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Case report

Non-ST-segment elevation myocardial infarction with coronary artery occlusion (OMI): when OMI means STEMI

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Abstract De Winter's pattern represents the equivalent of an acute ST-segment elevation myocardial infarction of anterior localization. This ECG pattern of changes is most similar to the hyperacute phase of ST-elevation anterior wall myocardial infarction and is one of the ECG signs of OMI and should be managed according to the STEMI protocol. This paper presents the case of a 49-year-old male with chest pain and overt coronary artery disease risk factors, and this specific ECG pattern. The aim of this paper is to highlight that the timely recognition of ECG changes indicating acute coronary artery occlusion in the absence of ST-elevation is of great importance for early myocardium reperfusion, reduction of the ischemic zone and scarring, as well as prevention of sudden cardiac death from coronary disease.

Introduction

Electrocardiography (ECG) is the primary test for diagnosing acute myocardial infarction (MI), while the presence of ST-elevation is still used to sort MI into ST-elevation (STEMI) and non-ST-elevation (NSTEMI) ones. However, increasing attention is paid to ECG patterns suggestive of MI with coronary artery occlusion (OMI), in the absence of ST-elevation. De Winter's pattern represents the equivalent of an acute ST-elevation MI of anterior localization. It is a specific ECG pattern that implies upsloping depression of the ST segment (1-3 mm), with symmetrical, pointed T-waves in the precordial leads and often ST-elevation in lead aVR is present. This type of ECG pattern indicates the left anterior descending (LAD) artery occlusion and occurs in about 2% of patients with LAD occlusion. Timely recognition of these changes is extremely important for taking further steps in reperfusion therapy and prevention of sudden cardiac death caused by coronary disease.

Case presentation

A 49-year-old man was hospitalized at the Department of Cardiology of the Clinic for Internal Medicine, Clinical Hospital Centre Zemun due to new-onset chest pain lasting about 30 minutes, along with electrocardiographic changes characteristic of De Winter's pattern (see **Figure**). Among the risk factors for coronary disease, the patient reported hyperlipidemia and a positive family history. During the physical examination, the patient was normotensive and hemodynamically stable, and he was referred from the emergency department of internal medicine to the room for cardiac catheterization. Upon arrival in the Angio Suite, ventricular fibrillation was

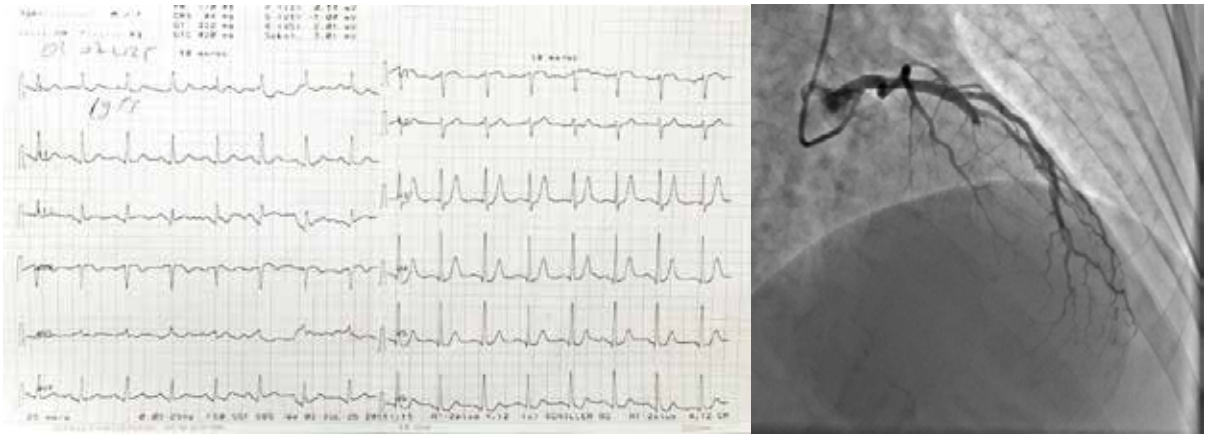


Figure. Electrocardiography on admission shows an upsloping ST segment depression of 1 mm with a symmetric, pointed, positive T wave in V3-V5 and ST-elevation of 0.5 mm in lead aVR (left), while coronary angiography showed acute thrombotic occlusion of the left anterior descending artery (right).

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registered on the monitor, and the patient was defibrillated before coronary angiography, which showed thrombotic occlusion of the mid segment of the LAD (**Figure**). During the same procedure, a primary percutaneous coronary intervention was performed with the implantation of a single drug-coated stent. The procedure and hemostasis were uneventful (no complications). No angiographically significant stenoses were observed in the other coronary blood vessels. Postprocedurally, the myocardial necrosis marker dynamics typical for acute MI was recorded. An echocardiographic examination immediately after the percutaneous intervention showed akinesia of the apex and distal half of the septum, along with mildly reduced systolic function of the left ventricle.

The patient was hemodynamically stable with stable cardiac rhythm, and discharged on hospital day five, with recommendation for further pharmacological therapy for coronary disease and risk factor management.

Discussion

Although it has been known in the literature for almost twenty years, De Winter's pattern is still relatively unknown, especially to doctors with less experience, as well as those who are not invlolved with cardiology and emergency medicine. This specific ECG changes pattern with high sensitivity and specificity indicates serious LAD occlusion and requires immediate reperfusion. This ECG pattern of changes is most similar to the hyperacute phase of ST-elevation anterior wall myocardial infarction and is one of the ECG signs of OMI and should be managed according to the STEMI protocol.

Conclusion

Timely recognition of ECG changes indicating acute coronary artery occlusion in the absence of ST-elevation is of great importance for early myocardium reperfusion, reduction of the ischemic zone and scarring, as well as prevention of sudden cardiac death from coronary disease.

Literature

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Sažetak

Akutni infarkt miokarda bez ST elevacije uz okluziju koronarne arterije: kada OMI znači STEMI

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De Winter-ov znak predstavlja ekvivalent akutnog IM sa ST elevacijom anteriorne lokalizacije. Ovaj obrazac EKG promena najsličniji je hiperakutnoj fazi akutnog infarkta miokarda prednjeg zida sa ST elevacijom i jedan je od EKG znakova OMI koje bi trebalo da budu lečeni prema protokolu za STEMI. U ovom radu prikazan je slučaj muškarca starog 49 godina sa bolom u grudima, poznatim faktorima rizika za koronarnu bolest i ovim specifičnim EKG obrascem. Cilj rada je da ukaže na činjenicu da je pravovremeno prepoznavanje EKG promena koje ukazuju akutnu okluziju koronarne arterije, u odsustvu elevacije ST-segmenta, od velikog značaja za ranu reperfuziju mikarda, redukciju zone ishemije i ožiljka i prevenciju naprasne srčane smrti usled koronarne bolesti.