

Acute Inferior Wall ST-Elevated Myocardial Infarction with Normal Coronary Arteries

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Abstract A 59-year old woman presented to the ER complaining of chest pain. ECG showed sinus rhythm at the rate of 72 beats per minute and ST segment elevations in Lead II, III, aVF. A Code STEMI was activated for emergent cardiac catheterization, which revealed the patient had normal coronary arteries with normal left ventricular systolic function. During the procedure, her symptoms of chest pain resolved. ECG, urine toxicology, and echocardiogram tests were done in the ICU, which were normal. The patient was eventually discharged home and scheduled to follow up with cardiology and primary care physician.

Keywords: STEMI, coronary artery, echocardiogram, cardiac catheterization, cardiology

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1. Introduction

ST elevation usually suggests acute coronary obstruction [1]. Myocardial infarction with 'normal' coronary arteries (MINCA) usually occurs in patients under fifties. Usually there is no history of angina or heart attack, and risk factors for ischemic heart disease may not be present [2].

This is a case of a 59-year old woman with acute ST-elevated myocardial infarction (STEMI) with normal coronary arteries.

2. Case Presentation

We present a case of a 59-year-old Caucasian woman with no past medical history who presented to the emergency room (ER) because of acute onset of chest pain. The patient who was in her usual state of health had a sudden onset of mid-sternal chest pain after her dinner. It was 8/10 in intensity and radiating down to both her arms associated with shortness of breath and diaphoresis. She immediately called the emergency medical services who gave her aspirin 325mg, sublingual nitroglycerin 0.5mg and brought her to the hospital. On arrival, the electrocardiogram (ECG) done showed sinus rhythm at the rate of 72 beats per minute (BPM) and ST segment elevations in Lead II, III, aVF. (e.g. Figure 1) Her blood pressure was 133/68 mm of Hg and other vital signs were within normal limits. Physical examination revealed a fairly obese woman who was in moderate distress, her chest examination and auscultation was within normal limits without any chest wall tenderness. A Code STEMI (ST-elevated myocardial infarction) was activated for emergent cardiac catheterization and she also received

prasugrel 60mg. Her other pertinent history included the significant history of smoking in the past of 100 pack years and family history of coronary artery disease in her father at the age of 60 years.

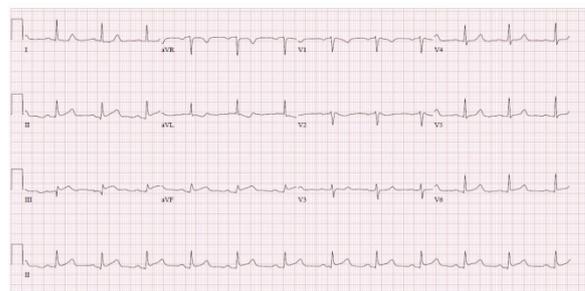


Figure 1. Electrocardiogram showing sinus rhythm at the rate of 72 BPM, ST segment elevation in leads II, III, aVF. Intervals: PR 184ms, QRS 84ms, QT 414ms, QTc 453 ms

The cardiac catheterization done revealed the patient had normal coronary arteries with normal left ventricular systolic function (e.g. Figure 2 – Figure 4) During the procedure, her symptoms of chest pain resolved and she did not have further symptoms of chest pain. The patient was transferred to the Intensive Care Unit for further monitoring. The cardiac enzyme Troponin-I were cycled every 6 hours. First troponin before angiography was 0.02 ng/ml, which reached a peak value of 46.1 ng/mL (N: 0.04 to 0.80 ng/mL) and then trended down. Her urine toxicology was negative for cocaine and other drugs. ECG done the next day showed normal sinus rhythm at the rate of 63 BPM and resolution of the ST segment elevations (e.g. Figure 5). An echocardiogram done revealed normal left ventricular systolic function with an ejection fraction of 65%, no valvular abnormalities, and normal filling pressure. The patient was eventually discharged home on a daily aspirin, beta blocker, calcium channel blocker,

ACE inhibitor, a statin and scheduled for a follow-up with her cardiologist and primary care physician. During follow-up four months later, patient had a negative ergonovine spasm test.



Figure 2. Angiogram (RAO – Caudal view) showing a normal Left Main, Left Anterior Descending, and Left Circumflex arteries



Figure 3. Angiogram (LAO – Cranial view) showing a normal Right Coronary Artery

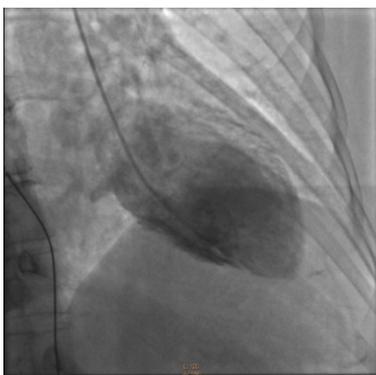


Figure 4. Angiogram (RAO – Cranial view) showing a normal Left Ventriculography

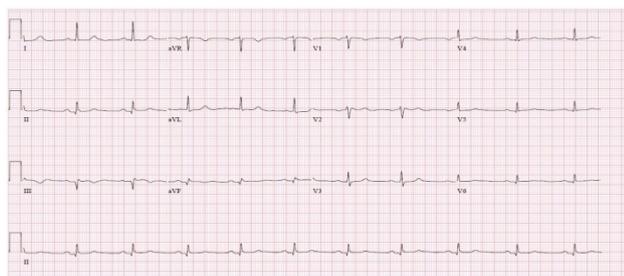


Figure 5. Electrocardiogram showing sinus rhythm at the rate of 63 BPM, resolution of ST segment elevation in leads II, III, aVF compared to previous ECG. Intervals: PR 186ms, QRS 82ms, QT 418ms

3. Discussion

There are numerous studies reporting of patients with heart attack and normal coronary angiograms. However, the exact pathogenic mechanism of myocardial infarction with normal coronary arteries (MINCA) remain unknown. The patient was suspected to have spontaneous lysis during the cardiac catheterization because during follow-up 4 months later, she had a negative ergonovine spasm test, which has high sensitivity and specificity [6]. Generally, the possible explanations in this situation would be coronary artery spasm (Prinzmetal angina), cocaine-induced vasospasm, spontaneous lysis, embolization, myocarditis or aortic dissection [2,3]. Smoking, hypertension, diabetes mellitus, inflammatory disease and psychiatric disorders are risk factors for MINCA [4]. Initial management of these patients is the standard treatment for myocardial infarction (MI), which includes pain relief, aspirin, thrombolysis if indicated and beta blockade. If patient is abusing cocaine, then beta-blockers are not used. These patients are at low risk for post-MI complications and have a favourable long-term prognosis [5].

4. Conclusion

This is a case of acute inferior wall ST- Elevated Myocardial Infarction with normal coronary arteries. Myocardial infarction with angiographically normal coronary arteries can be due to causes such as Prinzmetal angina, cocaine-induced vasospasm, spontaneous lysis, embolization, myocarditis or aortic dissection. Results of urine toxicology, ECG, and echocardiogram were normal. Urine toxicology is important to rule out cocaine abuse as a beta blocker is contraindicated in these patients. Patient was discharged home and scheduled to follow-up with cardiology and primary care physician. Ergonovine spasm test is helpful in diagnosing Prinzmetal angina. Initial management is the same as for acute myocardial infarction which includes aspirin, beta blocker, pain control, and thrombolysis.

Acknowledgement

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