



Left bundle branch re-entrant ventricular tachycardia in septal myocarditis with QRS narrowing after ablation

Alix Lambrecht ^{*}, Martijn Rogiers , Thomas Rosseel , Peter Haemers , Christophe Garweg , and Joris Ector 

Department of Cardiology, University Hospital of Leuven, Herestraat 49, 3000 Leuven, Belgium

*Corresponding author. Tel: +32 494644820. E-mail address: alix.lambrecht@gmail.com

A 42-year-old man with no prior medical history was hospitalized for an initially uncomplicated myocarditis. Two weeks after discharge, he was transferred to our centre in an arrhythmic storm.

Upon presentation, his electrocardiogram showed a broad complex tachycardia with a left bundle branch block (LBBB) pattern very similar to that in sinus rhythm, suggestive of a bundle branch re-entrant ventricular tachycardia (BBR-VT) (Panel A).

Blood results showed no signs of remaining inflammation. The coronary angiogram was normal. Cardiac magnetic resonance imaging performed a week before admission was compatible with active myocarditis with pronounced myocardial oedema in the basal anteroseptal and apical inferior region of the left ventricle and preserved left ventricular ejection fraction.

The ventricular tachycardia (VT) was refractory to all anti-arrhythmic drugs and hence required deep sedation and mechanical ventilation.

Electrophysiological study demonstrated a prolonged HV interval at baseline (81 ms). Despite multiple attempts and the use of an octapolar His catheter with close electrode spacing, it was not possible to obtain a very clear His signal at the proximal His-bundle region. We hypothesize that this finding is due to oedema in the basal interventricular septum. In contrast, the more distal His/right-bundle deflection was clearly visible and preceded the QRS complex during VT by 36 ms (Panel B). Both findings endorse the diagnosis of BBR-VT.

An urgent catheter ablation of the right bundle (RB) was performed during VT, resulting in termination and non-inducibility of the tachycardia. Remarkably, after ablation of the RBB, we observed a transition of his previous LBBB pattern to an RBBB pattern with marked narrowing of the QRS complex from 160 to 128 ms (Panels A and B). This suggests that the block of the left bundle (LB) was previously caused by concealed retrograde penetration after RB activation, but relieved after obtaining a block in the RB during ablation.

Moreover, this is an extra argument that the VT was in fact stopped by ablation of the RB. The ablation of a scar- or fibrosis-related re-entrant circuit would not result in such findings.

Our case thus demonstrates the main hallmarks of BBR-VT, a form of VT that includes both bundles and ventricular septum in its re-entrant circuit. A conduction delay in the His–Purkinje system is necessary to initiate the tachycardia.¹ Interestingly, there was important oedema in the septal region of the left ventricle due to the myocarditis, which could lead to the conduction abnormalities.

Bundle branch re-entrant ventricular tachycardia is a malignant form of VT and usually seen in patients with underlying heart disease.

To the best of our knowledge, this is the first reported case of BBR-VT in myocarditis. A similar case of a patient with an idiopathic cardiomyopathy and BBR-VT with QRS narrowing after ablation was described by Cooper *et al.*²

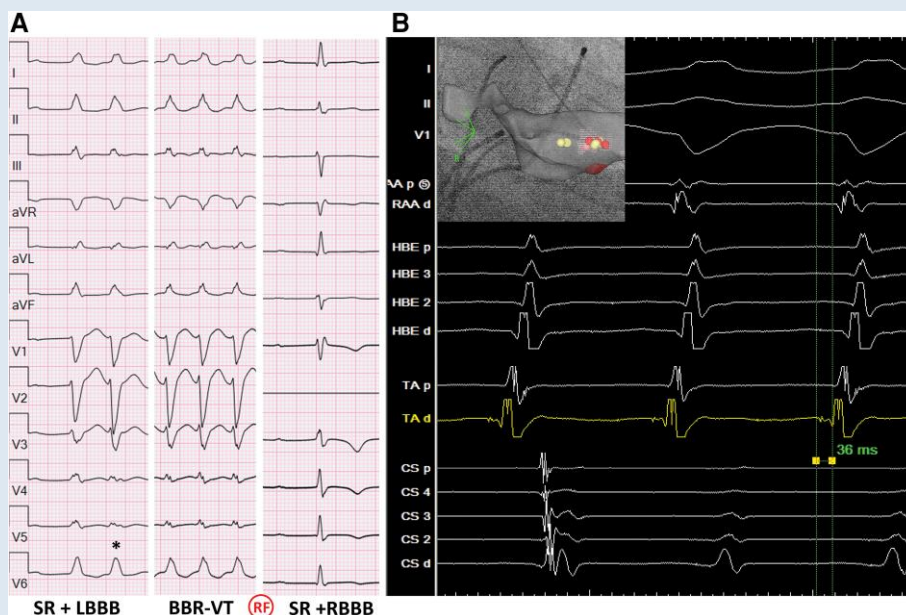
Conflict of interest: None declared.

References

- Voskoboinik A, Gerstenfeld EP, Moss JD, Hsia H, Goldberger J, Nazer B *et al.* Complex re-entrant arrhythmias involving the His-Purkinje system: a structured approach to diagnosis and management. *JACC Clin Electrophysiol* 2020;**6**:1488–98.
- Cooper JM, Soejima K, Stevenson WG. Narrowing of a left bundle branch block QRS after right bundle branch ablation. *Heart Rhythm* 2005;**5**:133.

© The Author(s) 2022. Published by Oxford University Press on behalf of the European Society of Cardiology.

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial License (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com



*Bundle branch re-entrant beat.