

# Acute Pancreatitis Induced by Acute Type A Aortic Dissection: A Case Report

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## ABSTRACT

Acute aortic dissection can present with a variety of complaints. We present a case involving a man who complained of sudden upper abdominal pain and vomiting 12 hours ago. He was initially diagnosed as acute pancreatitis based on his history and blood work but on computed tomographic scan, also was found to have a Stanford type A aortic dissection. His dissection and pancreatitis was managed medically including tight blood pressure control and protease inhibitor administration. But the patient died of a cardiac arrest 14 hours later.

**Key words:** acute pancreatitis; acute type A aortic dissection.

## INTRODUCTION

Acute pancreatitis (AP) is a common and multifactorial disease that can be caused by various factors including alcohol consumption and cholelithiasis.<sup>1</sup> But in rare cases, pancreatic ischemia was found to be another important independent causal entity of AP.<sup>2</sup> Pancreatic ischemia could be caused by aortic dissection (AD), since in AD, the layers of the media are separated by a column of circulating blood with variable proximal and distal extension throughout the length of the aorta, resulting in malperfusion of the pancreas that supplied by the aortic branches. Herein, we report an unusual case of AP associated with acute type A AD. The patient was initially diagnosed as AP based on symptoms and elevated amylase level.

## CASE REPORT

A 47-year-old man was admitted to our Emergency Department (ED) with sudden upper abdominal pain

and vomiting that started 12 hours before admission. He denied consumed alcohol heavily just prior to the onset or gallstone disease before. He had chronic hypertension for 3 years but he did not take antihypertensive drugs regularly. He had not experienced any cardiovascular disease before, and his family history was unremarkable. His initial vital signs were documented as follows: blood pressure, 215/88 mm Hg; heart rate, 66 beats per minute; SpO<sub>2</sub>, 98% on room air; respiratory rate, 20 breaths per minute; and temperature, 37.1°C. His pulses were equal bilaterally in all extremities. The only significant physical finding reported from the physical examination was minimal epigastric tenderness on palpation. Blood work revealed an elevated lipase reading of 643 U/L. The primary diagnosis was acute pancreatitis and medical management including administration of a protease inhibitor, antibiotics, maximum fluid replacement, and bowel rest, in addition to treatment for controlling blood pressure. A computed tomography (CT) was offered to confirm the diagnosis and evaluate possible complications arising from pancreatitis. In addition to edematous enlargement change of the pancreatic parenchyma (Figure 1), it also revealed an acute type A aortic dissection which extended from the aortic root to the common iliac artery (Figure 2). The true lumen was extremely narrow because of the compression of the false lumen. The superior mesenteric artery, celiac trunk and the left renal artery were supplied from the false lumen.

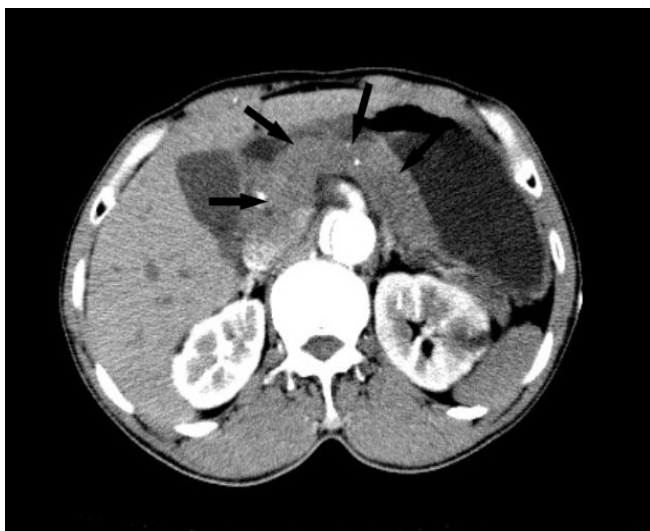
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**Figure 1: CT demonstrates edematous enlargement of the pancreas as pointed by the black arrows.**

We corrected our diagnosis of this case as acute pancreatitis associated with acute type A aortic dissection, based on the symptom, elevated serum amylase level and CT images. Both the patient and his relatives were informed of the necessity for emergent surgery, but they refused to give consent. The above conservative therapy was continued, but his general status became worse and he died of a cardiac arrest 14 hours later. Emergency thoracentesis then revealed the presence of bloody pleural effusion.

## DISCUSSION

We have described a rare clinical case of AP induced by acute AD. We made the diagnosis based on the following findings: 1) the patient presented with sudden upper abdominal pain and vomiting, 2) the concentration of serum pancreatic amylase was more than three times above normal, 3) the CT scan revealed edematous change of the pancreatic parenchyma and the major vascular that supply the pancreas arose from the false lumen, suggestive of hypoperfusion of the pancreas, 4) the patient did not drink prior to the disease onset and had no sign of gallstones.

AP is defined as an acute condition presenting with abdominal pain and is usually associated with raised pancreatic enzyme levels in the blood or urine as a result of inflammatory disease of the pancreas. The most common risk factors for AP are gallbladder disease (often caused by cholelithiasis) and chronic alcohol consumption.<sup>3</sup> Rare causes include metabolic disorders like hypercalcemia or hyperlipidemia, as well as drug side effects or autoimmune disorders.<sup>2</sup> However, it is uncommon for



**Figure 2: CT demonstrates the extended dissection from the aortic root to the common iliac artery as indicated by the black arrows.**

an acute AD to cause AP, and only a few case studies have reported this association.<sup>4,6</sup> AD can affect the visceral arterial blood flow to the pancreas, causing ischemic pancreatitis and releasing lipase as a stress enzyme.<sup>6</sup> Another pathophysiology was described by Hamamoto.<sup>5</sup> In this report, he speculated that the ischemia/reperfusion (I/R) injury mechanism was responsible for the initiation and progression of AP, because the pancreatic circulation was not fully damaged by the AD.

The clinical presentation of AD is diverse since dissection is a dynamic process that may occur anywhere within the aorta.<sup>7</sup> Abdominal pain is reported by up to 30% of patients with all types of dissection, a higher percentage of all of those patients get diagnosed with a Stanford type B dissection.<sup>7</sup> As AD has a prognosis highly dependent on time course, loss of time due to misdiagnosis of this process as a primary abdominal disease can lead to an increase in mortality. Among the most imaging tests, computed tomography (CT) is the most common initial assessment tool for the diagnosis of AD by its high sensitivity and specificity.<sup>7,8</sup> It is also recommended to be performed early in the course of AP to exclude alternative diagnosis or assess the severity of pancreatitis.<sup>9</sup> Abdominal ultrasound is a cheap, readily available, and easily portable for bedside application tool for the evaluation of pancreatitis, and it

also has a sensitivity of 87-98% in detecting gallstones.<sup>1</sup> However, it is of limited value for diagnosing AD. Other diagnostic modalities, e.g. magnetic resonance imaging (MRI), and digital subtraction angiography (DSA), are not the first choice due to their time-consuming or invasive disadvantages.

Most patients with Type A aortic dissection require emergency surgical intervention, especially for those with limb or visceral ischemia.<sup>10</sup> In our case, the patient denied surgery and died of a cardiac arrest despite of tight blood pressure control and additional supportive care. We speculated that the cause of his death was the sudden rupture of AD, because haemothorax was discovered by emergency thoracentesis.

### CONCLUSION

AP is a rare complication of AD. When assessing a patient with pancreatitis, AD should come to mind especially when common etiological factors were not found.

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### CONFLICTS OF INTEREST

There are no conflicts of interest.

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