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THE DIAGNOSIS OF CANCER OF THE LUNG

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It is generally agreed that the only hope of cure for patients with bronchial cancer lies in complete removal of the malignant growth. This involves either a lobectomy or a pneumonectomy, and if such procedures are to be successful they must be performed early. Because the symptoms and signs of bronchial carcinoma are in no way pathognomonic, the early diagnosis of this disease by purely clinical means is not possible. From this it follows, firstly, that if cancer is diagnosed correctly at the bedside it is already probably too late for successful surgical treatment and, secondly, if cancer is to be diagnosed at a stage when the only real promise of cure is possible, recourse must be had to special investigations. The most that can be achieved from a clinical examination in an early case of bronchial cancer is to arrive at a suspicion of its existence.

But suspicion is the beginning of diagnosis. It is worth while therefore to review some of the clinical features of the disease which would lead one to suspect its existence. The following should be regarded as indicating cancer of the lung until proven beyond doubt to have a different basis:

1. Chronic cough (often attributed to chronic bronchitis).
2. Haemoptysis in a person over 40 years old.
3. A pleural effusion in a person over 40 years old.
4. Pulmonary atelectasis, segmental or lobar.
5. Recurring lobar pneumonia.
6. Failure of a case of lobar pneumonia to resolve.
7. A pulmonary abscess.
8. A flat note on percussing the chest, in the absence of fluid.
9. Deep chest pain.
10. Pyrexia of unknown origin.

So great is the clinical, and even the radiological resemblance between pulmonary tuberculosis and bronchial carcinoma that the one is often confused with the other. In a country where tuberculosis is prevalent a great number of cases of bronchial carcinoma are bound to be diagnosed as pulmonary tuberculosis. This is an understandable, but fatal error. It behoves the practitioner, therefore, to think of lung cancer whenever he diagnoses lung tuberculosis. A great similarity also exists between bronchiectasis and lung cancer, hence bronchiectasis must be considered in the differential diagnosis. It must be remembered also that a fairly high

proportion, probably of the order of 10%, of cases of bronchial cancer do not present with pulmonary symptoms in the first place. This is largely because primary lung cancers are very likely to form secondary deposits in remote areas at an early stage.

Thus the primary complaint may be of an enlarged cervical lymphatic gland, or a secondary growth in the skin or in the adrenal glands giving rise to the syndrome of Addison's disease. Bronchial cancer may present as a secondary growth in bone manifested as a pathological fracture, or in the brain manifested as a mental change. In these cases, however, the diagnosis is not so urgent, for surgical treatment is contra-indicated.

CONFIRMATORY DIAGNOSIS

The greatest importance must be attached to the early pulmonary symptoms. Any of the above-listed clinical manifestations must engender a high degree of suspicion of lung cancer. But suspicion is not enough. There are three classical ways of confirming a suspicion of lung cancer:

1. Radiological examination of the chest.
2. Bronchoscopic examination.
3. Cytological examination of the sputum.

Radiological Examination

A chest 'X-ray' is imperative in all cases where suspicion exists. Sometimes the diagnosis will be confirmed; more often it will be substantiated without being confirmed; never can it be refuted. It cannot be too often stressed that what the radiologist sees is shadow not substance, and that often he will not see even shadow in cases where cancer is present.

Bronchoscopic Examination

A skilled bronchoscopist can see directly into the primary, secondary and tertiary bronchi. He thus covers the areas in which the great majority of bronchial cancers arise. Furthermore, by means of an attachment he can remove pieces of epithelium for microscopic examination. It must be remembered, however, that while the great majority of bronchial cancers are within the view of the bronchoscopist, a significant number are beyond his view.

Bronchoscopy is an uncomfortable procedure for the patient. It usually requires a general anaesthetic and for these reasons it should be the last of the special investigations

performed. It is not of course suggested that it should be delayed for any more than a few days.

Cytological Examination of the Sputum

Cytological examination, like radiological examination, is imperative in all cases where suspicion exists. It may be fairly stated that no examination of the lungs is complete until the sputum has been examined microscopically. As this is rather neglected procedure it will be considered in greater detail.

The number of people who confuse sputum with saliva is remarkable. Even a trained nurse when asked for a specimen of sputum from herself, produced saliva. Such specimens are useless. It cannot be too often stressed that what is required is the secretion from deep down in the lungs.

The common habit of clearing the nasopharynx before coughing is to be avoided as it adds useless bulk to the sputum. Sometimes it helps if the word *phlegm* is substituted for the word *sputum* when requesting a specimen because that term is more precisely understood by many people. To give a patient a sputum jar and ask him to spit into it is almost certain to result in an unsatisfactory specimen. Thus considerable patience is required in what might appear to be a simple task.

The sputum, having been collected, is sent immediately to the laboratory. Some delay at this stage is inevitable; a few hours is excusable, and on occasions malignant cells have been found after a delay of more than 24 hours. Such delay, however, is to be avoided. The sooner the specimen reaches the laboratory the better. Doctors practising in the country, who depend upon the postal services for sending specimens, thus find themselves in a quandary. For such, it is suggested that they themselves make the smears, selecting those parts of the sputum which are flecked with blood or any small solid mass which may be seen. The smear should cover the middle third of the slide. While it is still wet it should be

placed gently into a container filled with a mixture of equal parts of 95% alcohol and ether. Intimate contact between the slides is prevented by affixing a paper clip to each. Almost immediately after the slides are placed in this mixture the smears will be seen to turn white. This is due to precipitation of the protein. They are allowed to remain in the mixture for 1 hour. During this time the smears will be completely fixed. The slides are then removed, rinsed gently in water, and onto each smear is put a few drops of glycerine. A clean slide is placed on top of this, making a 'sandwich' of the smear and the glycerine between two glass slides. They are then sent to the laboratory together with the relevant clinical details. On arriving at the laboratory the glycerine is removed and the smears are stained according to the technique recommended by Dudgeon. The function of the glycerine is to keep the smears moist during transmission in the post.

What, it might reasonably be asked, is the precise value of cytological examination of the sputum in the diagnosis of bronchial cancer. It is not possible to answer this question. Some definite and even advanced cases give negative results on occasions but, and herein lies the importance of the procedure, some early cases give positive results. Work is at present in progress to establish more precisely the value of the method. In the meantime it seems reasonable to regard the search for malignant cells in the sputum in cases of bronchial cancer in the same way as a search for tubercle bacilli in the sputum in cases of pulmonary tuberculosis.

There is no disease so deadly, so common and at the same time so difficult to diagnose at an early stage as bronchial cancer. Even with the devices of modern medicine its presence often escapes recognition only to be discovered at post-mortem examination. If, however, the special investigations mentioned above are instituted on the basis of a well-founded suspicion, much can be done to avoid a way of death that does not come easily.