



## **Accessory Cardiac Bronchus: A Rare Cause of Hemoptysis**

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### **Abstract**

*Hemoptysis is a relatively common symptom which can be due to a number of causes such as tuberculosis, trauma, malignancy and cardiovascular diseases. Anomalies of the tracheobronchial tree can rarely present with hemoptysis. In this paper, we present a case report of a 45 yr old patient who presented to us with moderate to massive hemoptysis and was diagnosed as having an accessory cardiac bronchus.*

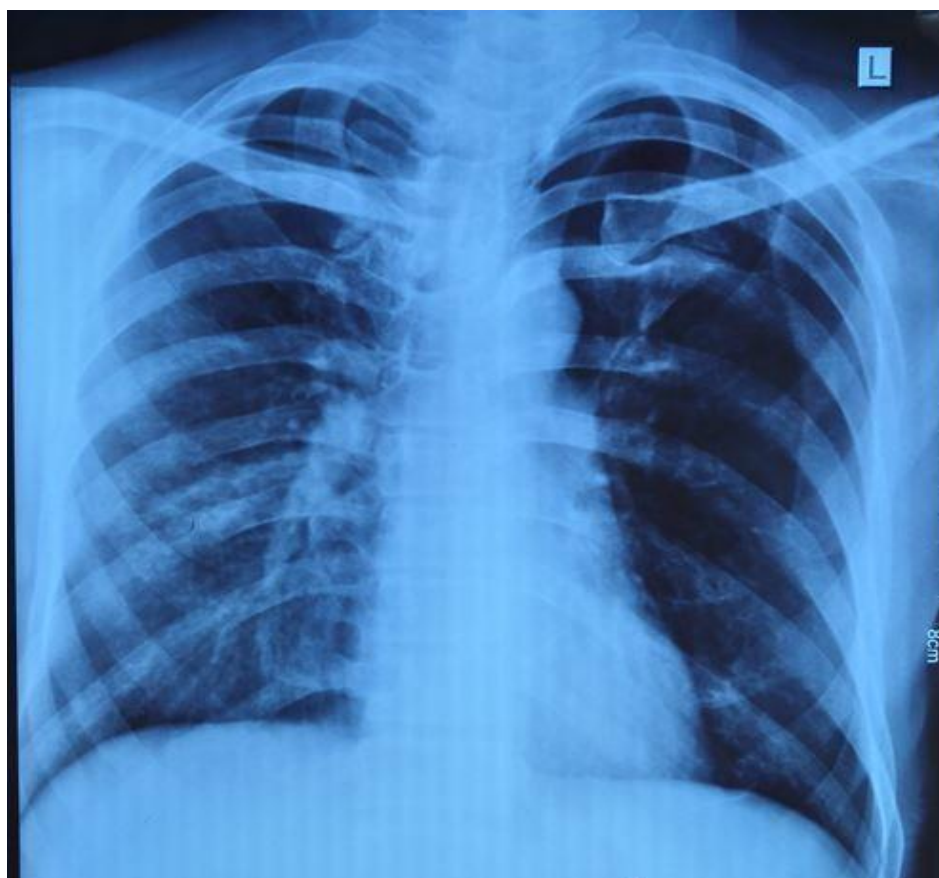
### **Introduction**

Hemoptysis is defined as the expectoration of blood, alone or mixed with mucus, from the lower respiratory tract. Infectious causes like bronchitis, bronchiectasis, tuberculosis are common causes of hemoptysis followed by lung malignancy, trauma and cardiovascular diseases. An accessory cardiac bronchus is a rare congenital anomaly of the tracheobronchial tree, usually persisting asymptotically in an individual. In the rare occasion that it may present symptoms, recurrent infections or hemoptysis have been reported as the most common among them. Here, we are presenting such a patient who presented to us with bouts of hemoptysis.

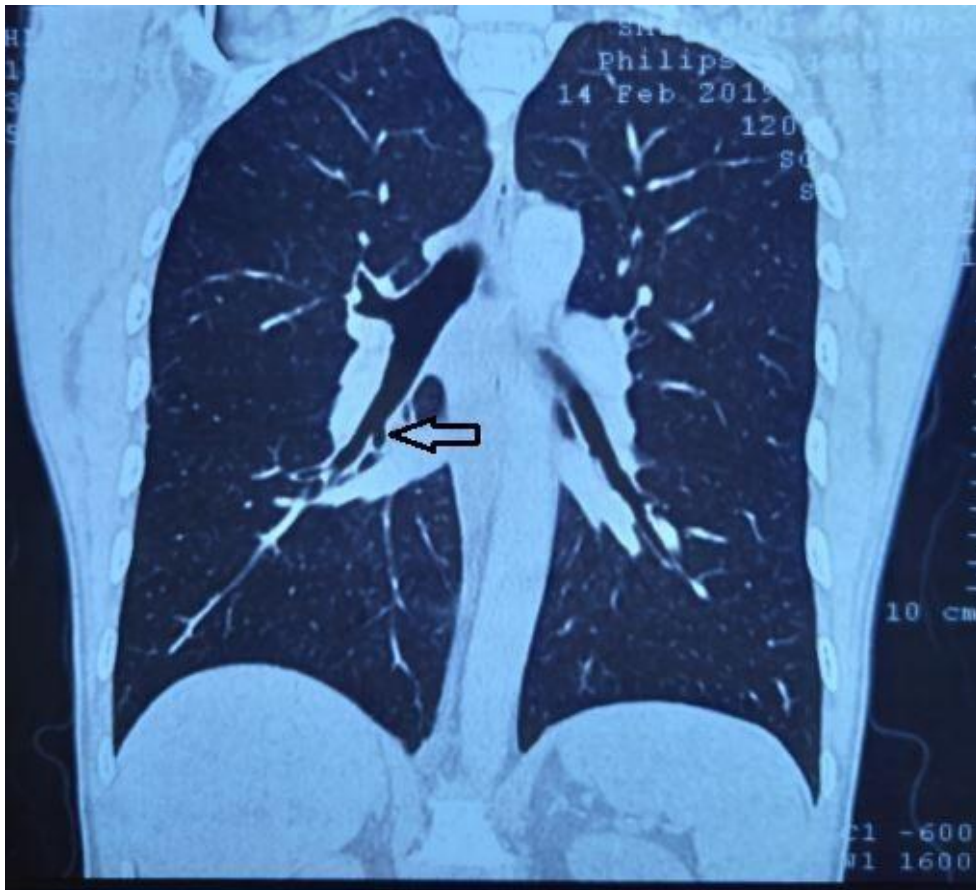
### **Case Report**

A 45 year old male patient came to us with complaints of hemoptysis since 8-9 months, 100-200 ml/day with a massive episode of bright red bloody expectoration on the day prior to admission. There was no history of fever, chest pain, shortness of breath, swelling of feet, loss of appetite or weight. Other systemic complaints were absent. Patient gave a history of intermittent blood tinged sputum since December 2017 when he was put on symptomatic medications. Patient was started on antitubercular therapy (clinicrodiologically) as per Category I DOTS in June 2018 which he took for 6 months with good improvement of symptoms. Due to relapse of his symptoms, he was again started on ATT (non DOTS) in August 2019 which he took for 2 months with no improvement and then stopped on his own. Thereafter, he was again started on DOTS 10 days prior to admission at our hospital. Patient gave no history of systemic hypertension, diabetes mellitus, coronary artery disease, chronic kidney or liver disease, any prior hospitalization history or history of intake of any medications, particularly anti platelet therapy. He is an ex-smoker who used to smoke 15-20 beedis/ day for 20 years (20 pack years) and left smoking 8-9 months back. Other personal, family and occupational history were non-contributory.

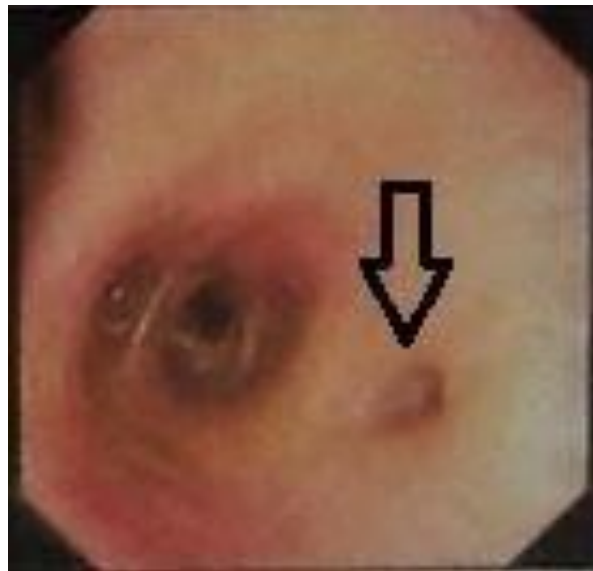
Physical examination on admission revealed a patient in no acute distress, with a body temperature of 37.6°C, a heart rate of 100 beats/min, and a blood pressure of 130/80 mm Hg over right brachial artery in sitting posture, a respiratory rate of 18/ min and an oxygen saturation of 99% on RA. Respiratory system examination revealed a centrally placed trachea, normal vesicular breath sounds with no adventitious sounds. Chest X ray showed an opacity in right paracardiac area (Fig 1). CECT Chest revealed an additional bronchus arising medially from the right intermediate bronchus opposite to the right upper lobe bronchus (Fig 2). Laboratory testing showed blood values within normal range including normal blood coagulation profile. Fiberoptic bronchoscopy revealed an extra opening originating from the right intermediate bronchus on the medial aspect, just above the bronchial opening of the superior segment of right lower lobe (Fig 3). The lumen of the accessory airway was filled with debris and fresh blood. Bronchial washings taken from this extra opening and the lower lobe bronchus was sent for CBNAAT which was found to be negative for mycobacterium tuberculosis. Patient was referred to the cardiology side. No active bleed was seen on arteriography. Hence, BAE was not done. Patient remained asymptomatic on subsequent follow up.



**Fig 1:** Paracardiac opacity in Chest X ray PA view



**Fig 2:** Additional bronchus arising from intermediate bronchus



**Fig 3:** Accessory bronchus

## Discussion

The occurrence of congenital tracheobronchial variance or anomaly is estimated historically to range between 1 to 10% of the overall population<sup>1</sup>. Availability and popularity of flexible bronchoscopy along with improvements in image acquisition and bronchial classification are responsible for the recent increase in the incidence of the tracheobronchial anomalies. Anatomic variations involving the upper lobes are the most frequent, whereas the occurrence of the accessory cardiac bronchus is considered one of the rarest tracheobronchial anomalies. The occurrence of accessory cardiac bronchus was first described by Brock in 1946.<sup>1-6</sup> Its incidence ranges from 0.08 to 0.5% in the general population, reaching as much as 16% among patients with associated major tracheobronchial anomalies. It occurs predominantly in men, with a male-to-female ratio of 2.8:1. [1,3,4]

The respiratory tract originates from the anterior division of the embryonic foregut at approximately 4 weeks of gestation. The tracheobronchial diverticulum has its origin in the pharynx and divides in two major bronchial branches that subsequently originate the segmental bronchi, bronchioli, and alveoli. The variations in the patterns of the bronchopulmonary tree arise mainly at the time when the segmental and subsegmental buds are being formed, between the fourth and the sixth week of embryogenesis,<sup>[3]</sup> and are caused by their appearance at atypical sites on the respiratory tree. Some authors believe that the accessory cardiac bronchus is the persistence of a reminiscent accessory lobe present in most other mammals.

It is detected incidentally in most cases and it is associated rarely with clinical manifestations. Occasionally, recurrent hemoptysis and infections (pneumonia, empyema, and bronchiectasis) involving the anomaly can occur.

The location of this anomaly is fairly constant. It arises from the medial wall of the truncus intermedius (86%), above and opposite the origin of the superior segmental bronchus to the right lower lobe and the origin of the middle lobe bronchus. Alternatively, it may arise directly from the right main bronchus (14%) and proceed inferomedially towards the pericardium.<sup>[1-6]</sup> It has a mean diameter of 8.7 mm and a mean length of 12.0 mm.<sup>[1-2,4]</sup> In contrast with diverticulum or acquired fistula, it has cartilage wall and normal lining bronchial mucosa.<sup>[1-3]</sup> Its configuration may range from a short, blind-end diverticulum to a longer structure with distal bronchiolar and alveolar ramifications.<sup>[1-4]</sup> When connected to an abnormal lobulus, it is usually located in the azygoesophageal recess and is demarcated by an anomalous fissure from the normal parenchyma of the right lower lobe. The detailed anatomy of this anomaly can be defined clearly by spiral computed tomography of the chest with three-dimensional reconstruction.

Flexible bronchoscopy usually demonstrates a narrow orifice with normal appearing mucosa and cartilaginous rings within the abnormal bronchus. These findings are considered definitive for the characterization of this tracheobronchial anomaly. Differential diagnosis includes acquired bronchial fistula, traction diverticula, adenoid recess, and mucus strands in the intermediate bronchus.

The accessory cardiac bronchus is a rare anomaly of the tracheobronchial tree and is diagnosed easily by flexible bronchoscopy and computed tomography with three dimensional reconstruction of the chest. Even though it is of low clinical relevance, its recognition and correct diagnosis is important because it could be associated with pathologies that may require clinical, endobronchial, and in some instances surgical interventions.

### **Conclusion**

Although a rare cause of hemoptysis, anomalies of tracheobronchial tree such as an accessory cardiac bronchus should be kept in mind in a patient with recurrent hemoptysis. Early diagnosis and interventions can help ameliorate the symptoms.

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