Clinical History:

A 21-year-old male patient presented with complaints of frank haemoptysis. He mentioned having similar episodes on several occasions since childhood for which he had not been evaluated.

Imaging Findings:

Chest radiograph showed a retrocardiac tubular opacity. A contrast-enhanced CT of the chest revealed a tortuous dilated anomalous artery about 1 cm in diameter arising from the distal descending thoracic aorta at D8/D9 level and supplying the left lower lobe. The left lower lobe pulmonary artery and its segmental branches appeared atretic. The anomalous artery had a swan neck-like configuration and ramified into multiple large segmental branches. There was no abnormal communication between the anomalous vessel and the pulmonary artery/vein. The bronchopulmonary segments involved were plethoric. The inferior pulmonary veins were seen draining normally into the left atrium. The bronchial tree appeared normal. Patchy areas of ill-defined ground glass attenuation was noted in the anterior and apical basal segments of the left lower lobe.

Discussion:

Anomalous systemic arterial supply to normal lung is the rarest of the congenital anomalies in the “sequestration spectrum” described by Pryce et al [1]. During embryologic development, the lung is supplied by bronchial and splanchnic vessels from the aorta. Persistence of embryonic connection between the aorta and the pulmonary parenchyma has been hypothesised as the cause of this condition [2]. A normal bronchial tree and pulmonary arteries distinguish this entity from classic pulmonary sequestration.

In most cases the abnormal vessel arises from the distal part of the descending thoracic aorta. The anomalous artery can also arise from the coeliac trunk, can supply the upper lobe or the right lung. Simultaneous systemic and pulmonary arterial flow into the same segments has also been described. An atresia of pulmonary artery has also been reported in these cases [3].

The most common presenting symptom is haemoptysis. Children may be asymptomatic and the condition may be incidentally detected due to a cardiac murmur.

CT angiography is excellent in detecting the anomalous vessel and also providing an overview of the morphology of
the bronchial tree and the pulmonary parenchyma, thereby excluding other causes of systemic arterialisation of lung like bronchopulmonary sequestration, congenital pulmonary venolobar syndrome etc. Absence or attenuation of the interlobar artery distal to the origin of the superior segmental artery has also been observed in these cases. Intralobar sequestration also has a systemic arterial supply and a normal pulmonary venous drainage but has no communication with the normal tracheobronchial tree and usually manifests as consolidation or rarely as a cystic lesion or cavitation [4].

A feared complication is the development of pulmonary hypertension and cardiac failure due to a left to left shunt between the systemic artery and the pulmonary vein. Treatment options include surgery – lobectomy or segmentectomy, ligation of the anomalous artery or therapeutic embolisation with coils and glue [3]. Our patient underwent a left lung lower lobectomy.

The findings may be subtle on chest X-ray and a high index of suspicion is needed to identify the abnormality and treat at the earliest. To the best of our knowledge very few case reports have been described in the literature. Systemic arterialisation of the lung is one of the rarest causes of haemoptysis and CT angiography plays a valuable role in detecting this condition.

**Differential Diagnosis List:** Systemic arterialization of left lung lower lobe without sequestration, Bronchopulmonary sequestration, Pulmonary AV malformation, Chronic inflammatory disease of lung with hypertrophied bronchial artery

**Final Diagnosis:** Systemic arterialization of left lung lower lobe without sequestration

**References:**


Description: Serial coronal reformatted CT images showing the anomalous vessel arising from the distal descending thoracic aorta and supplying the lower lobe of the left lung. Origin: Department of Radiology, Billroth hospitals, Chennai, India.
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Description: Coronal reformatted CT image showing the ‘swan neck-like’ abnormal artery arising from the distal descending thoracic aorta to the lower lobe of the left lung. Origin: Department of Radiology, Billroth hospitals, Chennai, India.
**Description:** Serial sagittal CT images showing the anomalous artery from the thoracic aorta. **Origin:** Department of Radiology, Billroth hospitals, Chennai, India.
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Description: Chest X-ray shows a tubular retrocardiac opacity. Origin: Department of Radiology, Billroth hospitals, Chennai, India
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Description: Coronal CT lung window shows mild ground glass attenuation in the anterior and apical basal segment of the lower lobe of the left lung. Origin: Department of Radiology, Billroth Hospitals, Chennai, India.
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Figure 6

*Description:* Thin volume-rendered images showing the anomalous vessel from the aorta to the lower lobe of the left lung. *Origin:* Department of Radiology, Billroth Hospitals, Chennai.
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Description: Volume rendered images showing the anomalous vessel from aorta to the lower lobe of left lung. Origin: Department of Radiology, Billroth Hospitals, Chennai.
Description: Serial axial CT images showing the origin of the anomalous vessel from the aorta to the lower lobe of the left lung. Origin: Department of Radiology, Billroth Hospitals, Chennai.
**Description:** Axial CT image showing the origin of the abnormal vessel from the descending thoracic aorta. **Origin:** Department of Radiology, Billroth Hospitals, Chennai.