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THE VALUE OF MRI IN THE DIAGNOSIS OF APICAL HYPERTROPHIC CARDIOMYOPATHY

Case Report

APİKAL HİPERTROFİK KARDİYOMYOPATİDE MAGNETİK REZONANS GÖRÜNTÜLEMENİN ÖNEMİ

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ABSTRACT

The differential diagnoses of T-wave inversions are diverse and ischemia, inflammation, electrolyte abnormalities, cocaine use, trauma, and others. Apical hypertrophic cardiomyopathy (HC) is a subtype of HC in which myocardial hypertrophy predominantly involves the apex of the left ventricle. Diagnosis is based on the presence of typical giant inverted T waves in midprecordial derivations (3) and spadelike view in ventriculography, cardiovascular magnetic resonance (MRI) and computed tomography(CT). Non-contrast echocardiography has been the usual first line investigation. However, echocardiography has limitations for visualising the apex and apical hypertrophy and may miss apical HCM.

In this case report, we will present a patient with giant T wave inversion and inconclusive echocardiography which lead us to the diagnosis of apical HCM.

Key words :*apikal hypertrophic cardiomyopathy;electrocardiography;echo cardiography;magnetic resonance.*

ÖZET

Apikal hipertrofik kardiyomyopatide magnetik rezonans görüntülemenin önemi Apikal hipertrofik kardiyomyopati (HKM) sol ventrikülün genellikle apeksinde myokard kalınlaşmasına neden olan hipertrofik kardiyomyopati çeşididir. Tanısı elektrokardiogramda (EKG) özellikle midprekordiyal derivasyonlarda tipik derin T negatifliğinin varlığı ve ventrikulografi, manyetik rezonans görüntüleme (MRG), bilgisayarlı tomografi (BT) ve ya ekokardiografide tipik maça benzeri görüntünün görülmesi ile konur. Kontrastsız ekokardiyografi günlük pratikte kullanılan ilk tanı metodudur. Buna rağmen apeksin görüntülenmesinde kısıtlılıkları bulunmaktadır ve apikal HKM tanısı atlanabilir.

Bu olgu sunumumuzda yetersiz ekokardiyografik bulguları olan ve derin T dalga negatifliği nedeni ile apikal HKM tanısına yönlendiğimiz bir hasta sunacağız.

Anahtar Kelimeler: *apikal hipertrofik; kardiyomyopati;elektrokardiyografi;ekokardiyografi;magnetik rezonans.*

INTRODUCTION

Apical hypertrophic cardiomyopathy (HC) is a subtype of HC in which myocardial hypertrophy predominantly involves the apex of the left ventricle. Apical hypertrophic cardiomyopathy (HC) was first described by Sakamoto et al (1). in 1976. Apical HC accounts for 25% of all cases of HC in Japan, whereas in non-Japanese populations, it represents only 1% to 2% of cases (2) and prognosis is worser than non-Japanese populations. Diagnosis is based on the presence of typical giant inverted T waves in midprecordial derivations (3) and spadelike view in ventriculography, cardiovascular magnetic resonance (MRI) and computed tomography(CT).

CASE REPORT

49 year old male was admitted in the emergency service with palpitations lasting for 15 days. Electrocardiogram(ECG) showed atrial fibrilloflutter and symmetric giant inverted T waves (**Figure 1**).

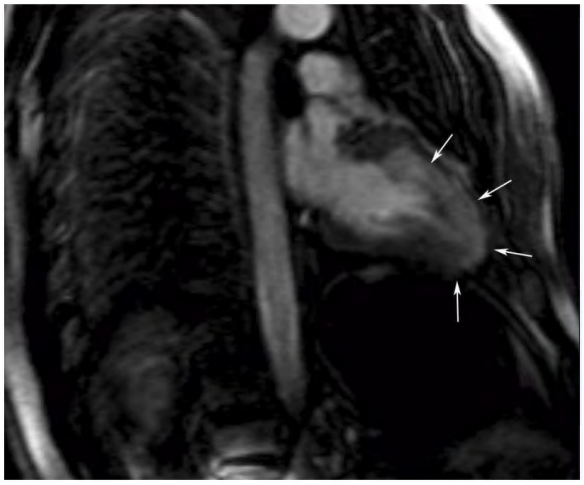

Figure 1: *electrocardiogram of the patient at the time of admittion to emergency service.*

3 months ago, the patient applied to emergency department of another hospital with atypical chest pain. Coronary angiography was performed and normal coronary arteries was found. Physical examination of the patient showed variation in intensity of the first heart sound and pulse deficit. Left ventricular wall was globally thickened (posterior wall: 12 mm interventricular septum: 12 mm), left atrial(LA) and left ventricular(LV) sizes were normal (LA: 34 mm LVD: 45 mm), ejection fraction(EF) was 60 % at the transthoracic echocardiographic images(TTE). Transesophageal echocardiography (TEE) was performed because cardioversion was planned for the patient and palpitation was lasting for more than 48 hours. Left atrial appendix (LAA) velocities were normal. There was no difference between TTE and TEE for LV wall thickness(**Figure 2**).

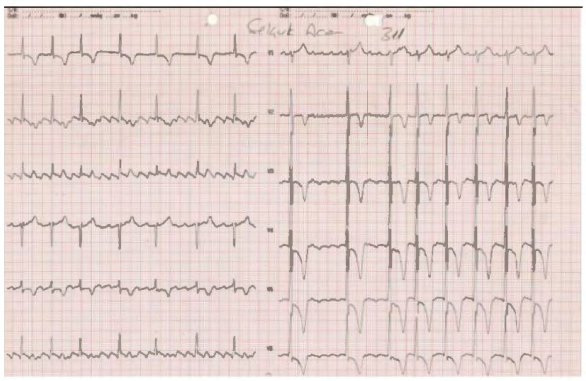

Figure 2: *transesophageal echocardiography image of left ventricule.*

Medical cardioversion with amiadarone infusion was tried first. Rhythm control was not established with medical cardioversion. DC cardioversion was performed and was successful. Cardiac MRI was performed because of typical ECG changes for apical HC. MRI showed thickened apical LV wall(apical wall: 19,5 mm) (**Figure 3**).

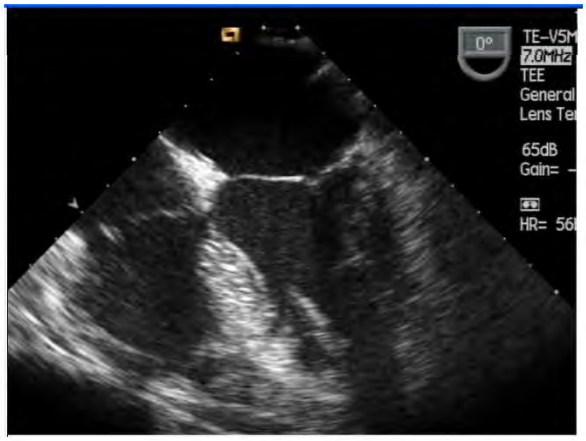

Figure 3: *cardiac MRI showing left ventricular apical wall thickening.*

The patient was charged with oral anticoagulation and oral amiadarone.

DISCUSSION

The differential diagnoses of T-wave inversions are diverse and ischemia, inflammation, electrolyte abnormalities, cocaine use, trauma, and others (4). Non-contrast echocardiography has been the usual first line investigation. However, echocardiography has limitations for visualising the apex and apical hypertrophy and may miss apical HCM (5).

Moon et all examined 10 patients with anterolateral T wave inversion for which there was no obvious pathological cause who had normal routine echocardiography without contrast for the exclusion of HCM and diagnosed apical HCM at CMR (6). Fattori et al investigated the significance of MRI in apical HCM (7). The investigators report a series of 13 consecutive patients with a suspicion or diagnosis of apical HC on the basis of electrocardiographic and/or echocardiographic findings who prospectively underwent MRI. Echocardiography provided correct diagnoses in 9/13 patients (69%), while in 4 patients echocardiographic results were normal or inconclusive. Chung et all (8) investigated 32 consecutive patients diagnosed apical HCM retrospectively. Six patients had documented late evolution of apical HC on electrocardiography and echocardiography up to 5 years after previous documented normal left ventricular morphology on echocardiography. The diagnosis of apical HC was initially missed in 7 patients because of inadequate image quality of the left ventricular apex and a lack of awareness of the condition. The correct diagnosis was assigned to all 7 patients after repeat echocardiography.

In patients with unexplained repolarisation abnormalities, a normal routine echocardiogram without contrast does not exclude apical HCM. Further imaging with CMR or contrast echocardiography may be required.

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