Is Myocardial Bridge an Incidental Finding?

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ABSTRACT
Myocardial bridge (MB) is seen as a segment of an epicardial coronary artery traveling through the myocardium creating a "bridge" across the artery. Myocardial bridge is a benign congenital anomaly. However, it can be associated with acute coronary symptoms, coronary spasms, ventricular septal rupture, arrhythmias (including supraventricular and ventricular tachycardia), and sudden death. In this report, we describe a case of acute coronary symptoms with electrocardiogram (ECG) changes secondary to myocardial bridge diagnosed by CT coronary angiography.

CASE REPORT
A 57-year-old Asian male presented with intermittent, typical chest pain of one day duration. Pain was substernal, pressure-like and radiating to the left arm. He had three episodes of exertional pain, lasting for 3-5 minutes, which were relieved with rest and aspirin. The patient did not have any history of heart disease but had hyperlipidemia and a 20-pack year history of cigarette use.

Physical exam was unremarkable. Blood pressure was 102/63 mm Hg and heart rate was 80 bpm. On admission, ECG showed T-wave inversions in (II, III, aVF) and (I, aVL, V3-V6) {figure 1}. Cardiac markers and lab results were negative. On admission, the patient was pain free. A diagnosis of acute coronary syndrome was made (pain and ECG changes) and the patient was admitted to the cardiac critical care unit. Ticagrelor, IV heparin, aspirin, metoprolol, and simvastatin were started. Three sets of cardiac markers were negative. Follow up ECG showed increased T wave inversions {figure 2}.

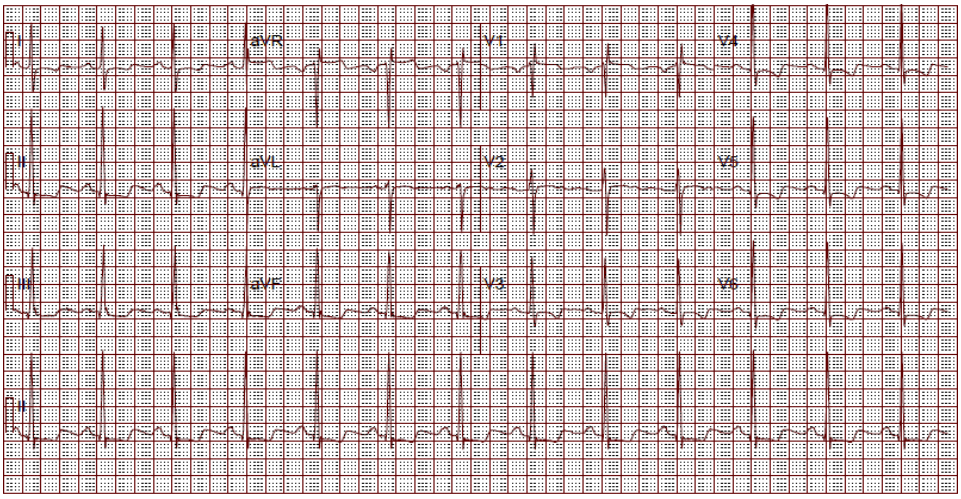

FIGURE 1 (on Admission): T wave inversion in lead II, III, aVF, I, aVL, and V3-V6

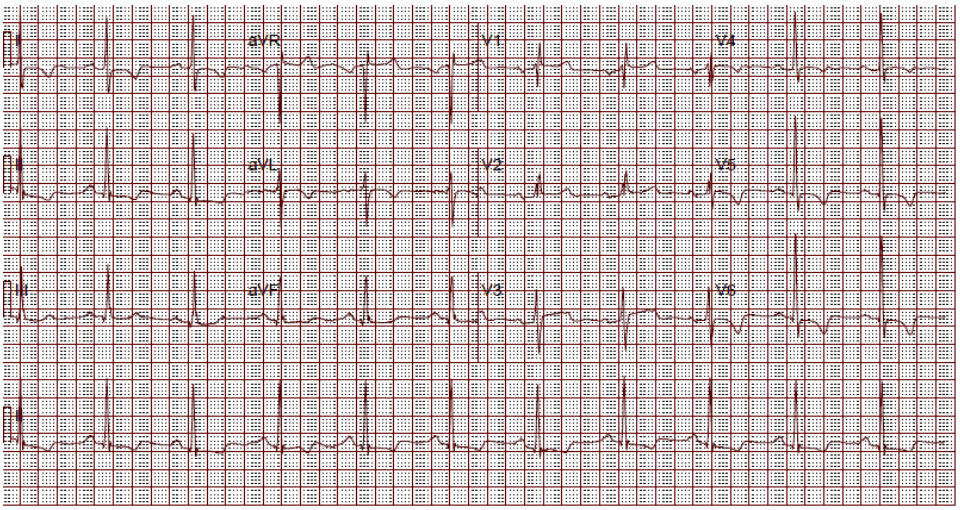

FIGURE 2 (8 hours after admission): Worsening T wave inversion in I, aVL, V3-V6

On day 2, echocardiogram revealed normal left ventricular systolic function with no wall motion abnormality. CT coronary angiography demonstrates deep myocardial bridging in the mid portion of the left anterior descending artery (LAD) with luminal narrowing. Plaques were noted in the left circumflex and right coronary artery without significant lumen narrowing. The next day, a myocardial perfusion imaging nuclear stress test revealed no significant ischemia with preserved ejection fraction.

The patient's hospital course was uneventful and the patient was discharged on diltiazem, and aspirin.

DISCUSSION

Myocardial bridge is an anomaly characterized by a muscle ban than runs above a coronary artery instead of below it. The reported prevalence of myocardial bridge is 5-86% [1-3] and the most common artery involved is the LAD [2]. Myocardial bridge can be classified into superficial or deep based on the depth of the tunneled portion of the left anterior descending coronary artery. It is felt that the superficial type (≤1mm in depth) of myocardial bridge is not constricted as prominently during systole as the deep myocardial bridge (≥1mm in depth). Because the deep type of myocardial bridge is deeper within the myocardium and has a greater overlay of muscle fibers, the left anterior descending coronary artery could undergo distortion during systole and have impaired relaxation during diastole leading to compromised blood flow and ischemia [4].

Patients with myocardial bridge may become symptomatic if there is a transient narrowing of an artery by forceful contraction of myocardium, vasospasm, tachycardia or acute thrombus [1, 5, 6, 7]. Few data have been published regarding presence of myocardial ischemia with LAD bridging. In a study published on patients with LAD bridging diagnosed by coronary angiography, 12% of patients were found to have positive exercise stress test [9, 10]. This shows that myocardial bridge may be anomaly that contributes to ischemic heart disease as positive exercise stress test [9].

Different modalities have been used to diagnose myocardial bridging. Intracoronary ultrasonography and doppler studies have been used to determine characteristics of myocardial bridges and its flow during systole and diastole [8]. Recently, non-invasive tests such as electron beam CT, multislice CT, and magnetic resonance tomography have been used to detect myocardial bridge but their sensitivity and specificity have not been determined.

The first line treatment for symptomatic myocardial bridge is medical therapy with negative inotropic and chronotropic agents [10]. The other therapeutic approaches consist of coronary angioplasty with stent implantation, coronary artery bypass surgery, and surgical myotomy of the bridge [11,12]. Surgical treatments are reserved for patients with symptoms that persist with medical management [13].

Our patient's symptoms of acute coronary syndrome were completely resolved on medical therapy. However, we do not have long-term follow up, as he did not keep his clinic appointments.

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