

## Abstract

Myocardial infarctions due to left circumflex artery (LCX) occlusions are under-diagnosed and mismanaged. We describe a case of an occult total occlusion of the LCX artery that presented with atypical symptoms, which then degenerated into convulsive syncope, polymorphic ventricular tachycardia and cardiac arrest, before being taken for emergent coronary angiography.

## Background

Leading organizations have published clinical practice guidelines for ST-elevation myocardial infarctions (STEMI) and out-of-hospital cardiac arrest; however, guidelines for non-STEMI, cardiac arrest in the emergency department (ED), and convulsive syncope are less defined.

## Clinical Case

A middle-aged, African-American woman was brought to our ED after calling 911 for feeling weak and dizzy. On arrival, the patient was afebrile, had a blood pressure of 154/78 mmHg, a heart rate of 56 beats/min, and oxygen saturation of 100% on room air. She was mildly confused and unable to give a reliable history. She had repeated episodes of vomiting. Physical examination was otherwise normal.

## Hospital Course

The initial ECG revealed new ST-segment depressions and T-wave inversions in the lateral leads. Shortly after arrival, she had a brief seizure-like episode after which she had a cardiac arrest. She was appropriately resuscitated. She was taken for immediate coronary angiography which revealed a 100% thrombotic occlusion of the proximal LCX artery with a TIMI 0 flow. Aspiration thrombectomy was performed with placement of one drug eluting stent. The patient was discharged in stable condition.

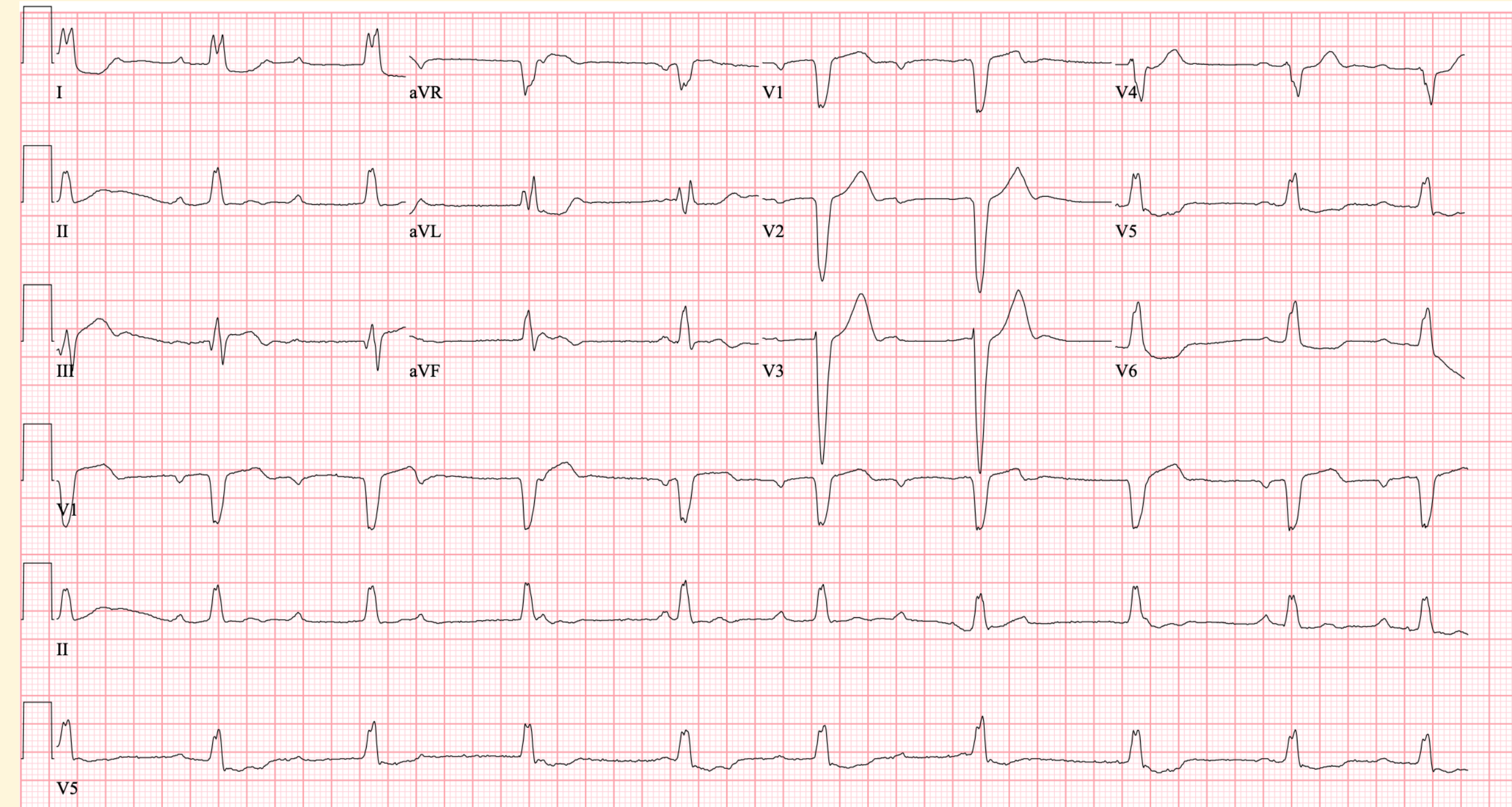


Image 1: EKG on arrival

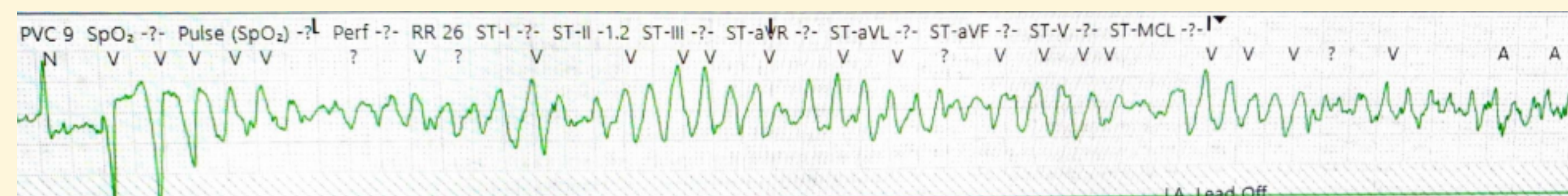


Image 2: Cardiac monitor tracing during the cardiac arrest

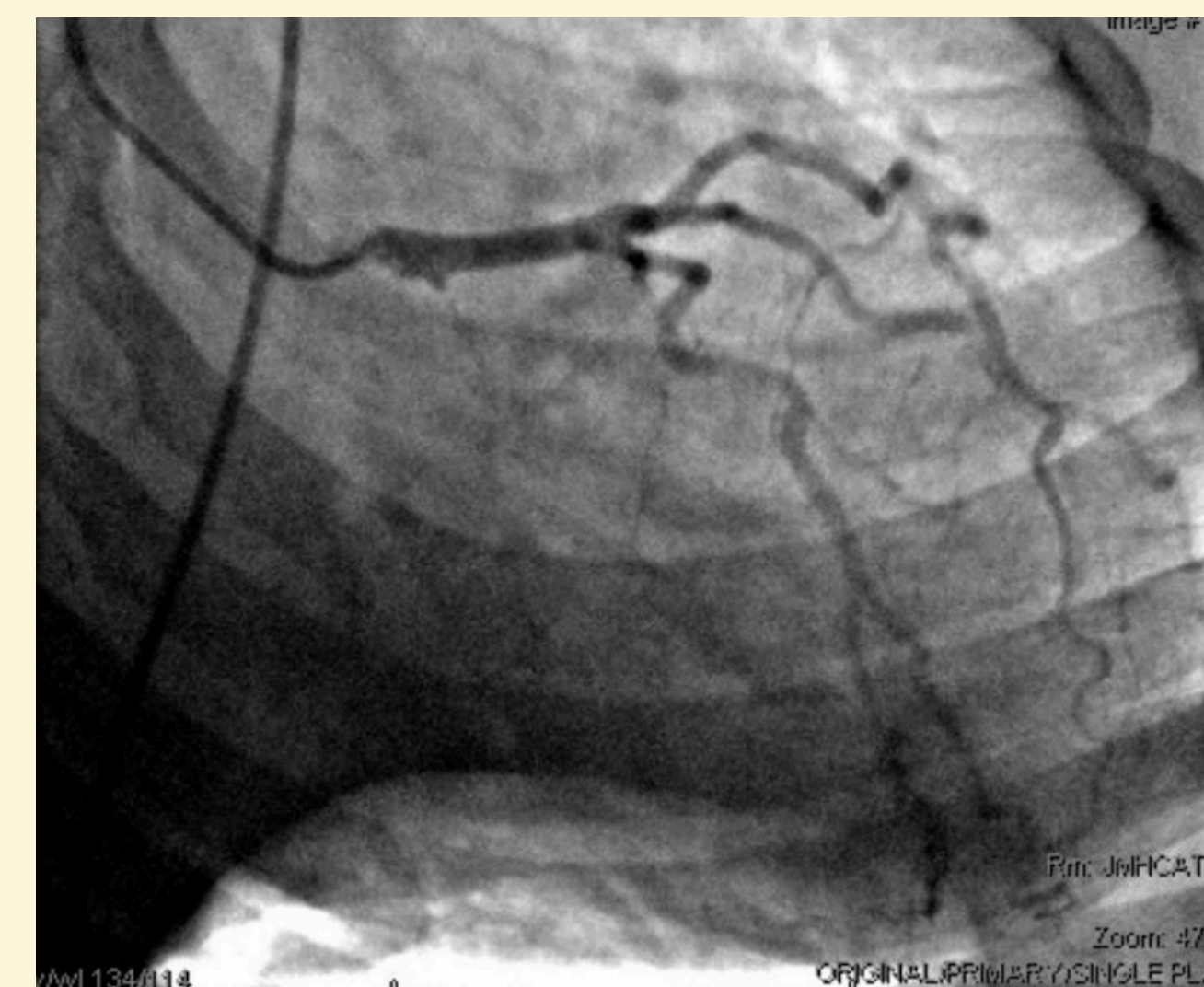


Image 3: Coronary angiogram showing complete occlusion of LCX artery

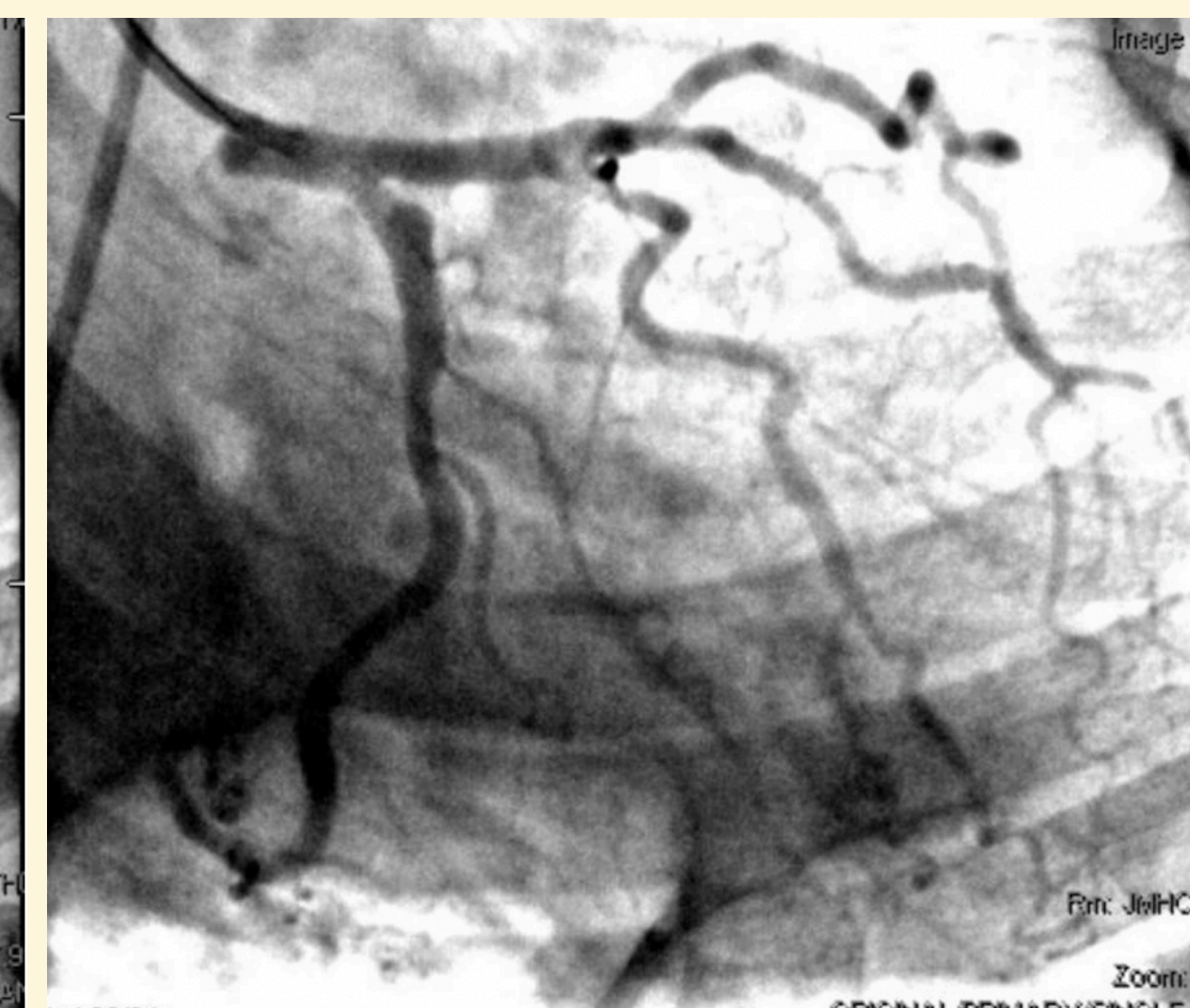


Image 4: Coronary angiogram showing restoration of flow in the left circumflex artery

## Discussion

MIs due to LCX artery occlusions may present with atypical symptoms and ECGs without ST-elevations. The standard 12-lead ECG lacks sensitivity in detecting ischemia of the lateral and posterior walls. Performing a “posterior ECG” may be useful. Acute complications are common. Global cerebral hypoxia induced by occult cardiac arrhythmias may present as convulsive syncope and is treated with anti-arrhythmic medications and not anti-epileptic. Occult polymorphic ventricular tachycardia may occur and decompensate into sudden cardiac arrest. Favorable resuscitation features (witnessed arrest, initial VF/VT rhythm, less than 30 minutes to ROSC amongst others) should be utilized to advocate for emergent coronary angiography, which could be lifesaving.

## Conclusion

We believe that our case presents diagnostic dilemmas in diagnosing LCX MIs and highlights the need for fresh guidelines for proceeding with emergent coronary angiography in non ST-elevation MIs.

## Take Home Messages

- MIs due to LCX artery occlusions do not always present with classic symptoms and ECGs.
- For patients with a high clinical suspicion of coronary artery occlusion, a low threshold for emergent coronary angiography should be maintained.
- Favorable resuscitation features should be utilized to advocate for immediate coronary angiography in cardiac arrest patients.

## References

- [1] Rogers WJ, Frederick PD, Stoehr E, et al. Trends in presenting characteristics and hospital mortality among patients with ST elevation and non-ST elevation myocardial infarction in the National Registry of Myocardial Infarction from 1990 to 2006. *Am Heart J.* 2008 Dec. 156 (6):1026-34.
- [2] Dixon WC IV, Wang TY, Dai D, Shunk KA, Peterson ED, Roe MT. Anatomic distribution of the culprit lesion in patients with non-STsegment elevation myocardial infarction undergoing percutaneous coronary intervention: findings from the National Cardiovascular Data Registry. *J Am Coll Cardiol* 2008;52:1347–1348.
- [3] From AM, Best PJ, Lennon RJ, Rihal CS, Prasad A. Acute myocardial infarction due to left circumflex artery occlusion and significance of ST-segment elevation. *Am J Cardiol.* 2010 Oct 15;106(8):1081-5. doi: 10.1016/j.amjcard.2010.06.016. PubMed PMID: 20920642.
- [4] Soelima K, Stevenson WG. Ventricular tachycardia associated with myocardial infarct scar: a spectrum of therapies for a single patient. *Circulation.* 2002 Jul 9;106(2):176-9.
- [5] Jorrit S, Lemkes, M.D., Gladys N. Janssens, M.D., Coronary Angiography after Cardiac Arrest without ST-Segment Elevation N Engl J Med 2019; 380:1397-1407.
- [6] Schott GD, McLeod AA, Jewitt DE. Cardiac arrhythmias that masquerade as epilepsy. *Br Med J* 1977; 1: 1454-7.