

## Thoracic aortic aneurysm: case report & literature review

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**Section:** Cardiovascular

**Area of Interest:** Cardiovascular system Arteries / Aorta

**Procedure:** Diagnostic procedure

**Procedure:** Imaging sequences

**Procedure:** Computer Applications-General

**Procedure:** Contrast agent-intravenous

**Imaging Technique:** Conventional radiography

**Imaging Technique:** CT

**Imaging Technique:** CT-Angiography

**Special Focus:** Aneurysms Arteriosclerosis Case Type: Clinical Cases

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**Patient:** 64 years, female

### Clinical History:

A 64-year-old British white lady presented with sudden onset sharp central chest pain of one hour duration with non-specific electrocardiographic findings and negative Troponin I test. She underwent Computed Tomography Aortography (CTA) and was sent for surgical management.

### Imaging Findings:

CT Aortography scout film showed widening of the mediastinum with curvilinear peripheral calcification, marginally increased in comparison with 3 years old X-ray chest. Non-contrast enhanced CT (NECT) images confirmed atherosclerotic dilatation of ascending aorta. Calcification was circumferential with no evidence of haematoma or thrombus formation. Axial contrast enhanced CT (CECT) images revealed dilated ascending aorta filling almost all of the mediastinum with some evidence of compression over the surrounding structures. Computer assisted sagittal and coronal reformatted images depicted dilatation of ascending aorta. The whole of the ascending aorta was aneurysmal in fusiform shape, widest in the middle of its length. It was well contained with no evidence of ulceration, leakage, rupture or dissection. Echocardiography was performed and showed competent aortic valve, however, the root of the aorta was also involved and therefore the patient was given an option of surgical correction with possibility of prosthetic valve replacement.

### Discussion:

Thoracic aortic aneurysm (TAA) is less prevalent (25%) as compared to its abdominal counter-part, however, it can be much more devastating because of enhanced chances of rupture and dissection [1]. An aneurysm is the irreversible blood filled dilatation of a vessel > 50% of its normal size. The shape of the aneurysm can either be saccular - localised outpouching of aortic wall or fusiform - symmetrical, uniform dilatation affecting the entire circumference. Degenerative changes in elastic media of aortic wall are the most common aetiological factor. It includes cystic medial degeneration causing fragmentation of elastic fibres and smooth muscle loss. Incidence of

TAA is approximately 5-10 per 100,000 patient years with 3-4% risk in population > 65 years of age [2]. TAA is closely linked to atherosclerosis in approximately 80% of patients and mainly involves all three layers of the vessel forming true aneurysm. Trauma is the second most common cause of TAA resulting mostly in pseudo-aneurysm formation and is seen predominantly in young adults. Inflammatory diseases like Giant cell aortitis, Takayasu aortitis, ankylosing spondylitis, infectious diseases like syphilis and HIV, genetic conditions like Marfan's Syndrome and Ehler Danlos Syndrome [3]; high blood pressure, coronary artery disease and abdominal aortic aneurysm are all associated with TAA. Patients can present with superior vena cava syndrome, dysphagia, hoarseness or stridor. It can also be diagnosed accidentally on routine chest X-ray and shows widening of mediastinum. CT Aortography is the investigation of choice because of its non-invasiveness & multi-planar reformatting [4]. Non-enhanced CT depicts high attenuation haematoma and helps in differentiation from dissection whereas contrast enhanced CT can show extravasation of contrast. MR aortography is excellent in characterisation of soft tissues, blood and blood products, but is slow and incompatible with pacemakers [5]. Asymptomatic TAA up to 5.5 cm can be managed medically by regular monitoring of size, strict BP control and smoking cessation. Elective repair is recommended at 5.5 cm in the ascending aortic aneurysm, at 6.5 cm in the descending aortic aneurysm in general population and 0.5 cm earlier in patients with familial disorders. Annual growth rate of 1 cm is an independent indicator. Open surgical resection with Dacron Graft replacement, endovascular stenting and hybrid of these two techniques are the treatment options where surgery is to be contemplated [6]. TAA should be suspected at an early stage and managed promptly so as to avoid dreadful complications.

**Differential Diagnosis List:** Thoracic aortic aneurysm, Mediastinal mass, Aortic dissection

**Final Diagnosis:** Thoracic aortic aneurysm

#### References:

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- Tseng E (2012) Thoracic Aortic Aneurysm. <http://emedicine.medscape.com/article/424904-overview>

**Figure 1**

**a**



**Description:** Widening of mediastinum **Origin:** Iqbal S, Department of Cardiology, Stepping Hill Hospital, Stockport, UK

**b**



**Description:** Lateral View **Origin:** Iqbal S, Department of Cardiology, Stepping Hill Hospital, Stockport, UK

**Figure 2**

**a**

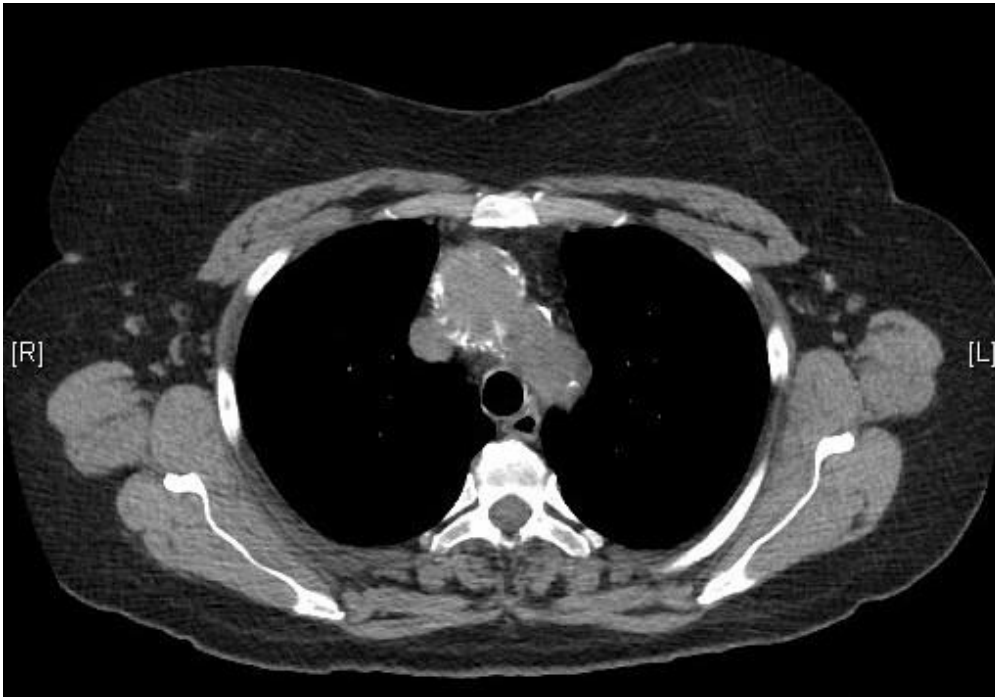


**Description:** Collimated CT scout view.

Widening of mediastinum with curvilinear peripheral calcification. **Origin:** Iqbal S, Department of Cardiology, Stepping Hill Hospital, Stockport, UK

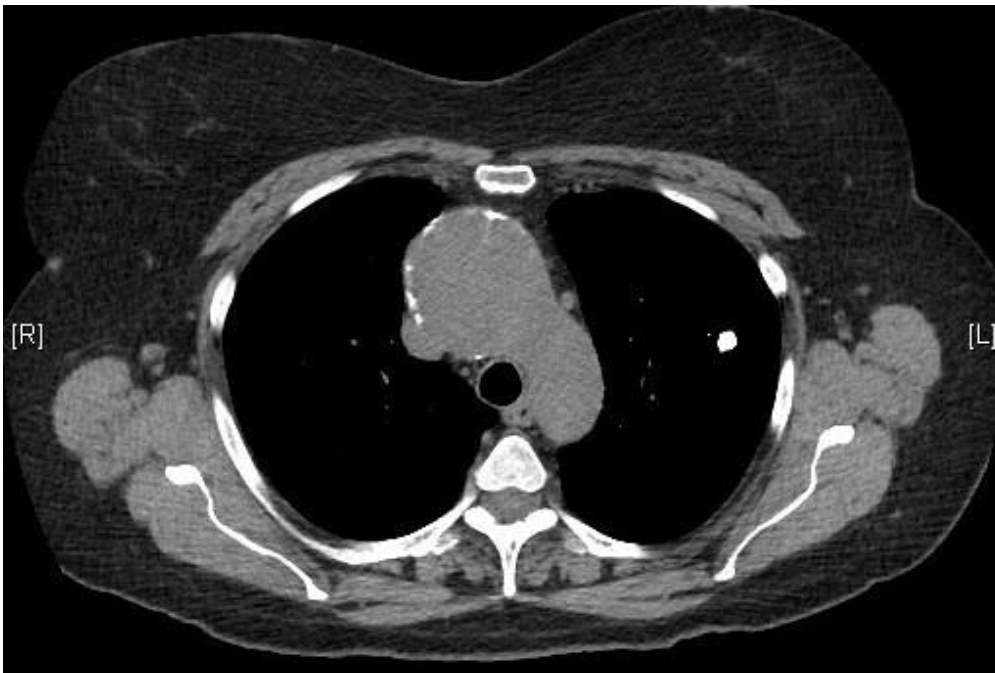
**Figure 3**

**a**



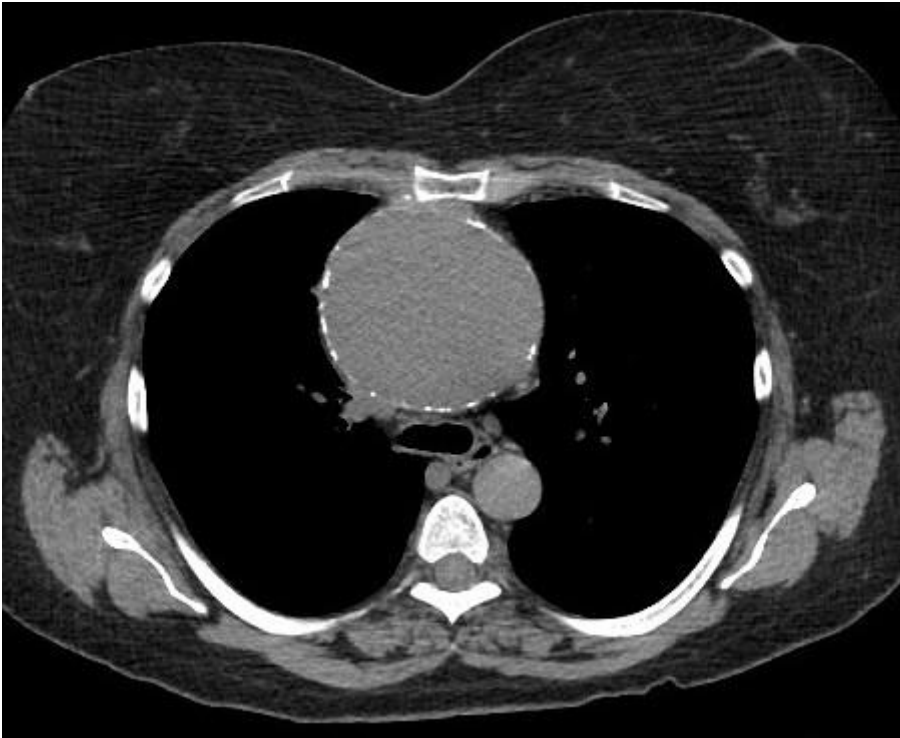
**Description:** NECT **Origin:** Iqbal S, Department of Cardiology, Stepping Hill Hospital, Stockport, UK

**b**



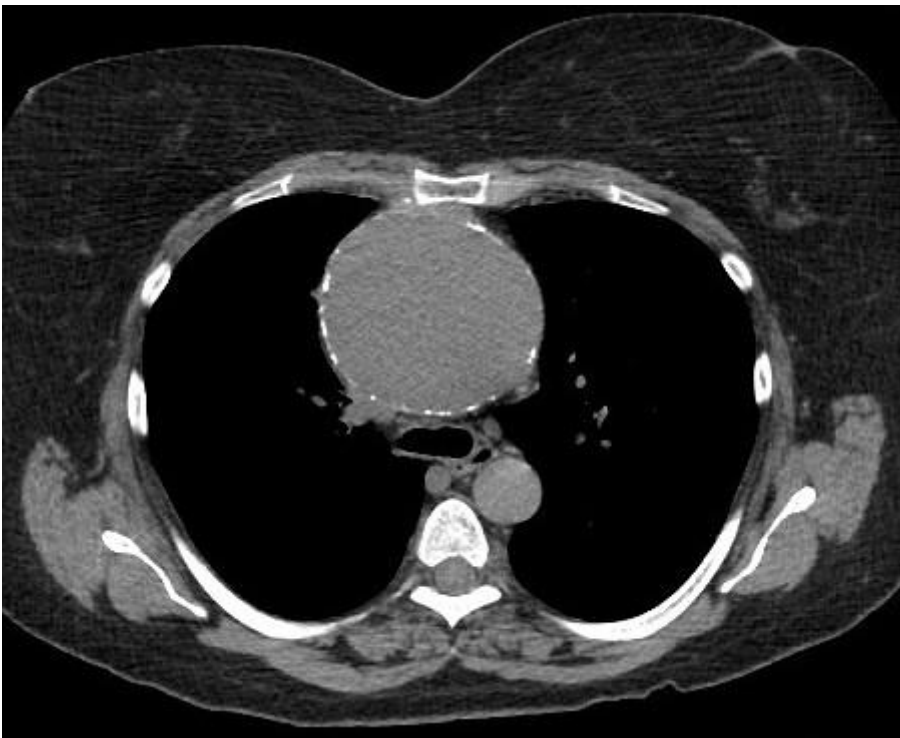
**Description:** NECT **Origin:** Iqbal S, Department of Cardiology, Stepping Hill Hospital, Stockport, UK

**c**



**Description:** Peripheral curvilinear calcification **Origin:** Iqbal S, Department of Cardiology, Stepping Hill Hospital, Stockport, UK

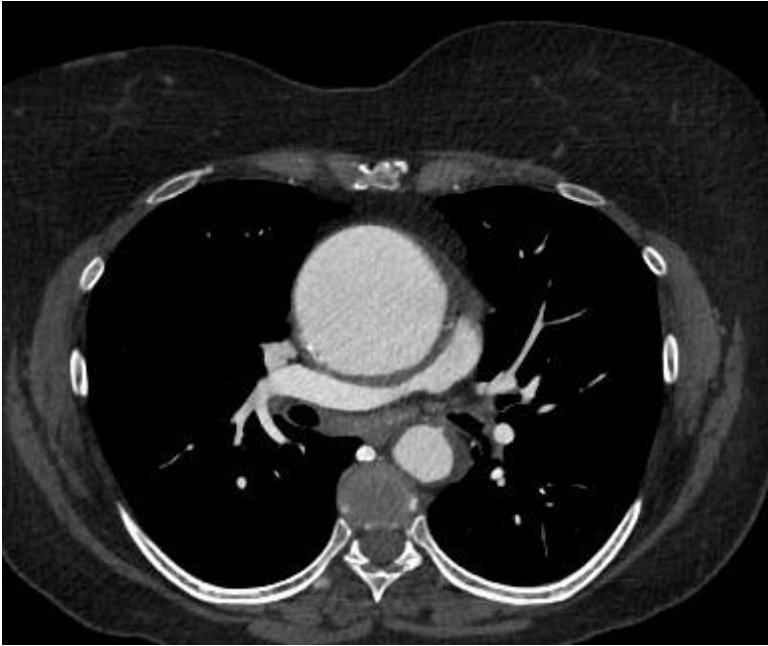
**d**



**Description:** Maximum dilatation **Origin:** Iqbal S, Department of Cardiology, Stepping Hill Hospital, Stockport, UK

**Figure 4**

**a**



**Description:** CECT **Origin:** Iqbal S, Department of Cardiology, Stepping Hill Hospital, Stockport, UK



**Figure 5**

**a**



**Description:** Coronal section depicting fusiform dilatation of ascending aorta. **Origin:** Iqbal S, Department of Cardiology, Stepping Hill Hospital, Stockport

**Figure 6**

a



**Description:** Sagittal section **Origin:** Iqbal S, Department of Cardiology, Stepping Hill Hospital, Stockport