

Right Bundle Branch Block or Something Else?

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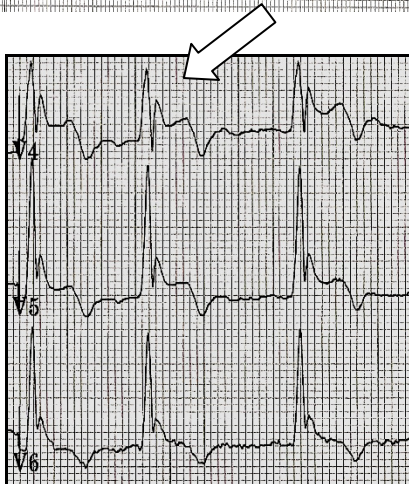
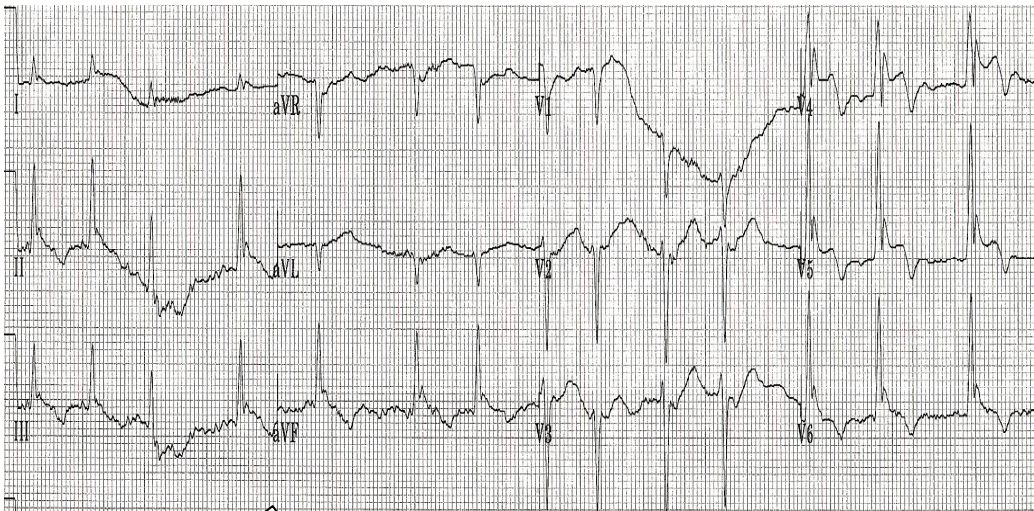
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Case

A 28-year-old male patient with insulin-dependent diabetes mellitus was found lethargic on the garage floor. At the hospital, he was unresponsive to verbal stimuli, his breath sounds were coarse, and his heart sounds were irregular. The admitting diagnosis was diabetic ketoacidosis and sepsis secondary to aspiration pneumonia. A CT scan of the head did not reveal any acute abnormality. Calcium and magnesium levels were normal. His initial ECG is below:



What is the diagnosis?

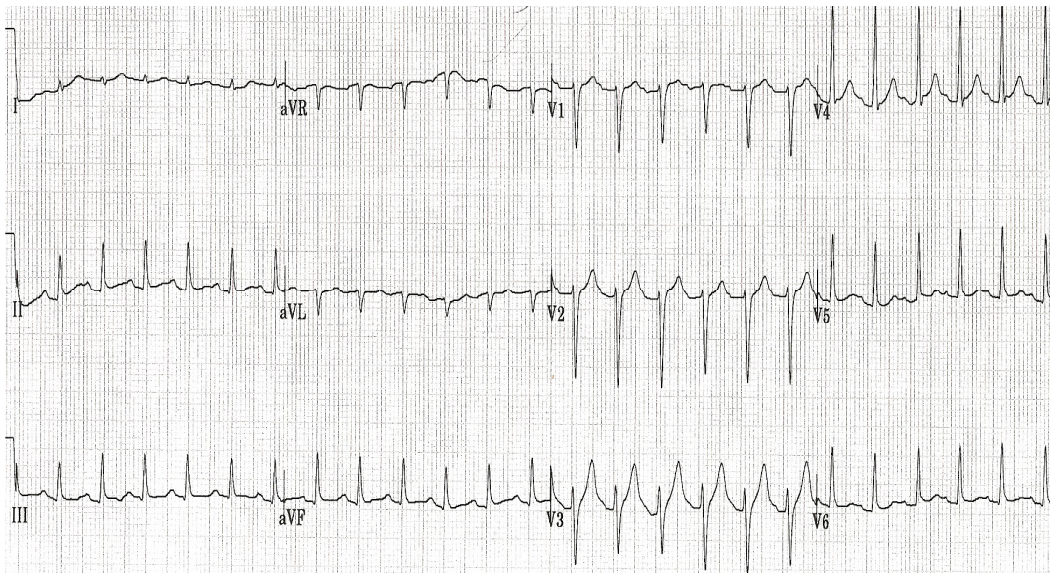
- (A) Right Ventricular Hypertrophy
- (B) Right Bundle Branch Block
- (C) Osborne Waves
- (D) Epsilon Waves
- (E) Wolf Parkinson White Syndrome
- (F) Brugada Syndrome

Correct Answer: C

The Osborn wave (also referred to as the J wave, or camel hump sign) was first described by Dr. John Osborn in 1953.¹ It is a distinctive deflection occurring at the QRS-ST junction of approximately 80% of hypothermic patients.² However, the presence of prominent J waves is not pathognomonic of hypothermia. They have been reported in the literature in normothermic individuals, and in patients with hypercalcemia, subarachnoid hemorrhage, cerebral injuries, and myocardial ischemia.³ The presence of J waves occurs after resuscitation from cardiac arrest, especially in association with ventricular fibrillation.² Very large Osborn waves may mimic right bundle branch block.

Hypothermia increases the epicardial potassium current relative to the current in the endocardium during ventricular repolarization. This transmural voltage gradient is reflected on the surface electrocardiogram as a prominent Osborn wave.

Our case had a temperature of 84 degrees Fahrenheit (29°C) on admission. Active external re-warming using warm blankets was done. The Osborn waves diminished in amplitude and disappeared after 24 hours and spontaneous conversion to sinus rhythm occurred. His ECG after re-warming is shown below:

**References**

- ¹ Krantz MJ, Lowery CM. Giant Osborn waves in hypothermia. *N Engl J Med* 2005; 352:184.
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- ³ Aslam AF, Aslam AK, Vasavada BC, Khan IA. Hypothermia: Evaluation, electrocardiographic manifestations, and management. *Am J Med* 2006; 119:297-301.

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