

HAEMOPTYSIS

Richard F Willey, Consultant Physician
Lancaster and Kendal Hospitals

DEFINITION

Haemoptysis is the production of blood from the lower respiratory tract, whether alone or, more commonly, with sputum. Careful history-taking will usually differentiate haemoptysis from bleeding arising from the nose, mouth or pharynx or from the stomach. In some patients, however, such differentiation will prove extremely difficult and it is then best to assume that haemoptysis has occurred and investigate accordingly. Usually haemoptysis presents as fresh red blood and the mixture is alkaline on pH testing, whereas haematemesis is often more of a brownish colour in an acidic medium.

CAUSES OF HAEMOPTYSIS

Coughing up blood is an alarming symptom for the patient and usually results in early reporting to medical attention. This is perhaps fortunate, since there are several important causes of haemoptysis and it is virtually the only symptom of early (ie still localised) bronchial carcinoma.

Some of the causes of haemoptysis are listed in Table 1. Some of the circumstances associated with haemoptysis can give clues to the underlying diagnosis, eg.:

- blood-streaking of sputum must be regarded as highly suspicious since this is the variety usually associated with bronchial carcinoma
- moderate amounts of fresh blood are more often associated with bronchiectasis, tuberculosis or pulmonary infarction
- recurrent haemoptysis over a period of years is more likely to be due to chronic bronchitis or bronchiectasis

COMMON	-	bronchial carcinoma pulmonary infarction bronchiectasis pulmonary tuberculosis pneumonia chronic bronchitis
LESS COMMON	-	bronchial adenoma aspergilloma haemorrhagic disorders foreign body
RARE	-	pulmonary haemosiderosis Goodpasture's syndrome pulmonary endometriosis

Table 1 - Causes of haemoptysis

- a solitary episode of haemoptysis is less likely to be due to significant pathology than several episodes
- cyclical bleeding at monthly intervals relating to menstrual periods may suggest the rare pulmonary endometriosis

Isolated haemoptysis with purulent sputum in a patient with chronic bronchitis may be due to an infective exacerbation, but this assumption should not be made until more significant causes have been excluded.

INVESTIGATION OF HAEMOPTYSIS

Investigation is required to:

- 1 exclude or confirm the presence of serious underlying diseases such as bronchial carcinoma
- 2 establish the diagnosis with a view to longterm management, especially when haemoptysis is recurrent, eg bronchiectasis, pulmonary embolism.

Chest x-ray is essential in all patients when they first present with haemoptysis. While a normal chest x-ray virtually excludes pulmonary tuberculosis and aspergilloma, it must be emphasised that it does not exclude a bronchial carcinoma. Most carcinomas are centrally placed and in the early stages can easily be hidden on chest x-ray by other mediastinal structures. Bronchoscopy must therefore also be considered.

Some studies have shown that 10-15% of patients presenting with haemoptysis, but with a normal chest x-ray, prove to have a bronchial carcinoma. Review of all diagnostic bronchoscopies undertaken at Lancaster and Kendal between 1st April 1994 and 31st March 1995 revealed similar results, with a bronchial carcinoma being found in 6 out of 417 (12.8%) of patients presenting with haemoptysis and a normal chest x-ray. It is recommended, therefore, that all patients over 40 years old, and all smokers and ex-smokers, should be considered for bronchoscopy, even if the chest x-ray is normal. This applies also to those who would not be considered for surgical treatment, such as the elderly and those with relatively poor lung function, since early detection of a localised, small bronchial carcinoma may lead to radical radiotherapy treatment and possible cure. Bronchoscopy is a relatively safe procedure that is carried out via either a rigid bronchoscope under general, or fibre-optic bronchoscope under intravenous sedation and local general anaesthesia. Fibre-optic bronchoscopy is much the most frequently used, but rigid bronchoscopy has some advantages for the assessment of surgical operability and is available at Lancaster. Fibre-optic bronchoscopy is available at Kendal and Lancaster.

There is no age limit for the investigation, which can be used on children as young as three months when necessary and the oldest patient investigated locally in the last year was 88 years old. The main limiting factor is lung function, since adequate ventilation through a rigid bronchoscope is difficult if the forced expiratory volume is one second (FEV₁) is less than 0.5 litres, and sedation for fibre-optic bronchoscopy is hazardous if there is carbon dioxide retention.

If an abnormality is seen at bronchoscopy, a direct biopsy is taken, but the investigation is still useful even when the chest x-ray shows a peripheral opacity, since brush biopsies and trap sputum samples obtained from the appropriate segmental bronchus can reveal the histological diagnosis. To help identify the correct segmental orifice for sampling, a lateral chest x-ray is required and patients undergoing bronchoscopy should therefore have:

- chest x-ray and appropriate lateral chest x-ray
- FEV₁ and FVC
- arterial blood gas if FEV₁ <1.0L

When haemoptysis is recurrent, repeat bronchoscopy at the time of fresh bleeding may be of benefit in identifying where bleeding is occurring. ENT inspection of the upper airway may also help if no lower respiratory tract source can be found. Other special investigations for recurrent haemoptysis may include CT scanning for bronchiectasis and ventilation-perfusion scanning or pulmonary arteriography for recurrent pulmonary embolism.

Sputum cytology is not of much benefit in the investigation of bronchial carcinoma, since samples have to be very fresh (difficult for out-patients) and have a very low positive diagnostic yield. It may be of help in showing iron-containing macrophages in pulmonary haemosiderosis and Goodpasture's syndrome.

MANAGEMENT OF HAEMOPTYSIS

Management of haemoptysis depends largely on the underlying diagnosis and whether it can be eradicated.

If a bronchial carcinoma cannot be cured by surgery or radiotherapy, occasional haemoptysis may respond to antibiotics, particularly where there are other symptoms

suggestive of infection. If haemoptysis persists, it is rarely of medical significance and the patient may need no more than reassurance. If the symptom is in any way distressing, or if larger haemoptysis occurs, then palliative radiotherapy will often be successful in stopping bleeding. Similarly, endoscopic laser therapy can be of help. This, however, is not yet available in Lancaster or in the region. Haemoptysis in bronchiectasis is often associated with infection, and antibiotic treatment may resolve an acute episode. Meticulous attention to postural drainage will reduce the frequency of subsequent attacks. Patients can learn the required techniques from a physiotherapist with a special interest in respiratory medicine.

Isolated haemoptysis in a smoker can reasonably be attributed to chronic bronchitis if the chest x-ray and bronchoscopy are both normal. Previously, we have followed up such patients two months later with a repeat chest x-ray. However, review of last year's bronchoscopies showed that nothing new was ever found in this group. If the same applies this year, then it would seem reasonable to discharge these patients after a normal bronchoscopy, unless further haemoptysis occurs.

If an aspergilloma cannot be resected, improvement of haemoptysis can sometimes be achieved by intra-cavitary anti-fungal therapy via a percutaneous catheter. Persistent haemoptysis sometimes requires bronchial artery embolisation.

Massive haemoptysis is a very uncommon medical emergency, which in the vast majority of cases is due to a non-malignant cause, such as bronchiectasis, aspergilloma, lung abscess or tuberculosis. Most cases will settle spontaneously, but death, usually due to aspiration rather than blood loss, occurs in about 30% of cases and the risk of recurrence is high. Surgical intervention or bronchial arterial embolisation should therefore be considered as soon as possible if a localised cause is found.

CONCLUSION

Haemoptysis, although most frequently due to a benign cause, can be an early feature of bronchial carcinoma. Chest x-ray alone cannot exclude this diagnosis. Bronchoscopy should be considered in the early investigation of patients over the age of 40 years and in smokers and ex-smokers, or those who have recurrent symptoms.