Brugada ECG Pattern Obscured by Right Bundle Branch Block: How to Resolve the Enigma?

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**Brugada ECG pattern, RBBB, electrophysiology study**

**Figure 1.** (Panel A) 12-lead ECG depicting high degree right bundle branch block (see text for details). (Panel B) 12-lead ECG depicting the “Chiale” maneuver Right apical ventricular pacing during with timed A-V intervals in the fused QRS complexes. Black arrows show classic type 1 Brugada ECG pattern. Upon cessation of pacing, high-degree right bundle branch block reappears (white arrows). ECG = electrocardiogram.

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**Case Presentation**

A 51-year-old Brazilian male patient presented with sporadic palpitations, a structurally normal heart and no evidence of Chagas’ infection (both serological tests complement fixation and enzyme-linked immunosorbent assay indirect immunofluorescence were negative). A 12-lead electrocardiogram (ECG) obtained in 2008 showed a peculiar Brugada pattern (type 1 in lead V1 and type 2 in lead V2). Later in 2013, the patient developed high-degree right bundle branch block.
(RBBB), making the diagnosis of Brugada very difficult, as it could be suspected only in lead V2 (Fig. 1, Panel A) due to the abnormal ST-segment elevation. He was referred to our clinic for help in the diagnosis and management of this case.

Was the Brugada ECG pattern obscured by high-degree RBBB or was transiently absent due to its well-known spontaneous variability?

**Discussion**

An ajmaline test and electrophysiology study were performed. During the ajmaline test (Fig. 2), ST-segment elevation was elicited in the right precordial leads, strongly suggesting the presence of type 1 Brugada pattern.

To elucidate the mechanism of this finding, a recently proposed maneuver\(^1,2\) was performed during an electrophysiology study (we call it “the Chiale maneuver” after Dr. Chiale from the Rosenbaum School from Buenos Aires first described it). It consists of creating fused QRS complexes showing nearly “normal” right ventricular activation by right apical ventricular pacing with appropriately timed A-V intervals. In the fused QRS complexes, a clear ST-segment elevation was obtained in the right precordial leads, still showing a mild degree of incomplete RBBB but depicting a classic Brugada pattern (Fig. 1, Panel B, black arrows). Upon pacing termination, RBBB pattern reappeared (Fig. 1, Panel B, white arrow). During programmed ventricular stimulation, ventricular fibrillation was induced with a single ventricular extrastimuli.

We concluded that the ECG Brugada pattern had been partially masked by the development of RBBB during the follow-up.

The rationale for the performed electrophysiological manoeuvre lies in the fact that in typical high-degree RBBB the final electrical forces of the QRS complex are oriented rightward and anteriorly, giving rise to the final broad R' wave in leads V1 and V2. In these leads, the “normal” ST-T wave is opposed to the main direction of the QRS electrical forces. Thus, the ST segment should be depressed and the T-waves negative. Consequently, a high-degree RBBB may counteract the characteristic ST-segment elevation of the Brugada pattern precluding an accurate diagnosis. Intermittency of RBBB may unveil the diagnosis by suppressing the RBBB with the novel electrophysiological maneuver depicted in Figure 1 (Panel B).

Electrophysiologic maneuvers including an ajmaline test (with backup right ventricular pacing) should be performed in patients with RBBB and high suspicion of Brugada syndrome in order to guide further diagnostic and therapeutic decisions.

**References**
