A Case of Verapamil-Sensitive Left Ventricular Tachycardia

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A Case of Verapamil-Sensitive Left Ventricular Tachycardia

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Case

A 54-year-old male presented to the hospital with a sudden onset of palpitations, dyspnea, and lightheadedness. On presentation, the patient was hemodynamically stable. However, his initial electrocardiogram displayed a wide-complex tachycardia with QRS durations of 150 milliseconds, a ventricular rate of 193 beats/minute, a right bundle branch morphology, and a right-axis deviation. Unsuccessful attempts were made to convert the patient to sinus rhythm with amiodarone and lidocaine infusions. Laboratory evaluation revealed normal cardiac markers. A transthoracic echocardiogram revealed an ejection fraction of 55% and no wall motion or significant structural abnormalities. He was then begun on verapamil on suspicion that his clinical presentation and electrocardiogram was suggestive of a left anterior fascicular ventricular tachycardia. The patient converted to normal sinus rhythm, and had resolution of his symptoms. Subsequent myocardial perfusion imaging was negative for any signs of ischemic heart disease, further supporting the diagnosis of verapamil-sensitive fascicular ventricular tachycardia.

![Image of electrocardiogram]

Fascicular Ventricular Tachycardia

Idiopathic fascicular ventricular tachycardia is a type of monomorphic idiopathic ventricular tachycardia arising from the fascicles of the left bundle branch in a structurally normal heart. It occurs in both genders with a median age of about 40 years. Symptoms are usually paroxysmal and typically manifest with palpitations, but patients can present with syncope and tachycardia-induced cardiomyopathy. The diagnosis of idiopathic fascicular tachycardia requires induction with atrial pacing, right bundle branch morphology with left or right axis deviation, a structurally normal heart, and sensitivity to calcium channel blockers. A documented negative evaluation for cardiac ischemia is crucial in its diagnosis.

Idiopathic fascicular VT is further subdivided into left posterior, left anterior, and left upper septal fascicular VT. The most common among the three is left posterior fascicular VT. The mechanism is thought to involve a macroreentry circuit, with origins in the Purkinje network of the left posterior fascicle. The circuit appears to primarily be dependent on slow inward calcium channels. Alternatively, false tendons or fibromuscular bands that extend from the posterior inferior left ventricle to the basal septum have been implicated. 90% of cases involve ECG characteristics of left posterior fascicular VT, which includes a right bundle branch block (RBBB) morphology with left axis deviation, consistent with a left anterior fascicular block. Approximately 10% of cases are consistent with left anterior fascicular VT, which involves a QRS complex with a RBBB morphology and right-axis deviation, consistent with a left posterior fascicular block. Less than 1% of cases are septal, with a narrow QRS complex and normal or right-axis deviation.

Acute management in terminating the rhythm is usually successful with intravenous calcium channel blockers, such as verapamil. In mild cases, the patient is transitioned to oral verapamil for the prevention of recurrent symptoms. Radiofrequency ablation is successful for those with severe or recurrent symptoms, with rates approaching 90%.

![Image of laboratory results]

Key Points

- Fascicular ventricular tachycardia can easily be misdiagnosed and over-treated with antiarrhythmic agents or cardioversion.
- Symptoms are paroxysmal and occur in younger individuals, manifesting most commonly as palpitations. However, patients can present with syncope and tachycardia-induced cardiomyopathy.
- The diagnosis includes ECG evidence of a widened QRS, and a RBBB morphology with a left or right axis deviation. The absence of ischemia and structural heart disease by diagnostic testing is important in its diagnosis.
- Sensitivity to verapamil is the hallmark of the arrhythmia, and is the treatment of choice in the acute and chronic setting. Radiofrequency ablation can be used for those with refractory symptoms.

References: