THORACOSCOPY IN DIAGNOSIS

BY

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(WITH SPECIAL PLATE)

The exact nature of an intrathoracic tumour is often very difficult to determine, but in recent years considerable help has been obtained from the skiagram, stereoscopic skiagrams, the tomogram, the bronchogram, and from bronchoscopic examination, and with these ancillary diagnostic aids it is true to say that in the majority of cases of bronchial tumours an accurate diagnosis can be made, and, furthermore, this type of tumour constitutes the large majority of intrathoracic growths. Nevertheless, there still remain the tumours arising from the mediastinum, from the pulmonary tissue or bronchioles, or from the chest wall, and secondary tumours, in the diagnosis of which the above-mentioned diagnostic measures often, and indeed usually, fail to establish their exact nature. In fact, in these cases the skiagram may be misleading, for the rounded, smooth, sharply defined outline of some of them often suggests an innocent tumour such as a dermoid or a fibroma, etc., but the subsequent history or investigation has proved many to be malignant. Even after the induction of a diagnostic pneumothorax the appearances may still be deceptive.

During the last decade there has been a very great advance in thoracic surgery, and, because of this, accurate diagnosis of these tumours has become more and more important; for if they can be proved to be innocent growths or growths lying free in the thoracic cavity, or even if they are malignant growths—provided they are confined to a single lobe, are discrete, and are not invading the mediastinum—surgical intervention can be expected to offer the prospect of a cure.

In spite of the great improvement in technique it cannot yet be claimed that an exploratory thoracotomy has reached the degree of benignity that is associated with an exploratory laparotomy, and, therefore, for the above reasons, when we have had to deal with such tumours we have endeavoured, by inducing an artificial pneumothorax and subsequently introducing a thoracoscope into the pneumothorax cavity, to ascertain the exact nature and extent of the growth, and, if possible, to remove a piece for section. At the same time it has also been possible to establish the precise anatomical relations of the growth, thus giving much help to the surgeon in planning his line of approach at the subsequent operation, a detail which may determine the success or failure of the operation; for, with the exception of cerebral surgery, there is probably no other branch in which the question of the approach to the operation is of such vital importance.

The method was first described in English in March, 1922, in the epoch-making paper by Jacobaeus and Einar Key in *Surgery, Gynecology and Obstetrics*. Since then further observations have been made and certain appearances recorded, but on the whole it has not received the attention it deserves. One reason perhaps is that fluid, either serous or haemorrhagic, may complicate the field, and although completely replaced by air the previous deposition of fibrin may obscure landmarks and all detail.

Even with fluid, or even with blood, this is, however, by no means always the case, and where there is no fluid and a diagnostic artificial pneumothorax is induced everything stands out with amazing clearness.

We believe that the cases which we are describing in this article demonstrate the value of diagnostic thoracoscopy.

Case I

A man aged 36 was admitted to the London Chest Hospital in February, 1930, complaining of blood-stained sputum. There was marked clubbing of the fingers. On the left side of the chest absolute dullness was found from the fifth rib downwards. Breath sounds were faint, and there was some pleural rub. The skiagram revealed a discrete rounded mass in the left lower lobe; the true lateral skiagram showed an oval sharply defined mass lying posteriorly. The Wassermann reaction and hydatid tests were negative. The white blood cells numbered 16,000 per c.mm., with 74 per cent. polymorphs. No tubercle bacilli were present in the sputum.

A pneumothorax was induced, and the lung, contrary to what we hoped, appeared to fold itself, as it were, around the mass. A thoracoscope was passed into the fifth space in the mid-axillary line. The surface of the lung was seen to be interrupted in many places by the invasion of what was obviously a malignant growth. In spite of this, as the tumour was so discrete, lobectomy was advised. This was performed by Mr. Romanis on March 21. Apart from a temporary empyema, which was drained and soon resolved, the patient made an excellent recovery, and six weeks later was well, gaining strength and putting on weight. He went away to a convalescent home, and six months later returned with the left side of the chest completely filled by malignant growth, apparently arising from the mediastinal glands.

Case II

A man aged 48 years was admitted to the London Chest Hospital complaining of pain between the scapulae. He had been quite well until two months before, when he was seized with an acute pain in the chest. The pain was increased by inspiration. This was followed by cough and some blood-stained sputum.

Physical examination was negative, except for some impairment of the percussion note in the left interscapular region. The Wassermann reaction was negative. The skiagram revealed a lobulated mass the size of a grapefruit, arising from the left hilar region. A true lateral skiagram showed a single spherical mass lying posteriorly. The bronchoscopic examination revealed some pressure coming from without, partially occluding the left main bronchus. An artificial pneumothorax was induced, and a thoracoscope was introduced into the fifth space anteriorly. The lung could be seen to be collapsed and free; the mass, reddish yellow in colour, was lying in the substance of the lung and infiltrating along under the visceral pleura. The condition was obviously malignant. In view of this no operation was considered, and the patient died six months after leaving hospital.

Case III

A woman aged 30, seen privately in March, 1938, complained of pain in the mid-sternal region. Eight weeks previously she had had pleurisy with some fluid on the left side. She was kept in bed for fourteen days, then went to her home town for convalescence. While there she consulted her own family doctor, who, because of the history of pleurisy, had the chest x-rayed. The radiograph revealed a mass on the right side, perfectly rounded in outline, apparently arising from the mediastinum opposite the region of the shadow of the aortic knuckle (Plate, Fig. 1). The true lateral skiagram showed the tumour to be situated posteriorly. An interesting feature in the history was that she had been hit by a tennis ball in the mid-sternal region four years before, and ever since she had experienced pain on and off in that region.

On admission to the London Chest Hospital a diagnostic pneumothorax was induced on the right side and the lung collapsed away from the tumour, leaving it free, unchanged

in position, and unaltered in shape. A thoracoscope was inserted in the fourth space, in the mid-axillary line, and a bluish-purple tumour could be seen, with fine veins on its surface arising in the posterior mediastinum from behind the great vessels and extending almost up to the arch of the subclavian artery and completely independent of the lung. A painting was made by Mr. Shiells (Plate, Fig. 2).

Four days later the patient was operated on by Mr. Holmes Sellors, and so far as was possible the tumour was removed. It was filled with a chocolate-coloured thick creamy substance. This was sucked out and finally mopped dry with gauze. The portion of the wall of the tumour under the great vessels had to be left behind; it was wiped clean and swabbed with formalin. The patient made an uninterrupted recovery.

The report on the tumour was as follows: "The cyst wall consists in great part of vascular fibrous tissue with a striking amount of lymphoid tissue disposed mainly around the vessels. In some parts large thin-walled blood spaces are seen and haemorrhage has occurred. Other components of the cyst wall are fat, bundles of muscle fibres, ciliated columnar epithelium, and acinous glands. No ectodermal elements have been recognized, and no cartilage or bone." The blow from the tennis ball had possibly caused a haemorrhage into the teratoma.

CASE IV

A man aged 33 complained of pain in the right side of the chest. Sixteen months previously he had had pain in the region of the dorsal spine radiating to the right costal margin anteriorly. For this condition he was admitted into a hospital in the North, where, after complete investigation, his appendix was removed; the pain, however, still persisted. Because of this he was again examined, and a skiagram of his chest revealed a mass in the right lung. He was admitted into the London Chest Hospital.

Physical examination was negative, except for some change in the percussion note at the right base posteriorly. The Wassermann reaction and the Casoni test were negative. The skiagram revealed a single spherical mass with smooth, sharply defined borders the size of an orange, situated in the right lower lung field (Plate, Fig. 3). A true lateral skiagram showed the mass to be lying close to the vertebral column (Plate, Fig. 4). Bronchoscopic examination was negative. An artificial pneumothorax was induced; the lung appeared to collapse away from the tumour, suggesting an innocent condition. A thoracoscope was introduced into the fifth space in the mid-axillary line. The mass was seen to be reddish yellow in colour, arising from the chest wall close to the vertebral column. It appeared to have a well-defined capsule. The lung was adherent to the growth at one point only, but it was infiltrated with multiple yellow sago-like nodules. Adjacent to the tumour, on the chest wall, were three secondary masses the size of a pea.

A section of the tumour was taken by means of forceps introduced through a second cannula; no undue bleeding was caused by this procedure. The section was reported by Drs. Gloyne and Page as a mixed-cell sarcoma, ? malignant change in a neurofibroma. In view of these findings a radical operation was regarded as impossible, and the patient was referred for deep x-ray therapy.

A recent necropsy provides another illustration of the potentialities of the method.

A woman was admitted to another hospital with a massive pleural effusion. The spleen was enlarged and a mass could be felt in the epigastrium. All the usual tests were made, but without result, and the differential diagnosis was malignant growth or lymphadenoma. An exploratory laparotomy had been advocated by two or three physicians as a diagnostic measure. Before this was done, however, the patient died. The post-mortem examination revealed a huge malignant mass behind the stomach, large secondary growths in the spleen, and metastases in many other parts; but, what is of interest in connexion with this communication, there were a number of raised white nodules the size of half a pea-nut on the

parietal pleura. It would have been a simple matter to replace the fluid by air through the thoracoscopic cannula, to insert the telescope, see the nodules, and remove a portion for section, whereas the proposed alternative would have been highly dangerous.

As regards technique, one of us (F. G. C.) uses a single-cannula method with a direct-vision telescope. Through this single cannula all instruments can be inserted, including the biting forceps and a diathermy knob for the arrest of haemorrhage, if any. The other employs the two-cannula technique when removing a piece of the growth for section.

Conclusion

The cynics have suggested, occasionally with some truth, that modern methods of investigation are more distressing and dangerous to the patient than the disease itself; but this criticism cannot seriously be advanced in the case of an exploratory thoracoscopy; for in skilled hands the patient should feel nothing more than the first hypodermic injection of the local anaesthetic, and it is clear that this investigation, as illustrated by Cases II and IV, may save the patient an unnecessary thoracotomy. If a pleural effusion is present, then the thoracoscopy can be carried out at the same time as the aspiration provided the paracentesis is accomplished through a thoracoscopic cannula, a procedure which gives more efficient evacuation of the fluid than an ordinary needle, with no more discomfort.

With ordinary aseptic precautions an exploratory thoracoscopy should be without risk to the patient. This has been our experience with a large number of cases.

CONGENITAL ATRESIA OF THE OESOPHAGUS

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(WITH SPECIAL PLATE)

The following case is recorded not on account of its rarity but because the condition has been so seldom mentioned in the English literature.

Case History

The patient was a female child born on August 23, 1937, of healthy parents. The mother had had three pregnancies: boy, who died at the age of 3 of pneumonia; a miscarriage; and the patient. Delivery in the present case, in the maternity ward of St. George's Hospital, was spontaneous and normal. Excessive liquor amnii was noted. There was some difficulty in reviving the baby, as she seemed choked with mucus. The excess of mucus continued, but nothing alarming was observed until the second day, when the mother's milk had come in. On being put to the breast the baby sucked easily, but in a few minutes choked, and turned blue in the face. The nurse rescued it, and sucked out the milk and mucus from its mouth. The same result was obtained at the next feed. Mucus in the mouth increased in quantity, and, apart from the attempted feeding, the child had attacks of cyanosis, which were relieved by clearing the throat.

On the second evening Dr. T. F. McNair Scott examined the child. It was lying in the cot, breathing with some difficulty and through a great deal of moist mucus in the mouth and nose. It was normally developed and nourished, but moderately dehydrated. The skin was clear. No glands were palpable. Examination of the head revealed no craniotabes. The anterior fontanelle measured about $1\frac{1}{2}$ by $1\frac{1}{2}$ inches, being depressed, and the posterior fontanelle one finger-tip.

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FIG. 1.—Case III. Radiograph showing a mediastinal teratoma in a woman aged 30.

FIG. 2.—Case III. The mediastinal teratoma as seen through the thoracoscope.

FIG. 3.—Case IV. Radiograph showing a single spherical mass in the right lower lung field in a man aged 33.

FIG. 4.—Case IV. Lateral radiograph. Biopsy after thoracoscopy showed this tumour to be a mixed-cell sarcoma.