






## ■ Case Report

# A case report: A young patient with inferior ST elevation accompanying reciprocal ST depression

## *Resiprokal ST depresyonu ile birlikte inferior ST elevasyonu olan genç hasta: Olgu sunumu*

Nezaket Merve YAMAN , Mustafa Bilal OZBAY , Hasan Can KONTE , Ertan EKICI,   
Elif Hande Ozcan CETIN\* 

University of Health Sciences, Turkey Yuksek Ihtisas Training and Research Hospital, Department of Cardiology, Ankara/TURKEY

### ABSTRACT

In patients admitting to the emergency department with chest pain and ST-segment elevation, the first diagnosis to be considered is acute myocardial infarction. Urgent differential diagnosis and immediately referral to catheter laboratory to perform coronary angiography is life-saving. The electrocardiography is a vital tool in the differential diagnosis of chest pain. Although the electrocardiographic findings of acute myocardial infarction and acute myocarditis are generally different, rarely two diseases can mimic each other. We presented a 21-year-old male patient who had admitted our emergency with acute typical chest pain and ST-segment elevation in D2, D3, AVF leads accompanying with reciprocal ST depression in DI and AVL leads.

**Keywords:** ST elevation myocardial infarction; myocarditis; electrocardiography

### ÖZ

Acil servise göğüs ağrısı ve ST segment elevasyonu ile başvuran hastalarda akut miyokard infarktüsü ilk akla gelen tanıdır. Acil ayırıcı tanı ve katater laboratuvarına koroner anjiyografi için hemen refere edilmesi hayat kurtarıcıdır. Elektrokardiyografi göğüs ağrısının ayırıcı tanısında çok önemli bir araçtır. Akut miyokard enfarktüsü ve akut miyokardit elektrokardiyografik bulguları genel olarak farklı olsa da, nadiren bu iki hastalık birbirini taklit edebilir. Acil servisimize akut başlangıçlı tipik göğüs ağrısı ile başvuran, D2,D3,AVF derivasyonlarında ST elevasyonu ile birlikte DI ve AVL derivasyonlarında resiprokal ST depresyonu görülen 21 yaşında erkek hasta vakası sunduk.

**Anahtar kelimeler:** ST elevasyonu miyokard infarktüsü; miyokardit; elektrokardiyografi

Corresponding Author\*: Elif Hande Ozcan Cetin, University of Health Sciences, Turkey Yuksek Ihtisas Training and Research Hospital, Department of Cardiology, Ankara/TURKEY

E-mail: dr.elifhande@gmail.com

ORCID: 0000-0001-5969-2345

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## Introduction

Acute myocardial infarction and acute myocarditis are the most common causes of chest pain in patients admitting to the emergency department. First evaluation of patients with chest pain is identifying the chest pain characteristics with electrocardiographic (ECG) findings and cardiac-specific enzymes and then the patient usually can be diagnosed. But in some cases it is very difficult to diagnose the case with those findings. Although the first diagnosis that comes to mind in a patient with chest pain and ST segment elevation is ST-Elevation Myocardial Infarction (STEMI), also other diagnoses such as pericarditis, myocarditis, Prinzmetal angina should be considered as differential diagnosis. ECG is essential to decide to emergency coronary angiography.

## Case report

We present a 21-year-old patient admitted to our emergency department at first contact with chest pain and dyspnea of one day history with ST segment elevation in D2,D3,AVF leads (inferior derivations) and reciprocal ST depression in DI and AVL leads in 12-lead electrocardiogram. In spite of these ECG abnormalities being in favor of acute inferior myocardial infarction, myopericarditis were diagnosed due to detecting normal coronary arteries in coronary angiography. In the literature, it has been reported that in very rare cases ST elevation and reciprocal ST depression is observed together in myopericarditis.

Our patient had no risk factors for atherosclerosis such as hypertension, diabetes, dyslipidemia, cocaine usage and family history except smoking. He had influenza ten days ago and treated with symptomatic medication. On admission, her blood pressure was 120/76mmHg, his heart rate was 67 beats/minute and sinus rhythm and body temperature was 35.6°C. The room air oxygen saturation was 98%. The chest wall examination revealed no rhonchi or rales. The findings of abdominal examination were unremarkable. On cardiac auscultation, S1 and S2 were normal, an S3 gallop was revealed, pathologic murmur and pericardial friction sound were not observed.  $\geq 1$  mm ST segment elevation in the inferior derivations and reciprocal ST depression in DI and AVL leads, and absence of R wave progression in anterior leads was observed in first ECG. (figure1) In second ECG at fifth minute  $\geq 1$  mm ST segment elevation in V5-V6 leads was also added. (figure 2) He was considered as acute coronary syndrome and was given aspirin 300 mg, ticagrelor 180 mg and standart heparin. Coronary angiogram (CAG) was immediately done in view of history of chest pain and ECG findings consistent with STEMI. But, it didn't show any significant coronary stenosis or vascular obstruction. 2D Echocardiography (ECHO) showed no segmental wall abnormality. Local ethics committee approved the study and informed consent was obtained from participant(s)

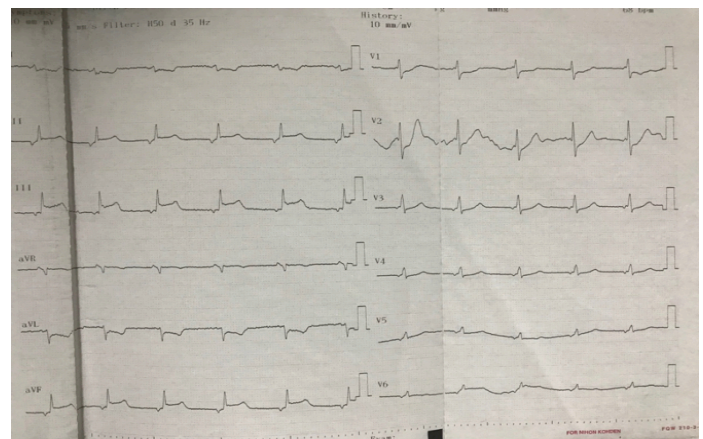


Figure1: Initial ECG

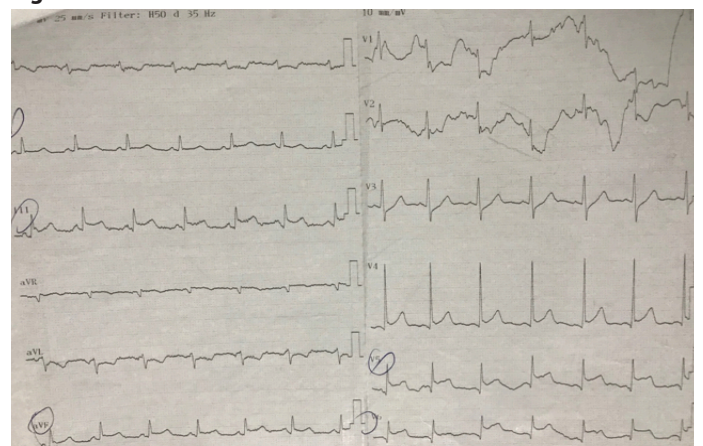


Figure 2 ECG in fifth minute

Creatine phosphokinase-MB isoenzyme was measured as 205.3 ng/ml and troponin T as 2.53 ng/ml. White blood cell count, erythrocyte sedimentation rate, C-reactive protein were 10,09 109, 51mm/h, 101.85 mg/l respectively. He had neutrophilia. Levels of serum electrolytes, glucose, blood urea and creatinine and thyroid function tests within normal limits. Liver function tests were slightly increased. During in hospital-follow up, electrocardiographic changes were resolved (Figure 3 and Figure 4).The discharge ECG demonstrated any ST segment elevation or depression (Figure 5).

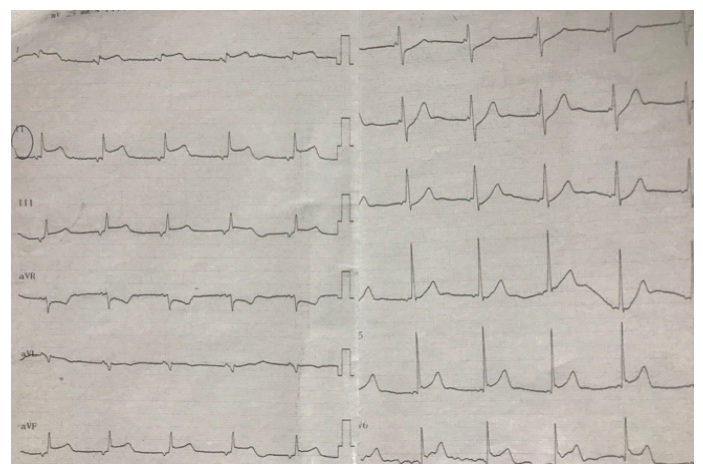
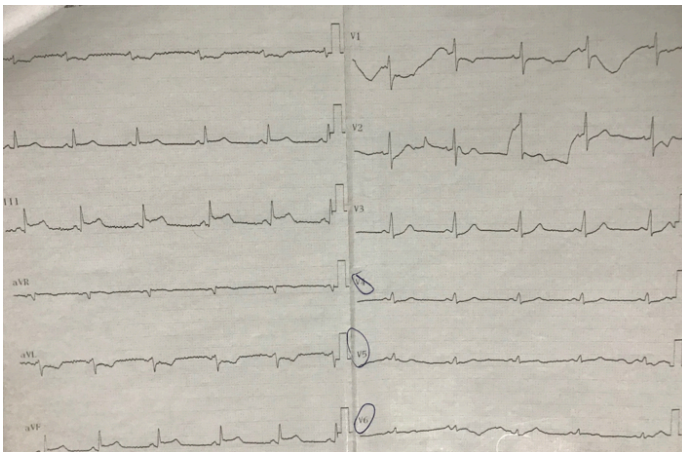
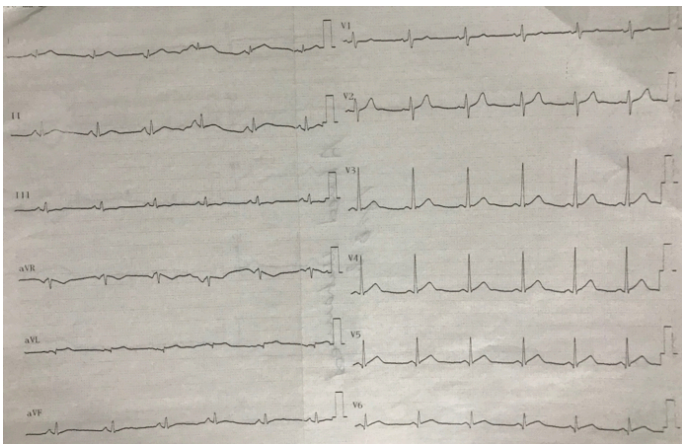


Figure 3 ECG after coronar angiography



**Figure 4** ECG at 24 hour



**Figure 5** ECG at 7th day during discharge

## Discussion

Initial evaluation of patients admitted with chest pain is firstly made with physical examination, electrocardiography and cardiac specific enzymes and we often can diagnose. But in some cases it is challenging to diagnose.<sup>1</sup>

In STEMI, ST segment elevation in at least two successive leads other than V2-V3 belonging to related vessel is observed as  $\geq 1$  mm convex ST elevation in the absence of left ventricular (LV) hypertrophy or left bundle branch block LBBB and there may also be a reciprocal ST depression.<sup>2</sup> In vasospastic angina, ECG is encountered with the same findings as in myocardial infarction.<sup>3,4</sup> Classic changes in acute pericarditis include widespread concave upward ST-segment elevation and PR-segment depression without T-wave inversions.<sup>5,6,7</sup> In contrast to acute pericarditis, pathologic Q waves, regional convex ST-segment elevations, and reciprocal changes commonly occur with myocardial ischemia or infarction.<sup>7</sup>

The first diagnosis that came to mind when considering his age, risk factors and history was myopericarditis but reciprocal ST

segment depression in ECG and being a compressive pain in central part of the chest and not responding to non-steroidal anti-inflammatory drugs; acute coronary syndrome was suggested. The most important feature of our case was observation of such a severe pain and unexpected reciprocal ST depression in lateral (I and aVL) leads which was seen only in few cases in the literature. So electrocardiography act as an acute inferior myocardial infarction with reciprocal ST depression in the lateral leads.

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