



Images in Clinical Medicine

Type B Wellens' syndrome: Electrocardiogram patterns that clinicians should be aware of

Yin-Chou Hsu, Chih-Wei Hsu, Tien-Chang Chen*

Department of Emergency Medicine, E-Da Hospital, I-Shou University, Kaohsiung, Taiwan

Received : 24-08-2016

Revised : 08-12-2016

Accepted : 02-01-2017

Electrocardiogram (ECG) interpretation in diagnosing acute coronary syndrome is critical for emergency physicians when evaluating patients with acute chest pain. The distinct ECG patterns of Wellens' syndrome, indicating myocardial ischemic disease caused by critical proximal left anterior descending (LAD) stenosis, could be overlooked due to the absence of the typical ST segment elevation of ST-segment elevation myocardial infarction. Here, we show a typical ECG in a 71-year-old male with Wellens' syndrome with proven occlusion of the LAD artery. The patient received percutaneous coronary intervention with bare-metal stent placement and was discharged in good condition.

A 71-year-old male with a history of hypertension, diabetes mellitus, and chronic kidney disease was sent to the emergency department with intermittent 5-min chest pain for 2 days. His chest pain was relieved by rest, precipitated by exertion, and associated with cold sweats. Physical examination showed no remarkable findings. The initial 12-lead ECG revealed biphasic T-waves in leads V2 and V3 [Figure 1a]. The patient became completely pain free after the administration of supplemental oxygen and sublingual nitroglycerin. A follow-up ECG 30 min later [Figure 1b] revealed normal sinus rhythm without ST-T segment abnormality. Laboratory tests revealed a troponin I level of 0.029 ng/mL (normal reference level <0.026 ng/mL). Eighteen hours after admission, cardiac catheterization demonstrated 95% stenosis of the proximal LAD artery [Figure 1c]. Subsequently, he received urgent percutaneous coronary intervention with bare-metal stent placement [Figure 1d] and was discharged 4 days after this admission in good condition. Wellens' syndrome, first described by Wellens' group, is characterized by ST-T segment abnormality in the precordial leads on an ECG acquired from patients during a pain-free period [1,2]. According to the Wellens' study, 75%–100% of patients who have these ECG characteristics have significant LAD stenosis and develop further extensive anterior wall infarction within weeks [1]. There are two ECG patterns in Wellens' syndrome: Type A is characterized by deeply symmetrical T-wave inversions in leads V2 and V3, often including leads V1 and V4 and occasionally leads V5 and V6; type B is characterized by biphasic T-waves in leads V2 and V3. The positive predictive value of Wellens' sign is approximately 86% [3]. The differential diagnosis in patients with similar ECG changes

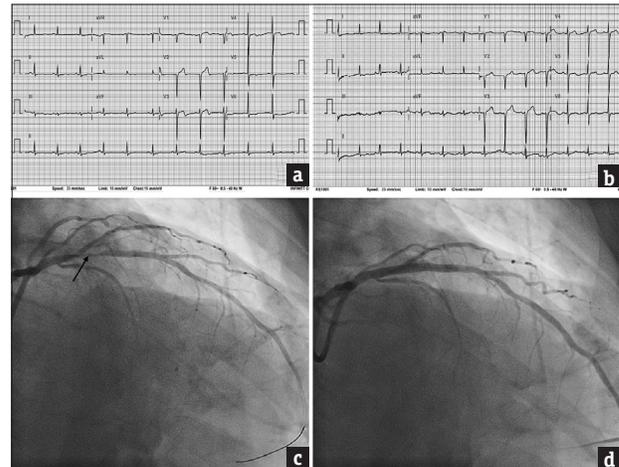


Figure 1: (a) Initial 12-lead electrocardiogram revealing biphasic T-waves in leads V2 and V3. (b) Follow-up electrocardiogram record 30 min later revealing normal sinus rhythm without ST-T segment abnormality. (c) Cardiac catheterization demonstrating 95% stenosis of the proximal left anterior descending artery (arrow). (d) A bare-metal stent was placed successfully with improvement of the left anterior descending artery stenosis

includes myopericarditis, Wolf–Parkinson–White syndrome, digitalis effect, and pulmonary embolic disease [4].

In clinical practice, stress testing might be performed due to lack of typical ST segment elevation in Wellens' syndrome to obtain more evidence of cardiac ischemia. However, increasing cardiac demand during stress testing may result in acute myocardial infarction, and even fatal dysrhythmia and death [5]. Therefore, it is essential to consider the coronary angiogram as the initial diagnostic modality instead of other conservative examinations in patients with ECG patterns, indicating a possibility of Wellens' syndrome.

Declaration of patient consent

The authors certify that they have obtained appropriate patient consent form. In the form the patient has given his

*Address for correspondence:

Dr. Tien-Chang Chen,
Department of Emergency Medicine, E-Da Hospital,
Yida Road, Jiao-Su Village, Yan-Chao District, Kaohsiung, Taiwan.
E-mail: skylong.chen@gmail.com

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How to cite this article: Hsu YC, Hsu CW, Chen TC. Type B Wellens' syndrome: Electrocardiogram patterns that clinicians should be aware of. Tzu Chi Med J 2017;29(2):127-128.

Access this article online	
Quick Response Code: 	Website: www.tcmjmed.com DOI: 10.4103/tcmj.tcmj_26_17

consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initial will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. de Zwaan C, Bär FW, Wellens HJ. Characteristic electrocardiographic pattern indicating a critical stenosis high in left anterior descending coronary artery in patients admitted because of impending myocardial infarction. *Am Heart J* 1982;103(4 Pt 2):730-6.
2. de Zwaan C, Bär FW, Janssen JH, Cheriex EC, Dassen WR, Brugada P, et al. 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;117:657-65.
3. Win Htut Oo SZ, Khalighi K, Kodali A, May C, Aung TT, Snyder R. Omnious T-wave inversions: Wellens' syndrome revisited. *J Community Hosp Intern Med Perspect* 2016;6:32011.
4. Rhinehardt J, Brady WJ, Perron AD, Mattu A. Electrocardiographic manifestations of Wellens' syndrome. *Am J Emerg Med* 2002;20:638-43.
5. Tandy TK, Bottomy DP, Lewis JG. Wellens' syndrome. *Ann Emerg Med* 1999;33:347-51.