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EP ROUNDS

WILEY

Wide complex tachycardia with negative precordial concordance: All that glitters is not gold

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1 | EGM ROUNDS

A 38-year-old woman with recurrent palpitations and no structural heart disease presented with a documented wide QRS complex tachycardia (WCT) with negative concordance (Figure 1). There was no significant past medical history, and the clinical examination was utterly unremarkable. A standard electrophysiologic study was performed using multipolar-electrode catheters positioned in the high right atrium, His bundle, right ventricular apex, and coronary sinus. Parihisian pacing was compatible with a nodal response. Then, spontaneously, the induced narrow-QRS tachycardia (NCT) (Figure 2) was followed by a WCT (Figure 3), identical to the patient's clinical tachycardia (Figure 1). What is the tachycardia mechanism?

2 | DISCUSSION

A WCT may result from supraventricular tachycardia (SVT) with bundle branch block (pre-existing or tachycardia-related), SVT with atrioventricular conduction over an accessory pathway (AP), or ventricular tachycardia (VT).[1–8] Double tachycardia is uncommon but should always be in differential diagnosis in the presence of CL or QRS morphology change. Three possibilities should be considered: (1) the narrow and WCTs are related to a single mechanism (SVT with transient aberrancy), (2) preexcited tachycardia with ventricular activation over an AP, or (3) an inducing VT.[9–22] The most common explanation for alternating narrow and wide QRS tachycardia with identical heart rates is SVT with alternating bundle branch block.[20]

Evaluation with a 12-lead ECG can support the differential diagnosis of the underlying mechanism, and several ECG criteria have been proposed.[23,24] However, accurate diagnosis of the underlying mechanism of WCTs, based solely on the 12-lead surface ECG, has been considered a rewarding challenge in cardiology.[24] Concordance of the predominant direction of wide precordial QRS complexes is a valuable ECG clue in differentiating between ventricular and SVT. When all ventricular complexes from leads V1 to V6 are positive (positive concordance), the diagnosis is most likely left basal VT or, rarely, SVT with atrioventricular conduction over a left posterior AP. However, the negative concordance is considered diagnostic of a VT arising from the apical area of the left ventricle.[1] However, rare exceptions to this rule have also been reported.[25–28] An abnormal anatomic position of the heart, such as pectus excavatum[28] or

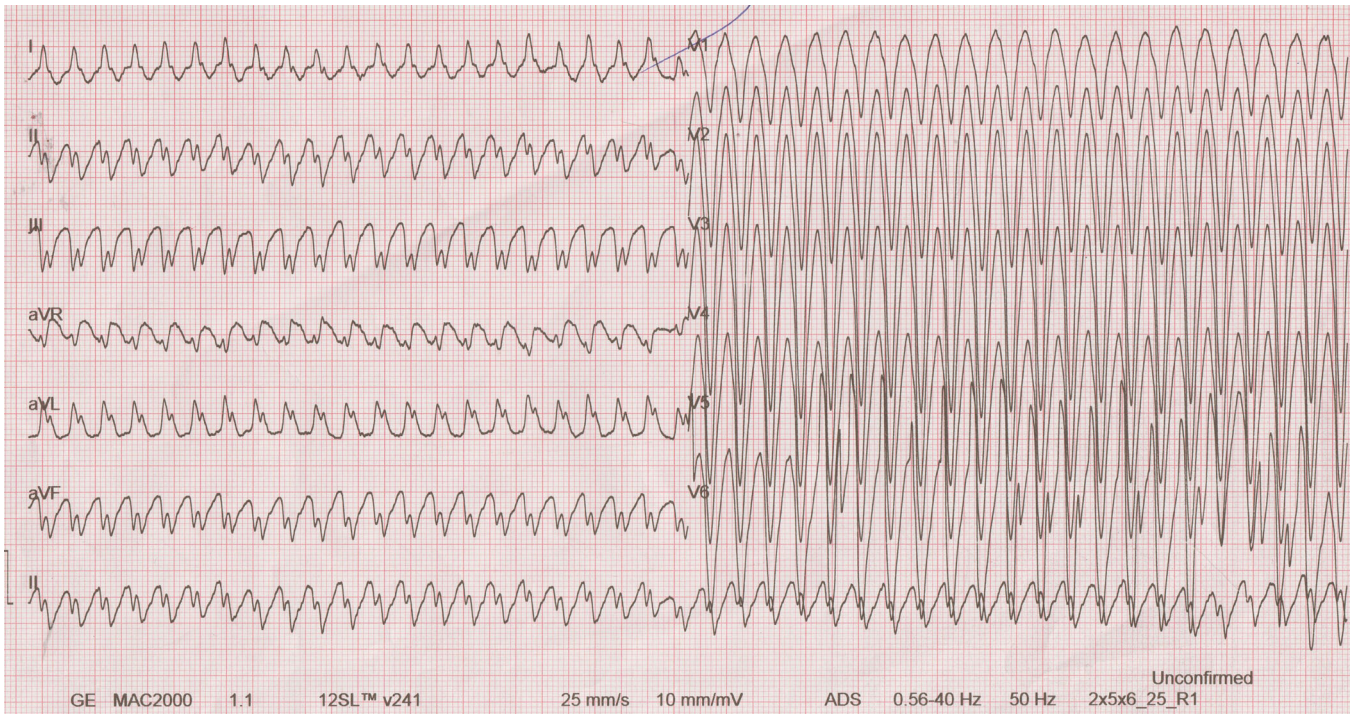

FIGURE 1 12-Lead ECG shows wide complex tachycardia with negative precordial concordance.

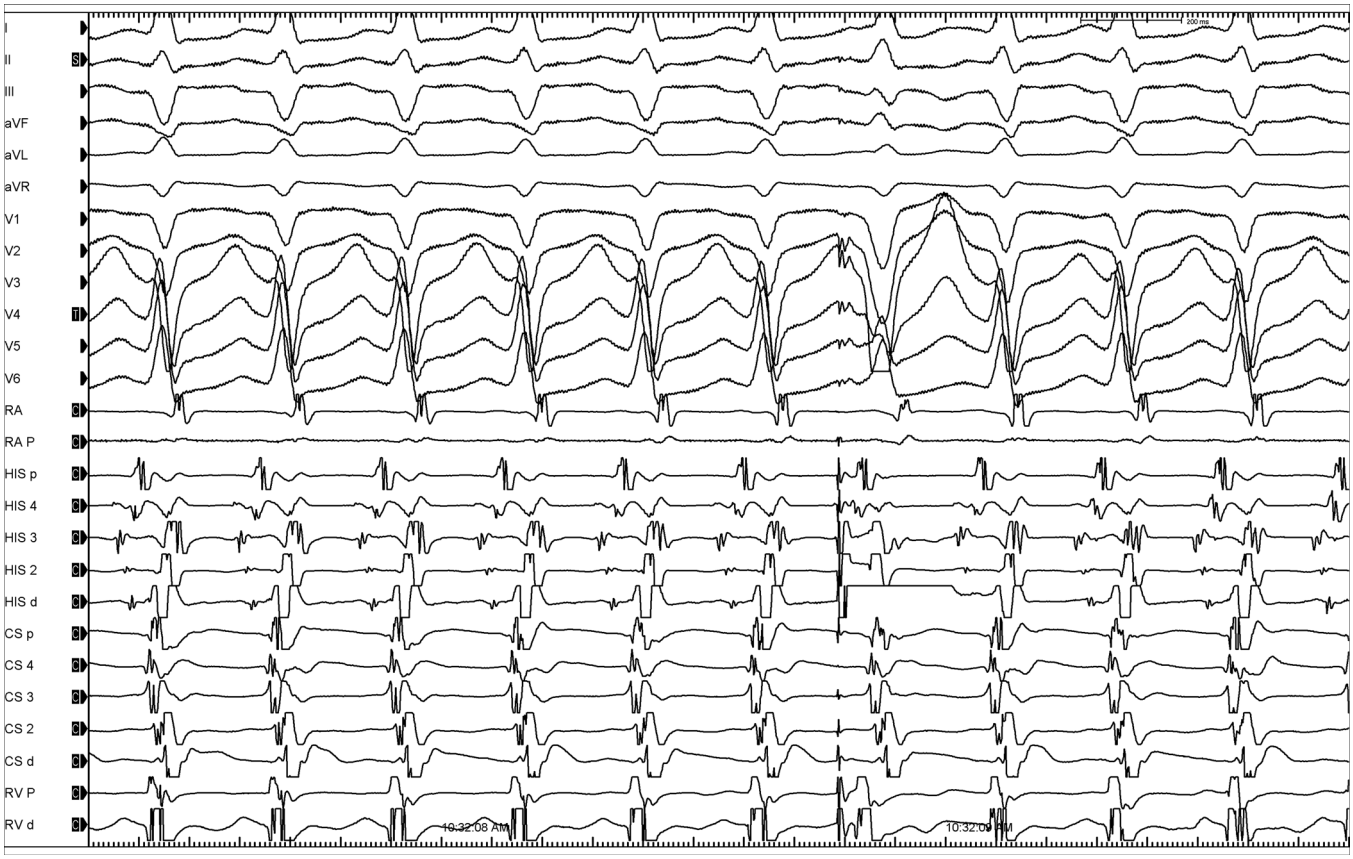

FIGURE 2 A on V tachycardia is seen during an electrophysiological study with an attempt at His refractory ventricular premature beats.

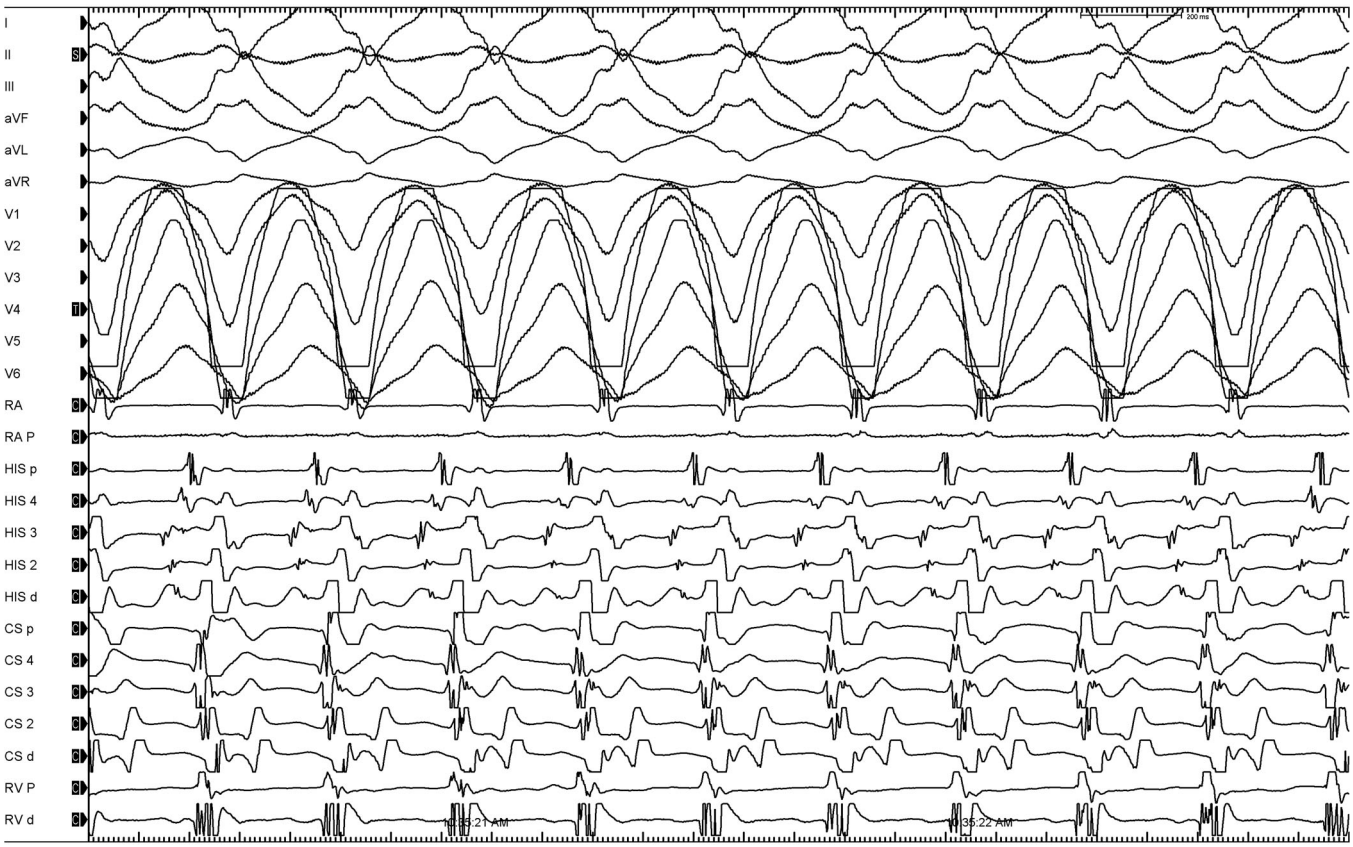

FIGURE 3 A wide complex tachycardia with negative precordial concordance is seen during electrophysiological study.

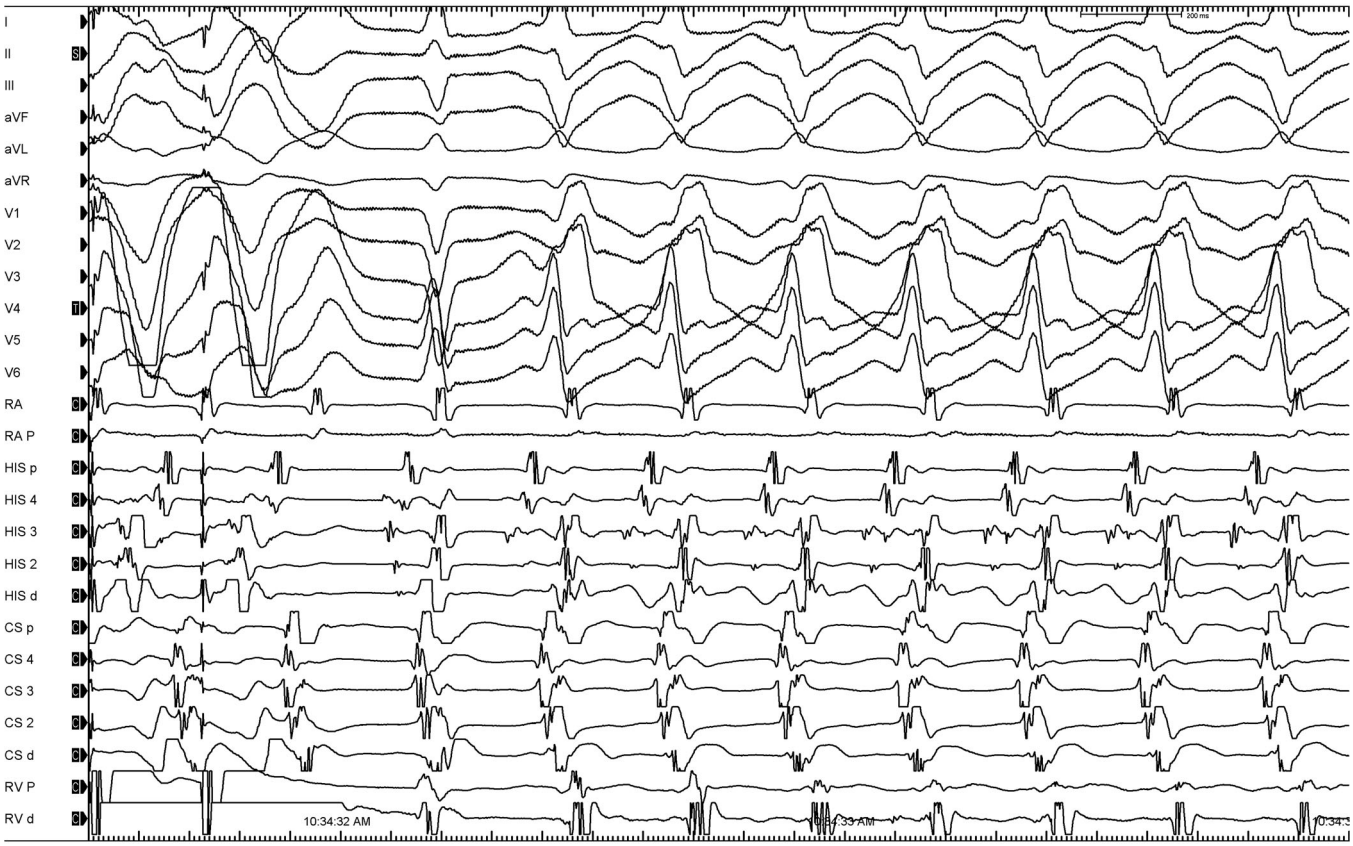

FIGURE 4 A ventricular overdrive pacing induces a wide complex tachycardia.

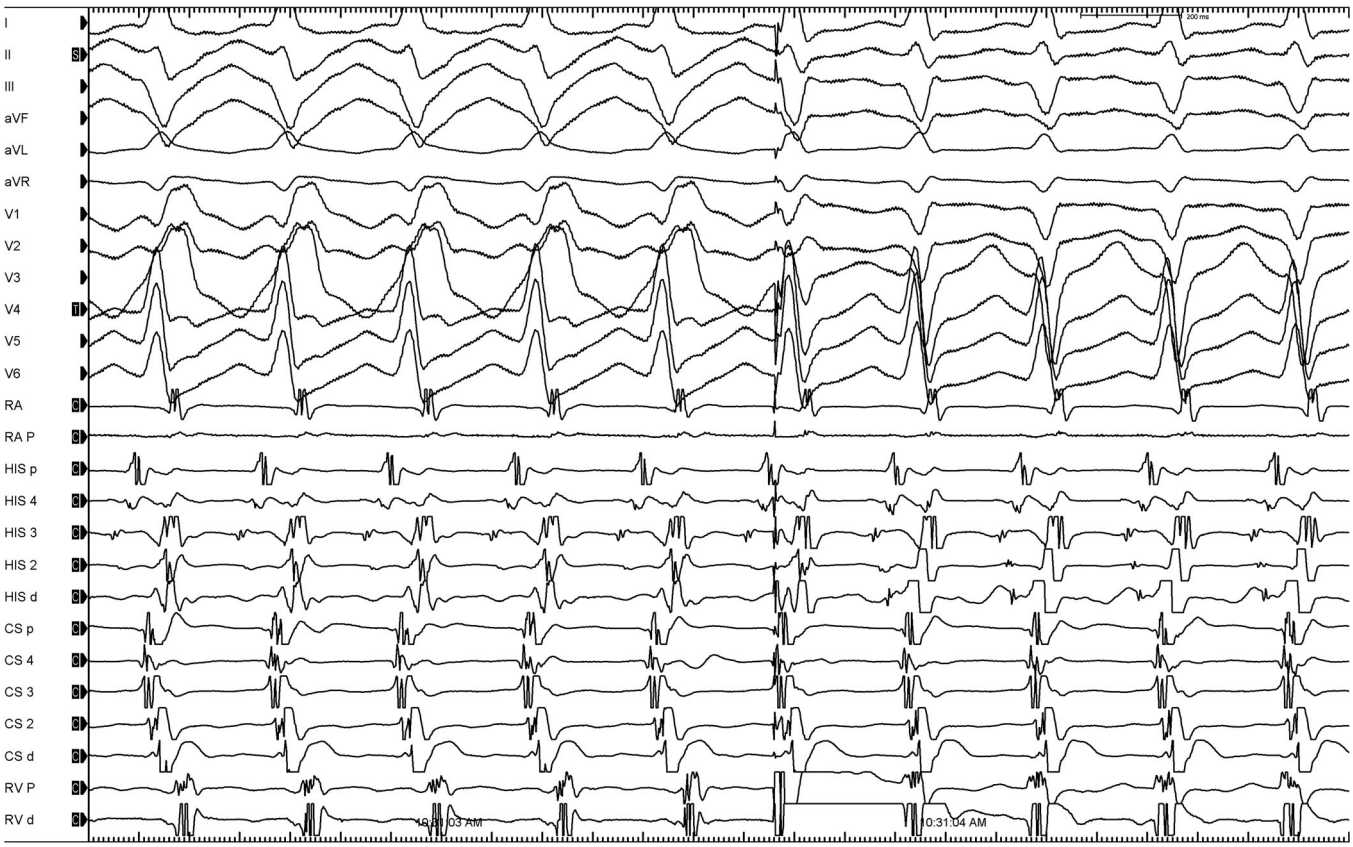

FIGURE 5 A ventricular premature beat causing peeling back refractoriness of the right bundle.

Ebstein anomaly[26] during SVT with left bundle branch block, can lead to negative concordancy in the precordial leads and a false diagnosis of VT. Furthermore, ventricular overdrive pacing revealed another WCT with the right bundle branch morphology and anterior fascicular block (Figures 4 and 5). An additional distal block on the posterior fascicle block might have been an apical exit causing negative concordance. Although initially, the possibility of two distinct types of tachycardias was considered in our present case, the morphology of the clinical WCT (Figure 1) appeared spontaneously without any change in the tachycardia cycle length. Furthermore, a His bundle electrogram preceded all V electrograms without any H–V interval prolongation and any change in the pattern of His sequence (Figure 3). Successful radiofrequency ablation of the slow pathway was subsequently performed. Repeated programmed stimulation, before and after isoproterenol infusion, did not succeed in displaying residual dual AV node physiology and inducing any tachycardia.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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