
Critical Myocardial Ischemia: Minor Electrocardiograph Changes – Wellens' Syndrome

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Early and prompt evaluation and treatment of myocardial ischemia is essential. The 2000 American College of Cardiology/American Heart Association guidelines for the management of patients with unstable angina, when referring to the electrocardiogram for risk stratification, mention T wave inversions greater than 0.2 mV as indicators of ischemia [1]. Other changes in T waves may therefore be interpreted by some as “non-specific T wave changes.” As shown in the present case report, they may sometimes also represent a large area of myocardium at risk.

Patient Description

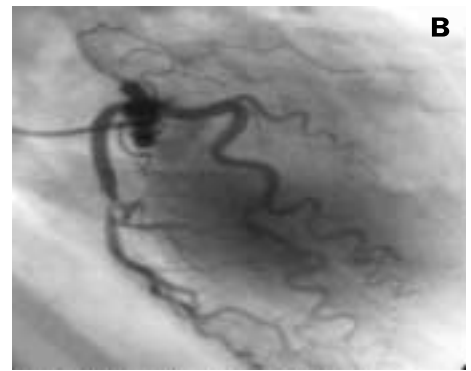
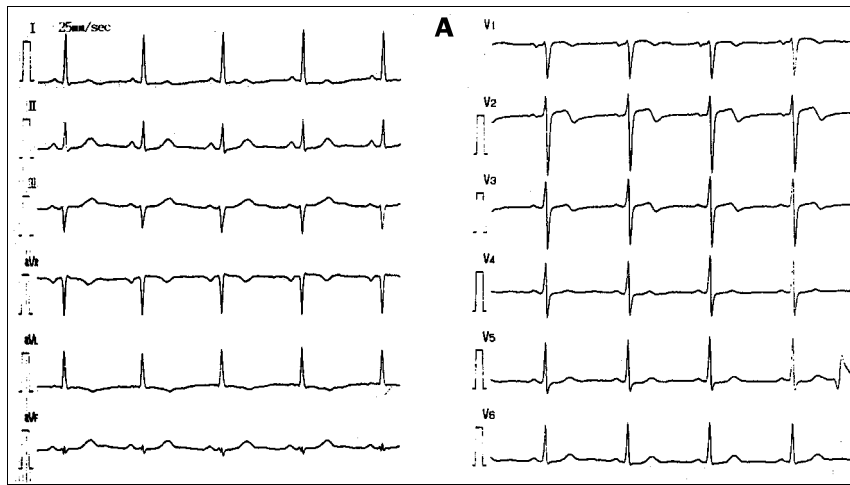
A 54 year old woman with a past history of

hyperlipidemia (treated with lovastatin 20 mg 4 times a day) was admitted because of new onset of typical anginal pain on mild effort. Physical examination on admission and the ECG were normal. Cardiac enzymes were not elevated. The day after admission the patient was asymptomatic but an ECG showed biphasic T waves in V1 to V3 [Figure A]. Coronary angiography on the following day revealed a 95% stenosis of the left anterior descending artery. Percutaneous angioplasty and stenting were performed [Figure B], and the patient was discharged 3 days later and remains asymptomatic

ECG = electrocardiogram

Comment

In 1982, Wellens and colleagues [2] described two electrocardiographic patterns that were predictive of critical narrowing of the proximal left anterior descending artery, and were subsequently termed Wellens' syndrome. The criteria were: a) prior history of chest pain, b) little or no cardiac enzyme elevation, c) no pathologic precordial ST segment elevation, d) no loss of precordial R waves, and e) biphasic T waves in leads V2 and V3, or asymmetric, often deeply inverted T waves in leads V2 and V3. In the original report of 145 patients admitted for unstable angina, this pattern occurred in 18% (half on presentation and half after 24 hours), and in a later study



[A], ECG 24 hours after admission with biphasic T waves in V1 to V3. **[B]**. Coronary angiogram showing 95% stenosis of the left anterior descending coronary artery.

occurred in 15% [3]. Seventy-five percent of the patients went on to develop anterior myocardial infarction within a few days despite clinical improvement. A study from another group showed similar results [4].

While the variant with the deeply biphasic T waves, which occurs in 76% of patients, is well recognized and will usually prompt aggressive therapy, the variant with inverted T waves may be overlooked as “non-specific T wave changes,” as described in the 2000 ACC/AHA guidelines for the management of patients with unstable angina [1]. Failure to recognize this pattern may have untoward sequelae, as described in a case report in which a patient with chest pain and biphasic T waves in leads V2 and V3 was referred for

exercise, during which he developed an anterior myocardial infarction and ventricular tachycardia and subsequently died. Autopsy showed 90–95% narrowing of the proximal left anterior descending artery [5].

Thus, patients with Wellens’ syndrome have an increased risk for anterior myocardial infarction and may require early invasive investigation. Recognition of the subtle pattern type in Wellens’ syndrome by physicians involved in the initial care of a patient with anginal syndrome is therefore crucial.

References

1. Braunwald E, Antman EM, Beasley JW, et al. ACC/AHA guidelines for the management of patients with unstable angina and non ST segment elevation myocardial infarction. *J Am Coll Cardiol* 2000;36:970–1062.
2. de Zwann C, Bar FW, Wellens HJJ. Characteristic electrocardiographic pattern in-

dicating a critical stenosis high in left anterior descending coronary artery in patients admitted because of impending myocardial infarction. *Am Heart J* 1982;103:730–6.

3. de Zwann C, Bar FW, Janssen HJ, et al. Angiographic and clinical characteristics of patients with unstable angina showing an ECG pattern indicating proximal narrowing of the proximal LAD coronary artery. *Am Heart J* 1989;117:657–65.
4. Haines DE, Raabes DS, Gundel WD, Wackers FJT. Anatomic and prognostic significance of new T wave inversion in unstable angina. *Am J Cardiol* 1983;52:14–18.
5. Tandy TK, Bottomy DP, Lewis JG. Wellens’ syndrome. *Ann Emerg Med* 1999;33:347–51.

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ACC = American College of Cardiology
AHA = American Heart Association

*None will improve your lot
If you yourself do not*

Bertholt Brecht, 20th century German dramatist and poet

Capsule



Keryx files for Phase III Kidney Disorder Trial

Keryx has filed a protocol for its Phase III clinical trials to advance KRX-101, otherwise known as sulodexide, a novel treatment for diabetic nephropathy. The trials will be predominantly U.S.-based, a requirement stipulated by the FDA. The drugs currently used to treat the disease are primarily from the family of

angiotensin receptor blockers, but their success is variable. Based on Keryx’s Phase II study with 223 patients, sulodexide may be more effective in combating this life-threatening condition.

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