

# Intermittent left bundle branch block caused by coronary vasospasm

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## ABSTRACT

Intermittent left bundle branch block (LBBB) has been reported in the literature following certain conditions such as cardiac blunt trauma, myocardial infarction (MI) or exercise induced LBBB. In the majority of cases, the patients usually have underlying coronary arteries disease. LBBB often prevents the electrocardiographic diagnosis of acute MI; therefore, new LBBB in the setting of chest pain is usually treated as transmural MI. We describe a case of patient who presented with intermittent LBBB associated with chest pain, and subsequently the patient was taken to the catheterization laboratory for emergency coronary angiogram, which revealed 80% spasm in left anterior descending artery, which was totally relieved by nitroglycerin infusion. No other significant CAD was noted.

**Key words:** Chest pain, coronary vasospasm, left bundle branch block

## INTRODUCTION

Intermittent left bundle branch block (LBBB) is an uncommon conduction disturbance with only few cases reported in the literature, mainly following myocardial ischemia or cardiac blunt trauma. Coronary vasospasm as a leading cause of intermittent LBBB has not been reported before. We present a case of middle-aged women with presentation of cardiac chest pain with intermittent LBBB in Electrocardiogram (EKG/ECG). The patient was taken to the catheterization laboratory immediately. The angiogram ultimately showed clean coronaries and moderate-severe vasospasm in left anterior descending artery (LAD), which totally relieved by vasodilators.

## CASE REPORT

A 53-year-old African American female with past medical history of diabetes mellitus, hypertension and dyslipidemia, presented to the hospital with 3 days history of intermittent chest pain. She described the pain as severe retrosternal, non-exertional, radiating to the left arm lasting for 20-30 min and is associated with severe diaphoresis and shortness of breath. It used to occur 3-5 times a day and relieved

spontaneously or by sublingual Nitroglycerin (NTG). The patient had 15 pack year's history of smoking, occasional alcohol intake and no illicit drug use.

On physical examination, she was hemodynamically stable, blood pressure of 115/52 mmHg, pulse of 78 bpm, with normal saturation on room air. The pain quickly resolved by sublingual nitroglycerin and IV morphine, cardiac exam showed 2/6 systolic ejection murmur at aortic area with no radiation, heart sounds were normal with regular rate and rhythm, there was no jugular venous distention, lungs were clear, pulses were strong and equal in all limbs and there was no edema in the lower extremities. Serial EKG/ECG were obtained, it consistently showed (LBBB) during chest pain episodes [Figure 1], and resolution of the LBBB pattern with deep T wave inversion in Leads V1-V4 during chest-pain-intervals [Figure 2].

Patient was started on aspirin 325 mg, loading dose of clopidogrel 600 mg, heparin drip, and was subsequently taken for emergent coronary angiogram. By the time, she arrived to Cath Lab, the chest pain was substantially improved. The coronary angiogram showed clean coronary arteries except of 80% LAD vasospasm, which was relieved by

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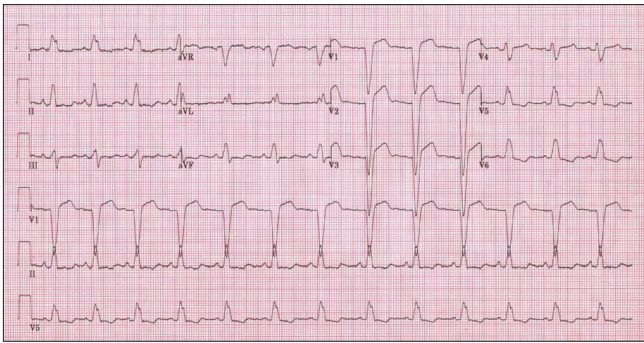


Figure 1: When the chest pain presents: Shows left bundle branch block

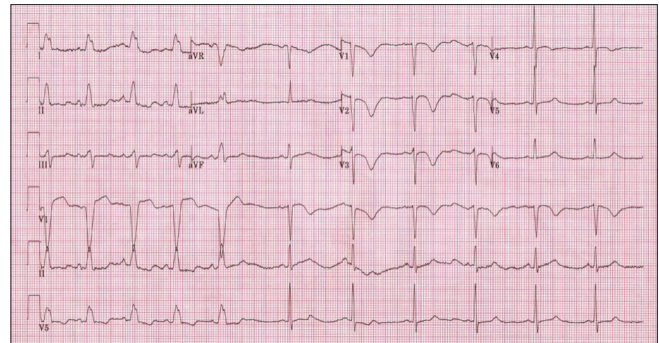


Figure 2: Chest-pain free shows deep T waves inversion in pericardial leads

intravenous nitroglycerin. Cardiac enzymes were negative. Echocardiogram showed normal left ventricular ejection fraction without any regional wall motion abnormalities. The diagnosis of coronary vasospasm was made and the patient was started on calcium channel blocker (Diltiazem) daily, which provided symptomatic relief. Patient did well during 10 months follow-up period with further chest pain episodes.

## DISCUSSION

Coronary Vasospasm (Prinzmetal, s Angina) is characterized by episodes of angina in association with EKG/ECG changes, typically S-T segment elevation.<sup>[1]</sup> The spasm usually happens regardless of presence of increase in myocardial oxygen demand or not, and also it might happen in normal or diseased vessels.<sup>[2,3]</sup> In the majority of the cases, the coronary vasospasm occurs in one single site, although diffuse spasm has been described before.<sup>[4]</sup> Cocaine abuse has been reported frequently in the literature to be associated with coronary vasospasm,<sup>[5]</sup> other characteristics include circadian variation,<sup>[6]</sup> exercise and hyperventilation,<sup>[7]</sup> and the patients are typically younger than those who present with acute coronary syndrome.

LBBB is a common pattern seen on the EKG/ECG. It usually presents in patients with underlying heart disease or conducting system disease. LBBB can be rate-dependent where the LBBB is seen at a critical heart rate.<sup>[8]</sup> There are two forms of rate-dependent LBBB: The acceleration-dependent block form, in which conduction delay occurs when the heart rate exceeds a critical value, and the deceleration dependent block in which conduction delay occurs when the heart rate decreases below a critical level.<sup>[9,10]</sup>

Intermittent LBBB was reported in the literature following few conditions such as cardiac blunt trauma,<sup>[11]</sup> myocardial ischemia,<sup>[12]</sup> exercise induced LBBB<sup>[13]</sup> or myocardial

infarction. Most of the time, it presents in patients with underlying coronary arteries disease, and rarely described in patients with normal coronary vasculatures.

This case is unique as for the first time in the literature, we report a coronary vasospasm associated with intermittent LBBB. Most of the time, coronary angiogram is needed to rule out coronary artery disease. Coronary vasospasm does not always present during the coronary catheterization. Therefore, it should be speculated based on the clinical presentation.

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