# Mini-Wellen's EKG (minimal terminal T wave inversion in V2-V3) is highly predictive of high grade left main or proximal left anterior artery disease

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### Abstract

Classic Wellen's syndrome or by some authors described as inverted U waves is consistent of biphasic terminal T waves inversion usually seen in V2 and V3 leads highly predictive of high grade left main (LM) or proximal left anterior ascending artery (LAD) disease. In this case, we are reporting a case of minimal terminal T wave changes not large enough to qualify as Wellen's EKG but similar to classic Wellen was associated with high grade LM and LAD disease despite negative troponins.

# Title: Mini-Wellen's EKG (minimal terminal T wave inversion in V2-V3) is highly predictive of high grade left main or proximal left anterior artery disease

Short title: Prognostic of minimal Wellen like EKG changes

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# Abstract:

Classic Wellen's syndrome or by some authors described as inverted U waves is consistent of biphasic terminal T waves inversion usually seen in V2 and V3 leads highly predictive of high grade left main (LM) or proximal left anterior ascending artery (LAD) disease. In this case, we are reporting a case of minimal terminal T

wave changes not large enough to qualify as Wellen's EKG but similar to classic Wellen was associated with high grade LM and LAD disease despite negative troponins.

### Case presentation:

The patient was a 57 year old male with a history of diabetes mellitus, hypertension, and recent cholecystectomy presented to the emergency room with diarrhea, upper abdominal pain, and lower chest pressure only when he took a deep breath. His inspiratory chest pain was persistent during his hospital admission. His high sensitive 5 serial troponin levels were within normal limits. His EKG was unremarkable except for minimal terminal T wave inversion in V2 and V3 (figure 1). The patient underwent upper endoscopy and was found to have Barrett's esophagus. He was started on proton inhibitor therapy and was discharged. A few days later, he presented again to the emergency department with similar chest pain but now more prominent in his lower chest area. EKG showed a similar finding with minimal terminal T waves inversion in V2-V3 but his troponin levels were significantly elevated at 322 with a raise to 822ng/L (Figure 2). He underwent coronary angiography showing 80% distal left main (LM) and 90% proximal left anterior descending (LAD) artery disease (Figure 3). His cardiac function was normal. He underwent successful coronary bypass surgery.

# **Discussion:**

Dr. Gerson et al. in 1979 described first time terminally inverted T waves as inverted U waves syndrome consistent with proximal left anterior descending artery disease (1) He initially reported this EKG pattern during exercise (1). A year later, Gerson et al. again described the same finding at rest consistent with LAD ischemia. (2) De Zwaan and Wellen et al. two years after Dr. Gerson's last publication in 1982, published the same EKG pattern (3-4) at high risk for anterior myocardial infarction. This pattern has been now confirmed and recognized by many authors as a warning sign of LM or proximal LAD disease. (5-7)

Reviewing original EKGs by Dr. Gerson and Wellens, a terminally inverted T wave is clearly illustrated. In our case, we are reporting the first case of very subtle EKG changes in the setting of high-grade LM and LAD disease. The EKG changes were so subtle that were described as normal. There is only one another reported case describing mini-Wellen' EKG similar to our case. (8) Another case describes initial mini-Wellen's EKG followed by classic Wellen's EKG. (9) Recognition of this very subtle minimal inverted terminal T wave changes described in this manuscript as "mini Wellen' EKG" is important in order to prevent missing serious high-risk coronary disease involving LM or proximal LAD similar to definite Wellen's EKG. On the other hand, other causes of so called "Pseudo-Wellens syndrome" needs in differential diagnosis such as sepsis or pancreatitis. (10,11)

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Figure 1: Arrows are showing mini Wellen's EKG seen during first admission



Figure 2: Arrows are showing mini Wellen's EKG seen during second admission



Figure 3: Coronary angiogram showing high grades left main and prox left anterior descending artery disease

