CHAPTER

10

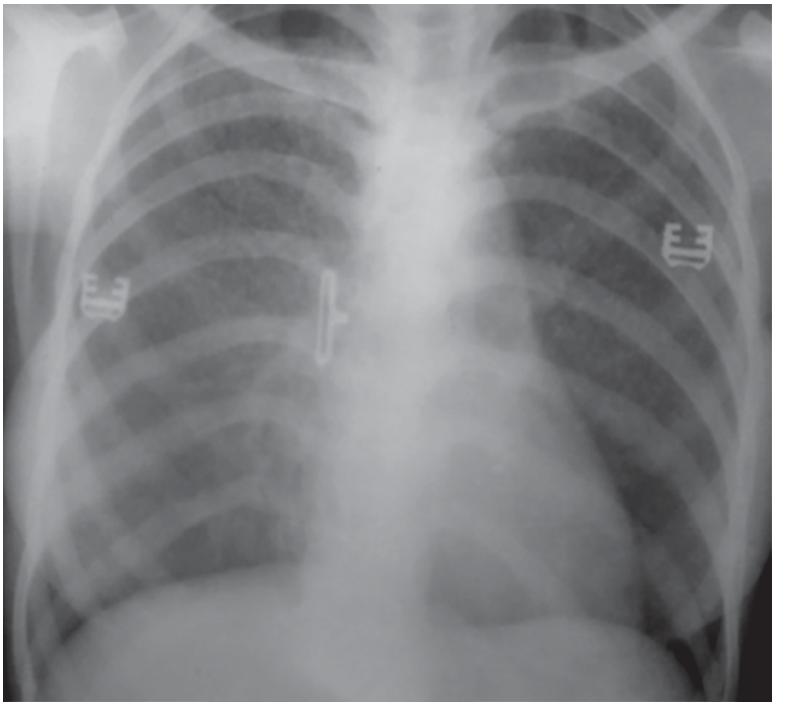
Lung Parenchyma II

Miliary Lesions

Very small from pinpoint to 5 mm size infiltrations which are distributed in both lungs symmetrically and uniformly

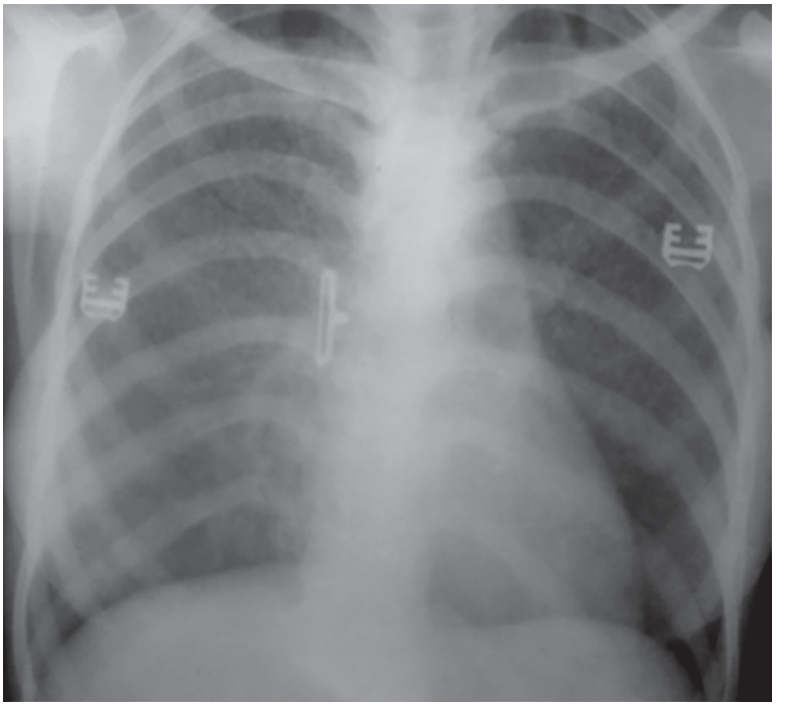
Miliary Lesions—*What are Causes?*

- Infection
  - Bacterial: Tubercular, bronchopneumonia, staphylococcal pneumonia
  - Viral: CMV, mycoplasma, varicella
  - Fungal: Coccidiomycosis, histoplasmosis, blastomycosis
  - Parasitic: Malaria, kala-azar, tropical pulmonary eosinophilia
- Pneumoconiosis
  - Anthracosis, silicosis
- Collagen disease
  - Scleroderma, rheumatoid arthritis, systemic lupus erythematosus
- Cardiac
  - Mitral stenosis, pulmonary embolism
- Neoplasm
  - Primary: Alveolar cell carcinoma, lymphoma, leukemia
  - Secondary: Renal carcinoma, thyroid carcinoma
- Others
  - Alveolar microlithiasis, idiopathic haemosiderosis, sarcoidosis



What is this?

See chest X-ray carefully. Patient presented with fever and weakness



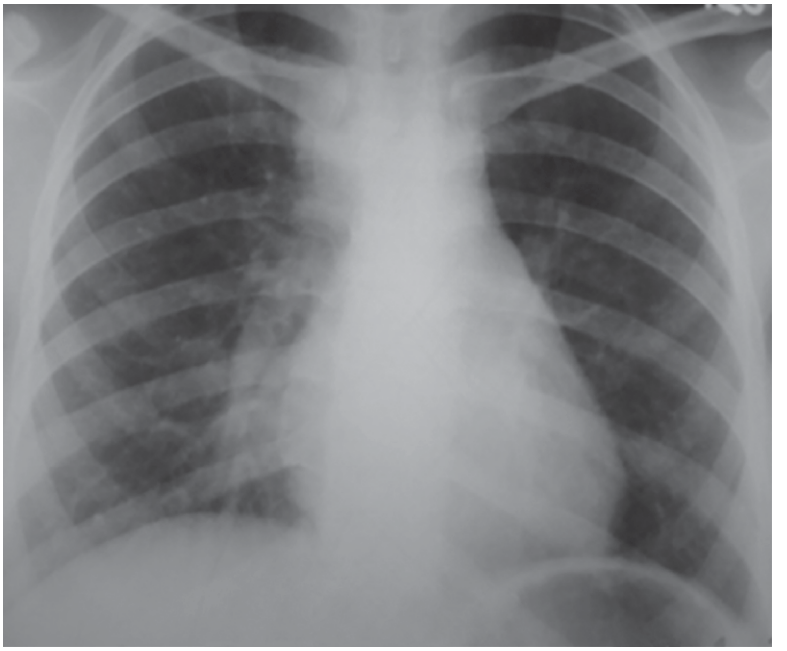
Miliary shadows cause miliary TB

What is this?

See chest X-ray carefully. Patient presented with fever and cough

Miliary shadows cause miliary TB

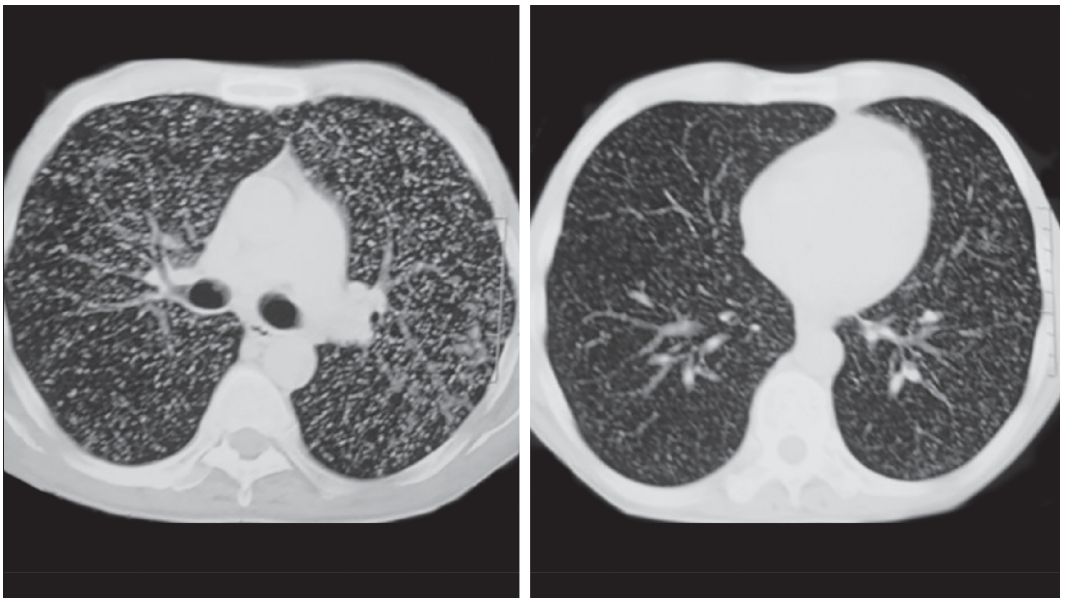
Miliary shadows resolving 2 months after
antitubercular treatment



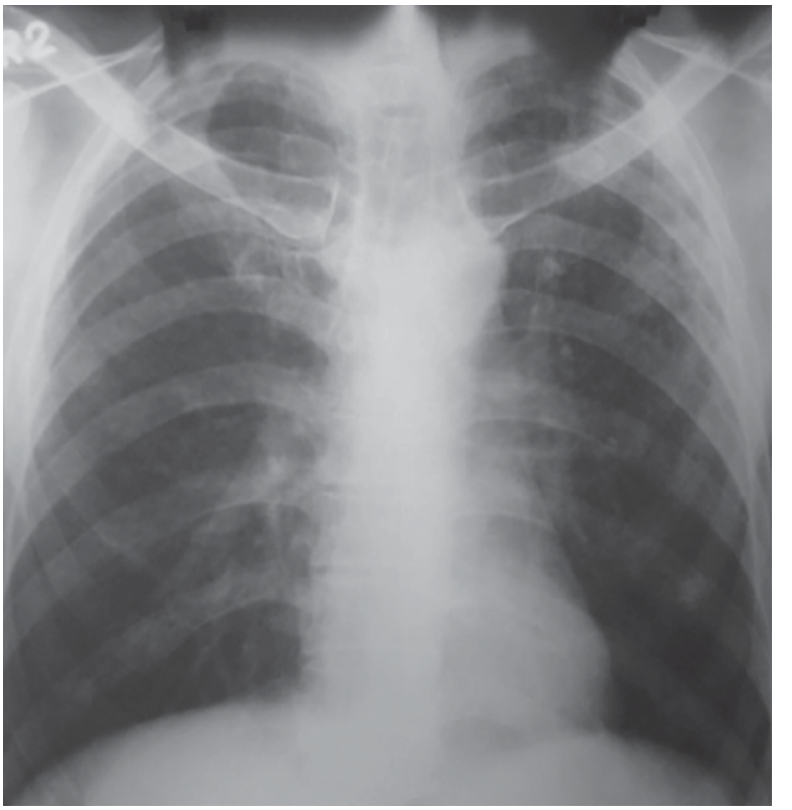
Miliary shadows completely resolved after 4 months
of antitubercular treatment
Please note that antituberculosis treatment should be completed

What is this?
A 40-year-old male C/O fever

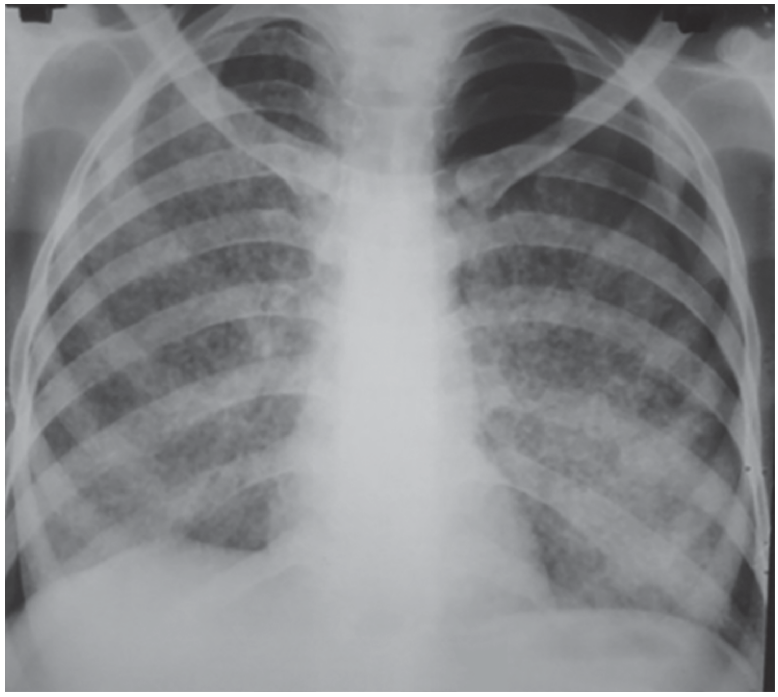
Miliary shadows cause miliary TB



Miliary shadows (miliary TB)



Miliary shadows completely resolved after 4 months of antitubercular treatment



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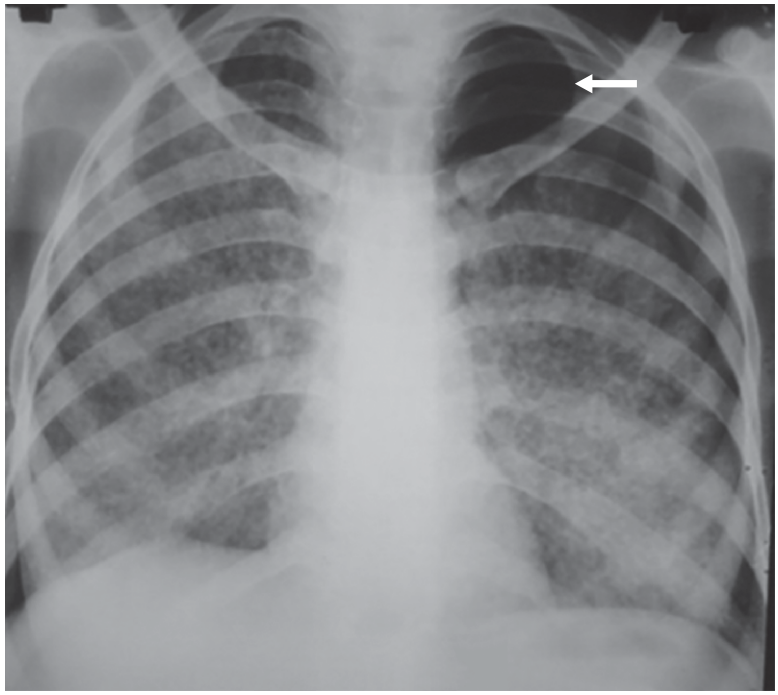
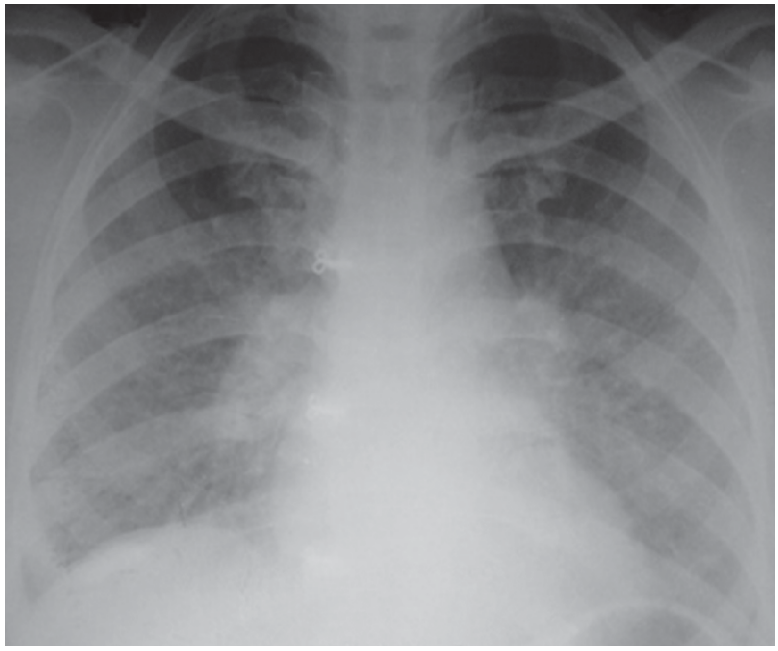


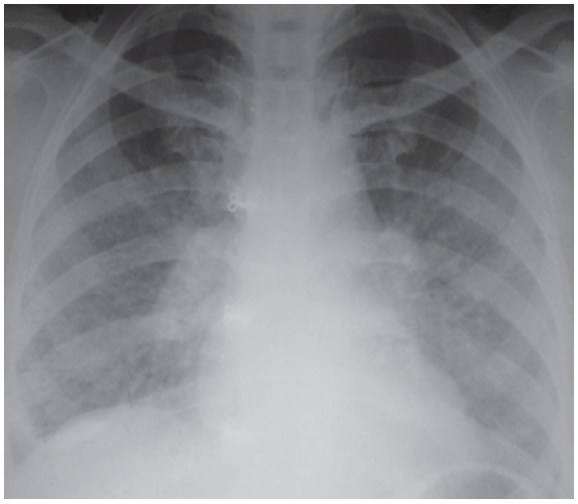
Miliary TB with pneumothorax (left side)

What is this?
C/O cough and high fever for 7 days

Bronchopneumonia

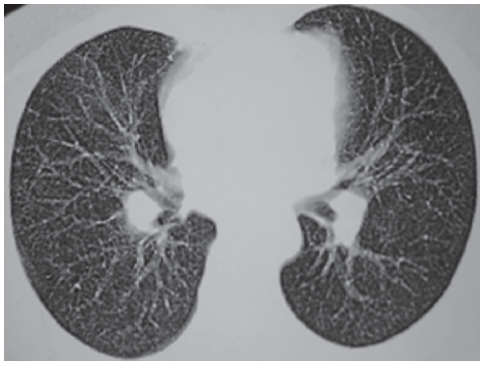


What is this?
A 30-year-old female C/O cough and breathlessness



TLC = 13,900, DLC = P30 L22 E48
Absolute eosinophil count = 6672 cells/mm^3

Tropical pulmonary eosinophilia



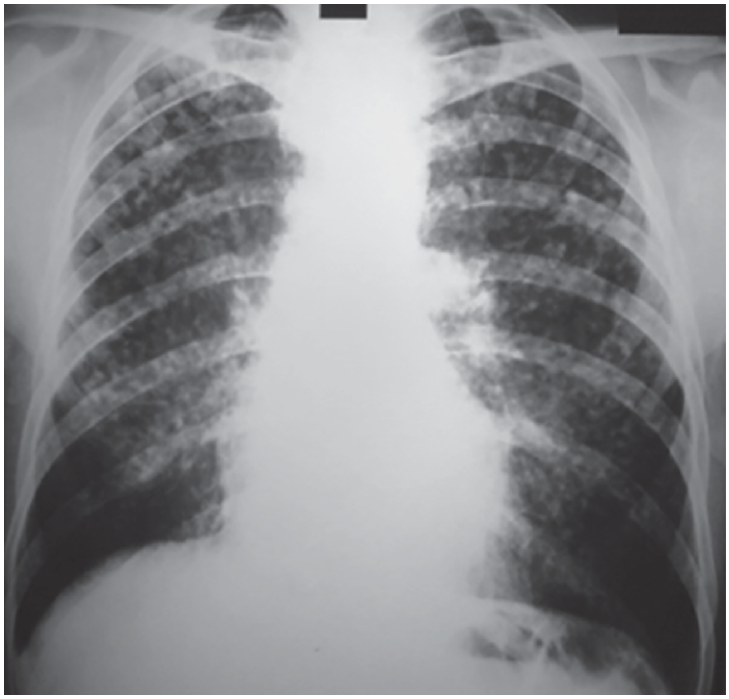
Miliary shadows cause tropical pulmonary eosinophilia

What is this?

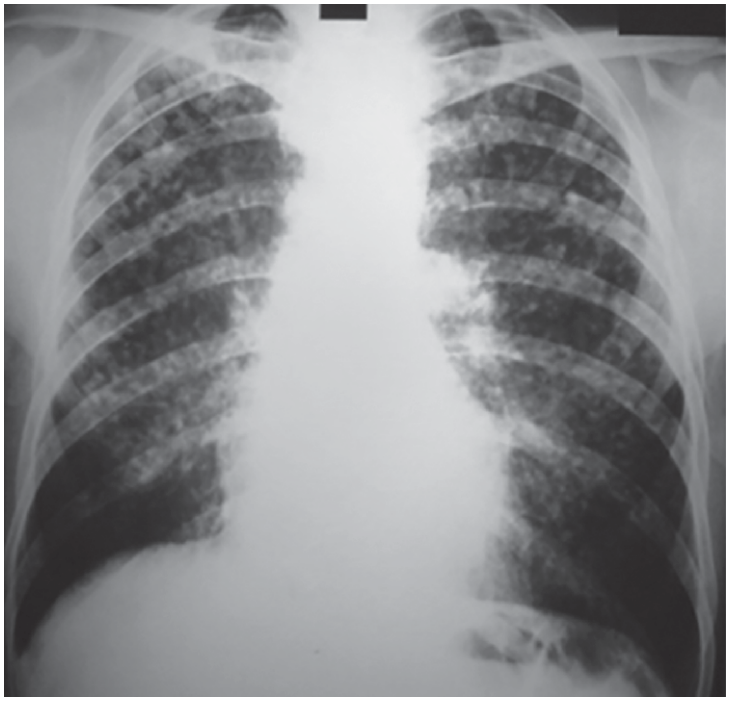
A 30-year-old male C/O dry cough, breathlessness, fever for 15 days, PPD:14 mm

TLC= 20,700, DLC= P11 L11 E78

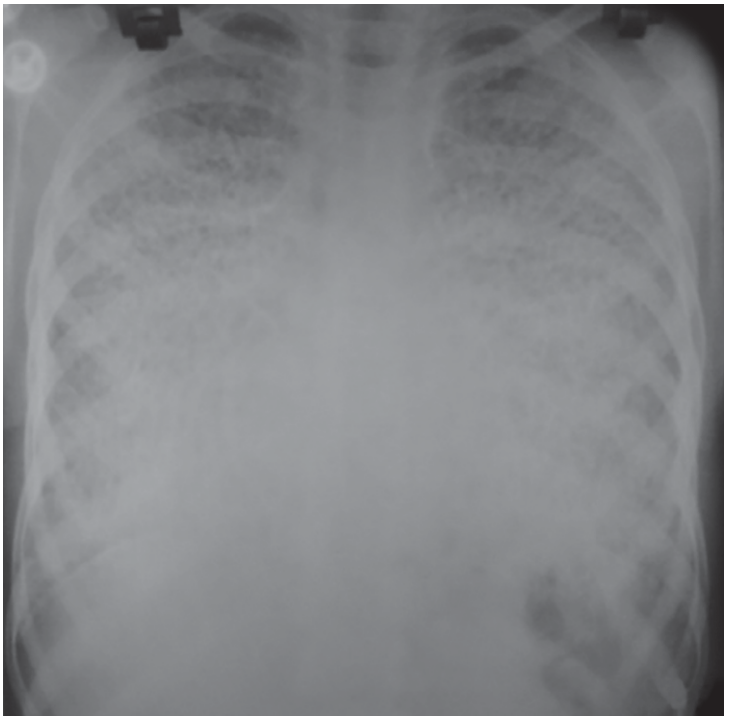
Miliary shadows cause tropical pulmonary eosinophilia



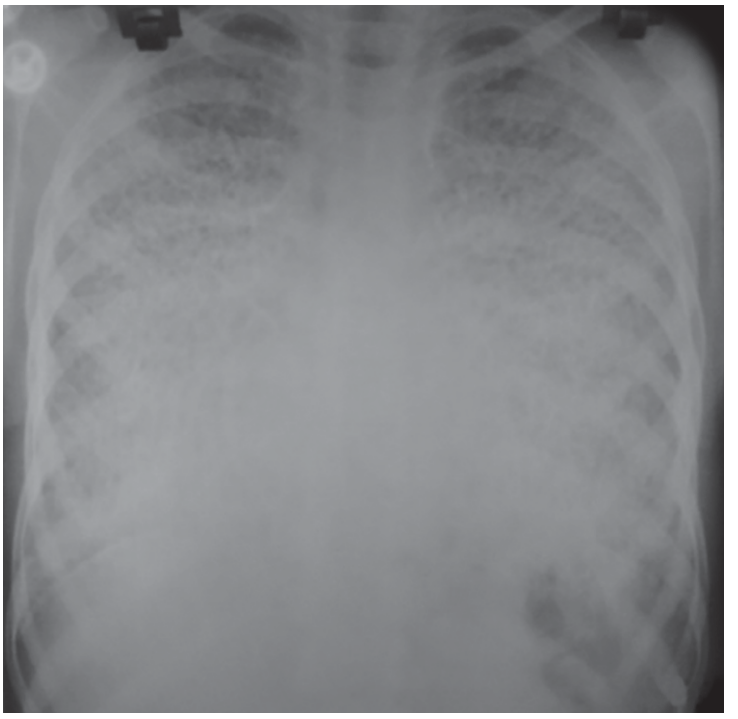
What is this?
C/O breathlessness for 5 years
H/O exposure in coal mine for 20 years



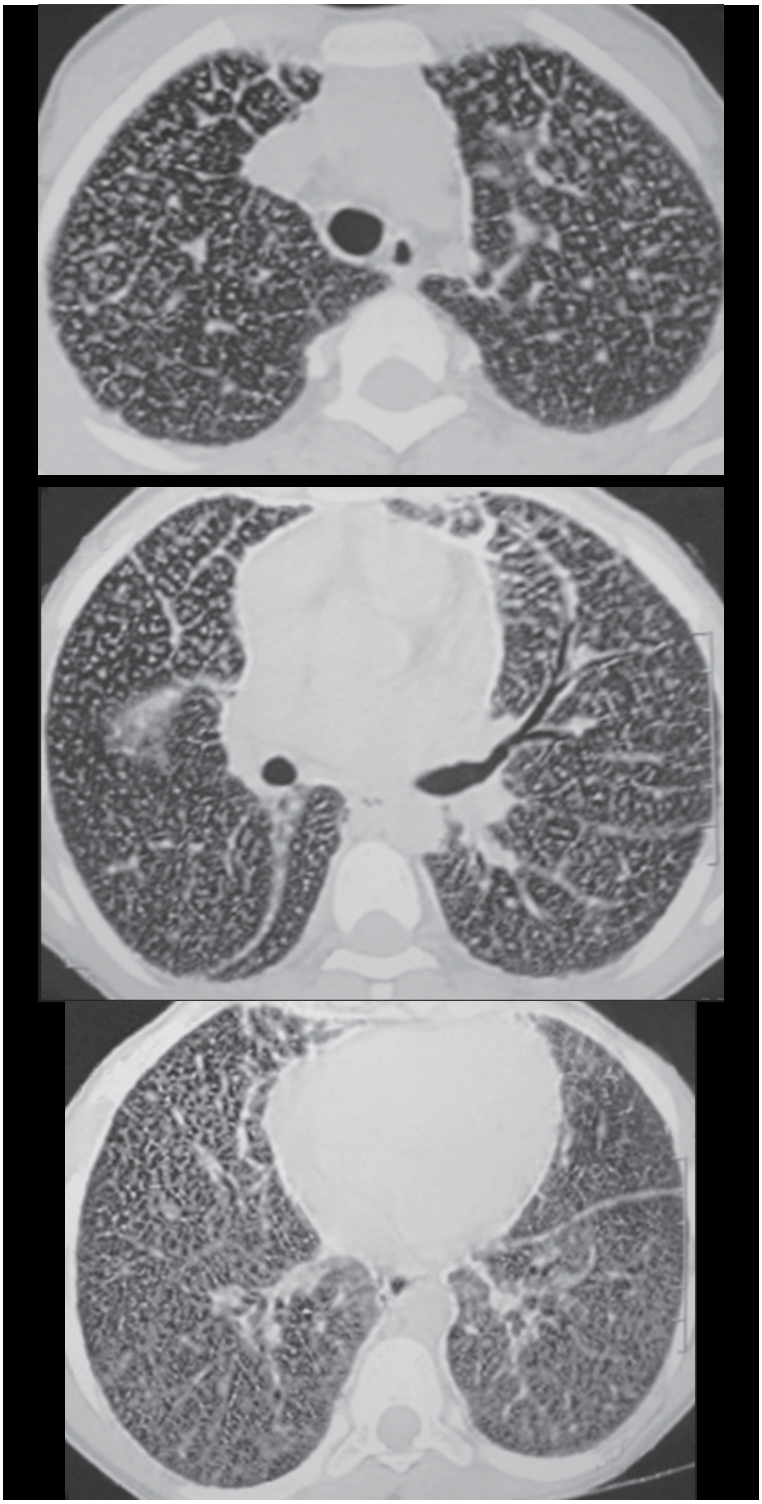
Pneumoconiosis (coal workers lung)



What is this?
An 18-year-old male with no complaints



Pulmonary alveolar microlithiasis



Pulmonary alveolar microlithiasis
Please note that HRCT shows typical numerous sand-like calcification throughout the lung with subpleural and peribronchial distribution

Pulmonary Alveolar Microlithiasis

Pulmonary alveolar microlithiasis (PAM) is a rare idiopathic condition characterized by widespread intra-alveolar deposition of spherical calcium phosphate microliths (calcospherites)

It is usually asymptomatic often discovered incidentally on a chest radiograph which shows sand-like calcification distributed throughout the lungs with black pleura sign

HRCT better shows numerous sand-like calcifications throughout the lungs with subpleural and peribronchial distribution (typically ~1 mm). Additional accompanying HRCT features include:

- Crazy paving pattern
- Calcified interlobular septa (virtually pathognomonic)
- Small subpleural cysts/emphysema
- Black pleura sign
- Ground glass opacities: Tends to be more common in children

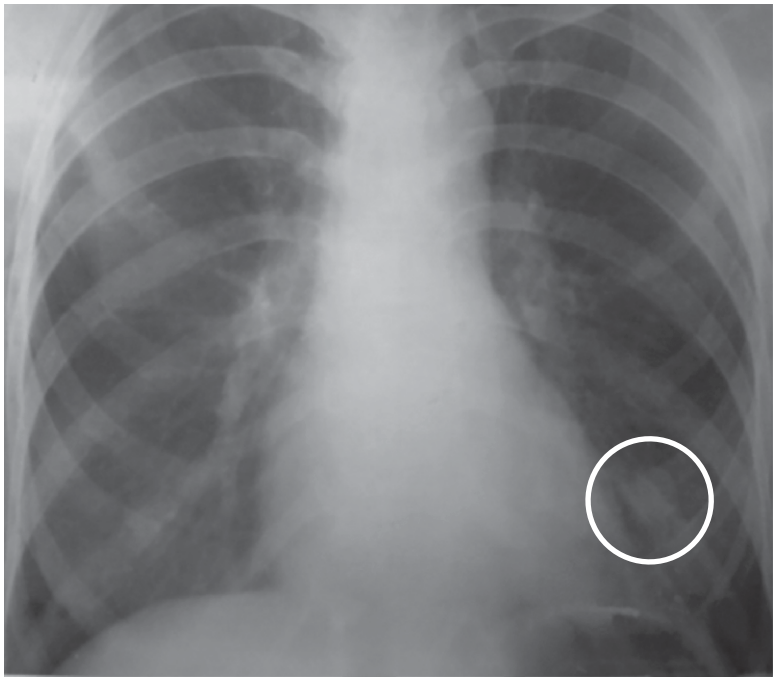
Usually requires no treatment but may progress and may require lung transplantation

Nodular Lesions

Nodule: Is a rounded or irregular opacity, which may be well or poorly defined, measuring ≤3 cm in diameter, surrounded by aerated lung on radiological imaging

Nodular Lesions—*What are Causes?*

- Neoplasm
  - Benign: Bronchial adenoma, fibroma, leiomyoma, lipoma
  - Malignant
    - Primary—bronchogenic carcinoma
    - Secondary—lymphoma, sarcoma, mesothelioma
- Granuloma: Tuberculosis, histoplasmosis, coccidioidomycosis, brucella, echinococcus
- Hamartoma
- Simulated pulmonary nodule: Skin tumor, nipple shadow, rib lesion, foreign body, artifact
- Others: Abscess, bulla, hematoma, infarct, loculated effusion



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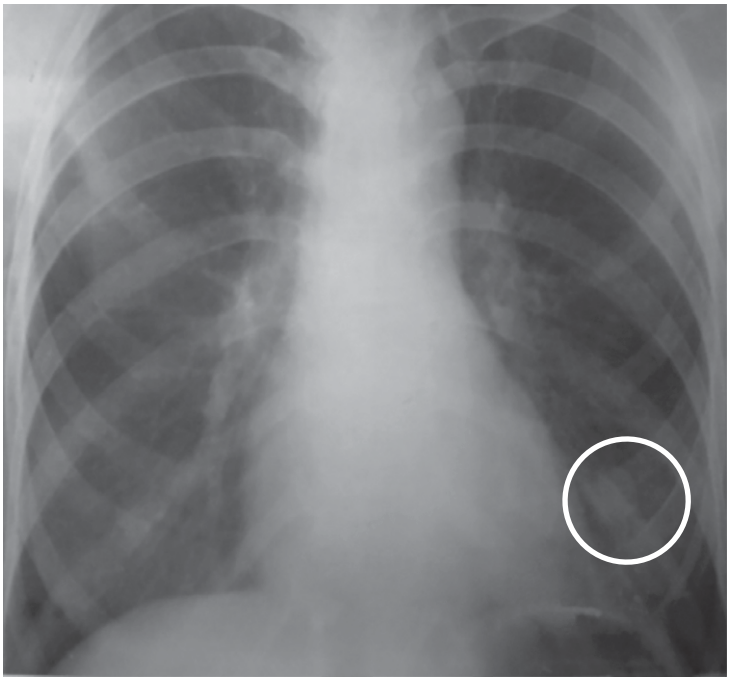
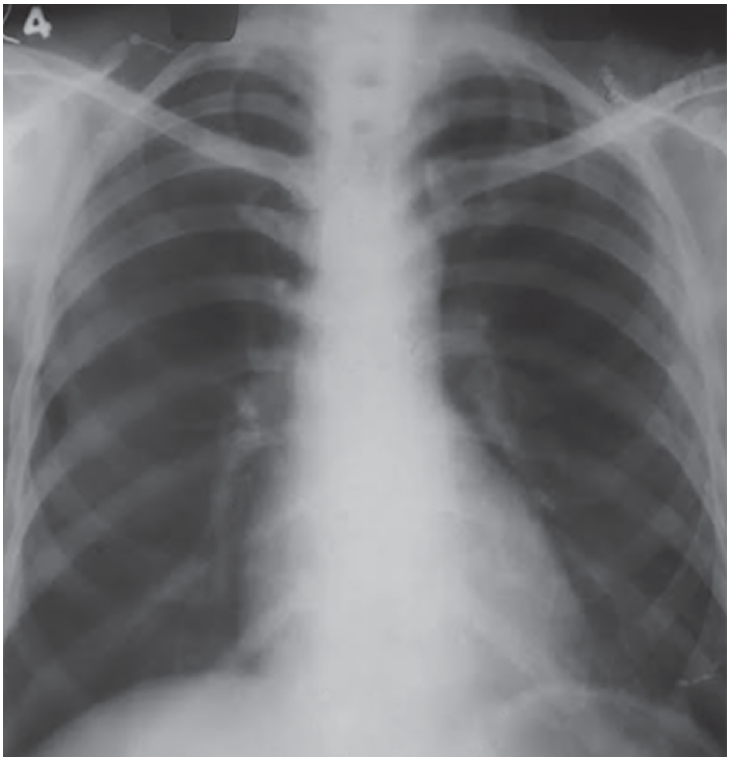
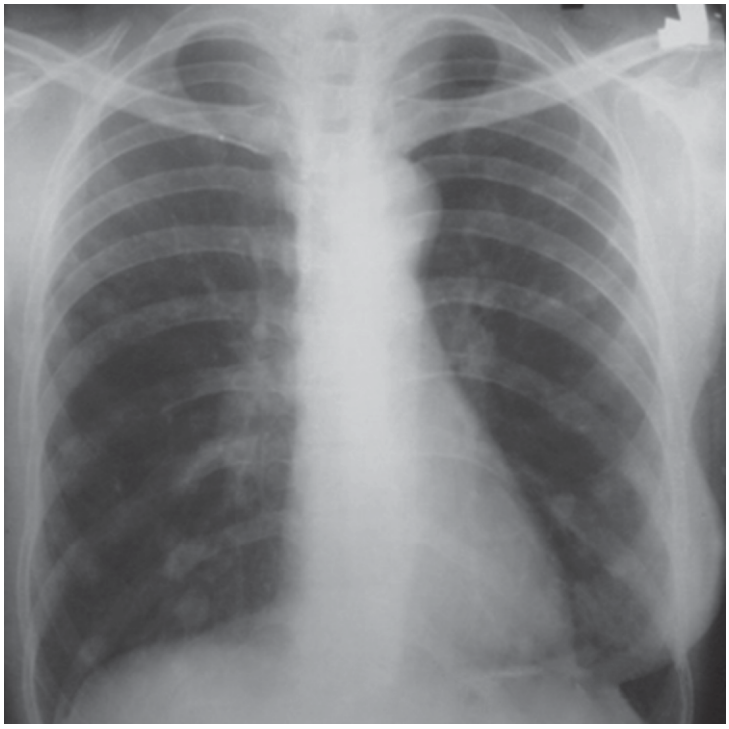


Nipple shadow



Chest X-ray PA view taken after strapping the breast which shows that nodule in the left lower zone has disappeared



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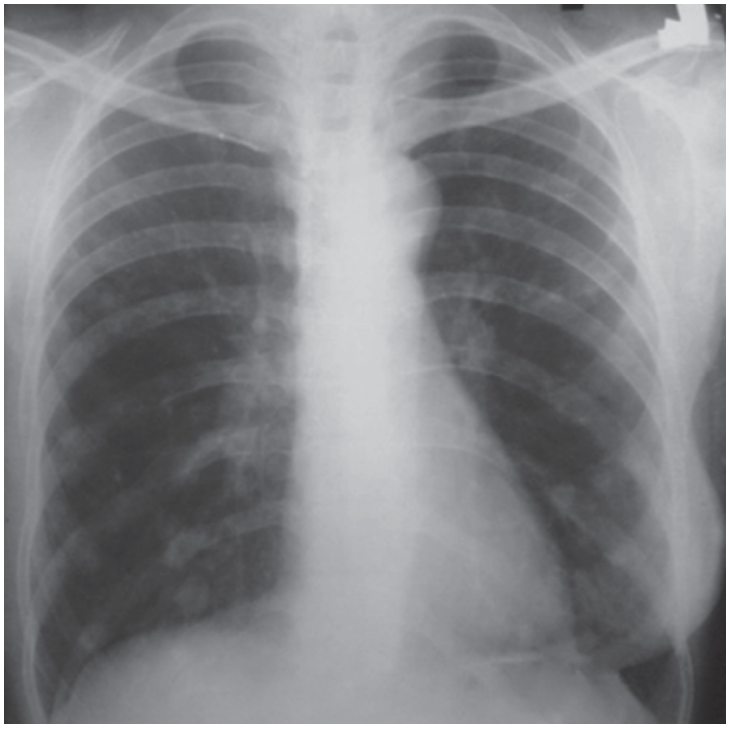
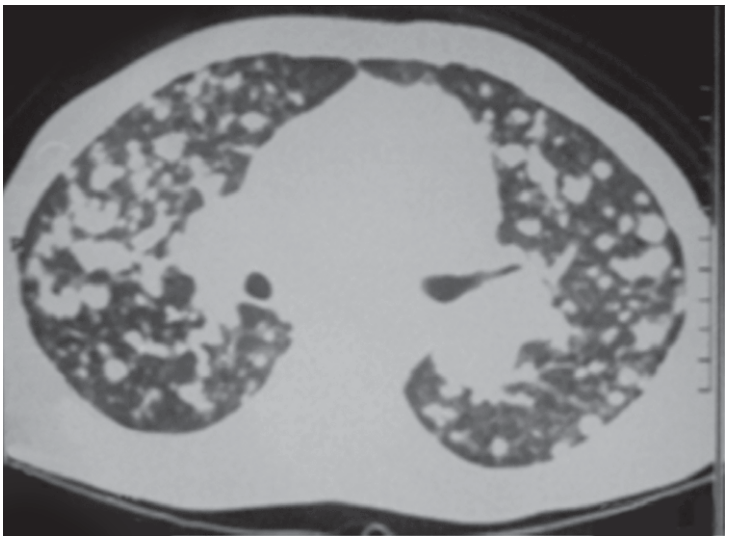


Secondaries from operated carcinoma right breast
(no breast shadow on the right side)



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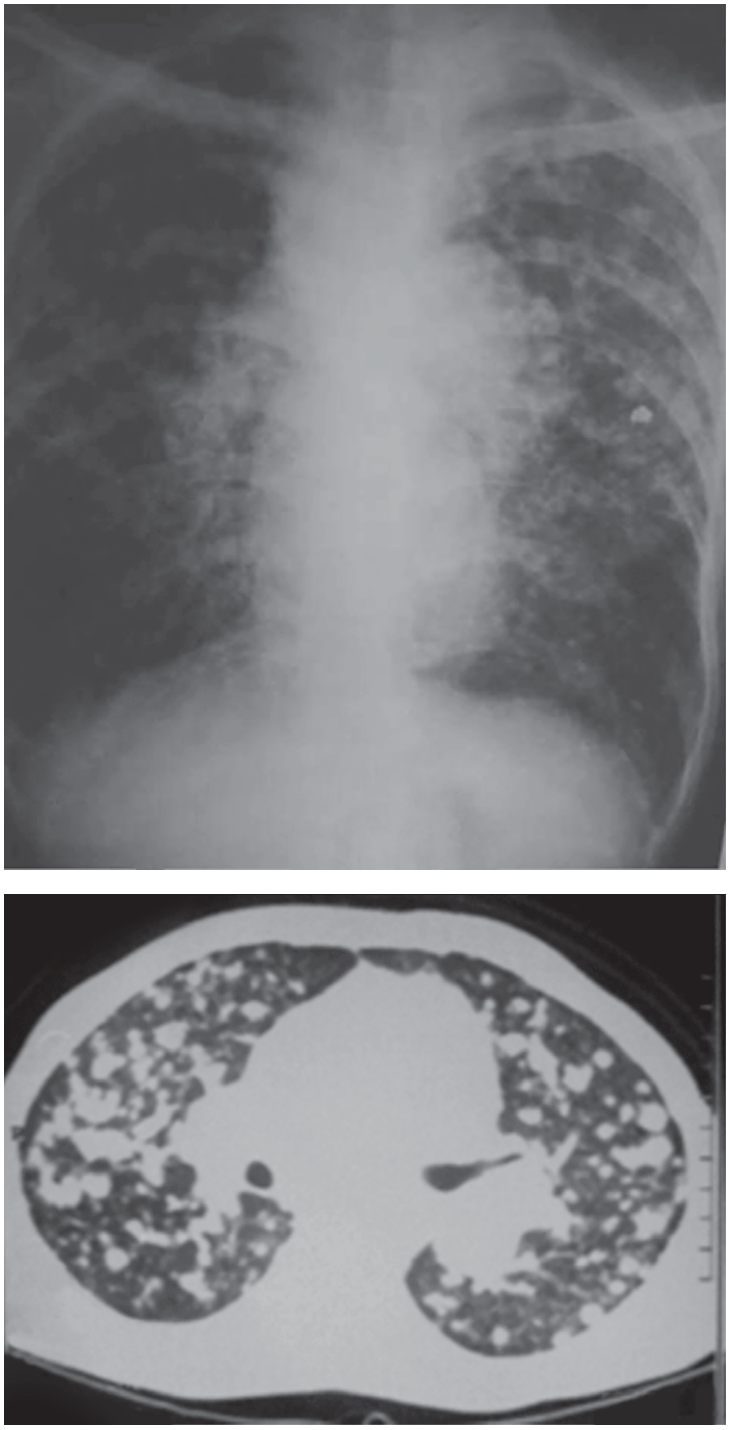
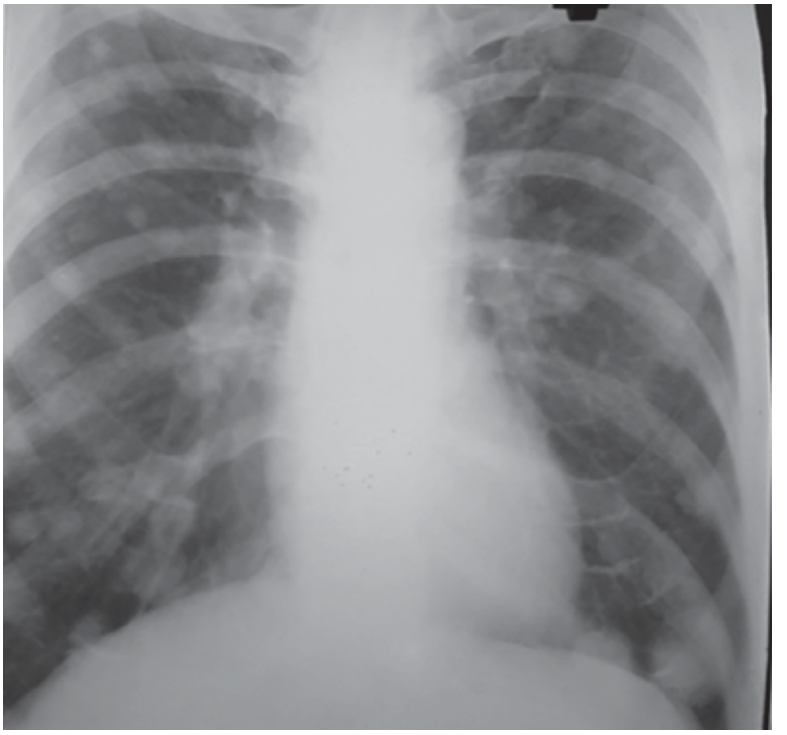


Secondaries from carcinoma thyroid



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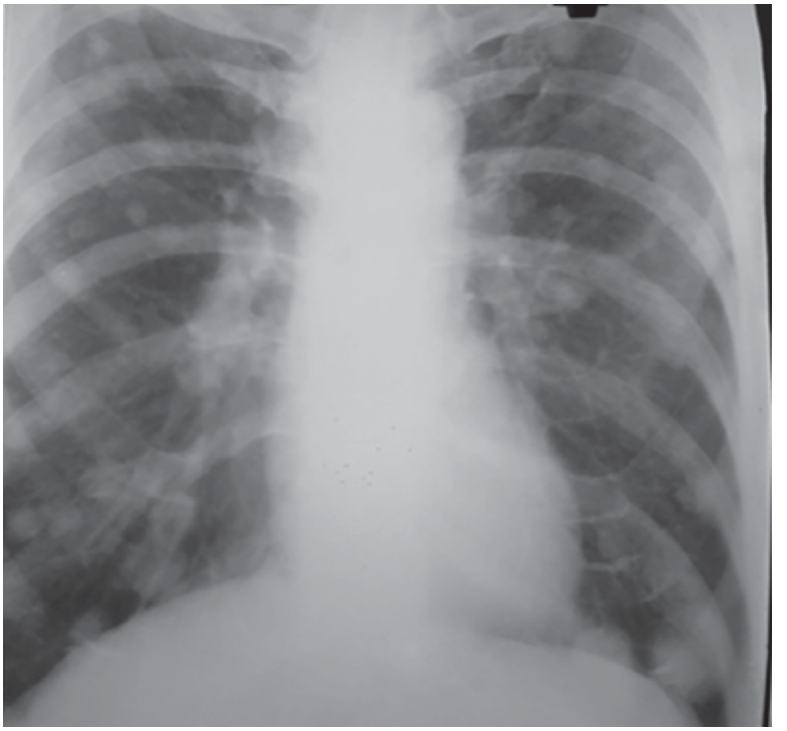
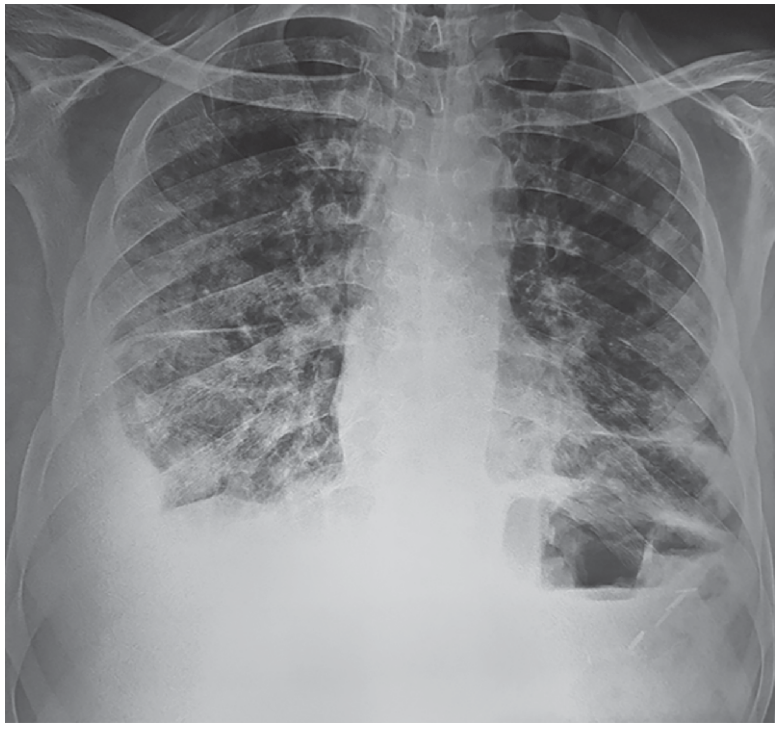


Multiple nodular shadows cause secondaries



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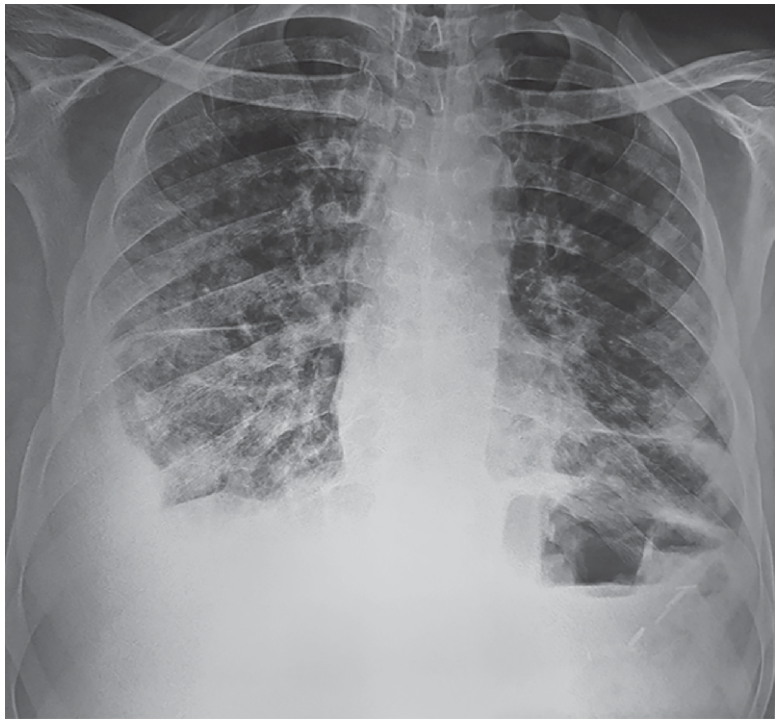
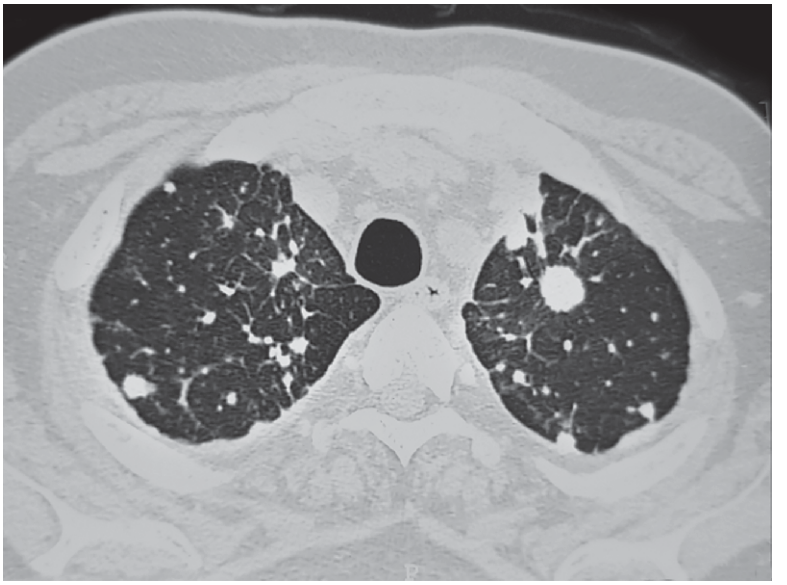


Secondaries with pleural effusion (right) from carcinoma pancreas



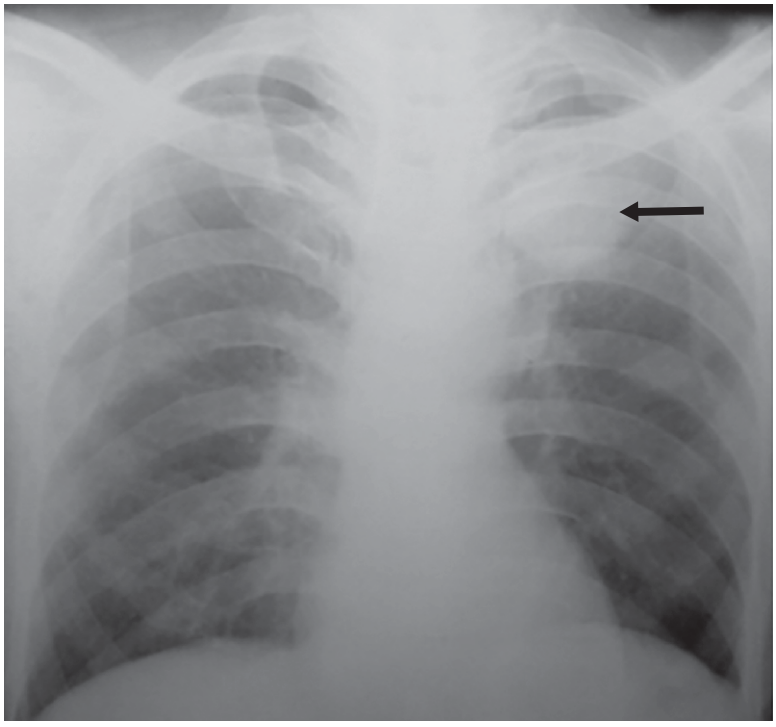
Secondaries with pleural effusion (right) from carcinoma pancreas

Mass Lesions

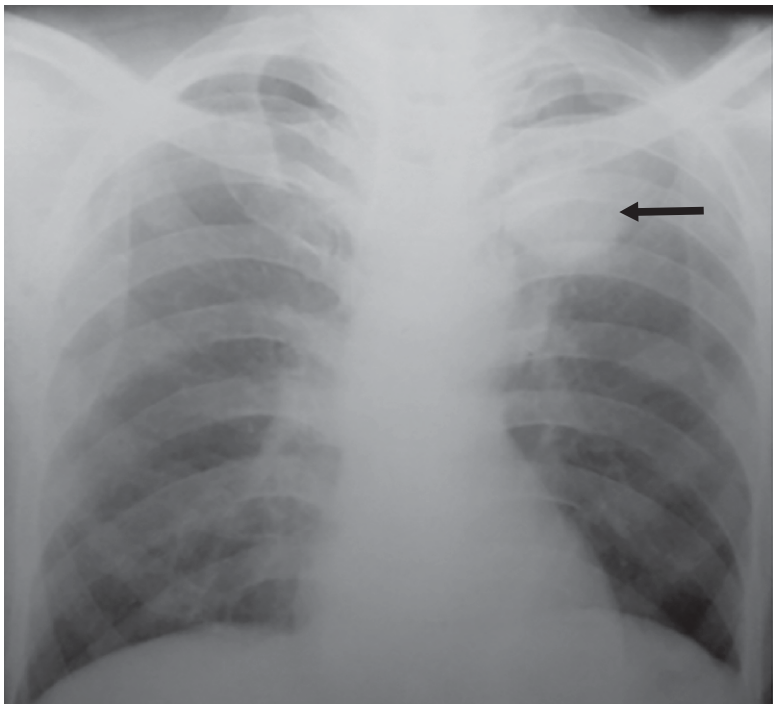
Mass: A pulmonary mass is any area of pulmonary opacification that measures more than 3 cm in diameter on radiological imaging

Mass Lesions or Rounded Opacity—*What are Causes?*

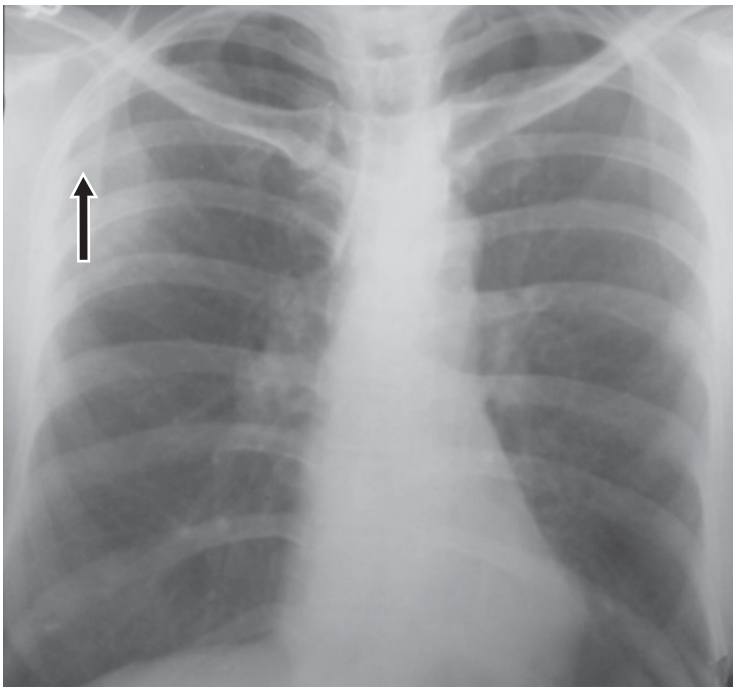
- Solitary
  - Infection
    - Bacterial: Tuberculoma, lung abscess, pneumonia
    - Fungal: Aspergilloma, histoplasmosis, coccidiomycosis
    - Parasitic: Hydatid cyst
  - Neoplasm
    - Benign: Adenoma, fibroma
    - Malignant: Primary/secondary
  - Developmental
    - Bronchogenic cyst, sequestration of lung, aneurysm
  - Others: Foreign body, pulmonary infarction, encysted effusion

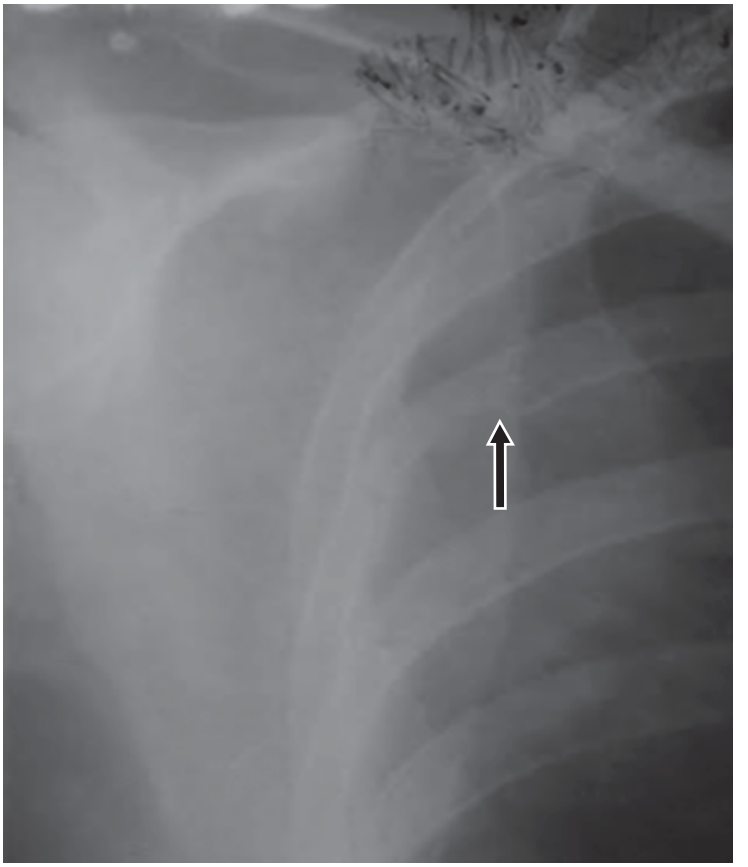


What is this?
C/O fever and cough for 3 months

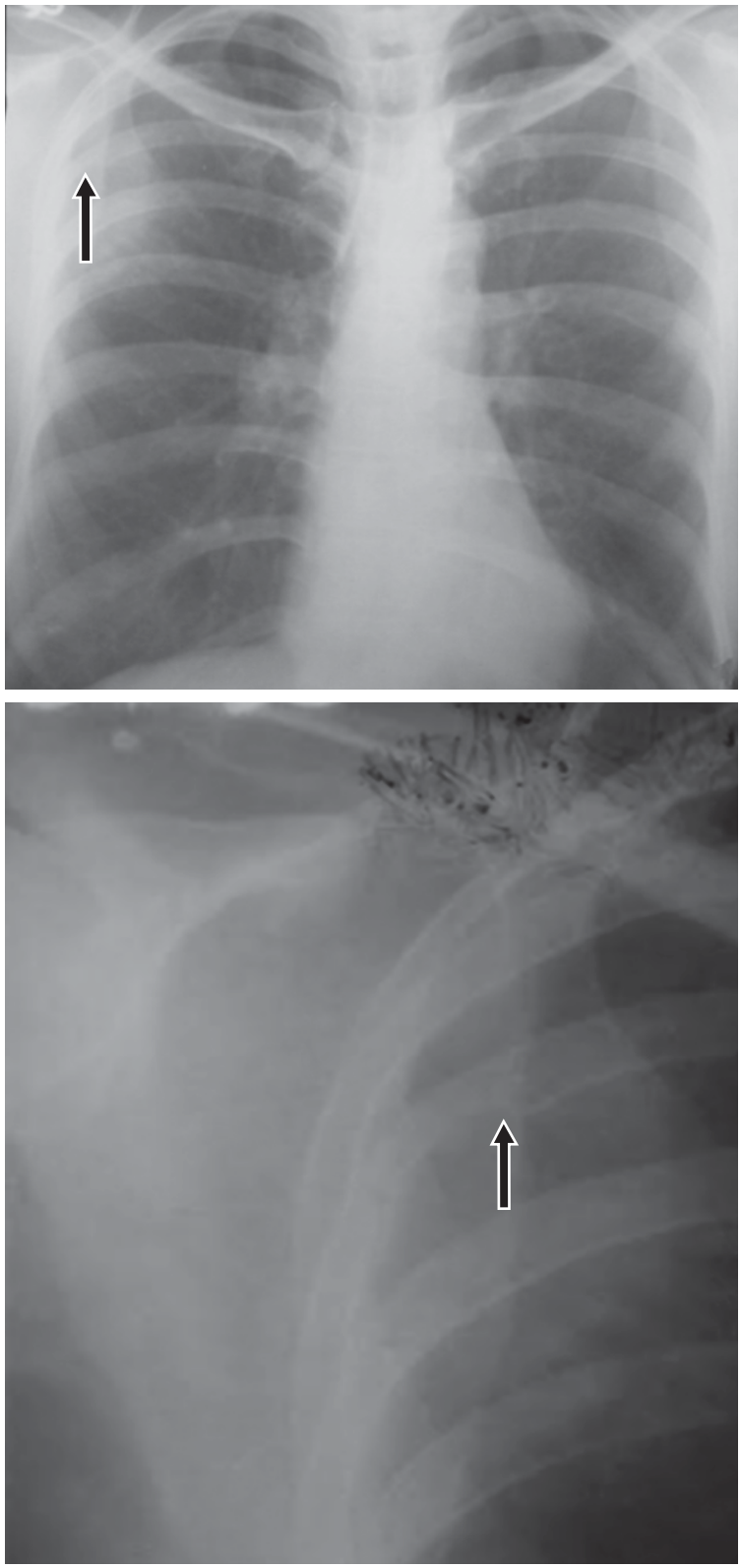


Tuberculoma left upper zone

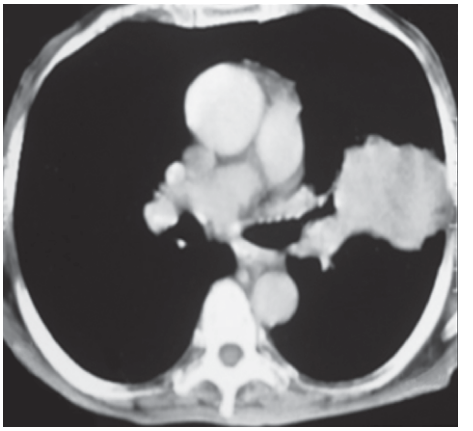




Magnified view
What is this?



Adenocarcinoma with erosion of posterior end of 4th rib



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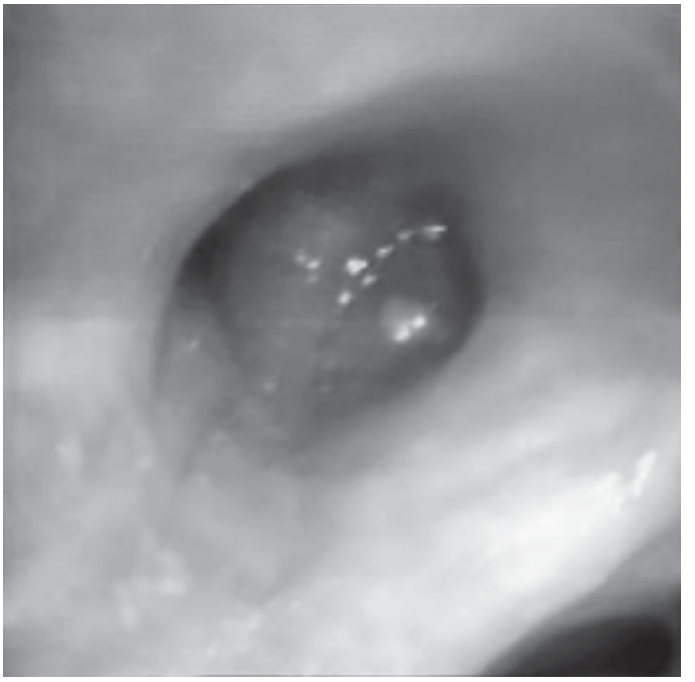
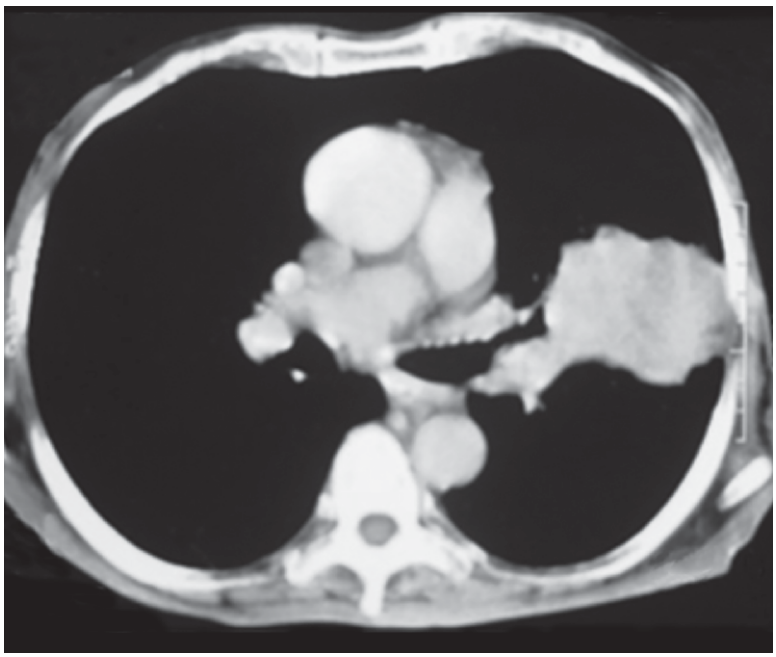
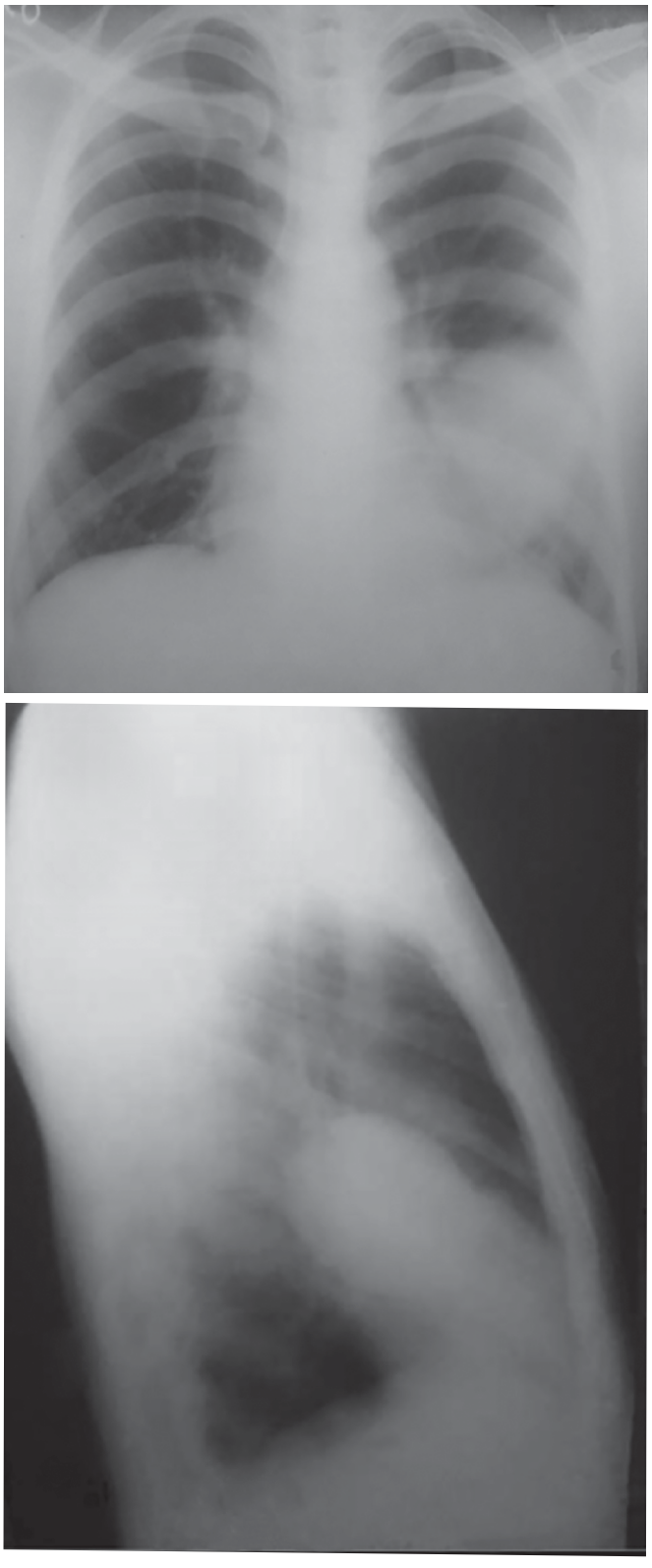


Fiberoptic bronchoscopy shows endobronchial growth
(Colour Plate I)

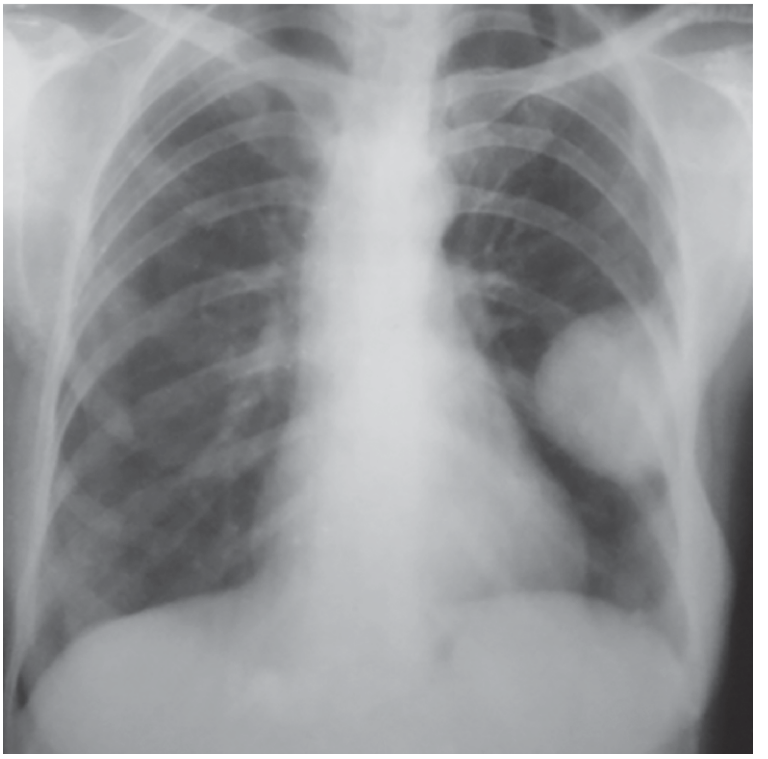


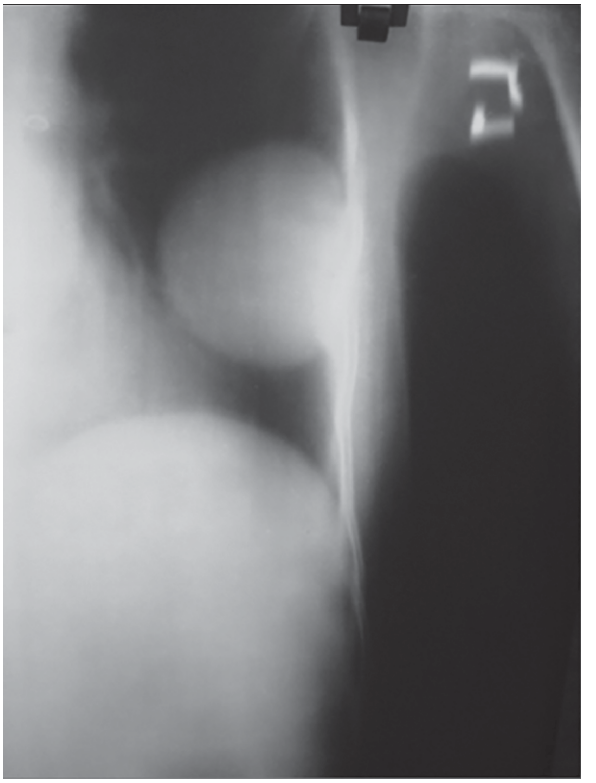
Squamous cell carcinoma

What is this?



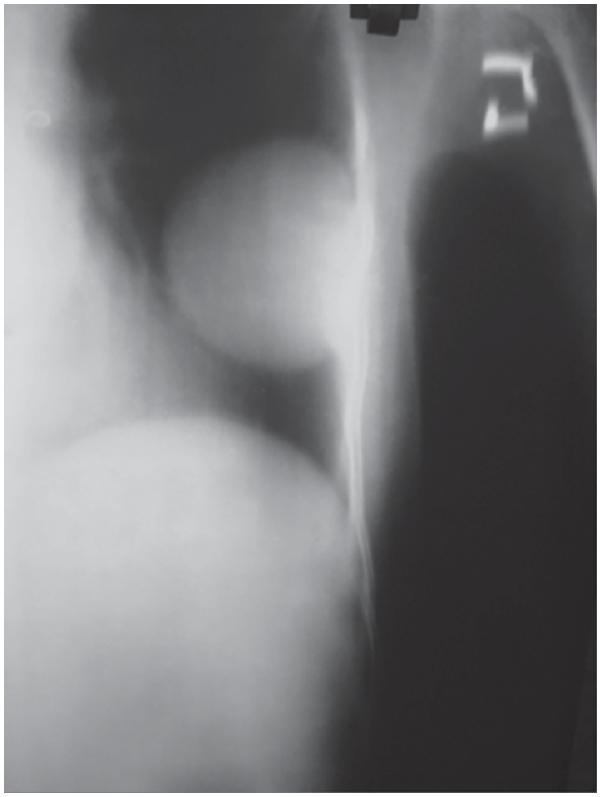
Small cell lung carcinoma



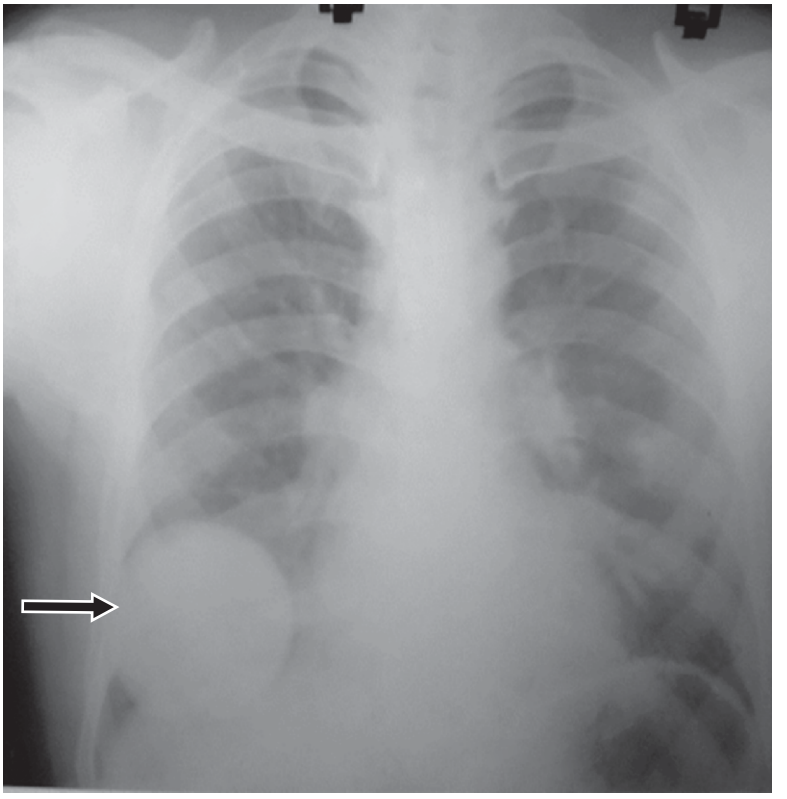


What is this?

See the rounded shadow which has very well-defined borders

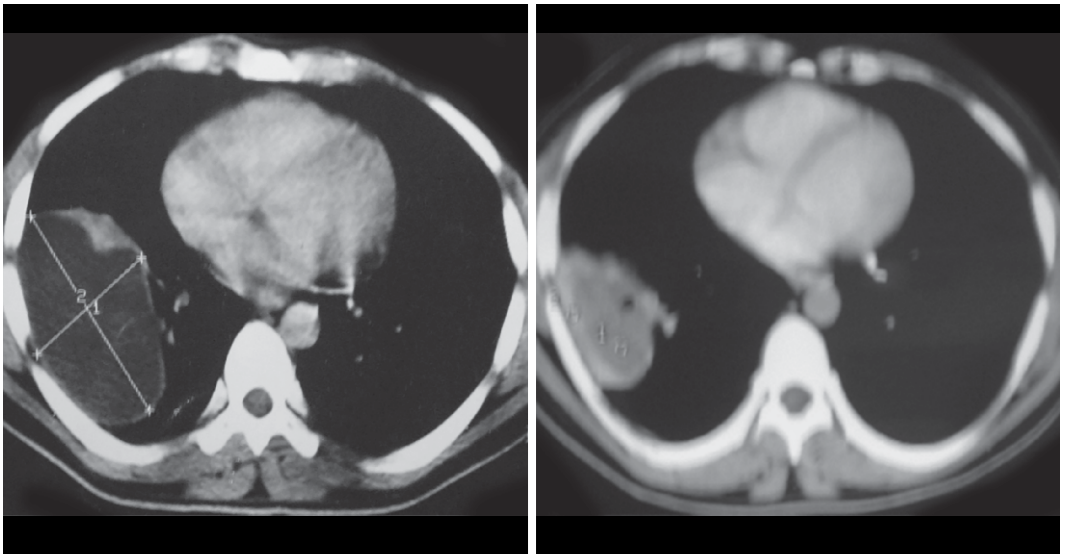


Rounded shadow with well-defined margins
hydatid cyst (left side)

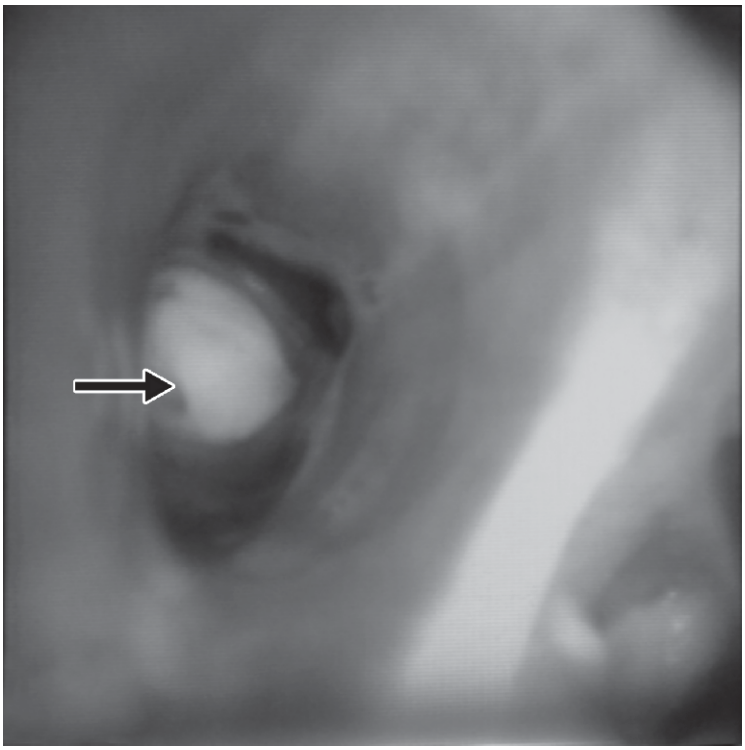


What is this?

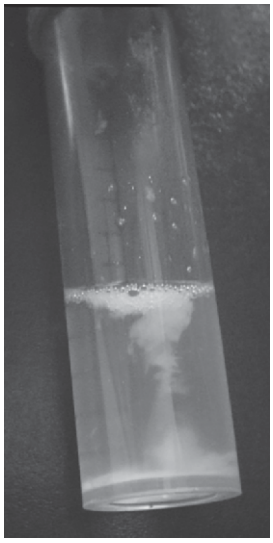
A 31-year-old male C/O hemoptysis 1 year back (50–100 ml), right-sided chest pain since 1 year, loss of appetite since 1 month, history of ATT (2 RHEZ/7RH) without any response



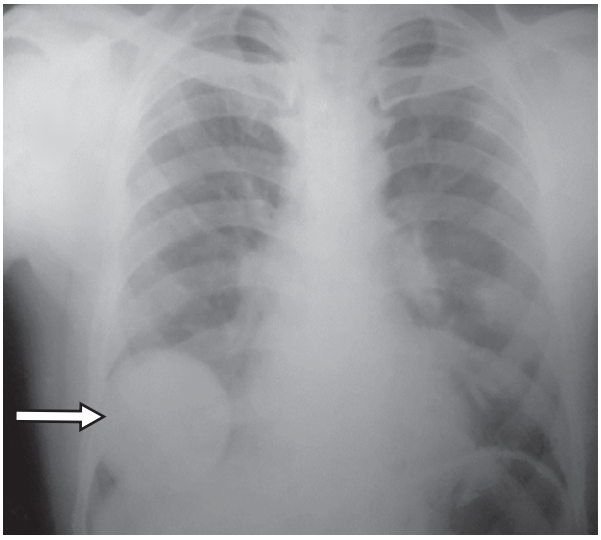
CT thorax showed cystic rounded shadow



Fiberoptic bronchoscopy showed whitish material in right lower lobe bronchus (Colour Plate I)

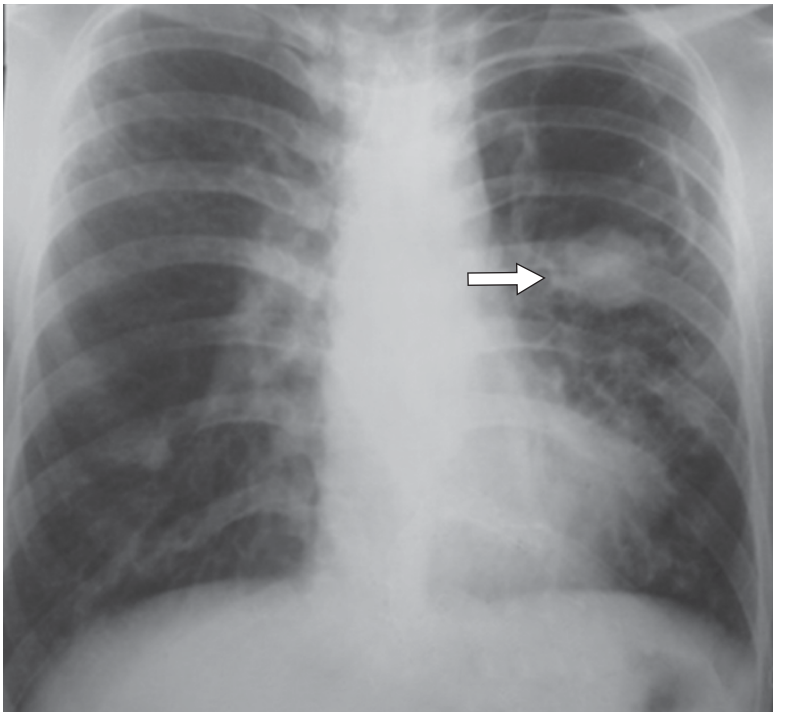


Bronchial aspirate shows membranous structure



Hydatid cyst which ruptured later on

Right lower lobe lobectomy was done and histopathology revealed hydatid cyst lung with associated pneumonitis



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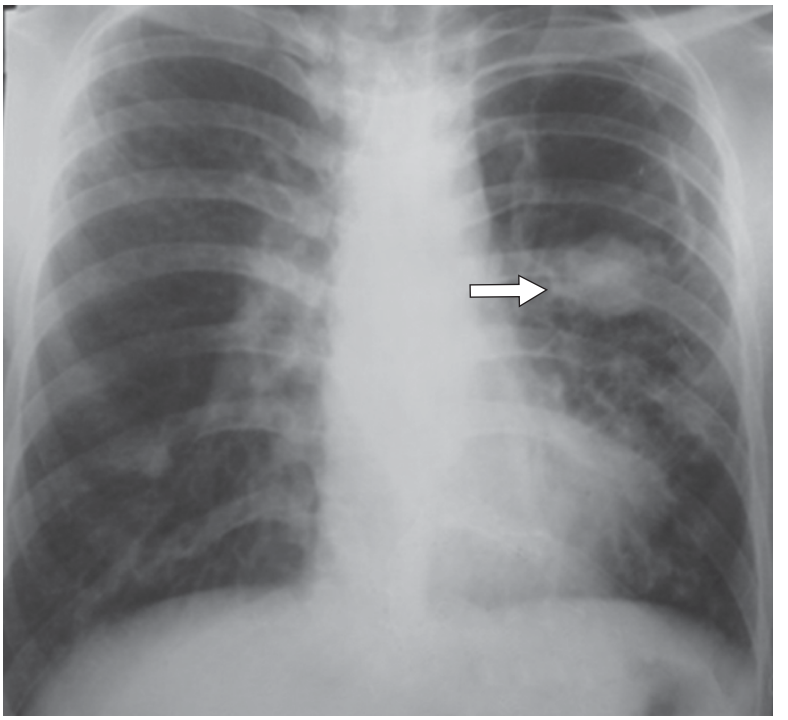
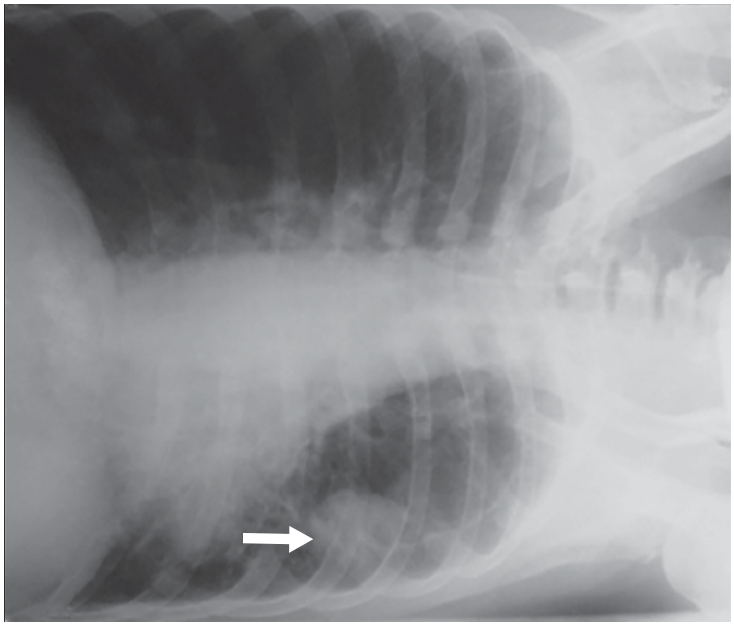
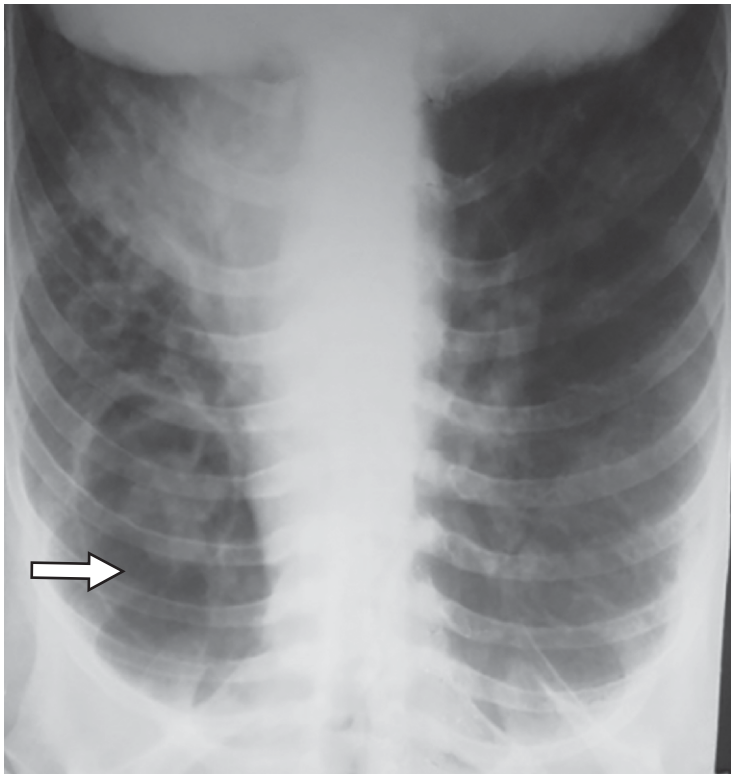


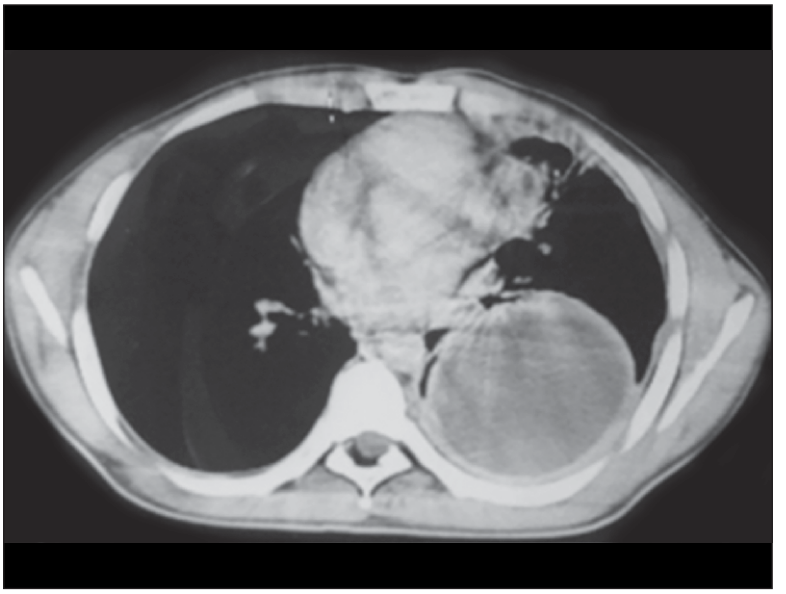
PA view



Left lateral decubitus view



X-ray in Trendelenburg position
Moving Aspergilloma
Please note that ball-like shadow has moved in different views. It is a rare condition



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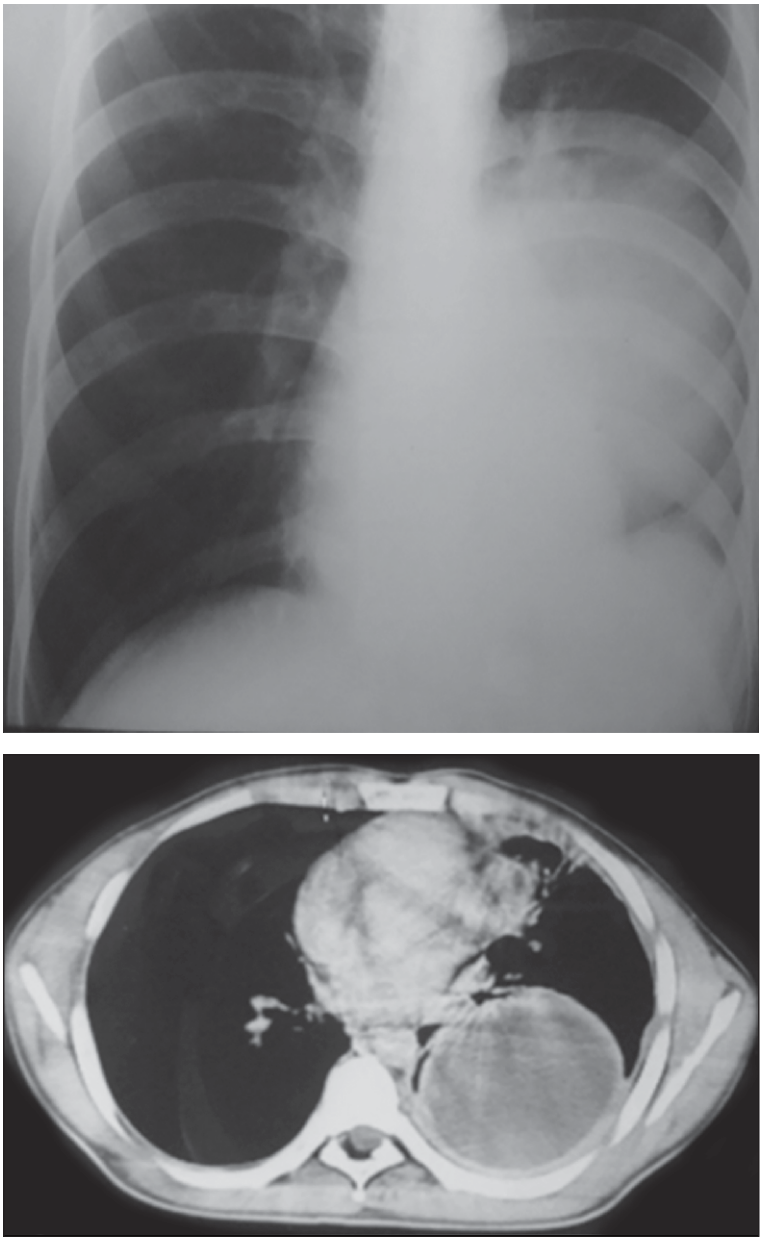
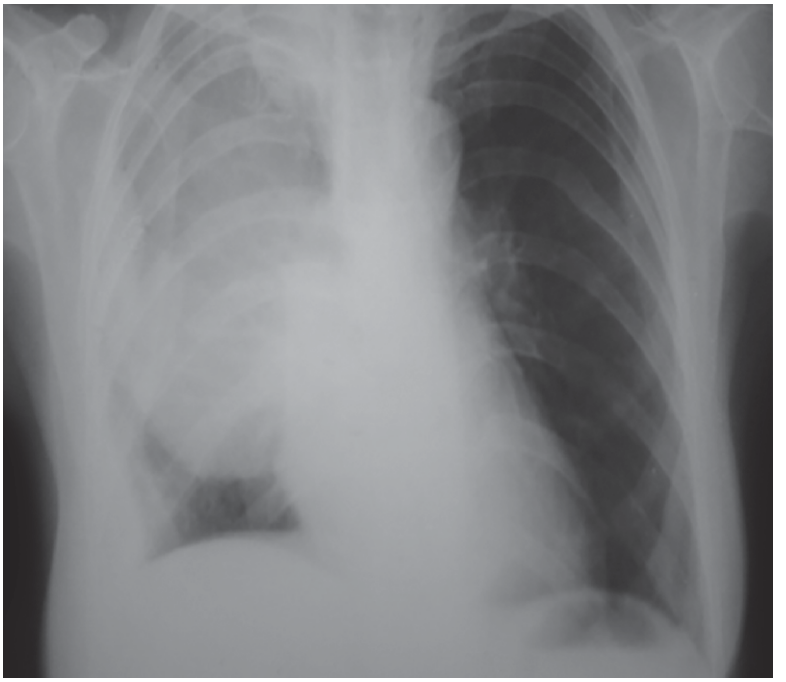


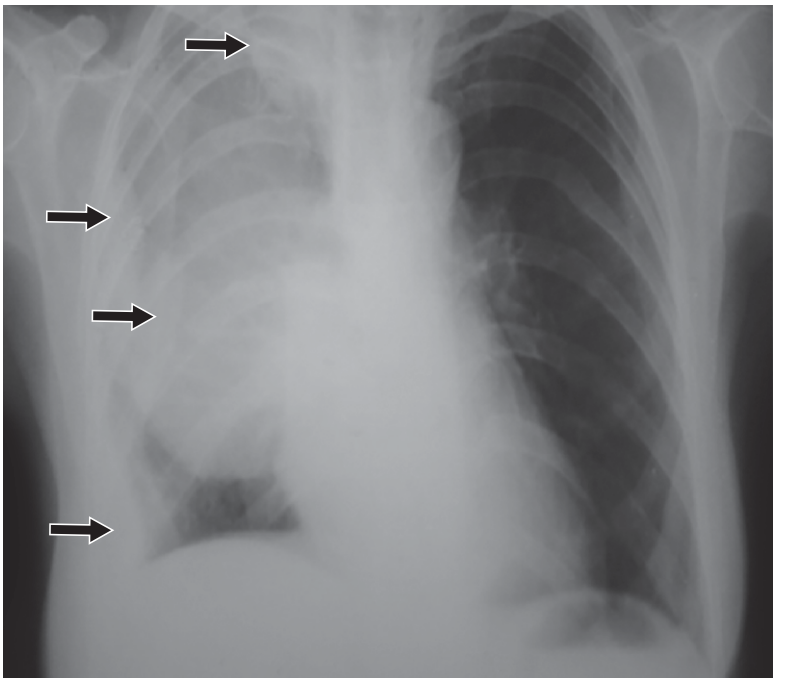
Encysted effusion (left)

Multiple Rounded Opacity—*What are Causes?*

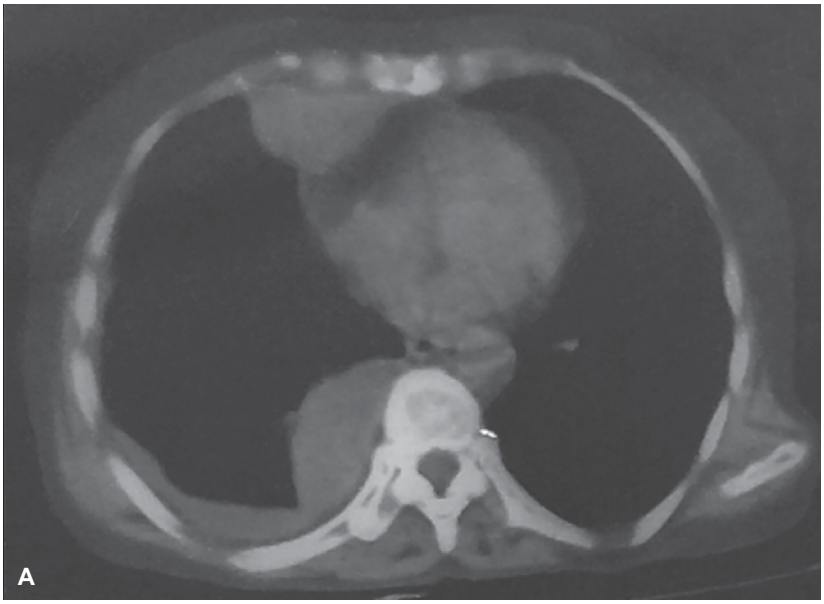
- Secondaries
- Multiple abscess
- Multiple encysted effusion
- Multiple hydatid cyst
- Multiple infarctions
- Rheumatoid arthritis
- Pneumoconiosis

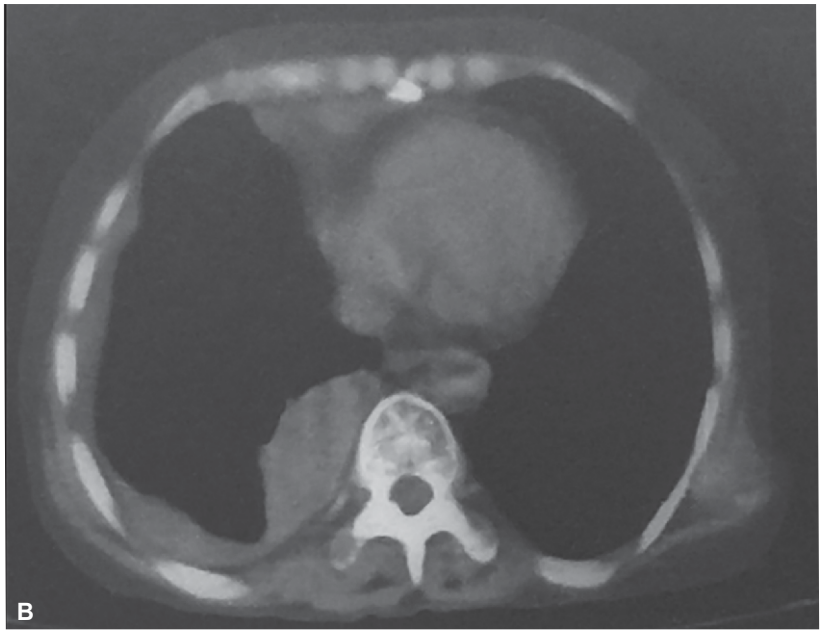


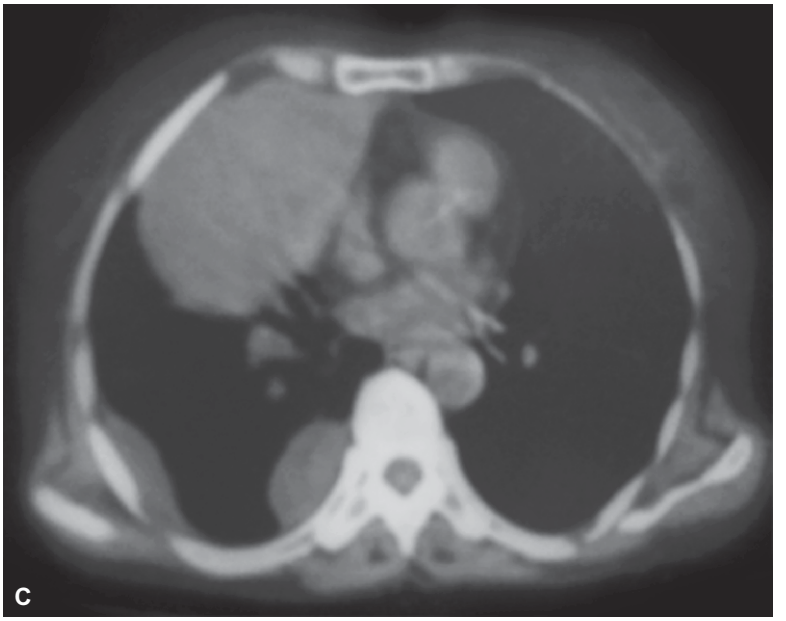
What is this?



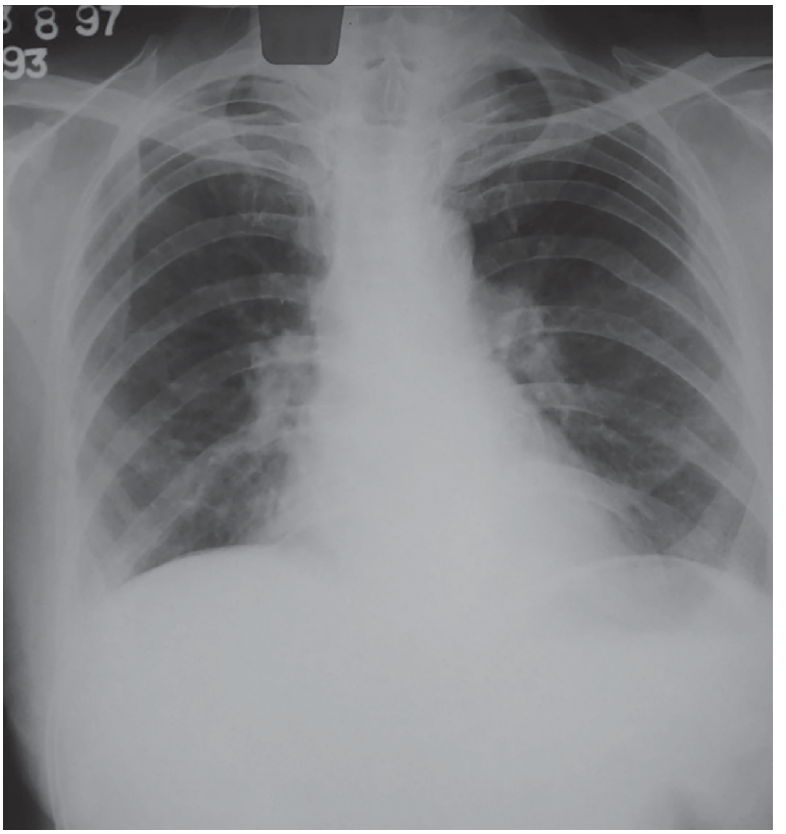
Multiple encysted effusion (left)


A


B



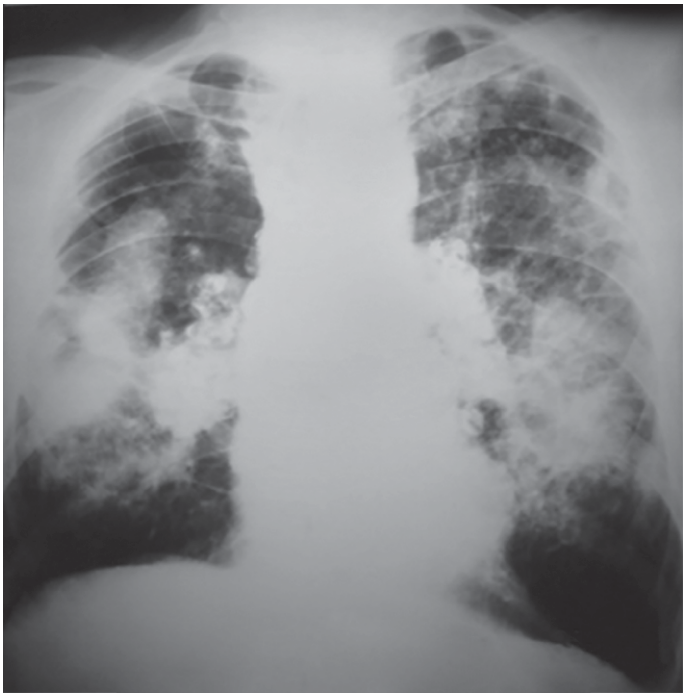
A, B and C: Multiple encysted effusion



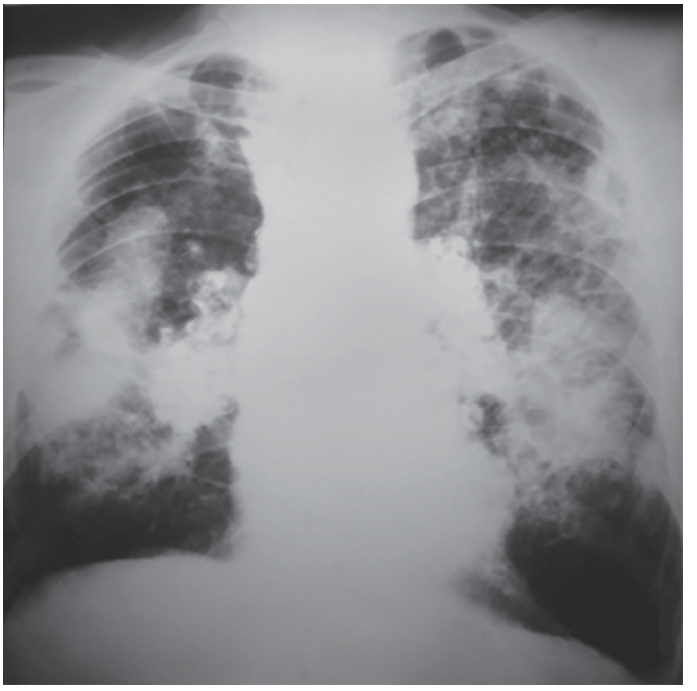
All shadows disappeared after pleural aspiration
and antitubercular treatment

What is this?

Multiple rounded shadows
secondaries from carcinoma thyroid



What is this?
C/O breathlessness with significant exposure to coal dust



Multiple masses
pneumoconiosis with progressive massive fibrosis

Calcified Lesions

Calcified Lesions—*What are Sources?*

- Endogenous
  - Intrapulmonary
  - Extrapulmonary
- Exogenous

Intrapulmonary Calcification—*What are Sources?*

- Parenchymal calcification
- Pleural calcification
- Vascular calcification
- Lymph nodes calcification
- Mediastinal calcification

Parenchymal

- Granulomatous
  - Tuberculosis
  - Actinomycosis
  - Coccidiomycosis
  - Histoplasmosis
  - Hydatid cyst
  - Chickenpox
- Abscess
- Neoplasm
  - Benign: Hamartoma
  - Malignant
    - Primary: Bronchogenic carcinoma
    - Secondary: Osteogenic sarcoma, chondrosarcoma, thyroid, breast, ovary, GIT
- Others
  - Infarction
  - Broncholith
  - Cavernolith
  - Sarcoidosis
  - Hemosiderosis
  - Silicosis
  - Alveolar microlithiasis
  - Metabolic disorder

Pleural Calcification

- Tuberculosis
- Empyema
- Haemothorax
- Asbestosis
- Talcosis

Vascular Calcification

- Hypertension
- Aneurysm
- Thrombus

Lymph Node Calcification

- Tuberculosis
- Histoplasmosis
- Sarcoidosis
- Silicosis

Mediastinal Calcification

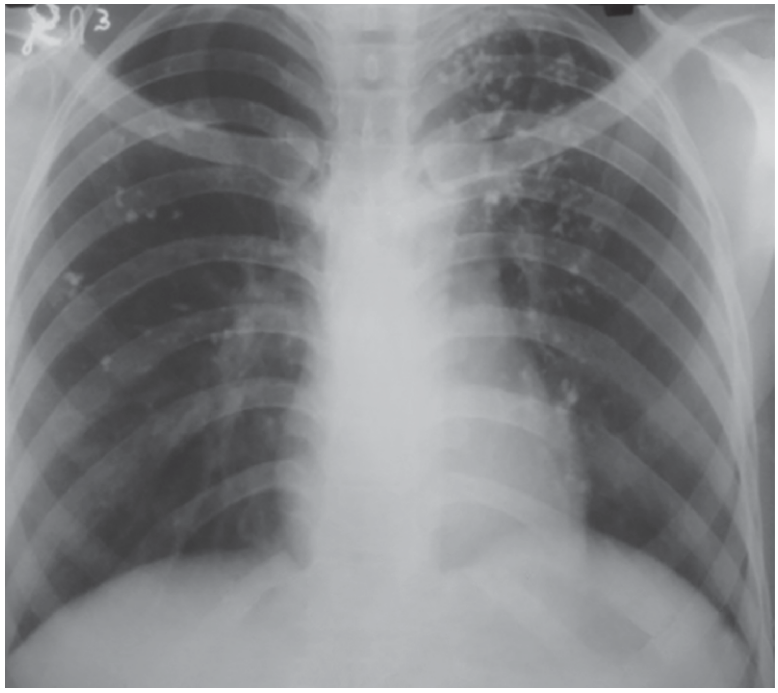
- Thyroid
- Thymus
- Dermoid
- Cardiac

Extrapulmonary Calcification

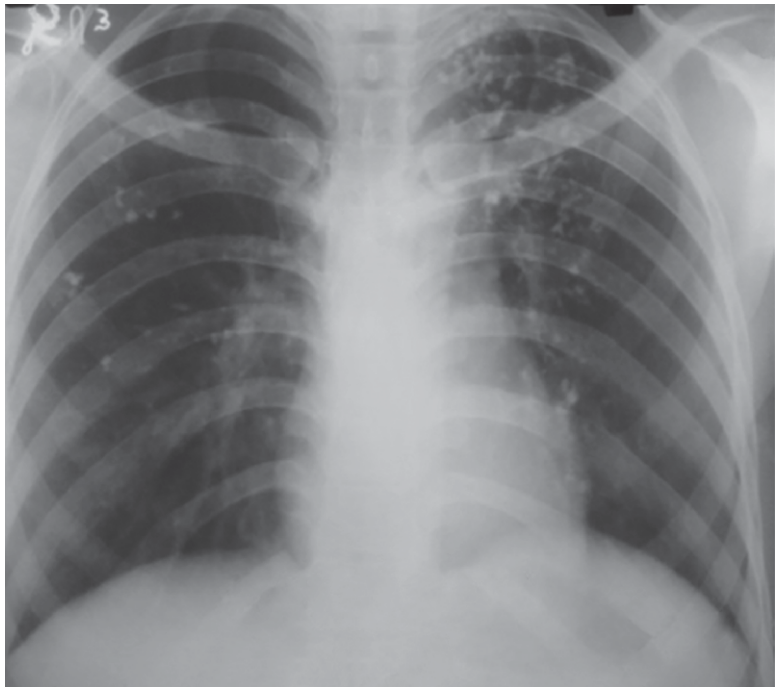
- Calcified rib
- Calcified costal cartilage
- Callous around fractured rib
- Calcified axillary and cervical lymph node
- Breast tumour calcification
- Fat necrosis
- Parasitic calcification

Exogenous Calcification

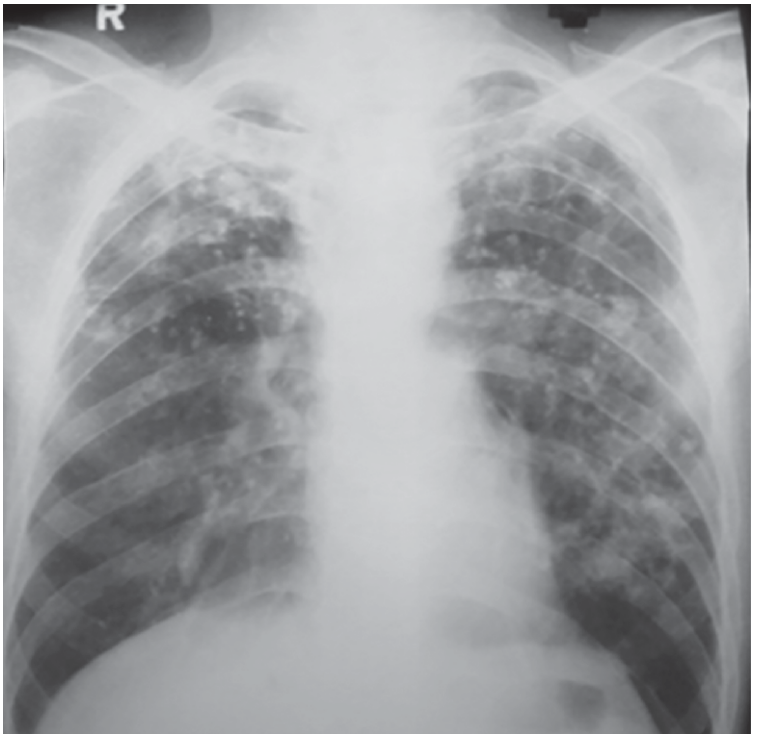
- Inhaled foreign body: Pin, metal piece
- Inhaled radiopaque dust: Iron, barium, tin, calcium
- Iodized oil
- Traumatic foreign body



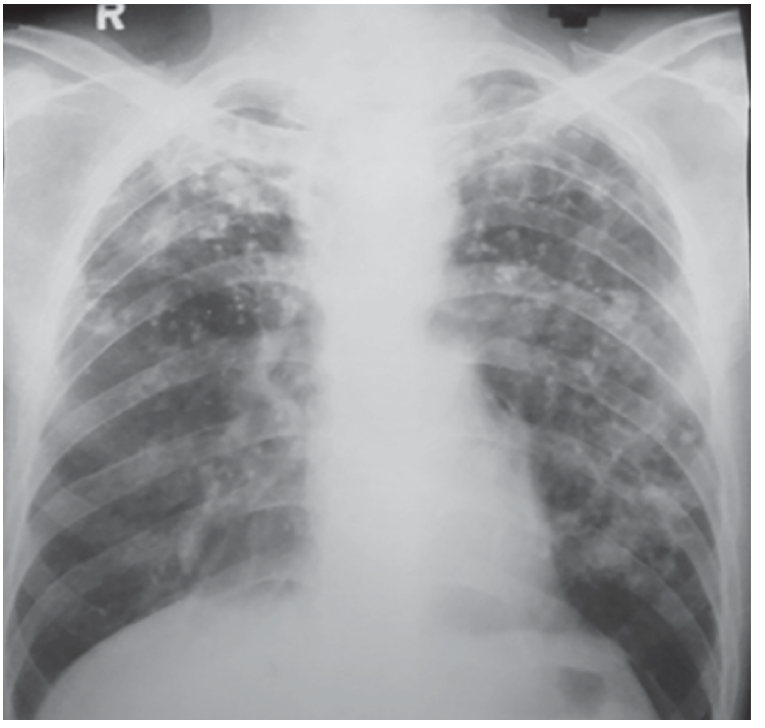
What is this?
C/O massive hemoptysis with history of adequate antitubercular treatment in the past



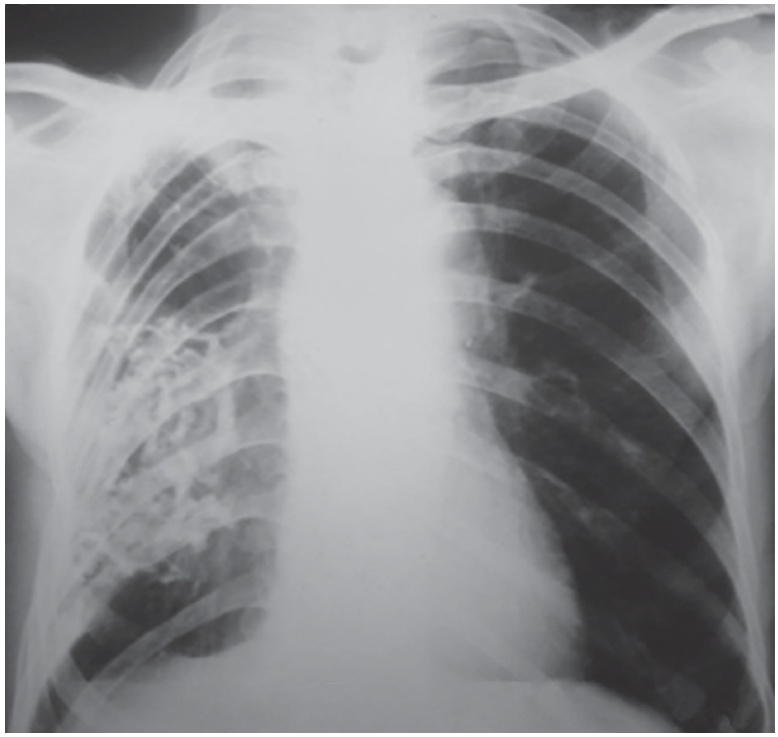
Intrapulmonary calcified shadows (healed pulmonary TB)
Do not forget to ask history of antitubercular treatment in the past



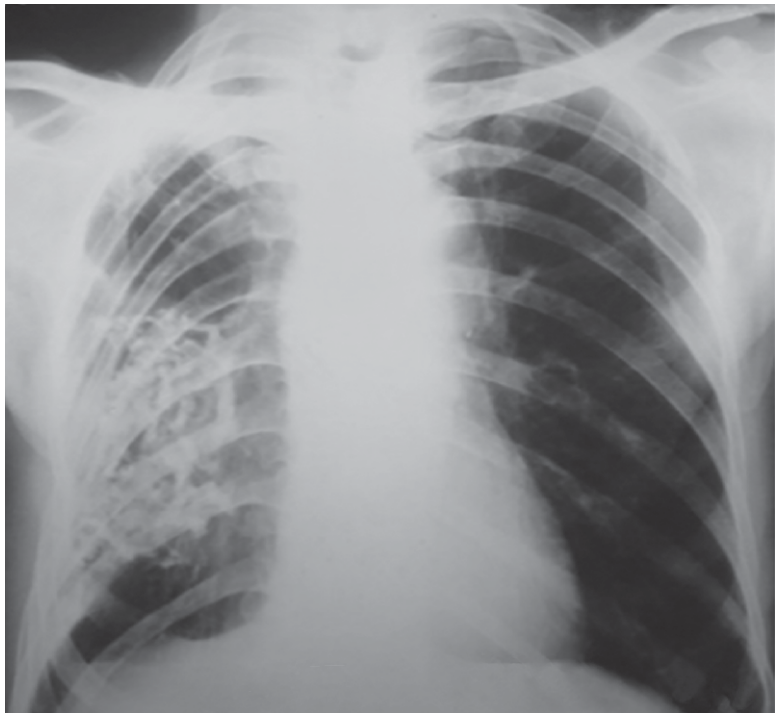
What is this?



Intrapulmonary calcification (healed pulmonary TB)
Do not forget to ask history of antitubercular treatment in the past



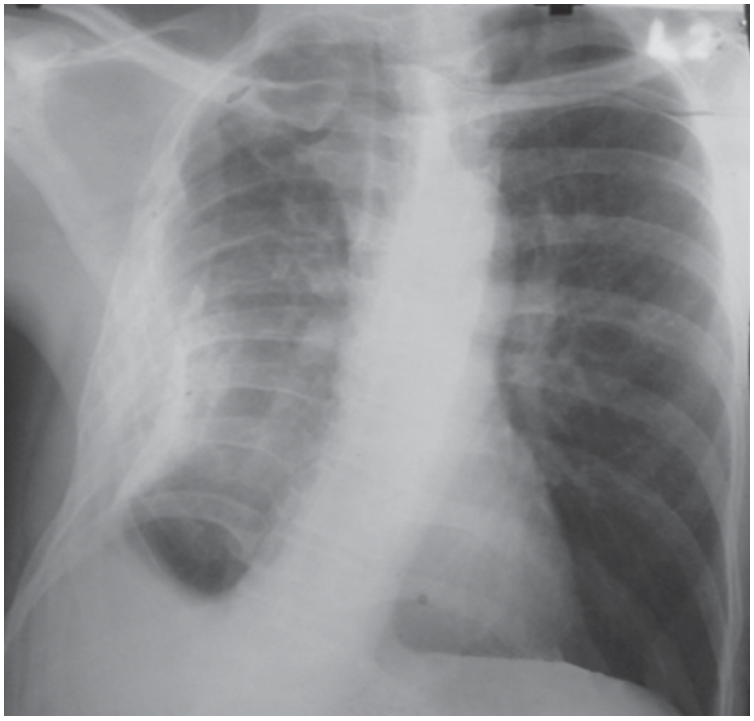
What is this?



Pleural calcification (right side)
Do not forget to ask history of empyema in the past

What is this?

Pleural calcification
Do not forget to ask history of empyema and intercostal tube drainage (ICD) in the past



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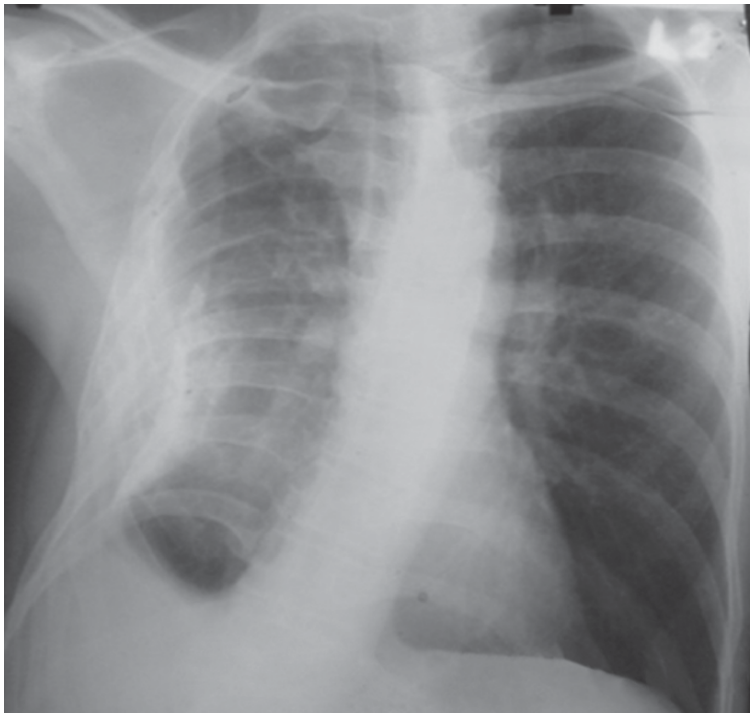
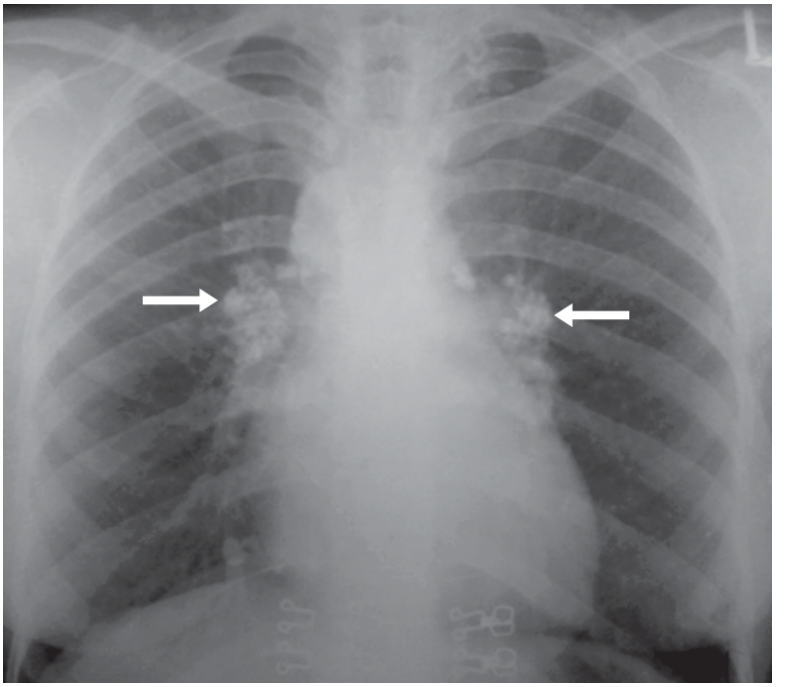
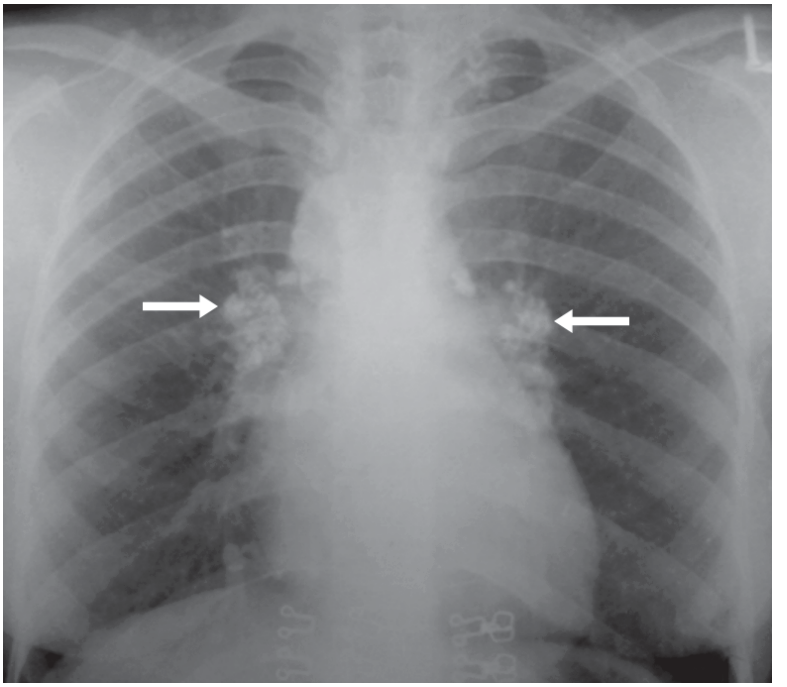


Pleural calcification

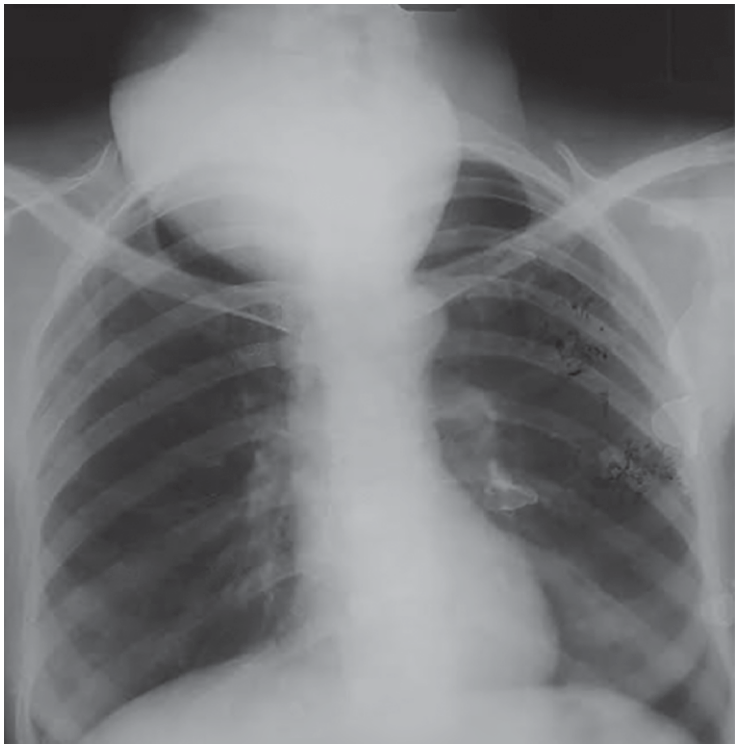
Do not forget to ask history of pleural aspiration in the past



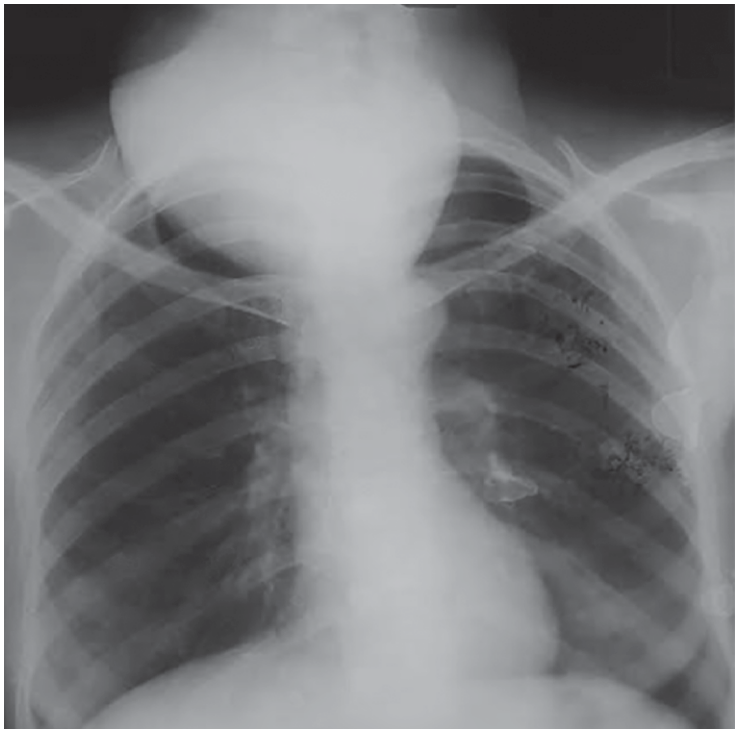
What is this?



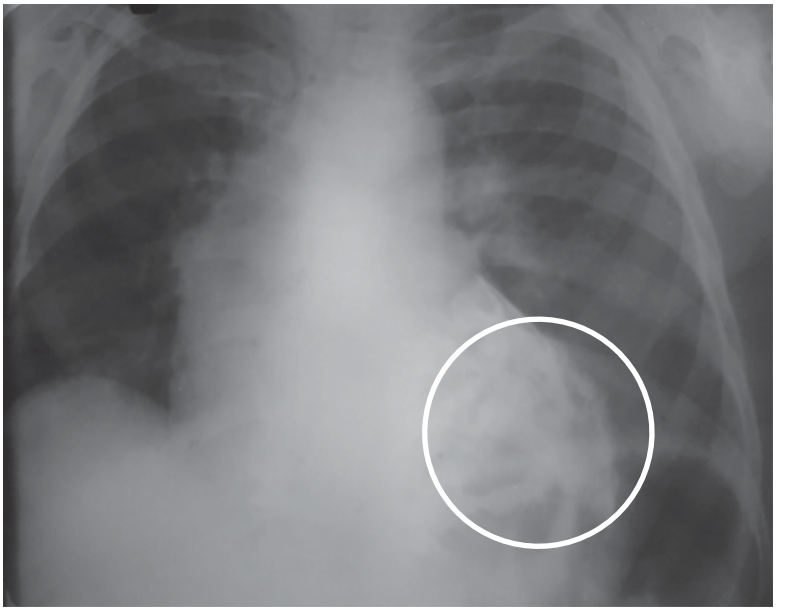
Calcified hilar glands (bilateral)

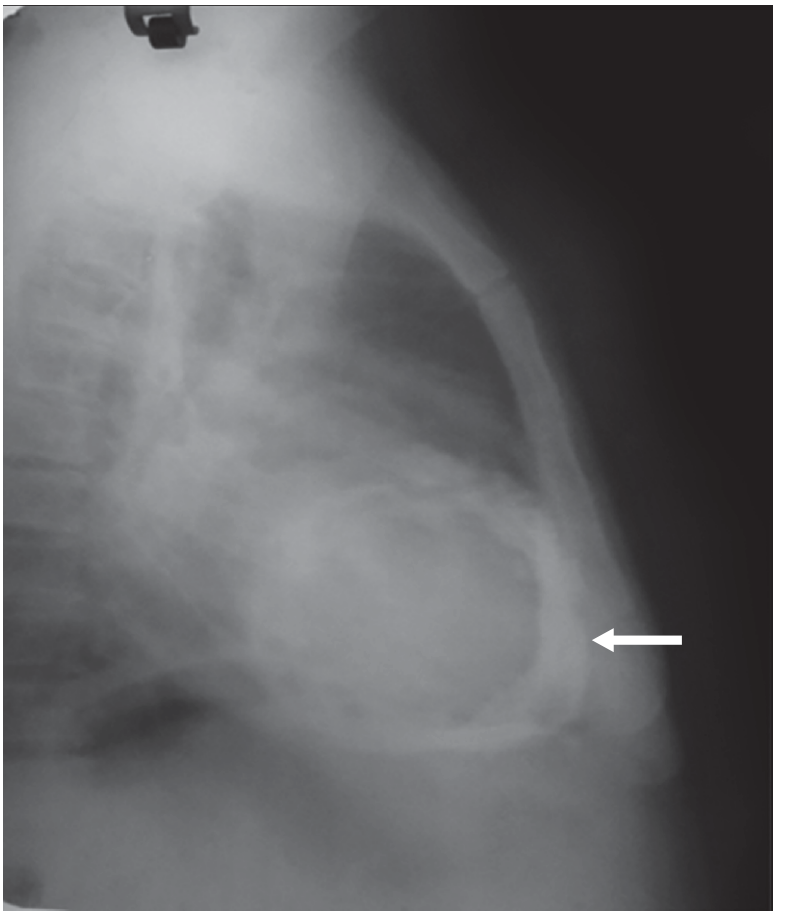


What is this?

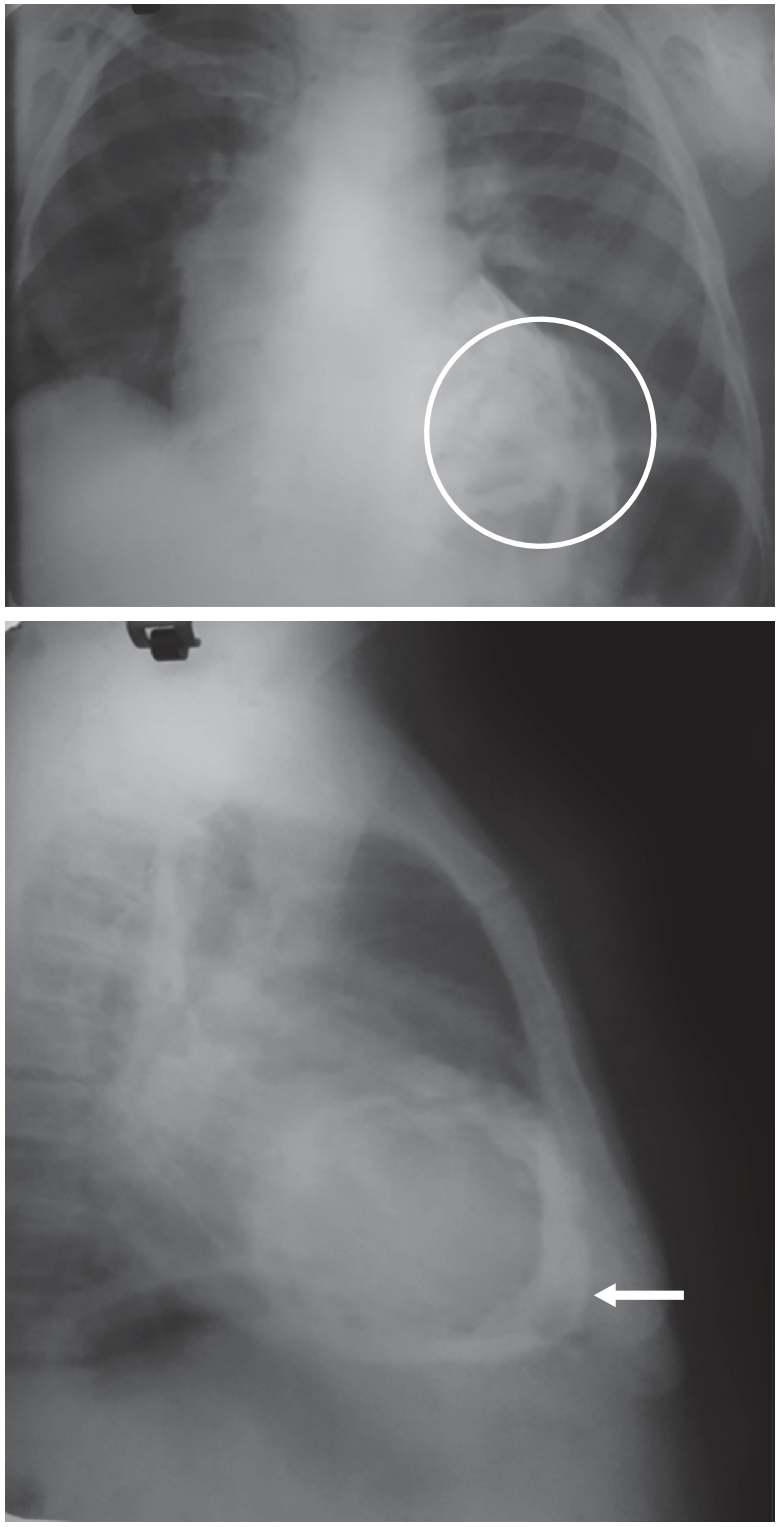


Thyroid calcification



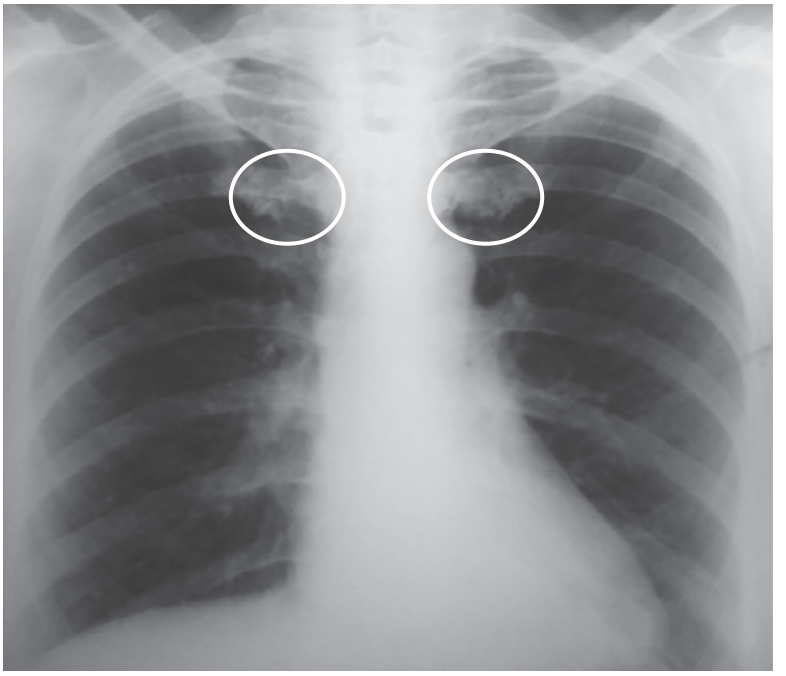


What is this?

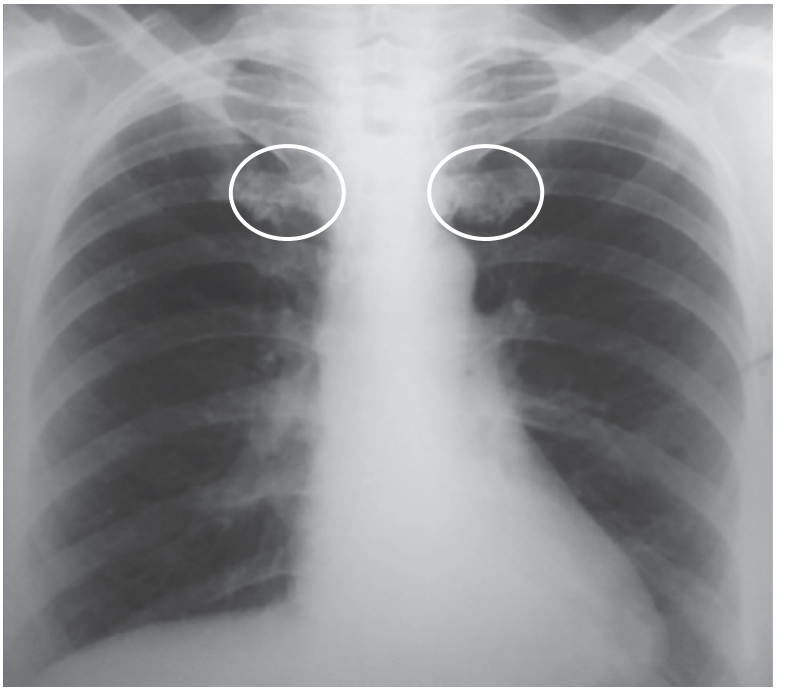


Pericardial calcification

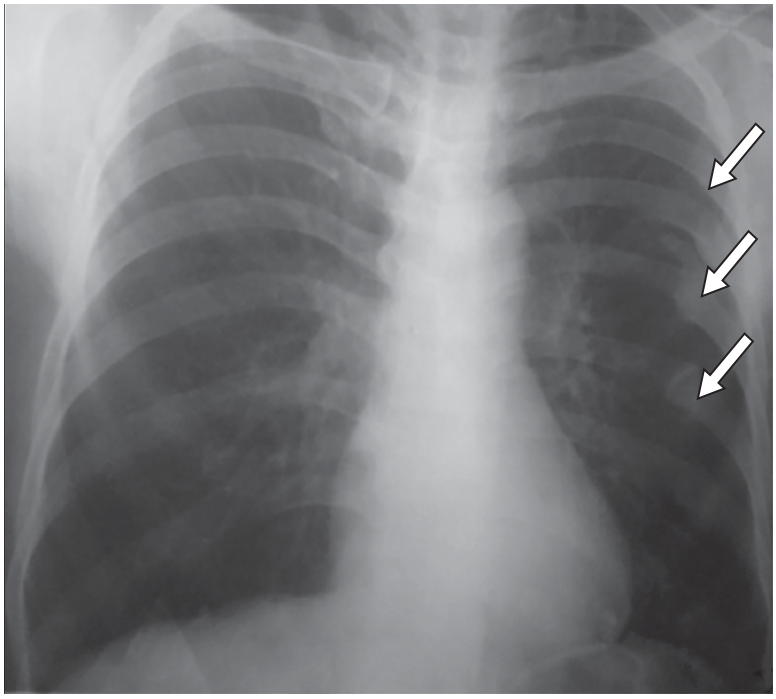
Do not forget to ask history of pericardial effusion and pericardial fluid aspiration. It is a rare condition



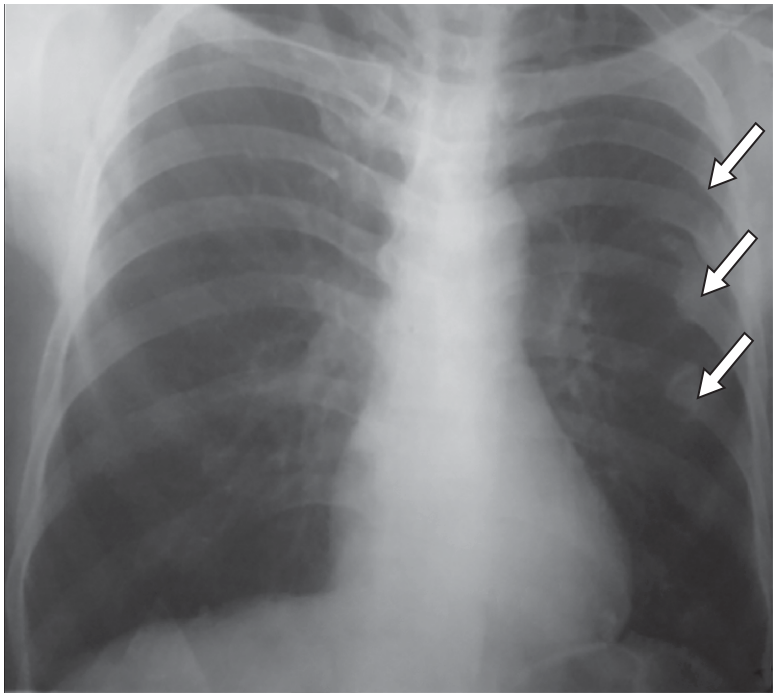
What is this?



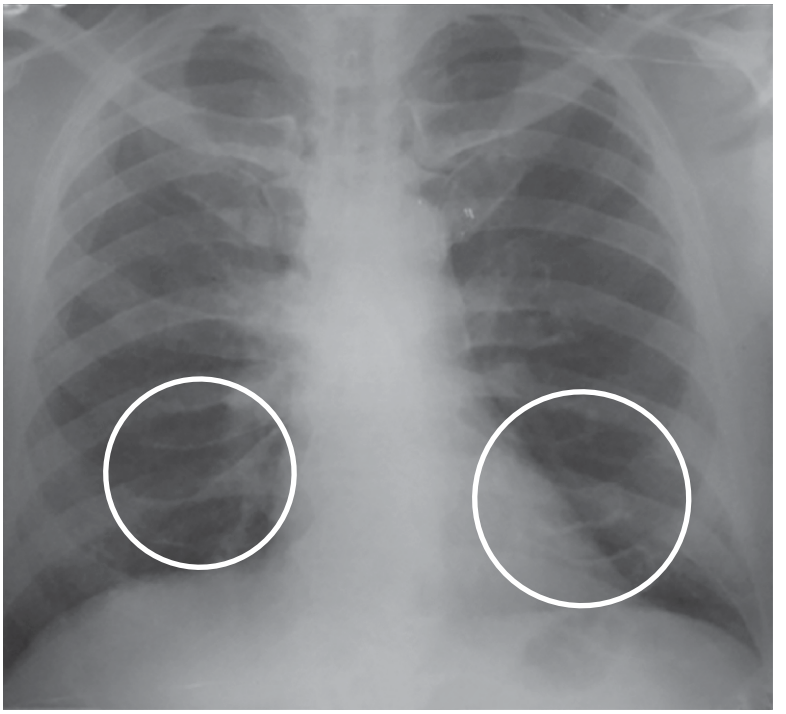
Calcified first costal cartilage



What are these shadows?



Old multiple fractured ribs with callus formation
Do not forget to ask history of chest trauma in the past



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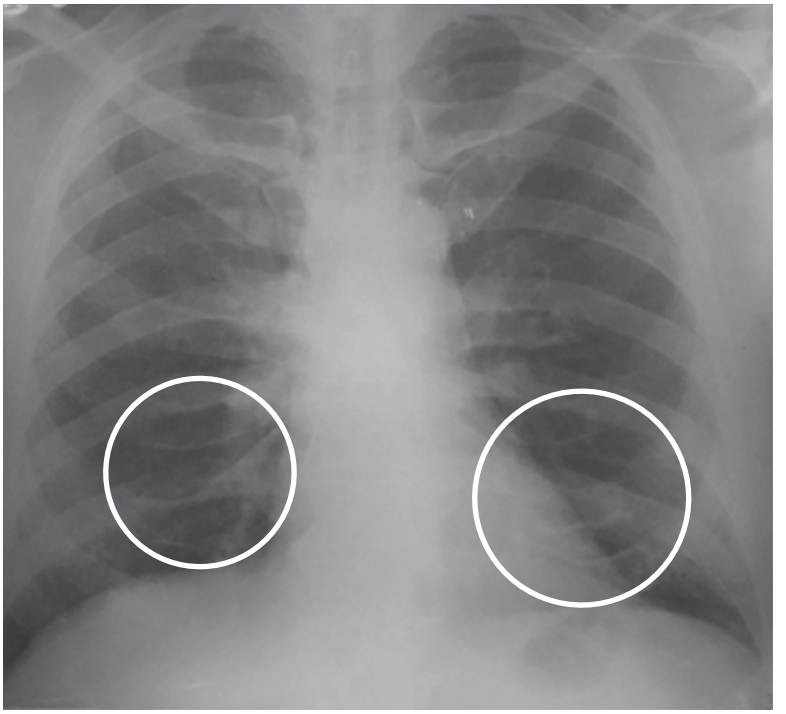
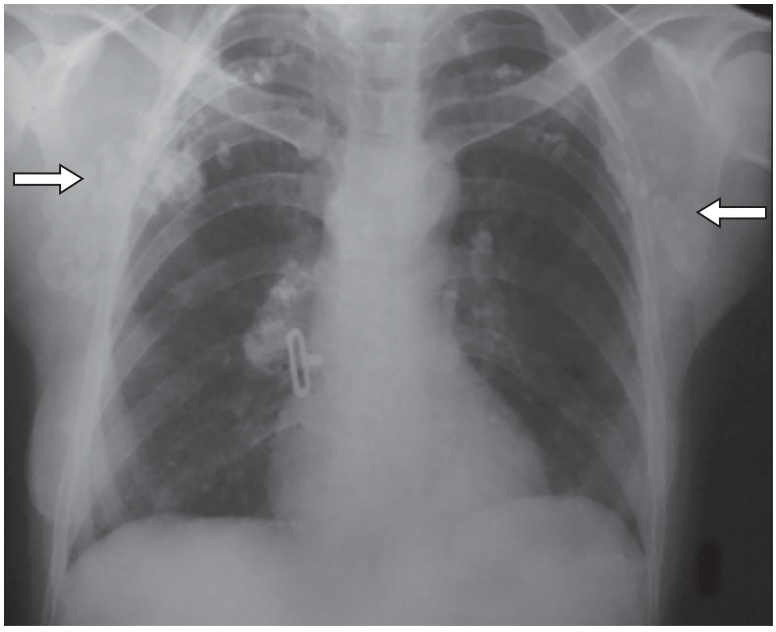
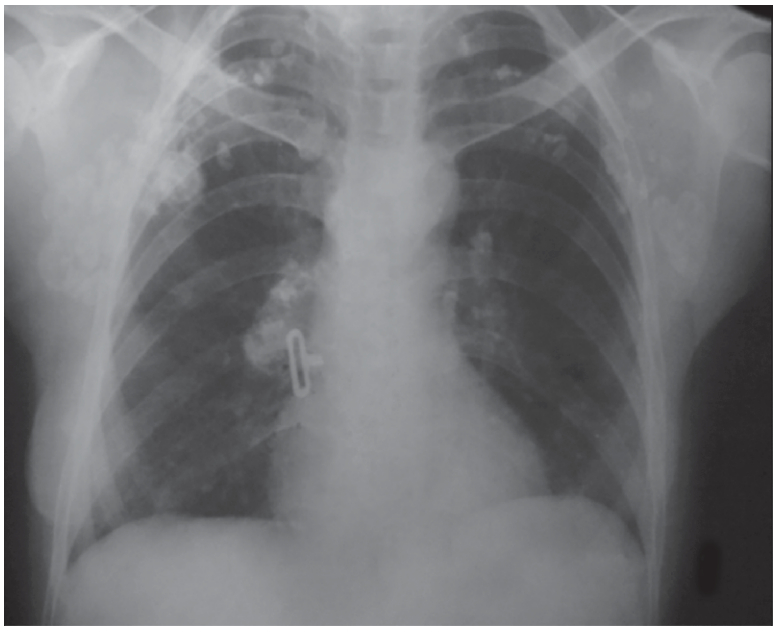


Costal cartilage calcification



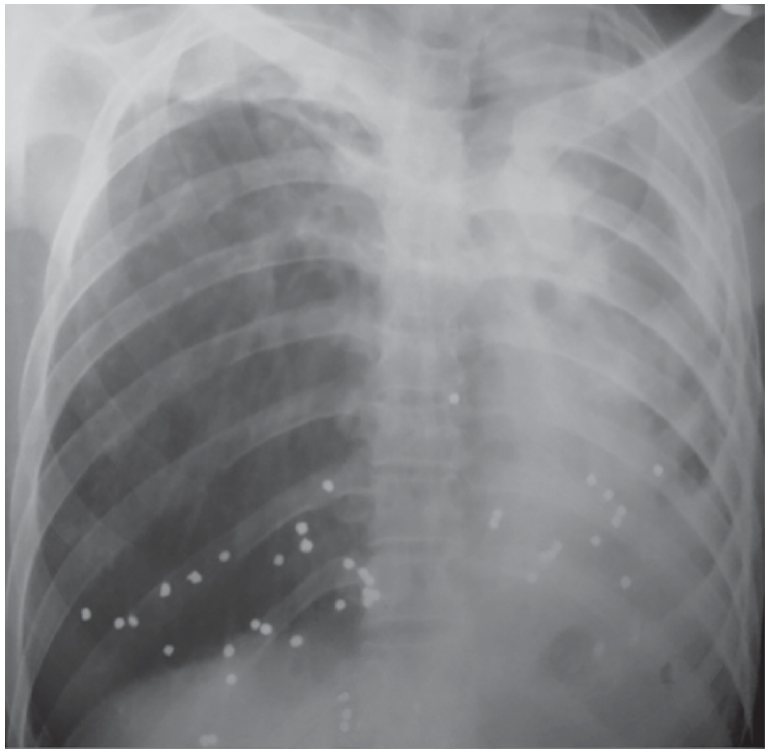
What are these shadows?



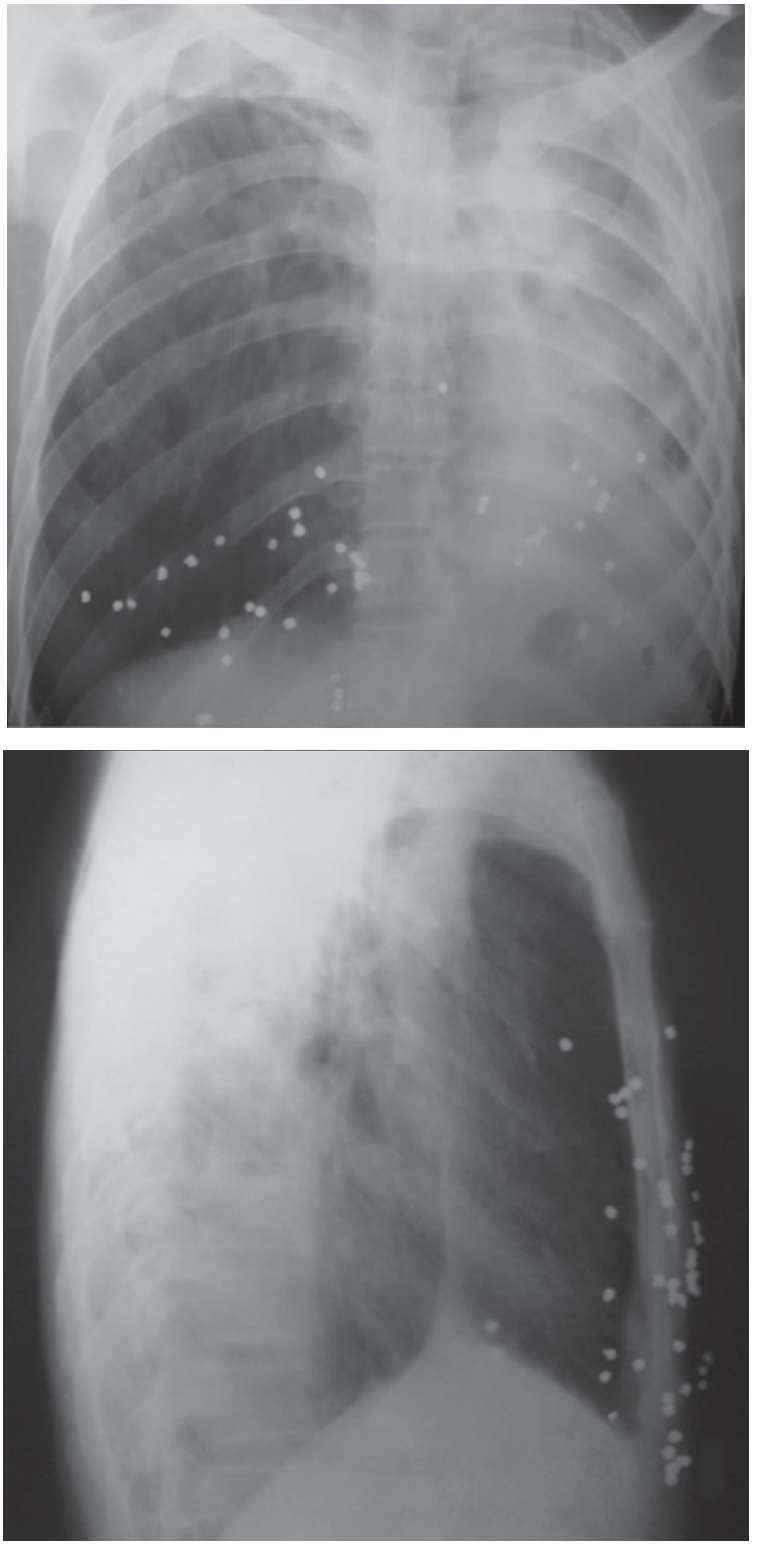
Calcified glands in soft tissue

What are these shadows?

Calcified worms (cysticercosis)

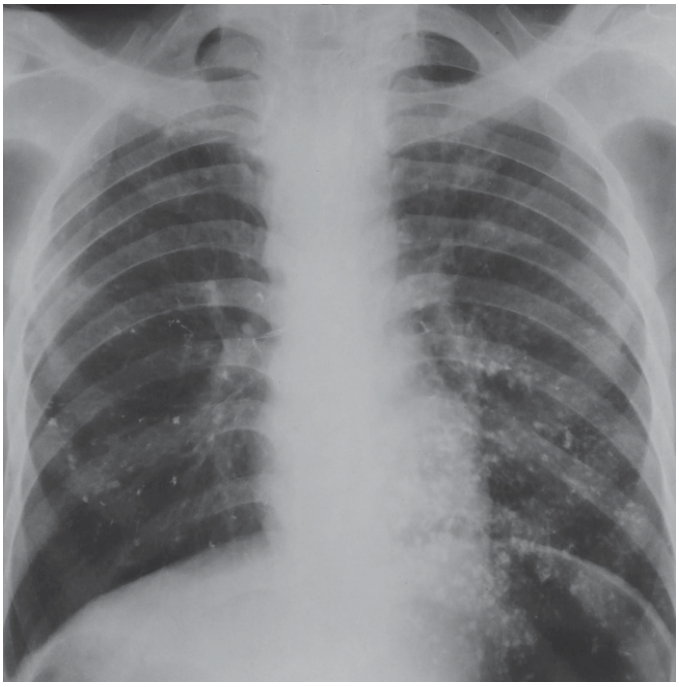


What are these shadows?

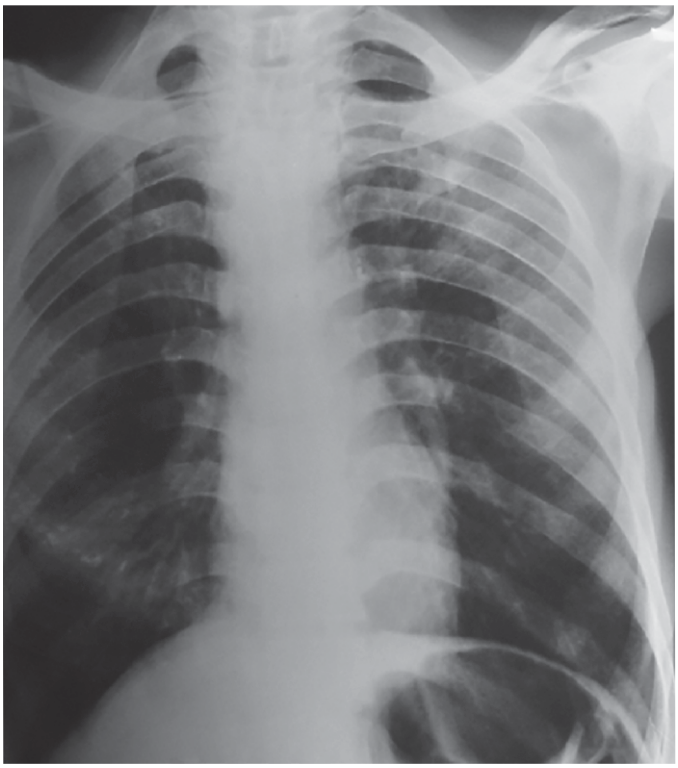


Pellets

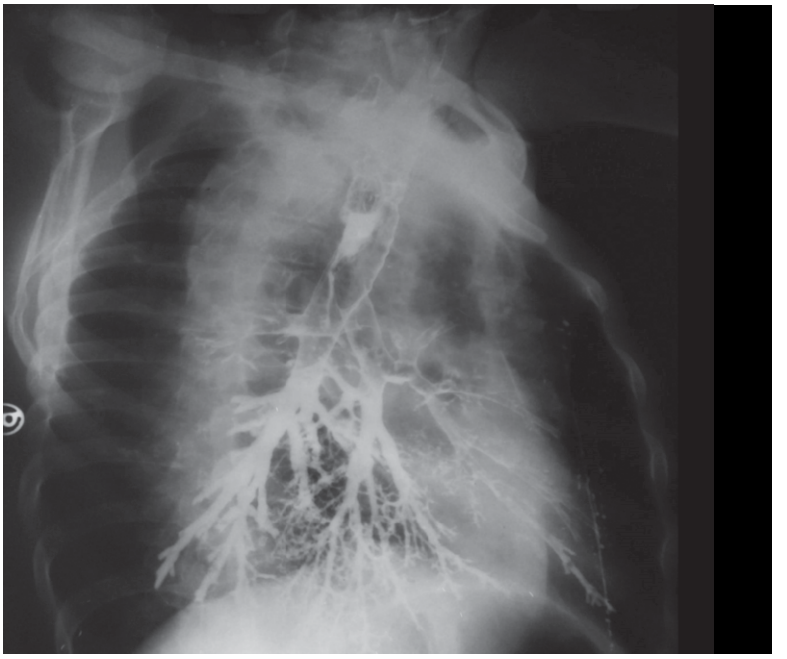
Do not forget to ask history of firearm injury in the past



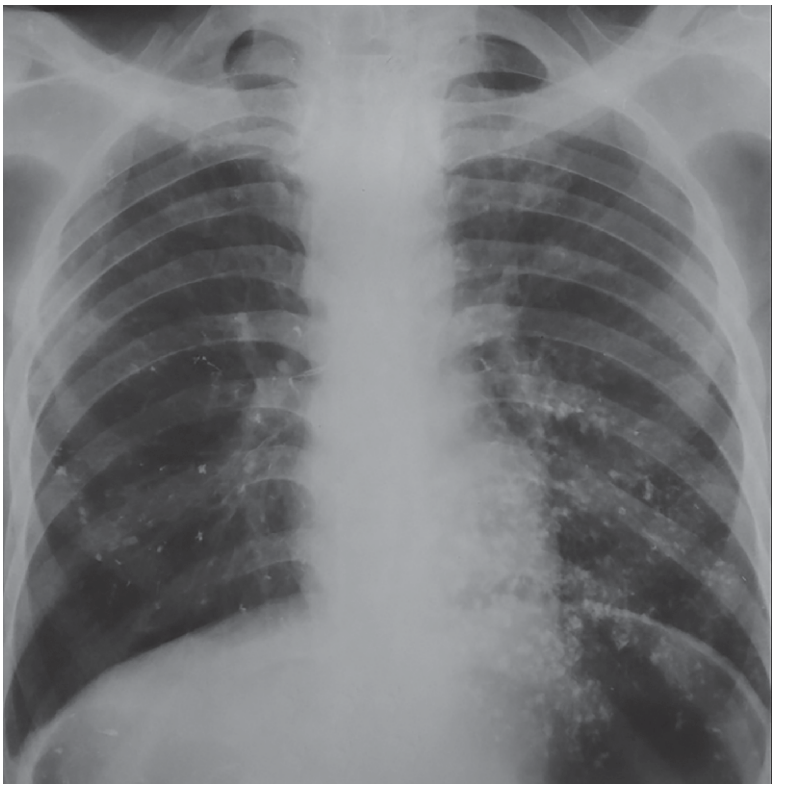
What are these shadows?



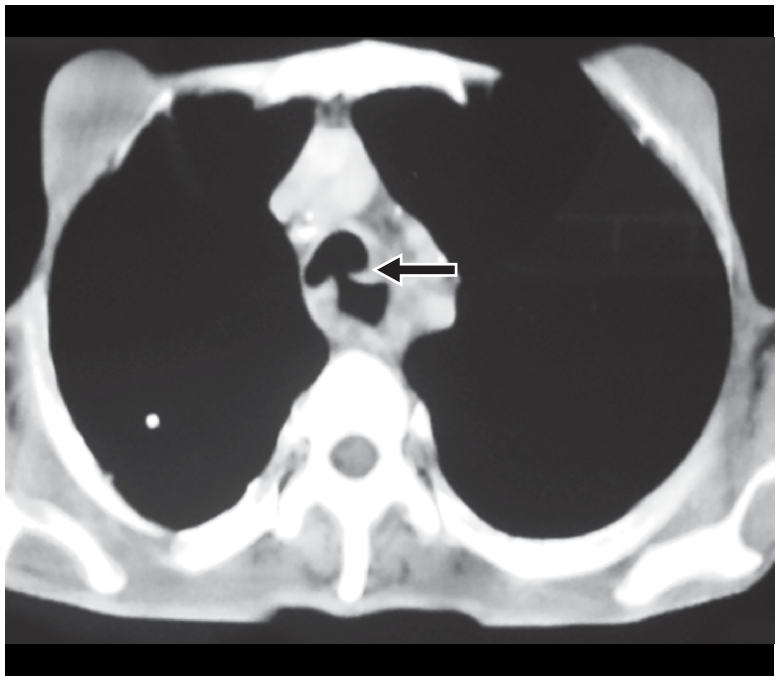
A 46-year-old male with C/o dysphasia, loss of weight and appetite and recurrent haemoptysis



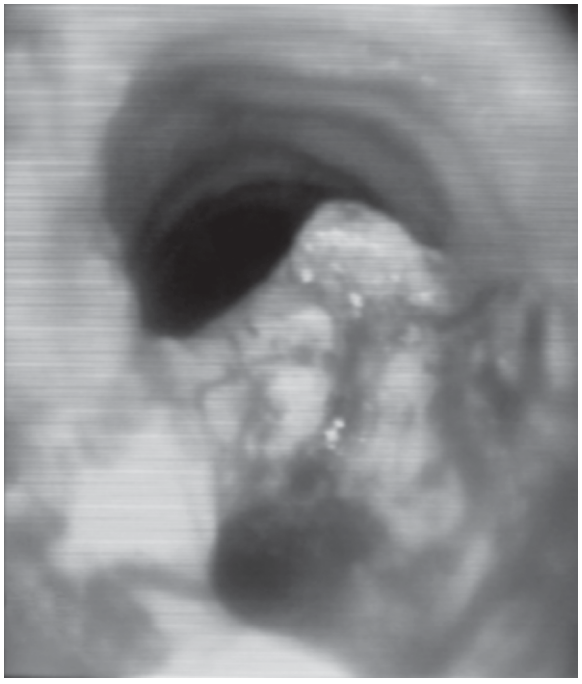
Patient underwent barium swallow to investigate dysphagia but dye enters tracheobronchial tree because of tracheobronchial fistula



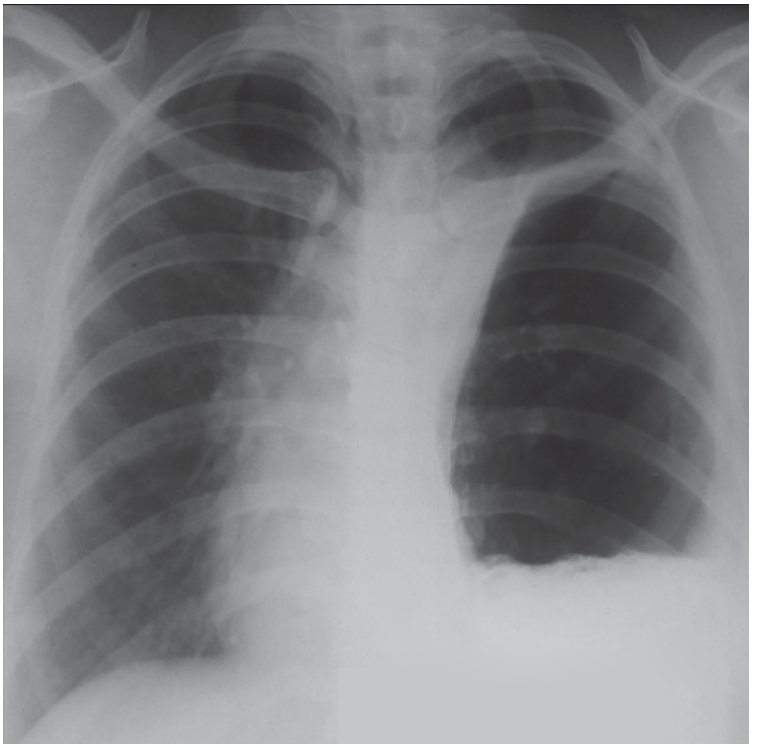
Dye seen in the X-ray after barium swallow



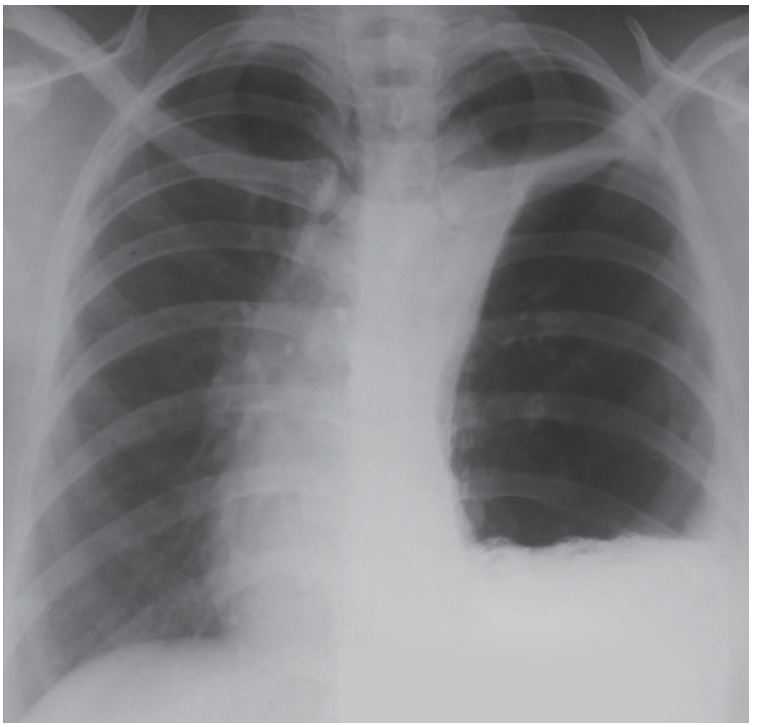
CT shows communication between
trachea and oesophagus



Bronchoscopy shows mass in oesophagus
protruding in trachea
(Colour Plate I)



What is this?



Barium sulphate in stomach causing shadow after barium meal study