HÆMOPTYSIS.*

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An adequate history is the first essential in the accurate diagnosis of any disease. In disease of the respiratory tract, there is a great variety of symptoms which must be considered, but there are six essential points upon which the fullest information must be gained in every case. These are:—

- (i) Cough;
- (ii) Sputum;
- (iii) Hæmoptysis;
- (iv) Dyspnoea;
- (v) Pain;
- (vi) Weight.

Without full information being obtained on each of these points, the history cannot be regarded as complete. It might be considered that it is unnecessary to make separate headings for "sputum" and "hæmoptysis", yet in practice it is found that this is essential, for many patients are diffident in acknowledging minor degrees of blood-spitting, and this particularly applies to patients with tuberculosis. It is desirable therefore in every case to make separate and special enquiries as to whether there has ever been a hæmoptysis.

It does not follow that, in every case in which hæmoptysis is alleged, the bleeding actually occurred in the lower respiratory tract. Confusion may arise from blood which originates in the mouth or the naso-pharynx, and even at times with blood which has been vomited. The classical condition of true hæmoptysis implies that bright red frothy blood has been coughed up and that for some days thereafter the sputum has been stained. Of course, sputum may be intimately mixed with altered blood giving rise to certain special appearances which do not need separate discussion here.

From a clinical point of view, it is desirable to bear in mind the common causes of pulmonary hæmorrhage and these may be briefly classified as follows:—

1. Local Causes in the Respiratory Tract.

(a) Larynx:

- (i) Injury;
- (ii) Acute laryngitis (rare);
- (iii) Chronic inflammations
 - Tuberculosis
 - Syphilis;
- (iv) New growth.

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(b) Trachea :

Lesions very rare, but new growth does occur.

(c) Bronchi :

(i) Foreign body ;

(ii) Acute inflammation (rare)

Whooping Cough ;

(iii) Chronic inflammation

Bronchiectasis (Sometimes in chronic bronchitis) ;

(iv) Bronchial carcinoma ;

(v) Erosion of a bronchus by aneurysm.

(d) Lungs :

(i) Injury ; penetrating wounds ;

(ii) Vascular causes

Infarction

Gross pulmonary congestion ;

(iii) Acute infections

Pneumonia

Lung abscess ;

(iv) Chronic infections

Pulmonary tuberculosis

Syphilis

Actinomycosis

Fungus infections

} Very rare.

(v) Infection by certain parasites such as
Lung Fluke, Hydatid, Amoeba.

2. General Causes.

(a) Disorders of the blood forming tissues

Purpura

Acute Leukæmia.

(b) The hæmorrhagic forms of the acute specific fevers.

Although it can be seen that there are many possible causes of pulmonary hæmorrhage, the common causes may be grouped concisely into three age periods :

(a) In *childhood* hæmoptysis is comparatively rare and is most commonly due to whooping cough or bronchiectasis. Pulmonary tuberculosis is rarely a cause before puberty.

(b) In *young adults* pulmonary tuberculosis is by far the commonest cause although infarction is not infrequent in cases of mitral stenosis.

(c) In *middle age* the commonest cause is bronchial carcinoma ; pulmonary tuberculosis and bronchiectasis are not infrequent.

A careful consideration of the history will commonly yield some indication as to the site of the damage and the lesion causing it. The cases may be divided roughly into two groups according to whether the sputum is merely blood-streaked on occasions or whether there is frank blood. In early phthisis it is not uncommon to obtain a history of occasional streaking of sputum at intervals for a period of months or even years before the patient first presents himself for examination. Cases may be seen in the very early stages and there may be complete absence of physical signs and of other evidence which would confirm the diagnosis. It is always wise to keep such patients under observation for a considerable time before pronouncing a confident opinion that there is no pulmonary tuberculosis. A profuse hæmoptysis is sometimes associated with the later stages of pulmonary tuberculosis and of certain cases of bronchiectasis, and it may be noted that this is very rarely fatal. A profuse and rapidly fatal hæmorrhage is more commonly met with in cases of malignant growth or aneurysm.

The other symptoms must also be taken carefully into account. A patient who is losing weight rapidly and suffers from night sweats is more likely to be tuberculous, whereas the majority of other conditions which cause this symptom are not associated with marked constitutional disturbance. Loss of weight is by no means a prominent feature in many cases of malignant disease.

Some difference of opinion exists as to whether blood-streaked sputum may result from simple chronic bronchitis. Observation in the Out-patient Department over a period of eight years has shown that there is a large number of middle-aged patients who complain of occasional small hæmoptyses, in whom chronic bronchitis is undoubtedly present, and in whom there has been no development to suggest the presence of any other condition. The natural conclusion appears to be that chronic bronchitis by itself is a definite cause of small hæmoptyses, but this diagnosis should not be made without the fullest possible investigation in order to exclude the co-existence of tuberculosis, bronchiectasis or malignant growth.

In patients who are acutely ill, the likely causes are pneumonia or foreign body. The "rusty" sputum of lobar pneumonia is so characteristic that, of itself, it may be an important point in diagnosis, and purulent sputum mixed with unaltered blood should suggest the possibility of lung abscess. The presence of a foreign body may be indicated by the history, but in children this is often unobtainable and the possibility should be borne in mind in suspicious cases, even although there is no direct indication to be obtained from the history.

Consideration of the past history of the patient may afford important evidence as to the nature of the chest trouble. Unexplained hæmoptysis which occurs in a patient who has previously suffered from pleurisy, either with or without effusion, is always very suggestive of tuberculosis and the very greatest care should be taken to establish the diagnosis in such cases, for the occurrence of pulmonary hæmorrhage is proof that the lesion is not confined to the pleura but is actually situated in the lung. A history of recurrent attacks of "pneumonia" should suggest the likelihood of bronchiectasis as the cause of hæmorrhage. In dry hæmorrhagic bronchiectasis there is a history of repeated, and often profuse, hæmorrhages extending over a period of years. In one of the cases under observation at this Hospital the bleeding had occurred at intervals over a period of forty-five years and the physical state of the patient was not impaired.

A consideration of the family history is chiefly of importance in connection with the question of tuberculosis. The presence of this disease in other members of the family, even although it may appear that the patient has not been in close contact with his affected relatives is always ground for grave suspicion, and such patients should always be kept under close observation.

Physical examination must naturally be directed to the whole of the respiratory tract, not forgetting the larynx.

The general condition of the patient must be considered first. The patient who is acutely ill usually has definite physical signs and it is not, as a rule, a matter of great difficulty to form a correct opinion as to the cause of the condition. It is in the patient who is apparently well that the greatest difficulty may arise, for in such cases there may be few or no physical signs to assist in diagnosis. The presence of clubbing of the fingers is suggestive of bronchiectasis or of malignant growth, and this may be an early sign. In cases of early pulmonary disease of any sort there may be no physical signs detectable in the chest and in such it is necessary to apply the methods of special investigation which will be considered later. When physical signs are present in patients who are not acutely ill, their interpretation is a matter of clinical experience and this cannot be adequately dealt with here. On the whole, it may be stated that apical signs are suggestive of tuberculous infection whereas basal signs are more likely to indicate bronchiectasis, although exceptions to this rule are not very infrequent. A carcinoma may cause signs in any part of the chest, and evidence of collapse of the lung should always suggest the possibility of this condition.

It must be emphasized that no physical examination of the chest is complete until the larynx has been examined. In this way local lesions are readily discovered and the cause may be determined with accuracy.

Apart from physical examination of the chest itself, general examination may yield valuable evidence as to the presence of malignant disease, in that metastases may be discovered in almost any part of the body, more especially the abdomen, and the central nervous system.

Although, on physical examination, a tentative opinion can usually be formed as to the nature of the disease process present, yet in every case appropriate investigations must be applied in order to obtain absolute proof. This can almost always be achieved by the appropriate special investigations which may be considered under the following headings:—

i. General state of the Patient.

It is often desirable, especially where the presence of early tuberculosis is suspected, to have the patient under observation for a few days at complete rest while the sputum and X-ray examinations are being carried out; an opportunity can thus be taken to obtain a temperature record. A constant slight evening pyrexia, and perhaps a slight degree of tachycardia, suggest the presence of a toxæmia and these are common in early phthisis, although their absence is not necessarily exclusive of the condition. An opportunity can also be taken, by repeated physical examinations, to determine the constancy or otherwise of any adventitious sounds which have been noted in the chest. This period of observation is

of great value in suspected phthisis, because it is in this condition that the results of physical examination and special investigations are most liable to be negative. In the other chronic conditions positive evidence may usually be obtained within a comparatively short time.

2. Sputum.

A naked eye examination of the sputum may afford information of considerable diagnostic importance. The rusty sputum of pneumonia is too well known to need description, and the classical "prune juice" and "red currant jelly" expectorations described in the text books are very suggestive of malignant growth, although in fact they are very rarely encountered in practice. Also, the pus which is coughed up from amœbic abscess may have the characteristics of anchovy sauce. Sputum of offensive odour is usually associated with destruction of lung tissue, and, as a rule, with anærobic infection; thus its presence is very suggestive of lung abscess or of bronchiectasis. It must be remembered, however, that either of these conditions may be present without foul sputum and therefore that its absence is not exclusive in any way. In the great majority of cases the expectorations merely consist of blood-stained mucus or muco-pus with no features of diagnostic importance.

In every case, no matter what the provisional diagnosis may be, repeated search must be made for the presence of tubercle bacilli, for their demonstration affords absolute proof of the presence of tuberculous infection. It must be remembered, however, that occasionally tuberculosis exists in association with some other condition such as bronchiectasis or new growth. In suspicious cases, therefore, further investigations may be necessary in order to determine whether some other condition is present as well.

The only other bacteria which are of diagnostic significance are spirochætes and fusiform bacilli. Their presence is very suggestive of lung abscess or bronchiectasis.

Microscopic examination of a fresh specimen of sputum should never be omitted in doubtful cases, for by this means motile amœbæ may be demonstrated or hydatid hooklets may be seen and thus a definite diagnosis may be established. The presence of elastic fibres indicates destruction of lung tissue and is not uncommon in cases of lung abscess. It is not yet possible to determine the presence of malignant cells in the sputum with any degree of certainty although efforts are being made in this direction by many pathologists with varying degrees of success. There is ample opportunity here for further research, but the presence of suspicious epithelial cells should be regarded as indicating the need of further investigation in order to exclude the presence of carcinoma.

3. Sedimentation Rate.

The erythrocyte sedimentation rate is increased in the great majority of bacterial infections so that it is, of itself, not of great diagnostic importance. In cases, however, where there are no physical signs of disease, the presence of a greatly raised sedimentation rate may be taken as suggestive of the presence of infection, and therefore it should act as an incentive to further efforts to trace the source of the trouble. It must not be taken as being in any way of diagnostic importance in special relation to tuberculous infections.

4. X-ray Examination.

It is now-a-days unjustifiable ever to give a definite opinion on any case of chest disease without the consideration of the radiological appearances. If physical signs of disease be present, then it is necessary to proceed to the examination of an X-ray film in order to discover more precisely the nature and extent of the lesion. On the other hand, even if no physical signs be detected, it is quite unjustifiable to assume that disease is not present, for it often happens that early lesions, and even others not quite so early, may be detected by this means, when the ordinary methods of physical examination have yielded an entirely negative result. It must, however, be stated that disease may be present with an apparently normal X-ray picture, and it must be noted that the absence of radiological changes does not abolish the necessity for constant observation and repeated sputum examinations when hæmoptysis occurs in a young adult. A considerable degree of bronchiectasis may also be present on occasion without causing any characteristic alteration in the skiagram.

The injection of lipiodol into the bronchial tree may be of considerable diagnostic assistance at times. Particularly is it useful in cases of latent bronchiectasis, especially in the variety known as "bronchiectasis hæmorrhagica sicca," in which there may be repeated hæmorrhages over a period of months or even years without symptoms of any sort during the intervals. The other main function of lipiodol in cases of hæmoptysis is the demonstration of bronchial obstruction. Hæmorrhage may occur comparatively early in the case of a bronchial carcinoma and at this stage there may be few physical signs and very little to be seen in the X-ray picture. It is just in such cases that lipiodol is sometimes most valuable in enabling an early lesion to be accurately localized and more fully investigated while it is still in a treatable stage.

5. Bronchoscopy.

The bronchoscope has brought the main bronchus and some of its larger divisions within our range of vision and therefore has enabled us to define the presence of disease in these areas with certainty. It is of the greatest importance in the detection of foreign body and new growth, although it is also of some use in establishing the nature of suppurative lesions, in which case the mouths of the affected bronchi may be seen to be reddened and swollen and pus may be observed to be coming from the affected region.

It sometimes happens that, even after these investigations have all been performed, there is evidence of disease within the lungs, and that its nature is still in doubt. The difficulty arises most often in connection with cases of suspected early malignant disease of the bronchi or lungs. In such, it may be desirable to consider whether an exploratory operation should be performed in order definitely to determine the nature of the lesion. It is only as the result of really early diagnosis, possibly obtainable by this means, that the radical treatment of malignant disease can be carried out with success at the present time, and it is therefore justifiable to advise an exploratory operation when this possibility is thought to exist.

Under no circumstances should the symptom of blood-spitting be lightly estimated in any patient. The condition should always be fully investigated and the evidence obtained by the appropriate methods should be carefully considered before any opinion is formed as to the nature of the condition.