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Aborted sudden cardiac death in a patient with implantable loop recorder

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ABSTRACT

We discuss a 46-year-old man with history of hypertension and inferior wall myocardial infarction and mild left ventricular dysfunction who presented with aborted sudden cardiac death due to episodes of ventricular tachyarrhythmia detected by a Reveal-LINQ which had been implanted one year prior to presentation.

1. Case presentation

A 46-year-old man was referred to us for further evaluation after aborted sudden cardiac death. He collapsed suddenly whilst playing hockey. Cardiopulmonary resuscitation (CPR) was performed, the patient regained consciousness a few seconds after defibrillation and then was transported to the hospital.

He had a history of inferior wall myocardial infarction two years prior due to spontaneous dissection of right coronary artery, and controlled hypertension. His medications at the time of his presentation were aspirin, atenolol and ramipril.

The 12-lead electrocardiography (ECG) showed normal sinus rhythm with small Q waves in leads of II, III and aVF as well as normal QRS, PR and QTc intervals which were similar to previous ECGs. In transthoracic echocardiographic study, normal left ventricular (LV) size and mildly impaired LV function [Left Ventricular Ejection Fraction (LVEF) = 45%] due to akinesia of basal inferior wall and hypokinesia of mid inferior wall were demonstrated; there was no new wall motion abnormality in comparison to previous echocardiographic evaluations. Moreover, serum electrolytes levels were normal and serum troponin-c level was only mildly elevated. Selective coronary angiography revealed a healed extensive dissection of right coronary artery (from proximal part to crux) with TIMI flow of 3; the other coronary arteries were normal (similar to the previous coronary angiogram).

One year ago, he had two episodes of palpitation lasted 20–30 seconds accompanied with some vague symptoms including right-sided facial numbness, staring and transient aphasia. He reported no chest pain or syncope at that time. Given his cardiac and neurologic assessments (including Holter monitoring and one-week event recorder) did not reveal any abnormalities; it was decided to implant a loop recorder (Reveal LINQ) for detection of the possible arrhythmia (AF or ventricular arrhythmia).

The Interrogation of the loop recorder after CPR showed three episodes of ventricular tachyarrhythmia diagnosed by the device. The first episode followed a period of sinus tachycardia related to exercise (Figs. 1 and 2). The second and third episodes were ventricular tachyarrhythmias with a cycle length of approximately 200 milliseconds, which were terminated after delivering DC shocks (Fig. 3 and 4).

Since the probability of a new acute coronary syndrome was low, we decided to implant a dual chamber ICD for secondary prevention and remove the loop recorder.

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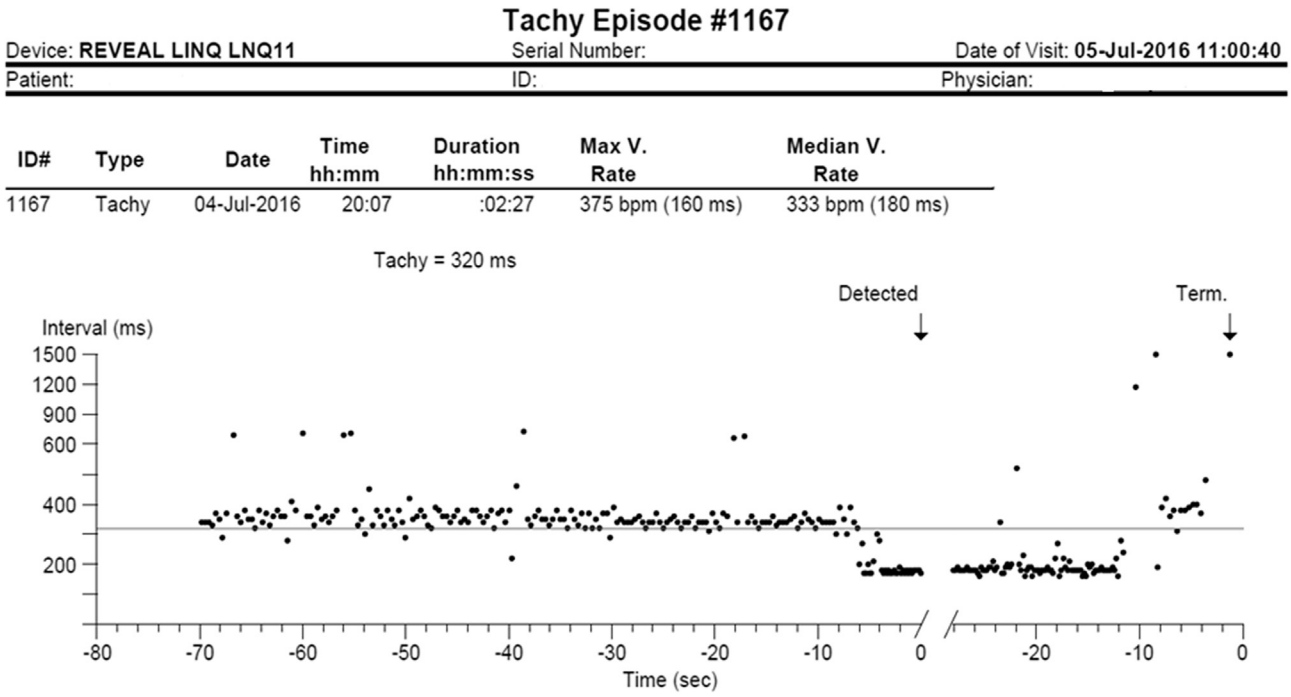

Fig. 1. A tachycardia with cycle length changing between 320 and 400 milliseconds most compatible with sinus tachycardia happened during exercise that suddenly changed to a more regular arrhythmia with cycle length of 180 milliseconds.

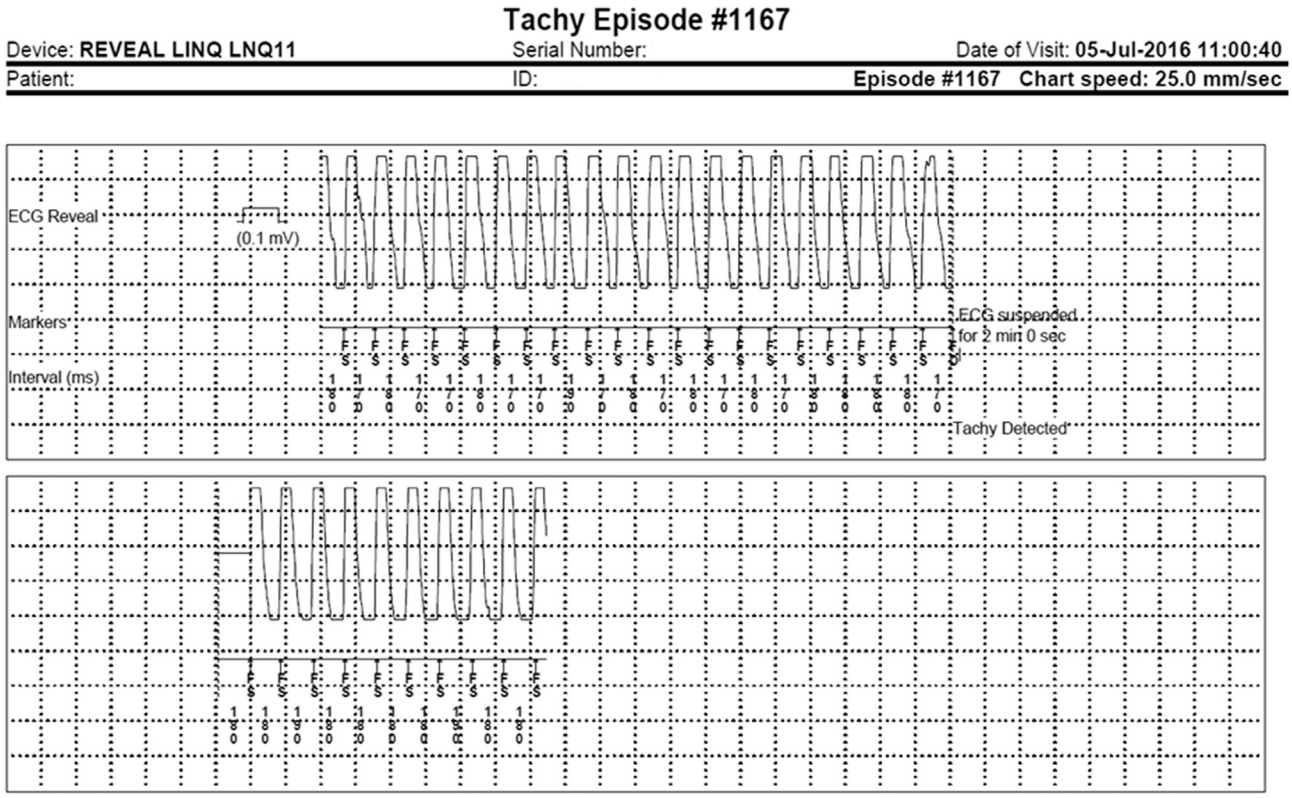

Fig. 2. The morphology of the ventricular tachyarrhythmia detected by loop recorder.

2. Discussion

Compared to a normal population, the mortality rate in patients with ischaemic heart disease is higher. Despite the introduction of several non-invasive methods for sudden cardiac death risk assessment, none of them is perfect. For example using tests like T wave alternans, heart rate variability and signal averaged ECG often is not useful because despite the fact they have a high negative