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Clinical Images - An Incidental EKG

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CLINICAL IMAGES - The Incidental EKG

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All authors have no conflicts of interest to disclose.

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Abstract

A routine employment stress test reveals Brugada syndrome, a rare abnormality.

Keywords: Brugada, stress testing

A 26 year old Caucasian male presented to the outpatient cardiology testing suite for treadmill stress testing as part of a routine employment examination. He was asymptomatic. He exercised for 10 minutes, achieving a heart rate of 200 beats per minute, or 103 % of predicted heart rate. His baseline EKG was unremarkable, with sinus rhythm and a right bundle branch block (Figure 1). Within 2 minutes of exercise, he developed significant coving ST segment elevation in the right precordial leads, with T wave inversion (Figure 2). These changes reverted to baseline 20 minutes after exercise (Figure 3).

Brugada syndrome is a rare inherited disorder of cardiac channels and is associated with sudden cardiac death. There is no reliable data on prevalence, although there are regional variations, with higher incidence in Asian and Southeast Asian countries.¹ It is inherited in an autosomal dominant fashion. Currently, there are 12 known genetic loci, affecting the sodium and potassium channels.

Three repolarization patterns were described: a) Type-1 ECG pattern, a coved ST-segment elevation ≥ 2 mm is followed by a negative T-wave, with little isoelectric separation, present in 1 or more right precordial lead (from V1 to V3); b) Type-2 ECG pattern, also characterized by a ST-segment elevation followed by a positive or biphasic T-wave that results in a “saddle-back” configuration; c) Type-3 ECG pattern, a right precordial ST-segment elevation ≤ 1 mm with either a coved-type or a saddle-back morphology.² (Figure 4)

The “Brugada syndrome” is diagnosed with typical EKG pattern plus one of the following additional findings: family history; symptoms, including syncope, seizures, or nocturnal agonal breathing; or ventricular arrhythmias. The only currently proven treatment to prevent sudden cardiac death is implantable defibrillator.

A recent systematic review identified only 5 cases of normal resting EKG’s which manifested Brugada pattern during exercise stress testing.³

Our patient was aware of his diagnosis and did have an implanted defibrillator in 2013.

Figure 1 - Baseline EKG showing sinus rhythm with right bundle branch block

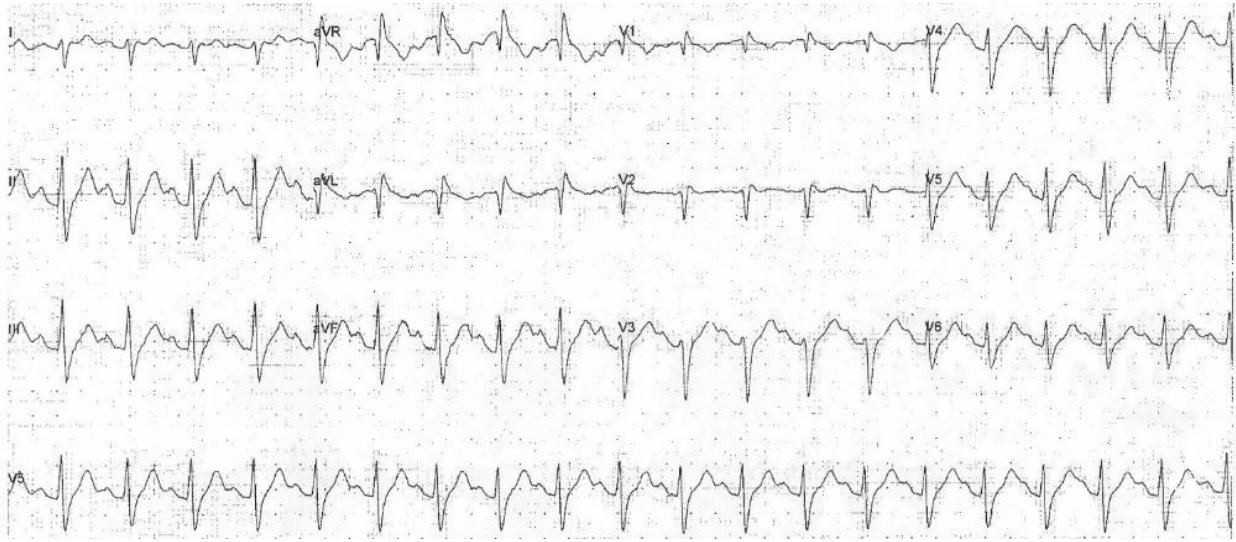


Figure 2 - Exercise EKG shows typical Brugada type 1 pattern, coved ST elevation in V1, V2 with inverted T waves.



Figure 3 - Recovery EKG shows resolution of the Brugada pattern.

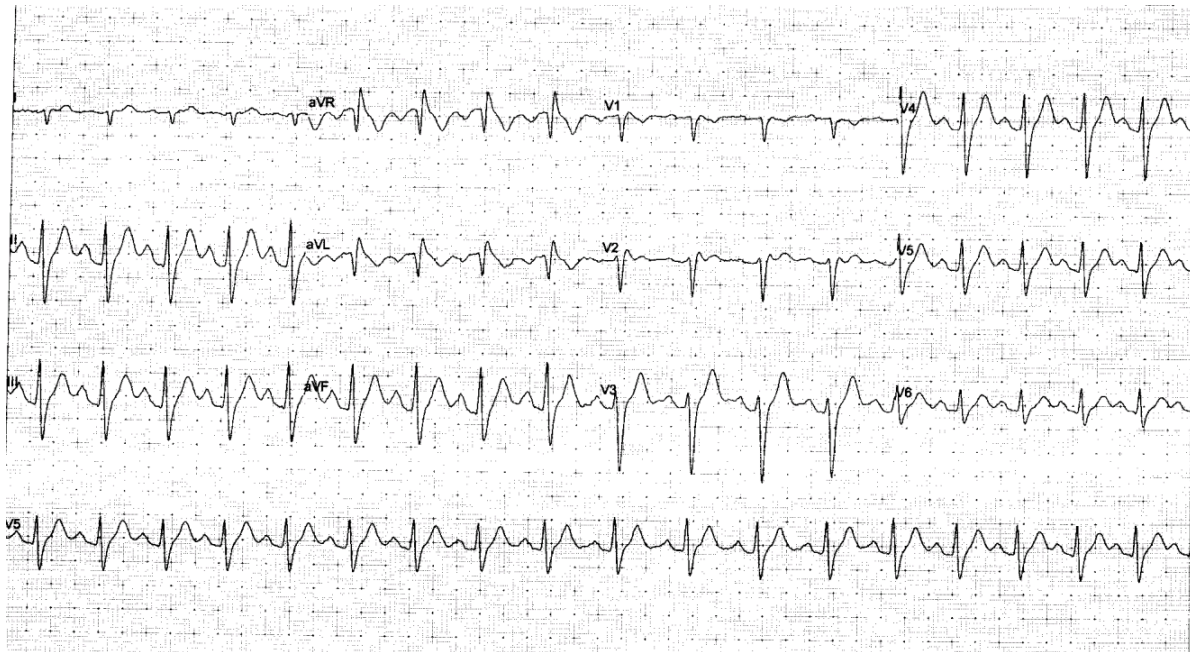
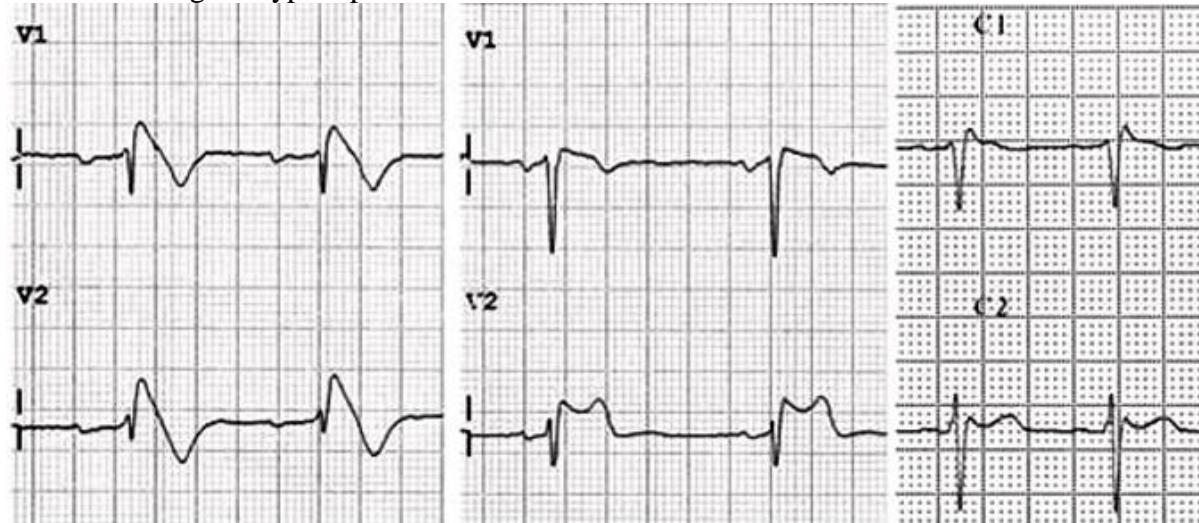


Figure 4 - Brugada Patterns. Left column - Type 1 pattern. Middle image- Type 2 pattern. Right image – Type 3 pattern.



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