

Case Report

A Rare Presentation of an Acute Type A Aortic Dissection Obscured Due to the Simultaneous Presence of Acute Pancreatitis

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Abstract

Introduction

Acute pancreatitis (AP) and acute aortic dissection (AAD) are medical emergencies that must be promptly recognized to avoid the development of life-threatening complications. Both of these diseases can present with chest or epigastric pain which can radiate to the back, thus, early suspicion based on clinical presentation and risk factors is essential. We present the case of a 56-year-old patient initially diagnosed with AP who was later found to have an AAD.

Clinical Findings

A 56-year-old man with a history of alcohol abuse presented with 1 day of diffuse abdominal pain, nausea and vomiting. His lipase was 3,909 U/L and creatinine was 2.19 mg/dL and he was diagnosed with acute alcoholic pancreatitis with acute kidney injury. A non-contrast computed tomography (NCCT) scan of the abdomen showed aortic calcifications. He received 3.8 liters of fluids after which he developed acute respiratory distress requiring intubation. A workup for extracorporeal membrane oxygenation (ECMO) was initiated, given the suspicion of acute respiratory distress syndrome (ARDS) due to pancreatitis. This revealed an AAD with severe aortic regurgitation on transthoracic echocardiography (TTE). CT angiogram showed type A AAD involving the aortic root, ascending aorta, descending aorta, suprarenal and infrarenal abdominal aorta. The celiac axis, superior mesenteric artery (SMA) and inferior mesenteric artery (IMA) were patent.

Outcomes

The patient underwent type A AAD repair with mechanical aortic valve replacement and survived the acute event. His AP resolved and he was discharged home with appropriate follow up.

Conclusion

We hypothesize that if our patient was not assessed for ECMO, the finding of AAD would have been a diagnostic challenge. AP secondary to AAD is rare but a high index of suspicion is required for diagnosis.

Keywords

pancreatitis; alcoholic pancreatitis; acute pancreatitis; type A acute aortic dissection; dissecting aneurysm; dissecting aneurysm/complications; aortic aneurysm/diagnostic imaging; extracorporeal membrane oxygenation; case report

Introduction

Aortic dissection (AD) is caused by an injury to the intimal layer of the aorta, which creates the formation of an intramural hematoma,

leading to a tear in the aortic wall. Hypertension is considered to be the most important risk factor for AD and is present in about 80% of patients with AD.¹ AD is grouped into two

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major types according to Stanford classification: type A, which affects the ascending aorta and can propagate to the arch and descending aorta, and type B, which involves the aorta distal to the left subclavian artery, sparing the ascending aorta. The International Registry of Acute Aortic Dissection (IRAD) has described chest pain as the most common presenting symptom in patients with type A AD, and back pain was found to be more common in type B AD. However, it is important to note that 4.6% of patients described in this registry presented with acute abdominal pain, which led to higher mortality, likely due to the atypical nature of the presentation.² The presenting complaint may vary and overlap with several other conditions which can pose a diagnostic challenge to the physician.¹⁻⁵ In general, untreated AD of the ascending aorta is highly fatal with a 1–2% mortality rate per hour after symptom onset.^{3,5}

Pancreatitis is one of the rare conditions associated with AD. Acute pancreatitis (AP) classically presents with severe epigastric pain, radiating to the back. A typical clinical presentation, along with elevated lipase or amylase level to greater than three times the upper limit of normal, with classical symptoms of abdominal pain can alone establish the diagnosis of AP, without the need for imaging studies.⁴ It is important to note that both these conditions have several overlapping features, which can mask the diagnosis of AD, leading to increased morbidity and mortality in such patients.

To our knowledge, there are only eleven well-documented cases reported worldwide,⁴ which mostly describe the misdiagnosis of type B AD as AP. This case describes type A AD presented with AP and moreover, how timely imaging studies and proper management proved advantageous in the care of this patient.

Case Presentation

A 56-year-old male with a history of alcohol abuse presented to the emergency department with worsening epigastric pain, chest discomfort, nausea, hematemesis and melena. The abdominal pain was non-radiating and without any alleviating or aggravating factors. Vital signs on presentation were temperature of 97.9° F, pulse of 84 bpm, respiratory rate of 18 breaths per minute and blood pressure of 160/60 mmHg. Except for diffuse abdominal tenderness, initial physical examination was unremarkable. Electrocardiogram (ECG) demonstrated normal sinus rhythm with incomplete right bundle branch block and left ventricular hypertrophy. Laboratory tests were significant for an initial troponin of 0.077 ng/mL, lipase level of 3,909 U/L and creatinine of 2.19 mg/dl. The patient was diagnosed with acute alcoholic pancreatitis with acute kidney injury (AKI). A non-contrast computed tomography (NCCT) scan of the abdomen demonstrated aortic calcifications. The patient developed acute respiratory distress after receiving 3.8 liters of normal saline. On re-evaluation, the patient was in respiratory distress with bilateral inspiratory crackles on auscultation. Arterial blood

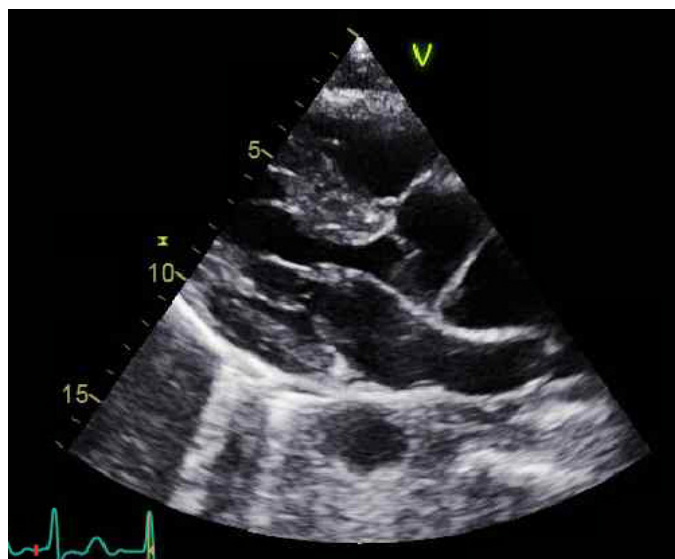


Figure 1. Parasternal long axis view showing dissection flap in the ascending aorta.

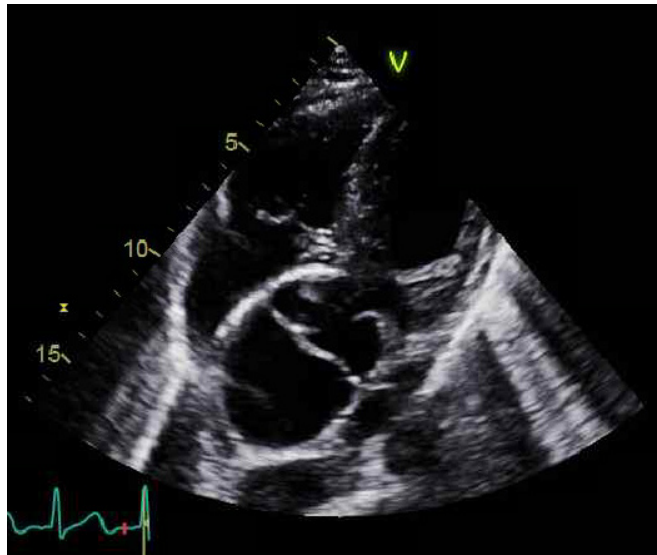


Figure 2. Apical four-chamber view showing dissection flap in the ascending aorta.

gas (ABG) demonstrated respiratory and metabolic acidosis with a pH of 6.89, $p\text{CO}_2$ of 78.8 mmHg, paO_2 of 96.6 mmHg and bicarbonate of 14.9 mM/L. After endotracheal intubation and ventilator adjustments there was marked improvement in the ABG, but preparation for extracorporeal membrane oxygenation (ECMO) was initiated in anticipation of acute respiratory distress syndrome (ARDS) secondary to the pancreatitis. Following this, transthoracic echocardiography (TTE) revealed AAD. (**Figures 1 and 2**) The ejection fraction was 40% and moderate to severe aortic regurgitation (AR) was noted. (**Figure 3**) The regurgitant jet was eccentric and anteriorly directed, suggestive of at least moderate AR.

CT angiogram of the chest was consistent with a type A AAD (**Figure 4**) involving the aortic root, ascending aorta and descending aorta. The CT angiogram of the abdomen showed involvement of the suprarenal and infrarenal abdominal aorta with a patent celiac axis, (**Figure 5**) superior mesenteric artery (SMA) and inferior mesenteric artery (IMA). The patient underwent a modified Bentall procedure and a mechanical aortic valve replacement. He was placed on temporary dialysis due to contrast use during imaging and cardiac surgery-associated acute kidney injury leading to acute tubular necrosis (ATN). He was subsequently extubated and discharged home.

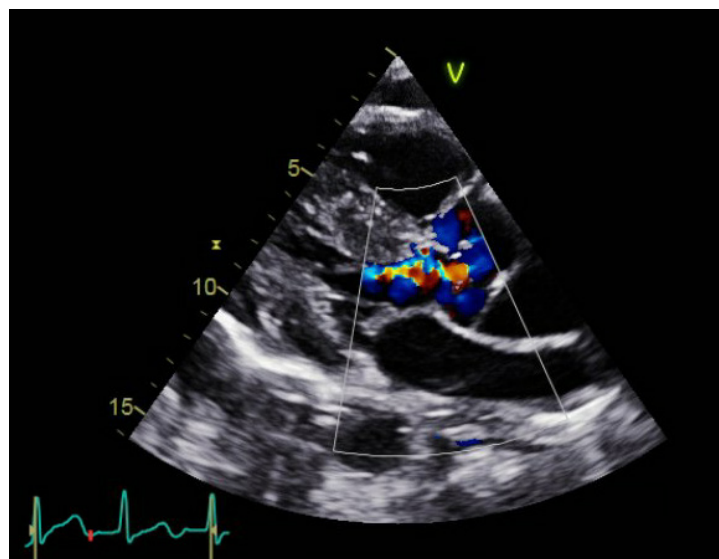


Figure 3. Parasternal long axis view with color doppler showing aortic regurgitation.

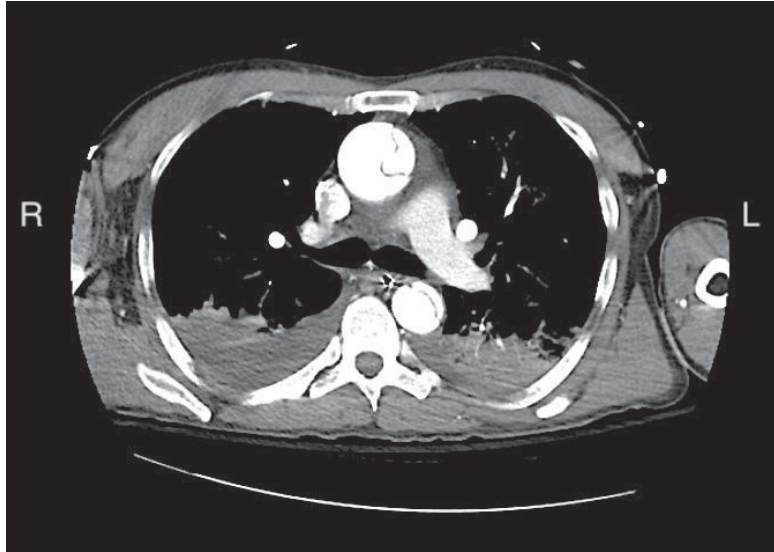


Figure 4. CT angiogram of the chest demonstrating type A aortic dissection involving the ascending and descending aorta.

Discussion

AD is a dangerous medical emergency with a high mortality rate, which can present with a variety of atypical clinical symptoms. In the absence of immediate diagnosis and treatment, acute type A AD initially has a mortality rate of about 1% per hour, and can be fatal for 50% of patients by day 3 and 80% of patients by the end of the second week.⁵

Misdiagnosis of AD is not uncommon. In a retrospective analysis of patients with AD who died unexpectedly, it was found that 26 out of 31 cases were initially misdiagnosed as acute myocardial infarction, coronary artery disease,

cholecystitis, acute gastroenteritis, renal/urinary lithiasis or acute pancreatitis.⁶

Due to anchoring bias and other cognitive biases, there may be a failure to diagnose AAD in a timely fashion.⁷ This can have very deleterious consequences. Given the mortality rate in type A AD, it is even more necessary to diagnose it earlier in the course of hospitalization. Fatima et al. discussed two fatal cases of type A AD with atypical initial presentations of multi-organ failure, gastrointestinal bleeding and transient ischemic attack-like symptoms.⁸ Multiple factors could play a role and may include aortic rupture, severe acute AR, pericardial tamponade and cerebral and coronary malperfusion.⁹

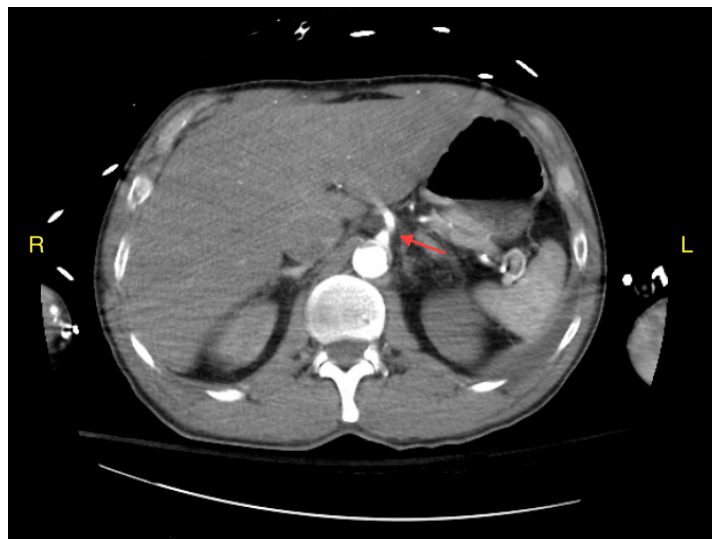


Figure 5. CT Angiogram of the abdomen demonstrating patent celiac artery (arrow).

Physical examination can supplement the clinical suspicion of AD to a certain extent. However, it is important to note that IRAD has stated that only 40% patients with type A AD had the characteristic diastolic murmur of aortic insufficiency at the time of presentation.² Another study done by Hamirani et al. concluded that the AR murmur was only detected in 16-67% patients with AD.¹⁰ In our patient, despite the presence of severe acute AR, no murmur could be appreciated on the physical exam. It is also possible that the murmur may have been missed as the early diastolic murmur of acute AR is softer and shorter compared with that of patients with chronic AR.¹⁰ The use of TTE can be helpful in determining the presence of acute AR. Incidental diagnosis of AD on imaging is rare but has been previously reported.^{2,11,12}

CT scan with contrast is the imaging modality of choice in acute scenarios and has a high sensitivity and specificity ranging around 98–100%.¹³ NCCT is not adequate for the diagnosis of AAD.⁵

Hypoperfusion due to AD, ischemia reperfusion injury and cholesterol embolism from the dissected aorta have been speculated to be causes of pancreatic necrosis in previous case reports.^{14,15} It is unclear if alcohol abuse or a complication of AD led to the development of pancreatitis in our patient.

Conclusion

An AD can mimic a variety of other cardiovascular and non-cardiovascular conditions. A high index of clinical suspicion is required for diagnosing type A AD.

Abbreviations

AP - Acute pancreatitis
AAD - Acute aortic dissection
NCCT - Non-contrast computed tomography
ECMO - Extracorporeal membrane oxygenation
ARDS - Acute respiratory distress syndrome
SMA - Superior mesenteric artery
IMA - Inferior mesenteric artery
IRAD - International Registry of Acute Aortic Dissection
AKI - Acute kidney injury
TTE - Transthoracic Echocardiography
ECG - Electrocardiogram

ATN - Acute Tubular Necrosis
AR - Aortic regurgitation

Conflicts of Interest

The authors declare they have no conflicts of interest.

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