

CLINICAL VIGNETTE

DeWinter Sign: EKG Findings You Do Not Want to Miss

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Introduction

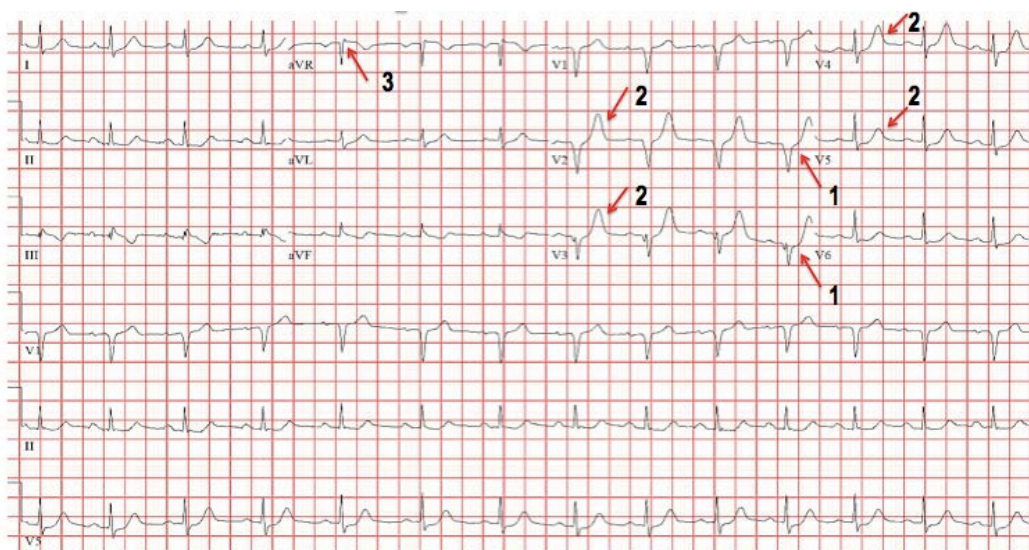
ST elevation Myocardial Infarction (STEMI) requires prompt recognition and urgent cardiac catheterization and potential percutaneous coronary intervention (PCI). This is the current standard of care, as early revascularization reduces myocardial damage and improves cardiac function. However, some patients who do not have STEMI changes on electrocardiogram (ECG) still require prompt cardiac catheterization.

DeWinter sign includes of specific ECG changes that are considered a STEMI equivalent. Recognizing these changes early with appropriate management can reduce cardiovascular morbidity and mortality.

Case

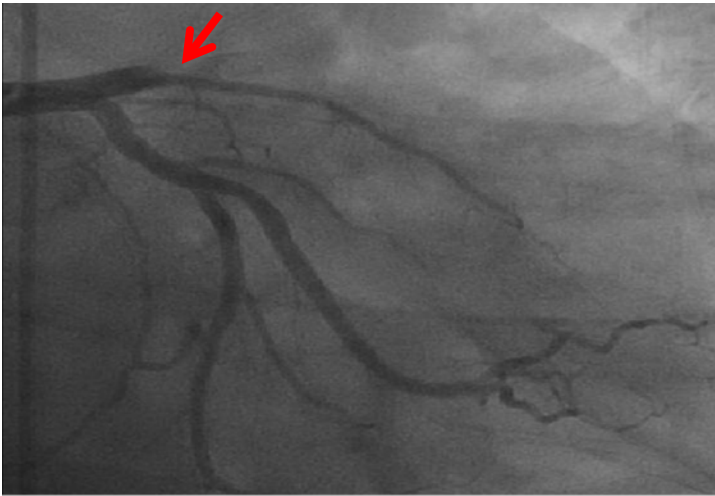
A 42-year-old African American male presented to the emergency room with two hours of left-sided chest pain with radiation down his ipsilateral arm. Past medical history was significant for non-ST elevation myocardial infarction (NSTEMI) six months prior with placement of one drug-eluting stent (DES) in the proximal LAD. Family history was negative for heart disease. He has been on dual antiplatelet therapy of Aspirin and Clopidogrel, but stopped taking clopidogrel three days prior to presentation. His admission vital signs were within normal limits and his physical exam was remarkable only for mild distress and diaphoresis.

EKG in the Emergency Room noted DeWinter Sign:



- Precordial (V1-V6) changes:
 - ST depressions at the J point with up-sloping ST segments (1)
 - Peaked T-Waves (2)
- $>0.5\text{mm}$ ST elevation in aVR (3)

Cardiac Catheterization revealing proximal LAD occlusion:



Hospital Course:

- Admission, complete blood count, basic metabolic panel, lipid panel, troponin, and CK-MB were unremarkable.
- Initial ECG was obtained (shown above) and serial ECGs were unchanged.
- He was given full dose Aspirin and sublingual nitroglycerin with resolution of chest pain.
- Troponins 8 hours later was elevated at 0.066. He also developed chest pain and was taken to the cath lab.
- Coronary angiogram revealed acute occlusion of the drug-eluting stent (DES) in the proximal LAD. He underwent thrombectomy and balloon angioplasty of the LAD with successful revascularization.
- Post-PCI ECG revealed normalization of ST/T wave changes and his chest pain resolved.

Discussion

- A single center study of 1890 patients who underwent emergent PCI for suspected anterior myocardial infarctions had retrospective ECG analysis which revealed 98% having classical ST elevations in the precordial leads, but 2% having DeWinter ST/T wave changes. These atypical ECG changes were static. Nearly all of these patients had angiographic evidence of acute proximal LAD occlusion.^{1,2}
- Patients with atypical ECG changes were younger and more frequent hypercholesterolemia compared to the group with typical ECG findings.^{1,2}
- Another case report observed these ECG findings in an asymptomatic patient who was conservatively managed until development of frank ST elevation 1 day later. Subsequent cardiac cath revealed acute proximal LAD occlusion.³

Conclusion

- These ECG findings may be interpreted as reversible ischemia which could delay time to reperfusion therapy.
- Currently, it is unclear if these ECG changes are truly static or may progress to overt ST segment elevations.
- However, DeWinter sign on ECG should be considered a STEMI equivalent since reports shows both share angiographic evidence of acute proximal LAD occlusion.

REFERENCES

1. **Verouden NJ, Koch KT, Peters RJ, Henriques JP, Baan J, van der Schaaf RJ, Vis MM, Tijssen JG, Piek JJ, Wellens HJ, Wilde AA, de Winter RJ.** Persistent precordial "hyperacute" T-waves signify proximal left anterior descending artery occlusion. *Heart*. 2009 Oct;95(20):1701-6. doi: 10.1136/hrt.2009.174557. Epub 2009 Jul 19. PMID: 19620137.
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3. **Samadov F, Akaslan D, Cincin A, Tigen K, Sari I.** Acute proximal left anterior descending artery occlusion with de Winter sign. *Am J Emerg Med*. 2014 Jan;32(1):110.e1-3. doi: 10.1016/j.ajem.2013.08.024. Epub 2013 Sep 17. PMID: 24051010.