

THE PLAIN FILM DIAGNOSIS OF COMBINED RIGHT MIDDLE AND LOWER LOBE COLLAPSE

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SYNOPSIS

The combination of right middle and lower lobe collapse is uncommon. The plain films can be difficult to interpret but there are definite features for an accurate diagnosis to be made. A malignant tumour is the cause in most cases. Hence, the importance of early recognition of this double lobar collapse to be followed by bronchoscopy with biopsy.

INTRODUCTION

The recognition of uncomplicated single lobar collapse on plain films is relatively straight forward (1,2,3,4,5,6). The collapse of two lobes, excluding total collapse, can be difficult. The most frequent combination is collapse of the right middle and right lower lobes (7,8). It is important to recognize this particular combined collapse as it involves a major bronchus, the intermediate bronchus. In a series of 12 cases, 8 were found to be due to a tumour. Analysis of the plain films do reveal there are features for a definite diagnosis to be made. This would lead to an immediate indication for bronchoscopy with biopsy, bypassing other investigations like bronchography or needle lung biopsy.

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RESULTS

The diagnostic features of right middle lobe (RML) on plain films are clear and reliable. The frontal view has an ill-defined opacity obscuring the right heart border. The greater the collapse, the more uncertain the opacity due to compensatory hypertranslucency of the right upper lobe. The most medial segment of the major fissure can be seen which indicates that the right lower lobe is clear. The lateral view shows a characteristic triangular opacity with the apex at the lung hilum, sharply defined by the minor and major fissure. The right pulmonary artery is slightly depressed with respect to the left pulmonary artery.

The features of right lower lobe (RLL) collapse are also fairly definite. The frontal view shows a triangular shape opacity with the apex at the hilum. The superior border is sharp but the diaphragm, particularly the medial segment is obliterated. The superior border (which is due to the major fissure) extends medially, well into the hilum. In severe collapse when the lobe is well plastered against the right paramediastinum, the opacity becomes uncertain but the hilum will be seen as a posterior inferior opacity with a sharp anterior border which overlaps and obliterates the right hemidiaphragm. The opacity becomes smaller with increasing severity of the collapse, simulating a posterior pleural effusion.

In combined RML and RLL collapse, the frontal view simulates a RLL collapse but both the hemidiaphragm and right heart border are obscured (Figure 1 & 2). The abnormal opacity extends all the way to the right costophrenic angle. Both fissures are depressed but the depression is more so over the lateral segment than the medial segment. The fissures may be seen separately (Figure 4), but disappears when the collapse becomes severe.

The lateral view is confusing but it is precisely this which confirms the diagnosis after seeing the frontal view. The abnormal density surprisingly covers the lower chest from front to back looking like a large pleural effusion with obliteration of the hemidiaphragm. The superior margin of the density can be concave or convex. It is this startling appearance of a large effusion on the lateral view in contrast to the frontal view which is felt to be the key feature of the RML and RLL collapse (Figure 1b,2b,3).

The differential diagnosis on the frontal view includes a right heart or mediastinal lesion, an elevated right hemidiaphragm from liver pathology, and a sub-pulmonic effusion. On the lateral view, a large pleural effusion and an extensive lung consolidation will need to be excluded. But a pair of frontal and lateral views should be able to provide the diagnosis. The frontal view ought to be somewhat "penetrated" to demonstrate the depressed edges of both fissures and the air bronchogram of the upper and intermediate bronchus.

Partial or incomplete consolidation-collapse is easy to recognize when the lobes of both RML and RLL are well shown by their fissures (Figure 4 & 5).

12 cases of combined RML and RLL collapse were reviewed. They were confirmed by tomography, bronchography or bronchoscopy or a combination of these procedures. 8 out of 12 cases were due to a malignant tumour and 4 were from severe lung infection. All cases were highly suspected or diagnosed right away as combined RML and RLL collapse on applying the plain film features described here.



Figure 1(a) Collapse-consolidation of RML and RLL.

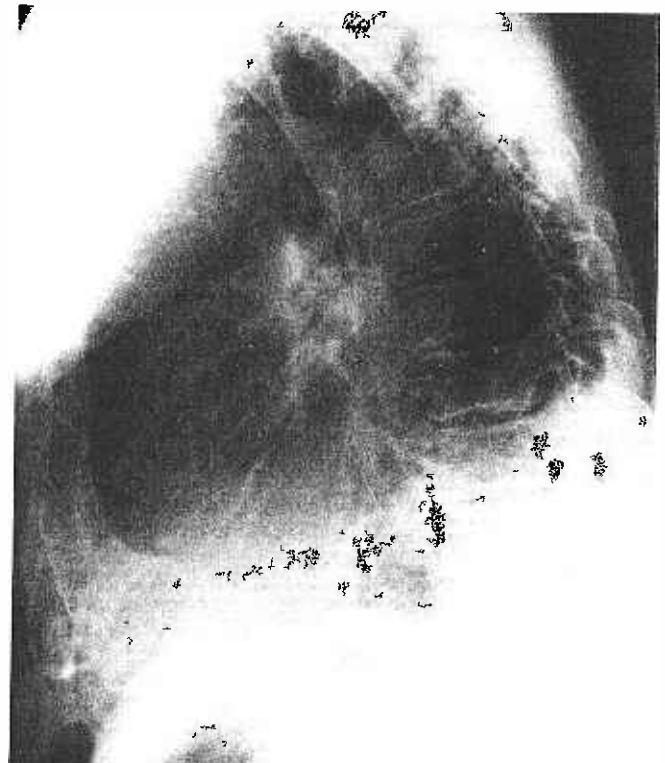


Figure 1(b) The lateral view shows an ill-defined opacity from front to back simulating a pleural effusion.

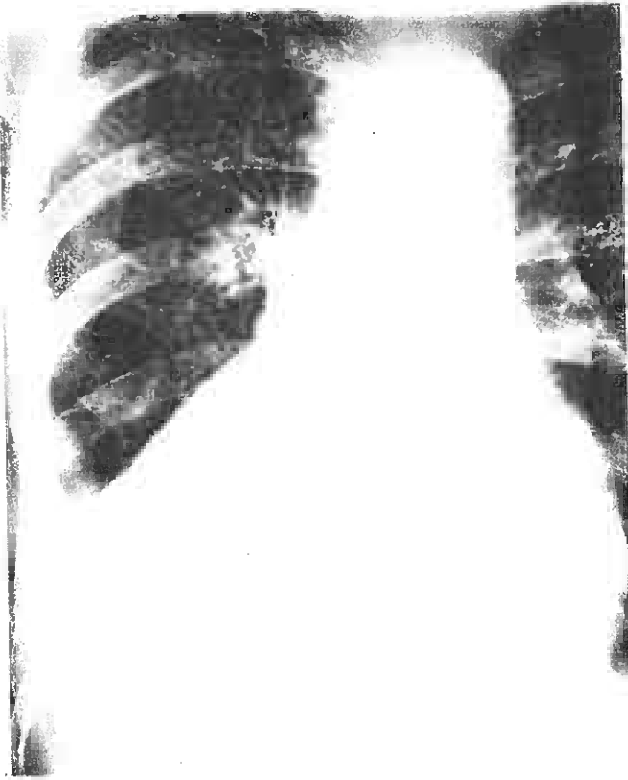


Figure 2(a)
Typical frontal view. The opacity has a sharp border (the oblique fissure), extending medially right into the hilum and laterally to the costophrenic angle with obliteration of the diaphragmatic and right heart border.



Figure 2(b)
The lateral view is confusing but typical.



Figure 3(a & b) Lateral views of two patients showing a typical front to back opacity, which is not quite to be expected from the frontal view.

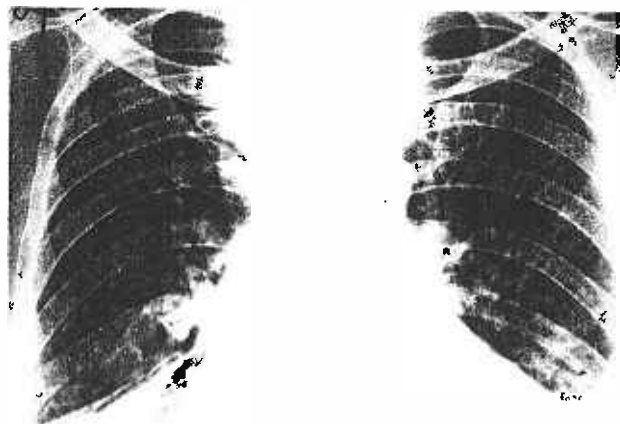
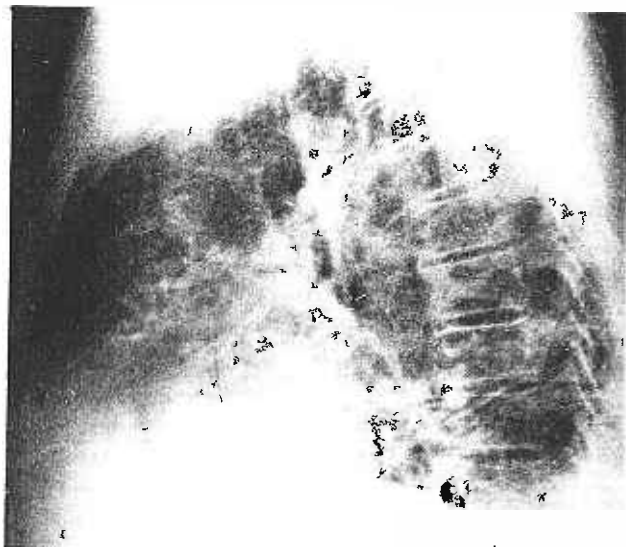


Figure 4(a & b) Incomplete collapse-consolidation. The lateral view is difficult to interpret but the frontal view shows both horizontal and oblique fissures depressed.

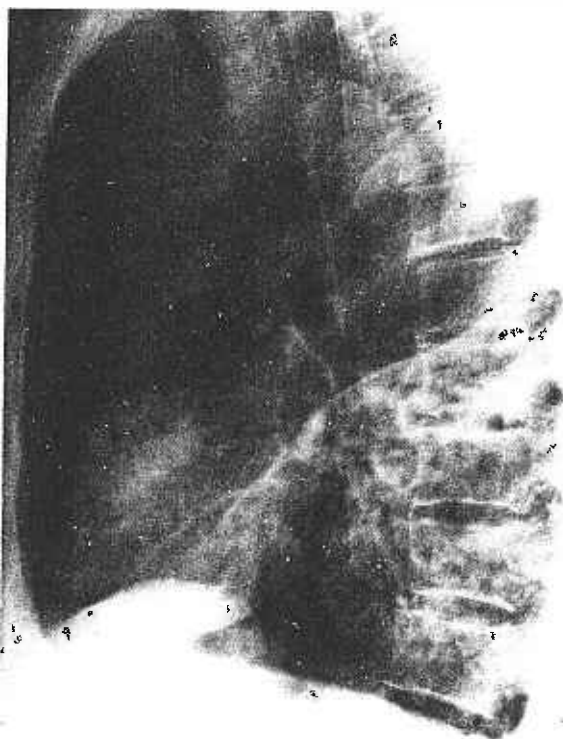


Figure 5
Incomplete collapse-consolidation. The lateral view shows the fissures for the diagnosis. It gives a good idea of what the appearance would be in a complete collapse-consolidated state.

CONCLUSION

Combined right middle lobe and right lobe collapse is an uncommon occurrence. Its recognition is important as it is very often due to a malignant tumour in the intermediate bronchus. The radiological appearance on plain films can be confusing and difficult to interpret but there are diagnostic features. Close scrutiny for such features on a pair of frontal and lateral views will enable the diagnosis to be made confidently. An analysis of 12 cases support this contention.

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