

EXTENSIVE AORTIC DISSECTION- A RARE CASE REPORT

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ABSTRACT:

Aortic dissection is a rare and a life threatening event. Classically, aortic dissection presents as sudden, severe chest, back or abdominal pain that is characterized as ripping or tearing in nature. However, a timely diagnosis can be elusive in the event of an atypical presentation. So, a high index of clinical suspicion is mandatory for the accurate and rapid diagnosis of aortic dissection. We report a case of a 87 years old male who presented with atypical signs and symptoms and was later found to have aortic dissection.

Keywords: Aortic Dissection, Ripping Luminal tear, Chest pain.

CASE REPORT :

A 87-year-old man presented to the emergency department with complaints of dizziness, generalized weakness, nausea and chest pain. The patient assumed his blood pressure was elevated, however, despite oral medications, his symptoms persisted prompting her presentation to the ED. He denied any headache and changes in the vision. The patient's medical history consisted of hypertension. His home medications for hypertension included Amlodipine and Carvedilol.

In the ED, the initial vital signs were blood pressure of 119/83 mmHg, pulse rate 64/min, respiration rate 18/min, temperature 97.4°F and oxygen saturation of 99% on room air. The patient was in no acute distress. The cardiac exam showed a normal S1 and S2 with no murmur and the peripheral exam showed normal bilateral peripheral pulses. The neurologic exam showed grossly normal motor strength. Electrocardiogram (EKG) showed sinus rate at 63 bpm. Laboratory findings were also normal.

The chest X-ray (CXR) showed a widened mediastinum, enlarged cardiomeastinal silhouette with b/l pleural effusion.

2D Echo was done which showed aortic flap involving the aortic root, arch and descending aorta.

Subsequent CECT chest and abdomen-pelvis was done which showed intimo-intimal separation in the ascending aorta and arch of the aorta giving a wind sock or lumen in lumen appearance. The intimal flap extended to the branches of arch of aorta and to the first part of the left axillary artery. It was further extending obliquely downwards to the thoracic and abdominal aorta, involving the celiac artery, b/l renal arteries and into bilateral common iliac arteries upto the level of bifurcation.

DISCUSSION:

Aortic dissection is a rare event that is characterized by the separation of the layers of the aortic wall by extraluminal blood that enters it, almost invariably through a luminal tear.(1) The estimated incidence of aortic dissection is 5 to 30 cases per million population per year(2) and is a life threatening condition with a high mortality in the acute stage that is further accentuated by misdiagnosis and mishandling.(3) Moreover, an atypical presentation makes this diagnosis even more difficult.

The aorta is a large elastic artery composed of three layers; the thin delicate intimal layer is lined by endothelium and can be easily traumatized; the thick middle layer is the media, composed of sheets of spirally arranged elastic tissue which affords maximum tensile strength, smooth muscle cells and collagen. Adventitia is the outer layer composed of loose connective tissue and carries vasa vasorum which nourishes the outer half of the aortic wall including much of the media. The ascending aorta is 5 cm long and its lower segment; the aortic root is 3.3 cm, begins at the level of the aortic valve, extends to the sinotubular junction and the upper tubular segment joins with the aortic arch. . Aortic root dilatation predisposes to the dissection or rupture which accounts for 1% - 2% of deaths in industrialized nations [1]. The maximal internal diameter of ascending aorta in dissection is 55.7 ± 12.4 mm (range 35 - 90 mm). Aortic dissection is not always associated with aneurysmal dilatation of aortic root [2].

Degenerative changes associated with aging result in breakdown of collagen, elastin, smooth muscle cell as well as an increase in basophilic ground substance contributing the histologic change of cystic medial necrosis associated with dissection. However, a study showed that a minority of patients with aortic dissection established medial degeneration [8]. Sometimes, these changes lead to weakening of the aortic wall and results in formation of fusiform aneurysm often involving the aortic root. The term annuloaortic ectasia was used to describe this condition which was first coined by Ellis et al. in 1961, occurs in 5% to 10% of patients with aortic regurgitation and the aortic root is bulbous, pear-shaped, pyriform appearance or flask shaped. The medial destruction often results in progressive aneurysmal dilatation of the aortic root, only potentially causes aortic dissection in tertiary stage [9]

Mechanical forces contributing to aortic dissection include flexion forces at fixed sites, radial impact of pressure pulse, and the shear stress of the blood. Aortic dissection occurs in the region of aorta that is subjected to the greatest LV ejection force and pressure fluctuation [15]. The hydrodynamic forces in the blood stream that are generated by the propagation of a pulse wave with a velocity increases from ascending aorta in the abdominal aorta [16] and systolic BP during each cardiac cycle deliver energy to the aortic wall and the repeated motion of aorta related to contractile function of the heart results in flexion stress which are more marked in the ascending aorta and eventually leads to dissection and

its propagation. Hypertension is one of the most significant triggers for aortic dissection in 72% - 90% of cases [17] and tends to be higher in distal dissections (70%) than proximal dissections (36%). Hypertension adds to a mechanical strain and the shearing forces exerting a longitudinal stress along the aortic wall contributing to the development of aortic dissection. Severe hypertension is relatively common during the period of hospitalization after an acute aortic dissection even without a prior history of hypertension and it may reflect marked increase in sympathetic tone, triggered by severe inflammation of aortic wall. Classification systems are used to locate the aortic dissection and its extent. The Stanford classification was developed from a functional approach based on whether the ascending aorta was involved. Many cases of aortic dissection do not fit into these classifications therefore, it is prudent to simplify the classification into anatomical categories thus, a classification based on the pathophysiologic features of aortic lesion rather than its location was developed by the European Society of cardiology. Thus, it is recommended that acute aortic syndrome (AAS) are classified according to both lesion type and location [22].

This case has illustrated the importance of considering aortic dissection as one of the differentials in mind when a patient presents with atypical signs and symptoms. The x-ray findings showing mediastinal widening is another important finding in relation to a diagnosis of aortic dissection. Once the diagnosis is suspected, it needs to be confirmed by means of an echocardiography or CT scan. CT, especially with arterial contrast enhancement and specifically computed tomography angiography (CTA) is the investigation of choice, not only to diagnose and classify the dissection but also to evaluate for distal complications. Thoracic aortic dissection can extend distally into the abdominal aorta and iliac arteries; therefore, simultaneous CT imaging of the abdomen and pelvis is often performed to identify concomitant mesenteric or abdominal visceral malperfusion. Contrast-enhanced CT (preferably CTA) gives excellent detail. Findings include intimal flap, double-lumen representing the true and false lumens, dilatation of the aorta due to aortic insufficiency and windsock sign. These are consistent with our case findings.

FIG 1. Coronal and axial Chest and Abdomen CECT images showing intimo-intimal separation in ascending aorta and arch of aorta giving windsock (lumen in lumen) appearance



CONCLUSION:

We report an unusual mode of presentation of a rare and often fatal condition. This case illustrates the importance of considering aortic dissection as one of the differentials in mind when a patient with atypical signs and symptoms in the emergency room. It also emphasizes that non-invasive diagnostic methods such as echocardiography and CT should be performed promptly.

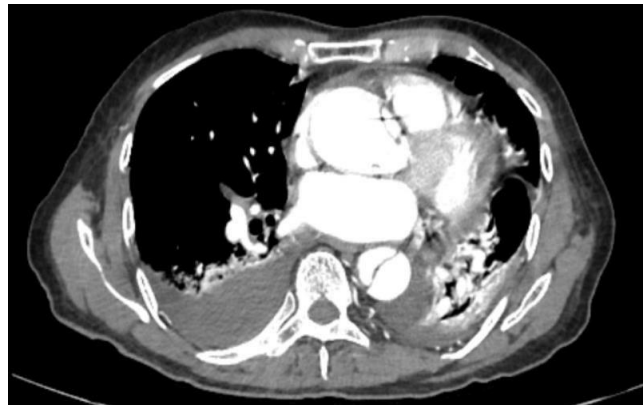


FIG 2. Axial Abdomino-pelvic CECT images showing the luminal flap extent involving celiac artery , b/l renal arteries extending till the bifurcation of aorta



Fig 3. Axial Chest CECT image showing b/l pleural effusion

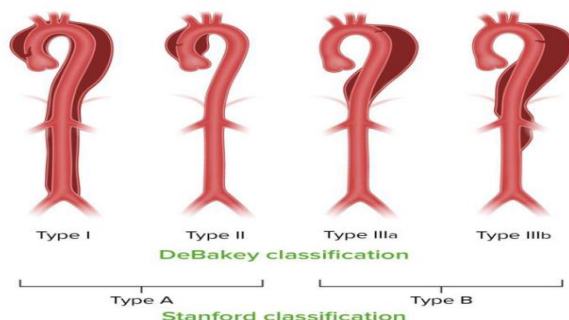


FIG 4 : Stanford and DeBakey classification system

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