



# Could This Young Patient Really Have a STEMI? A Case Report of a Spontaneous Coronary Artery Dissection

**Urgent Message:** It is important to quickly obtain an electrocardiogram in patients presenting with chest pain or other symptoms suggestive of acute coronary syndrome, even for those who are young and without traditional coronary risk factors.

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**Key Words:** chest pain, spontaneous coronary artery dissection, acute coronary syndrome

## Abstract

**Introduction:** Spontaneous coronary artery dissection (SCAD) is a rare cause of acute coronary syndrome (ACS) that can present as an ST-elevation myocardial infarction (STEMI). This disease entity disproportionately affects women, younger patients, and those without traditional cardiovascular disease risk factors—constituting a cohort that may be more apt to seek initial evaluation in the urgent care (UC) setting.

**Clinical Presentation:** A 22-year-old previously healthy man presented to a local UC center with chest pain that awoke him from sleep. He reported that the pain radiated to his jaw and made him feel short of breath.

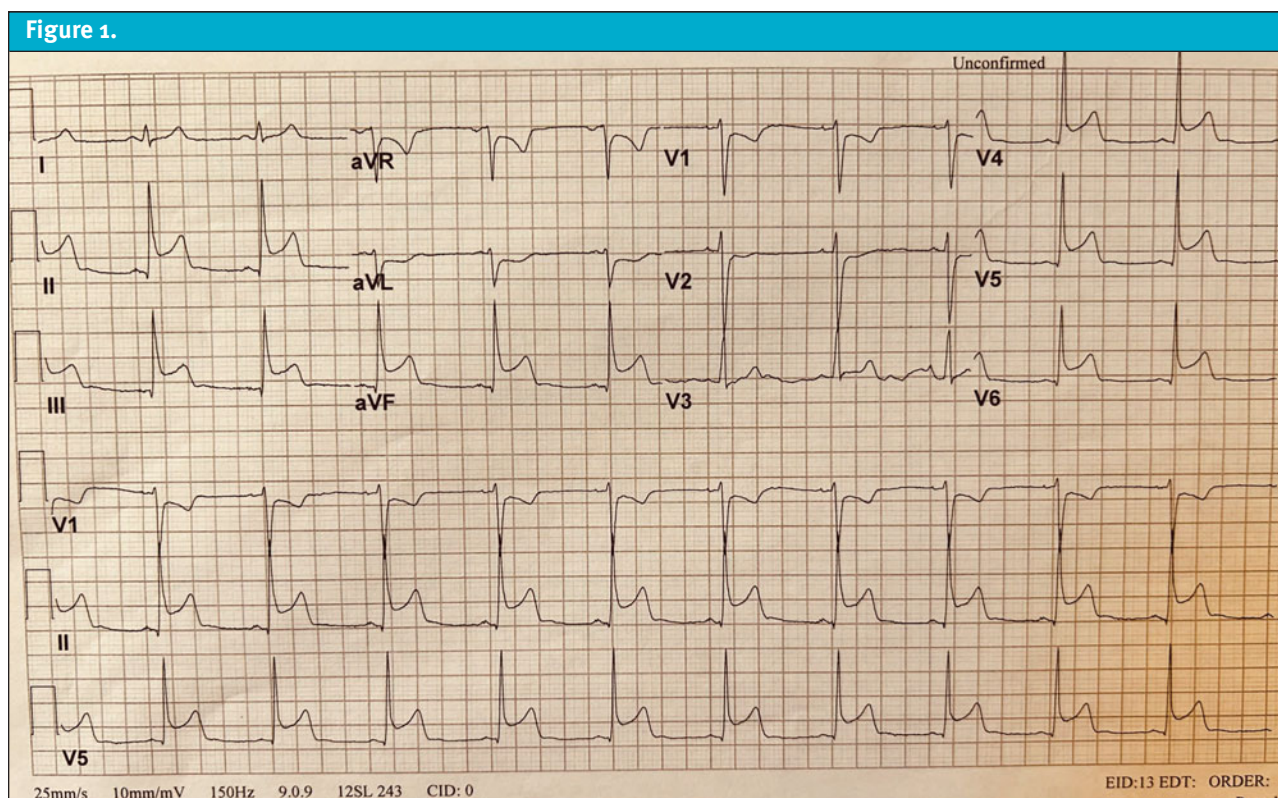
**Physical Exam:** The patient appeared uncomfortable and diaphoretic, and his blood pressure and respiratory rate were elevated. He had a normal cardiopulmonary exam.

**Case Resolution:** A 12-lead electrocardiogram (ECG)



was obtained in UC showing ST-elevations, and he was transferred to the adjacent emergency department (ED). In the ED, his pain was treated with sublingual nitroglycerin, and he received oral (PO) aspirin and intravenous (IV) heparin. He was taken immediately for emergent cardiac catheterization where coronary angiography revealed a spontaneous coronary artery dissection. The patient was managed conservatively without percutaneous coronary intervention (PCI) and subsequently discharged on aspirin, metoprolol, and clopidogrel.

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**Conclusion:** Young patients without traditional cardiovascular risk factors who present with ACS can frequently have SCAD as an underlying etiology. It is important that age and absence of traditional risk factors for coronary artery disease do not dissuade UC clinicians from considering ACS or from screening patients with suggestive symptoms using a 12-lead ECG.

### Introduction

Spontaneous coronary artery dissection occurs when an intramural hematoma develops within the wall of a coronary artery. It is not related to atherosclerosis, trauma, or an iatrogenic process (eg, coronary catheterization). It may subsequently progress to the development of an intimal dissection flap or expand to result in hemodynamically significant obstruction of the lumen resulting in an acute myocardial infarction (MI).<sup>1,2,3</sup> It is important to note that SCAD is a rare condition, but it occurs more commonly in women and younger patients.

### Clinical Presentation

A 22-year-old previously healthy man presented to a UC center complaining of retrosternal chest pain that awoke him from sleep 16 hours prior to arrival. The

pain radiated to his jaw and was associated with a sensation of shortness of breath. He denied pleuritic pain, abdominal pain, and back pain. He was a college student and did not use alcohol, tobacco, or illicit drugs. He reported no family history of early cardiovascular disease in his first-degree relatives. He took no prescription or over-the-counter medications and had no known allergies.

### Physical Exam Findings

The patient appeared both uncomfortable and diaphoretic. His vital signs were significant for an elevated blood pressure of 160/100 and respiratory rate of 24. The remaining vital signs were normal. His lung, cardiac, abdominal, and neurological exam were normal.

### Urgent Care Management

The patient had a 12-lead ECG (**Figure 1**) shortly after his presentation to UC. The clinician evaluating him interpreted the ECG as normal sinus rhythm with a ventricular rate of 65 beats per minute. There was 4-5 mm ST elevation observed in leads II, III, aVF, and V4-V6, with ST depression in aVL, consistent with an inferior-lateral STEMI. He was immediately transferred to the adjacent on-site ED.

### Emergency Department Evaluation and Management

In the ED, a repeat ECG was obtained and was unchanged. The cardiac catheterization lab was activated. While awaiting transfer to the catheterization lab, he had a chest x-ray and bedside echocardiogram which were both interpreted as normal. His laboratory studies were normal except for a high-sensitivity troponin I (hsTnI) of 10,000 pg/mL. His pain was treated with sublingual nitroglycerin. The cardiologist also recommended the patient receive PO aspirin and IV heparin prior to going to the catheterization suite. His vital signs remained stable, and his symptoms improved with nitroglycerin.

### Diagnostic Assessment and Case Conclusion

In the cardiac catheterization laboratory, a coronary angiogram demonstrated a SCAD of the left circumflex artery, causing a subtotal occlusion of the obtuse marginal artery 2 branch. The patient was treated conservatively without PCI (ie, no stenting or angioplasty was performed) and, after a short and uneventful admission for cardiac telemetry, was discharged on aspirin, clopidogrel, and metoprolol. He was noted to be doing well at a subsequent outpatient cardiology follow-up visit 6 months after discharge.

### Discussion

SCAD is defined as the development of an intramural hematoma of a coronary artery not related to atherosclerosis, trauma, or an iatrogenic process.<sup>4</sup> This may progress to a dissection flap or expand to occlude the coronary artery's lumen resulting in MI.<sup>5,6,7</sup>

SCAD is a relatively uncommon condition, accounting for 1-4% of all cases of ACS; 90% of those affected are women.<sup>1</sup> SCAD most commonly presents with ECG findings of STEMI (49%), followed by NSTEMI (44%), and unstable angina (7%).<sup>1</sup> Presenting complaints are similar to those of other causes of ACS, including chest pain, diaphoresis, dyspnea, vomiting, and dizziness.<sup>5,6</sup> Common risk factors for SCAD include female sex, emotional stress, pregnancy, connective tissue disorders, and stimulant drug misuse.<sup>7</sup> A notable risk factor for women who develop SCAD is fibromuscular dysplasia (FMD).<sup>8</sup> FMD is a rare idiopathic disease found in younger women often presenting as renovascular hypertension or early ischemic stroke and is diagnosed as a "string-of-beads" on vascular imaging. Coronary angiography remains the gold standard for the diagnosis of SCAD, and expert consensus guidelines recommend conservative management with long-term aspirin, beta blocker, and short-term clopidogrel.<sup>8</sup> Patients with

SCAD have a favorable prognosis with a 99% 3-year survival rate.<sup>9,4</sup>

*"It is important to quickly obtain an ECG in patients presenting to UC with chest pain or any other symptoms suggestive of ACS."*

### Takeaways for Urgent Care Providers

- Young patients without traditional risk factors for cardiovascular disease may still have ACS, which could be related to SCAD as an underlying etiology.
- It is important to quickly obtain an ECG in patients presenting to UC with chest pain or any other symptoms suggestive of ACS, even if they are young and devoid of traditional coronary risk factors.

### Ethics Statement and Patient Perspective

The patient was unable to be contacted as he was lost to follow-up, therefore, certain demographics and some details of the case were changed to protect patient anonymity and confidentiality. ■

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