Complex aortic dissection with multifaceted clinical presentations

Ramu V
Consultant, Emergency Medicine, Kauvery Hospital, Cantonment, Trichy
*Correspondence: raamragu@gmail.com

Abstract

Aortic dissection is a life-threatening cardiovascular emergency that requires rapid diagnosis and intervention [1]. Complex cases involving the root of the aorta, ascending aorta, coronary vessels, and concomitant symptoms of myocardial infarction, brain infarct, and upper limb blood pressure variation present unique challenges. We present a case report that exemplifies this complexity, emphasizing the diagnostic dilemma, treatment strategies, and clinical outcomes associated with such cases.

Keywords

Complex aortic dissection, aortic dissection with stroke, aortic dissection with ECG changes, aortic dissection with varying blood pressure.

Background

Aortic dissection is a catastrophic condition characterized by the tearing of the aortic wall, creating a false lumen within the vessel. While aortic dissections are relatively uncommon, they can manifest in various forms, sometimes presenting with atypical clinical features that challenge accurate diagnosis and management. We report a case that vividly illustrates the intricacies of this condition.

On a morning, around 7 am, we received a moderately obese elderly male of 68yrs in unconscious state, with low GCS (E1 V1 M2). He had a history of headache before going to bed on previous day and woke up with a headache at dawn, around 5:30am. He went to kitchen to drink water, and after 15mins, was found unresponsive on the kitchen floor.

On arrival he had involuntary movements of right upper limb and lower limb. As per adopting the ABCDE approach, the patient was intubated in view of low GCS.

HR was 90, BP was 180/100 on left Upper limb and weak pulse with 60/? in right upper limb.

ECG showed borderline Left Axis Deviation and ST depression in V2-V6.

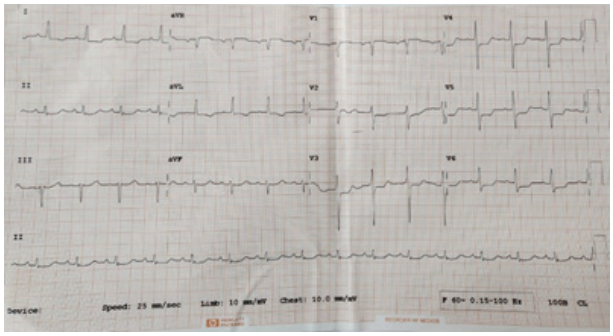

Fig.(1) ECG shows ST Depression from V2 to V6.

POCUS revealed moderate LV dysfunction with pericardial effusion. But unlike a transudate, there were wiggling fish tail like structures in the pericardial fluid.

Doppler of right subclavian artery showed a biphasic flow compared to the left subclavian artery where there was a triphasic flow.

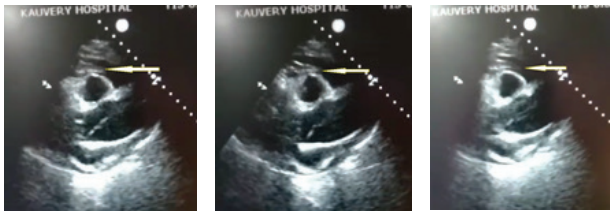

Fig.(2) Echo shows pericardial effusion.

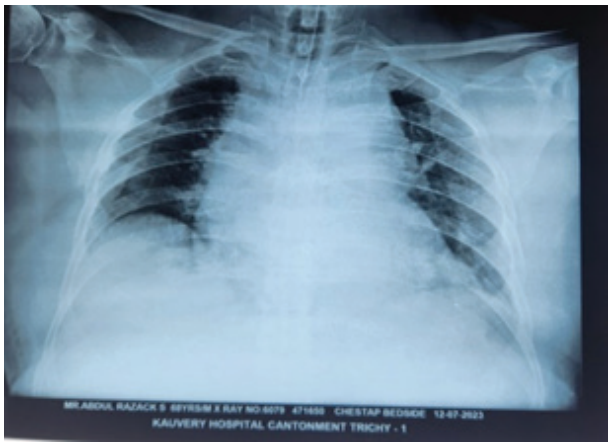

Fig.(3) Chest X ray showed mediastinal widening.

We put together a differential diagnosis of Acute Coronary Syndrome, Rt Subclavian occlusion, Ischemic stroke, along with strong suspicion of Aortic dissection, of ascending aorta.

Urgent computed tomography angiography (CTA) of the chest was performed, revealing a Type A aortic dissection extending from the root of the aorta to the ascending aorta, with involvement of the coronary vessels. The dissection flap was compromising the true lumen of the brachiocephalic trunk, causing the upper limb blood pressure variation.

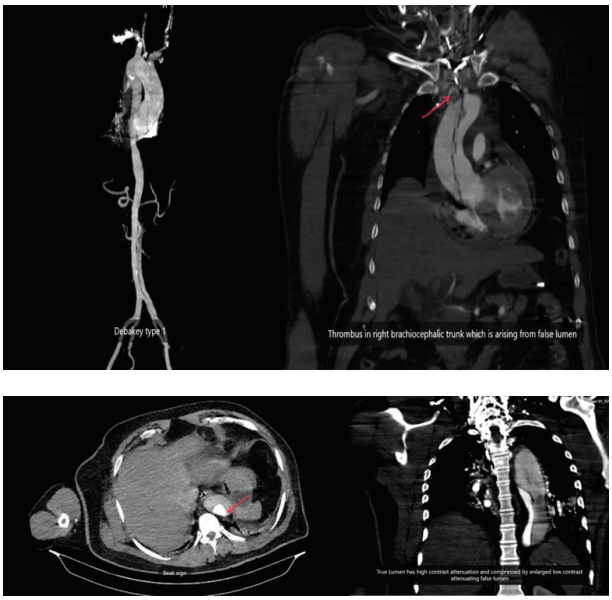

Fig.(4) Computed tomography angiography (CTA) of the chest.

The diagnosis, the prognosis for the disease and the need for emergency surgery were explained to family members, but they were not willing to proceed further because of the prognosis.

Discussion

The diagnosis of aortic dissection is difficult to make in the emergency department because of its complexity of presentation. Patients may not present with the classical chest pain and back pain. A significant number of cases may be missed. Literature available [4-5] indicate the possible high morbidity and mortality.

There are two main anatomic classifications used to classify aortic dissection.

The Stanford system is more frequently employed. It classifies dissections into two types based on whether ascending or descending part of the aorta involved.

Type A involves the ascending aorta, regardless of the site of the primary intimal tear. Type A dissection is defined as a dissection proximal to the brachiocephalic artery.

Type B aortic dissection originating distal to the left subclavian artery and involving only descending aorta.

The DeBakey classification divides dissections into 3 types, as follows:

Type I involves the ascending aorta, aortic arch, and descending aorta.

Type II is confined to the ascending aorta.

Type III is confined to the descending aorta distal to the left subclavian artery.

Pulse deficit is one of the signs present in aortic dissection but only 19% have pulse deficit in type A and 9% in type B [2].

The ECG findings of ST depression and T wave changes highlight the importance of considering aortic dissection in the differential diagnosis of NSTEMI or Unstable Angina. Such ECG changes are associated with higher incidence of shock and tamponade [6].

One third of the patient with ascending aortic dissection present with pericardial effusion [2]. Cardiac tampoade is the main cause of hypotension and death in AAD before reaching the hospital [1-3].

The incidence of stroke in type A ascending aortic dissection(TAAAD) is between 3-32% (8-11) and 6% enrolled in IRAD (International Registry of Acute Aortic Dissection) had stroke presentation, and more than 1 of 20 patients with TAAAD had stroke [7].

Advanced imaging techniques, particularly CTA, play a pivotal role in confirming the diagnosis and assessing the extent of the dissection. A multidisciplinary approach is essential, involving cardiovascular surgeons, interventional cardiologists, and neurologists, to address the myriad of clinical challenges.

Treatment includes emergent surgical intervention, including aortic root and ascending aorta replacement,

coronary artery revascularization, and resolution of the dissection flap.

Conclusion

Complex cases of aortic dissection involving the root of the aorta, ascending aorta, coronary vessels, and multifaceted clinical presentations pose a significant clinical challenge. This case report highlights the need for vigilance in considering aortic pathology in patients presenting with MI symptoms, especially when accompanied by neurological symptoms and blood pressure variations. Timely diagnosis, a multidisciplinary approach, and emergent surgical intervention are pivotal in achieving successful outcomes in such intricate cases.

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