

Abstract

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3 **(Background)** The appearance of complete right bundle branch block (CRBBB) in

4 Brugada syndrome (BrS) is associated with an increased risk of ventricular fibrillation

5 (VF). The pathophysiological mechanism of CRBBB in BrS patients has not been well

6 established. We aimed to clarify the significance of a conduction delay zone associated

7 with arrhythmias on CRBBB using body surface mapping (BSM) in BrS patients.

8 **(Methods and Results)** BSM was recorded in 11 BrS patients and 8 control patients

9 both with CRBBB. CRBBB in control patients was transiently exhibited by

10 unintentional catheter manipulation (proximal RBBB). Ventricular activation time

11 (VAT) maps were constructed for both the groups. We divided the anterior chest into 4

12 areas (inferolateral right ventricle [RV], RV outflow tract [RVOT], intraventricular

13 septum [IVS], and left ventricle [LV]) and compared activation patterns between the

14 two groups. Excitation propagated to the RV from the LV through the IVS with

15 activation delay in the entire RV in the control group (proximal RBBB pattern). In 7

16 BrS patients, excitation propagated from the inferolateral RV to the RVOT with

17 significant regional activation delay. The remaining 4 BrS patients showed a proximal

18 RBBB pattern with the RVOT activation delay. The VAT in the inferolateral RV was

19 significantly shorter in BrS patients without a proximal RBBB pattern than in control

20 patients.

21 **(Conclusions)** The CRBBB morphology in BrS patients consisted two mechanisms: 1)

22 significantly delayed conduction in the RVOT and 2) proximal RBBB with RVOT

23 conduction delay. Significant RVOT conduction delay without proximal RBBB resulted

24 in CRBBB morphology in BrS patients.