ATYPICAL PRESENTATIONS OF AORTIC DISSECTIONS: A CASE SERIES

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ABSTRACT

Objective: This study aims to explore the atypical presentations of the Acute Aortic Dissection among the patients who admitted to Emergency Department.

Methods: This is a single centre retrospective review conducted over a 3-year period (April 2010 to April 2013). Records with a diagnosis of ‘dissection of aorta’ (International Classification of Diseases, Tenth Revision code I71.0) from the hospital discharge database and hospital death register were selected.

Results: A total of 43 patients were included in the analysis during the study period, of which 8 (18.6%) had atypical presentation. This rate is higher than literature datas.

Conclusion: The rate of Acute Aortic Dissection with atypical presentation is higher than literature datas, and it should always be considered by Emergency Physicians.

Key words: Aortic Dissection, Atypical aortic pain.

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Introduction

Acute Aortic dissection (AAD) is a rare, life threatening condition with a worldwide mortality rate of 3.2 per 100 000 people, per year. It commonly presents initially with the acute onset of severe chest, abdominal or back pain⁴. It is a part of acute aortic syndrome⁵. Dissection is a dynamic process that may occur anywhere within the aorta⁶. The primary tear is usually more than 50% of the circumference of the aorta⁴. And it is usually perpendicular to the long axis of the aorta in the intimal layer⁴. The tear exposes the degenerated media layer to the forces of blood pressure. A longitudinal tear then occurs in the media layer of the aorta, now connecting the media with the aortic lumen and redirecting the flow of blood⁶. This blood under pressure creates a cleavage plane within the media, extending the longitudinal tear⁶. Risk factors can be divided into two mechanisms⁷: direct mechanical forces on the aortic wall such as hypertension, hypervolemia, and derangements of aortic flow and factors that affect the composition of the aortic wall itself such as connective tissue disorders or direct chemical destruction⁸.

Because of the typical locations of intimal tears just described, aortic dissections are usually categorized into one of the following three types: ascending and descending aorta; limited to ascending aorta; or descending thoracic aorta with progression distally⁹. Although there is more than one classification system, the Stanford system classifies by anatomical location and extent of dissection into types A or B⁹. Stanford Type A (ascending) dissection involves the aorta proximal to the ligamentum arteriosum, is the more common type, and usually is located on the right anterior aspect of the ascending aorta superior to the aortic valve. Stanford Type B (descending) dissection starts in the aorta at the site of the ligamentum arteriosum⁹. Classical clinical presentations of Type A AAD are; chest pain (82%), back pain (46%), pulse deficit (31%), hypotension (18%) and cardiac tamponade (16%). Classical clinical presentations of Stanford Type B AAD are; back pain (81%), chest pain (78%), hypertension (77%), abdominal pain (37%) and
encephalopathy (14%). Clinical presentations of aortic dissection (AD) can be so varied and atypical that one begins to question whether there is atypical presentation to AD. Statistics show that painless aortic dissection occurs approximately 5%-15% of the time. Compared with patients with more typical symptoms of AD, patients with painless or atypical presentations have higher mortality rates, especially when the AD is Type B.

The clinical presentation of an AD may at times be primarily abdominal and/or retroperitoneal discomfort and/or pain. Other presentations reported in the literature include heart failure, heart block, syncope, focal neurological complaints such as extremity weakness, numbness, and hemiparesis, or transient global amnesia.

Materials and methods

The setting of our study was in the Emergency Medicine Department (EMD) of Training and Research Hospital, a tertiary hospital in Kayseri, Turkey which has approximately 300,000 EMD attendances per year. The period of the study was from April 2010 to April 2013. The study was approved by the local institutional ethics review board. We selected records with a diagnosis of "dissection of aorta" (International Classification of Diseases, Tenth Revision, code I71.0 (dissection of any part of aorta)) from the hospital discharge database, and hospital death register were collected. Emergency medicine department attendance (index admission) that resulted in admission with the discharge diagnosis of AAD or EMD attendance within 14 days of death because of AAD patients were included in the study. The 14-day period from symptom onset was designated as the acute phase of aortic dissection.

Datas collected from the EMD records included patient demographics, medical history, clinical presentation, clinical examination, electrocardiogram (ECG) and imaging findings, and EMD diagnosis.

We detected eight AAD with atypical presentation and reported them.

**Case 1**

A 69-year-old woman with a medical history significant for primary hypertension presented to EMD with feeling faint. Vital signs upon arrival to the EMD were: temperature 36.4°C, pulse 86 beats/min, respiratory rate 18 breaths/min, blood pressure 90/60 mmHg, and pulse oximetry 98% on room air. She had a Glasgow Coma Scale score of 15. On physical examination, her heart sounds were normocardic with a regular rhythm. She had no murmurs, rubs, or gallops. She had normal chest expansions. Auscultation of her chest revealed normal breath sounds. Abdominal examination was normal, except minimal tenderness around her belly. There were no palpable masses. Neurological examination revealed no focal deficits. Femoral and brachial pulses were palpable bilaterally. Electrocardiogram was unremarkable apart from slight left ventricular hypertrophy. Complete blood count (CBC) and biochemical (including Troponine I and creatine kinase) parameters were normal. Direct abdominal graphy was revealed normal. A bedside abdominal ultrasound was performed and revealed normal by radiologist. The feeling faint was suggestive of cerebrovascular disease and a computed tomography (CT) was carried out. It revealed normal. Due to the continuation of her complaint and hypotension an abdominal CT was performed. It showed an abdominal aortic dissection with extension of the dissection down to the common iliac artery, Stanford type B aortic dissection (Figure 1). In order to exclude thoracic aortic dissection, a thoracic CT was performed at the same time. On the basis of these data the patient was hospitalized to the cardiovascular surgery department.

**Case 2**

A 72-year old patient with a history of chronic renal failure, and hypertension was admitted to EMD with 1 month history of recurrent episodes of pain on the right shoulder. Upon admission, the patient was alert, well oriented, without thoracic and abdominal pain, and hemodynamically stable with GCS 15. He had no history of trauma. The chest examination revealed equal bilateral breath.
sounds, with minimal crackles on the lung bases bilaterally. The heart rate was 82 beats / min. and regular, blood pressure 140/90 mmHg, the abdomen was soft, flat, with normoactive bowel sounds and no palpable mass lesions. Bilaterally brachial and radial pulses were palpable. On the examination there was no limitation of movement of bilaterally shoulders. An upright chest radiograph and right shoulder radiograph was performed. Shoulder radiograph revealed no fracture no dislocation but chest radiograph showed borderline widening of the mediastinum. But there was no significant difference between the blood pressures of left and right arms. A bedside transthoracic echocardiography demonstrated that there was a suspected descending aorta aneurysm. Because of these reasons thoracic CT was performed and it showed a Stanford type B aortic dissection (Figure 2). The patient was hospitalized for surgical repair.

![Figure 2](image2.png)

**Case 3**

A 67-year-old woman with a no significant medical history presented to EMD with a progressive shortness of breath in a month. She had admitted to different hospitals with this complaint and got medical treatment with the diagnosis of asthma. Vital signs upon arrival to the EMD were: temperature 36.7°C, pulse 98 beats/min, respiratory rate 22 breaths/min, blood pressure 130/85 mmHg, and pulse oximetry 96% on room air. She had a Glasgow Coma Scale score of 15. On physical examination, her heart sounds were normocardiic with a regular rhythm. She had no murmurs, rubs, or gallops. She was mildly tachypnoeic with normal chest expansions. Auscultation of his chest revealed normal breath sounds. Abdominal examination was normal, with no bruits or tenderness. In the EMD, the patient was placed on cardiac and respiratory monitoring. Oxygen was given via a nasal cannula.

Laboratory investigations including arterial blood gas analyse and cardiac biomarkers revealed normal. Chest radiography revealed normal. But in order to explain this clinical situation a chest CT with intravenous contrast was then performed. And it was revealed Stanford Type A aortic dissection (Figure 3). The patient was hospitalized.

![Figure 3](image3.png)

**Case 4**

A 74-year-old man with a medical history significant for primary hypertension presented to EMD with nausea and vomiting. Vital signs upon arrival to the EMD were: temperature 36.2°C, pulse 104 beats/min, respiratory rate: 20 breaths/min, blood pressure: 80/40 mmHg, and pulse oximetry: 92% on room air. He had a Glasgow Coma Scale score of 15. On physical examination, heart sounds were tachycardic with a regular rhythm. He had normal chest expansions with mildly tachypnea. Auscultation of chest revealed widespread crackles on both lungs. Electrocardiogram was unremarkable apart from slight left ventricular hypertrophy.

![Figure 4](image4.png)

The patient was consulted to cardiology department to exclude heart failure and cardiac tamponade and a bedside echocardiogaphy was
performed. It revealed an intimal flap of ascending aorta. To confirm the diagnosis chest CT with intravenous contrast was performed. It was revealed Stanford type A aortic dissection (Figure 4). The patient was hospitalized.

**Case 5**

A 45-year-old woman with a no significant medical history presented to EMD with abdominal pain. At the admission, the patient was alert, well oriented, without thoracic pain, and hemodynamically stable. The patient could not localized and explain his abdominal pain. Vital signs upon arrival to the EMD were: temperature: 36.7°C, pulse: 94 beats/min, respiratory rate: 18 breaths/min, blood pressure: 120/80 mmHg, and pulse oximetry: 96% on room air. The patient had a Glasgow Coma Scale score of 15. The chest examination revealed decreased breath sounds on the left hemithorax, with no wheezes or crackles, the abdomen was soft, flat, with normoactive bowel sounds and no palpable mass lesion. Electrocardiogram was remarkable for voltage depression. Direct abdominal graphy was unremarkable but chest radiograph showed borderline widening of the mediastinum. The patient was consulted to cardiology department and a bedside echocardiography was performed. It revealed a pericardial fluid. To confirm the diagnosis a chest CT with intravenous contrast was then performed. It was revealed Stanford type A aortic dissection, pericardial and left pleural effusion (Figure 5). The patient was hospitalized.

![Figure 5: Contrast-enhanced computed tomographic image of the thorax at the level of the descending aorta shows a dissection plane (arrow) and pleural and pericardial effusion.](image)

**Case 6**

A 60-year-old man with a medical history significant for primary hypertension presented to EMD with dizziness. Vital signs upon arrival to the EMD were: temperature 36.5°C, pulse 98 beats/min, respiratory rate: 16 breaths/min, blood pressure: 90/60 mmHg, and pulse oximetry: 96% on room air. He had a Glasgow Coma Scale score of 15. His physical and neurological examination revealed normal. Electrocardiogram was unremarkable. Laboratory investigations including cardiac biomarkers revealed normal. The initial cranial CT was unremarkable. The patient was consulted to neurology department but they advised cardiology consultation. And then the patient was consulted to cardiology department, a bedside echocardiography was performed. It revealed an intimal flap of ascending aorta. To confirm the diagnosis a chest CT with intravenous contrast was then performed. The result was Stanford type A aortic dissection (Figure 6). The patient was hospitalized.

![Figure 6: CT scan obtained at the level of the aortic arch shows a flap (arrow) along the course of the whole aortic arch.](image)

**Case 7**

A previously healthy 52-year-old man was admitted to EMD with pain in left leg for one hour. He was unable to walk because of pain. Vital signs upon arrival to the EMD were: temperature 36.2°C, pulse 114 beats/min, respiratory rate 22 breaths/min, blood pressure 160/80 mmHg, and pulse oximetry 94% on room air. He had a Glasgow Coma Scale score of 15. Muscle power in left lower extremity was grade 3 (due to pain in left leg ?) on a scale of 0 - 5 (0, no contraction; 5, normal power). The dorsalis pedis artery pulse was not palpable and skin temperature in both lower limbs was slightly lower than normal. Arterial doppler ultrasonography of the left lower limb revealed thrombosis in femoral artery. In order to exclude aortic dissection a thoracic and abdominal contrast enhanced CT was performed. It revealed Stanford type A aortic dissection (Figure 7 a-b). The patient was hospitalized.
Case 8

A 83-year-old man with a medical history significant for primary hypertension presented to EMD with shortness of breath. Vital signs upon arrival to the EMD were: temperature 36.3°C, pulse 105 beats/min, respiratory rate: 17 breaths/min, blood pressure: 94/65 mmHg, and pulse oximetry: 96% on room air. The patient had a Glasgow Coma Scale score of 15. Physical and neurological examination revealed normal except bibasillary crackling rales on the auscultation of chest.

Electrocardiogram was unremarkable apart from slight left ventricular hypertrophy. Femoral and brachial pulses were palpable bilaterally. In the laboratory investigation D-dimer value was 4500 ng/mL (normal value <500 ng/mL). In order to exclude pulmonary tromboembolism and aortic dissection a thoracic and abdominal contrast enhanced CT was performed. It showed a Stanford type B dissection of aorta (Figure 8).

Discussion

The incidence of aortic dissection ranges from 5 to 30 cases per million per year. Morbidity and mortality rates are high, with patients exsanguinating before presentation or before diagnosis. It has been estimated that the mortality rate of untreated acute aortic dissection is in the region of 25% in the first 24 h and 70% during the first 2 weeks\(^\text{12}\). Despite improvements in diagnosis and treatment, the mortality rate in patients with acute thoracic dissection is still high with an in-hospital mortality rate of 25\%\(^\text{13}\). Aortic dissection is missed in up to 38\% of patients on initial evaluation, and in up to 28\% of patients the diagnosis is made at autopsy\(^\text{13}\). Traditionally, aortic dissection without pain was thought to be rare. More recent information suggests that symptoms in patients with aortic dissection are more variable than previously recognised, and the classic findings of sudden onset of tearing chest, back, or abdominal pain are often absent\(^\text{14}\). The “classic” pattern of pain is the presenting symptom in over 90\% of patients, with fewer than 10\% presenting with atypical symptoms\(^\text{13}\). About 10\% of aortic dissections are painless and may present with symptoms secondary to complications of the dissection\(^\text{15}\). In our study we have found that the rate of atypical presentation rate of aortic dissection was higher than literature. This rate enhances the importance of considering aortic dissection in the differential diagnosis of the patients who admitted to EMD with atypical symptoms.

Conclusion

Acute aortic dissection is uncommon, but complications develop rapidly and the outcome is often fatal. Even though we have often been taught to associate this condition with the classical chest pain syndrome, in reality the clinical manifestations are diverse and what were previously considered to be classical symptoms and signs are often absent. And Emergency physicians must always consider the differential diagnosis of aortic dissection with atypical presentations.

References


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