Acute myocardial infarction in a young patient with bicuspid aortic valve

İki yapraklı aort kapağı olan genç bir hastada akut miyokart enfarktüsü

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Bicuspid aortic valve is one of the most common congenital heart valve disorders. We present the development of acute myocardial infarction (AMI) in an 18-year-old male patient with unrecognized bicuspid aortic valve and moderate aortic regurgitation. He presented with chest pain. The electrocardiogram showed ST-segment elevation in leads V2 to V6. Creatine kinase-MB level was elevated to 97 U/l and troponin I was very high (45,000 ng/ml). The diagnosis was made as anterior wall AMI. Following treatment with intravenous rt-PA, ST-segment elevation completely returned to normal. Transthoracic echocardiography showed a bicuspid aortic valve, moderate aortic regurgitation, and apical wall hypokinesia; left ventricular global systolic function was normal. The patient had no risk factors for coronary atherosclerosis, nor a history of substance addiction or a family history of coronary artery disease. Protein C, protein S and homocysteine levels were normal. He refused any further intervention. Two weeks after discharge, he presented again with chest pain. Electrocardiography, cardiac markers, and coronary arteriography were normal. He was discharged on appropriate medical treatment. The presented case is the first report of AMI in a patient with bicuspid aortic valve.

Key words: Aortic valve/abnormalities; myocardial infarction/etiology.

İki yapraklı aort kapağı, en sık karşılaşılan doğuştan kalp kapağı hastalıklarındandır. Bu yazıda, iki yapraklı aort kapak varlığı yeni ortaya çıkan ve orta derecede aort yetersizliği olan 18 yaşında bir erkek hastada gelişen akut miyokart enfarktüsü (AME) sunuldu. Göğüs ağrısıyla başvuran hastanın elektrokardiyografisinde, V2-V6 derivasyonlarında ST-segment yükselmesi görüldü. Kreatin kinaz-MB (97 U/l) ve troponin I (45000 ng/ml) düzeyleri yüksek bulunan hastaya anterior duvar enfarktüsü tanısı kondu. İntravenöz rt-PA tedavisi sonrasında ST yükselmesi tamamen normale döndü. Transtorasik ekokardiyografide iki yapraklı aort kapağı, orta derecede aort yetersizliği ve apikal duvarda hipokinezi saptandı; sol ventrikül genel sistolik fonksiyonu normaldi. Hastada koroner ateroskleroz için herhangi bir risk faktörü, madde bağımlılığı öyküsü veya ailesel koroner arter hastalığı öyküsü yoktu. Protein C, protein S ve homosistein düzeyleri normaldi. Daha ileri girişimi kabul etmeyen hasta, taburcu edildikten iki hafta sonra, göğüs ağrısıyla tekrar başvurdu. Elektrokardiyografi, kardiyak belirteçler ve koroner arteriyografi bulguları bu kez de normaldi. Hasta uygun ilaç tedavisi ile taburcu edildi. Sunulan olgu, iki yapraklı aort kapağı varlığında AME geliştiği bildirilen ilk olgudur.

Anahtar sözcükler: Aort kapağı/anormallik; miyokart enfarktüsü/etyoloji.

Bicuspid aortic valve is seen in 1% to 2% of the population and may be complicated by aortic stenosis or aortic insufficiency and infective endocarditis. It may be associated with abnormalities of the aortic wall such as coarctation of the aorta, aortic dissection, and aortic aneurysm. Most patients with a bicuspid aortic valve develop some complications during life.[1] Individuals with a bicuspid valve may be unaware of its presence and are at risk for unsuspected complications. Congenital coronary anomalies, coronary atherosclerosis, and calcification have been described in association with bicuspid aortic valve.[2] However, acute myocardial infarction (AMI) in the setting of bicuspid aortic valve has not been described. We present a case of AMI in a young patient with unrecognized bicuspid aortic valve and moderate aortic regurgitation.

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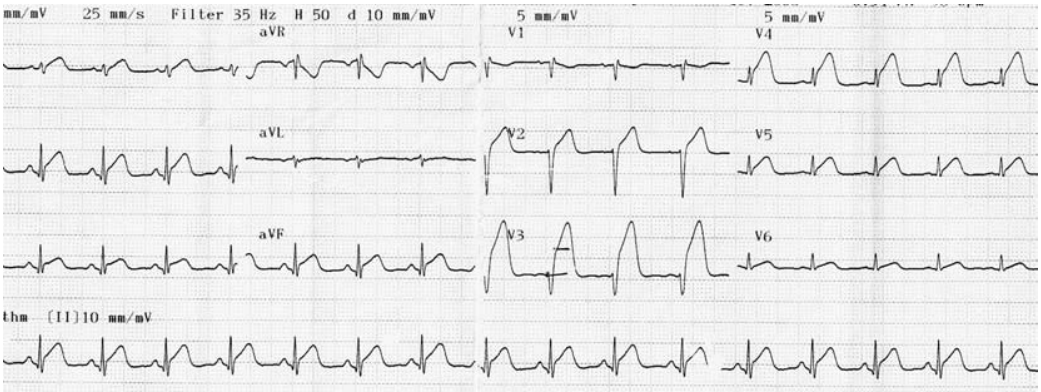

Figure 1. Admission electrocardiogram showing ST-segment elevation.

CASE REPORT

An 18-year-old man presented to our department with chest pain typical for myocardial infarction. On physical examination, arterial blood pressure was 130/80 mmHg and heart rate was regular with 85 beats/min. Auscultation revealed a systolic murmur at the base of the heart and an early diastolic decrescendo murmur along the left sternal border. The electrocardiogram showed ST-segment elevation in leads V2 to V6 (Fig. 1). Creatine kinase-MB level was elevated to 97 U/l and troponin I was very high (45,000 ng/ml). Other laboratory findings including total blood count, serum electrolytes, renal function tests were normal. The diagnosis was made as anterior wall AMI. The patient was treated with 100 mg intravenous rt-PA without any complication. ST-segment elevation completely returned to normal after thrombolytic treatment. Transthoracic echocardiography showed a bicuspid aortic valve, moderate aortic regurgitation, and apical wall hypokinesia. Left ventricular global systolic function was normal (ejection fraction 55%). Other findings were normal (Fig. 2). The patient had no risk factors for coronary atherosclerosis nor a history of cocaine addiction or smoking, or a family history of coronary artery disease. Protein C, protein S and homocysteine levels were normal. We planned coronary arteriography, but the patient refused any further intervention and he was discharged from hospital. However, two weeks later, he presented to our department again with chest pain. Electrocardiography and cardiac markers were normal and coronary arteriography was performed. His coronary arteries were normal (Fig. 3). The patient was discharged on medical treatment including aspirin, clopidogrel, ramipril, atorvastatin, and bisoprolol.

DISCUSSION

We present a case of AMI in a young patient with unrecognized bicuspid aortic valve and moderate aortic regurgitation. The patient had no risk factors for coronary atherosclerosis. There was not a history of cocaine addiction or smoking, nor a family history of coronary artery disease. The levels of protein C, protein S, and homocysteine were normal. The absence of these factors left behind only the bicuspid aortic valve to implicate in the development of AMI. Bicuspid

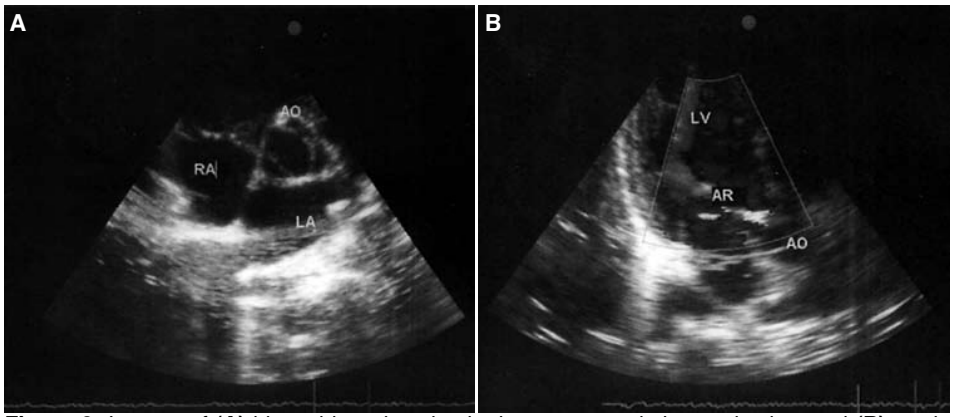

Figure 2. Images of **(A)** bicuspid aortic valve in the parasternal short-axis view and **(B)** aortic regurgitation in the apical view.

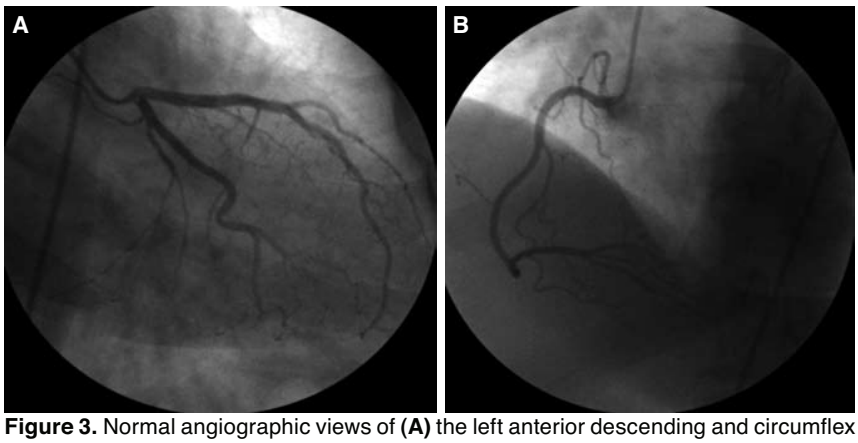

Figure 3. Normal angiographic views of **(A)** the left anterior descending and circumflex coronary arteries and **(B)** right coronary artery.

aortic valve is seen in 1% to 2% of the population and may be complicated by aortic stenosis or aortic insufficiency, and infective endocarditis.[1] It may be associated with abnormalities of the aortic wall such as coarctation of the aorta, aortic dissection, aortic aneurysm, sudden death, and rarely coronary artery anomalies.[2-6] Additionally, bicuspid aortic valve may be associated with atherosclerosis, and coronary and aortic calcification. Groves et al.[7] reported primary valvular amyloidosis in a young patient presenting with bicuspid aortic valve and acute ischemic syndrome. The presented case is the first report of AMI in a patient with bicuspid aortic valve.

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