with marked displacement of the heart, he is able, with certain precautions, to undergo violent exercise, and was placed in Grade I by a medical board. Hiccup is a prominent symptom which has not hitherto been noted in connexion with this condition.

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THE SIGNIFICANCE OF PLEURISY AND PLEURAL EFFUSION IN DIFFERENTIAL DIAGNOSIS

BY

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The assessment of the significance of pleurisy and pleural effusion comes under three main headings of history and physical signs, x-ray diagnosis, and laboratory examination of fluid in cases of frank effusion. Only by considering the findings in this order can the physician come to a justifiable decision in any difficult case for differential diagnosis. To place too much reliance on the results of the accessory laboratory and x-ray reports without considering them in the light of the fundamental findings of careful history and physical examination may lead to disastrous results for the patient.

History: Temperature

Certain points in the history deserve special attention. The age of the patient can often give an indication of what the physician may expect as the true cause of the condition. At all ages the possibility that the illness is secondary to any primary lesion between pneumonia and new growth must be borne in mind, but there are certain broad lines of direction. Thus, if we are to believe after-histories, the disease is seldom tuberculous under the age of 15. In the age group 15 to 25, however, the diagnosis of tuberculosis must be to the fore: while at its earlier ages many cases are idiopathic, towards its later ages we must be on the look out for underlying lung disease. The probability of such primary tuberculous disease remains in age groups up to 40; over 40, new growth demands increasing consideration.

Examination of the temperature chart can give much assistance. Tuberculous pleurisy and pleural effusion usually cause an acute rise of temperature to the neighbourhood of 102° F., and while in primary idiopathic cases the fall is commonly by steady lysis, that in secondary tuberculous effusion is by interrupted lysis—that is, in a series of peaks of temperature at intervals of 2 or 3 days, each successive peak being slightly lower than its predecessor, and intervening falls being of 1 or 2 degrees. Such a temperature chart is not like that of pleural effusion complicating the case of pneumonia. Here the initial onset temperature round 103° F. is maintained until the crisis brings a fall to a subfebrile rather even level, maintained as long as the fluid is clear, but replaced by swinging variations on the appearance of pus. It is not, however, easy to distinguish such a chart from that of pneumonia complicated by abscess of lung. The charts of effusion in new growth or cardiac and renal failure may show continued subfebrile temperatures, but most show no rise above the normal line.

Pain

The history of pleural pain, with reference to its site and intensity, is almost diagnostic in several instances. The agonizing mid-axillary pain of pneumonia is totally unlike the basal discomfort of the bronchopneumonic. That described as the "growing of wings" between the shoulder-blades, often

the first sign of plastic pleurisy in a recently active case of phthisis, is quite different from both the "rheumatic" shoulder ache of healing and healed upper-zone tuberculosis, and the shooting shoulder and upper-arm "neuritis" of diaphragmatic pleurisy. The stabbing posterior axillary pain of acute tuberculous pleurisy—of longer duration than pneumonic pleurisy, and often maintained until effusion is established—should be readily distinguished from the pain of middle-lobe collapse. Here the pain is always anterior, below the mammary line, periodic, and varying in characteristic waves of intensity from discomfort to acute agony. Further, such varying intensity in a confined and usually silent area is in direct contrast with the slightness or absence of pain associated with an extensive pleural rub in abscess of the lung. On the other hand, the limited extent of pleural signs as against the marked extent of dullness in the average bronchiectatic is an interesting comparison with the repeated discomforts and absent or anomalous stethoscopic findings in cystic disease of the bronchi. Epidemic myalgia ("Bornholm disease") shows such variations, and so marked a dissociation between pain and pleural friction in the cases so labelled that it is probably not a true entity but a mixture of two separate conditions, some patients having muscular rheumatism and others abortive lung abscess; moreover, it is diagnosed at seasons when upper sinusitis and antral infections are common.

General Examination

Careful and complete physical examination should be carried out in all cases. The necessity for a general examination cannot be overstressed, for the possibility that chest symptoms and findings are secondary to abdominal disease—e.g., diaphragmatic pleurisy complicating subphrenic abscess—must ever be kept in mind.

The general appearance and facies will repay their study. The anxious look of fear predominates in the pneumonic, and while he may have a flush on one or both cheeks, which is particularly marked with the onset of complications, he never has the appealing look, the clear complexion, and the bright eye of the average tuberculous patient. This is in contradistinction to the muddiness of complexion which is a predominant feature in cases of chronic sepsis, whether the lesion be an encysted purulent effusion in the main pleural sac or in an interlobar fissure, bronchiectasis, or the purulent complications of congenital cystic disease. It appears fairly rapidly in the acute septic complications of the pneumonias such as lung abscess, but here is often accompanied by a look of excitement, absent in the drawn facies of the exhausted cardiac patient and in the characteristic wasting of carcinoma.

If pulmonary osteo-arthritis is present its type should be noted, as there is a marked difference between that of established phthisis, with its antero-posterior enlargement, and that of sepsis which involves the phalanx laterally as well as antero-posteriorly to produce a diagnostic drumstick appearance.

Physical Signs

Two points are particularly important in actual physical signs: the position and extent of dullness, and any evidence of mediastinal displacement. On the whole, the dullness of established lobar pneumonia is both anterior and posterior, and in intensity is equal, at any involved area in the lung, between the periphery and the mediastinum. That of collapsed lower lobe is first completely posterior; as the collapse progresses, the dullness diminishes in extent towards the inner third, while the outer zones become more and more tympanitic by compensatory emphysema. When collapse is complete the dullness is confined to the anterior cardio-phrenic angle. Such a finding is in direct contradistinction to the bilateral areas of dullness confined to the costo-phrenic angles in pleural effusion complicating cardiac failure, and should not be confused with either the outer-half dullness of established tuberculous pleural effusion or the anterior lower-zone dullness of a collapsing middle lobe.

The "sterno-mastoid sign" is the easiest method of diagnosing mediastinal displacement, as tension of one muscle will demonstrate the pushing or pulling of the mediastinum to the same side as the tension. The sign is a valuable correlation with the position of the apex beat, the displacement of which means that there is a lesion on one side of the chest which

is either confined to the lower zone or involves all three zones of the lung. Upper-zone disease alone seldom moves the apex beat. An actual example of the application of these findings may be given in the diagnosis of fluid complicating right lower-lobe collapse. Immediately collapse begins, the sterno-mastoid on the same side becomes tense. As collapse increases, the apex beat moves to the right. Should fluid supervene on the collapsing lobe the position of the apex beat will not be an aid in itself; it will often remain within normal limits as the result of two opposing forces. The sterno-mastoid sign, however, remains positive on the right side and will therefore be direct evidence that the case is one of secondary and not of primary pleural effusion.

X-ray Examination

The examination of x-ray films of pleural effusion requires specialized knowledge. Unfortunately it has become accepted in many textbooks that the radiograph of frank pleural effusion is recognized by a curved line showing a concavity downwards and inwards from the axilla to the diaphragm. It is possible that to wait for such a confirmatory line may postpone necessary treatment and diagnostic pleural puncture to a late stage. Fluid first accumulates in the posterior diaphragmatic angle, and from the beginning seems to be associated with an area of fine equal loss of translucency in the costo-phrenic angle of the affected side. Examination of several cases seen at this early stage appears to lead to the conclusion that this shadow is at first due on the right side to a relaxation of the diaphragm and a rise of the liver. The differential diagnosis of the shadow of established effusion, as against that of pneumonia, is that while pleural effusion shows loss of translucency increasing in density from the periphery to the middle zone, the shadow of established lobar pneumonia is equal in density at any one level between the periphery and the mediastinum. Moreover, the fact that pneumonia does not displace the mediastinum is a distinct aid.

The changing density of shadow in pleural effusion is due in the majority of cases to pressure-collapse of the lung; the establishment of a definite linear curve means only that already there is some organization of the visceral pleura. The midzone density may of course be due to underlying disease of the lung. In both cases withdrawal of fluid, even if accompanied by air replacement, is not always helpful to final diagnosis, as all that may occur is that the fluid remains over the collapsed or diseased area, to produce a shadow this time convex in outline as against its previous concavity.

The case of suspected interlobar effusion should always have the benefit of a lateral radiograph, and it often pays to carry out a lordotic examination at the same time.

The main difficulties in the differential diagnosis of interlobar effusion are connected with shadows in the region of the right upper interlobar fissure. Here the physician may have to consider the possibilities of pneumonia affecting one branch of the bronchus, tuberculous pneumonia, and bronchial carcinoma. While pneumonia in its later stages of non-resolution may produce a concavity upwards of the interlobar fissure, the uncomplicated case seldom shows a well-defined line. Tuberculous pneumonia usually has its most marked density of shadow above the middle third of the raised interlobar fissure. New growth has similar increased density of the inner third. Involvement of one branch of the bronchus by pneumonia gives an inner or outer third increase of density according as to whether the infection is in the axillary or the pectoral branch; it is not confined to the interlobar fissure, but extends well into the lung substance. In all such chronic conditions the upward concavity in the interlobar fissure is due to shrinkage-collapse of the affected lobe and compensatory emphysema of the underlying lobes. An added help in the radiograph is that whereas tuberculous pneumonia from its start, and bronchial carcinoma in its later stages, show mediastinal displacement to the affected side, uncomplicated pneumonia shows a central mediastinum. Interlobar fluid, if it does cause displacement, will show it to the side opposite from the lesion until the effusion becomes encysted and, in drying, produces fibrosis. Again, where fluid is present the underlying compensatory emphysema is no longer evident: the well-defined interlobar fissure becomes a straight line or shows a convexity as against its previous concavity.

The shadow of middle-lobe collapse is so different as to be usually diagnostic, especially in the lateral view. The antero-posterior view has two specific findings. The first is that the shadows in the lower midzone are lateral in formation as against the usual downward and outward distribution of lower-lobe bronchopneumonia. The second is that there is almost always an area of translucency between the raised diaphragm and these lateral shadows. The lateral radiograph may be completely diagnostic in itself, in that it shows a typical triangular formation, the upper apex of the triangle lying at the junction of the upper two-thirds and the lower third of the mediastinum, the upper outer side of the triangle going outwards towards the fourth rib in the axilla, and the inner lower side passing downwards and inwards towards the middle of the raised diaphragm.

Difficulty is often encountered in the differential diagnosis of middle-lobe collapse or fibrosis on the one hand and mediastinal or mediastino-interlobar effusion on the other, by faulty positioning of a patient who has to be radiographed by portable apparatus while in bed. Often a semi-lordotic film is produced, giving a confused picture of the mediastinum and a squat shadow of the heart, and it may be necessary to support the patient in bed to get good antero-posterior and lordotic pictures before final diagnosis is made.

Idiopathic diaphragmatic pleurisy does not show any involvement of lung or diaphragm in radiographs. A secondary diaphragmatic pleurisy is common in abdominal disease, and in particular in subphrenic abscess. The effusion tends to be localized, and in most cases shows in the antero-posterior picture as a loss of translucency which sits above the line of the diaphragm, with a density little less than that of the underlying congested liver.

The radiograph of the transudates of cardiac and renal failure generally shows bilateral effusion, small in extent, and confined to the costo-phrenic angles.

Examination of the Fluid

It does not seem to be generally recognized that it is of primary importance to accompany the examination of pleural fluid with a complete blood count. This is as important as the general examination of the patient, as it is quite possible that an underlying primary disease, either lung or abdominal, may be missed in all good faith. For example, the finding of a predominant leucocytosis in the blood film is as important as the presence of excess polymorphs in an effusion which is going on to empyema. A diaphragmatic effusion in its early stages may be read as tuberculous in origin, whereas the true underlying condition may be subphrenic abscess.

In general, it may be stated that it does not follow that an effusion in a known tuberculous case is necessarily tuberculous; difficulties have been encountered in cases in which the true primary cause has been shown later to be cardiac failure. Another general point that requires emphasis is that no effusion should be considered as blood unless such blood is evident to the naked eye. In the examination, therefore, it is always necessary that the pathologist should compare the actual incidence of leucocytes and of true red cells in the sample submitted. Further, it does not follow because there is blood to the naked eye that the underlying condition is necessarily new growth; it may be acute tuberculosis.

The appearance of the fluid can be of much help. A clear odourless yellowish fluid is found in both exudates and transudates, but the tuberculous exudate clots more readily, has a higher specific gravity, and usually contains protein of more than 4 mg. per c.cm. Its cell count shows excess of small lymphocytes. An excess of endothelial cells is common in transudates and in obstruction to the circulation; it may suggest new growth, but is not diagnostic. Excess eosinophils are common in hydatid cyst which has been mistaken for pleural effusion. It is said that if they occur in a post-pneumonic effusion the prognosis is likely to be good, in that the patient will not go on to empyema.

The bacteriology of tuberculous fluid can be very misleading if the proper time for examination is not chosen. Fluid withdrawn at the onset of tuberculous effusion will usually be entirely negative to both culture and guinea-pig inoculation, and if this finding is taken as conclusive the result to the patient may be serious.

Cloudy fluid is common in streptococcal infections. Chylous effusion is usually opaque and must make the physician think of chronic tuberculosis or endothelioma of the pleura. It is exceedingly common in injury to the left subclavian vein or the main thoracic duct. Purulent effusions which are odourless are as a rule thin in the early stages. Tuberculous septic pyothorax usually gives a greenish-yellow purulent fluid. Where the effusion is offensive, the observer must immediately suspect the presence of lung or bowel communication with the pleural cavity, and his mind will run on a differential diagnosis for the primary lesion as between abscess of lung, bronchiectasis, empyema with broncho-pleural fistula, and pus in the abdomen, where subphrenic abscess is by far the commonest finding.

TRANSUTERINE INSUFFLATION AND SALPINGOGRAPHY

BY

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The usual methods of uterine and tubal insufflation, whether by gas or by radio-opaque substances, are somewhat tedious to carry out, and their use often involves a certain amount of physical as well as psychological trauma to the patient. The following method, in which a simplified type of cannula is used, was evolved by me some twelve months ago, and has proved to be satisfactory either for gas-insufflation in the consulting-room or for injection of radio-opaque fluid in the x-ray department or operating theatre.

The Apparatus

The insufflation cannula (Figs. 1 and 2, B) consists of a hollow metal tube with a conical, rather sharp, screw-tip; this can be screwed into the cervical canal tightly enough to prevent leakage around it. At first sight this might seem a traumatic procedure; but repeated examinations made after its use have failed to show that any damage has been inflicted on the cervix, nor is the process of insertion and screwing-in attended with more than very minor discomfort. The proximal

FIG. 1

end of the tube is expanded so that a rubber tube can be slipped on to it from the ordinary CO₂ or air-insufflator apparatus, and into this same end can be screwed, if lipiodol is to be used, an adapter with bayonet-fitting to take any standard S.I.M.A. syringe (Fig. 1, E). The cannula also has a stylet (Figs. 1 and 2, C), which reaches about three-quarters of an inch beyond the distal end. The purpose of this is to guide the cannula into the cervical canal, from which it is automatically extruded during the process of screwing-in.

Method of Use.—The patient lies in the left lateral or the lithotomy position. A narrow, warmed and lubricated Fergusson's speculum with obturator (Fig. 2, A) is passed and the obturator withdrawn. Illumination is provided by angle-poise lamp or headlamp, and when the os presents it is mopped dry and cleaned with a suitable antiseptic; for this purpose I have found it convenient to use cotton-wool swabs held in Desjardins' gall-stone forceps (Fig. 2, D). The speculum is steadied with the left hand, and the cannula, armed with its stylet, is passed with the right hand. The stylet, guiding the tip of the screw-cone through the external os into the cervical canal, is now loosened, and the cannula is screwed home gently but firmly; the stylet is now removed and the

speculum may also be withdrawn. If the patient is in the left lateral position she is now asked to turn on to her back; meanwhile the cannula is simply steadied by the operator, for it will not disengage itself. The gas or lipiodol connexion

FIG. 2

is now fitted at the distal end of the cannula, and the routine insufflation carried out with the minimum of assistance and fuss.

Comment

1. It is claimed that this method has the merit of simplicity.
2. An air- and oil-tight connexion is ensured, and hence leakage, which may produce false impressions, is avoided.
3. The use of vulsella, which are painful and traumatic when applied to the cervix, is rendered unnecessary. This is particularly valuable, since distortion of the uterus and appendages by traction and countertraction is avoided. Indeed, the cervix can actually be pulled down during insufflation or injection, if desired.

4. During the process of "screwing home" the patient may complain of some pain; this is usually slight, and ceases as soon as the screw is fixed in the cervix.

The cannula was originally made for me by Mr. A. E. Christmas of Frome, to whom I am greatly indebted for many helpful suggestions, and is now being manufactured and marketed by Messrs. Down Bros. Ltd.

THE PITRESSIN DIAGNOSIS OF IDIOPATHIC EPILEPSY

BY

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As a rule in hospital practice there is little urgency for a rapid diagnosis to be made in cases of suspected idiopathic epilepsy, and doubtful cases can be submitted to prolonged observation until an actual seizure has taken place. There are, however, certain occasions when it is necessary to establish a definite diagnosis as early as possible. In the average hospital case the required period of observation will be a matter of days or at the most a week or so, but when irregular seizures occur at infrequent intervals this period may have to be extended into months before a definite diagnosis can be established. It is with a view to curtailing this period of observation that an attempt has been made to determine a method whereby the condition can be diagnosed with a degree of certainty in the absence of seizures.

Indications for Use of the Method

The circumstances under which it may be necessary to give a rapid opinion on the existence or otherwise of this condition