

CASE REPORT

Wellens' Syndrome Depicted by Coronary CT Angiography

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ABSTRACT

Introduction: Wellens' Syndrome is indicated by deeply inverted or biphasic T-waves in V2-V3 precordial leads without ST elevation or pathological Q waves, immediately following an episode of angina pectoris. Case presentation: A case of Wellens' syndrome depicted by coronary CT angiography (CTA) and invasive coronary angiography is reported. Conclusion: Recognition of these ECG changes is important, due to the imminent danger of acute LAD occlusion. Patients with Wellens' syndrome should undergo invasive coronary angiography without delay. Ischemia provocation tests (i.e. treadmill) are contraindicated in these patients.

Keywords: coronary CTA, invasive angiography, Wellens' syndrome, critical LAD occlusion

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INTRODUCTION

A 72-year-old man was scheduled for coronary CT angiography (CTA) following atypical chest pain. His medical anamnesis was unremarkable except for treatment of hypertension over the last 15 years. Immediately prior to the CT examination, he complained of the recurrence of chest discomfort. Elevated blood pressure of 160/95 mmHg was measured, and a 12-lead ECG was performed that showed biphasic T-waves in V2-V3 and T-wave inversion in V4-V5 (Figure 1). His chest pain resolved on the administration of 0.8 mg sublingual nitroglycerine with normalization of blood pressure.

The coronary CTA showed an occluded proximal left anterior descending artery with signs of acute plaque rupture and thrombus formation. A weak contrast enhancement was observed in the distal part of the vessel. A partially calcified plaque was visualized in the proximal part of the obtuse marginal branch with moderate luminal narrowing and high-risk features (low attenuation, positive remodeling).¹ The right coronary artery showed only mild atherosclerotic plaques (Figure 2).

The patient underwent urgent invasive coronary angiography, which confirmed the acute thrombotic occlusion of the left anterior descending (LAD) artery (Figure 2,

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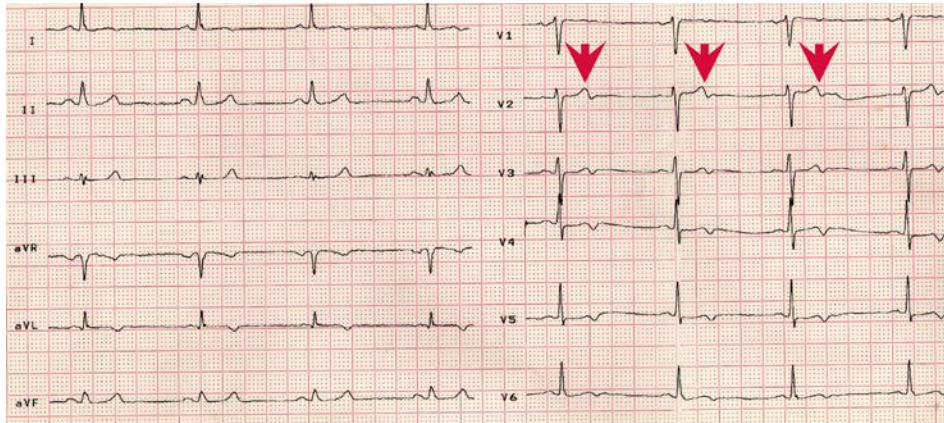


FIGURE 1. 12-lead ECG on arrival. Red arrowheads indicate biphasic T-waves, which are characteristic for Wellens' syndrome.

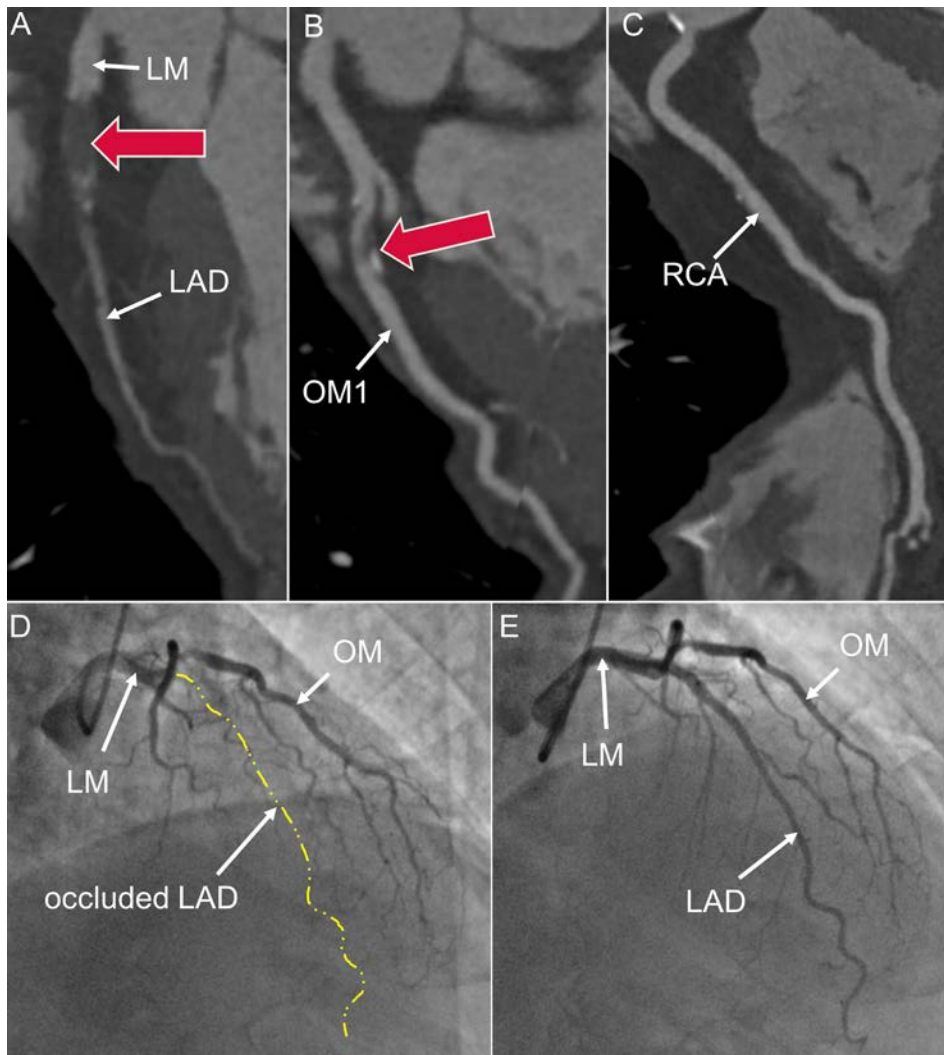


FIGURE 2. **A, B, C** – coronary CTA images with multiplanar reconstruction. Panel **A** shows the occluded LAD and the red arrow indicates the site of coronary plaque rupture. A myocardial bridge can be appreciated in the distal LAD. Panel **B** illustrates the OM1 branch with a high risk plaque (positive remodeling, low attenuation). Panel **C** show the RCA, which has minimal coronary atherosclerosis. Panels **D** and **E** panels show invasive coronary angiography snapshots before and after the stent implantation.

Video 1 and 2). Percutaneous coronary intervention was performed with the implantation of a drug-eluting-stent. Post-procedural blood tests showed an elevated cardiac troponin level (TnT 332 ng/L) that confirmed the diagnosis of an acute myocardial infarction.

The patient agreed to the publication of his data, and the institution where the patient had been admitted approved the publication of the case.

DISCUSSION

Deeply inverted or biphasic T-waves in V2-V3 precordial leads without ST elevation or pathological Q waves, immediately following an episode of angina pectoris, are indicative for Wellens' syndrome.^{2,3} These ECG changes persist after the resolution of the angina and are signs of proximal LAD critical stenosis. Recognition of these ECG changes is important due to the imminent danger of acute LAD occlusion.⁴ Cardiac enzymes are not informative in these patients and should not guide therapeutic decisions, as cardiac necrosis enzymes are not necessarily elevated.⁵ Therefore, patients with Wellens' syndrome should undergo invasive coronary angiography without delay. Ischemia provocation tests (i.e. treadmill) are contraindicated in this patient population.

Coronary CTA is a uniquely suited noninvasive imaging modality that is able to visualize coronary atherosclerotic plaques, not just the coronary lumen.⁶ Considering its high sensitivity and high negative predictive value, coronary CTA has a major role in ruling out coronary artery disease. The use of coronary CTA can also be beneficial in

patients with acute chest pain, helping clinicians to make a safe, rapid and cost-effective triage of these patients.

CONFLICT OF INTEREST

Nothing to declare.

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