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## Spontaneous Coronary Artery Dissection in a Young Male: A Case Report

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# Spontaneous Coronary Artery Dissection in a Young Male: A Case Report

## Abstract

### Abstract

Cardiovascular disease remains the number one cause of death worldwide. In recent years, there has been an increased focus on Coronary Artery Dissection due to the increasing number of young individuals without any cardiovascular risk factors presenting with chest pain. Many of these patients would also have elevated troponins and sometimes electrocardiogram changes suggestive of myocardial infarction. Many reported cases have been in women and only a handful of cases have been reported in men. Although some potential risk factors have been identified, more data is needed to support these hypotheses. Coronary Artery Dissection (CAD) mimics Acute Coronary Syndrome (ACS), thus swift recognition and differentiation are important as depending on the patient's specific presentation, the course of treatment will be different. There has been debate over the management of patients with Coronary Artery Dissection with regards to surgical intervention vs medical management alone, and the various medications that can or cannot be used given the overlap seen in SCAD and ACS. Early recognition and treatment especially in a young male without significant risk factors can significantly decrease myocardial injury.

## Keywords

SCAD, Spontaneous Coronary Artery Dissection, Dissection

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## Conflict of Interest Statement

I, Irene Tchuente, have no conflict of interest with this manuscript.

## Cover Page Footnote

Signed informed consent was obtained from the patient.

## CASE REPORT

# Spontaneous Coronary Artery Dissection in a Young Male: A Case Report

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### Abstract

Cardiovascular disease remains the number one cause of death worldwide. In recent years, there has been an increased focus on Coronary Artery Dissection due to the increasing number of young individuals without any cardiovascular risk factors presenting with chest pain. Many of these patients would also have elevated troponins and sometimes electrocardiogram changes suggestive of myocardial infarction. Many reported cases have been in women and only a handful of cases have been reported in men. Although some potential risk factors have been identified, more data is needed to support these hypotheses. Coronary Artery Dissection (CAD) mimics Acute Coronary Syndrome (ACS), thus swift recognition and differentiation are important as depending on the patient's specific presentation, the course of treatment will be different. There has been debate over the management of patients with Coronary Artery Dissection with regards to surgical intervention vs medical management alone, and the various medications that can or cannot be used given the overlap seen in SCAD and ACS. Early recognition and treatment especially in a young male without significant risk factors can significantly decrease myocardial injury.

*Keywords:* SCAD, Spontaneous coronary artery dissection, Dissection

## 1. Introduction

The most common cause of acute coronary syndrome remains atherosclerosis. However, in recent years, spontaneous coronary artery dissection (SCAD) has grown in prominence, mostly spurred by patient inquisitiveness. SCAD accounts for one to four percent of all cases of acute coronary syndrome, a number which is likely to increase with awareness and recognition.<sup>1</sup> Females are more commonly affected than males.<sup>1</sup> Males have been reported to present at a younger age than females.<sup>1</sup>

A coronary artery dissection occurs when an intramural thrombus forms in the wall of the coronary artery spontaneously. This intramural thrombus separates the outer one-third of the tunica media and compresses the true lumen of the coronary artery. Compression of the true lumen can hence lead to myocardial hypoperfusion and subsequently myocardial ischemia.

## 2. Case

A thirty-four-year-old male with medical history significant only for hypertension presented with a chief complaint of chest pain and chest tightness. Per patient, his pain was substernal, 10/10 in intensity, not progressive, non-radiating, not positional, and not reproducible on palpation, but worsened on deep inspiration and exertion. There were no alleviating factors, but he did obtain mild relief after he was given a sublingual nitroglycerin tablet by Emergency Medical Services. The patient denied ever experiencing similar symptoms or ingesting anything that could have possibly provoked such symptoms. The patient reported associated symptoms of diaphoresis and nausea. The patient's symptoms began while he was getting ready for church earlier that morning. He reported being a very active and healthy person as he performed weight lifting exercises daily. He however

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had not exercised or lifted weights that morning. He was a non-smoker, non-drinker, and non-drug user.

On initial evaluation at an outside facility, the patient's chest x-ray was normal, and Troponin I was elevated without any electrocardiogram (EKG) changes. He was transferred to our facility after the initiation of a heparin drip for cardiology evaluation.

On arrival, the patient appeared to be comfortable but reported being nervous. His Computed Tomography Angiography (CTA) chest and abdomen at the time of arrival ruled out aortic dissection. He was also chest pain-free at the time of evaluation. A repeat troponin I at the time of arrival was 15.3 ng/mL (normal range 0–0.04 ng/mL) and subsequently 22.3 ng/mL, still without any major changes on his EKG. Echocardiogram showed a left ventricular ejection fraction of 35–40%, diffuse hypokinesis, and a mildly dilated aortic root. He was scheduled for a cardiac catheterization.

Cardiac catheterization revealed a coronary intimal dissection involving the distal Right Coronary Artery that was successfully treated with a  $5.0 \times 30$  and  $5.0 \times 26$  drug-eluting stent, intimal dissection involving the posterolateral ventricular branch treated with a  $3.0 \times 12$  and  $2.5 \times 28$  drug-eluting stents, and residual dissection in the distal vessel where the artery was very small. Also appreciated was diffuse ectatic disease of the rest of the right coronary artery and right circumflex artery. Diffuse moderate disease was also seen in the Left Anterior Descending Artery and Left Circumflex Artery. Inferior wall hypokinesis was noted with an Ejection Fraction of 40%. The left ventricular end-diastolic pressure was normal.

The patient obtained relief after the cardiac catheterization and stent placement. He was started on aspirin, clopidogrel, atorvastatin, losartan, and spironolactone.

### 3. Discussion

The majority of cases of SCAD have been reported in younger women generally below age fifty with no cardiovascular risk factors.<sup>1</sup> Cases reported in younger men are rare. SCAD has been associated with fibromuscular dysplasia, the use of exogenous hormones, pregnancy, multiple births, connective tissue disorders, and high levels of stress, risk factors predominantly found in women.

Any coronary artery can be affected in SCAD. Greater than fifty percent of cases have been reported from disease to the left anterior descending artery (LAD), the diagonal artery of the LAD, and the septal branches of the LAD. Our patient had disease in multiple arteries, but intimal dissection

was largest in the right coronary artery; his only known risk factors were hypertension and possible stress from weight-bearing exercise. Given the extensive nature of this patient's disease, an underlying connective tissue disorder was also suspected, but work-up deferred to the ambulatory setting.

The mainstay of diagnosis for SCAD is cardiac catheterization as this distinguishes SCAD from other causes of acute coronary syndrome. Early identification and diagnosis are important for patients to receive appropriate treatment. Patients who are young and healthy can be easily overlooked, especially if there are no convincing ACS risk factors or symptoms.<sup>2</sup> Intravascular ultrasonography and optical coherence tomography provide detailed visualization of the arterial wall that helps the diagnosis of SCAD. However, these tests are expensive and not readily available at most facilities. Coronary CTA therefore is an option to be used for diagnosis.

The Yip-Saw Angiographic classification of SCAD is the gold standard used to categorize intimal involvement at different stages.<sup>3</sup> In Type 1, multiple radiolucent lumens or arterial wall contrast staining is seen. In Type 2 there is diffuse stenosis that can be of varying severity and length, usually greater than 20 mm. Type 2 is subclassed into 2A which shows diffuse/smooth arterial narrowing exclusively in areas in which the intramural hematoma is present, as the surrounding tissue is preserved, and 2B which represents diffuse narrowing that extends to and involves the distal tip of the artery. Type 3 consists of focal or tubular stenosis usually less than 20 mm in length that mimics atherosclerosis.

Although lacking in studies, The American College of Cardiology, American Heart Association, and The European Society of Cardiology guidelines all favor revascularization of the dissection with stent placement, rather than conservative therapy alone. Stent placement reduces the risk of hematoma expansion and luminal collapse which can continue to cause myocardial ischemia. There have been reports of improvement and even resolution of the dissection with conservative management in patients who underwent repeated cardiac catheterizations in as little as three to five days and up to thirty days post initial insult. There has been debate over the pros and cons of medical management including anticoagulation and antiplatelet therapy, however, studies are needed to come to any major conclusions. Medical management should be preferred in patients who are not candidates for surgery.<sup>4</sup>

#### 4. Conclusion

An under-recognized entity, particularly in the young, most major society guidelines for the management of SCAD favor revascularization of culprit lesions with stent placement over conservative therapy alone. Further study is needed to determine optimal medical management in those that are not surgical candidates.

#### Conflict of interest

I, Irene Tchuente, have no conflict of interest with this manuscript.

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