Haemoptysis

Haemoptysis has many underlying causes, not all of which are sinister. Here we outline the comprehensive approach needed to determine its aetiology.

Haemoptysis is the coughing-up of blood or blood-stained sputum from the respiratory tract. Importantly, it must be distinguished from bleeding that arises from the mouth, nasopharynx or gastrointestinal tract. It is a distressing symptom that almost always causes patients great alarm. In itself, it may represent a life-threatening emergency or be a manifestation of serious underlying disease.

It is also a symptom that can be associated with such trivial conditions as viral upper respiratory tract infections. Indeed, it has been estimated that it can be a manifestation of more than 100 different clinical conditions. In spite of extensive investigation, as many as 30% of patients who experience haemoptysis will never have the cause identified.

Haemoptysis has been classified as:
- Mild - less than 40 ml per day or just streaks or flecks of blood in the sputum;
- Moderate - 30-200 ml per day;
- Severe - 200-600 ml within 48 h or where consequent haemodynamic instability occurs.

A single episode of haemoptysis is said to have occurred when there has been one episode of bleeding lasting up to 7 days, whereas it is regarded as recurrent if the duration is longer or there is a break of 2-3 days in continuity. Frank haemoptysis describes the expectoration of blood in the absence of accompanying sputum.

DIFFERENTIAL DIAGNOSIS

There are enormous global, geographical variations in the causes of haemoptysis. In the West, for example, malignancy and non-tuberculous causes are most common, although the social mix of the population is an important variable. Human immunodeficiency virus (HIV)-related tuberculosis (TB) is also on the increase. Within poorer Third World countries, however, tuberculosis is often the most likely cause.
Some of the most frequently seen causes within the UK are listed in Box 1. Respiratory tract infections are the most common cause of haemoptysis, accounting for between 60 and 70% of cases. In children, lower respiratory tract infections and inhalation of foreign bodies are usually responsible.

**HISTORY**

Important clues to the diagnosis can be gained from a carefully taken history, although further confirmatory investigations are almost always necessary.

Was the blood actually coughed up rather than vomited? Was it a single episode, or is it a recurrent problem? When did it occur? Was it, for example, during the night when the patient was lying down? Are there any associated symptoms such as shortness of breath, chest or leg pain? Does the patient have a previous history of lung disease such as bronchitis or bronchiectasis? Does he have symptoms that suggest a current respiratory tract infection?

If he is or has been a smoker, he is at risk of developing lung cancer, the use of tobacco being the most important risk factor for this disease. Does he have other features such as weight loss or change in bowel habit that might indicate a malignancy elsewhere in the body? Breast, renal and colonic cancers are the ones that are most likely to metastasise to the lungs.

Does he have any particular risk factors for developing a pulmonary embolism, for example immobility or a recent surgical procedure, or is the patient a woman taking the combined contraceptive pill? What is the ethnic origin of the patient and has he or any of his close family contacts lived or travelled abroad where he might have been at risk of contracting TB? Is he known to have any sort of blood disorder such as polycythaemia or haemophilia, or is he taking any medication such as warfarin that may increase his propensity to bleed?

**CLINICAL EXAMINATION**

Physical examination needs to be thorough and extensive. The most important immediate need is to assess whether the patient’s condition is serious enough to demand emergency hospital admission for resuscitation. Cyanosis, severe dyspnoea and cardiopulmonary collapse all indicate that this is likely to be the case.

Looking at, or at least asking, the patient for a description of what has been coughed up may be helpful. In general terms, haemoptysis is bright red, haematemesis is brown and the sputum of pulmonary oedema is pink and frothy.

Examination of the nasal cavity and oropharynx will help to exclude “non-pulmonary causes for the bleeding (pseudo-haemoptysis).”

Clubbing of the fingers may be present in chronic pulmonary disease or lung cancer, whereas evidence of recent weight loss or muscle wasting may be significant. Supraclavicular lymph nodes, jaundice or hepatomegaly may also suggest an underlying malignancy.

Deep vein thrombosis in a calf muscle is often difficult to exclude but is classically associated with pain, swelling and Homans’ sign (pain on flexing the foot).

Abnormal findings within the chest may include reduced air entry, rales, wheezing and basal crepitations. Dullness on percussion may suggest consolidation or a pleural effusion, whereas the presence of a diastolic murmur may indicate mitral stenosis.

An elevated jugular venous pressure, a gallop rhythm or peripheral oedema may indicate cardiac failure and pulmonary oedema as the cause of the problem.

**INVESTIGATION**

If malignancy is suspected, or the patient’s condition warrants it, an urgent referral to secondary care for investigation is often appropriate. Notwithstanding this, an urgent chest X-ray is essential in investigating the patient with haemoptysis; this often provides the diagnosis or at least suggests the direction of further testing. Between 20 and 30% of chest X-rays are, however, likely to be normal or to show non-specific, inconclusive abnormalities.

There is only a small likelihood of discovering a carcinoma in a patient with haemoptysis and a normal chest X-ray. Reviewing the data, Sood and Mukhopadhyaya suggest this reflects the fact that haemoptysis is usually a late symptom of lung cancer, by which time most patients will have abnormal X-rays.

A number of characteristics identify patients who are most likely to have a malignancy causing their symptoms. The principal ones are male gender, age of 50 years or more and smoking of 40 pack-years or more. (A pack-year is calculated by multiplying the number of packs of cigarettes smoked per day by the number of years the person has smoked.)

Depending on the radiological findings, culture and microscopy of the sputum for infective causes may be appropriate. Cytological examination may reveal malignant cells. Bronchoscopy and high-resolution computed tomography (CT) scanning of the chest are now considered fairly routine investigations, albeit usually after referral for specialist advice.

Debate continues over whether a CT scan should be performed before, after or instead of bronchoscopy. The former is of course less invasive and

**Box 1. Causes of haemoptysis**

- Pneumonia
- Bronchitis
- Bronchiectasis
- Lung cancer - primary or metastatic
- Mitral stenosis
- Congestive cardiac failure
- Pulmonary embolism
- Tuberculosis
- Haemorrhagic diathesis
- Anticoagulant therapy
"An urgent chest X-ray is essential in investigation the patient with haemoptysis"

may be better at detecting endobronchial and parenchymal abnormalities. It does not, however, allow histological confirmation of the diagnosis, and in reality the investigations should be regarded as complementary. Bronchography, on the other hand, is now considered obsolete, having been superseded by better and more effective procedures.

Where pulmonary embolism is considered possible, perhaps from a thrombosed calf vein, additional investigation is likely to include D-dimer testing and ultrasound scanning. Some hospital trusts now offer this as a ‘one-stop’ outpatient service.

**CONCLUSION**

Due to its diffuse possible aetiology, a single overall treatment strategy is not possible. The management of haemoptysis is complex, with the need to address three distinct issues:

• Control of bleeding,
• Prevention of aspiration;
• Treatment of the underlying cause.

The relative importance of these will depend on the severity of the bleeding. The first two certainly lie firmly within the province of secondary care but, depending on the underlying problem, some patients may be investigated and managed within the community. What is clear, however, is that haemoptysis is not always a marker of sinister underlying disease, and cautious reassurance can often be given after careful assessment. Whatever advice is given, it should always include strong counselling to give up smoking permanently.

**REFERENCES**