

# Cocaine-Induced Electrocardiographic Phenomenon

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**A** 27-year-old white man presented at the hospital after recent cocaine use, reporting intermittent left-sided chest pain, diaphoresis, and dizziness. His vital signs were normal; results of physical examination were not noteworthy. Chest radiographic and cardiac enzyme test results were normal. His urine was positive for cocaine. An electrocardiogram (ECG) during a pain-free state revealed findings not present one month earlier: a prolonged QTc interval, new T-wave inversions, and biphasic T waves in leads V<sub>2</sub> and V<sub>3</sub> (Fig. 1, arrows).

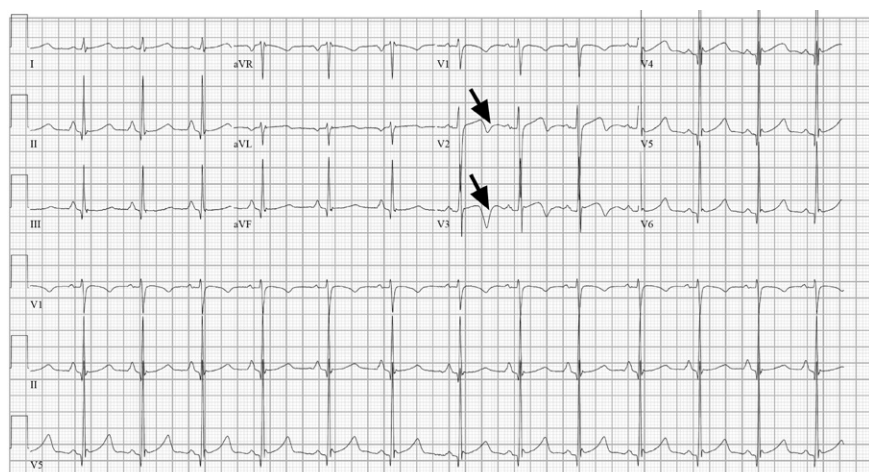


Fig. 1

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A transthoracic echocardiogram (TTE) showed nothing unusual, and a radionuclide myocardial perfusion imaging test revealed no inducible or reversible ischemic changes. At the patient's follow-up visit one week later, the ECG changes had spontaneously resolved.

**Which of the following is associated with these ECG findings?**

- A) Anterior postischemic changes/Wellens syndrome
- B) Aberrant posterior descending artery
- C) Left main coronary artery stenosis
- D) Left circumflex coronary artery stenosis

See next page for the answer, as well as a link to the Focus on ECGs blog, where you can participate in a moderated discussion.

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# FOCUS ON ECGs: ANSWER #16

## Answer

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### A) Anterior postischemic changes/Wellens syndrome

Wellens syndrome, or left anterior descending coronary artery (LAD) T-wave syndrome, has a distinctive pattern in the precordial leads (V<sub>1</sub> through V<sub>3</sub>): an isoelectric or minimally elevated takeoff of the ST segment from the QRS complex, a concave or straight ST segment passing into a negative T wave at a 60° to 90° angle, and a symmetrically inverted T wave.<sup>1</sup> Biphasic T-wave inversion in leads V<sub>2</sub> and V<sub>3</sub> was present in 24% of patients who had a variant of Wellens syndrome.<sup>2</sup> These ECG changes indicate postischemic reperfusion injury, typically related to critical narrowing of the LAD.

Wellens syndrome is associated with cardiac and non-cardiac causes, including drug and medication use.<sup>3</sup> Cocaine users may have ECG changes typical of Wellens syndrome, but as part of a vasospastic phenomenon, without underlying stenosis or reperfusion injury.<sup>4,5</sup> Accordingly, β-blockers should be prescribed cautiously, if at all.

Our patient had normal myocardial perfusion and TTE results, so cocaine-induced coronary vasospasm plausibly explains the ECG changes. Knowing that a

patient uses drugs can help to clinically differentiate true Wellens syndrome from cocaine-associated pseudo-Wellens.

## References

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