A Wide QRS Tachycardia in a Young Patient: Does It Ring a Bell?

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Answer to the Rhythm Puzzle

The ECG shows a wide complex tachycardia with a rate of 230 beats/min, a QRS duration of 130 ms, superior axis and an RBBB configuration. There is no evidence of AV dissociation, fusion or capture beats. The QRS morphology in the precordial leads (q in V1, QS pattern in V3 and V4 and rS pattern in V5 and V6) as well as the QRS axis of -100° is consistent with a monomorphic ventricular tachycardia (VT), originating from the apico-postero-lateral wall of the left ventricle [1].

This patient was diagnosed as having an idiopathic left ventricular tachycardia. The specific morphology of this VT (often misdiagnosed as SVT) indicates an origin in the region of the posterior fascicle of the left bundle branch. These idiopathic fascicular VTs are also known as Belhassen VTs and occur typically in young males (15 to 40 years) without demonstrable heart disease. Belhassen was the first to report the characteristic termination of this VT with intravenous administration of verapamil (therefore, it is also called verapamil-responsive VT) [2]. Its exact mechanism is a matter of debate, but appears to be macro-reentry that involves both normal and abnormal Purkinje tissue that is verapamil sensitive [3].

The VT can be acutely treated with intravenous verapamil. Class I antiarrhythmic drugs and β -blockers are less effective [4]. Oral verapamil is also effective in the prevention of recurrences. This patient was free of symptoms for years with β -blocker therapy, although previous reports suggest less efficacy of this treatment in the prevention of recurrences. RF ablation has efficacy rates of 85% to 100% in patients with drug-resistant or incessant idiopathic fascicular VTs or those intolerant to medication [5]. Ruling out structural heart disease or acquired cardiomyopathies such as cardiac sarcoidosis is paramount and can usually be done by echocardiography and MRI. The prognosis of Belhassen's VT is favourable, and sudden death is rare.

In this patient, an electrophysiological study was performed, confirming the diagnosis of a Belhassen's VT. It was easily induced by right ventricular programmed stimulation and successfully treated by RF catheter ablation. The patient remained free of symptoms during 5 months of follow-up.

References

1. Brugada P, Brugada J, Mont L, Smeets J, Andries E. A new approach to the differential diagnosis of a regular tachycardia with a wide QRS complex. *Circulation*. 1991;83:1649–59.
2. Belhassen B, Shapira I, Pelleg A, Copperman I, Kauli N, Laniado S. Idiopathic recurrent sustained ventricular tachycardia responsive to verapamil: an ECG-electrophysiologic entity. *Am Heart J*. 1984;108:1034–7.
3. Nogami A, Naito S, Tada H, Taniguchi K, Okamoto Y, Nishimura S, et al. Demonstration of diastolic and presystolic Purkinje potentials as critical potentials in a macroreentry circuit of verapamil-sensitive idiopathic left ventricular tachycardia. *J Am Coll Cardiol*. 2000;36:11.
4. Mont L, Seixas T, Brugada P, Brugada J, Simonis F, Kriek E, et al. The electrocardiographic, clinical and electrophysiologic spectrum of idiopathic monomorphic ventricular tachycardia. *Am Heart J*. 1992;124:746.
5. Nakagawa H, Beckman K, McClelland J, Wang X, Arruda M, Santoro I, et al. Radiofrequency catheter ablation of idiopathic left ventricular tachycardia guided by a Purkinje potential. *Circulation*. 1993;88:2607.

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