Spontaneous Coronary Artery Dissection in a 37-year-old Female with a History of Substance Use Disorder Post-Mechanical Ventilation: A Case Report

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Introduction

- Spontaneous coronary artery dissection (SCAD) is a rare and poorly understood cause of acute coronary syndrome (ACS).
- SCAD usually presents in female patients, with risk factors including age (40-50s), female sex, physical and emotional stressors, fibromuscular dysplasia, systemic inflammatory conditions, and hormonal therapy[1].
- It is best diagnosed utilizing coronary angiogram with optical coherence tomography or intravascular ultrasound[1].
- Treatment includes conservative medical management, percutaneous coronary intervention, or surgery[2] .
- Here, we discuss the case of a 37-year-old female who was found to have SCAD, potentially incited by cocaine use disorder.

Clinical Presentation

- Patient is a 37-year-old African American female with a past medical history of CVA with residual right-sided weakness, pseudotumor cerebri, bipolar disorder, schizophrenia, hypertension, polysubstance use disorder, and obesity who was brought in by EMS because of altered mental status and showing signs of distress. Per family, she recently ingested cocaine, alcohol, and edible cannabis.
- **Physical examination upon arrival:** AOx0, GCS 9, in respiratory distress, tachycardic, and tachypneic breathing at the rate of > 50. She was intubated and placed on mechanical ventilation.
- **Labs at Arrival:** Lactic Acid 5.4, sodium: 127, potassium: 3.9, chloride: 94, anion gap: 18, glucose: 223, creatinine: 2.37, WBC count of 14.3, ANC 11.5.
  Venous Blood Gas showed pH 7.363, pCO2 32.9, pO2 44.4.
  Troponin on admission was 15. Urine Drug Screen was positive for cannabinoids and cocaine. Rest of the labs were unremarkable.
- **Initial Imaging:** Chest X-Ray post-endotracheal tube and orogastric tube placement showed right basal/middle lobe partial atelectasis or aspiration pneumonitis

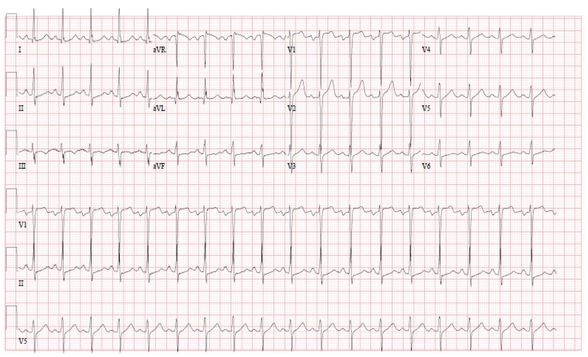

Figure 1: EKG at onset of chest pain on day 4 of admission

Hospital Course

- The patient was intubated for acute hypoxemic respiratory failure for one day and was subsequently extubated and transferred from ICU to general medical floor with telemetry.
- On day 4 of hospitalization, she developed chest pain at rest which was retrosternal in location, radiating to left arm, and associated with mild shortness of breath. Physical exam was unremarkable.
- EKG showed sinus tachycardia, possible left atrial abnormality, and nonspecific T wave changes (figure 1)
- 2D Echocardiogram performed - showed LVH, EF 70% with mild-moderate regurgitation, impaired diastolic relaxation, no regional wall motion abnormalities.
- Troponin trends through hospitalization were as follows: 15 (admission) →300 (day 4) → 434 → 660
- On day 5 from the admission, patient continued to have chest pain and was given sublingual nitroglycerin, aspirin, atorvastatin, and IV heparin per ACS protocol
- Repeat EKG showed marked ST depression, with changes suggestive of inferior subendocardial injury (figure 2)

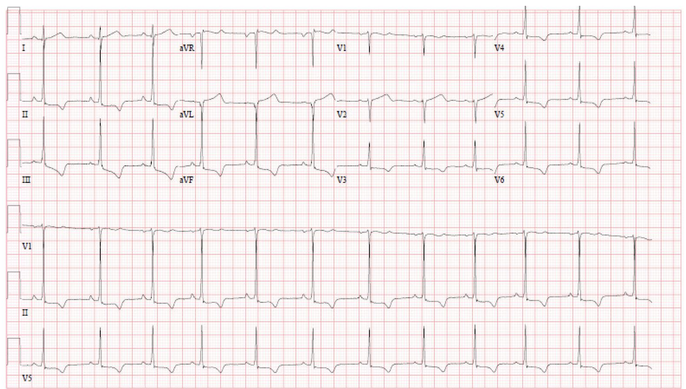

Figure 2: Repeat EKG performed 25 hours after initial EKG

- Cardiology was consulted and the patient underwent coronary angiogram with with left heart catheterization that showed the distal LAD was wraparound the apex type IV vessel mid to distal LAD has dissection that was not flow-limiting with TIMI-3 flow and in the midsegment there is a coronary bridge. Since the dissection was not flow-limiting intervention was not done. These findings were confirmed even after injection of 200 mcg of nitroglycerin intracoronary. Left main coronary artery was patent. Rest of the findings were insignificant. (figure 3)
- Post-procedure her symptoms resolved, and she was discharged next day on a beta-blocker, ACE-i, and statin, with the addition of dual antiplatelet therapy (aspirin and clopidogrel) for one month, isosorbide mononitrate daily, and sublingual nitroglycerin as needed .

Hospital Course

- She was counselled about polysubstance use and was encouraged to follow up with cardiology on an outpatient basis.

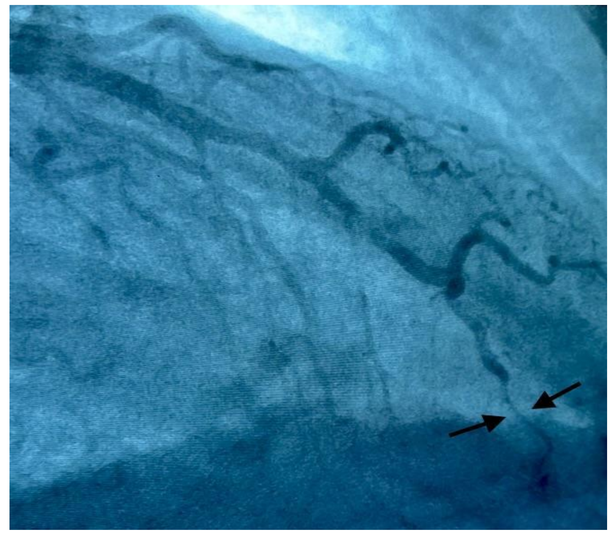

Figure 3: Imaging from the coronary angiogram with LV gram and with left heart catheterization. Arrows point to SCAD in the distal LAD

Conclusion

- SCAD is a known yet underdiagnosed cause of myocardial infarction without obstruction of coronary arteries (MINOCA) . This is in part due to symptoms resembling that of myocardial infarction, angina, or otherwise classically presenting ACS. Typically, it presents as an NSTEMI.
- Imaging makes it clear to differentiate SCAD from other causes of MINOCA
- Treatment options are still being debated and patient-specific, however success is usually with conservative medical management as in this patient, or surgical intervention if necessary.
- Our case highlights that SCAD can develop in patients with chronic cocaine use any time during hospitalization and should be suspected in patients with active cocaine use and signs of ACS.

References

1. Kidess, G. G., Brennan, M. T., Harmouch, K. M., Basit, J., & Chadi Alraies, M. (2024). Spontaneous coronary artery dissection: A review of Medical Management Approaches. *Current Problems in Cardiology*, *49*(6), 102560. https://doi.org/10.1016/j.cpcardiol.2024.102560
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