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SPOTLIGHT

Arrhythmia diagnosis using a permanent pacemaker

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Wide complex tachycardia (WCT) is common. The precise diagnosis of the WCT is frequently unknown prior to embarking on an invasive catheter ablation procedure. This knowledge may impact procedure planning. It is not infrequent that some patients with WCT have implantable cardiac devices. Herein, we describe a case of a patient with a left bundle branch block (LBBB) tachycardia, where the precise diagnosis was obtained prior to the invasive electrophysiology study using pacing maneuvers with the patient's implanted pacemaker.

An 88-year-old female with a recent transcatheter aortic valve procedure had a dual-chamber pacemaker inserted for a postprocedure left bundle branch block (LBBB). Postprocedure the patient had recurrent wide complex tachycardia of an LBBB pattern (Figure 1A). During one episode of tachycardia pacemaker, interrogation was performed (Figure 1B). The tachycardia cycle length (TCL) was approximately 430 ms. 1:1 ventriculoatrial (VA) association was persent. In tachycardia, the VA time was relatively long at 89 msec (Figure 1B). Using the temporary pacing option of the device, right ventricular pacing was performed which demonstrated a V-A-V response with a postpacing interval (PPI) of 230 ms. Prolongation of the VA time with pacing (the SA time) occurred and was 276 ms (SA-VA = 189 ms). Tachycardia was consistently induced with the additional atrial extrastimuli (not shown). These maneuvers confirmed the diagnosis of atypical atrioventricular node reentry tachycardia. The diagnosis was confirmed during an invasive electrophysiology study (Figure 1C) and the application of radiofrequency energy in the region of the slow pathway rendered the tachycardia noninducible. The patient has not had recurrent arrhythmia since.

Noninvasive program stimulation using implantable devices can be useful when diagnosing wide complex tachycardia and understanding the hemodynamic status of patients during their arrhythmia.[1,2] Although there are many ECG findings used in the differentiation of SVT, the diagnosis may not be confirmed in the setting of atypical wide complex tachycardia. This case highlights that when available, pacemaker interrogation may be diagnostic thereby allowing one to properly plan an invasive approach.

The presence of atrial and ventricular leads can highlight the AV relationships and assess the response to atrial and ventricular pacing maneuvers. The mechanism of SVT can be established as is traditionally done at the time of an invasive electrophysiology study with this information.[3] This approach can allow for a more wholesome conversation with the patient on the risks and benefits of a procedure and allow an operator to better plan their procedure.

CONFLICT OF INTEREST

N/A

ETHICS APPROVAL STATEMENT

N/A

CLINICAL TRIAL REGISTRATION

N/A

PATIENT CONSENT STATEMENT

Available.

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FIGURE 1 (A) Wide complex tachycardia; (B) Pacemaker interrogation and entrainment maneuvers consistent with atypical atrioventricular nodal reentrant tachycardia; (C) The entrainment maneuvers during an invasive electrophysiology study were compatible with pacemaker interrogation entrainment maneuvers

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