

JSS Academy of Higher Education and Research

**Research Connect**

---

Radiology Teaching Files

---

2021

## **MULTIPLE PULMONARY ARTERY ANEURYSMS : A CASE REPORT OF PULMONARY VASCULITIS**

Sanath Kumar Dr

*JSS Medical College, JSS AHER*

Sudha Kiran Das Dr

*JSS Medical College, JSS AHER*

Gurumurthy M Dr

*JSS Medical College, JSS AHER*

Follow this and additional works at: <https://rescon.jssuni.edu.in/radiologyteachingfiles>

---

### **Recommended Citation**

Kumar, Sanath Dr; Das, Sudha Kiran Dr; and M, Gurumurthy Dr, "MULTIPLE PULMONARY ARTERY ANEURYSMS : A CASE REPORT OF PULMONARY VASCULITIS" (2021). *Radiology Teaching Files*. 1. <https://rescon.jssuni.edu.in/radiologyteachingfiles/1>

This Cardiovascular is brought to you for free and open access by Research Connect. It has been accepted for inclusion in Radiology Teaching Files by an authorized administrator of Research Connect.

## **MULTIPLE PULMONARY ARTERY ANEURYSMS : A CASE REPORT OF PULMONARY VASCULITIS**

### **CLINICAL HISTORY**

**Presenting history** – A 24 year old male patient came with complaints of haemoptysis since 3 months, aggravated on exertion around 3-4 episodes per day with around 3-4 ml of frank blood. No complaint of chest pain/ fever. No past history of PTB. No e/o significant past history. Patient tested negative for HLA b51 and Anti-nuclear antibody.

### **Imaging**



**Chest radiograph PA view Fig 1** - Few well-defined nodular opacities in bilateral perihilar region and right lower zones. No e/o calcifications. Accentuated bronchovascular markings noted.

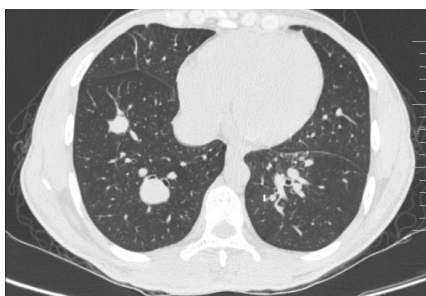


Fig.2a

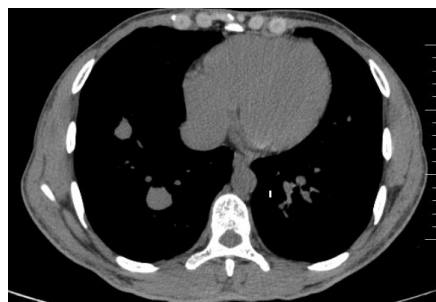


Fig.2b

**Plain Computed tomography thorax Axial section - Fig 2a (lung window) and 2b (mediastinal window)** - Multiple well-defined nodules in bilateral lung fields. No e/o calcifications/ air bronchogram.

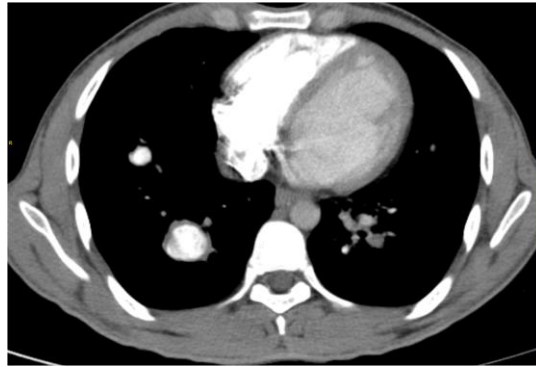
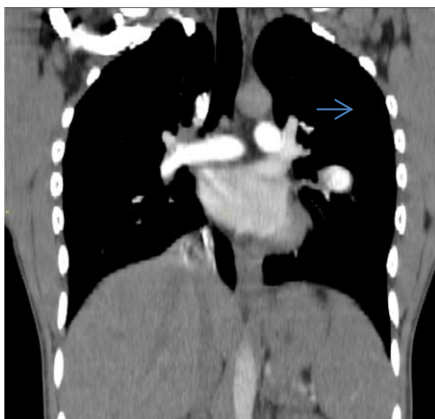


Fig. 3

**CECT pulmonary angiogram Fig 3 - Axial section -** Multiple well-defined homogeneously enhancing nodules arising from segmental pulmonary artery with peripheral non enhancing areas – s/o Pulmonary aneurysms with thrombosis.



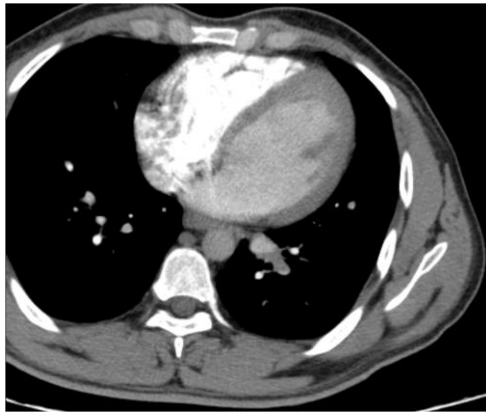
4a



4b

**CECT pulmonary angiogram - Fig.4 a & 4b Coronal & sagittal section (mediastinal window)**

Well-defined homogeneously enhancing nodule arising from segmental branches of left lower pulmonary artery with peripheral non enhancing areas. Feeding artery sign noted in image 4b.

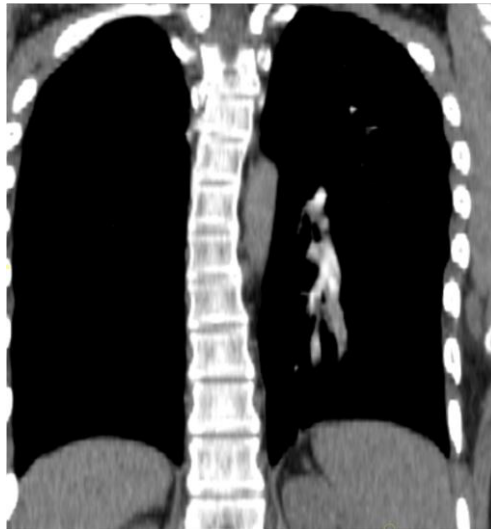


5a

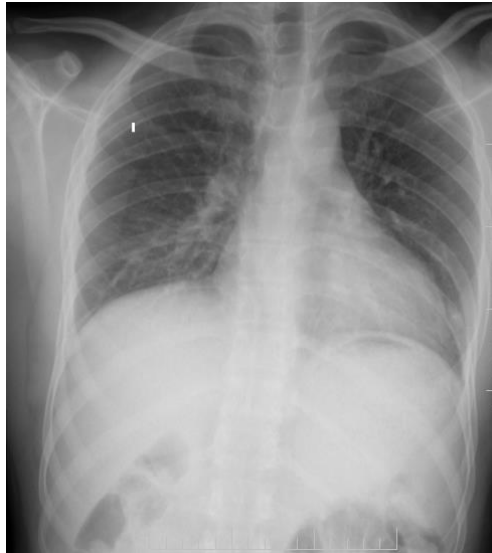


5b

**CECT pulmonary angiogram Fig.5 a & 5b Axial section (mediastinal window) -**  
Near total resolution of the previously imaged pulmonary aneurysms post immunosuppressant's therapy.



**CECT pulmonary angiogram Fig.6 Coronal section (mediastinal window)**  
(mediastinal window) shows circumferential filling defect in postero-basal segment of left lower lobe artery – s/o chronic thrombosis.



**Fig.7 Chest radiograph PA view** -Near total resolution of previously imaged nodules post immunosuppressant therapy.

**Follow up** : There was near total resolution of the previously imaged nodules on follow up scans (Fig 5a, 5b, 6 & 7) post treatment with immunosuppressants (Pulse methyl-prednisolone & azathioprine).

### **Differential diagnosis**

- Behcets disease.
- Giant cell arteritis.
- Takaysaus arteritis.

➤

### **Final diagnosis**

- Pulmonary vasculitis with multiple pulmonary aneurysms.

### **Discussion**

#### **Etiopathogenesis –**

Pulmonary artery aneurysms are rare & infrequently diagnosed. The causes can be congenital or acquired.

#### **Congenital -**

Persistent ductus arteriosus, atrial & ventricular septal defect, pulmonary valvular stenosis & regurgitation. Connective tissue disorders ( Ehler danlos & marfans syndrome).

#### **Acquired –**

Vasculitis ( Behcets & giant cell arteritis), infections ( syphilis, tuberculosis & pyogenic bacteria), pulmonary arterial hypertension, neoplasms, & chronic pulmonary embolism.

In ANCA-associated vasculitis, an intense infiltration of activated neutrophils results in fibrinoid necrosis and dissolution of vessel walls, thus compromising the vascular lumen<sup>5</sup>.

Production of autoantibodies such as antiglomerular basement membrane antibody (type 2 hypersensitivity reaction), formation of immune complexes (type 3 hypersensitivity reaction), and T cell involvement (type 4 hypersensitivity reaction) are likely to link to the pathogenesis of small-vessel pulmonary vasculitis<sup>5</sup>.

The damage to the integrity of the vessels results in the leakage of blood into the alveolar space from the interstitial capillaries and causes stenoses, thrombotic obstruction, and aneurysms of the corresponding vessels<sup>5</sup>.

Most common and dreaded complication is haemoptysis.

### **Imaging Features –**

Chest radiograph - Dilatation of main pulmonary trunk, right & left main pulmonary artery. Interlobar arteries also shows increased size & opacity. Mediastinal widening due to thrombosis of the superior vena cava<sup>4</sup>. Well defined nodular opacities with peripheral calcifications can be seen in case of thrombosis of pulmonary artery aneurysms.

### CT findings –

Aneurysmal dilation of segmental pulmonary arteries.

Pulmonary aneurysms can be fusiform to saccular<sup>2</sup>. Partially or total thrombosis may be noted.

Diffuse ground-glass opacity (GGO) (associated with diffuse alveolar hemorrhage [DAH]), focal or patchy areas of GGO or consolidation, cavitating and noncavitating nodules<sup>5</sup>.

Poorly defined centrilobular small nodules (nodules <10 mm in diameter), and vascular tree-in-bud signs (small centrilobular nodules and nodular branching structures)<sup>5</sup>

Sub pleural wedge shaped opacity may be noted in case of chronic pulmonary thromboembolism – s/o pulmonary infarct.

Thrombotic occlusion of the SVC with oedema of the mediastinal fat and multiple collateral vessels in the mediastinum and chest wall<sup>4</sup>.

## **Therapeutic options**

Based on the Etiology the treatment varies.

In case of vasculitis – Immunosuppressive therapy is the treatment of choice with close monitoring.

In case of PAH, treatment should include calcium channel blockers, diuretics, and anticoagulants, and patients may benefit from the use of vasoactive substances such as endothelin receptor antagonists, phosphor-diesterase type 5 inhibitors, and prostacyclin derivatives<sup>2</sup>.

Indications for surgical management are

- Absolute PAA diameter  $\geq 5.5$  cm.
- Increase in the diameter of the aneurysm of  $\geq 0.5$  cm in 6 months.
- Compression of adjacent structures.
- Thrombus formation in the aneurysm sack.
- Evidence of valvular pathologies or shunt flow.

Transcatheter embolization with steel coils is an effective and safe method of preventing aneurysm rupture<sup>1</sup>.

Aneurysmorrhaphy.

Aneurysmectomy and repair or replacement of the right ventricular outflow tract.

## **Teaching points**

- Pulmonary vasculitis are non-infectious and are associated with granulomatous, eosinophilic, lymphoplasmocytic, or neutrophilic inflammatory diseases<sup>5</sup>.
- Diseases of elastic arteries show aneurismal dilatation with or without intraluminal thrombosis or vascular stenosis with inflammatory wall thickening and luminal narrowing<sup>5</sup>.
- Diseases of muscular arteries or arterioles usually manifest as cavitating or noncavitating nodules or multifocal consolidation along the bronchovascular bundles<sup>5</sup>.
- Vasculitis involving capillaries or arterioles usually demonstrates DAH or small centrilobular nodules and tree-in-bud signs of vascular origin<sup>5</sup>.

## References

1. Pelage JP, El Hajjam M, Lagrange C, Chinet T, Vieillard-Baron A, Chagnon S, Lacombe P. Pulmonary artery interventions: an overview. *Radiographics*. 2005 Nov;25(6):1653-67.
2. Kreibich M, Siepe M, Kroll J, Höhn R, Grohmann J, Beyersdorf F. Aneurysms of the pulmonary artery. *Circulation*. 2015 Jan 20;131(3):310-6.
3. Castañer E, Alguersuari A, Gallardo X, Andreu M, Pallardó Y, Mata JM, Ramírez J. When to suspect pulmonary vasculitis: radiologic and clinical clues. *Radiographics*. 2010 Jan;30(1):33-53.
4. Seo JB, Im JG, Chung JW, Song JW, Goo JM, Park JH, Yeon KM. Pulmonary vasculitis: the spectrum of radiological findings. *The British journal of radiology*. 2000 Nov;73(875):1224-31.
5. Chung MP, Yi CA, Lee HY, Han J, Lee KS. Imaging of pulmonary vasculitis. *Radiology*. 2010 May;255(2):322-41.