**Title:** Extracorporeal Membrane Oxygenation for Electrical Storm as a Complication of Acute Myocardial Infarction

**Authors:** Lennep BW1, Saxon JT2, Winniford MD2

**Author affiliations:** 1 University of Mississippi Medical Center, Department of Internal Medicine; 2 University of Mississippi Medical Center, Department of Internal Medicine, Division of Cardiology

**Introduction:**

Cardiogenic shock and refractory ventricular tachycardia are known complications of acute myocardial infarction (AMI) that are associated with a high mortality rate. Treatment of these sequelae is challenging, and prompt intervention is paramount to promote good outcomes. When cardiogenic shock or ventricular tachycardias are refractory despite appropriate revascularization, mechanical circulatory support is an appropriate treatment.

**Case Description:**

A 36-year-old African-American female with history of peripartum cardiomyopathy presented with acute onset of chest pain, and initial electrocardiogram (ECG) demonstrated an acute anterior ST-elevation myocardial infarction. She was referred for emergent coronary angiography, which revealed complete occlusion of the proximal left anterior descending (LAD) coronary artery and occlusion of two distal branches of the first obtuse marginal (OM1) coronary artery. The patient underwent emergent percutaneous coronary intervention (PCI) with manual aspiration thrombectomy in the LAD and deployment of a bare-metal stent in the proximal LAD. Due to persistent hypotension throughout the procedure, a dopamine infusion was initiated and an intra-aortic balloon pump (IABP) was placed for support. Over the next 24 hours she reported no chest pain, but serial ECGs demonstrated an evolving anterior infarct pattern and transthoracic echocardiography showed depressed left ventricular systolic function with an estimated ejection fraction of 35% with anterior wall and apical hypokinesis. 24 hours after admission, she developed ventricular tachycardia, which was refractory to multiple external defibrillations as well as dual anti-arrhythmic therapy with amiodarone and lidocaine. She was then upgraded to full mechanical circulatory support with veno-arterial extracorporeal membrane oxygenation (ECMO), and the IABP was removed. During 96 hours of ECMO support, she suffered no further hypotension or ventricular arrhythmia. Subsequently, she was successfully weaned from ECMO and treated with standard medical management of acute coronary syndrome prior to being discharged home on hospital day #10.

**Discussion:**

The widespread implementation of early revascularization techniques has not significantly decreased the incidence of cardiogenic shock complicating AMI, and despite recent improvement, mortality remains high amongst patients who develop this complication1. Cardiogenic shock due to electrical instability presents a particularly difficult clinical scenario when ventricular arrhythmias are refractory to anti-arrhythmic therapy. Under such circumstances, temporary cardiopulmonary support with veno-arterial ECMO has been used in some cases as a bridge to recovery of myocardial function2,3. This patient suffered a refractory, non-perfusing rhythm that was not amenable to medical therapy. With upgrade to complete cardiopulmonary circulatory support, her electrical instability resolved and she was successfully weaned from circulatory support 96 hours later.

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**Category:** Clinical Vignette