

Case Report

DOI: 10.22114/ajem.v0i0.233

Acute Thrombotic Occlusion of proximal Left Anterior Descending Artery without ST-elevation (de Winter sign) in Electrocardiogram: A Case Report

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Published online: 2019-10-03

Abstract

Introduction: ST-elevation in precordial leads is diagnostic for acute transmural myocardial infarction (MI) related to acute occlusion of left anterior descending artery (LAD).

Case presentation: In this case report, a 54-year-old man was admitted to the emergency department (ED) due to chest pain. ST-depression with tall T waves in precordial leads was detected in surface electrocardiogram (ECG). Angiography showed acute total occlusion of proximal LAD and ad hoc percutaneous coronary intervention (PCI) was performed successfully.

Conclusion: This case highlights that total occlusion of LAD may present without typical ST-elevation pattern in ECG.

Keywords: Anterior Wall Myocardial Infarction; Case Reports; Electrocardiography

Cite this article as: Mehrpooya M, Salehi A, Sherafati A. Acute Thrombotic Occlusion of proximal Left Anterior Descending Artery without ST-elevation (de Winter sign) in Electrocardiogram: A Case Report. *Adv J Emerg Med.* 2020;4(4):e93.

INTRODUCTION

Electrocardiogram (ECG) changes suggestive of acute occlusion of a coronary artery necessitate the decision to perform reperfusion therapy immediately (1). In patients complaining of chest pain, obtaining an ECG is essential for initial evaluation and diagnosis. ST-elevation equal to or more than 1 millimeter in precordial leads usually represents acute occlusion of left anterior descending coronary artery (LAD) (2). In this case report, a patient with acute total occlusion of proximal LAD is presented without the classic ST-elevation in ECG.

CASE PRESENTATION

A 54-year-old man was admitted to the emergency department (ED) with chief complaint of severe chest pain. The pain was initiated in the morning and had lasted for more than 2 hours before presenting to the hospital. The pain was felt in left hemithorax with radiation to both arms. The quality of pain was pressure like and it worsened by activity. The pain was accompanied by diaphoresis but without dyspnea or nausea/vomiting. His past medical history and drug history were unremarkable. Although, he had a history of smoking for 20 years.

In physical examination, vital signs were stable.

Blood pressure was 110/70 mmHg, and heart rate was 75 bpm. Carotid pulses were normal. Jugular veins were not distended. In heart examination, point of maximal impulse (PMI) was palpated in the 5th left intercostal space, midclavicular line. In auscultation, S1 and S2 were heard without any murmur. Breathing sounds were normal with no rales or crackles in lung auscultation. No lower limb edema was detected. Distal pulses were symmetric and normal.

A 12-lead ECG was obtained within 10 minutes of patient's arrival to the hospital, which showed an upsloping ST-segment depression about 2mm in precordial leads along with tall, positive T waves. Also ST-segment elevation about 2 mm was seen in lead aVR (Figure 1). The patient was transferred to catheterization unit immediately. Coronary angiography revealed acute thrombotic occlusion of proximal LAD (Figure 2). Thrombus formation with complete disruption of LAD flow was detected. PCI for LAD with stent implantation (Xience 3*28) was performed, which was successful in restoration of blood flow (TIMI flow grade 3 was achieved) and patient's symptoms were improved (Figure 3). In the obtained ECG following PCI, ST-elevation in V1-V4 with T wave inversion and loss of R wave were detected, which

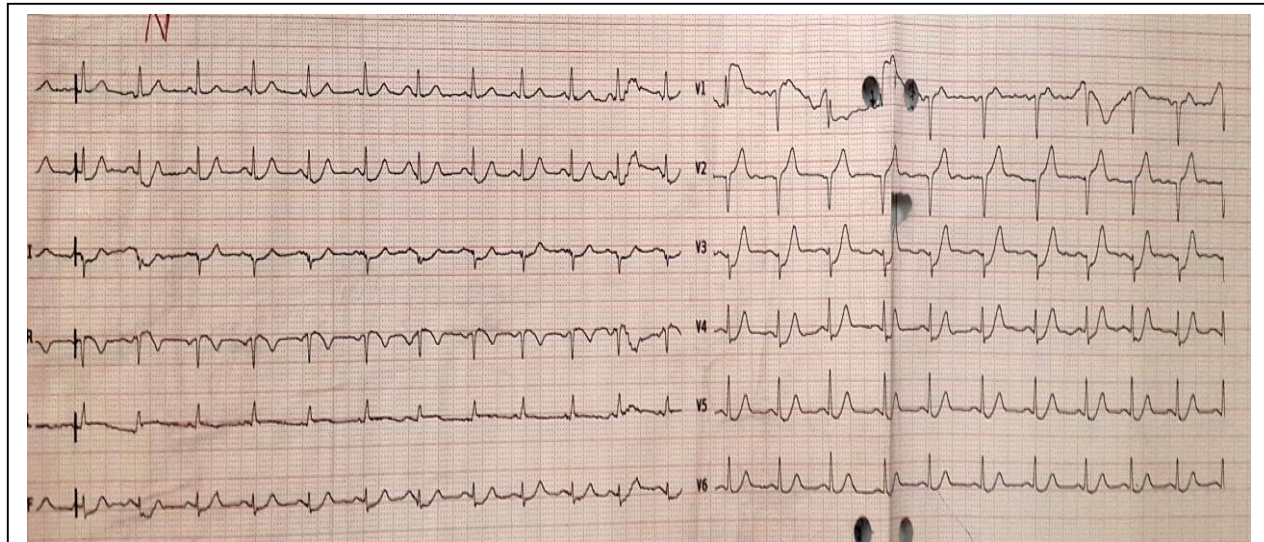


Figure 1: Admission ECG

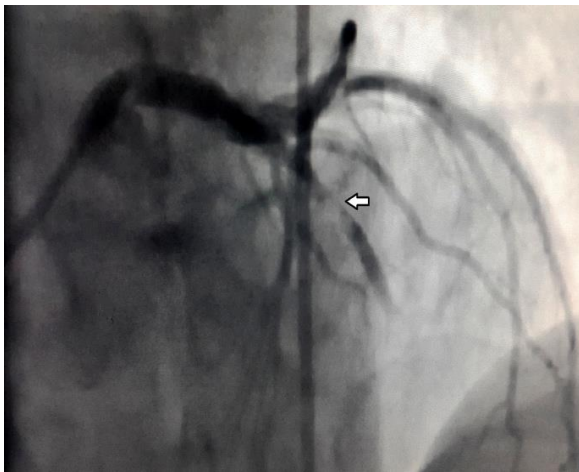


Figure 2: Proximal acute occlusion of LAD artery

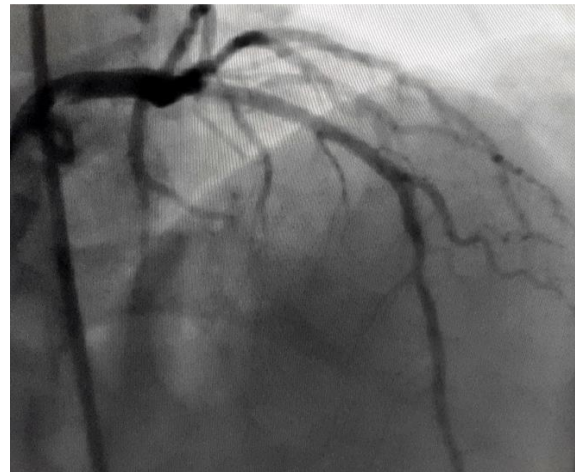


Figure 3: Post-PCI coronary angiography

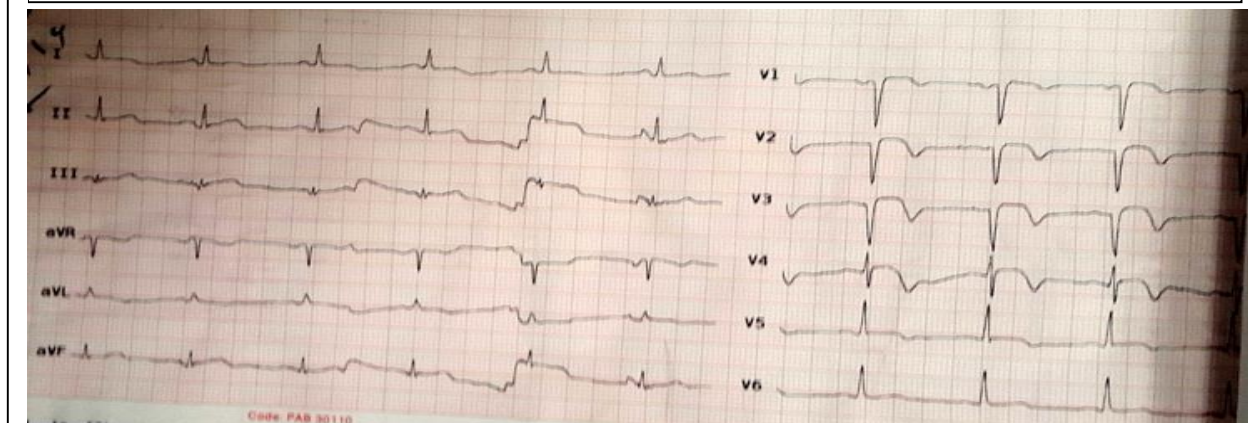


Figure 4: Post-PCI ECG

was identical to ECG changes of anterior ST-elevation myocardial infarction (STEMI) (Figure 4). The patient was transferred to coronary care unit (CCU). He remained asymptomatic with no complication and was discharged four days later.

DISCUSSION

Acute occlusion of the left anterior descending artery is usually accompanied by ST-segment elevation in precordial leads (3). In our patient, acute myocardial infarction caused by acute

occlusion of LAD was not with the usual pattern of ECG changes. Instead, in this case upsloping ST-segment depression was detected in the precordial leads. However, T waves were tall and positive in leads V2-V6 resembling hyperacute T waves, which are seen in the early phase of STEMI. These T waves were our clue for diagnosing acute MI and transferring the patient for immediate reperfusion. Another notable point in the initial ECG was ST-segment elevation in lead aVR, which can be seen in left main coronary artery or proximal LAD stenosis or occlusions.

In a survey, Robbert J. de Winter et al. (4) reported this specific ECG pattern in 30 of 1532 patients with acute MI (2%). Transient tall and peaked T waves were noted as representation of hyperacute manifestation of acute total occlusion of coronary artery followed by ST-segment elevation (5). But De Winter (4) recognized that in their survey, tall and peaked T waves in the precordial leads were persistent and unchanged from the time of the first ECG until the preprocedural ECG.

Lack of sarcolemmal ATP-sensitive potassium channel (K_{ATP}) activation was mentioned to explain lack of ST-elevation, which can happen due to the ischemic ATP depletion. This may result in ST-depression instead of elevation (6). An interesting point in our patient was appearance of ST-elevation following coronary artery reperfusion with T wave inversion, which can be seen in the evolution process of STEMI. The most probable explanation for appearance of ST-elevation in post PCI electrocardiogram,

considering the relief of patient's symptom, is akinesia of anterior wall following acute coronary artery occlusion. Microvascular involvement following distal embolization of ruptured plaque material is another explanation.

CONCLUSIONS

In conclusion, although the ECG pattern shown in this case is uncommon in a patient with acute total occlusion of the proximal LAD, it is of great importance for clinicians to be aware of this pattern. When a patient comes to the emergency department with chest pain, recognizing this pattern of ECG guides physicians to consider prompt mechanical reperfusion therapy and transferring the patient to catheterization unit.

ACKNOWLEDGEMENTS

None.

AUTHORS' CONTRIBUTION

All the authors fulfilled the criteria of authorship based on the recommendations of the International Committee of Medical Journal Editors (ICMJE).

CONFLICT OF INTEREST

None declared

FUNDING

None declared

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