Case Report

Disappearance of Muscle Bridge of Left Anterior Descending Artery after Rising Blood Pressure

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A 62 years–old woman with chief complaint of repeated compressive chest pain on physical activity presented to the emergency department. Angiography showed narrowing of mid part of left anterior descending artery at systole, normal caliber in diastole and good distal flow but after normalization of blood pressure and pulse rate, the left anterior descending artery lesion disappeared in systole and diastole. As in this patient, it is imperative to note that hypotension due to any cause such as vasovagal reaction, could stimulate myocardial bridge.

Introduction

The three major coronary arteries generally pass alongside the epicardial surface of the heart. Myocardial bridging, occurs in 5 to 12 percent of patients, and is usually confined to the left anterior descending artery (LAD).[1] Because a bridge of myocardial fibers passes over the involved segment of the LAD, each systolic contraction of these fibers can cause narrowing of artery. Myocardial bridging has a characteristic appearance on angiography with the bridged segment of normal caliber during diastole and abrupt narrowing with each systole.[1] Occasionally, compression of a portion of a coronary artery by a myocardial bridge can be associated with clinical manifestations of myocardial ischemia during strenuous physical activity and may even result in myocardial infarction or initiate malignant ventricular arrhythmias.[2] Medical treatment generally includes beta blockers, although nitrates should be avoided because they may worsen symptoms.[1] Intracoronary stents and surgery have been attempted in selected patients, but the results have been mixed.[1]

Case report

A 62–years–old women presented to emergency department with chief complaint of repeated compressive chest pain on physical activity. The patient had no history of Hypertension, Diabetes Mellitus, Hyperlipidemia or smoking. Her Blood pressure was 120/70mmhg with pulse rate of 80 bpm, and in cardiac auscultation had S4 without any murmur.

Electrocardiography showed no significant ST-T change. Transthoracic echocardiography revealed ejection fraction of 55% without Regional wall motion abnormality, and other parameters of echocardiography were normal.

Due to continuing chest pain, coronary Angiography was planned for her. At the start of angiography, the patient developed hypotension and bradycardia (BP 70 mmHg over pulse and Heart Rate of 40 beats per minute), which was responded properly with hydration and

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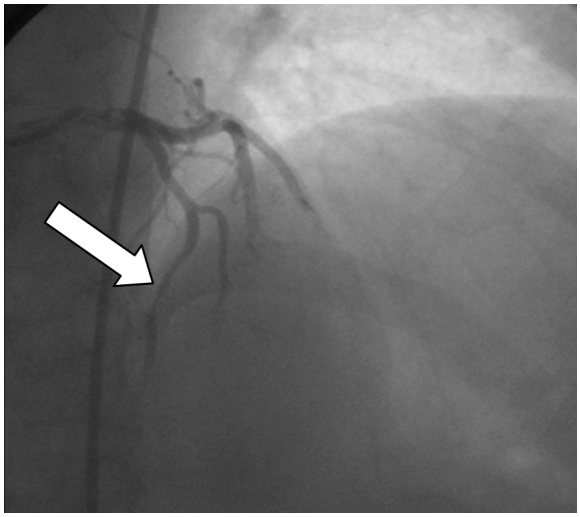

Figure1. Coronary angiography shows narrowing of mid part of LAD during systole.

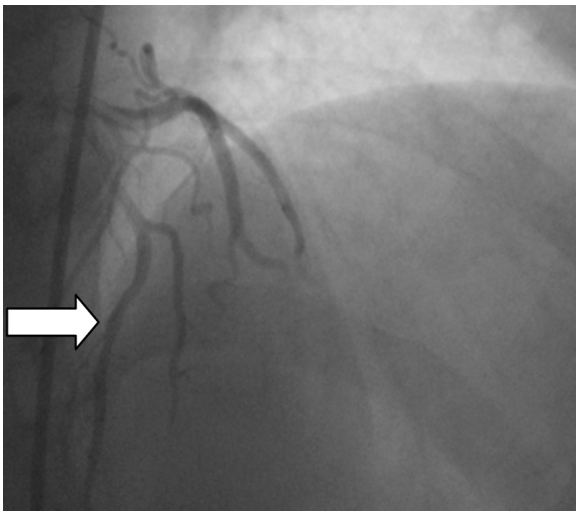

Figure2. Coronary angiography illustrates normal mid part of LAD during diastole

atropine injection. After stabilization coronary angiography was performed that showed narrowing at mid part of left anterior descending artery at systole with normal caliber in diastole and good distal flow (Fig. 1,2).

Although, this coronary angiography had characteristic appearance for muscle bridge, after normalization of blood pressure and pulse rate, new injection revealed the disappearance of left anterior descending artery lesion in systole and diastole (Fig. 3,4).

Thus in this patient, myocardial bridge was provoked by hypotension and disappeared by increasing blood pressure.

Discussion

Myocardial bridges are most commonly localized in the middle segment of the left anterior descending coronary artery (LAD) and located at a depth of 1 to 10 mm with a typical length of 10 to 30 mm.[3,4] Bridging of coronary arteries is observed during coronary an-

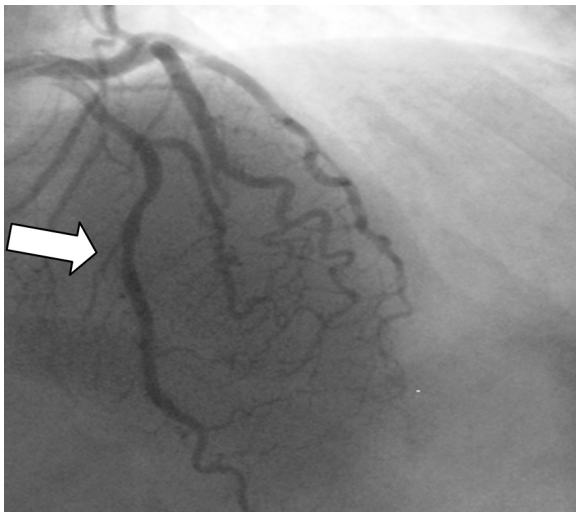

Figure 3. Coronary angiography during systole after rise of blood pressure

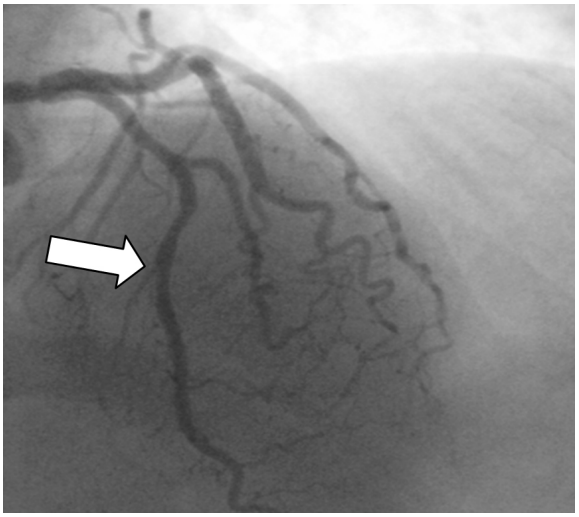

Figure 4. Coronary angiography during diastole after rise of blood pressure

giography at a rate of less than 5 percent in otherwise angiographically normal coronary arteries with ordinary doses not constituting a hazard.[1] The current gold standard for diagnosing myocardial bridges is coronary angiography with the typical milking effect and a step down-step up phenomenon induced by systolic compression of the tunneled segment.[3] Decreasing intracoronary pressure by different means, such as intracoronary nitrates is the best way to induce this milking effect.[3] In this case during low blood pressure angiography showed myocardial bridge that disappeared after correction and rise of blood pressure. A similar presentation was found in patients with baseline low blood pressure such as those recovering from the vasovagal reaction. Thus it is important to note that hypotension with any cause such as vasovagal reaction, could provoke myocardial bridge. Three treatment strategies have been explored:

1 Negative inotropic and/ or chronotropic agents ie; B blockers and calcium channel blockers.[5] This is generally considered to be the first line therapy in symptomatic patients.

2 Surgical myotomy or bypass surgery in patients refractory to medications.[6]

3 Stenting of tunneled segment.[7]

Acknowledgements

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