

Unusual Cause of ST Elevation

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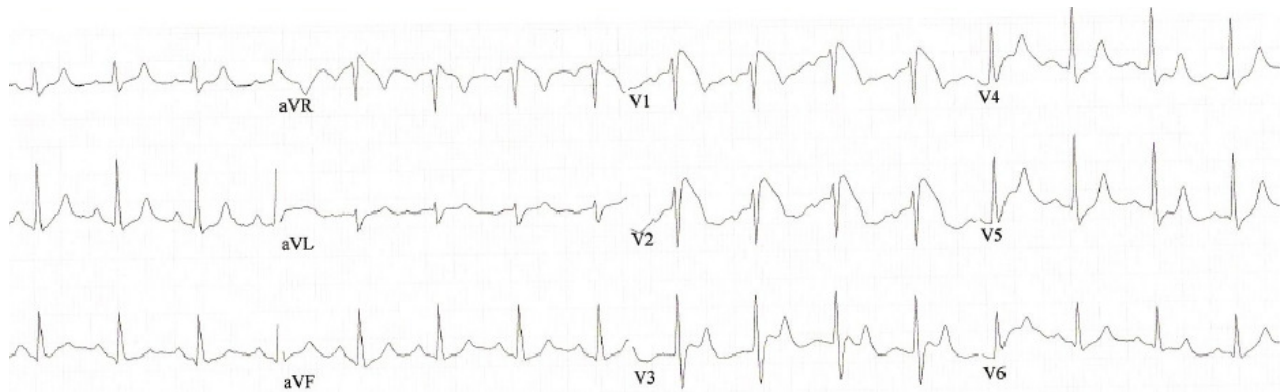
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A 48-year-old woman with a history of major depressive disorder was found unresponsive at home. In the emergency room, no focal neurologic signs were present and computed tomography of the head revealed no acute abnormalities. Serum potassium level was 7 mEq / L and the serum level of tricyclic antidepressants was elevated.

The initial ECG showed:

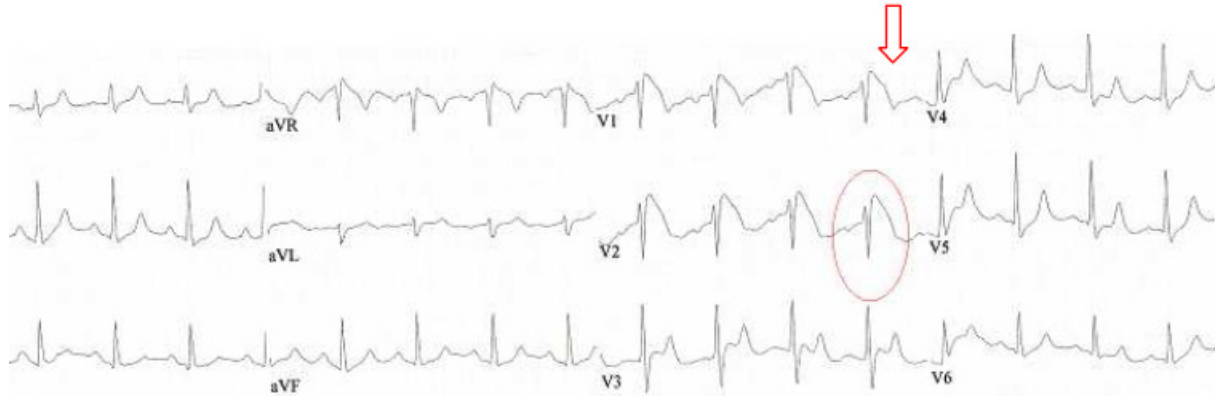


What is the diagnosis?

- A) Acute anteroseptal ST segment elevation myocardial infarction
- B) Ventricular aneurysm
- C) Osborn waves
- D) Right bundle branch block
- E) Brugada-like ECG
- F) Acute pericarditis
- G) Epsilon waves
- H) Normal ECG with early repolarization
- I) Artifact

CORRECT ANSWER: E

Brugada-like ECG is a finding characterized by ST-segment elevation in right precordial leads V1-V3 and accompanied by a right bundle branch block (RBBB) morphology on the ECG.¹

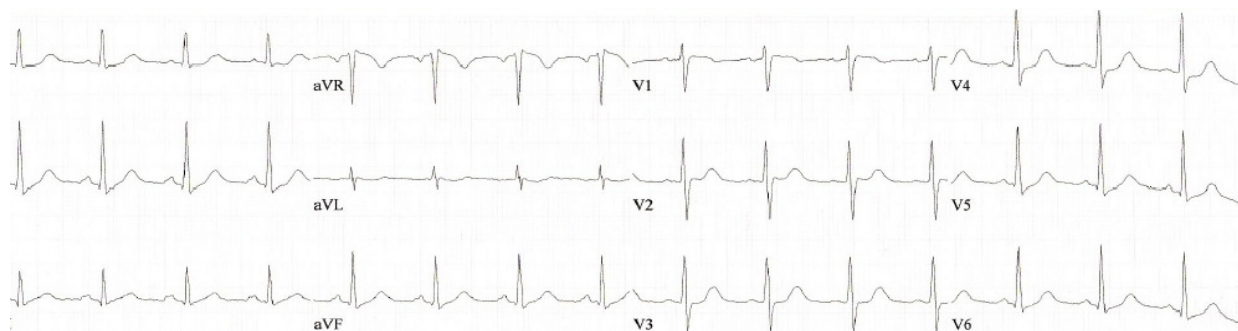


This pattern has been associated most commonly with Brugada Syndrome and also has been associated with certain drug intoxications², such as tricyclic antidepressants (amitriptyline, nortriptyline, desipramine, clomipramine), tetracyclic antidepressants (maprotiline), phenothiazine (perphenazine, cyamemazine), and selective serotonin reuptake inhibitors (fluoxetine), and first-generation histaminic H1 receptor antagonist (dimenhydrinate). In addition, cocaine use and certain electrolyte abnormalities, such as hyperkalemia and hypercalcemia, also can cause the Brugada-like pattern on ECG.²

Brugada syndrome is an autosomal dominant disease³, due to a defect in the cardiac sodium channel that presents with syncope and sudden cardiac death in individuals with healthy heart.² Brugada syndrome is diagnosed when these ECG findings are associated with one of the following criteria⁴:

- A) Documented ventricular fibrillation (VF)
- B) Polymorphic ventricular tachycardia (VT)
- C) Family history of sudden cardiac death at less than 45 years old
- D) Brugada-like ECGs in family members
- E) Inducibility of VT with programmed electrical stimulation
- F) Syncope
- G) Nocturnal agonal respiration

Because of the lack in these criteria, our patient was diagnosed with *Brugada-like ECG*. After correction of the hyperkalemia and treatment of the tricyclic intoxication, the repeated ECG was within normal limits, as shown below.



References

- ¹ Brugada P, Brugada J. Right bundle branch block, persistent ST segment elevation and sudden cardiac death: A distinct clinical and electrocardiographic syndrome. A multicenter report. *J Am Coll Cardiol* 1992; 20:1391-1396.
- ² Francis J, Antzelevitch C. Brugada syndrome. *Int J Cardiol* 2005; 101:173-8.
- ³ Priori SG, Napolitano C, Grillo M. Concealed arrhythmogenic syndromes: The hidden substrate of idiopathic ventricular fibrillation? *Cardiovasc Res* 2001; 50:218-223.
- ⁴ Antzelevitch C, Brugada P, Borggrefe M, et al. Brugada syndrome: Report of the Second Consensus Conference: endorsed by the Heart Rhythm Society and the European Heart Rhythm Association. *Circulation* 2005; 111:659–670.

Keywords: Brugada Syndrome, Brugada ECG pattern, tricyclic antidepressants, intoxication