The Right Base

BY

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This survey of the radiological changes seen at the right base in the more common lesions affecting that area is offered because some of the commoner are infrequently seen in anyone man’s experience. When expert interpretation is not available, but where a radiograph can be obtained, it is important to have a clear basis on which to make a diagnosis uninfluenced by clinical preconceptions.

It is upon the radiological findings that the diagnosis is often made in this area and consequent treatment instituted. I have not considered the rarities since they would defeat the whole object by an overweight of irrelevancy.

It is essential to have a very clear mental picture of what we are looking at, and any unusual shadows must first be determined as to their nature and site; in this connection two views are essential and should be routine, namely, a postero-anterior and a lateral view with the right side of the chest against the film, both being taken at a distance of two metres and both showing the whole contour of the diaphragm. When the postero-anterior film is inspected and some abnormality is seen in the lower half of the right lung field, attention should be directed to the rest of the chest to determine whether or not similar or other changes are present, in which case the scope of this survey does not apply. The chest wall is first examined for any bone lesions or malformations which can produce auscultatory phenomena of a strange nature. I refer to metastases and fibrocystic disease of the ribs, large pleural fibromata, and fractures, pathological or traumatic, with considerable haematoma formation. Again I have heard interesting discussions about a marked loss of translucency at the right base caused by a rather heavy breast shadow in a patient upon whom a left mastectomy had been performed.

ANATOMICAL LANDMARKS

In order to locate the site of the lesion the following landmarks must be defined: (1) The lateral chest wall; (2) the diaphragm; (3) the right border of the heart; (4) in many cases the interlobar pleura; (5) the main interlobar fissure.

The lateral chest wall is clearly defined and should meet the diaphragm in the costo-phrenic sulcus at a clearly defined acute angle. It is here that a small amount of fluid is first detected by an obliteration of this angle, and its replacement by a shadow continuous with the diaphragm, convex downwards, and having its upper level merging into the chest wall. The diaphragm usually has a simple convex contour clearly defined, but there may normally be several muscular convex sections representing different muscular bundles whose upper surfaces are all clear cut and conform to the general contour. The right border of the heart is convex and, although it may meet the diaphragm at an acute angle, other shadows are usually superimposed, e.g., the inferior vena cava. The interlobar pleura is seen as a straight horizontal line running from the hilum almost to the chest wall, but never actually reaching it; when thickened this is an obvious and a valuable landmark. The main fissure is only seen when the pleura is thickened; it runs from the second to the third dorsal vertebra to the anterior costo-phrenic sulcus, usually about one inch from the chest wall. It is surprising how marked can be the radiological changes and how scanty the physical signs. The upper horizontal line and the convex lower border not quite meeting the diaphragm seen in the postero-anteroview, while the general triangular shape with its base on the lower part of the anterior chest wall is demonstrated in the lateral view. An extension of the inferior surface up to the second dorsal vertebra divides the thoracic cavity into two, the lower portion being occupied by the lower lobe and the upper portion by the mid and upper lobes.

EXTRA-PULMONARY LESIONS

The commonest of these is a thickened pleura, and unless this is arranged as a bundle or band it will produce a diffused and ill-defined loss of translucency with no definite borders. When the interlobar pleura is affected this will be most clearly seen in the lateral view, since it is in this plane that the pleura is seen end on. A thickened pleura may be accompanied by fluid, which is perhaps the commonest cause of any considerable opacity in this region. Fluid naturally falls to the lowest level and occupies those available spaces where there is least resistance, so that it is found immediately above the diaphragm and around the periphery.
of the lung. Thus its superior level will be found on the lateral chest wall well above the main body of the fluid. In the presence of any considerable effusion the diaphragm will be completely obliterated, and if the diaphragmatic dome cannot be seen it is conclusive that fluid is present above it.

This is really the diagnostic sine qua non of the presence of fluid. Fluid may be loculated in one of the fissures, in which case in the postero-anterior view it will appear as a vague area of opacity, but in the lateral view will be quite clearly seen in the course of one of the fissures, when it will assume an elliptical shape.

Air within the thoracic cavity will be detected merely by the collapse of the lung, but should fluid be present at the same time this fluid, instead of adopting the appearances previously described, will have a horizontal superior surface extending from the mediastinum to the lateral chest wall, and if the patient is tilted the fluid will still remain horizontal in relationship to its gravitational level. In this connection it is interesting that whereas an effusion of only half a pint may encroach upon the whole of the lower half of the thoracic cavity, such an amount of fluid in the presence of air will only cover the top of the diaphragm, since the collapse of the lung has rendered considerable potential space at the extreme base of the thoracic cavity.

The only confusion that may occur is that where there is a complete consolidation of the right middle lobe with a completely horizontal line in the middle of the thoracic cavity, but this opacity as it extends downwards will be found not to obliterate the diaphragm, nor will it reach to the lateral chest wall.

Air and fluid may of course be accompanied by a lesion in the lung, and should this be in the lower half of the chest it often becomes obscured by the presence of the fluid, so that the source of the fluid is often hidden until this is removed and further films taken.

LESIONS OF THE LUNG

Pneumonia.—It is quite common to get a complete consolidation of the right middle lobe which has previously been considered, but it is uncommon to see more than one segment of the lower lobe affected at any one time. The general appearance is one of loss of detailed structure accompanied by varying amounts of density or loss of translucency, the limits of which are clearly defined. Again in this connection the lateral view is generally the most helpful in locating the site of the lesion. The appearances seen in collapse differ very little and, when all is said and done, the collapsed lung or lobule has pathologically the same density as one in which pneumonic consolidation is present and in which aeration is no longer taking place. In collapse the volume of the lung is diminished and the diaphragm rises, though this is not always easy to detect.

Bronchiectasis.—Only when this process is advanced is it detected on an ordinary routine examination. What should lead one to suspect its presence is that the normal vascular shadows are more crowded together and apparently more numerous because the bronchi which run roughly beside them are filled with pus and therefore rendered opaque, thus producing an apparent overcrowding of the normal vascular pattern. In the saccular type of bronchiectasis small rounded opacities are seen, but when this stage of a bronchiectasis is reached there is very little need for a radiological confirmation of the pathological condition of the lung.

Lung Abscess.—This condition is now fortunately rarely seen, though I think the early stages of lung abscess are more commonly present than is realised, and that as complete necrosis does not take place due to modern therapeutics, the fact that an abscess has been averted is often not appreciated. An abscess shows itself usually not in one of the accepted sites in a pneumonic consolidation, but as a generally blurred opacity at first having no border whatsoever, and then gradually forming a barrier where it becomes localised and the characteristic necrosis and cavitation take place. It is important to realise, however, that in the early stages, unless vigorous measures are adopted, the disease can easily follow its natural and very serious course. I remember in my early days as a radiologist seeing several such abscesses in the course of a week, whereas in the last years I rarely see a lung abscess in its full-blown stage.

Other Infections.—There are of course other rarer infections, but they are not usually confined to the right lower lobe and thus hardly come within this survey.

TUMOURS

Primary

(1) Innocent: Such tumours are very rare, but quite easily detected by their clearly defined edges and spherical shape.

(2) Malignant: A carcinoma of the middle or lower bronchus or their main divisions may
be seen as a dense mass rising from the hilum, causing some degree of collapse of the portion of the lung from which this division of the bronchus is derived. The collapse itself does not differ in any way to collapse due to other causes, but its presence with a mass, which may not be large, rising from the hilum is very valuable support of a diagnosis of malignant disease, and furthermore it is quite common for the phrenic nerve to be involved and for the diaphragm to be paralysed.

Secondary
Secondary tumours are never confined to the right lower lobe and therefore are not included in this survey.

Other Conditions
A host of other lesions are sometimes seen at the right base, but they have no features which distinguish them from those seen in other parts of the lung. Such lesions as cystic disease, echinococcal cysts, congenital atelectasis, congenital bronchiectasis of the alveolar type and others more rare.

Subdiaphragmatic Lesions
Where there is a homogeneous hepatic enlargement the diaphragm need not be raised nor its excursion impaired, but the general convexity is often exaggerated. Where metastases or abscesses are present in the liver and projecting under the diaphragm this will produce distortion of the normal curve in the form of a bulge like an apple. Where pus is present beneath the diaphragm there is usually some sympathetic collapse of the base of the lung and perhaps a small effusion and general blurring of the outline of the diaphragm itself, but not obliterating it completely.

Conclusions
When confronted by an opacity in the right base it will be seen that the following questions must be asked:

(1) Is fluid present? If so, is it free or encysted? Thus the mere fact of being able to see the diaphragm clearly is a very great aid in the recognition of any opacity in this area.

(2) Where is this opacity? Is it upper, mid or lower lobe? By remembering the exact location of the middle lobe this becomes evident in the lateral view.

(3) Is there a mass in the hilum?

Having answered these three questions we are a very long way towards arriving at a diagnosis and an interpretation of the abnormality at which we are looking.