



# A Special Case of Wellens Syndrome (With Significant Increase of Myocardial Enzyme Markers)

Zhang W\*, Dong B, Wei J and Mu Q

Department of Cardiology, Binzhou Medical University Hospital, China

## Abstract

Wellens syndrome, also known as left anterior descending coronary T wave syndrome, is an Electrocardiogram (ECG) pattern that indicates severe proximal stenosis of the left anterior descending coronary artery. It is characterized by intermittent chest pain with typical ECG changes. The chest leads of patients with unstable angina pectoris showed deep inverted T wave or biphasic T wave. This characteristic ECG pattern is a sign of impending myocardial infarction. Cardiac biomarkers are within the normal range, or only slightly elevated in this case. This case will introduce a special case of Wellens syndrome, which has typical ECG findings, and the coronary angiography results show that 95% of the Left Anterior Descending branch (LAD) is stenotic, and the myocardial enzyme markers are significantly elevated at admission. It can be said that it has met the diagnostic criteria for non-ST segment elevation myocardial infarction.

**Keywords:** Wellens syndrome; NATE-ACS; Myocardial infarction

## Introduction

Wellens syndrome describes an abnormal T wave in leads V2 and V3 associated with Left Anterior Descending branch (LAD) stenosis. Among these findings, about 75% of patients have deep inverted T waves, and about 25% of patients show different forms of biphasic T waves in similar leads [1]. Also known as lad T wave syndrome [2]. T wave abnormalities are also common in V1 and V4, and in rare cases in V5 and V6.

It is very important to diagnose and manage Wellen's syndrome at its first appearance to prevent adverse clinical outcomes. Here, we report a case of a 42-year-old middle-aged man who was treated for "repeated chest pain for one year". Although he had no obvious symptoms of chest pain at the time of treatment, the clinician immediately performed emergency coronary angiography on him due to his typical ECG performance after full communication with the patient and his family members. It was found that there was severe stenosis in the anterior descending branch (95%) and a stent was implanted. The patient recovered well after operation.

## Case Presentation

The patient, a 42-year-old male, developed chest pain, chest tightness and upper limb radiation pain at rest one year ago. He said that he could relieve the symptoms after taking ibuprofen. He developed the above symptoms 17 h ago and relieved after taking ibuprofen again. He came to our hospital for further diagnosis and treatment. No previous history of hypertension and diabetes, smoking preference and no smoking cessation. After the patient was admitted to the hospital, the ECG examination showed that the T wave of lead V2-V3 was positive and negative (Figure 1). In combination with the patient's medical history, the patient and his family members agreed to undergo coronary intervention and signed the informed consent after the patient and his family members explained their condition and risk. The coronary angiography results of the patient after admission: Calcification shadow can be seen in the left coronary artery shaped area, the coronary artery blood supply is right dominant, LM is normal, 95% of the proximal and middle lad is in stage stenosis, 60% of the D1 opening is in localized stenosis, and the forward flow TIMI is grade 3. No stenosis is found in LCX, and the forward flow TIMI is grade 3 (Figure 2). The wall of the proximal and middle segment of RCA is irregular, with 20% to 30% diffuse stenosis, and the forward flow TIMI is grade 3. During the operation, it was decided to intervene the lesion in the proximal and middle segment of lad, and a stent was implanted in the lesion. The angiographic appearance after stent implantation (Figure 3). The results of urgent blood examination (Figure 4) showed that: CTNI: 3.91 ng/ml, CK-MBm: 16.1 mmol/ml, CK: 195.5 u/l (Figure 4). After operation, the vital

## OPEN ACCESS

### \*Correspondence:

Weiwei Zhang, Department of Cardiology, Binzhou Medical University Hospital, No. 661 Huanghe 2<sup>nd</sup> Road, Binzhou City, Shandong 256603, China, Tel: 8605433256597;

E-mail: zww20040823@163.com

Received Date: 12 Oct 2022

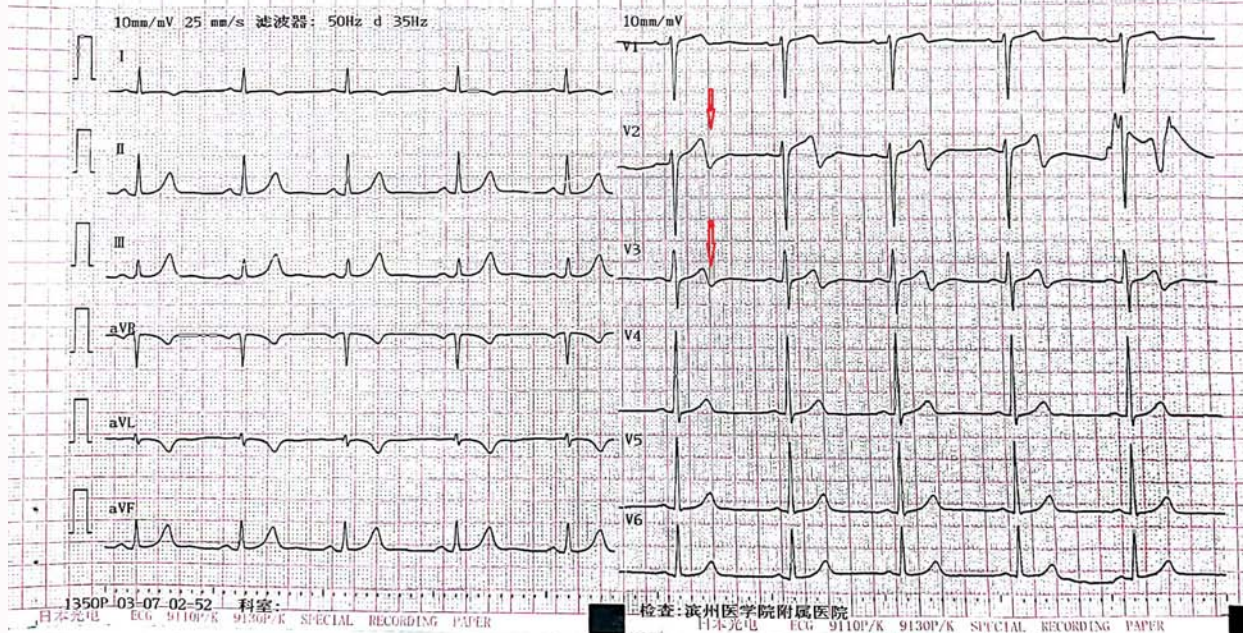
Accepted Date: 31 Oct 2022

Published Date: 04 Nov 2022

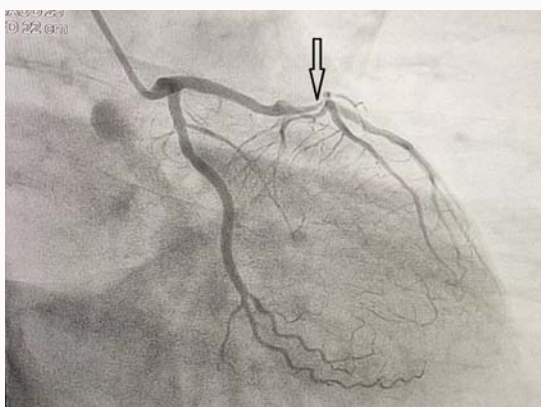
### Citation:

Zhang W, Dong B, Wei J, Mu Q. A Special Case of Wellens Syndrome (With Significant Increase of Myocardial Enzyme Markers). *Ann Med Medical Res.* 2022; 5: 1052.

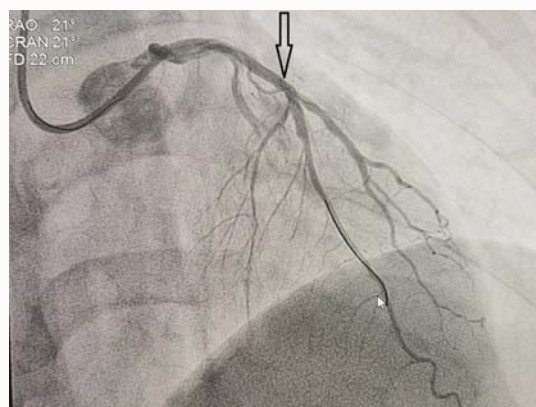
Copyright © 2022 Zhang W. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



**Figure 1:** Admission ECG: Biphasic T-waves in lead V2 and V3 (the red arrows indicate) (typical manifestations of Wellens's syndrome).



**Figure 2:** Coronary angiography results after admission: LM is normal, 95% of the proximal and middle lad is in stage stenosis, 60% of the D1 opening is in localized stenosis, and the forward flow TIMI is grade 3. No stenosis is found in LCX, and the forward flow TIMI is grade 3. (The white arrow indicates).



**Figure 3:** The angiographic appearance after stent implantation: Residual stenosis 0% and the forward flow TIMI is grade 3. (The white arrow indicates).

signs of the patient were stable, and there was no further attack of chest pain.

**Discussion**

Wellens syndrome was first described in 1982, de Zwaan et al. recognized that 26 of 145 (18%) patients admitted for unstable angina demonstrated characteristic EKG patterns [3]. In a larger study conducted by de Zwaan et al. [4], it was observed that among 1,260 patients hospitalized for unstable angina pectoris, all 180 patients with these characteristic ECG changes had LAD stenosis, ranging from 50% to complete obstruction. Clinical features of Wellens syndrome: Intermittent chest pain, normal or slightly elevated myocardial enzyme level, no poor increase of precordial Q wave or R wave, deep inverted symmetric T wave or biphasic T wave in painless period V2-V5 or V6, mild elevation or depression of ST segment (<1 mm). In the past, Wellens syndrome was classified as high-risk unstable angina pectoris, which was easy to progress to acute ST

segment elevation myocardial infarction, but in fact, some patients' myocardial biochemical necrosis markers have increased. According to the latest global definition of myocardial infarction, combined with the ECG standardization and analysis recommendations published by ACC/AHA in 2019 and the consensus published by the international society for ambulatory electrocardiogram and noninvasive electrocardiography in 2010, The above T wave changes are also classified as post ischemic T wave changes (without QRS and ST segment changes) in non-ST segment elevation Acute Coronary Syndrome (NATE-ACS).

In this case, the clinical symptoms, ECG findings and coronary angiography results of the patient are consistent with the characteristics of Wellens syndrome, but the ECG results of the patient are significantly higher when there is no injured ST segment elevation, which is different from the typical Wellens' syndrome, indicating that the patient has had no ST segment elevation myocardial infarction at this time, and needs timely myocardial reperfusion treatment. After PCI, the patient had no chest pain and recovered well.

序	项目	结果	单位	参考范围
1	肌钙蛋白I	CTNI ↑ 3.91	ng/ml	0-0.09
2	二氧化碳	CO2 ↓ 22.1	mmol/L	23--29
3	尿酸	UA ↑ 515.0	μ mol/L	208--428
4	葡萄糖	GLU ↑ 6.26	mmol/L	3.9--6.1
5	尿素氮	BUN 6.05	mmol/L	3.1--9.5
6	肌酐	CREA 79.80	μ mol/L	0--135
7	镁	Mg ↓ 0.74	mmol/L	0.75--1.02
8	钙	Ca 2.25	mmol/L	2.2--2.7
9	肌酸激酶同工酶质量测定	CK-MBm ↑ 16.1	ng/ml	0-3.7
10	肌酸激酶	CK 195.5	U/L	25-200
11	钠	Na ↓ 135.10	mmol/L	137--147
12	钾	K 3.89	mmol/L	3.5--5.3
13	氯	CL 105.00	mmol/L	99--110
14	血浆渗透压	xjsty 290.29	mOsm/L	280--310
15	磷	P 1.06	mmol/L	0.85--1.51
16	阴离子隙	AG 11.89	mmol/L	11-16

Figure 4: The results of urgent blood examination: Myocardial enzymes increased significantly.

### Conclusion

Timely recognition of Wellens' syndrome by characteristic T-wave changes is critical. When such patients are encountered in clinic, even if the patients have no obvious symptoms of chest pain, it is necessary to perform coronary angiography to clarify the coronary artery stenosis of the patients and deal with it in time, so as to avoid more serious myocardial infarction and its complications and maximize the benefits of the patients.

### References

1. Hsu YC, Hsu CW, Chen TC. Type B Wellens' syndrome: Electrocardiogram patterns that clinicians should be aware of. *Ci Ji Yi Xue Za Zhi.* 2017;29(2):127-8.

2. Aufderheide TP, Gibler WB. Rosen's Emergency Medicine: Concepts and Clinical Practice. St. Louis: Mosby; 1998. Acute ischemic coronary syndromes. 1688-91.

3. de Zwaan C, Bar 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;103:730-6.

4. de Zwaan C, Bar FW, Wellens HJ, 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.