CASE REPORT

PULMONARY ARTERY PSEUDOANEURYSM: A POST-COVID COMPLICATION

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We present a case report of a potentially lethal post-COVID complication. A 65-year-old male presented with shortness of breath and fever with chills. He had recently recovered from COVID pneumonia. Contrast enhanced CT scan chest gave the suspicion of pulmonary pseudoaneurysm. CT aortogram revealed a well-defined rounded mass in the right lung mainly occupying the lower lobe of the right lung. Angiography through the right common femoral vein was performed and it confirmed a huge pseudoaneurysm arising from the posteromedial branch of the right descending interlobar artery. As the artery was not found suitable for endovascular embolization, the patient was referred to a thoracic surgeon.

Keywords: Pulmonary pseudoaneurysm; COVID; Post-COVID

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INTRODUCTION

The arterial wall consists of three layers. The innermost layer is intima, the middle layer is tunica media and the outer one is adventitia. An aneurysm is weakening the arterial wall creating a local bulge in it. A true aneurysm involves all three layers of the vessel wall. A pseudoaneurysm, on the other hand, develops due to a leakage from the vessel wall and is encapsulated in a compressed layer of surrounding connective tissue. It has a high risk of rupture and hence is a very life-threatening entity. Various causes of pulmonary artery pseudoaneurysms have been described, including congenital and acquired.[1] Acquired causes include iatrogenic, trauma, infections, neoplasms, radiation therapy, pulmonary embolism, traction bronchiectasis, pulmonary fibrosis and idiopathy. Iatrogenic causes include Swan-Ganz catheter placement, biopsies, chest tube insertions, lobectomy, and right cardiac catheterization. Infectious causes include mycobacterial infection, pyogenic or fungal infection. Traumatic causes include stab wounds to the chest or gunshot injuries.[2,3] Radiographic findings are non-specific in the case of pulmonary artery pseudoaneurysms. CT scan with contrast gives better details although CTPA is the gold standard imaging modality in the case of pulmonary artery pseudoaneurysm.[4] In this paper we report a case of pulmonary artery pseudoaneurysm secondary to COVID-19 pneumonia and its findings in radiographic images.

CASE REPORT

A 65-year-old male with one-month history of COVID-19 pneumonia came to our hospital with complaints of shortness of breath, decreased oxygen saturation, on and off fever, chills, rigours, and mild dry cough.

He underwent HRCT performed on which showed a loculated high-density fluid collection in the right hemithorax and raised the suspicion of an inspissated right-sided pleural effusion/ abscess/ hydatid cyst. He then got his CT chest with contrast performed after 7 days of initial HRCT from an outside facility which gave the suspicion of pulmonary pseudoaneurysm.

He then again came to our hospital to have his CT aortogram done which revealed a well-defined rounded mass in the right lung mainly occupying the right lung lower lobe showing heterogenous enhancement on arterial phase with CT density of approximately 110–130 HU with peripheral hypodense rim. It measured 10×X 10×12 mm (AP X TR X CC). The right-sided lower lobar subsegmental arterial branches appeared to be splayed around the periphery of this mass and were narrowed in calibre, however, no definite communication with the above arteries was noted. The suggestion of communication of one of the sub-optimally contrast opacified segmental branches was given.

On the given venous phase images, this mass showed homogenous contrast enhancement with attenuation like that of the aorta in the venous phase. Based on these findings, a diagnosis of right sided pulmonary pseudoaneurysm was given and further confirmation with conventional angiography was advised.

The very next day patient underwent catheter angiography through the right Common Femoral Vein. Informed consent was obtained. Right groin access was achieved using 5 Fr sheath. 5 Fr

Pigtail catheter was used to catheterize the pulmonary artery (PA) and right pulmonary artery (RPA). Right pulmonary artery pressure recording was made (20 mmHg). J-wire exchanged with Amplatz wire. 5 Fr Pigtail catheter removed. Sheath upsized to 10 Fr short sheath. 8 Fr long sheath placed with its tip in the main pulmonary artery (PA). 5 Fr Vertebral catheters over glide wire used to selectively cannulate the posteromedial branch of the right lower lobe pulmonary artery. The catheter and sheath were removed. No immediate post-procedure complications were noted.

It confirmed a huge pseudoaneurysm arising from the posteromedial branch of the right descending interlobar artery (branch of RPA) supplying the lower lobe. A jet of contrast was noted filling the aneurysm. However, there was no active extravasation of contrast from the aneurysm or any other branches of the right pulmonary artery was observed at the time of the procedure. Selective runs of the feeding branch of the aneurysm was performed. The feeding branch did not appear to be suitable for endovascular embolization. Therefore, the embolization procedure with plugs/coil was not opted for. Further assessment and evaluation by a cardiothoracic surgeon were advised

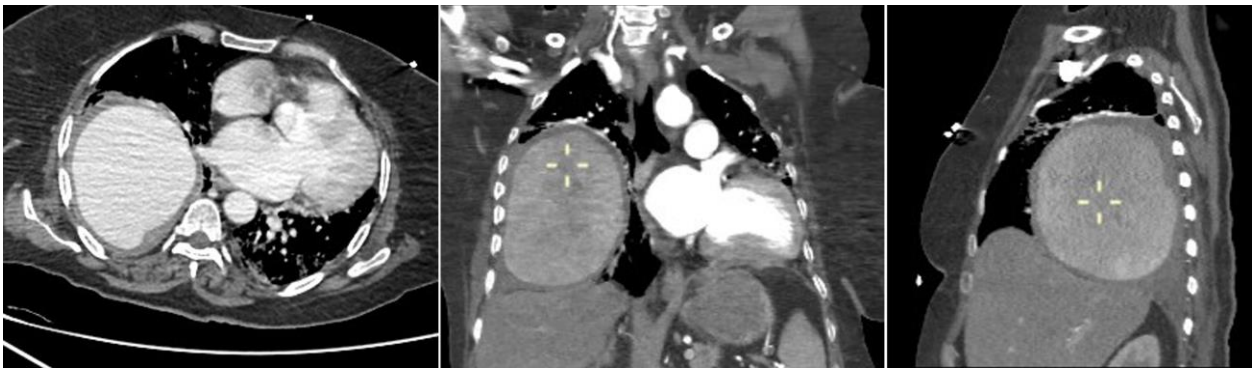

Figure-1a, 1b and 1c: Contrast enhanced axillary, coronal and sagittal images of CT scan of chest showing a well-defined contrast opacified structure in right hemithorax, representing pseudoaneurysm.

Figure-2: Fluoroscopic AP image of catheter angiography showing large right sided pulmonary aneurysm

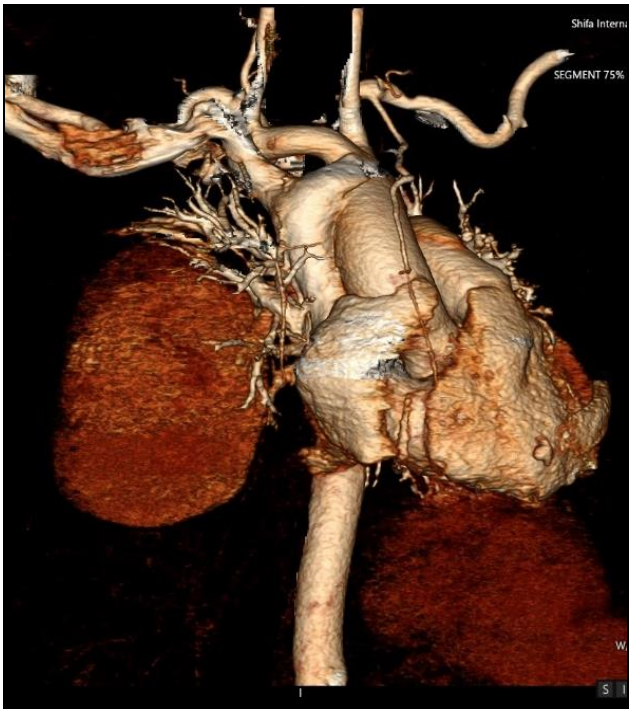

Figure 3: 3-D reconstructed images confirming the pseudoaneurysm

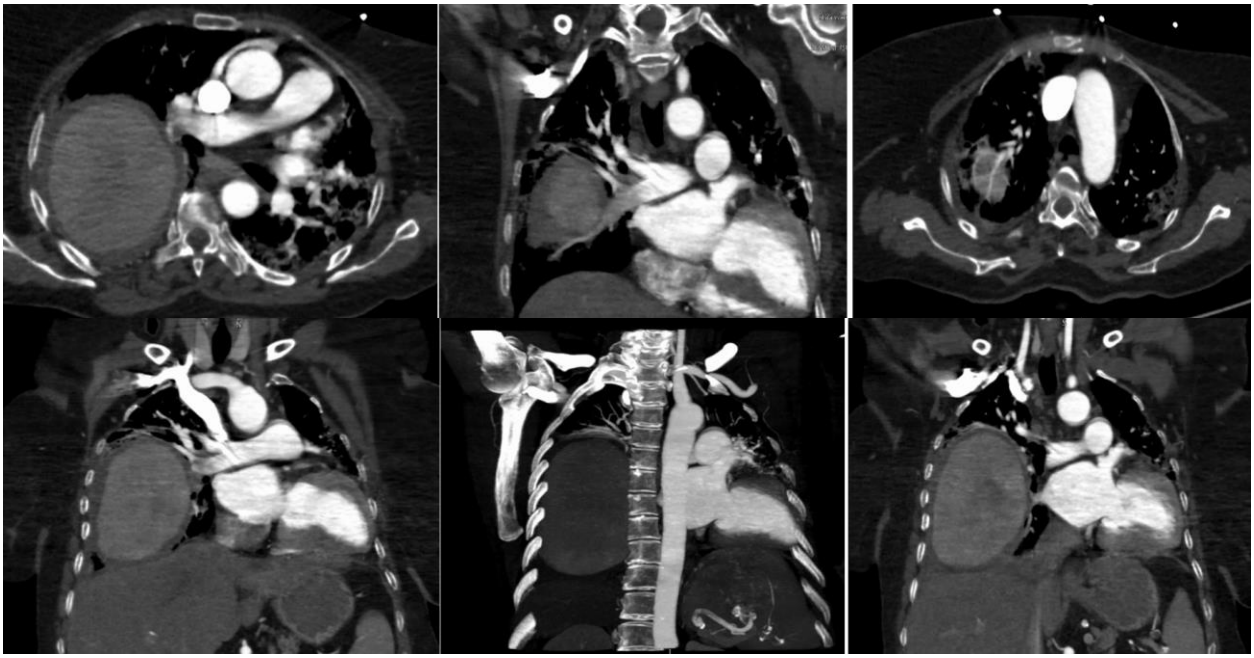

Figure-4a, 4b, 4c, 4d, 4e and 4f: Axial and coronal MIP images showing huge pseudoaneurysm arising from the posteromedial branch of the right descending interlobar artery (branch of RPA) supplying the lower lobe.

DISCUSSION

Pulmonary pseudoaneurysms (PAPs) are seldom seen in the spectrum of pulmonary artery diseases and are defined as the focal dilatation of a segment of a pulmonary artery. It is a rare and potentially life-threatening entity.[5]

Normal adult main pulmonary artery and interlobar pulmonary artery diameters measure up to 29 mm and 17 mm respectively on Computed Tomography. A pseudoaneurysm involves only the tunica media and adventitia of the vascular wall while a true aneurysm involves all three vascular walls (tunica intima, tunica media, and tunica adventitia). As PAPs involve fewer layers thus it is more prone to rupture than a true aneurysm.

PAPs can be proximal or peripheral. Proximal involves the pulmonary trunk while peripheral involves the intrapulmonary artery.

Aetiologies can be congenital or acquired and presentation varies as patients present with nonspecific symptoms which make their diagnosis more difficult.[6] Even though the incidence of PAPs is low yet their mortality is high so this needs prompt diagnosis and treatment.

Suspicions can be alarmed on a CXR and Contrast CT but this is confirmed on CT angiography. They can be incidentally discovered but they propose high mortality if rupture.[7] One of the most deteriorating aetiologies is infectious and COVID-19 is notorious for attacking the respiratory system. The mechanism of how COVID-19 involves the pulmonary arteries leading to pseudoaneurysm is still unclear but it is very rare to be reported.

The prevalence of pulmonary thromboembolic disease is 38% of the CT angiography of Covid-19 patients.[8] CT angiography plays a pivotal role in diagnosing such cases and exterminating other differentials.[9]

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