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Atypical Presentation of Acute Coronary Syndrome and Importance of Wellens' Syndrome

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Data Interpretation D
Manuscript Preparation E
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Conflict of interest: None declared

Patient: Female, 74
Final Diagnosis: Acute coronary syndrome
Symptoms: Throat pain
Medication: —
Clinical Procedure: Percutaneous coronary intervention
Specialty: Cardiology

Objective: Challenging differential diagnosis





Background: Acute coronary syndrome (ACS) is a common and potentially life-threatening condition encountered in emergency departments. Despite its dreaded nature, nearly one-third of ACS present without chest pain and may mislead clinicians. Additionally, Wellens' syndrome is a pre-infarction stage of significant proximal left anterior descending (LAD) artery stenosis, which can lead to extensive anterior wall myocardial infarction without timely intervention.

Case Report: We report the case of a 74-year-old woman presenting with isolated throat pain and Wellens' pattern in the initial EKG, which prompted the proper workup and management. Subsequently, coronary angiogram revealed more than 90% occlusion of the proximal LAD artery, and a drug-eluting stent was deployed. The patient did well after the procedure and the follow-up at 2 weeks after discharge was uneventful.

Conclusions: This case highlights the importance of awareness of atypical presentation of ACS and importance of Wellens' syndrome. We also discuss the incidence of craniofacial symptoms of ACS, and the epidemiology, pathophysiology, management, and prognosis of Wellens' syndrome.

MeSH Keywords: Acute Coronary Syndrome • Neck Pain • Asymptomatic Diseases • Percutaneous Coronary Intervention • Diagnostic Techniques, Cardiovascular

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Background

Typical chest pain in acute coronary syndrome (ACS) is pressure-like left-sided chest pain, possibly with radiation to the left shoulder/arm and associated dyspnea, nausea/vomiting, diaphoresis, or lightheadedness. However, ACS can present with no or atypical symptoms, which can lead to delayed diagnosis and suboptimal treatment, and subsequent detrimental outcome, especially in elderly patients [1–3]. Additionally, Wellens' syndrome is abnormal T wave changes in patients with suspected ACS, indicating significant occlusion of the proximal left anterior descending (LAD) artery [4]. Herein, we report the case of a 74-year-old woman who presented with isolated throat pain and was found to have Wellens' syndrome and ACS.

Case Report

A 74-year-old woman with diabetes, hypertension, dyslipidemia, and hypothyroidism presented with a 3-week history of intermittent throat pain. She denied any chest pain, dyspnea, lightheadedness, nausea/vomiting, or stomach/back pain. She also denied any known coronary artery disease. Her home medications are metformin, vitamin B12, enalapril, atorvastatin, and levothyroxine. Her vital signs were stable and physical exam results were negative, including cardiac and pulmonary exam. Of note, the patient was completely asymptomatic at the time of evaluation. The initial electrocardiogram (EKG) showed T wave inversions over right precordial leads (Figure 1), which were new compared to prior EKG 2 years ago (Figure 2). Initial troponin was 0.9 ng/ml, which went up to 1.7 ng/ml 6 h later. The patient was treated with aspirin, clopidogrel, atorvastatin, carvedilol, and protocol-based heparin infusion for

non-ST elevation myocardial infarction (NSTEMI). The patient was admitted to the coronary care unit for close monitoring. Subsequently, a coronary angiogram showed more than 90% stenosis in the proximal left anterior descending artery (LAD), for which a 2.5×12 mm Xience drug-eluting stent was deployed, with good flow (Figure 3). The patient tolerated the procedure and was discharged with standard medical therapy. Follow-up 2 weeks later showed favorable outcome without recurrent events.

Discussion

ACS is a common and potentially life-threatening condition encountered at emergency departments (ED). Despite its dreaded nature, 33% of ACS may mislead clinicians with atypical presentations [1], which could be dyspnea (49.3%), diaphoresis (26.2%), nausea/vomiting (24.3%), or presyncope/syncope (19.1%), in the order of dominant presenting symptoms [2]. The atypical symptoms tend to occur more commonly among those who are older, female, diabetic (possibly due to autonomic neuropathy), hypertensive, and with prior heart failure. They were reported in 5.7% and 12.3% of patients with unstable angina and NSTEMI, respectively [2]. Consequently, they delay the correct diagnosis and optimal therapy, with an increased risk of in-hospital mortality. As would be expected, because of the frailty and comorbidities, elderly populations are more likely to have complications of ACS, especially when they present without chest pain [3].

Craniofacial pain is the sole presenting symptom in 6% of patients with an ischemic cardiac event, and it is 4 times more frequent than stomach and back pain [5]. Craniofacial pain is

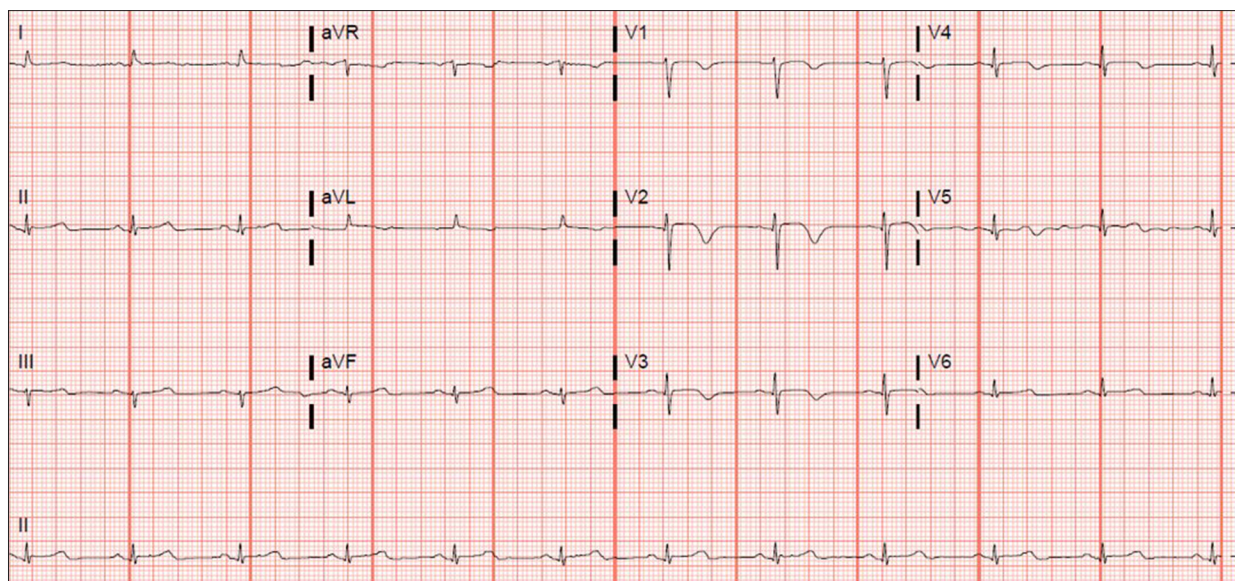


Figure 1. EKG showing deep symmetric T wave inversions in right precordial leads.

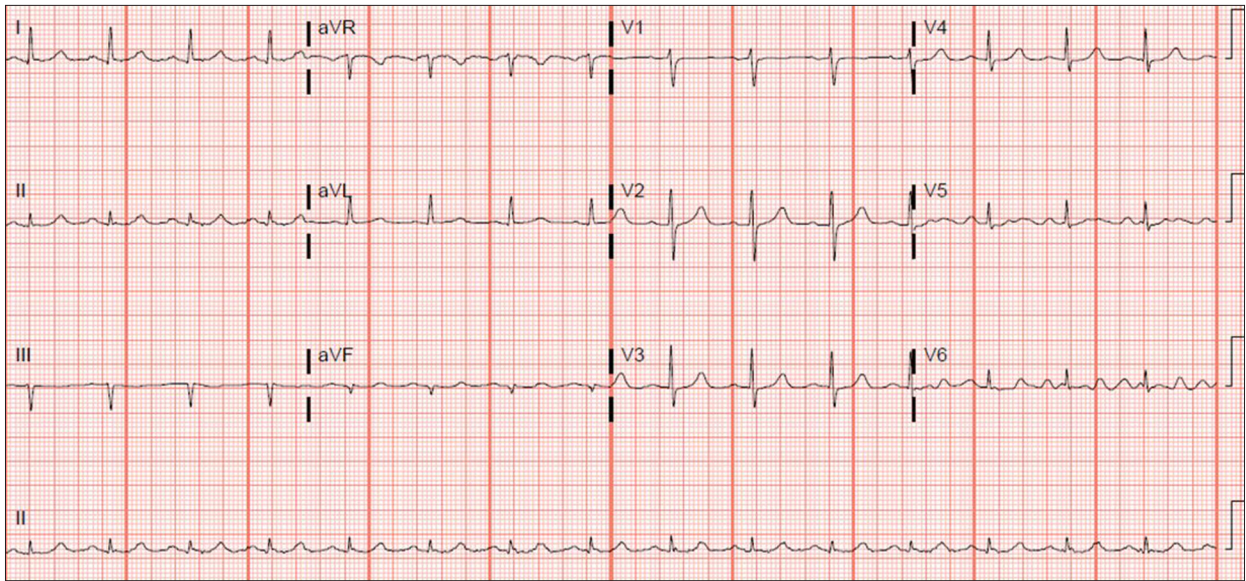


Figure 2. Prior EKG 2 years ago, showing normal sinus rhythm without significant T/ST changes.



Figure 3. Coronary angiogram showing more than 90% proximal LAD stenosis (A) and status-post stent with restoration of good flow in the LAD (B).

a referred pain from the afferent vagal nerve of the heart to efferent somatic nerves to the head and neck [5,6]. It is also more prevalent in women than in men. The throat is the most common site of craniofacial pain. Other sites of referred pain are the mandible, temporomandibular joint, ears, neck, and teeth [5]. Hiccups, a rare presenting symptom, was reported in a patient with PCI (percutaneous coronary intervention)-related STEMI [7].

First reported by Zwaan et al. in 1982, Wellens' syndrome is a pre-infarction stage of significant proximal LAD artery stenosis and may lead to extensive anterior wall myocardial

infarction without timely intervention [4,8]. It was reported in 26% (35/137) of patients with suspected coronary artery disease (CAD) undergoing coronary angiogram [9]. T wave changes in Wellens' syndrome are associated with widely scattered electrical and mechanical activities (QTc dispersion) in myocardium and severe myocardial dysfunction [9]. Wellens' syndrome can be identified as 2 patterns on EKG [8]:

- Pattern A has biphasic T waves in V2–V3 (25%) and
- Pattern B has symmetric and deeply inverted T waves in chest leads (75%).

The diagnostic criteria for Wellens' syndrome includes the presence of pattern A or pattern B in EKG plus a history of angina, pain-free period, little or no elevation of ST segment, no Q waves in chest leads, and normal or minimal elevation of cardiac enzymes [4,10]. The T wave inversion has 69% sensitivity, 89% specificity, and 86% positive predictive value for significant LAD occlusion [11]. Even in the challenging situations with pre-existing left bundle branch block (LBBB), Wellens' EKG patterns can be used to detect acute coronary syndrome [12,13].

The differential diagnoses of T wave inversions are acute coronary syndrome (ACS), pulmonary embolism, myocarditis, left ventricular hypertrophy, juvenile T wave, Wolf-Parkinson-White syndrome, and digoxin toxicity [14]. Unlike the regular practice in patients with possible ischemic chest pains, cardiac stress testing is contraindicated in Wellens' syndrome patients because it can precipitate acute myocardial infarction [9]. When Wellens' sign is discovered in patients with suspected ACS, a low threshold should be maintained for prompt coronary angiography to determine treatment options [4,8,9]. If there is significant proximal LAD occlusion, percutaneous coronary intervention (PCI) or coronary bypass surgery should be performed to prevent extensive anterior myocardial infarction. When solely managed with medical therapy, 75% of Wellens' syndrome patients developed extensive anterior wall infarction within 1 week [8].

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Our patient initially presented with isolated throat pain without any other associated symptoms. Her vital signs and physical exam results were normal. Given the risk factors (age, sex, diabetes, dyslipidemia, and hypertension) and concern for ACS, routine EKG was done, which showed Wellens' pattern B. Notably, she was asymptomatic when the EKG was performed. The patient was subsequently diagnosed with NSTEMI and underwent PCI. After discerning the Wellens' sign, we were able to provide correct diagnosis and optimal management.

Conclusions

In conclusion, craniofacial pain can be the sole presentation of ACS, of which throat pain is the most common symptom. It can be a diagnostic challenge for clinicians, mandating a low threshold of clinical suspicion for ACS. The presence of Wellens' sign in the EKG can be a crucial clue in patients with atypical presentation of ACS. Therefore, it is imperative for clinicians to identify the EKG characteristics of Wellens' syndrome and provide necessary tests and appropriate intervention. Medically treated LAD stenosis with Wellens' syndrome eventually requires coronary intervention to prevent re-occlusion and extensive myocardial injury [8,15–17].

Conflict of interests

None.