Case Report

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Focal Myocarditis Mimicking Subendocardial Ischaemia: A Case Report

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Abstract

Introduction: Myocarditis is an infrequent, possibly life-threatening, and inflammatory myocardial disease with various number of clinical complaints and symptoms, often caused by infectious agents.

Case Presentation: A 24-year-old male came to the emergency department (ED) with the complaints of angina-like retrosternal chest pain and tightness lasting for three days. The ECG suggesting inferior submural ischaemia and echocardiographic assessment was normal. Laboratory tests showed troponin T levels increased. Coronary angiography was normal. CMRI showed patchy contrast uptake. It looked more like viral myocarditis.

Conclusion: Acute myocarditis diagnosis is most difficulty and predictively in connection with the variety of clinical presentations. The differential diagnosis between myocarditis and AMI can be troublesome in ED.

Keywords: Angina pectoris, endomyocardial biopsy, ischaemia, myocarditis

Introduction

Myocarditis is an infrequent, possibly life-threatening, and inflammatory myocardial disease with various number of clinical complaints and symptoms, often caused by infectious agents[1]. Myocarditis occurs with acute decompensation of heart failure and come with disproportionate dyspnea on exertion, chest pain, arrhythmias and sudden death. Acute myocarditis diagnosis is most difficulty and predictively in connection with the variety of clinical presentations. To confirm the diagnosis, the clinical presentation, physical examination, laboratory testing, electrocardiographic (ECG) changes and a normal coronary angiography should be considered[2]. Endomyocardial biopsy (EMB) is the best diagnostic option, but is not used as commonly. This report presents a case of young male suffering from angina-like chest pain who had ECG changes and cardiac enzyme levels suggesting acute myocardial ischemia of which the diagnosis of acute myocarditis was confirmed using cardiac magnetic resonance imaging (CMRI).

Case

A 24-year-old male came to the emergency department (ED) with the complaints of angina-like retrosternal chest pain and tightness lasting for three days. He did not have any chronic disease, cardiovascular risk factors and medication. One week before, he was diagnosed with an acute gastroenteritis. At presentation, his pulse rate was 110 bpm, blood pressure was 110/80 mmHg and temperature was 36.9 ˚C. The initial physical examination showed heart sounds were normal. The first ECG in the ED demonstarted sinus tachycardia with negative T-waves in the inferior leads (Figure 1), suggesting inferior submural ischaemia. The echocardiographic (ECHO) assessment revealed a left ventricular ejection fraction around 56% and no hypokinesis. Laboratory tests showed white blood cells counts of 9,9×109/mL, C-reactive protein (CRP) of 112 mg/dL (reference range[rr]:0-6), creatine kinase (CK) of 696 IU/L (rr:0-190), muscle brain fraction of CK (CK-MB) 54 IU/L (rr:3-25), troponin T of 574,3 ng/L (rr:=0-14). Based on these findings, initial diagnosis of acute non st elevation myocardial infarction was considered. Coronary angiography was performed immediately. It looked more like viral myocarditis as epicardial coronary arteries were normal. The diagnosis of myocarditis was confirmed by CMRI, which showed patchy contrast uptake at inferolateral wall and left ventricle apex (Figure 2). β-blocker therapy was advised as complementary medication. Four weeks later, he had no complaint, and so β-blockers were discontinued.

Discussion

Myocarditis is a confusing diagnosis due to the variety of clinical presentations ranging from fatigue, mild chest pain,

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sings of congestive heart failure, ECG changes to life-threatening cardiogenic shock, ventricular arrhythmia and sudden death. Common symptoms included dyspnea (71.7%), unspecific chest pain (31.9%) and arrhythmic events (17.9%). Patients with severe myocarditis characteristically experience serious heart failure or cardiogenic shock symptoms[1]. Chest pain in acute myocarditis may imitate typical angina and may be linked to ECG abnormalities, including ST segment changes[2,3]. The European Society of Cardiology Working Group on Myocardial and Pericardial Diseases recommend all clinically suspected myocarditis cases should be considered for selective coronary angiography. Damage to cardiac myocytes lead to fluctuations in electrical activity which brings about ECG ST - T wave changes, ST segment elevation, atrial and ventricular arrhythmias, atrioventricular and intraventricular conduction defects and prematüre repolarization. However, ECG is sensitive for myocarditis by 47% only[4]. Cardiac Tn increases in the early stage of myocarditis and shows a gradual drop as the patient recovers. Sensitive tests specific for myocyte injury, such as cTnI, is likely to assist in the diagnosis of myocarditis[5]. Erythrocyte sedimentation rate and CRP levels are often raised in myocarditis, but are not used to diagnose myocarditis[1]. The European Study of Epidemiology and Treatment of Cardiac Inflammatory Disease (ESETCID) reported that 78.3% of the patients with an ejection fraction higher than 45% and in patients with normal or only mild reduction of ejection fraction, chest pain (42.1%) was the main symptom[6]. Speckle-tracking ECHO characterized by the precise evaluation of local contractility could be supportively used to diagnose acute myocarditis and inflammatory cardiomyopathy[7,8]. At the same time ECHO helps to rule out non-inflammatory cardiac diseases such as heart valve diseases. Today CMRI is used as one of the most powerful devices for detecting and diagnosing myocarditis. CMRI can detect myocardial edema and myocyte damage noninvasively. Myocarditis is characterized by a characteristic contrast enhancement pattern that originates primarily from the epicardium and protects the subendocardial layer. Conversely, myocardial infarction characteristically shows a subendocardial improvement on MRI. The European Society of Cardiology Working Group on Myocardial and Pericardial Diseases recommend CMRI for diagnosis. On the other hand, the single process for a definite diagnosis of myocarditis is endomyocardial biopsy, with a sensitivity from 43% to 64%, an overall complication rate of 6%, and a 0.4% incidence of death due to perforation. In 2013, The European Society of Cardiology Working Group on Myocardial and Pericardial Diseases recommended heart biopsy as a routine test for all cases of suspected myocarditis. Conversely, the routine application of EMB was not recommended by the 2013 American College of Cardiology Foundation/American Heart Association, which shows a lack of consensus on EMB for diagnosing myocarditis9. Almost 50% of the patients with acute myocarditis tend to naturally get better within a month's period, approximately 25% will develop persistent impaired cardiac function and up to 25-30% may either progress to dilated cardiomyopathy that requires heart transplantation. In patients with chest

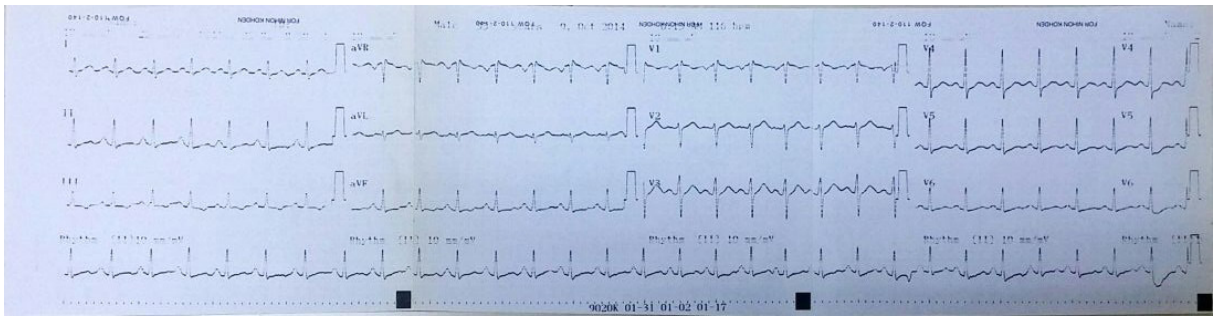

Figure 1: ECG shows negative T-waves in the inferior leads

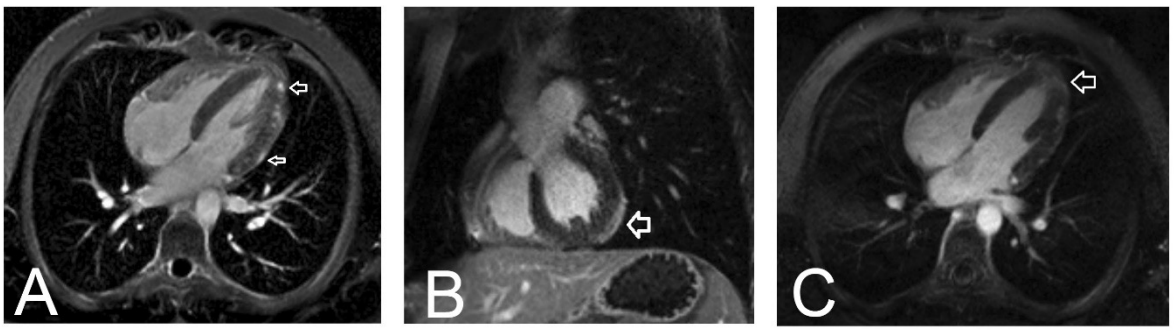

Figure 2: Contrast-enhanced cardiac magnetic resonance identified areas of myocardial inflammation (arrows) and minimal pericardial effusion due to focal myocarditis in the inferolateral wall. A. CMRI shows minimal pericardial effusion, B. CMRI shows minimal pericardial effusion, C. CMRI shows patchy contrast uptake at inferolateral wall and left ventricle apex.

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pain, elevated myocardial enzymes and ECG changes, AMI is the primary diagnosis. Coronary heart disease chiefly occurs in patients over 40, and younger male and female patients have different risk factors, clinical presentations, and prognosis than older patients. Myocarditis may affect people of all ages, but it is often encountered in the patients at young ages[3]. In this case, AMI was primarily considered due to angina-like chest pain, inferior negative T-waves on the ECG, elevated cardiac markers, for this reason coronary angiography had been performed. Young age, previous acute gastroenteritis with fever, lack of segmental wall motion on ECHO and a normal coronary angiography supported to diagnosis of myocarditis. The diagnosis of acute myocarditis was confirmed using CMRI.

Conclusion

In summary, the patients with focal myocarditis may complain of angina-like chest pain, ECG changes and elevated cardiac enzymes mimicking AMI. The differential diagnosis between myocarditis and AMI can be troublesome in ED. CMRI can be a useful diagnostic tool to distinguish between myocardial ischemia, infarction, or spasm from acute myocarditis.

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