

Near missed diagnosis of extensive aortic dissection in a young patient presenting with non-specific symptoms

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Abstract

Acute aortic dissection is a frequently fatal condition that rarely involves young individuals. It has an estimated worldwide prevalence of 0.5-2.95 per 100,000 persons per year, with a mean incidence at around age 60. Of all the aortic dissections, less than 10% involve patients younger than 40 years of age. We present the case of a forty-year-old male who presented in the emergency department with non-specific complaints of nausea and lightheadedness. The patient being hemodynamically and clinically stable was discharged after supportive treatment. However after 5 hours the patient presented again in the emergency department with a neck pain, hypotension and sweating. CT angiography revealed a massive aortic dissection involving ascending, arch and descending aorta up to the bifurcation of iliac arteries. The patient was immediately taken for surgery for the replacement of ascending aorta and resuspension of aortic valve. The patient tolerated surgery well and was discharged after being clinically and haemodynamically stable.

Keywords: Acute aortic dissection, cardiovascular, cardiothoracic surgery, emergency medicine

Introduction

Aortic dissection (AD) occurs when a tear in the inner layer (tunica intima) of the aorta causes the blood to spread between the layers of the aortic wall resulting in separation of the layers.¹ AD was first described by Morgagni 200 years back and in 1958 Hirst et al reviewed 505 patients with AD, highlighting the high mortality rate and frequency of ante-mortem diagnosis.² It is more common in men than women³⁻⁵ with an estimated worldwide prevalence of 0.5-2.95 per 100,000 individuals per year, with a mean age incidence at around 60 years of age.⁴⁻⁶ AD rarely occurs in population younger than 40 years of age, making it only less than 10% of all AD. Patients are usually normotensive, but may have a history of cardiac surgery or a bicuspid aortic valve and connective tissue

diseases or trauma.⁵ Other risk factors associated with aortic dissection in a young patient include severe trauma, use of cocaine, chronic hypertension and weightlifting.⁷ This case was of a 40-year-old male who presented with non-specific symptoms in the emergency department was discharged after being given supportive treatment. However, the patient presented again after 5 hours in the emergency department with neck pain, hypotension and sweating, later revealing extensive aortic dissection. This case report was written after receiving approval from Ethical and Research Committee of the hospital and with informed consent from the patient.

Clinical Case

A 40-year-old male presented to the Emergency Department (ED) of Aga Khan Hospital in the last week of April 2012 with non-specific complaints of nausea and lightheadedness for 5 hours. Initial vitals and physical examination were normal. Past medical history revealed mild hypertension and a hip replacement secondary to a traffic accident (motor bike head-on collision) 4 months ago. Laboratory investigations came back normal. The patient remained haemodynamically and clinically stable and was later discharged as having vertigo. However, the same night he was again presented to the ED with neck pain, profuse sweating and drowsiness.

Initial monitoring revealed hypotension with blood pressure (BP) of 90/50 mmHg. Rest of the systemic examination was normal. Examination of extremities revealed no palpable pulse in bilateral radial arteries, right femoral and right dorsalis pedis arteries.

Investigations

Initial blood work revealed electrolytes under normal range and creatinine at 1.3 mg/dl. CBC (Hb. 8.1 gm/dl and haematocrit at 35%). Coagulation studies were normal. Troponin was negative (<0.500 ng/dl). ECG was done twice with non-specific changes showing mild ST flattening, inconsistent with ongoing ischaemia. D-dimer was not requested. Patient's chest X-ray showed prominence of

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Figure-1: CT angiography revealing extensive aortic dissection involving ascending, arch and descending aorta upto bifurcation of iliac arteries. The dissection was involving the origin of left subclavian artery, brachiocephalic trunk and it was extending into left common carotid artery. Active leak was noted from descending aorta from its medial posterior aspect with resultant haematoma seen medial to descending thoracic aorta contained within thrombus.

arch and descending aorta without any calcification, pointing towards an aortic aneurysm.

Differential Diagnosis

Bearing in mind neck pain and hypotension, acute coronary syndrome and aortic dissection should be considered first. Acute hypotension can also be explained by acute cardiogenic shock secondary to myocardial infarction and pulmonary embolism.

CT angiography of chest revealed massive aortic dissection involving ascending, arch and descending aorta up-to bifurcation of iliac arteries (Figure 1 and 2), involving the origin of left subclavian artery, brachiocephalic trunk and extending into left common carotid artery along with

coeliac, superior mesenteric and left renal artery up to bifurcation of iliac arteries.

Treatment

The patient was rushed to the operating room, where replacement of ascending aorta with 24mm double velour vascular graft was done along with re-suspension of aortic valve. With two chest tubes along with pacing wire, the patient was shifted to the coronary care intensive unit (CICU) for further management. BP was maintained at 120 systolic with anti-hypertensive. The patient was extubated successfully after two days in CICU however during post-extubation, the patient experienced pain and numbness in the right leg. Vascular surgery was advised after Doppler ultrasound showed proximal narrowing likely due to the extensive AD. The patient continued to improve clinically while undergoing cardiac rehabilitation and was eventually discharged prescribed with anti-hypertensives.

Outcome and follow-up

Prescribed with amlodipine and hydralazine for four months, the patient's condition during follow-up visits to the cardiologist remained stable. These were later switched to metoprolol. For strengthening weakness in his leg, the patient was undergoing physiotherapy.

Discussion

Type A, AD is rare among young patients. In our case, the patient's physical features didn't reveal any clues that might suggest history of connective tissue disorder or bicuspid aortic valve. There was history of a significant road traffic accident four months ago, which included extensive pelvic fracture that needing urgent hip replacement surgery. This trauma may have possibly caused the development of aortic dissection.

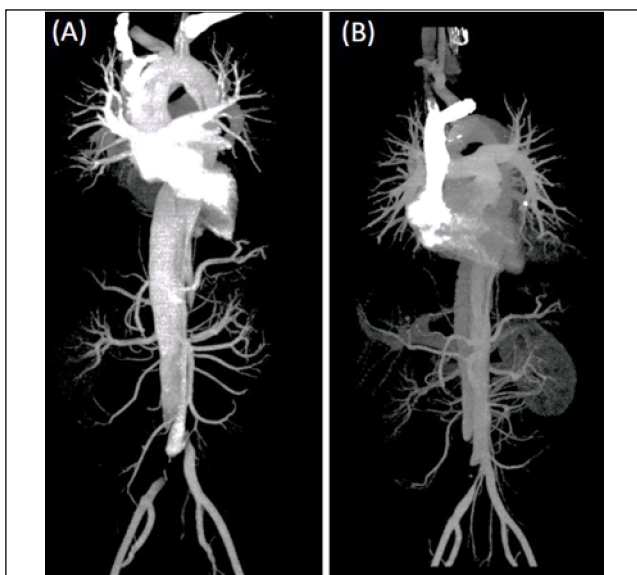


Figure-2: (A) CT angiography before surgery (B) CT angiography one week after surgery revealed non-visualization of part of aortic dissection at the aortic origin and ascending aorta considering patient's history of surgery. The distal extension of the aortic dissection was unchanged.

AD classically presents with sharp or "tearing" chest pain that radiates to the back.^{1-7,9,10} However, other signs include BP discrepancy in the upper extremities, Horner syndrome and hoarseness. Up to 30% of patients ultimately diagnosed with AD may have different preliminary diagnosis.⁶ Patients rarely have neck pain on initial presentation, in fact in a retrospective study of 109 patients, only 3% of the patients presented with neck pain.⁴ Our patient had nonspecific symptoms which is typical for Type A Aortic dissection. Nicolauss L, et al identified 27 patients, mostly men, younger than 40 years of age presenting in ER with either acute or chronic Type A dissection. Connective tissue disorder was found in 46% followed by bicuspid aortic valve (22%).⁸ Aortic dissection can be classified clinically and anatomically. Stanford classification is used globally which distributes AD in 2 types: Type A signifies involvement of the ascending aorta, and Type B in which ascending aorta is not affected. Type A, AD need emergent open-heart surgery. Surgical approach is considered superior.^{2,7,9,11} Medical management includes antihypertensive with a combination of a beta-blocker and a vasodilator (nitroprusside) as standard therapy.^{9,5} Calcium channel blockers and beta blockers have shown to improve survival in patients postoperatively after aortic dissection, while angiotensin-converting enzyme inhibitors did not show association with mortality.¹²

Type A, AD have grave prognosis: cause of death is aortic rupture followed by aortic regurgitation.¹¹ Without treatment, mortality rate reaches about 1% per hour initially and 80% by the end of 2nd week.² Surgically managed patient have mortality rate of 26% versus 58% without surgery.¹ Overall mortality has decreased over the years from 40% to 5-26%.⁴

Clinicians must remember that not all aortic dissections present as acute, with a classical clinical picture of chest pain radiating towards the back resulting in critical fatality. Individuals may present in ED with nonspecific and apparent but inconsistent symptomatology. A thorough examination with appropriate investigations should be conducted in patients with non-specific symptoms, especially in patients with history of trauma. In cases of low probability, a negative D-dimer test should be considered to rule out AD. A D-dimer <0.5 µg/mL with a sensitivity of 94% is a good predictor to rule out AD.^{10,13,14}

In our case, the patient was not tested for D-dimer when he arrived in the ER for the first time. He was fortunate

enough to survive the aortic dissection, but it could have been fatal considering how extensive his aortic dissection was, as precious time was lost due to delay in diagnosis when he had been discharged earlier that day.

Recommendation

- " There should be a high suspicion of aortic dissection in patients who have a history of trauma. A thorough examination should be conducted in such patients who present in emergency departments, even those with vague clinical symptoms.
- " A D-dimer <0.5 µg/mL with a sensitivity of 94% is a good predictor of ruling out AD.

Conclusion

Aortic dissection is rare, however a fatal condition that seldom presents in young individuals and suspicion of the diagnosis may be considered in atypical presentation. It is important for the clinicians to remember that not all aortic dissections present as acute, with a classical clinical picture of chest pain radiating towards the back and resulting in fatality.

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