REFRESHER COURSE FOR GENERAL PRACTITIONERS

BRONCHIECTASIS

BY

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The clinical picture of bronchiectasis detailed by Laennec was one of heavy infection existing in the walls of dilated bronchi and in the surrounding interstitial tissue. This was demonstrated at post-mortem examination. With modern techniques these dilated bronchi can be demonstrated in the living patient, and it is now known that dilated bronchi can exist without producing any respiratory disturbances at all. Such cases are referred to as "dry" or "uninfected" bronchiectasis.

Further studies have shown that the bronchial walls dilate and lengthen with each inspiration, and that they are not rigid tubes of unvarying calibre. Also, if any part of the intrathoracic contents shrinks, the bronchi dilate beyond their normal inspiratory size, this being part of the compensating mechanism. Should this shrinkage of the parts of the lung be temporary, then the bronchial dilatation may also be temporary.

If, as is often the case, the shrinkage of part of the lung is due to an infective cause, this infection will affect the dilated bronchi and the surrounding interstitial tissue, and produce secretions which will stagnate in the incompetent dilated bronchi. The intensity and the virulence of the infection vary, and may produce a very variable clinical picture. Of equal importance to the virulence of the infection are the number and the distribution of the affected bronchi.

Aetiology

The most common causes of bronchiectasis are the respiratory disorders of childhood. First and foremost is whooping-cough, followed very closely by measles, with its attendant bronchopneumonia. Primary lung tuberculosis in the child often leaves behind, in healing, an area of atelectasis and bronchiectasis. Bronchitis and asthma add their quota to the total. Inspired foreign bodies, which include debris from nasal and oral infections, contribute a small number of cases. The frequency with which tracheotomy scars are seen in the necks of adult sufferers suggests that in the past diphtheria claimed a few cases. In early adult life pulmonary tuberculosis begins to play a part in the causation of bronchiectasis, and as life advances this becomes more common. Finally, in middle and later life bronchial carcinoma produces a number of cases in which bronchiectasis is an unimportant part of a more devastating complaint.

Symptoms

As has already been stated, many cases are completely symptomless and are discovered accidentally. These require no treatment. Those persons, however, who seek advice because of disability due to infected bronchi give a very characteristic history. Their lives are chequered by one respiratory disease after another, starting in childhood with an attack of whooping-cough. Bronchitis, pneumonia, and pleurisy occur and recur, and in the intervals between they have chronic cough with copious purulent sputum. Occasional slight haemoptyses may occur. In many patients the

cough and sputum disappear in the summer or during spells of dry weather. When the infection is more virulent, the child may show retarded growth, both physically and mentally. So much of the lung may be at fault that dyspnoea is a prominent feature.

As adult life is attained, a certain stability is reached and acute episodes become less frequent, without, however, any amelioration of cough and sputum. Dyspnoea becomes more pronounced as life progresses, and by the age of 40 it is the most distressing symptom. Occasionally haemoptyses occur of such a size that they may overshadow the other symptoms. In a few cases haemoptyses at infrequent intervals may be the only complaint. This point should be kept in mind when investigating and treating cases of haemoptyses. In the past, many patients have spent months in sanatoria on account of this symptom, which later has been shown to be due to dilatation of the bronchi and not to tuberculosis.

Signs

The signs of bronchiectasis may be as fugitive as those of pulmonary tuberculosis. There may be only an area of diminished breath sounds to suggest that emphysema is masking the deeper-lying dilated bronchi. In more marked cases, especially those of lobar distribution, dullness to percussion, with either absent breath sounds or loud bronchial breathing, is present. Numerous rales may be heard in the suspected area. Displacement of the heart to the affected side is present in unilateral cases. When the upper lobe is at fault deviation of the trachea to the side of the faulty lobe is found. Clubbing of the fingers is a variable finding, and in some cases may be very pronounced. Its presence seems to depend on the extent to which lung is involved rather than on the degree of dilatation or the intensity of infection. This is a generalization which has many exceptions.

Though bronchiectasis can occur in any part of the lung, lower-lobe disease is the most common. As the result of intensive investigation, involvement of isolated segments of the lung is being found more often. These questions of distribution of the disease are of great importance in planning treatment for the individual case.

Radiological Appearances

Bronchiectasis can be diagnosed with some degree of certainty from a plain radiograph of the chest. The ultimate diagnosis depends, however, on the display of dilated bronchi outlined by a radio-opaque oil.

The radiological changes suggesting the presence of bronchiectasis are of two main varieties: (1) atelectasis and (2) the compensatory mechanisms which attend collapse: localized emphysema, displacement of the mediastinum, and distortion of the diaphragm all point to a diagnosis of bronchiectasis (see Figs. 1 and 2). The dilated bronchi themselves throw no shadow. Occasionally dilated bronchioles and alveoli have a "soap-bubble" appearance.

FIG. 1.—Radiograph of chest of a man aged 40 who attended on account of a small haemoptysis. The heart is displaced to the left, and there is a localized area of emphysema in the left costophrenic angle.

FIG. 2.—Bronchogram of the same patient as in Fig. 1. The diagnosis of bronchiectasis is confirmed.

Differential Diagnosis

It is of great importance when considering the diagnosis of bronchiectasis to look further and to try to determine the cause of the condition. Thus foreign bodies and neoplasm must be considered, and, if necessary, bronchoscopy must be performed to exclude these causes. A stricture with partial occlusion of a main bronchus must be considered because of the greater liability to recurrent infection in these cases. Recurrent bronchitis and unresolved pneumonia may mark an underlying bronchiectasis.

The diagnosis is made by outlining all the bronchi in both lungs with radio-opaque oil. This technique is complicated and time-consuming, and should be done only in a department used to the procedure.

Treatment

The treatment of bronchiectasis lies in the eradication of infection in the dilated bronchi. This can be accomplished by posturing the patient so that he empties his bronchi at frequent intervals, and by giving him the drug specific to the organisms found in his sputum. The posture to be adopted depends on the bronchi which are affected. If they are anterior to the bifurcation of the trachea the patient should lie on his back on a bed, with the foot raised 6 to 9 in. (15 to 23 cm.) from the ground. If the left lung is involved he should lie partly on his right side; if the right lung is affected he should lie partly on his left side. If the bronchi involved lie posterior to the bifurcation of the trachea the patient must lie on his face mainly on the unaffected side, again with the foot of the bed raised. This raising of the bed can be accomplished by putting the bar connecting the legs of the bed on a low chair.

At first, sleeping all night in this position is necessary; more drastic postures can be adopted during the day. These consist of hanging over the edge of the bed so that the chest is almost vertical, head down. Upper-lobe disease, of course, does not need these postures, as the patient is draining his bronchi in the normal upright position.

The best results are obtained if this posturing is combined with a course of penicillin injections. Half a million units of procaine penicillin intramuscularly for 14 days in those whose sputum contains a majority of penicillin-sensitive organisms may produce complete cessation of the sputum. In some the sputum continues, though with decreased bulk, owing to the persistence of Gram-negative organisms. In such cases a short course of streptomycin injections, 1 g. a day for five days, will help. If the original sputum examination shows a large number of Gram-negative organisms, then combined streptomycin and penicillin can be used.

Penicillin by inhalation does not give any better results than penicillin by intramuscular injection, but in a case with a large amount of purulent sputum and widespread disease both

methods can be used simultaneously. The inhalation can be given by means of a Collinson inhaler, but this method needs an oxygen cylinder; there are many portable "atomizers" on the market which are efficient, and many of them can be hired. The amount to be inhaled is about 5 ml., containing 100,000 units. The inhalations should be repeated three or four times a day.

The advances in surgical technique in recent years and the discovery of the sulphonamides and antibiotics have made lobectomy and pneumonectomy safe procedures. The mortality from these operations is probably less than the overall mortality from bronchiectasis. For this reason, many physicians and surgeons advocate operative treatment in all cases of bronchiectasis. This attitude is a lazy one, and ignores the possibility of giving an individual prognosis. All physicians must have seen patients with bronchiectasis who have lived long and useful lives in spite of their complaint. From the study of individual cases, by repeated examinations with radio-opaque oil, it can be shown that bronchiectasis is not always, or even often, a progressive disease. Whether the life of a bronchiectatic patient is worth living depends on the mental attitude of the sufferer, not on the presence of dilated bronchi.

If a patient is not prepared to practise postural drainage or to face the possibility of recurring infections necessitating a further course of penicillin injections, then the surgical removal of the affected lobes must be advised. Similarly, there are patients to whom the burden of their complaint is so overwhelming that surgery offers the best chance of a happy life. Lobectomy may be a life-saving procedure in certain cases—for example, in the case with recurring, ever-increasing haemoptyses, and also in the case of a virulent infection which is only partially or temporarily controlled by antibiotics.

Some patients suffer so severely from recurrent infections which, although controlled at the time by antibiotics, nevertheless disorganize their lives so much that they are unable to earn a living. Such a case is best treated by the surgical removal of the diseased areas. It is the physician's duty to consider whether a patient would best be treated by surgery. The practicability of operation is decided by the surgeon.

In cases in which all five lobes of the lung are involved, surgical removal of the disease is obviously impossible, but bilateral disease is not of itself a contraindication to operation. No patient should be advised to have a bronchiectatic area of lung removed until the full benefit of a course of postural drainage and penicillin treatment has been obtained. Nor should operation be advised for at least a year after the presence of the bronchiectatic lesion has been first demonstrated.

Complications

Chronic bronchitis is such a common complaint in the temperate zones that great care should be exercised in determining whether the symptoms present are not in fact due to this complaint rather than to the presence of a few dilated bronchi.

The occurrence of tuberculosis in cases of bronchiectasis is frequent enough to raise the question of whether the bronchiectasis may not have been tuberculosis from the start. In some cases, however, there is no doubt that the bronchiectasis was present first, and that the tuberculous infection occurred at a later date. There is no evidence to suggest that a subject with bronchiectasis is more liable to develop pulmonary tuberculosis than a person with normal lungs.

Cerebral abscess is a complication which occurs in a number of the more severely infected cases. Its incidence has not been established, though figures as high as 15% were given when bronchiectasis was diagnosed only in the very severe cases—before the introduction of bronchography in 1922. Amyloid disease is so rare a complication that it may be said not to constitute a risk.

Repeated infections in the bronchiectatic area are really part of the natural history of the disease, and this complication is by far the most frequent and the most serious hazard.

Prognosis

The outlook for uninfected cases of bronchiectasis is good. Such patients are able to lead a useful, full-employed life, marry and have children, and live to a ripe old age. The danger of a second infection lurks in the background, but with modern antibiotics this complication is not as serious as it was in the past.

Where the infection is virulent, death may occur a few months after the onset, or during a succeeding lung infection, but here again modern therapy will probably control the infection and render the case suitable for surgery.

Where the disease is very widespread and beyond the scope of surgery the outlook is not so good, and if the infection cannot be controlled by antibiotics, then life is not likely to be prolonged. Cases of this severity, however, are rare.

During the first year of the disease it is always possible that re-expansion of the lung will occur, and infection die out; consequently, the bronchiectasis may also disappear.

Most mortality figures were established before the modern improvements in diagnosis, and all of them were produced before the introduction of modern therapy. At the best they cannot help in evaluating a particular patient's chances of survival.

HEBERDEN SOCIETY

The annual general meeting of the Heberden Society was held on December 8 and 9 at Westminster Hospital Medical School, with Dr. W. S. C. Copeman, the president, in the chair. The president for 1951, Sir Henry Cohen, was elected, with Lord Horder as president-elect. During the meeting it was announced that Professor E. C. Kendall had accepted an invitation to give the Heberden Oration for 1951.

The society was welcomed to the medical school by Sir Adolphe Abrahams, the dean, and the first session was devoted to addresses on the endocrine aspects of rheumatic disease by Professor E. C. Dodds and Dr. Peter Bishop.

I.—ENDOCRINE ASPECTS OF RHEUMATIC DISEASE

Professor E. C. Dodds said that he proposed to give a brief account of the physiology and biochemistry of the suprarenal glands. In their history there were two dates of principal concern: the first was 1563, when these very unobtrusive bodies were first discovered and were given the name of suprarenal capsules; and the other 1849, when Addison drew attention to the importance of the suprarenals in the disease that bears his name. His description was remarkably succinct:

"The leading and characteristic features of the morbid state to which I would direct attention are anaemia, and general languor, and debility, a remarkable feebleness of the heart's action, irritability of the stomach, and a peculiar change of colour of the skin occurring in connexion with a diseased condition of the suprarenal capsules."

Between those two dates, so far as the suprarenal glands were concerned, there was a complete blank in history.