

NSTEMI “But” STemi-De Winters Sign

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Authors' contributions

This work was carried out in collaboration between all authors. Author PKA designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author RR managed the literature searches, analyses of the study. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CA/2015/17599

Editor(s):

(1) Anonymous.

Reviewers:

(1) Alexander Berezin, Internal Medicine, Medical University, Zaporozhye, Ukraine.

(2) Pietro Scicchitano, Cardiology, University of Bari, Italy.

Complete Peer review History: <http://www.sciencedomain.org/review-history.php?iid=842&id=26&aid=9002>

Case Study

Received 19th March 2015

Accepted 2nd April 2015

Published 27th April 2015

ABSTRACT

Anterior ST elevation myocardial infarction can present with a specific electrocardiographic (ECG) pattern without ST segment elevations, known as De Winter sign. Recognizing this ECG pattern is important since it is considered an equivalent to ST elevation myocardial infarction (STEMI), hence may require thrombolysis when primary PCI facilities are not available or delayed. We report a 28 year old male who presented to us with de winters ecg pattern. Subsequent coronary angiogram showed Proximal left anterior descending (LAD) artery occlusion.

Keywords: De winters sign; proximal left anterior descending artery; STEMI; STEMI equivalent.

1. INTRODUCTION

De winters sign on ECG is a specific pattern equivalent of an anterior STEMI, but presents like an NSTEMI. Approximately 2% of such patients have proximal LAD occlusion. Like wellness pattern recognizing this sign is of

utmost importance since it should be managed like any STEMI.

2. CASE REPORT

A 28 year old male patient presented to our institute with typical angina since 2 hours

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duration. He had no significant past history of diabetes, hypertension, dyslipidemia nor any family history of coronary artery disease (CAD). The patient was a non smoker. Admission ECG [Figs. 1,2] showed up sloping ST depression with up Wright T waves in the anterior precordial leads, with 1mm ST elevation in lead aVR. Troponin T was within normal limits since the window period of presentation was early. His hemodynamics was stable. With a provisional diagnosis of acute coronary syndrome-Unstable

angina/NSTEMI he was taken for primary percutaneous coronary intervention (PCI) immediately. Coronary angiogram [Fig. 3] showed 95% thrombus filled lesion in the Proximal left anterior descending (LAD) artery. The patient underwent successful angioplasty [Fig.4] with a 4 x 25 mm second generation Drug eluting stent. Post procedure ecg showed a pattern of typical evolved anterior wall myocardial infarction [Fig. 5].

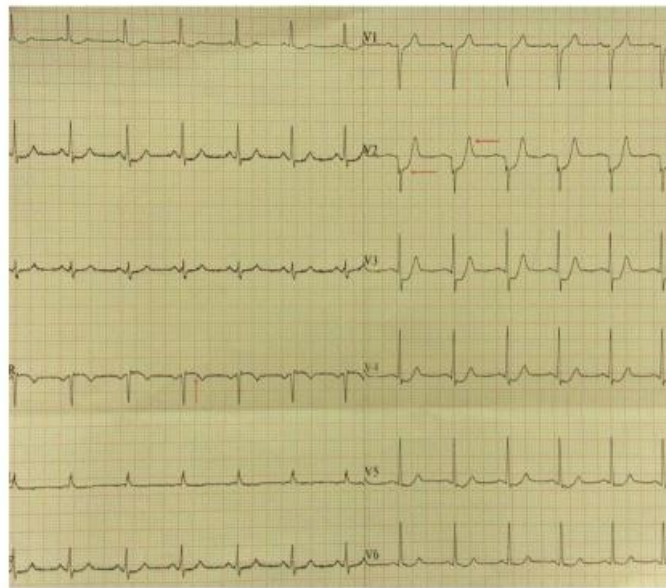


Fig. 1. ECG-upsloping ST depression with upwright T waves in the anterior precordial leads, with 1mm ST elevation in lead aVR

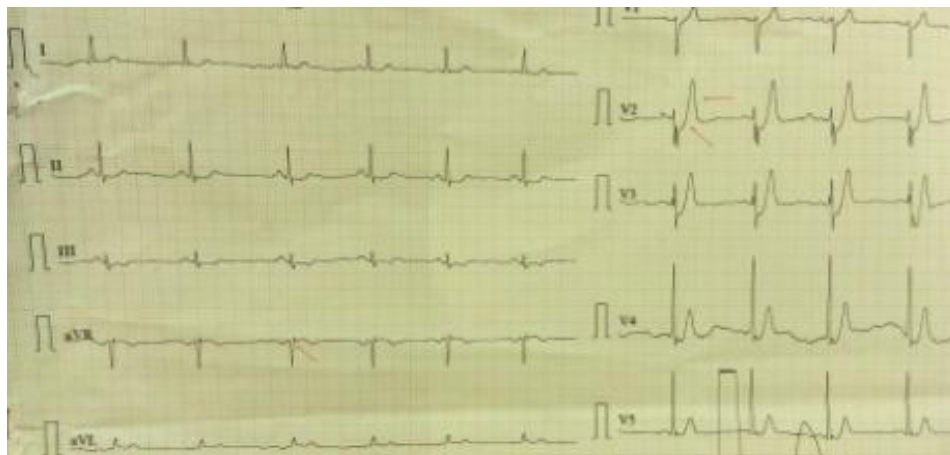


Fig. 2. Ecg 15 mins after admission showing classical de winters pattern

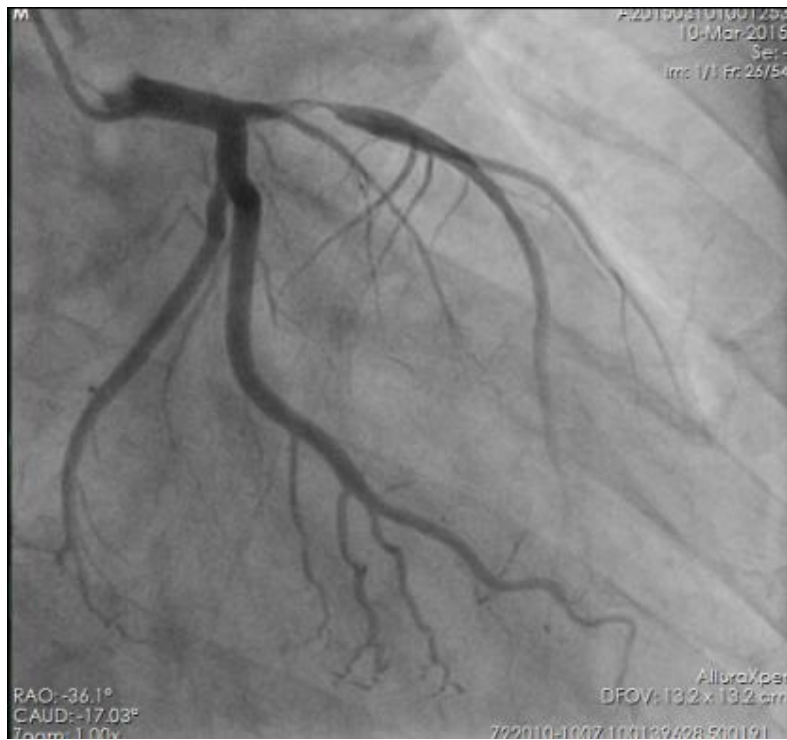


Fig. 3. Coronary angiogram showing proximal LAD lesion with thrombus



Fig. 4. Coronary angiogram post PTCA to LAD showing TIMI 3 flow

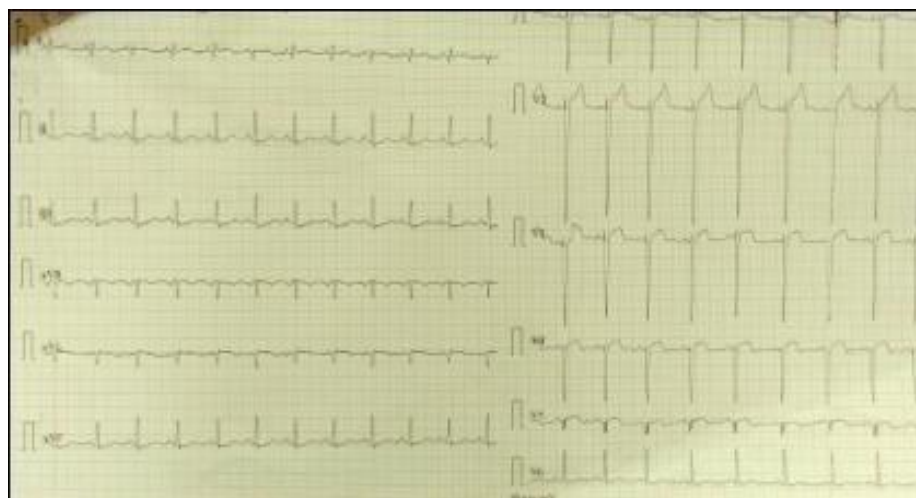


Fig. 5. Post PTCA ecg showing Evolved anterior wall MI changes

3. DISCUSSION

The de Winter ECG pattern is an equivalent of anterior STEMI. Recognizing it is clinically important since it presents without obvious ST segment elevation and may lead to under treatment [1]. ST depression and peaked T waves in the precordial leads is the usual presentation. Mechanism of these ecg changes that have been proposed are, theoretically, an anatomical variant of the Purkinje fibers, with endocardial conduction delay. Alternatively, the absence of ST elevation may be related to the lack of activation of sarcolemmal ATP sensitive potassium (KATP) channels by ischemic ATP depletion, as has been shown in KATP knockout animal models of acute ischemia [2]. This pattern is seen in ~2% of acute LAD occlusions. This was first reported by De Winter and Wellens, in 30 / 1532 patients with acute LAD occlusions [3]. Verouden et al. [4] also reported similar pattern in 35 / 1890 patients requiring PCI to the LAD. The profiles of such patients were usually younger males with a higher incidence of hypercholesterolemia compared to patients with a classic STEMI pattern. Knowledge about pattern of changes in an ECG that are associated with acute occlusion of a coronary artery helps us to plan an immediate invasive strategy [5-7]. De Winter ECG pattern is highly predictive of acute LAD occlusion. Some consider it a "STEMI equivalent" similar to wellens pattern, ST elevation in lead aVR [8]. Prompt recognition is a must and such patients should receive emergent reperfusion therapy with PCI or thrombolysis.

Diagnostic Criteria for De winters sign:-

- 1) Tall, prominent, symmetric T waves in the precordial leads
- 2) Upsloping ST segment depression >1 mm at the J-point in the precordial leads
- 3) Absence of ST elevation in the precordial leads
- 4) ST segment elevation (0.5 mm-1 mm) in aVR
- 5) Normal STEMI morphology may precede or follow the deWinter pattern

4. CONCLUSION

Knowledge about this specific ecg pattern is important for physicians since it may be mistaken for NSTEMI and treatment with thrombolysis would be delayed or missed.

CONSENT

Informed and written consent was taken from the patient regarding this case report.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Goebel M, Bledsoe J, Orford JL, Mattu A, Brady WJ. A new ST-segment elevation myocardial infarction equivalent pattern? Prominent T wave and J-point depression in the precordial leads associated with ST-segment elevation in lead aVr. *Am J Emerg Med.* 2014;32(3):287.
2. Li RA, Leppo M, Miki T, Seino S, Marban E. Molecular basis of electrocardiographic ST-segment elevation. *Circ Res.* 2000;87:837-9.
3. de Winter R, Verouden N, Wellens H, Wilde A. A new ECG sign of proximal LAD occlusion. *N Engl J Med.* 2008;359:2071-3.
4. Verouden NJ, Koch KT, Peters RJ, et al. Persistent precordial "hyperacute" T-waves signify proximal left anterior descending artery occlusion. *Heart.* 2009;95:1701-6.
5. Engelen DJ, Gorgels AP, Cheriex EC, et al. Value of the electrocardiogram in localizing the occlusion site in the left anterior descending coronary artery in acute anterior myocardial infarction. *J Am Coll Cardiol.* 1999;34:389-95.
6. Zimetbaum PJ, Josephson ME. Use of the electrocardiogram in acute myocardial infarction. *N Engl J Med.* 2003;348:933-40.
7. Wang K, Asinger RW, Marriott HJ. ST-segment elevation in conditions other than acute myocardial infarction. *N Engl J Med.* 2003;349:2128-35.
8. Yan AT, Yan RT, Kennelly BM, Anderson FA Jr, Budaj A, et al. Relationship of ST elevation in lead aVR with angiographic findings and outcome in non-ST elevation acute coronary syndromes. *Am Heart J.* 2007;154(1):71-8.

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