

Exercise induced left bundle branch block in a patient with slow coronary flow

Yavaş koroner akımlı bir hastada egzersize bağlı gelişen sol dal bloğu

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Abstract

We report a patient having exercise-induced left bundle-branch block found to have normal coronary arteries and slow coronary flow on angiogram. The association of exercise induced left bundle branch block with slow coronary flow in angiography has not been previously reported.

Keywords: Left bundle branch block, slow coronary flow, exercise electrocardiography.

Özet

Bu vaka raporunda normal koroner arterler ve yavaş koroner akıma sahip bir hastada egzersiz testi sırasında gelişen sol dal bloğu sunulmuştur. Bildiğimiz kadarıyla anjiyografide koroner yavaş akım ile egzersizle indüklenen sol dal bloğu birlikteliği daha önce rapor edilmemiştir.

Anahtar Kelimeler: Sol dal bloğu, koroner yavaş akım, egzersiz elektrokardiyografi.

Introduction

The appearance of exercise induced bundle branch block has an incidence of 0.2% to 1.1% according to different series (1-3). In most of the cases left branch is blocked (2). Exercise induced left bundle-branch block (LBBB) has been documented in association with underlying heart disease (4-5) and also in patients with apparently normal hearts. On the other hand the coronary slow flow phenomenon is an angiographic finding characterized by delayed distal vessel filling in the absence of significant stenosis of epicardial coronary arteries. Generally, slow coronary flow phenomenon is observed in approximately one percent of the patients undergoing coronary angiography (6). As far as we know, the association of exercise induced left bundle branch block with slow coronary flow in angiography has not been previously reported.

We report a patient having exercise-induced left bundle-branch block found to have normal coronary arteries and slow coronary flow on angiogram.

Case report

A 47-year-old man was admitted to our hospital with complaint of exertional chest pain radiating to left shoulder. It began 2 months ago. Chest pain was relieving in two to three minutes with

cessation of physical activity. He had a history of hypertension and smoking. Physical examination and routine laboratory studies including thyroid function tests were within normal limits. The resting electrocardiogram was in sinus rhythm and unremarkable (Figure 1).

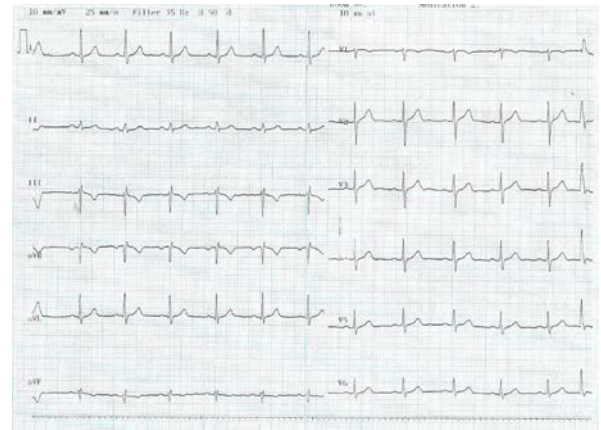


Figure 1. Electrocardiogram of the patient

The transthoracic echocardiogram revealed normal left ventricular systolic function without signs of structural heart disease. For a possible coronary artery disease the patient underwent treadmill exercise test on a Kardiosis treadmill device according to the multistage Bruce protocol. During the procedure, all standard leads were monitored and the ECG was recorded. Du-

ring the first minute of stage 3, at a heart rate of 138 beats per minute the patient experienced retrosternal chest pain simultaneously with development of LBBB (Figure 2).

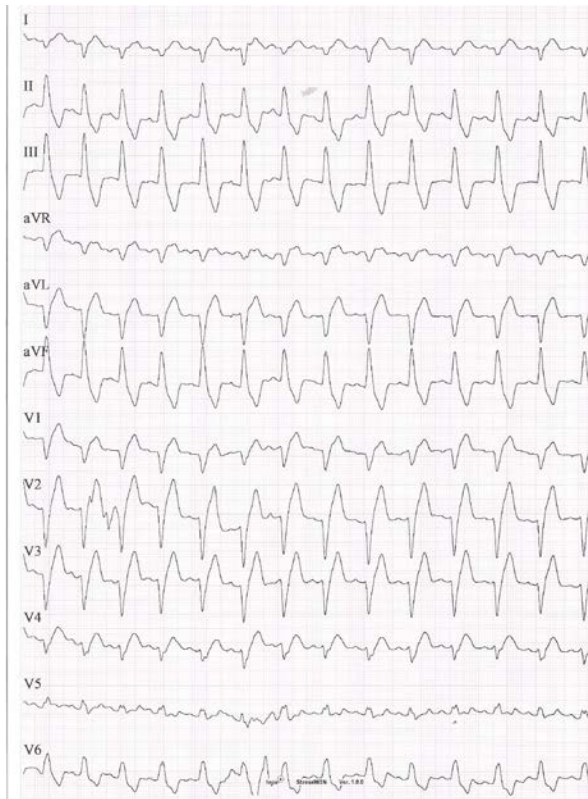


Figure 2. Exercise electrocardiogram of the patient

The exercise test was terminated. Afterwards within 5 minutes of termination chest pain and LBBB disappeared. Patient was scheduled for coronary angiography. Coronary angiography was performed by femoral approach using the standard Judkins technique and images of the coronary arteries were obtained in multiple and standardized projections at a film rate of 30 frame/s. Left ventriculography was performed in right and left anterior oblique views. A non-ionic contrast agent (Iopromide- Ultravist 370, Schering AG, Berlin) was used as contrast media. The coronary angiogram demonstrated normal coronary arteries with slow flow in 3 major coronary arteries. We assessed the flow in coronary arteries using the thrombolysis in the myocardial infarction (TIMI) frame count method, described by Gibson et al (7) The corrected TIMI frame count for LAD(52), LCX(40), RCA(44), were well above the previously defined cut-off values 21.1

± 1.5 frames for LAD, 22.2 ± 4.1 frames for LCX and 20.4 ± 3 frames for RCA, as previously described. He was discharged with the medical treatment including aspirin, metoprolol, atorvastatin, and ramipril after coronary angiography.

Discussion

The development of exercise-induced LBBB when accompanied by chest pain is generally considered indicative of coronary artery disease, mainly when the LBBB appears in a heart rate lesser than 125 bpm (8). About 0.5% to 1.1% of all patients who underwent exercise testing develop a transient LBBB during exercise, which is predictive of a higher risk for death and major cardiac events (9). The coronary slow flow is an angiographic phenomenon characterized by normal coronary arteries with delayed opacification of the distal vessels. The association of slow flow with angina pectoris and acute myocardial infarction have been previously reported (10,11). The exact pathophysiological mechanisms of slow coronary flow phenomenon remain uncertain (12). Tambe et al firstly described slow coronary flow phenomenon in 1972 on six patients with chest pain (13). The rationale of the LBBB took place at the exercise test may be the ischemia caused by the slow coronary flow. Also, the abnormal septal motion of the patients with LBBB may lead to false positive results on transthoracic echocardiography and stress echocardiography.

In literature a similar case was not previously reported. As known the development of left bundle branch block can indicate extensive ischemia that may result from stenosis of dual blood supply of left bundle branch. Here LBBB may have occurred as a consequence of ischemia related with slow flow. Angina in patients with slow coronary flow mainly occurs due to ischemia. We suggest that slow coronary flow should be considered as a possible cause of LBBB when evaluating an exercise test.



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