A Case of ST-segment Elevation on ECG and Gastric Volvulus

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Case Presentation

An 83-year-old woman with hypertension, hyperlipidemia, and dementia presented to the emergency department with abdominal pain, altered mental status described as increased fatigue. Her medications upon presentation included amlodipine, anastrozole, aspirin, and rosuvastatin.

Upon presentation, blood pressure was 138/93 mmHg, heart rate was 111 bpm, respiration rate was 18/minutes, and SpO2 was 93%. Her abdomen was distended and mildly tympanic upon percussion. Decreased breath sounds were noted bilaterally. Cardiac rhythm and rate were regular. Initial labs were notable for potassium 3.3 mmol/L (reference, 3.6-5.2 mmol/L), BUN 39.8 mg/dL (reference, 7.0-25.0 mg/dL), creatinine 2.23 mg/dL (reference, 0.50-1.10 mg/dL), white blood cell count 28.1 10^3/uL (reference, 4.5-11.0 10^3/uL), hematocrit 44.7% (reference, 36.0-51.0%), lactic acid 4.9 mmol/L (reference, 0.3-2.0 mmol/L) and anion gap of 21 (reference, 8-16). Initial high-sensitivity troponin I 131 ng/L (reference, <15 ng/dL) and B-type natriuretic peptide was 680 pg/mL (reference, <100 pg/mL).

ECG showed sinus tachycardia with 5 mm concave ST elevation in inferior leads (II, III, aVF) with reciprocal ST depression in lead V1. Coronary angiography was performed emergently but demonstrated normal coronary arteries.

Transthoracic echocardiogram (TTE) then showed left ventricular ejection fraction of 55-60% and mild regional hypokinesis, but also suggestion of external compression of the left atrium. CT abdomen and pelvis with contrast was then performed, demonstrating gastric dilation, hiatal hernia, and suspected gastric volvulus. An upper gastrointestinal endoscopy confirmed a large hiatal hernia and gastric volvulus. During the endoscopy procedure, 2200 mL of fluid was aspirated from the stomach.

Two days post-procedure, ECG showed resolution of ST changes. Repeat TTE revealed resolution of previously observed regional wall abnormalities and left atrial compression. After treatment of a urinary tract infection, she was discharged home with cardiology follow-up.

Discussion

This case highlights the importance of attention to the entire clinical presentation, laboratory abnormalities, and other diagnostic studies. Myocardial infarction can present with atypical symptoms in the elderly, and obtaining an accurate history is particularly challenging in patients with dementia. Although ST elevation can be concerning for acute coronary syndrome and total coronary artery occlusion, and justifiably was excluded first, other etiologies should be considered.

There remain a few possibilities for the patient's presentation and ECG findings. Coronary compression syndrome can present similarly to an ischemic event. In this patient, ECG abnormalities localized the occurrence to the inferior portions of the myocardium, where the stomach was compressing the heart. This suggests that one possible explanation was compression syndrome where the gastric volvulus came into contact with the heart. The proximity of the stomach and heart that allowed this was a result of the hiatal hernia and gastric volvulus. Ciofani et al, Narala et al., and Rossington et al. have reported similar cases. Narala et al. also hypothesized that extrinsic compression of the coronary vasculature could have caused the ST-segment elevation on ECG.

Pericarditis can also present with chest pain and ST-segment elevation in some cases. Additionally, the patient's presentation with mild pericardial effusion indicates the possibility of her presentation resulting from pericarditis. A previous case has been reported with massive pericardial effusion with similar presentation to this case.

Vasospastic angina can also provide an explanation for this patient's presentation. This syndrome can occur in the microvasculature of the myocardium and cause angina and ST-segment elevation. These diagnostic features are very similar to this patient's initial presentation.

This presentation serves as a pertinent reminder that a ST elevation presentation is not exclusively linked to acute coronary syndrome due to plaque rupture. It is important to appreciate that a broad differential is possible in explaining even common symptom presentations. An in-depth history and careful review of all diagnostic findings allow clinicians to determine possible causes of presentation. However, in patients with dementia or altered mental status, an in-depth history becomes difficult to obtain. This case should serve as a reminder to keep an open mind when evaluating a common symptom presentation.