ECG CHALLENGE

ST-Segment Elevation in a Patient With Nausea, Vomiting, and Intracerebral Hemorrhage

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ABSTRACT

A 60-year-old man who presented with nausea, vomiting, and intracerebral hemorrhage developed inferior ST-segment elevation and angina. Coronary angiography showed no coronary obstruction. The patient was found to have a small bowel obstruction causing superior translocation of the heart. Relief of obstruction caused immediate resolution of electrocardiographic changes and symptoms. (Level of Difficulty: Beginner.)

What was likely the cause of the ECG findings in Figure 1A?

A) Pericarditis
B) Type 2 myocardial infarction
C) Superior translocation of the heart
D) Increased intracranial pressure
The answer is C, superior translocation of the heart. Figure 1A shows ST-segment elevation in leads II, III, and aVF and reciprocal ST-segment depression in leads I and aVL, findings concerning for inferior wall type 1 myocardial infarction. However, coronary angiography findings were normal.

The ST-segment changes were likely the result of superior translocation of the heart from SBO-induced gastric distention that shifted the mean axis of depolarization relative to traditionally placed ECG leads. Figure 1B shows a superiorly translocated heart, which returned to a normal position.

**Figure 1. ECG and CT Findings**

(A) Electrocardiogram (ECG) during acute worsening of nausea with persistent chest pain. (B) Chest computed tomography (CT) with contrast enhancement: anteroposterior view showing the heart (asterisk) and stomach (arrow). (C) Computed tomography of the abdomen and pelvis without contrast enhancement following gastric decompression showing the heart (asterisk) and stomach (arrow). (D) Electrocardiogram immediately after gastric decompression.
following gastric decompression (Figure 1C). Associated immediate resolution of ECG changes (Figure 1D) suggests that the SBO-induced gastric distention was the cause of the changes. SBO causing ST-segment elevation has been described in a small number of case reports (1-3). In some cases, inferior wall ischemia from extrinsic compression of the right coronary artery has been the proposed mechanism. This was less likely in our patient with normal coronary angiography and mild myocardial injury.

According to the Fourth Universal Definition of Myocardial Infarction, the diagnosis of type 2 myocardial infarction requires a rise and/or fall in troponin. Because there was no significant change in troponin in our patient, answer option B in the foregoing multiple-choice question is incorrect.

Pericarditis (answer option A in the multiple-choice question) is unlikely given the regionality in the ST-segment elevation and the nonpositional nature of the patient’s chest pain.

ST-segment changes in intracerebral hemorrhage are thought to be the result of sustained sympathetic stimulation and a dysfunctional autonomic nervous system. Although this patient had risk factors for increased intracranial pressure (answer option D in the multiple-choice question), repeat cranial imaging was unchanged.

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REFERENCES

1. Parikh M, Amor MM, Verma I, et al. Small bowel obstruction masquerading as acute ST elevation myocardial infarction. Case Rep Cardiol. 2015;2015:685039.
2. Patel K, Chang N, Shulik O, et al. Small bowel obstruction mimicking acute ST elevation myocardial infarction. Case Rep Surg. 2015;2015:739147.
3. Siddique O, Rasla S, Clark S, et al. A case of ileus and ST segment elevation. R I Med J. 2013;99(11):44-46.

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