

Hemoptysis Vasculature from Bronchiectasis

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Introduction

The expectoration of blood or blood-tinged sputum from the lungs or tracheobronchial tree is known as hemoptysis. Hemoptysis is a common symptom that makes both the patient and the physician nervous. Unless the condition is both moderate and recurrent, a conservative approach may be recommended in this scenario. A thorough medical history can help identify not only the bleeding place but also the cause. The first step in examining hemoptysis is to convince oneself that the bleeding is coming from the lower respiratory tract. Because nonpulmonary sources of bleeding are not frequently associated with hemoptysis, coughing is significant.

In addition, the doctor must be sure that the bleeding is not caused by gastrointestinal problems. A history of nausea, vomiting, heartburn, and abdominal discomfort may be helpful, but the differential diagnosis might be challenging at times, necessitating either direct observation of the patient's hemoptysis or endoscopic study of the upper gastrointestinal tract. The doctor should quantify the amount of blood that has occurred as precisely as possible (e.g., a teaspoon, a cupful). Because patients and doctors sometimes overestimate the amount of bleeding, nothing beats actual observation. The estimated rate of bleeding must be carefully calculated. The relevance of this component of the history cannot be overstated because the speed and scope of the work-up are heavily reliant on the above quantification.

The amount of earlier bleeding and the scope of previous examinations are really useful. Despite the fact that repeated assessments for recurrent hemoptysis are frequently recommended by professionals, they can be costly and unsatisfying for many patients. The stuff being created should then be properly investigated. A rare case of *Serratia marcescens* pneumonia with red pigmentation, glass sanders with sputum stained by iron oxide, and ruptured hepatic amebic liver abscess with "anchovy paste" sputum are all examples of red sputum that contains no blood. A patient may come with pseudo-hemoptysis that has been induced intentionally using various methods.

In the examination of hemoptysis, associated pulmonary symptoms such as persistent cough with sputum production, change in cough, shortness of breath on exertion, chest pain (particularly of a pleuritic origin), and wheezing are also essential. The link between these symptoms and the commencement of hemoptysis can be quite useful. Hemoptysis is a late indication of lung cancer or tuberculosis that is frequently preceded by weight loss, cough changes, exhaustion, and other persistent symptoms. Previous pulmonary infections, recent blunt chest trauma, seizures, and lower extremity pain or swelling; exposure to agents such as cigarette smoke, alcohol, asbestos, and tuberculosis; use of medications (e.g., anticoagulants); and finally, systemic symptoms such as fever, weight loss, and other bleeding problems, especially

hematuria, must all be addressed in the history. The patient's age can also help limit down the possible diagnoses. Children and young adults suffer from cystic fibrosis; middle-aged people suffer from mitral stenosis, bronchial adenomas, Goodpasture's syndrome, and primary pulmonary hypertension; and people over 50 suffer from lung cancer [1,2].

Hemoptysis can be caused by a variety of pathologic mechanisms, depending on the underlying condition. Remember that the pulmonary and bronchial vessels are different circulatory systems in the lung. Hemoptysis can develop when either is involved.

A variety of disorders can cause lung tissue infarction and hemoptysis. As a result of ischemic pulmonary parenchymal necrosis, pulmonary emboli frequently manifest with hemoptysis. All idiopathic vasculitides involving the pulmonary arteries, including Wegener's granulomatosis, have a comparable ischemia necrosis. *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Aspergillus fumigatus*, and the phycomycetes are the most common infections that cause blood vessel invasion and infarction [3].

Another cause of hemoptysis is vascular enlargement with erosion. As a result of an acute infection, such as viral or bacterial bronchitis, a chronic infection, such as bronchiectasis, or a toxic exposure, such as cigarette smoke, this happens within the bronchial capillaries in the mucosa of the tracheobronchial tree. Coughing can cause bleeding due to its shearing force. The common bacterial pneumonias, such as *Streptococcus pneumoniae*, cause local hyperemia. The red hepatization of the lung occurs when the alveoli are filled with blood-tinged fluid and microorganisms, to which neutrophils and fibrin are added. This causes the rust-colored, purulent sputum that is characteristic with pneumococcal pneumonia [4].

In tuberculosis, bronchiectasis, lung abscesses, and cystic fibrosis, vascular engorgement of dilated bronchial arteries develops, as do anastomoses between the pulmonary and bronchial circulations. Hemoptysis can be severe due to degradation and rupture of the pulmonary capillaries or neighbouring bronchial arteries. A Rasmussen's aneurysm (a dilated bronchial artery in the tuberculous cavity's wall) rupture is a relatively uncommon cause of hemoptysis. In persistent diseases like tuberculosis and malignant lung tumours, pulmonary parenchyma necrosis might be detected. Outgrowing their blood supply and resulting tumour necrosis, as well as bronchial mucosal invasion, the latter can cause bleeding (also seen in tuberculosis). Massive hemoptysis is a rare complication of large vessel invasion [5].

A young healthy woman with chronic hemoptysis could have a bronchial adenoma, but the same patient with dyspnea and hemoptysis could have mitral stenosis or primary pulmonary hypertension; mucocutaneous telangiectasis is common in Osler-Weber-Rendu syndrome; and putrid sputum in an alcoholic or seizure patient could indicate a lung abscess. Although bronchitis is the most common cause of streak hemoptysis in persistent smokers, cancer of the lung must always be ruled out, especially if the patient has other symptoms such as weight loss. Both tuberculosis and bronchiectasis can cause a chronic cough with fever and weight loss exacerbated by hemoptysis, albeit the latter often has more pronounced sputum output. The presence of hemoptysis in a systemic condition suggests vasculitis or Goodpasture's syndrome.

Conflict of Interest

The authors declare that there is no conflict of interest associated with this manuscript.

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