

'Air Bronchogram' - An Important Radiological Sign

Introduction

Chest radiographs are the most commonly-requested radiological examination. Whether you are reviewing a chest film in the clinic or on a ward round, or regularly receive reports of chest X-rays from radiologists, the chances are that you would have come across the term 'air bronchogram'. It is one of the cornerstones of interpretation of chest films.

This quick review explains the pathophysiology and causes of this radiological sign.

Target Readers

This review would be useful for medical students, foundation and specialist trainees from almost all medical and surgical specialities. General practitioners and community physicians would also find this information useful.

Pathophysiology of Air Bronchogram

On the X-ray film, normal lung fields are radiolucent (black) and therefore, the air-containing bronchi are not seen separately. In cases of consolidation, the air in the alveoli is replaced by either fluid or cells and therefore, alveolar spaces appear opaque (white). Against the background of opacified (white) alveoli, the bronchi then stand out as darker branching tubular structures.

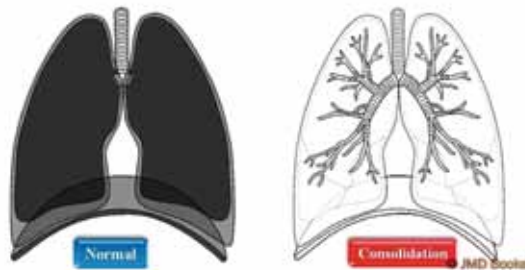


Figure 1: Air bronchogram occurs when air in the alveoli is replaced by fluid or cells and the air-containing darker branching bronchi are seen passing through the consolidation in the lung (Reproduced with permission from: Basics of Chest Radiology, ASIN: B005CYWM7S).

Common Causes of air bronchogram ^(Ref 1):

- Consolidation
- Pulmonary oedema
- Hyaline membrane disease in children
- Acute respiratory distress syndrome (ARDS)
- Sarcoidosis
- Alveolar proteinosis
- Passive collapse/non-obstructive atelectasis
- Malignancies such as bronchoalveolar carcinoma and lymphoma
- Severe interstitial disease
- Pulmonary infarction
- Pulmonary haemorrhage

This important radiological sign was first described on conventional chest X-rays by the late Dr Benjamin Felson, Professor Emeritus and one of the most famous American chest radiologists. Air bronchogram is also seen on CT scans. This sign indicates patent bronchi. If this appearance persists for more than 6-8 weeks despite appropriate antimicrobial therapy, then a neoplasm should be excluded.

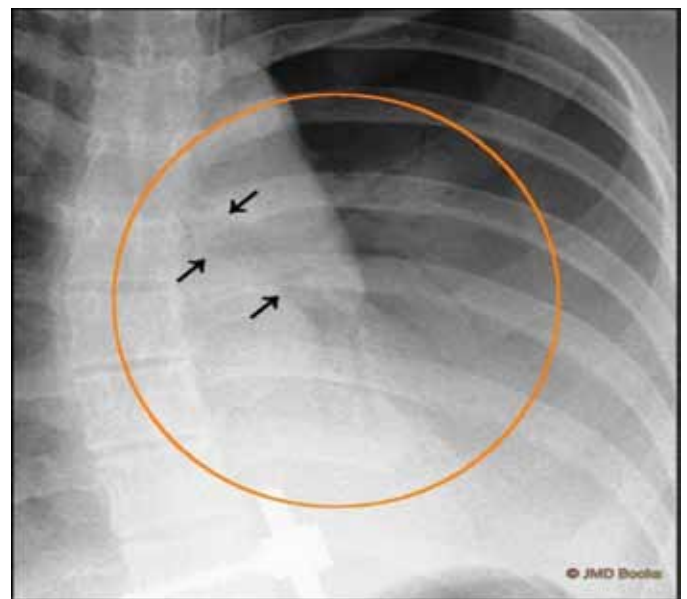


Figure 2: Close-up of air bronchogram in a case of left lower lobe consolidation.

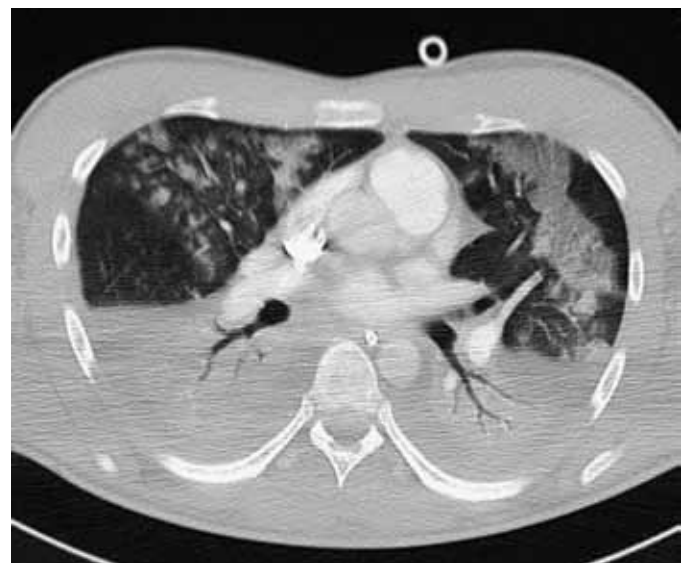


Figure 2: Air bronchogram on a CT scan in a case of ARDS.

Take Home Message

- Air bronchogram is a classic sign of consolidation. Clinicians should be familiar with common causes, which include benign and malignant disorders.
- It is also one of the commonest radiological signs shown in the exam.

Reference

1. Basics of Chest Radiology - A Beginner's Guide to Chest Imaging: Dr D Dr H Davies, Dr S Gandhi, JMD Publishing, ASIN: B005CYWM7S, 2011.



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