

The importance of clinical suspicion in the diagnosis of a successfully managed case with De Bakey Type 1 acute aortic dissection: A case report

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ABSTRACT

Type 1 aortic dissection is a catastrophic clinical entity originating from the ascending aorta. Clinical suspicion in patients with epigastric pain, chest pain and gastrointestinal symptoms might be life saving. Aortic dissection and acute mesenteric ischemia might be confusing in diagnosis of patients with epigastric pain, chest pain, gastrointestinal symptoms and high white blood cell count and D-dimer. In this case report of a patient who was admitted to the emergency room with a presentation resembling acute mesenteric ischemia, this diagnosis was excluded within the first 24 hours as a result of clinical suspicion. In this case report, the successful management in diagnosis and treatment of a 30-year-old male patient with type 1 aortic dissection is discussed in light of the literature.

Key Words: Aortic dissection, chest pain, acute mesenteric ischemia

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INTRODUCTION

A 30-year-old male patient who presented to the emergency service with complaints of epigastric pain, diarrhea and nausea was admitted to the general surgery service with a diagnosis of acute mesenteric ischemia, however, his further evaluation and analysis revealed a Type 1 aortic dissection. In this case report, the successful diagnosis and treatment of the patient within 24 hours was presented after obtaining informed consent, together with review of the literature.

Type 1 aortic dissection is a catastrophic clinic entity, arising from the ascending aorta. The perioperative mortality is approximately 22%. Overall in-hospital mortality for Type 1 dissection is around 30%. Delay in diagnosis increases the hourly mortality rate by 1% (1). Acute mesenteric ischemia is another fatal vascular emergency requiring early diagnosis and intervention, with a mortality rate of 60%-80%. Its clinical presentation is nonspecific. It manifests with severe abdominal pain incompatible with physical examination findings (2-4). If the diagnosis of acute mesenteric ischemia is not made 24 hours after the onset, survival decreases from 50% to 30% (5).

Clinical suspicion in patients presenting with epigastric pain, chest pain, nausea and vomiting might be life-saving (6).

CASE PRESENTATION

A 30-year old, 95 kg, male patient presented to the emergency department with complaints of severe pain and tenderness in the epigastric region. He also had diarrhea that started on the same day. His medical history revealed treatment for spontaneous pneumothorax, and a rheumatologic disorder that was not regularly followed-up. His neck, arms and fingers had an elongated look and had pectus excavatum, with a general marfanoid appearance. His blood pressure was 95/38 mmHg, and heart rate was 95 beats/min. On physical examination, the abdomen was slightly distended with increased bowel sounds and epigastric abdominal tenderness. There was no rebound tenderness or guarding. The rectal examination was normal.

The complete blood count showed WBC count of 15.300/ μ L. The biochemical analysis was normal except for a slight elevation of ALT and total bilirubin levels. The patient's SpO₂: 81%, and his arterial blood gas result was pH: 7.47, PCO₂: 31.5 mmHg. The D-dimer level was 469.5 ng/dL. The aortic arch was evident on chest X-ray. His abdominal ultrasonography was normal, and the abdominal Doppler ultrasound detected patent mesenteric vessels. Due to the chest x-ray findings a thoracoabdominal computed tomography



Figure 1. The false lumen view on CT in De Bakey type 1 aortic dissection

was requested. There was no obvious pathology in the abdominal computed tomography, however the thoracic CT detected aortic dilatation reaching up to 40 mm and an intimal flap at the level of aortic arch, ascending aorta and descending aorta (compatible with Stanford Type 1 dissection) (Figure 1). There was bilateral pleural effusion, reaching up to 40 mm in the right and 11 mm in the left hemithorax. Compressive atelectatic areas in the basal segments of the right lobe were observed. On echocardiography, dissection flap in the aortic root and 3o aortic insufficiency was detected. During follow-up, the patient's arterial blood pressure began to rise. Nitroglycerin infusion and beta-blockers were started as antihypertensive treatment. The patient was operated urgently. ECG, pulse oximeter and from invasive blood pressure monitoring from the left radial artery were provided. Following preoxygenation, via a 20-gauge IV cannula, co-induction with 0.1 mg/kg midazolam, 3 mg/kg of thiopental sodium and 1 mcg/kg remifentanyl IV bolus was performed, muscle relaxation was ensured with 1.2 mg/kg rocuronium bromide and the patient was endotracheally intubated with a No. 8.5 tube. A 9F dialysis catheter was applied from the right internal jugular vein and a 16-gauge IV cannula was inserted into the left antecubital vein. Arterial blood pressure control was achieved with infusions of remifentanyl, esmolol and perlinganit. Anesthesia maintenance was provided with 1 MAC sevoflurane in 50% O₂ -air mixture.

An arterial cannula was inserted from the proximal right brachial artery to the subclavian artery for systemic and selective cerebral external cardiopulmonary bypass after adequate heparinization. With midline sternotomy, right atrial venous cannulation, retrograde cardioplegia cannula, and left ventricle sump were introduced. In appropriate conditions, cardiac arrest was achieved by switching to cardiopulmonary bypass. The patient was cooled to 20°C, the brachiocephalic and left common carotid arteries were clamped simultaneously providing simultaneous selective cerebral circulation (5-10 cc/kg/min). The aortic cross-clamp was removed and it was observed that there was no tear into the false lumen in the aortic arch and its distal segment. The onset of aortic arch was replaced with no 28 dacron graft with teflon supports. The arterial cannula was placed in the graft and the lower end of the graft was clamped thus systemic arterial circulation was transferred from the brachial region to the ascending aorta region.

In the aortic root, the dissection width included the coronary ostia area, and a wide transverse rupture was detected. Due to the preoperatively identified 3^o aortic insufficiency, the leaflets were protected and the second portion of the dacron graft was replaced with the aortic root, then the coronary ostia were reimplanted. The selective cerebral perfusion time was 19 minutes, the aortic cross clamp time was 205 minutes, and the total perfusion time was 145 minutes. The operation was completed after achieving hemostasis. Two units of whole blood, 3 units of packed red blood cells, 5 units of fresh frozen plasma and 3 units of platelet infusion were performed. After nine hours of surgery, the patient was followed in the intensive care unit, in an entubated state with pentothal and remifentanyl infusions. He was extubated after achieving hemodynamic stability on the first postoperative day. He neither required a reoperation for either bleeding or any other reasons, nor developed neurological complications. Urine output and all the vital parameters were within normal limits, and he was transferred to the ward on the 2nd postoperative day, and was uneventfully discharged on the 7th postoperative day.

DISCUSSION

Aortic dissection and rupture most often develops secondary to atherosclerosis and hypertension. It can also occur for traumatic and non-traumatic reasons (1). Aortic dissection is more common in patients with Marfan syndrome, Ehlers-Danlos syndrome, Turner syndrome, and those with transforming growth factor receptor mutations than the normal population (6). In this case, although there is no definitive diagnosis, the patient's clinical presentation was marfanoid.

Patients with aortic dissection usually present to the emergency department with a sudden onset chest pain and cardiovascular collapse (7). In these cases, neurological and gastrointestinal symptoms may also occur (7, 8). Patients with acute aortic dissection might be misdiagnosed as pulmonary embolism or acute coronary syndrome that shares the same symptoms. Major bleeding that might develop due to anticoagulation increases in-hospital mortality by causing hemodynamic instability (1, 9, 10). Studies state that 31-39% of acute aortic dissections are initially misdiagnosed (1). In a retrospective study by Chua et al. (6), the possibility of misdiagnosis in patients with aortic dissection was higher in patients without a pulse difference and widening of the mediastinum on chest X-ray. In our case, the patient's complaints were epigastric pain and sudden onset diarrhea. The patient's sudden onset, severe abdominal pain that was not parallel to the vague abdominal examination findings and elevations in white blood cell and D-dimer levels have lead us to differential diagnosis of acute abdomen, especially mesenteric ischemia (11). Conventional abdominal ultrasonography viewed the intra-abdominal organs as normal and cholecystitis was excluded. The lack of serious abdominal examination findings, absence of free air on plain abdominal X-ray and absence of intra-abdominal free fluid on ultrasonography have ruled out gastric perforation, malpositioned acute appendicitis and atypical diverticulitis. The absence of intra-abdominal fluid on ultrasonography and normal pancreatic amylase levels helped us exclude acute pancreatitis.

Mesenteric ischemia was excluded by visualization of mesenteric vessel patency on Doppler ultrasound and abdominal computed tomography. The diagnosis was made by thoracic computed tomography and an emergency surgery was planned. Ruling out mesenteric ischemia and making the correct diagnosis of aortic dissection is a life-saving step, since the anticoagulant treatment for mesenteric ischemia might markedly increase the mortality in patients with aortic dissection (1, 9, 10).

Repair with the hybrid technique using intra-luminal stent is not widely accepted in repair of Type 1 aortic aneurysm rupture (12, 13). Although repair with intraluminal stent can be achieved without increasing morbidity and mortality, the cardiopulmonary bypass and total circulatory arrest time is increasing. Spinal cord ischemia, mesenteric ischemia and malperfusion syndromes are the most feared complications of this technique (12-14). Although only a few studies are available, it is reported that by causing early thrombosis of the false lumen it decreases the possibility of formation of thoraco-abdominal aneurysm therefore reducing the rate of reoperation (12, 13).

Advanced imaging techniques and early preoperative diagnosis thorough history, appropriate surgical treatment and careful perioperative anesthesia and intensive care follow-up is life saving in the management of patients who developed life-threatening type I aortic dissection (15).

CONCLUSION

Although the clinical outcome in patients with acute aortic dissection depends on various factors, the key in the management of acute aortic dissection is clinical suspicion that will lead to this diagnosis.

Informed Consent: Written informed consent was obtained from the patient who was presented in this case.

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