/50 mmHg, and heart rate was 150 beats/minute. Physical examination revealed right pleural effusion. The admission electrocardiogram (ECG) demonstrated ventricular tachycardia at a rate of 146/min (Fig. 1a). Lidocaine infusion suppressed ventricular tachycardia, and sinus rhythm with first degree atrioventricular block and ST-segment elevations in inferior and anterior leads were noted on the following ECG (Fig. 1b). Although she did not have angina, aspirin, low-molecular weight heparin, and amiodarone were initiated with a diagnosis of acute coronary syndrome complicated by ventricular tachycardia. Cardiac troponin T and

Received: December 5, 2006 Accepted: February 8, 2007

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Figure 1. (A) Ventricular tachycardia on the admission ECG. **(B)** Sinus rhythm with first degree atrioventricular block and ST-segment elevations after suppression of ventricular tachycardia.

CPK-MB levels remained in the normal range at repeat measurements and serial ECG recordings showed the persistence of ST-segment elevations without new Q waves. Echocardiographic examination demonstrated increased myocardial wall thickness particularly involving the interventricular septum and the apex, and regional wall motion abnormality with moderately reduced systolic function of the left ventricle. Computed tomography (CT) of the thorax revealed multiple metastases involving the myocardium and lungs (Fig. 2). Electrocardiographic abnormalities were attributed to myocardial invasion of the malignant tumor rather than to acute coronary syndrome and heparin was discontinued. Ventricular tachycardia did not recur during the follow-up under amiodarone treatment. The patient received systemic chemotherapy for metastatic breast carcinoma.

DISCUSSION

Although ECG abnormalities simulating myocardial infarction have been reported in patients with malig-

nant myocardial infiltration,^[6] a patient presenting with ventricular tachycardia and ST-segment elevations is a challenging case. The presented patient did



Figure 2. Myocardial invasion on a thorax computed tomography scan. RA: Right atrium; RV: Right ventricle; LA: Left atrium; LV: Left ventricle; TM: Myocardial metastases of the tumor.

not complain of angina, and serial ECG recordings showed the persistence of ST-segment elevations without new onset Q waves, and the cardiac markers remained in the normal range. Considering very high myocardial tissue specificity and sensitivity of cardiac troponin T,^[7] acute coronary syndrome was not considered to be responsible for ventricular arrhythmia and ST-segment elevations in our case. Thoracic CT helped to detect myocardial involvement of the cancer that was not noticed before. Echocardiography, magnetic resonance imaging (MRI), and CT are useful diagnostic tools to assess neoplastic infiltration to the myocardium. Due to clearer images obtained by transesophageal echocardiography, this technique may be preferred to visualize intracardiac metastatic tumors.^[8] Whereas echocardiography is a more easily accessible imaging method to examine the heart, MRI and CT offer advantages when widespread metastatic disease is in question.^[9] Both imaging modalities provide a large field of view, allowing evaluation of the disease extension throughout the body.

In conclusion, myocardial infiltration of the tumor should be considered when ECG alterations without typical angina are found in a patient with malignancy and normal cardiac markers.

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