



Case Report

Early Repolarization Pattern with the Huge and Tall Peaked T Wave as Clinical Suspicious Brugada Syndrome



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SUMMARY

Brugada syndrome (BS) is an arrhythmogenic ion channelopathy, which constitutes a distinct subtype of idiopathic ventricular fibrillation. It is characterized by unique electrocardiographic (ECG) manifestations, including right bundle branch block, ST-segment elevation of coved or saddle-back type, and T-wave inversion in the right precordial ECG from V₁ to V₃ leads, and a high incidence of sudden death from ventricular tachyarrhythmia. Early repolarization (ER) has traditionally been considered a benign entity with ECG characterized by an elevation greater than 0.1 mV of the junction between the end of the magnetic resonance angiography (QRS) complex and the beginning of the ST segment (J point) and a notching or slurring of the terminal portion of the QRS complex followed by a positive T wave. Early repolarization pattern (ERP) has been associated with vulnerability to ventricular fibrillation in independent case-controlled studies. Recently, clinical interest in ERP has been rekindled because of its similarities with BS. Here, we reported a case of a middle-aged male who presented with syncope that unmasked an ECG pattern consistent with diagnoses of both BS and ER, and discussed the variations in BS and the high-risk features associated with it.

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1. Case description

A 47-year-old male was admitted to the emergency department with sudden tightness of the chest, palpitation, dyspnea, foaming at the mouth, and loss of consciousness. An ECG examination revealed ventricular fibrillation, which was terminated by external DC defibrillation.

Physical examination revealed the patient's vital signs to be normal. His body temperature was 36.8 °C, blood pressure was 120/70 mmHg, heart rate was 65 beats/min, and skin was normal without rashes. Heart auscultation revealed normal S1 and S2, without murmurs or gallops. Lung, abdominal, and neurological examinations were also unremarkable. A transthoracic echocardiogram was performed to measure the left ventricular (LV) contractile function and it revealed a structurally and functionally normal heart. The chest X-ray, the computerized tomography (CT) of the chest and brain, and the coronary angiography were all unremarkable. No coronary stenosis or spasms were found.

Laboratory test results were unremarkable, and revealed normal plasma levels of potassium, magnesium, calcium, and C-reactive protein. Repeat cardiac markers obtained every day after admission were negative (Troponin level I [–] and CK-MB 12 U/L [reference 0–25 U/L]). Complete blood count, electrolytes, blood sugar, blood urea nitrogen, and D-dimer were within normal limits.

The patient was healthy, did not have hypertension, and denied any prior symptoms suggestive of arrhythmias (i.e., syncope). There was no family or social history of sudden death or arrhythmias. The patient had two younger brothers, one sister, and two daughters, all in good health and no similar symptoms. The two younger brothers were examined through ECG in the hospital, and showed mild abnormalities.

2. Electrocardiographic measurement

The baseline ECG of the patient showed a sinus rhythm and a normal ECG pattern (Fig. 1).

Immediately after the defibrillation of the VF, the ECG showed sinus tachycardia, with a heart rate of 123 beats/min, and a type-1 Brugada ECG pattern characterized by a coved ST-segment

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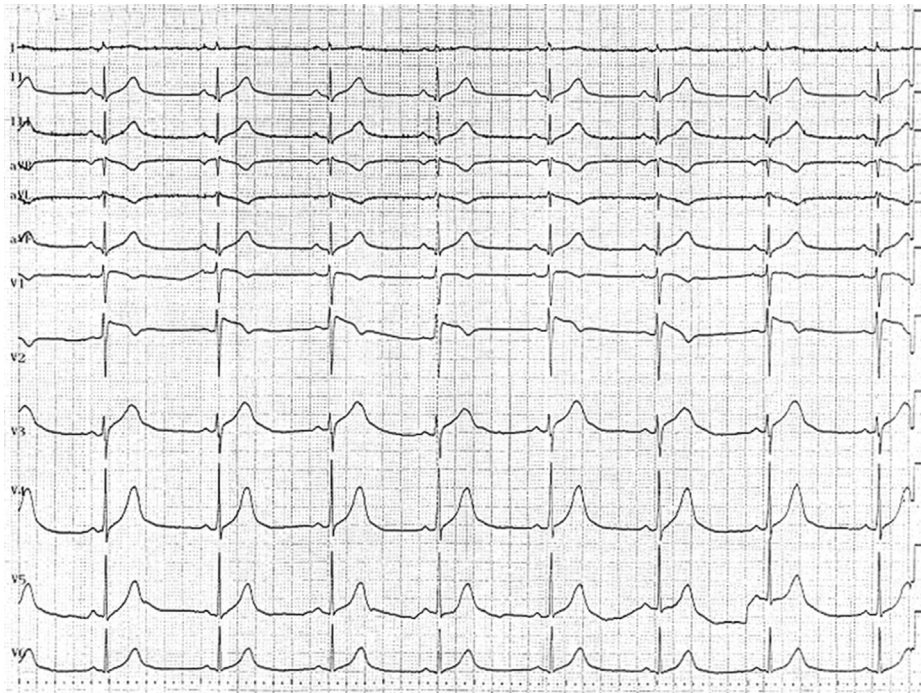


Fig. 1. Sinus rhythm, T wave inversion in the chest lead V1, slight ST-elevation in the chest lead V2, basically normal ECG.

elevation followed by T-wave inversions in V₁ and V₂, a right bundle branch block (rSr', 110 ms), a decreased ST segment in II, III, avF, and V₃ to V₆ leads, a shortened QT interval (260 ms), and occasional ventricular premature beats (Fig. 2).

Four hours after defibrillation of the VF, the ECG (Fig. 3, right) showed sinus rhythm, with a heart rate of 63 beats/min, and an ECG with a Brugada pattern characterized by ST-segment elevation followed by T-wave inversions in V₁ and V₂, a right bundle branch

block in V₂ (rSr', 110 ms), a decreased ST segment in II, III, avF, and V₃ to V₆ leads, and an ECG with an ERP characterized by increased T wave voltage most obvious in the V₄ lead (Rv₄ can reach 2.0 mv) and a normal QT interval (440 ms). One day after defibrillation, the ECG (Fig. 3 left) showed sinus bradycardia, with a heart rate of 58 beats/min. The ECG showed the Brugada pattern and the ERP, with a T-wave bimodal and a prolonged QT interval (520 ms). The ECG was found to be normal on the fourth day after admission.

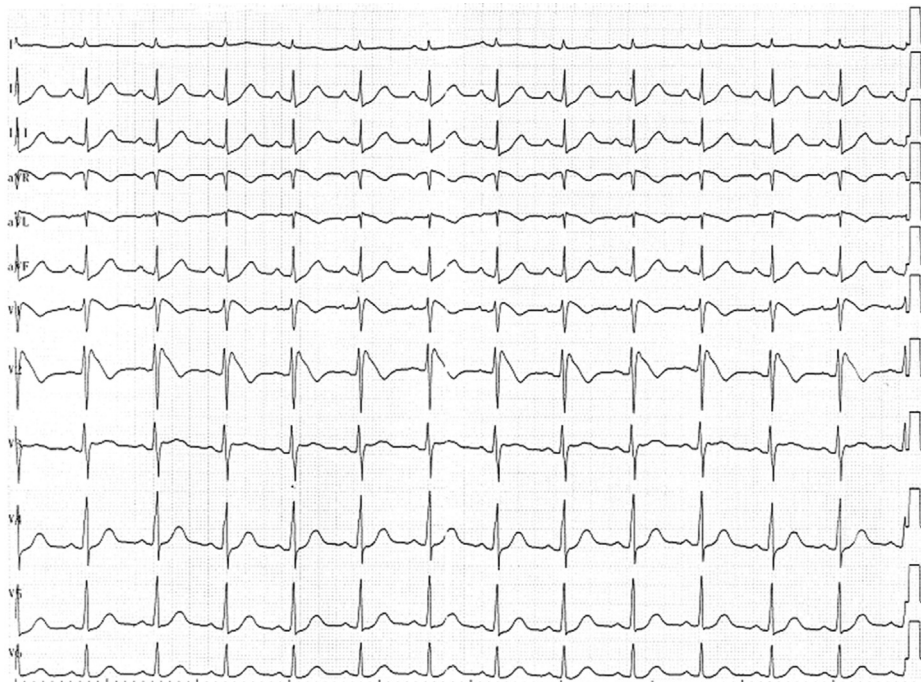


Fig. 2. The ECG of immediate (right) and 50 min (left) after defibrillation sinus tachycardia, type 1 ECG Brugada pattern.

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