

# Visual Diagnosis in Emergency Medicine

## CHEST PAIN IMAGING: EXPECT THE UNEXPECTED

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### CASE REPORT

An 86-year-old woman with a history of Crohn's disease and hypertension presented to emergency with acute chest pain radiating posteriorly (pain score 8 out of 10), associated with chest tightness, dyspnea, and cyanosis.

On physical examination, vital signs were: temperature 36.1°C, blood pressure 150/90 mm Hg, heart rate 94 beats/min, respiration rate 16 breaths/min, and oxygen saturation 93% on room air. Pulses were present in all extremities, mildly attenuated on the left arm.

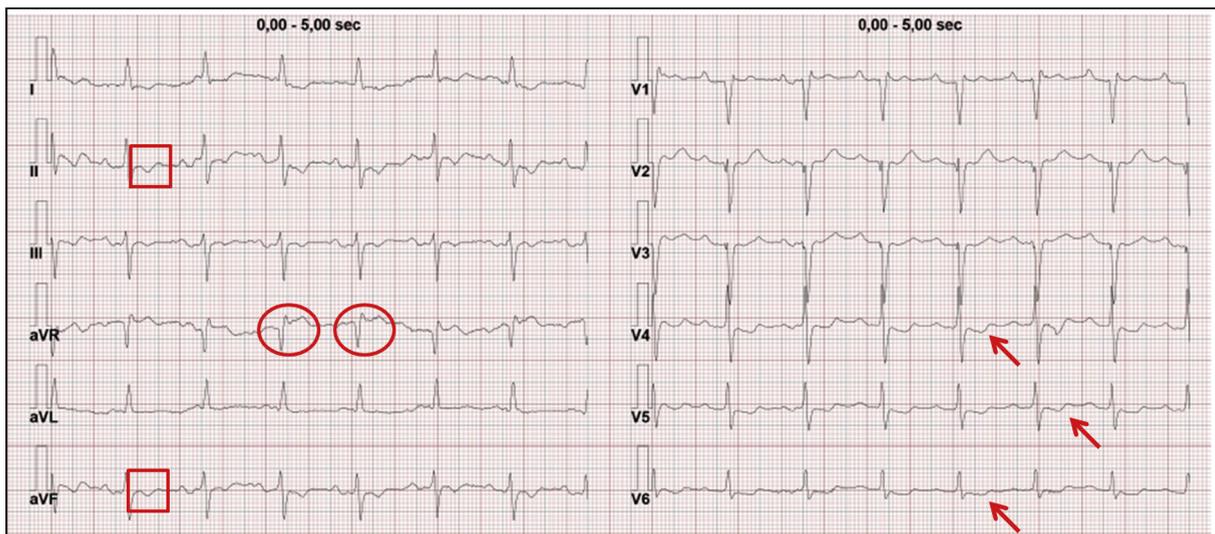
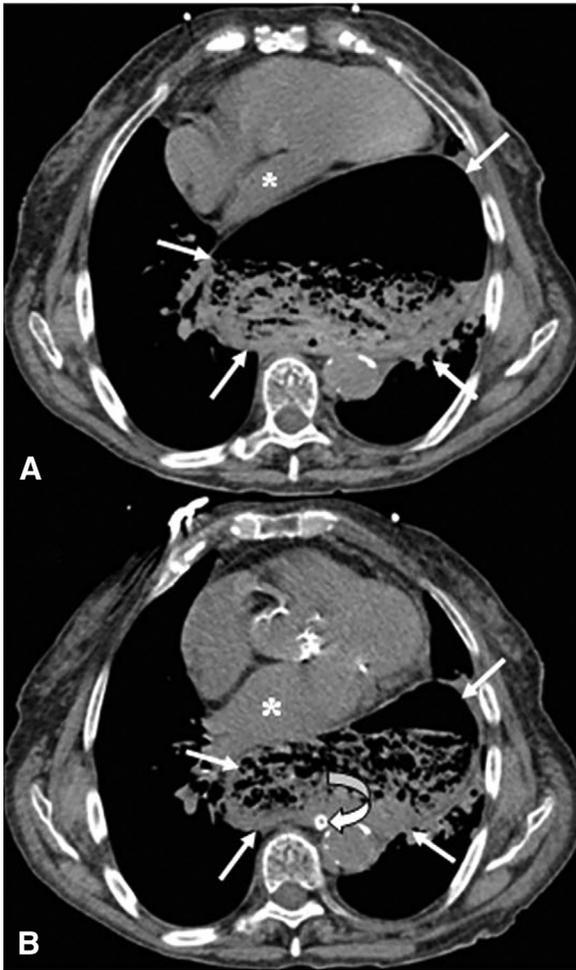


Figure 1. Electrocardiography with diffused ST depression in the lateral leads (red arrows), ST elevation in aVR (red circle), and T-wave inversion in the inferior leads (red rectangle).



**Figure 2.** Computed tomography scan, axial plane. (A) The unenhanced first row of images showed a huge transhiatal gastric hernia (arrows) with a marked gastric distension that compressed the heart, especially the left atrium (\*) and ventricle. (B) After positioning of nasogastric tube (curved arrow), there was reduction of volume of the hernia; the left atrium was not compressed anymore (\*).

Transthoracic echocardiography was performed in the emergency department, without recording images, and showed only mild septal hypokinesia.

Laboratory tests demonstrated increased troponin levels (0.096 g/L; normal range 0–0.046 g/L). Electrocardiography (ECG) revealed diffuse ST depression, ST elevation in avR, and T-wave inversion in the inferior leads (Figure 1).

The pain was not responsive to sublingual administration of nitrates. To rule out possible aortic disease, computed tomography (CT) was ordered.

The unenhanced first row of images showed a huge transhiatal gastric hernia with marked distension of the whole gastric body by retained food and air, causing se-



**Figure 3.** Coronal view of the unenhanced computed tomography scan showed the pyloric region still in the abdominal cavity (curved arrow), with hernia's hiatus recognizable at the level of antral region (arrows).

vere compression on the heart, especially left atrium and ventricle (Figure 2A).

A nasogastric tube was placed in the CT room with immediate, partial resolution of symptoms, in particular of chest tightness and dyspnea followed by reduction in heart rate (83 beats/min). The post-procedural unenhanced CT scan clearly showed a reduction in heart compression (Figure 2B).

The pyloric region remained in abdominal cavity, and gastric outlet obstruction was noted at the antral region, where the stomach passed into the thoracic cavity. No signs of gastric volvulus were detected (Figure 3).

No other pathological conditions were detected at contrast-enhanced, whole-body CT.

Both laboratory and ECG findings normalized after about half an hour.

## DISCUSSION

We herein present a patient with a rare cause of acute chest pain. Usually, pulmonary, cardiac, or vascular pathologies prevail in emergency thoracic settings. Gastric hernias are often asymptomatic or present with gastroesophageal reflux symptoms (1). However, large ones may cause compressive symptoms, such as dyspnea and chest pain from mediastinal dislocation and mass effect on cardiac structures (2,3). Dyspnea is common in patients with large hiatal hernias, and its origin is often misdiagnosed and attributed to patient comorbidities. Recently, the

relationship between the presence of such gastric conditions and respiratory problems has been highlighted and surgical repair is suggested in severe cases (3).

Cardiovascular complications can also occur. Cardiac output can be reduced and, in particular, left atrium, pulmonary veins, and coronary sinus can be compressed. As a result, symptoms such as postprandial syncope can occur due to left atrial volumes reduced after meals (4–7). This may also represent a diagnostic challenge in the emergency setting, because hernia itself could mimic a left atrial mass on transthoracic echocardiography (8).

In the management of acute chest pain, contrast-enhanced CT imaging is usually requested to rule out acute coronary syndromes, pulmonary embolism, or acute aortic diseases, and to address their correct management (9).

However, sometimes, as demonstrated herein, something completely unexpected can occur and uncommon causes of acute chest pain can be revealed.

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