

5<sup>th</sup> International Conference on

# Clinical & Experimental Cardiology

April 27-29, 2015 Philadelphia, USA

## Ventricular fibrillation sudden cardiac death and ST-elevation myocardial infarction induced by coronary artery spasm: Images of spasm during coronary angiography

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**Background:** Coronary artery spasm is an important factor in the pathogenesis of ischemic heart disease. Ischemic episodes caused by coronary spasm may induce arrhythmia, including cardiac arrest.

**Case Description:** A 53-year old male smoker presented after witnessed cardiac arrest. He was in ventricular fibrillation and underwent successful defibrillation. On arrival to the emergency department he had ST elevations in the anterolateral ECG leads V2 – V6. The patient was treated for ST-elevation myocardial infarction (STEMI) with heparin, amiodarone, aspirin and clopidogrel. Laboratory testing was significant for cardiac Troponin I peak at 6.25 ng/mL. Urine toxicology was negative. Echocardiogram revealed decreased left ventricular ejection fraction of 30% with an akinetic anteroseptum and apex. Coronary angiography revealed no significant disease of the left anterior descending (LAD) coronary artery. After repeat injection of dye, the LAD developed complete occlusion concerning for coronary artery spasm that was associated with tachycardia to 178 beats per minute and severe hypertension to 200/133 mmHg. The spasm and associated symptoms resolved with intracoronary nitroglycerin administration.

**Discussion:** This patient presented with STEMI in the absence of obstructive coronary artery disease. Coronary angiography images confirmed that the patient's symptoms were induced by spasm of the LAD. Potential mechanisms of coronary spasm include endothelial dysfunction and vascular smooth muscle cell hyperreactivity. In the setting of active cardiac catheterization, intracoronary nitrates and atropine have been demonstrated to reverse coronary spasm. Outpatient treatment options include calcium channel blockers and long-acting nitrates, as well as magnesium, statins, antioxidants, angiotensin antagonists and anti-inflammatories.

### Biography

Cyrus Hadadi is a first-year cardiology fellow at Geisinger Medical Center in Danville, Pennsylvania. He graduated from the University of Maryland, College Park and received a medical degree from Drexel University College of Medicine in Philadelphia, Pennsylvania. He completed his residency in internal medicine at the University of Maryland Medical Center in Baltimore, Maryland.

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