



WHEN THE STARS ALIGN IN A VT STORM: A CASE REPORT

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INTRODUCTION

- Ventricular storm, defined as >3 ventricular tachyarrhythmias (VT) in a 24-hour period, is a life-threatening condition. VT occurring post-myocardial infarction (MI) is associated with ongoing ischemia, cardiogenic shock, and preexisting arrhythmogenic substrate.
- Management can be difficult and may demand a multifaceted approach. We present a novel case of refractory electrical storm in the post-MI setting with incomplete revascularization successfully treated with a dobutamine infusion.

CASE DESCRIPTION

- A 64 year-old female presented with NSTEMI and reduced EF 25%. Angiogram revealed severe 3-vessel CAD. The patient had a 2v-CABG with LIMA-LAD and SVG-LCx. The RCA was unable to be grafted.
- On POD 3 & 4: The patient developed NSVT and sustained VT requiring DCCV. ECG was negative for ischemia, and troponin was trending down. Limited echo showed EF 30%. Amiodarone infusion was transitioned to oral amiodarone at this time.
- On POD 7: Sustained polymorphic VT (PVT) and electrical storm. Metoprolol, amiodarone, and lidocaine infusions were tried unsuccessfully. Then intubated and sedated. >25 defibrillations were required.
- For refractory PVT, left stellate ganglion block was performed. However, the patient continued to have recurrent VT storm and hypotension several hours later secondary to PVCs with R-on-T phenomenon.
- Finally, as a last resort, a dobutamine infusion was started with subsequent shortening of the R-R interval and resolution of PVT.

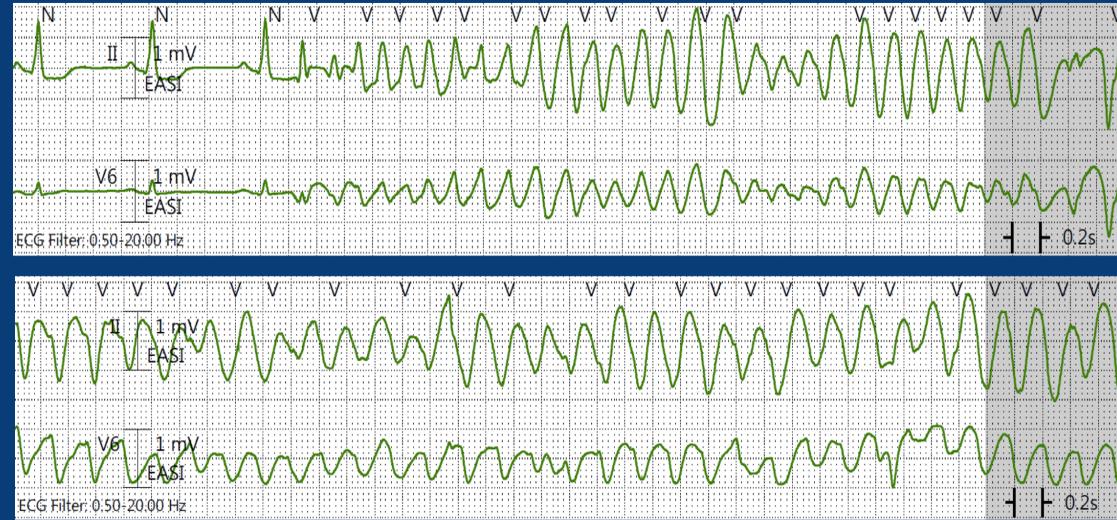


FIGURE 1: Polymorphic Ventricular Tachycardia

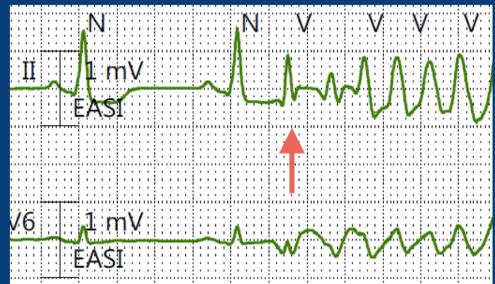


FIGURE 2: R-on-T phenomenon (arrow) provoking polymorphic VT.

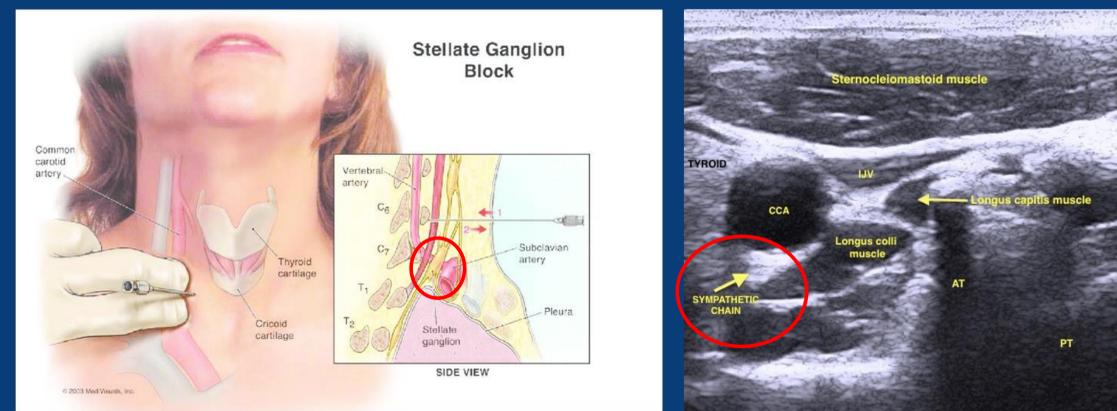


FIGURE 3: Diagram of stellate ganglion block (left)⁴ and landmarks on US (right).⁵

DISCUSSION

- The incidence of VT storm reported in the literature varies depending on the population studied, as high as 10-20% in ICD recipients. Mechanisms of VT include abnormal automaticity, triggered activity (early and delayed after depolarization), and reentry. Etiologies vary, from myocardial ischemia or scar, structural abnormalities (dilated CM, ARVD), electrolyte abnormalities, to inherited channelopathies (Brugada, LQTS, CPVT). Treatment includes beta blockers, amiodarone, lidocaine, and suppression of sympathetic tone with sedation and intubation.¹ In refractory cases, stellate ganglion block is effective by targeting the nerves that innervate the myocardium to reduce adrenergic tone.²
- In this case, the patient's VT storm was thought to be due to ongoing ischemia from incomplete revascularization. Unusually, her QTc was within normal limits. Polymorphic VT was persistent despite all pharmacologic therapies. Left stellate ganglion block provided reprieve for several hours until R-on-T phenomenon caused recurrent VT storm, ultimately requiring repeat defibrillation. Between episodes of VT, she was noted to be bradycardic and hypotensive. Her QTc was mildly prolonged compared to prior.
- Dobutamine infusion was started for cardiogenic shock as a last resort with rapid resolution of PVT. We believe the beta agonist properties of dobutamine increased HR, shortened the refractory period, and prevented PVCs. Its inotropic properties addressed the ongoing shock. The patient stabilized and was later discharged with an ICD. At 6-month follow up, her EF had improved to 55%, and she had no shockable events.

LEARNING POINTS

- PVT can develop during the healing phase after MI due to ischemia or infarct. These events can start with short-coupled PVCs and lead to drug-refractory arrhythmic storms.³
- While typically considered proarrhythmogenic, dobutamine may be considered in select cases to treat persistent electrical storm secondary to R-on-T phenomenon in the presence of cardiogenic shock.

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DISCLOSURE INFORMATION

The authors have no disclosures.

