

# COMMON PRESENTATION, UNCOMMON OUTCOME

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**PRESENTING SYMPTOMS** A 57 year old male was evaluated in the emergency department after he developed substernal chest pain with radiation down both arms while shoveling snow. His EKG revealed anterolateral ST segment elevations consistent with an anterior myocardial infarction (MI). He was treated with aspirin, intravenous nitroglycerin, heparin, and clopidogrel.

**STUDIES/HOSPITAL COURSE** He underwent emergent cardiac catheterization which revealed a 99% stenosis of the proximal left anterior descending artery (LAD; see Figure 1A), abnormal left ventricular (LV) systolic function, and LV anterolateral hypokinesis. This lesion was successfully angioplastied with a drug eluting stent resulting in TIMI-3 flow (see Figure 1B). The patient's left ventricular ejection fraction (LVEF) was measured at 25 to 35% by left ventriculogram and an intra-aortic balloon pump was placed for hemodynamic support. A left bundle branch block was noted and a temporary transvenous pacing wire was inserted due to concern for heart block. He was initially managed in the coronary care unit and then transferred to a telemetry unit as he convalesced.

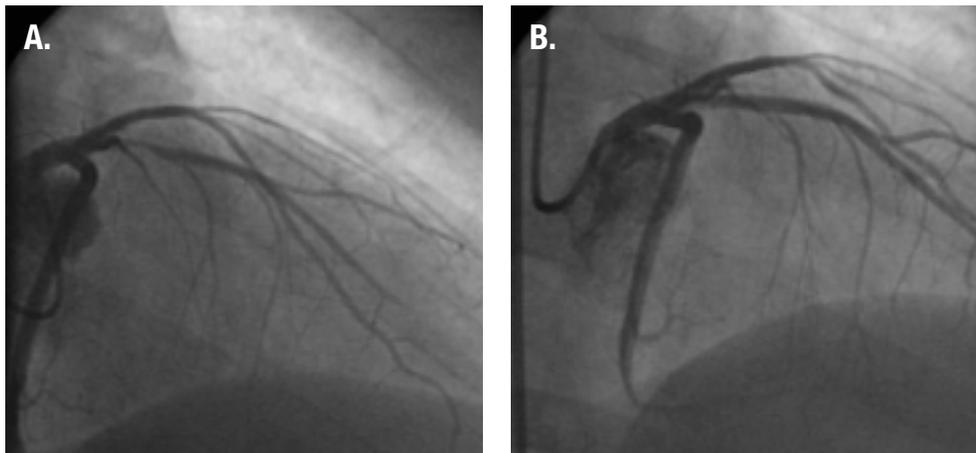


Figure 1: Presenting a Angiogram (A) and post-revascularization with a drug eluting stent in the proximal LAD (B).

Six days post angioplasty, a few beats of asymptomatic, non-sustained monomorphic ventricular tachycardia were documented on telemetry. Electrophysiology was consulted and considered the patient to be at high risk for ventricular arrhythmias. It was recommended that he undergo an electrophysiology study for further risk stratification. But the patient refused the study and wanted to go home and think about it. He was discharged home with a wearable cardioverter defibrillator (WCD), (manufactured by ZOLL, Pittsburgh, PA, marketed under the brand name LifeVest®). His discharge medications included aspirin, clopidogrel, a beta blocker, an ACE inhibitor, and a statin.

He was seen by an electrophysiologist in clinic the following week and an electrophysiology study was once again recommended for further risk stratification against ventricular arrhythmias. The patient agreed to schedule the study.

**FOLLOW-UP** The night before his planned study, he suddenly collapsed in his bed while watching TV with his wife. He experienced an external shock from his WCD. Interrogation later revealed that his WCD delivered a 150J biphasic shock 47 seconds after spontaneous ventricular fibrillation (VF) had occurred (Figure 2). His post shock rhythm was sinus bradycardia at a rate of 49 beats per minute. The patient's wife called 911, but he decided to remain at home and continue to wear his WCD until he could be seen by his physician. The following morning,

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he was instructed by his cardiologist to come emergently to the hospital for further evaluation. He presented to the hospital that evening and subsequently had another VF arrest and was successfully defibrillated by an external shock.

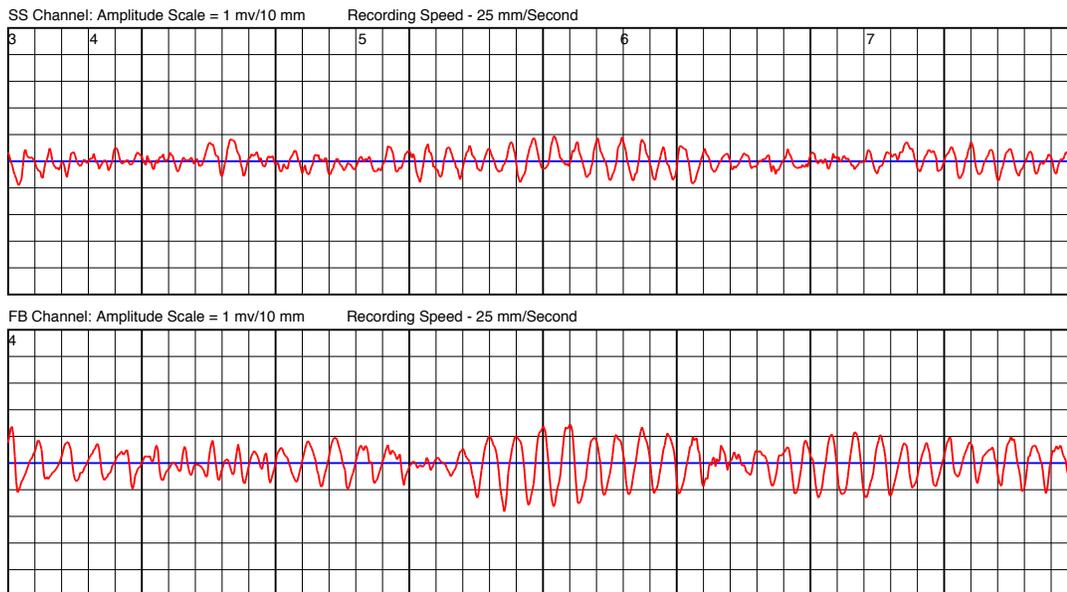


Figure 2: EKG downloaded from WCD. The WCD continuously monitors the patient's EKG using a 4 electrode, 2 lead system [side-to-side (SS, top), and front-to-back (FB, bottom)]

Urgent cardiac catheterization was performed and revealed continued left ventricular systolic dysfunction with anteroapical akinesis, an LVEF of 20%, and no evidence of in-stent thrombosis. Electrophysiology was consulted and an implantable cardioverter-defibrillator (ICD) was implanted during his hospitalization. He was discharged home in stable condition and has not had any ICD shocks during a follow-up period of 6 months.

**DISCUSSION** This patient had a common presentation of MI and underwent successful emergent angioplasty of his culprit vessel in a timely fashion. Complicating this typical presentation was the fact that the patient experienced two episodes of sudden cardiac arrest (SCA) manifested as VF after initial hospital discharge. This case illustrates the importance of appropriately identifying and protecting post-MI patients from SCA. Numerous studies have shown the most important factor used to assess SCA risk is a low ejection fraction ( $\leq 35\%$ ). The addition of other risk factors such as: age > 65, renal insufficiency, Killip class 2 or 3, TIMI flow 0-2, anemia, and three vessel disease further negatively impact patient 1 year mortality.<sup>1</sup> This patient's LVEF was  $\leq 35\%$  and was experiencing Killip class 2 symptoms. Also, non-sustained ventricular tachycardia after a myocardial infarction in patients with EF <40% has been shown to be an important marker for SCA requiring further risk stratification.<sup>2</sup> These risks were recognized in this patient and he was appropriately bridged with a WCD while he underwent further risk stratification for ventricular arrhythmias.

## REFERENCES

1. Halkin, A, Singh M, Nikolsky E et al. Prediction of Mortality After Primary Percutaneous Coronary Intervention for Acute Myocardial Infarction: The CADILLAC Risk Score. JACC 2005; 45:1397-1405.
2. Buxton AE, Lee KL, Fisher JD et al., A randomized study of the prevention of sudden death in patients with coronary artery disease Multicenter Unsustained Tachycardia Trial Investigators. N Engl J Med. 1999 Dec 16; 341(25):1882-90.

