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Case Report

Myocardial Infarction or Pericarditis: An Interesting Case

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Abstract

There are many diseases whose presentation is very similar. This in turn makes the diagnosis of the disease difficult. Similarly, I encountered a case in my hospital where we were trying to rule out if the patient had myocardial infarction or pericarditis. The presentation of the symptoms was so confusing and unjustifiable with the diagnostic tests, that the diagnosis of the disease was unclear till the end. Though with the help of vague connections, we finally figured out the management which eased the symptom of the patient.

CASE REPORT

A 29-year old male patient was in his usual state of health when he started feeling sharp chest pain on his left side which was non-radiating and persistent regardless of any position. His chest pain stayed for at least one hour when he finally rushed to a nearby hospital where his electrocardiogram (ECG) was done which showed marked ST-elevation. He was advised to get the blood tests done, but he was not satisfied. He then came to a tertiary care hospital where his ECG was again performed which again showed marked ST-elevation though the patient did not have chest pain on arrival to the hospital. The patient had no active co-morbidities other than being an occasional smoker. His blood tests were sent for further investigation along with cardiac enzymes troponin level. His troponin leak was 6.09 in emergency (the normal range is <0.006). He received the ACS protocol (discussed below), and was rushed to Cath lab for Left Heart Catherization (LHC).

Background

Myocardial infarction (MI) also referred as heart attack is the death of the heart muscles when there is lack of blood supply to cardiac cells due to blockage in the coronaries [1]. The common cause of heart attack includes cardiovascular diseases which includes risk factors such as hypertension, smoking, high blood cholesterol, diabetes and lack of exercise [2]. In some cases, there are high possibility that the person with MI doesn't give you any symptom; however, most of the people show sign of chest pain which may radiate to shoulder, back or jaw, and may be accompanied by shortness of breath, faintness, dizziness and nausea [3].

Pericarditis on the other hand is the inflammation of the pericardium (made of parietal and visceral layer) which rubs against the heart. Similar to heart attack, chest pain is also present in pericarditis which makes it difficult to diagnose these two diseases [4]. The common cause of pericarditis is viral fever or idiopathic in immunocompetent people; however, HIV and tuberculosis are common etiology in immunocompromised people [5].

Myocardial infarction is sometimes difficult to diagnose because the symptoms closely resembles to that of pericarditis. ST elevations upon ECG, chest pain and troponin leak are some overlapping signs between myocardial infarction and pericarditis. These were the same set of signs which we got in our patient.

DISCUSSION

Initially when he came to ER, his ECG showed ST elevation in Lead II, III, aVf, and V2-V4 (Figure 1). This ECG made doctors highly suspicion that this young boy has ST elevation MI (STEMI). Simultaneously, his blood tests were also send for troponin I leak and other baseline studies like electrolytes, complete blood count etc (Table 1).

All the tests and ECG made doctors think that this young patient might had an acute myocardial infarction. They were trying to rule out if this patient had a STEMI or NSTEMI, though the ECG favored for STEMI. The patient received the ACS protocol (acute coronary syndrome protocol) which is given to patients mostly with NSTEMI with troponin leak. In the ACS initial treatment, the goal of the therapy is to reduce the myocardial damage by providing antithrombotic therapy, and thus the initial management is to give aspirin 162-325 mg, clopidogeral 300-600 mg, Intravenous nitroglycerin, and morphine if the chest pain is very severe [6]. Likewise, this patient received clopidogeral

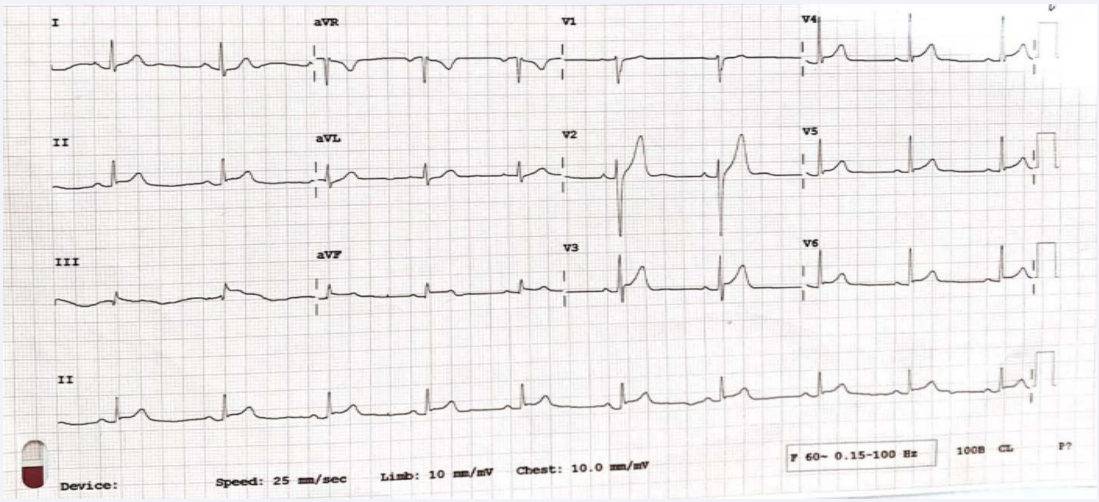

Figure 1 ECG showed ST elevation in Lead II, III, aVf, and V2-V4.

300 mg, aspirin 300 mg, and 5000 units of heparin as initial management. In addition to this, this patient was also given a doubt to perform a left heart catherization (LHC) commonly known as angiography to figure out if there is any perfusion blockage in the coronaries.

Table 1: Complete blood count.

Test	Values
Trop- I	6.096
Creatinine	1.1
Sodium	139
Potassium	3.7
Chloride	101
Bicarbonate	28.7
Hemoglobin	15.1
White blood cell	8.3
Monocytes	7.8
Lymphocytes	17.1
Platelets	228
PT	11.3
INR	1.1
APTT	25

Table 2: No Variation blood count.

Test	Values
C-reactive proteins	8.10
Magnesium	2.1
Creatinine	1.2
Sodium	145
Potassium	3.5
Chloride	107
Bicarbonate	25.6
HbA1c	5.6
Hemoglobin	15
White blood cells	8.9
Monocytes	9.8
Platelets	246
Trop-I	5.611

The doctors couldn't differentiate between pericarditis and myocardial infarction at this point in time because the complete blood count doesn't reveal any sign of infection which might lead to pericarditis though chest pain and trop-I leak may also be present in this disease. Monocytes are elevated in patients who have infections mostly viral [7]. However, if we refer Table 2, there are no any variations in the blood test which may favor pericarditis.

A left heart catherization was performed using the femoral artery to identify any blockage in the coronaries. Surprisingly, all the coronaries were absolutely normal without any occlusion. This finding made doctors clear that this patient doesn't have myocardial infarction. Now it was the time to rule out the non-ischemic causes of his condition (Figure 2).

After his angiography was performed and it was clear that this patient did not have myocardial infarction, the doctors were thinking that this patient might have pericarditis. An ECG was again performed (Figure 3) with trop-I levels which were 5.611 this time.

In this ECG, the patient had normal sinus rhythm with borderline ST elevation in the anterior leads. However, these findings were not enough to support the diagnosis of pericarditis. The other diagnostic evaluations for pericarditis includes medical history of recent viral infection, physical examination which might reveal pericardial friction rub, blood tests (WBCs, ESR, C-reactive proteins, troponin, complete blood count [CBC], urea, creatinine), echocardiogram, and chest X-ray [8]. Likewise, the doctors then moved to these diagnostic tools including chest X-ray, echocardiogram, CBC, troponin I, electrolytes and C-reactive proteins.

All the findings of test were within the normal ranges. This made doctors to then go for a chest X-ray and echocardiogram to see if they find any evidence of pericarditis from these radiographs. The echocardiogram of this patient showed normal heart chambers with normal ventricular function (Figure 3). The chest X-ray concluded no any signs of pulmonary disease and enlargement of the heart which may favor pericarditis.

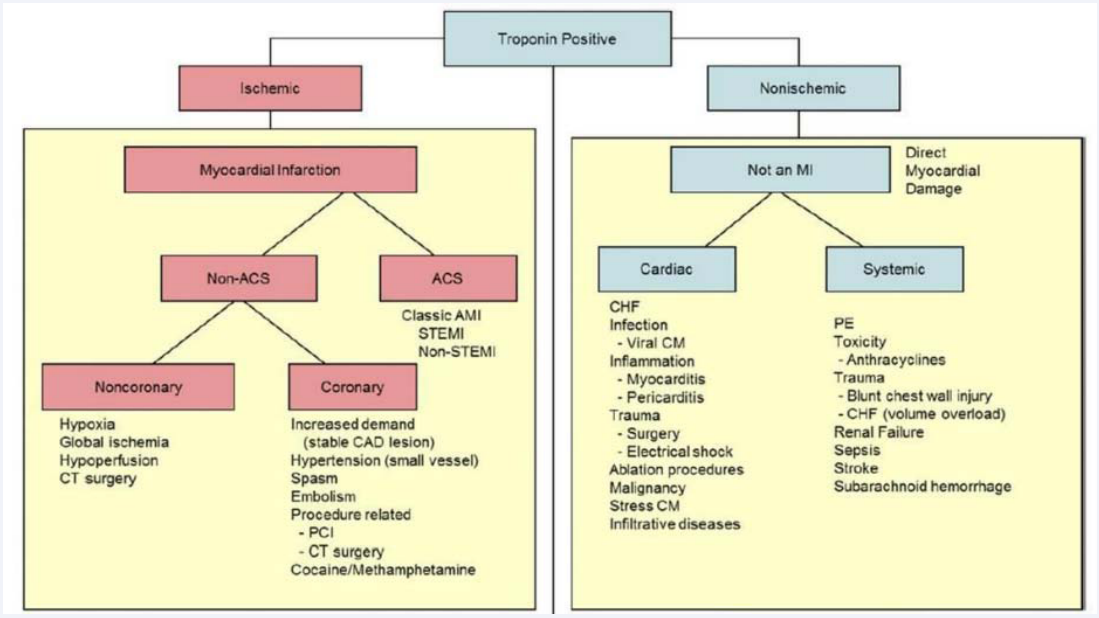

Figure 2 Non-ischemic causes.

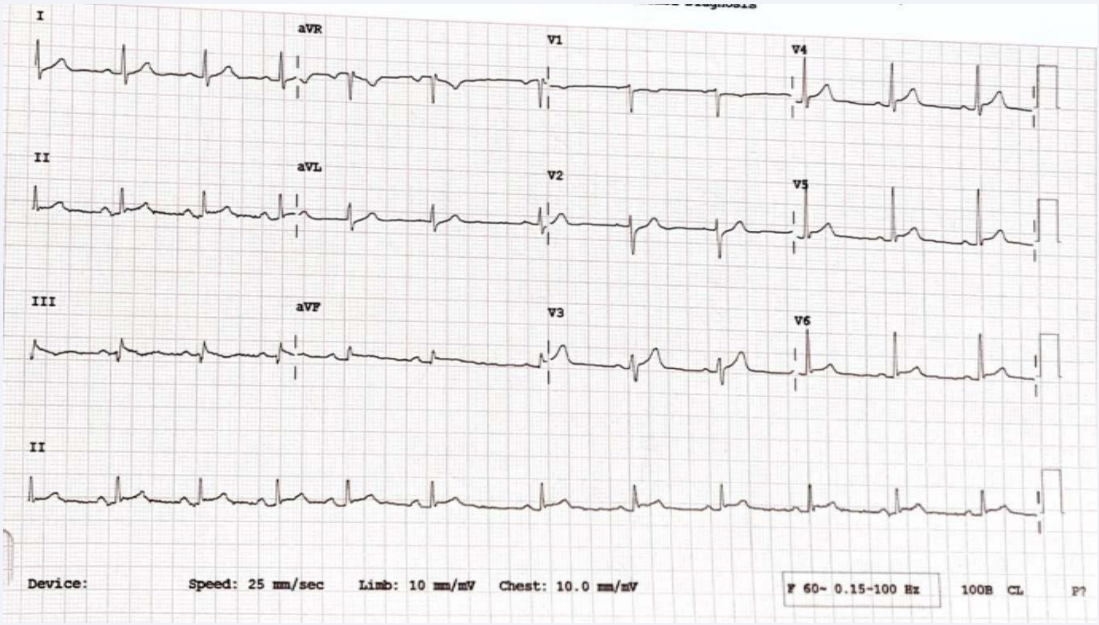

Figure 3 ECG was again performed with trop-I levels which were 5.611 this time.

In addition to this, there were no any signs of pericardial friction rub upon assessment. The doctors then tried to dig a bit more in the history. After taking a detailed history, they got to know that the patient had certain GI discomfort (cramps and pain) six months back. They then decided to manage the patient for pericarditis. They started ibuprofen which is a non-steroid anti-inflammatory drug (NSAID), and considered as a mainstay treatment for pericarditis as it involves the inflammation of the pericardium. It is suggested that a full dose NSAID needs to be continued until the C-reactive protein (CRP) comes within the normal range [9]. C-reactive proteins are the markers which becomes elevated when there is any inflammation in the body (10). Unlikely to this, the levels of the CRP were already in the normal ranges, but still doctors chose to give him a NSAID therapy.

The patient was all fine after taking the ibuprofen, and was discharged at home with the same medication for some time in order to recover fully.

CONCLUSION

The presentation of myocardial infarction and pericarditis may trick the doctors to make an accurate diagnosis at first hand,

Interpretation

Cardiac chambers are of normal size.
There is no left ventricular hypertrophy.
Left ventricular systolic function is normal.
Visually estimated ejection fraction is approximately 55-60%.
No segmental wall motion abnormalities noted.
Right ventricular systolic function is normal.
Aortic valve normal with no stenosis. No aortic regurgitation.
Mitral valve normal with no stenosis. Trace mitral regurgitation.
Tricuspid valve normal with no stenosis. Trace tricuspid regurgitation.
Pulmonary valve normal with no stenosis. No pulmonary regurgitation.
Normal transmitral inflow pattern. Normal pulmonary vein Doppler .
E/E' is 8, suggestive of normal LV filling pressure.
No obvious thrombus, vegetation, pericardial effusion or intracardiac shunt.

Conclusion

Cardiac chambers are of normal size.
Normal left ventricular systolic and diastolic function.

Figure 4 Chest X-ray concluded.

and thus there are certain lab and radiologic test tests required to rule out the conditions. The case shared above had a very confusing disease presentation. However, the patient was fine after getting the NSAID therapy.

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