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Imaging Features Of Unusual Thoracic And Abdominal Aneurysms, Case Series And Literature Review

Dr. Sangeetha Elango, Dr.Yuvabalakumaran .G, Dr.Vinoth kumar .S
Vinayaka Mission Kirupananda Variyar Medical College Salem- 636308

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Introduction:

Aneurysm is the abnormal focal dilatation of the arteries. Thoracic aneurysms are rare occurring approximately 5-10 in every 100,000 people[1].Visceral artery aneurysms are extremely rare and their prevalence reported as 0.1- 2 percent [2]. The most important and feared complication of aneurysm is progressive enlargement and rupture of aneurysm. Few other complications are fistula formation and infection. With the recent advancement in the Computed Tomography (CT) angiography providing maximum intensity projection images along with three dimensional volume rendering images, these rare aneurysms are diagnosed with much ease. [3].

Unlike conventional angiography, CT angiography is a fast and noninvasive investigation with least complications. CT angiography guides in detecting the morphological feature, extent of the aneurysm, presence of thrombus and details of the adjacent structure. Though the main limitation of CT angiography is radiation exposure , the benefits exceeds the risk of imaging. To over come such exposure , low dose dose radiation with low volume contrast medium CT angiography protocol emerged as recent advance in the evaluation of non contrast chest pain [4]. Here we discuss a series of imaging features of unusual thoracic and abdominal aneurysms.

Case 1:

Sixty six year old male presented with chest pain who was a known case of hypertension. X Ray chest PA view, showed a well-defined round opacity in the left side of mediastinum obliterating the left Para tracheal stripe, which made suspicious of mediastinal mass. Contrast enhanced CT showed a tight narrowing of the thoracic aorta just distal to the origin of the left subclavian artery, suggesting coarctation of aorta. A focal outpouching of descending aorta measuring 3.5 cm in diameter noted just distal to the coarctation with peripheral calcification suggesting saccular aneurysm of descending aorta. Three dimensional volume rendering (VR) images showed multiple collaterals from the internal mammary artery.

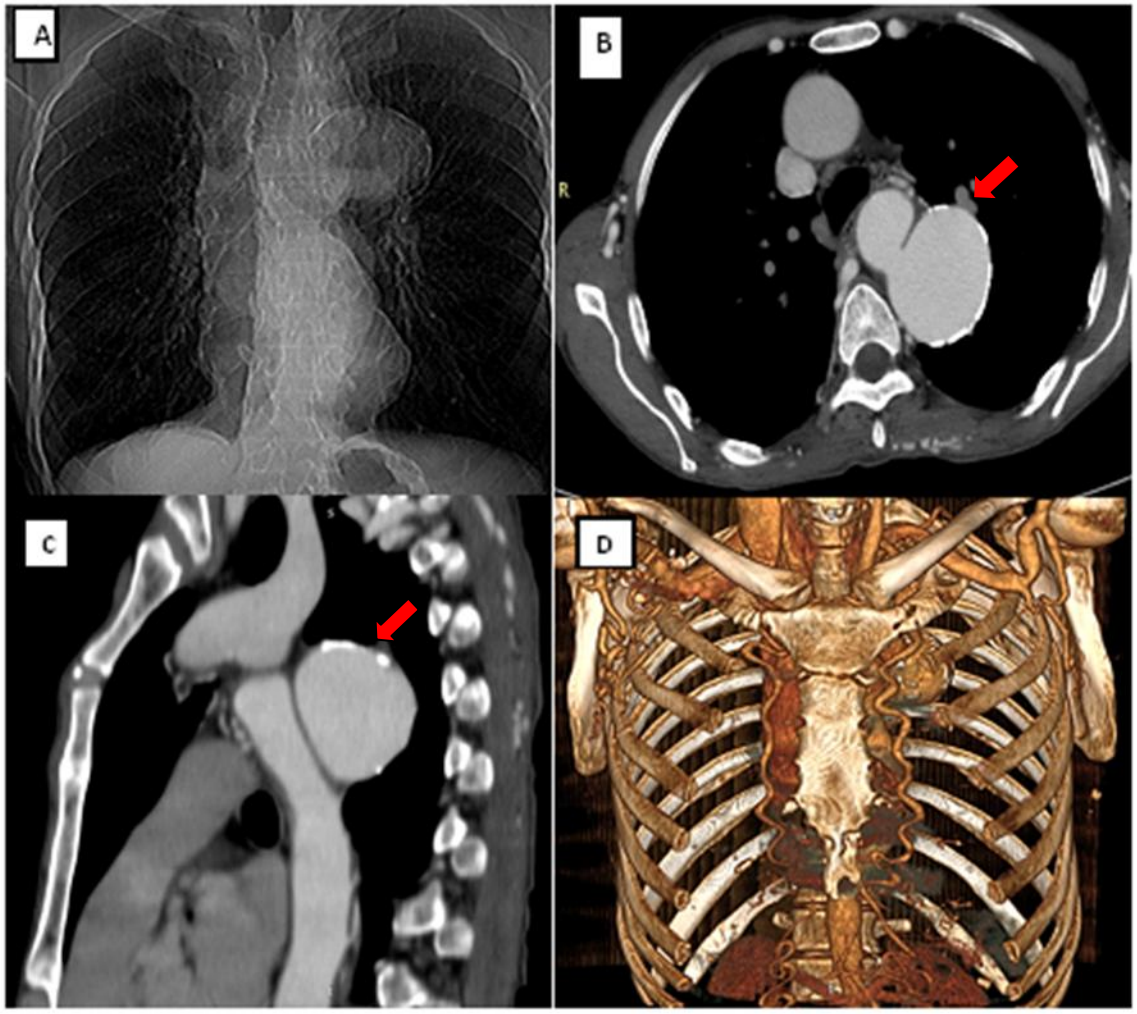

Fig 1: **Fig (A) chest X ray showing left mediastinal mass, Fig (B, C) axial and coronal section shows coarctation of aorta with saccular aneurysm with peripheral calcification, Fig (D) VR images demonstrates multiple internal mammary artery collaterals.**

Case 2:

Twenty three year old male presented with history of nonspecific chest Pain. He had a history of blunt trauma to chest 2 months back. Chest X ray showed a round opacity in the right mediastinum. Further contrast enhanced CT showed a focal narrow neck outpouching from the ascending aorta surrounded by a thick eccentric low density thrombus with peripheral calcification suggesting a pseudo aneurysm. Aortic pseudo aneurysms typically occurs after trivial trauma of which 85 % are penetrating trauma and 15 % are blunt injury.

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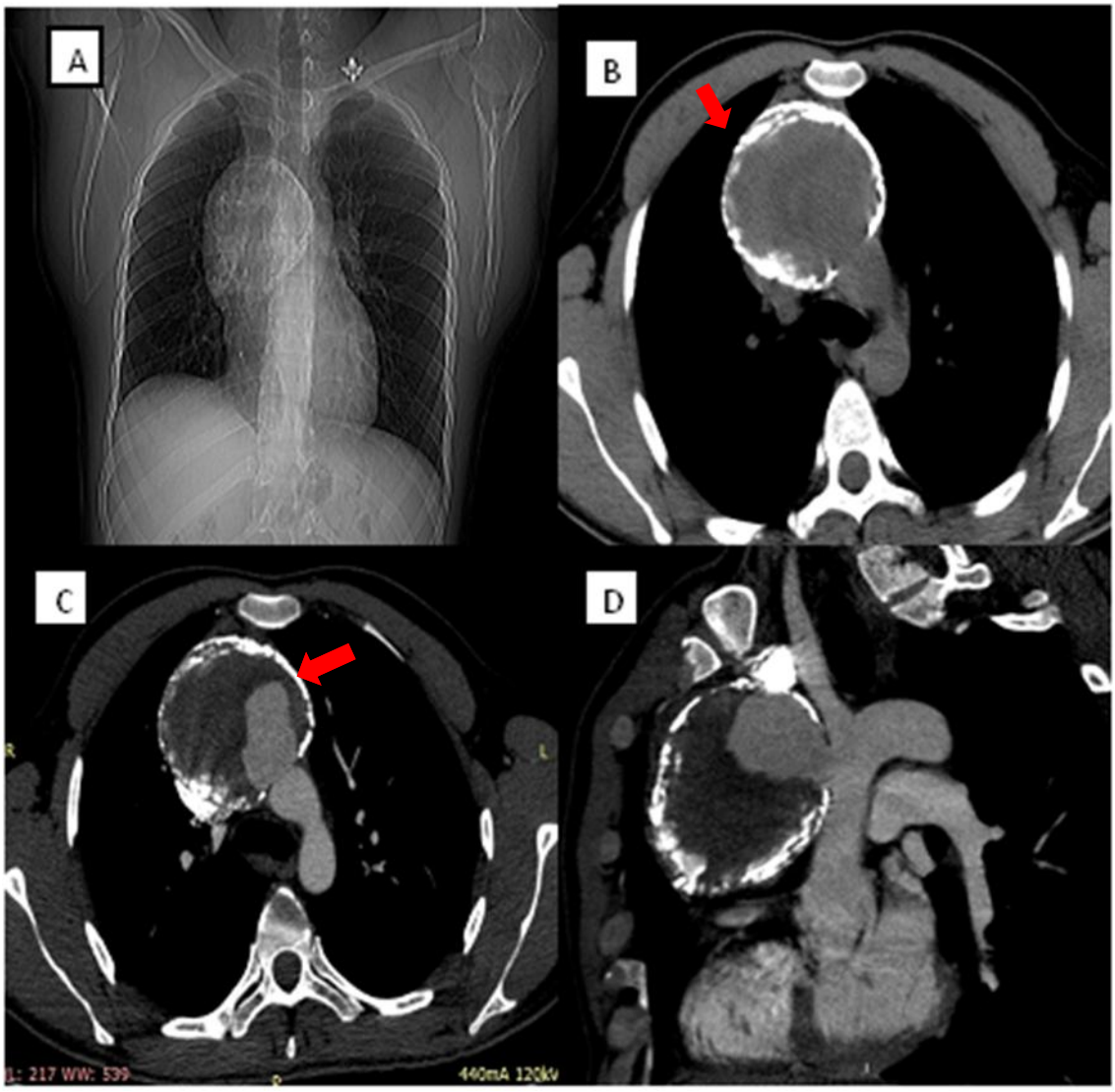

FIG 2: Fig (A) shows a right mediastinal mass. Fig (B) axial section shows ascending aortic aneurysm. Fig (C, D) post contrast axial and coronal section shows ascending aortic pseudo aneurysm with intramural thrombus with peripheral calcification.

Case 3:

A 60-year-old male presented with history of acute abdominal pain. Initially on ultrasound we diagnosed a large hetero echoic collection with in the gall bladder lumen and pericholecystic region**.** Further on contrast enhanced CT, arterial phase showed a aneurysm of the cystic artery. Coronal section confirmed the origin of the aneurysm from cystic artery. Venous phase axial image demonstrated distended gall baldder with hyperdense content suggesting haemorrhage. Concomitant features of fat stranding and heterogeneous pancreatic parenchyma noted, suggesting rupture of cystic artery pseudo aneurysm associated with pancreatitis.

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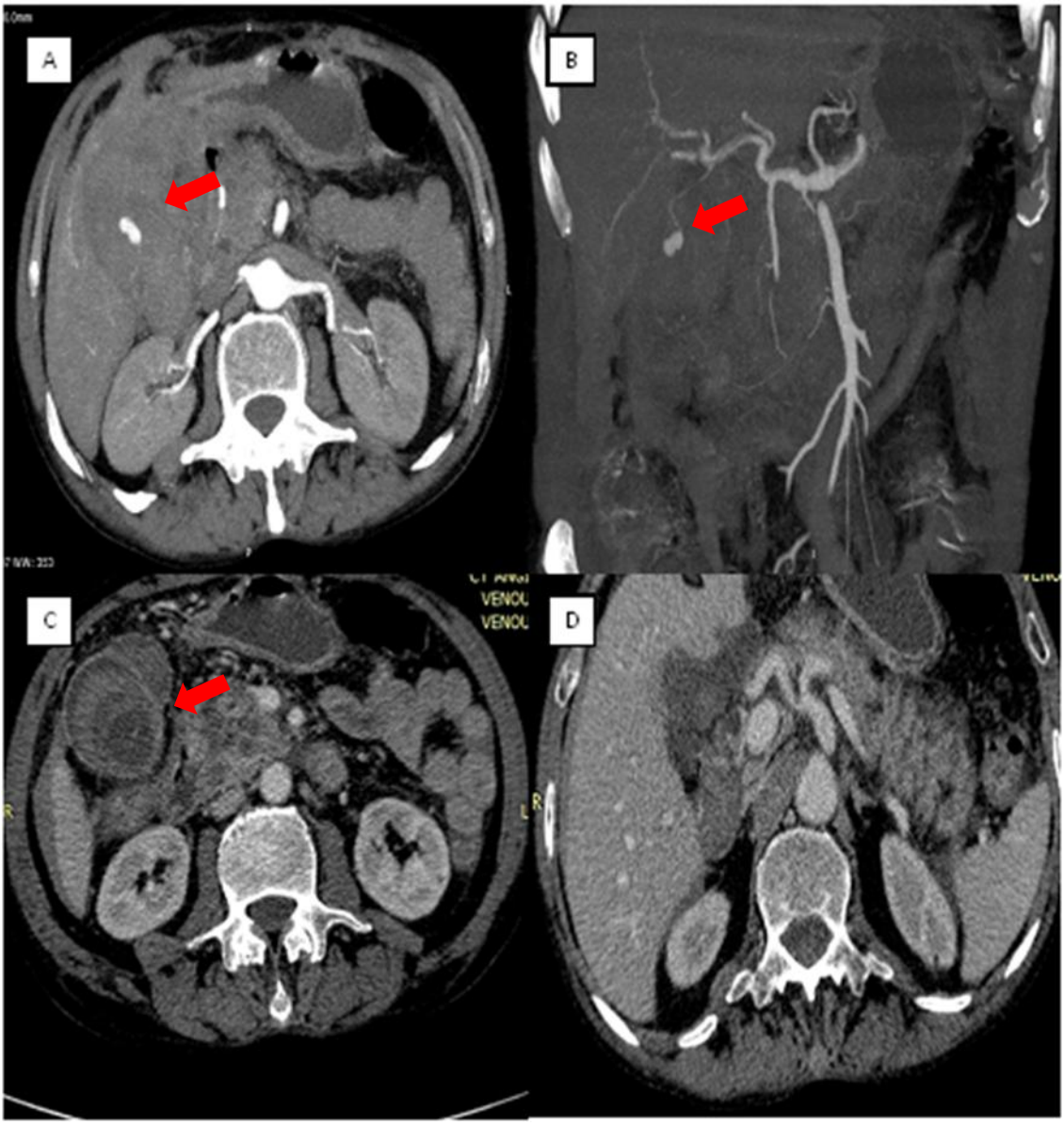

FIG 4 . Fig (A, B) shows cystic artery pseudo aneurysm. Fig (C) shows distended gall bladder with hyper dense content. Fig(D) axial section shows pancreatitis.

Case 4:

A twenty two year old male presented with complaints of epigastric pain with one episode of hematemesis and melena. Laboratory investigation showed elevated bilirubin. Contrast enhanced axial images showed aneurysmal dilatation of hepatic artery with surrounding isodense haematoma at the level of hilum. Coronal sections confirmed the aneurysm involving from right hepatic artery which also showed anomalous origin of common hepatic artery from the superior mesenteric artery. 3D images showed irregular fusiform dilatation of descending aorta suggesting aortoarteritis with pseudo aneurysm of right hepatic artery.

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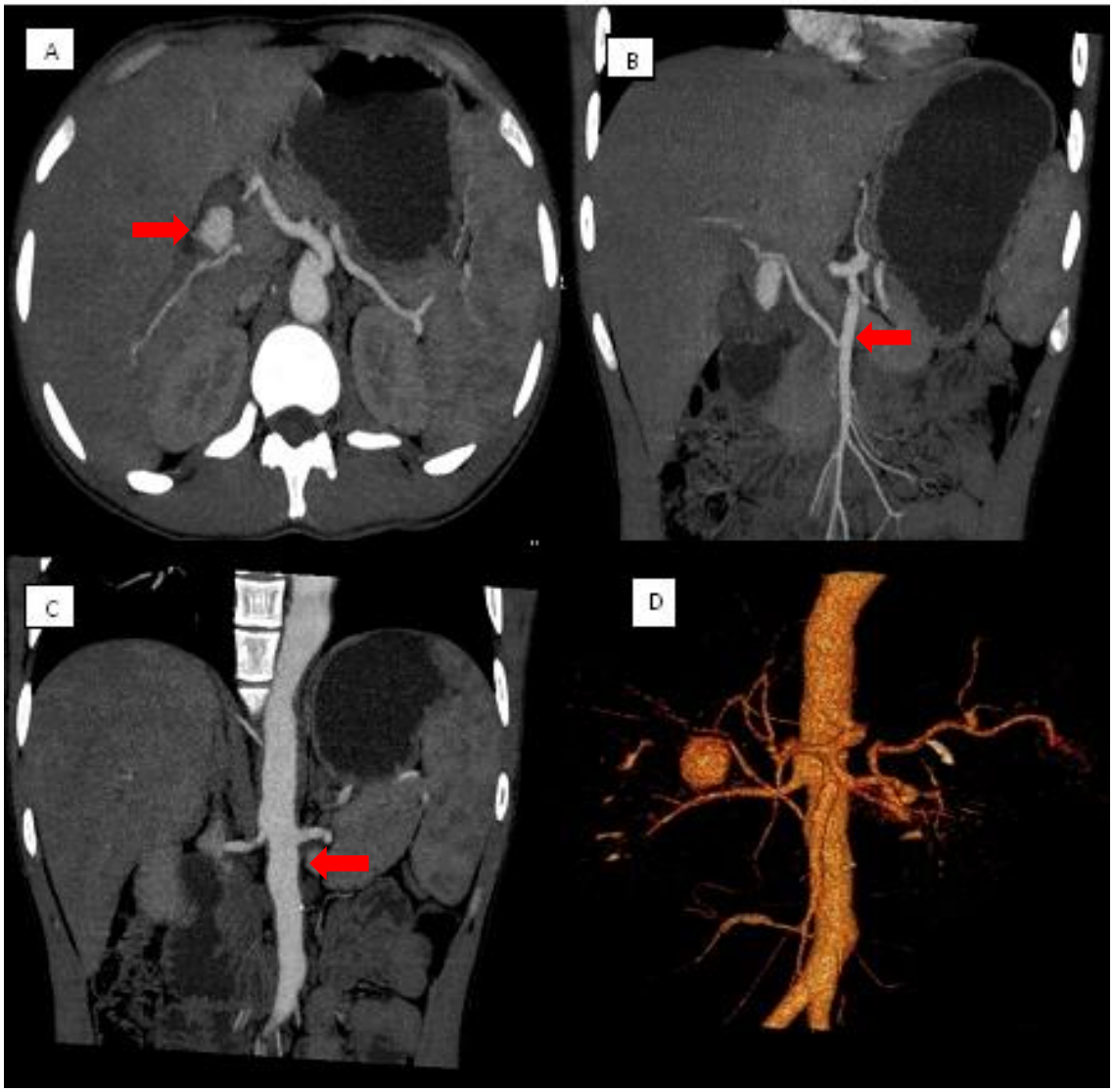

FIG 5; Fig (A) shows hepatic artery aneurysm with surrounding isodense haematoma. Fig (B) shows anomalous origin of common hepatic artery from superior mesenteric artery, Fig (C, D) coronal and volume rendering images demonstrates aortoarteritis.

Discussion:

Among various patients who underwent CT angiogram, we diagnosed the above 4 cases with unusual and rare manifestations. Patients with coarctation of aorta are at significant risk of aneurysm formation later in life. A fusiform aneurysm associated with coarctation of aorta is well known in adults and in most case they remain asymptomatic for prolonged period. Here we showed a case of saccular aneurysm with coarctation of aorta as an exceedingly rare presentation [5].

Aortic pseudo aneurysm occurs spontaneously. However penetrating injury,blunt injury, infection are the leading cause of aortic pseudo aneurysm . Rarely it can also be iatrogenic in less than 5 percent patients at aortotomy site who underwent a cardiac surgery. In a noncontrast CT a large ascending aortic pseudo aneurysm can mimic mediastinal lymphadenopathy which can lead to miss such life threatening condition[6].The size of pseudo aneurysm has no correlation with risk of rupture. Even a small pseudo aneurysm can lead to life threatening haemorrhage, while large pseudo aneurysm can be found incidentally [7].

George noussios et al described that 80 % normal people has normal anatomic origin of common hepatic artery arising from coeliac trunk and rest 20

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% has anatomic variations [8]. In our case we encased an anomalous origin of common hepatic artery arising from superior mesenteric artery with pseudo aneurysm.

Visceral pseudo aneurysms mostly presents with provoking inflammatory conditions like pancreatitis, cholecystitis. Cystic artery pseudo aneurysms are uncommon as only 16 patients are reported in literature [9]. Cystic artery pseudo aneurysms rarely manifests due to early spontaneous thrombosis before going for haemorrhagic rupture. We represented such rare cystic artery pseudo aneurysm.

Conclusion:

Unusual presentations of aneurysm/pseudo aneurysms are possible. Radiologists may be the first to suggest the diagnosis in such cases. Clinical background is essential. CT angiography is the workhorse for diagnosis. CT angiography comes up with better spatial resolution than Magnetic resonance angiography and echocardiography. Interventional radiologist plays a vital role in management of visceral aneurysm. Early diagnosis and treatment with less invasive surgical procedures reduces the mortality. Endovascular repair has evolved with newer designs leading to less complications and better outcomes. However, we need to be aware of the complications such as endoleaks, rupturing aneurysms.

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