Cardiac memory following idiopathic fascicular left ventricular tachycardia

Chan-Il Park, Pascale Gentil, David Carballo, Nam Tran, Simon Monnard, Dipen Shah
Division of Cardiology, Department of Internal Medicine, University Hospital of Geneva, Switzerland

Summary

Cardiac memory (CM), also called Chatterjee phenomenon, is characterised by transient negative T-waves during sinus rhythm on the surface electrocardiogram (ECG). This phenomenon reflects a change in ventricular activation repolarisation induced by prolonged abnormal electrical activation (e.g., cardiac pacing). We report a case of a 28-year-old patient with repolarisation abnormalities due to CM in response to idiopathic left fascicular ventricular tachycardia (IFLVT).

Key words: ablation; cardiac memory; ventricular arrhythmia

Case report

A 28-year-old healthy male without structural heart disease complained of five episodes of palpitations over a 2-year period, which were never documented.

Electrocardiography (ECG) in sinus rhythm soon after spontaneous cardioversion of a palpitation episode lasting for about 15 hours, showed negative T-waves in inferior leads and V4–V6, which were absent on a comparative ECG two years prior (fig. 1A).

An electro-physiological study with programmed stimulation under isoproterenol infusion induced a sustained tachycardia with a right bundle branch block pattern and left-axis deviation compatible with an IFLVT (fig. 1B). The tachycardia was successfully ablated with nine applications of radiofrequency (RF) current in the basal and mid inferoseptal LV segments (fig. 2A, 2B), where a late diastolic potential preceding ventricular activation was recorded (fig. 3). The arrhythmia was no longer inducible and fifteen months after the patient remains asymptomatic. A cardiac magnetic resonance (CMR) the day after the ablation showed subendocardial late gadolinium hyper-enhancement of the inferoseptal wall of LV (fig. 2C), reflecting inflammation following RF energy delivery. The underlying mechanism of IFLVT is thought to be re-entry with a slow conducting area, close to the Purkinje fibre network of the left posterior fasci-
The locations visualised with CMR corresponded precisely to the sites where the tachyarrhythmia was successfully terminated.

The T-waves abnormalities shown in the initial ECG are probably related to abnormal cardiac activation during IFLVT reflecting cardiac memory (CM) [2]; the T-wave vector shows the same direction as the QRS vector during the IFLVT (fig. 1A and 1B). These abnormalities were no longer visible three months after the intervention confirming this hypothesis (fig. 4).

In the differential diagnosis of T-wave inversion in young adults, CM due to tachyarrhythmia must be considered when hypertrophic cardiomyopathy, myopericarditis or cardiac ischaemia have been excluded.

References