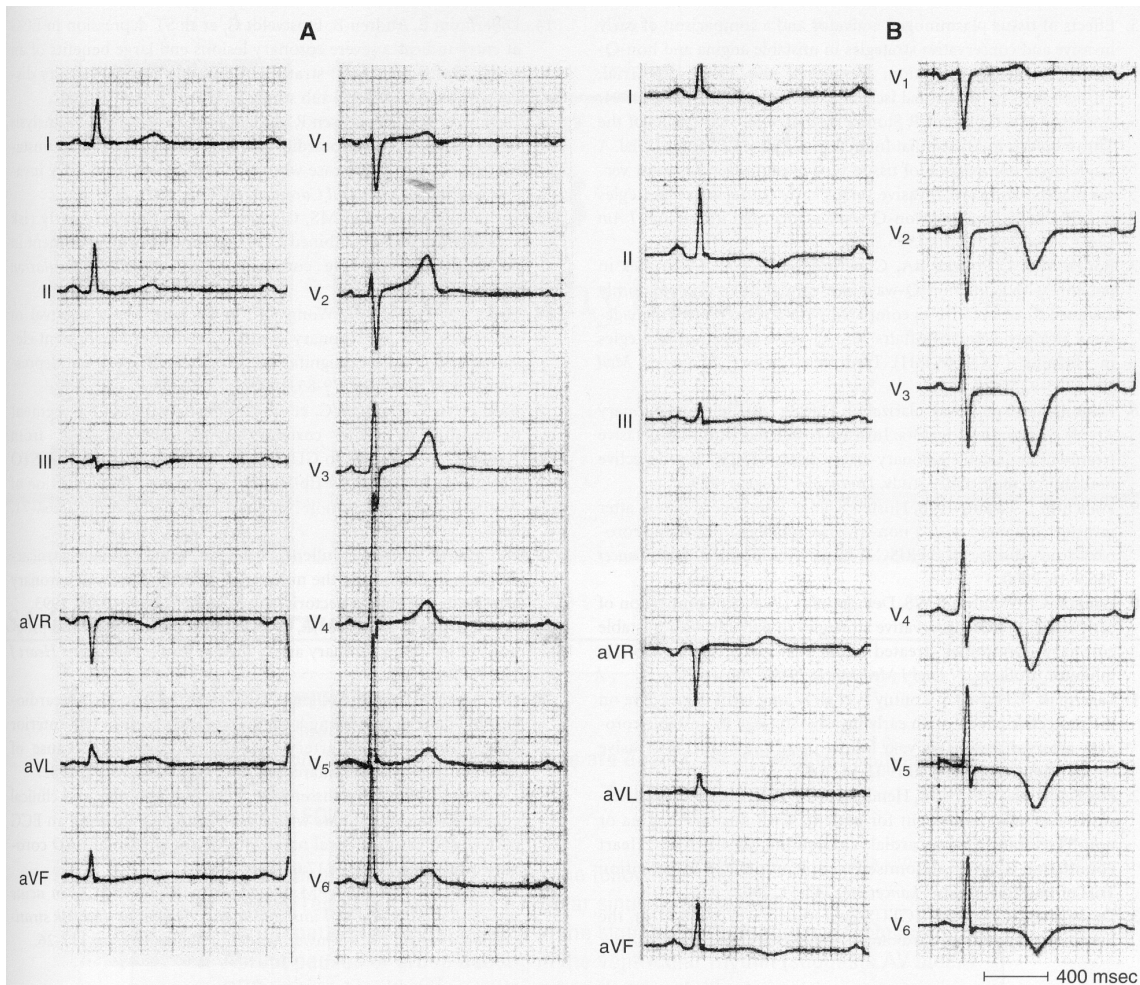


# WELLENS SYNDROME—ECG RECOGNITION OF CRITICAL PROXIMAL LAD STENOSIS (Physicians and Critical Care RNs)

Mary Boudreau Conover



**Figure 2-4** ECG changes reflecting critical proximal LAD stenosis. ECG when the patient is admitted for anginal pain (A). Only slight negativity is present at the end of the T waves in leads V<sub>1</sub> to V<sub>3</sub>. Twelve hours later (B), when the pain subsided, the ST segment shows symmetrical deep T-wave inversion in leads V<sub>2</sub> to V<sub>6</sub>.

(Illustration from Wellens HJJ, Conover MB: *The ECG in Emergency Decision Making*, 2nd ed, Saunders Elsevier, 2006, p. 57.)

Wellens syndrome is recognized **during a pain-free period** by the following signs:

- Prior angina
- Progressive, deep, symmetrical T wave inversion in V<sub>2</sub> and V<sub>3</sub>
- Little or no troponin elevation
- Little or no ST elevation
- No loss of R wave progression

The ECGs are from a patient admitted because of angina. There is a slight negativity at the end of the T wave in leads V<sub>2</sub> and V<sub>3</sub> in the admission ECG, shown in A. Twelve hours later (B) when the patient is without pain, the T waves are deep and symmetrical in leads V<sub>2</sub> to V<sub>6</sub>, reflecting critical proximal LAD stenosis.

In the 1980's the Wellens group in Maastricht, The Netherlands, described in lectures and publications the ECG criteria by which critical stenosis high in the left anterior descending (LAD) coronary artery could be diagnosed from specific ST-T wave changes in V<sub>2</sub> and V<sub>3</sub> during the *pain-free period* in a patient with unstable angina. The symmetrical T wave inversion in at least V<sub>2</sub> and V<sub>3</sub> reflects reperfusion of the anterior wall in the presence of a severe lesion of the LAD. Emergency intervention prevents the development of extensive anterior wall myocardial infarction. In view of the large area of ventricle at risk, the recognition of this ECG pattern is of critical importance.

## REFERENCES

Wellens HJJ: **Characteristic electrocardiographic pattern indicating a critical stenosis high in left anterior descending coronary artery in patients admitted because of impending myocardial infarction.** Paper presented at the Symposium on New Strategies in the Management of Ischemic Heart Disease, Scottsdale, Az, Jan 24-26, 1981.

Conover M: **Understanding Electrocardiography, 8th ed.** Mosby, St. Louis.

Wellens HJJ, Conover MB: **The ECG in Emergency Decision Making,** 2nd Ed, 2006, Saunders Elsevier.

de Zwaan C, Bar RWHM, Wellens HJJ: **Characteristic electrocardiographic pattern indicating a critical stenosis high in left anterior descending coronary artery in patients admitted because of impending myocardial infarction,** *Amer Heart J* 105:730, 1982.

Wellens HJJ: **The electrocardiogram 80 years after Einthoven.** The bishop Lecture, Presented at the annual meeting of the American College of Cardiology, Anaheim, Ca, March 1985.

de Zwaan C, Bär FW, Janssen JH, Cheriex EC, Dassen WR, Brugada P, Penn OC, Wellens HJJ: **Angiographic and clinical characteristics of patients with unstable angina showing an ECG pattern indicating critical narrowing of the proximal LAD coronary artery.** *Am Heart J.* 1989 Mar;117(3):657-65.

mc: 05/19/2009; revised 06/06/2010