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CLINICAL VIGNETTE

A Case of Methamphetamine Induced Cardiomyopathy and Myocardial Infarction

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Case

A 35-year-old male with no past medical history presented to the emergency department (ED) complaining of 2-3 days of shortness of breath and new onset pressure like chest pain. He was a current smoker of 1 pack per day for the last 20 years, drinks 4-5 beers per day, and abuses methamphetamine, cocaine, and PCP. His chest pain was constant, 7/10, without radiation and was not relieved or aggravated by anything. The patient admitted using PCP and methamphetamine during the previous week and the morning he presented to the ED. He denied fever, chills or cough. He was comfortable, without cardiac or respiratory distress, with oxygen saturation of 100% on room air and heart rate of 86. Chest x ray was unremarkable. Pulmonary embolism was less likely with Wells criteria of 0 and PERC rule of 0. Electrocardiogram was free of any ST segment elevations or depressions. Troponin was elevated at 0.63 and urine toxicology was positive for PCP and methamphetamine. He was admitted to the internal medicine service on telemetry with a diagnosis of non-ST elevation myocardial infarction (NSTEMI).

Cardiology agreed with the diagnosis of NSTEMI and started the patient on medical management for acute coronary syndrome (ACS) and troponin trended every 4 hours along with a Transthoracic echocardiogram (TTE).

The TTE was notable for a severely reduced left ventricular ejection fraction of 25-30% and repeat troponin had increased to 2.45. Cardiology performed emergent diagnostic left heart catheterization (LHC). Notable findings included an 80% proximal left anterior descending (LAD) lesion and reduced ejection fraction of about 20% with global hypokinesis on ventriculography. He tolerated the procedure well with no complications and stable hemodynamics. He was transferred to an outside hospital and started on nitroglycerin drip for percutaneous coronary intervention (PCI) of the critical LAD lesion.

He had a successful percutaneous intervention with revascularization of the proximal LAD lesion and deployment of a bare metal stent. He was educated on the importance of lifestyle changes, avoidance of drugs or significant alcohol abuse, with close follow up. He was discharged home on aspirin, clopidogrel, carvedilol, lisinopril, furosemide, atorvastatin, and spironolactone.

The patient follow up in cardiology clinic and adopted recommendations regarding lifestyle changes and medication

compliance. Repeat transthoracic echocardiogram eight months after the ischemic event showed improvement of his ejection fraction from 25-30% to 40-45% and spironolactone was discontinued. He completed one year of dual antiplatelet therapy and clopidogrel was discontinued. He was feeling well, free of chest pain and exertional dyspnea.

Discussion

Methamphetamine abuse is a global problem and is now the second most commonly used illicit substance worldwide, after cannabis.¹ Figures release by the American National Survey on Drug Use and Health in 2013 estimated that 1.4 million individuals aged 12 or older abused amphetamine.² Abuse is predominantly seen in unemployed single white men aged 20-35.³ The most common side effects are hypertension and tachycardia which increase with increasing doses of methamphetamine due to adrenergic stimulation. Other common complaints include chest pain, palpitations, and shortness of breath. Cardiac manifestations including acute myocardial infarction (AMI), heart failure, or arrhythmia related to the abuse of amphetamines have been documented as increasing but are still rare. Cocaine also has well established cardiac toxicity and is more rare than amphetamine related AMI.⁴ Amphetamine associated AMI will become more common if the rate of amphetamine abuse continues to increase. Physicians in the emergency department and cardiologists should be aware of this complication as early diagnosis may lead to successful management of this potentially fatal complication. Methamphetamine associated cardiomyopathy (MAC) appears to be potentially reversible upon cessation of methamphetamine and guideline directed management for heart failure. One report, cardiac magnetic resonance imaging was performed in a patient with severe MAC, and showed no delayed gadolinium enhancement to suggest any significant fibrosis.⁵ The timing and degree of recovery of left ventricular systolic function remain unknown.

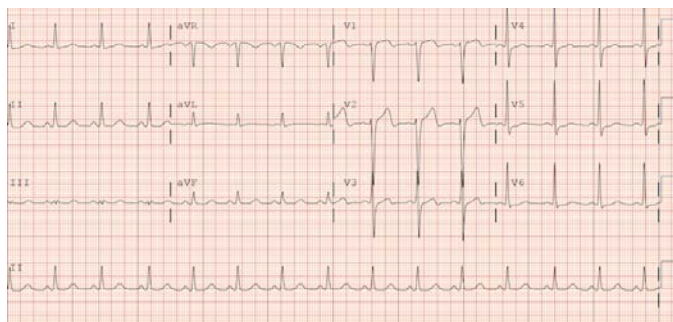


Figure 1: EKG completed at initial presentation in the ED with no ST segment changes.

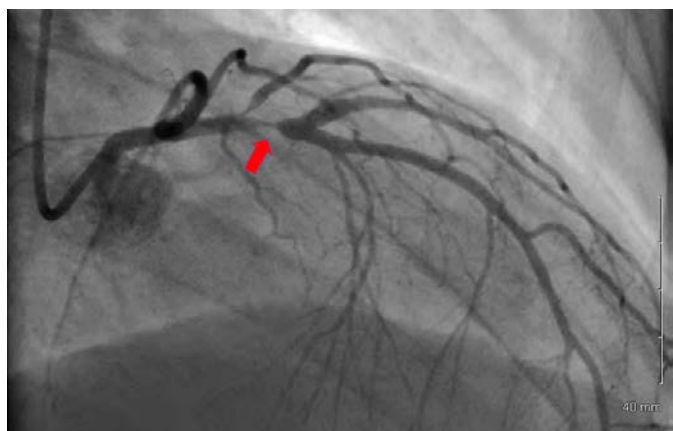


Figure 2: Pre-stenting of the proximal left anterior descending coronary artery lesion of 80%.

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