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Azygos Vein Aneurysm: A Rare Cause of Posterior Mediastinal Mass

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Abstract: ***Azygos vein aneurysm is a rare cause of mediastinal mass and is usually an incidental finding on chest radiography. Nowadays the diagnosis is made by non-invasive tests such as CT thorax and/or magnetic resonance imaging. Here we report a case of a female in whom a mediastinal mass due to an azygos vein aneurysm was diagnosed by CT chest, the aetiology of which, in all probability, was idiopathic.***

1. Clinical History

A 56 year old female patient presented to medical OPD with complaint of breathlessness for 2 months. No other complaints. Except for hypertension, her medical history was unremarkable. Vitally she was stable. She was referred to radiology department initially for chest xray.

2. Imaging Findings

Frontal chest roentgenogram (pa view) (FIGURE1) showed widening of right paratracheal stripe (S/o posterior mediastinal mass) Rest no significant abnormality was detected.

Patient was followed up with a CT scan thorax.

On plain CT, a well-defined homogenous soft tissue density lesion measuring approx. (4.5 x 4.2 x 3.5)cm (AP x ML x SI) noted in right paravertebral region in azygoesophageal recess extending craniocaudally from T3 to T5 vertebral level.

On contrast administration, the lesion shows intense enhancement in venous phase with average HU of +155 (enhancement similar to superior vena cava). The lesion appears to be continuous above and below with Azygos vein. Anteriorly, the lesion is in close relation with posterior wall of right bronchus. Medially, the lesion is reaching upto right lateral wall of esophagus.

MRI thorax with mediastinum was performed for better evaluation of the lesion which yielded following findings: well defined altered signal lesion measuring 4.3 x 3.0 x 4.2 cm (AP x TR x SI) noted in right paravertebral region in posterior mediastinum. The lesion showed signal void with turbulent flow signals on TruFISP images and is located along course of Azygos vein.

On contrast images (Figure8), the lesion shows intense homogenous enhancement in venous phase. It is communicating with superior vena cava. A diagnosis of Azygos vein aneurysm was made.

3. Discussion

a) Background

Azygos vein is a unilateral vein, draining posterior chest and abdominal walls, formed by the union of ascending lumbar veins and right subcostal vein, at the level of T12 – L2 and then enters thoracic cavity through aortic hiatus and ascends right to vertebral column in posterior mediastinum until it arches over right main bronchus and then curves into SVC at the level of T4. Azygos vein aneurysm is a rare cause of posterior mediastinal mass. Patients are usually asymptomatic and is found as an incidental finding. Diagnosis is made by contrast enhanced CT and MRI.

b) Pathophysiology

Etiology of Azygos vein aneurysm is not well characterized, but most cases occur in patients with raised central venous pressure such as in decompansated heart failure, portal hypertension[1], traumatic pseudo aneurysm, obstruction of IVC by tumor or lymph node, and if no cause is identified i.e. idiopathic cases essentially considered to be congenital[1].

c) Clinical Perspective

Usually asymptomatic. Rarely can present with chest tightness due to mass effect. More rarely may cause breathlessness or dysphagia due to compression of trachea or oesophagus.

d) Imaging Perspective

On frontal chest x-ray, azygos vein aneurysm presents as a right superior mediastinal abnormal density which typically changes in size with respiration especially on valsalva manuver[3].

On CT and MRI, a right paratracheal mass is seen along the course of vein. On post contrast dynamic CT, characteristic intense enhancement is seen which is similar to veins[2].

On T2WI, heterogeneously bright high signal with internal flow voiding mass lesion is seen in connection with and draining into SVC, suggestive of vascular origin.[4]

On T1WI the mass shows homo-iso intense signal.[4]

On dynamic post contrast T1WI,the lesion isseen gradually filled with contrast material in venous phase.

e) Treatment options

Management protocol varies from conservative to interventional radiology guided embolization or coiling of aneurysm to surgical resection[2]. Asymptomatic patients should be followed as aneurysms may develop following complications[1]:

- May enlarge in size and compress right main bronchus or superior vena cava.
- Thrombosis may develop and in turn pulmonary thromboembolism can occur.
- Theoretical possibility of rupture.

f) Impact of imaging

Dynamic contrast enhanced CT scanning and MRI not only provide non-invasive methods for the diagnosis of vascular abnormalities, but can also clarify the nature of the mass and eliminate the need for invasive procedures[3].

g) Take Home Message / Teaching Points

Azygos vein aneurysm is a rare cause of mediastinal mass and should be included in the differential diagnosis of posterior mediastinal mass. Non invasive tests, dynamic contrast enhanced CT and MRI provide accurate diagnosis as well as origin of the lesion and also provide information about the connections to adjacent vascular structures.

h) Final Diagnosis

Azygos vein aneurysm

i) Differential Diagnosis List

- Neurogenic benign masses such as Schwanomma and Paragangliomas
- Teratoma
- Oesophageal duplication cyst
- Bronchogenic cyst

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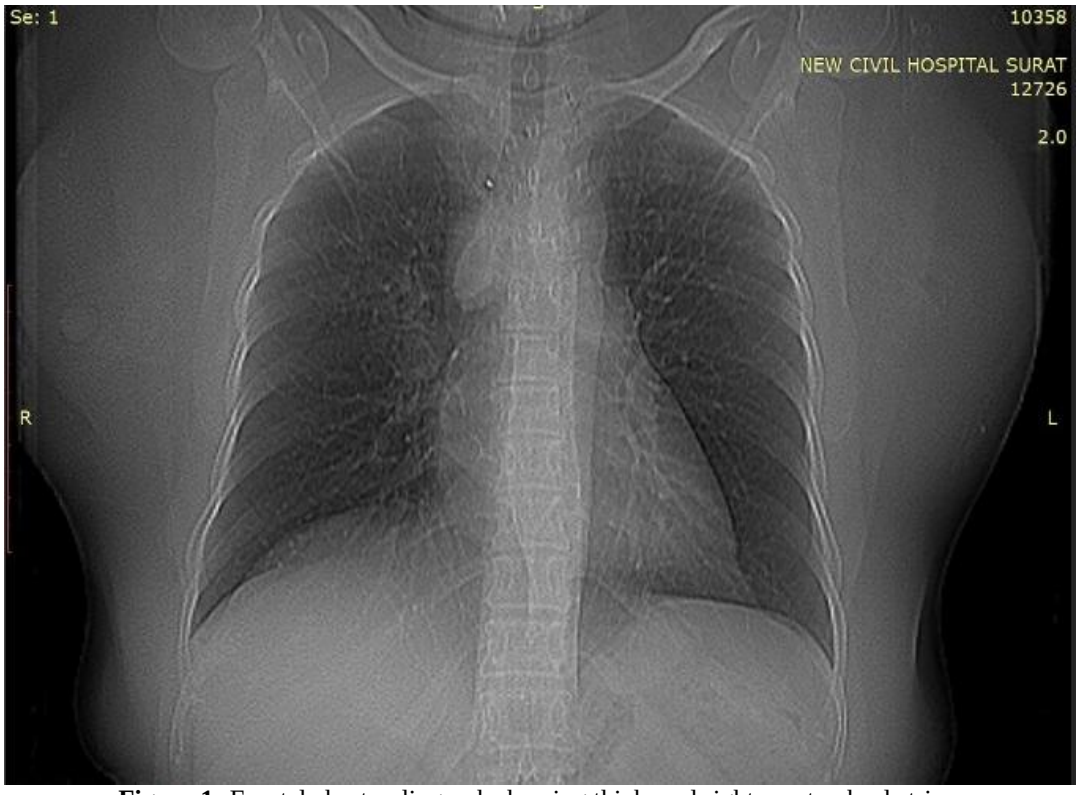

Figure 1: Frontal chest radiograph showing thickened right paratracheal stripe

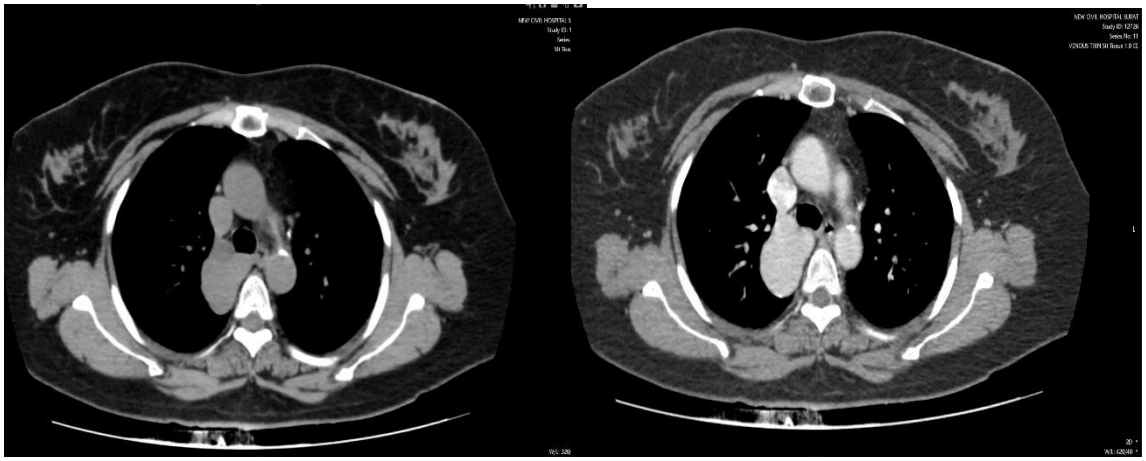

Figure2 **Figure3**

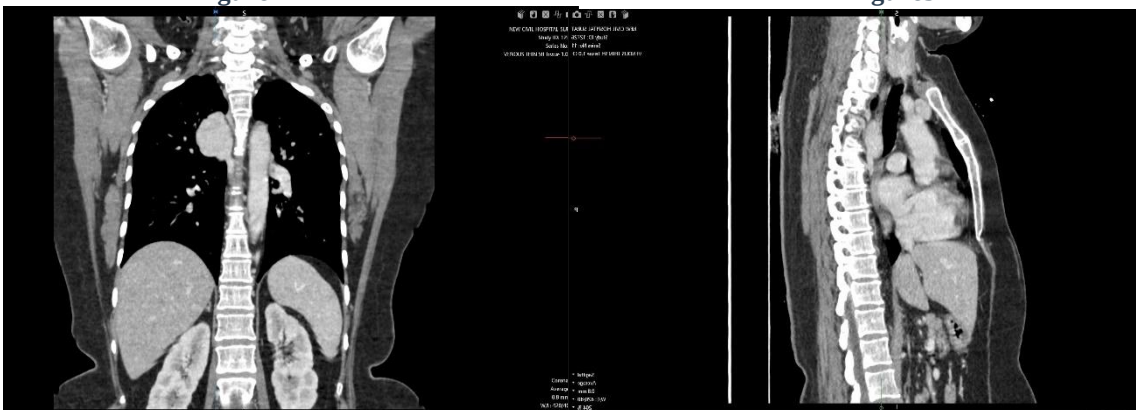

Figure 4 **Figure 5**

Figure 2 axial plain CT chest showing well defined homogenous soft tissue lesion in azygoesophageal recess.
Figure 3, 4, 5 post contrast venous phase showing intense enhancement (+155HU and same as SVC) of lesion and its continuation below and above with Azygos vein and appears to open into superior vena cava.

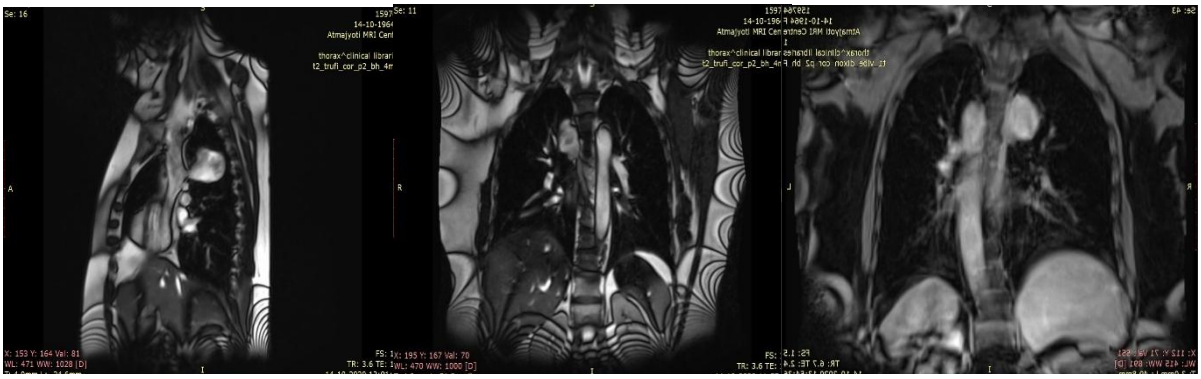

Figure 6 **Figure 7** **Figure 8**

Figure 6-7: Sagital and coronal T2WI bright high signal with internal flow voiding mass lesion.
Figure 8: Post contrast T1WI, the lesion is seen gradually filled with contrast material in venous phase and appears to drain into SVC.