THE DIFFERENTIAL DIAGNOSIS OF HÆMOPTYSIS.

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Hæmoptysis or blood-spitting is a symptom of many different diseases and it should always lead to a complete investigation of the patient so as to try and determine its cause. The amount of blood expectorated varies greatly from a few streaks of blood in the phlegm or blood-stained sputum to a free hæmorrhage of many ounces. When it occurs for the first time it is rarely copious but it is a symptom which always causes great anxiety and rarely does a patient ignore it. This is in striking contrast to other symptoms of chest disease for a patient may have had a cough for months before seeking medical advice.

When a patient goes to a doctor with the history of having coughed up blood, a re-assuring attitude should be adopted and a history of the circumstances accompanying the hæmoptysis should be obtained. If possible, the actual blood should be observed especially if the history is not clear whether the blood was actually coughed up or vomited. Occasionally, a history of epistaxis precedes that of the hæmoptysis and blood may be seen to be coming from the nasopharynx.

The *past history* of the patient may offer a clue to the ætiology. For example, a history of pleurisy with effusion, especially if there is a family history of tuberculosis, suggests that the cause is tuberculous. A history of pneumonia in childhood followed by a chronic cough would suggest bronchiectasis. A history of rheumatic fever or chorea followed by a cardiac lesion would suggest mitral stenosis as the most likely cause. Very often, however, especially in young adults, hæmoptysis comes on without previous symptoms and without any warning.

Of all the causes of hæmoptysis, *tuberculosis* is the most important and it may occur during any stage of the disease. In young adults, it may be the initial symptom. A common history is as follows: the patient was seemingly in good health and complained of a "tickling" in the throat followed by a salty taste in the mouth. On spitting, to the patient's great surprise and apprehension, bright blood was seen. The absence of any preceding cough in many of these cases is worthy of emphasis. Such a case calls for the most complete investigation and this consists of (a) an accurate history (b) physical examination (c) bacteriological examination of any available sputum and (d) X-ray examination.

The history may reveal the fact that the patient had been unduly tired at the end of the day and in some cases a history of excessive bodily exertion is obtained. In others, some loss of weight may have been noticed although this is rarely very marked in an early case. Physical examination of the lungs may prove inconclusive and this is the rule rather than the exception when hæmoptysis is the first symptom of any ill-health. If there are definite physical signs at one or other apex and, especially if râles are heard after coughing, the diagnosis is most likely tuberculosis but the presence of these signs indicates that the disease is no longer really in an early stage in spite of the fact that the patient had not complained of any symptoms previously to the hæmoptysis.

If there is any sputum present, it should always be examined for tubercle bacilli and if the first examination proves negative, it should be examined again.

The most important investigation in a suspected early case of tuberculosis is the radiological examination of the chest and this should never be omitted. Mention has already been made that the physical examination usually proves inconclusive and also that sputum examination may prove negative but the radiological appearances of early tuberculosis are sufficiently characteristic to warrant a diagnosis of tuberculosis being made on the X-ray film alone. Tuberculosis begins as a localized area of infiltration of the lung and there is much truth in the remark—"the earliest lesion of tuberculosis may be seen but not heard."—It is in such a case that the prognosis is good for the diagnosis of tuberculosis in its earliest stage is tuberculosis in its most curable phase. In the years before radiological investigation was available as a method of diagnosis of chest diseases, clinicians had taught that the case in which hæmoptysis was the initial symptom did well because the patient rarely neglected this symptom and sought medical advice in the earliest stage of the disease. With increasing facilities for chest radiology, we can expect to meet more really early cases of tuberculosis and this help in diagnosis must never be omitted if the patient has been fortunate enough to have attention called to the possibility of tuberculosis by spitting up blood. If the X-ray film proves negative, the patient should be kept under observation and another film taken in about two months' time.

Radiological examination may reveal that the disease can no longer be considered early but a good film is the best method of determining the extent of the disease and thus a record is available to judge of the future progress of the case. When the disease is advanced, hæmoptysis may occur from time to time and may ultimately prove fatal, but it is noteworthy that some patients die of the disease without ever having coughed up any blood.

Many patients have cured themselves of tuberculosis without knowing they had the disease in early life but even in such cases of fibroid tuberculosis, a small hæmoptysis may occur without any other symptoms. As this comes on in the later decades of life, the condition may suggest a more serious cause but radiological examination will again reveal the diagnosis.

After tuberculosis, *bronchiectasis* is the most important pulmonary cause of hæmoptysis. In a typical case, the long-standing history of cough with gradually increasing amount of purulent sputum especially in the early morning is very characteristic. In such cases, a history of one or more attacks of pneumonia in childhood is common and careful enquiry will show that cough has been present to a varying degree since the pneumonia. On examination; clubbing of the fingers is an important point in diagnosis. If the condition is advanced, displacement of the heart will occur to the side of the bronchiectasis and the apex beat should always be located. The characteristic auscultatory sign is the presence of moist râles at one or other base and the breath sounds will usually be of a bronchial quality. Such unilateral basal signs are almost always due to bronchiectasis but occasionally basal tuberculosis is the cause. The sputum should therefore always be examined for tubercle bacilli and if a purulent sputum is carefully examined and found negative on three occasions, tuberculosis may be excluded. X-ray examination will also be carried out as a routine and the ordinary film will in many cases be strongly suggestive of bronchial dilatation. Within recent years, the diagnosis of bronchiectasis has been made much more accurate since the introduction of lipiodol. This opaque medium renders it possible to visualise the bronchial tree and by this method not only can the diagnosis of bronchiectasis be definitely made

or excluded, but also the extent of the condition can be accurately determined. If bronchiectasis is advanced, hæmoptysis is almost certain to occur from time to time but rarely is it so profuse as may occur in advanced tuberculosis.

The value of lipiodol in the diagnosis of bronchiectasis is especially marked in the diagnosis of that atypical type of bronchiectasis in which hæmoptysis is the most important symptom and expectoration is almost negligible. This type of bronchiectasis is called dry or hæmorrhagic bronchiectasis and in such, the hæmoptysis may be repeated many times and may be profuse. In these cases as in the more common type of bronchiectasis, a history of pneumonia in childhood is often obtained, but the physical signs will not usually be very obvious. In such cases, the diagnosis is made by the injection of lipiodol.

Just as tuberculosis may rarely cause physical signs at one base, so may bronchiectasis rarely cause physical signs at one apex. The radiograph of apical bronchiectasis does not show the infiltration characteristic of tuberculosis but in such cases lipiodol bronchography must be used to make an accurate diagnosis.

Hæmoptysis may also occur in chronic bronchitis but it is not common and when it does occur the possibility of some bronchial dilatation should be considered.

Another important cause of hæmoptysis is *carcinoma of the lung*. The majority of such cases begin in one of the main bronchi. The history is often suggestive. A middle-aged patient who has previously been free of any chest symptoms seeks medical advice because of a troublesome cough. Later, the cough is accompanied by blood-stained sputum or a small hæmoptysis may occur. Careful enquiry will most likely elicit the fact that there has been some dyspnoea on exertion. Such a history, especially in a man, for the condition is much more common in men than in women, should suggest the possibility of early bronchial carcinoma. If really early, no physical signs will be present. Later, as the growth advances, blockage of the affected bronchus occurs and then signs of collapse of the affected lobe will become evident, i.e. dullness on percussion, displacement of the mediastinum to the affected side and diminished or weak bronchial breath sounds. Such a case calls for further investigation and X-ray examination before and after lipiodol injection should be carried out. The latter will often demonstrate the characteristic picture of a blocked bronchus. Bronchoscopy should now be advised so that a portion of tissue may be removed for histological examination. The symptoms and signs of a carcinoma of the bronchus, including hæmoptysis, may be produced by a benign adenoma of the bronchus, but the latter is unfortunately very rare as compared with the former which can no longer be considered as an uncommon type of cancer.

Hæmoptysis may occur in any of the acute chest conditions but in such the diagnosis has usually already been made. The blood-stained sputum of *lobar pneumonia* is characteristic and although it may rarely be brightly stained in the early stage, it is usually rusty. In *abscess of the lung*, hæmoptysis is common and the mixture of blood and pus gives a characteristic pinkish appearance to the sputum. The colour, however, of the sputum is not its important feature, but its foul odour.

Lastly, hæmoptysis may occur as a result of *trauma* to the chest wall and may rarely occur without fractured ribs.

Of the cardio-vascular causes of hæmoptysis, the most important is the chronic pulmonary congestion secondary to *mitral stenosis*. In such a case, the hæmoptysis may vary from blood-stained sputum to a profuse hæmorrhage. Occasionally, the hæmoptysis is the first symptom for which the patient seeks advice and on routine examination the typical presystolic murmur of mitral stenosis is heard at the apex of the heart. More commonly, the patient is known to have had mitral disease following rheumatic fever or chorea in childhood.

Another important cause of hæmoptysis is *infarction* of the lung due, to pulmonary embolism which may be the result of a thrombo-phlebitis or may follow an abdominal operation. This condition is often accompanied by sudden pain in the chest and in some cases a pleural friction rub will be audible.

Aneurysm of the ascending aorta may also cause hæmoptysis by pressure and ultimately weeping through a bronchus but such cases are rarely seen.

Of the cardiac emergencies, blood-stained sputum, usually frothy, may be a feature of *acute œdema of the lungs*.

In conclusion, careful investigation of a case of hæmoptysis will almost always lead to a cause being found but cases are occasionally met with where a definite diagnosis cannot be made. Such cases are labelled "Hæmoptysis of unknown origin" but every method of investigation including X-ray after lipiodol injection and bronchoscopy should be carried out before such a diagnosis is made. These patients should be kept under observation and periodic radiology of the chest will most likely solve the problem.