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Sudden Cardiac Arrest with Ventricular Fibrillation in a Patient with Epilepsy and a Vagus Nerve Stimulator(2025)

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Abstract

Sudden Unexpected Death in Epilepsy (SUDEP) is a major cause of mortality in patients with refractory epilepsy and is thought to involve peri-ictal autonomic dysfunction and malignant arrhythmias. The cardiac effects of Vagus Nerve Stimulator (VNS) therapy remain incompletely understood. A 36-year-old woman with drug-resistant epilepsy managed with VNS experienced a generalized tonic–clonic seizure followed by sudden collapse. Emergency services documented ventricular fibrillation, and she was successfully resuscitated with defibrillation. Comprehensive cardiac evaluation, including electrocardiography, echocardiography, and coronary angiography, revealed no structural or ischemic heart disease. In view of unexplained ventricular fibrillation, the patient underwent implantation of a subcutaneous implantable cardioverter-defibrillator (S-ICD) for secondary prevention. Multidisciplinary follow-up was arranged involving neurology and cardiology teams. This case highlights the potential for seizure-related malignant arrhythmias in structurally normal hearts and underscores a possible mechanistic link between epilepsy, autonomic dysfunction, and cardiac instability. Increased awareness and consideration of cardiac evaluation in high-risk epilepsy patients may help mitigate the risk of SUDEP.