Tuberculosis *(TB)*

Done By:

Seeveen Hanieh

Neama Abed

Nayfeh Al-Momani

Islam Hwaimel

Fourth year medical student

Mutah University

Definition of TB :-

- It is a type of pulmonary infection.
- It is a chronic granulomatous disease.
- Caused By :-

1) Bacteria (Mycobacterium tuberculosis).
2) Fungi (rare).

- The disease is confined to the lung in most patient , but may spread to almost any part of the body.
- There are two types :-

1) Primary TB :- arises with initial exposure
2) Secondary TB :- arises with previous exposure (reactivation)

Mode of transmission :-

Inhalation of the air droplets

Risk Factors :-

1) Immunocompromised patients (AIDS)
2) Poverty
3) smoking
4) poor ventilation
5) Old age

Pathogenesis :-

- After entry into the lungs, the organism is ingested by alveolar macrophages.
- > As a result of natural defenses of the tubercle bacilli, alveolar macrophages may be unsuccessful in destroying the bacilli, which then lie dormant within the macrophage and may travel via the pulmonary lymphatics & a few escape into the bloodstream.

- The first infection with M. tuberculosis is known as primary tuberculosis. It is usually subpleural, often in the mid to upper zones (Ghon's focus, single granulomatous lesion).

- TB granuloma consists of a central area of necrotic material of a cheesy nature, called caseation, surrounded by epithelioid cells and Langhans' giant cells with multiple nuclei. Lymphocytes are present and there is a varying degree of fibrosis.

- ***> Components of primary complex:***

1) Ghon's focus (TB granuloma).

2) Lymphangitis.

3) Lymphadinitis in the draining LN.

- Formation of granuloma with caseating necrosis in the center ***(Ghon`s Focus)***

- A Ghon focus alongside ipsilateral mediastinal lymphadenopathy → ***(Ghon`s complex)***

- . A calcified Ghon complex (Ghon lesion and ipsilateral mediastinal lymph node) → ***(Ranke complex)***

- Radiological signs of complications :

e.g.

o Cavity, Consolidation , Collapse , Calcification, Fibrosis.

o Miliary shadows. (diffuse small nodular densities)

o LN enlargement. (hilar or paratracheal LN) .

o Pleural effusion.

VALUE OF RADIOLOGY IN TUBERCULOSIS:

1) Early detection of TB .

2) The extent of TB :

a) Minimal lesion : no cavitation.

b) Moderately advanced lesion: Total diameter of cavitations less than 4cm.

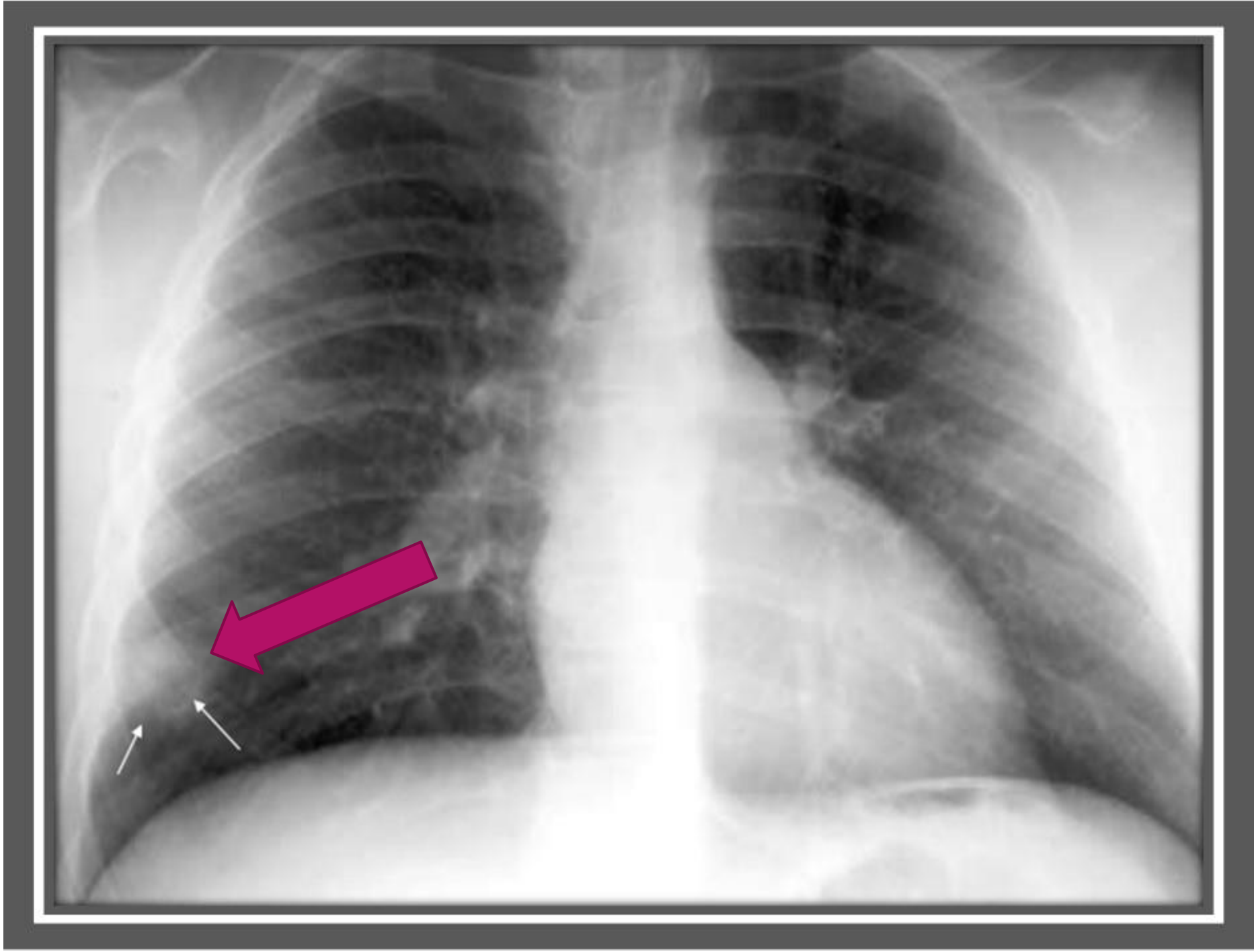
c) Advanced lesion : more extensive than moderately advanced.

Normal
chest X-ray

Ghon`s complex

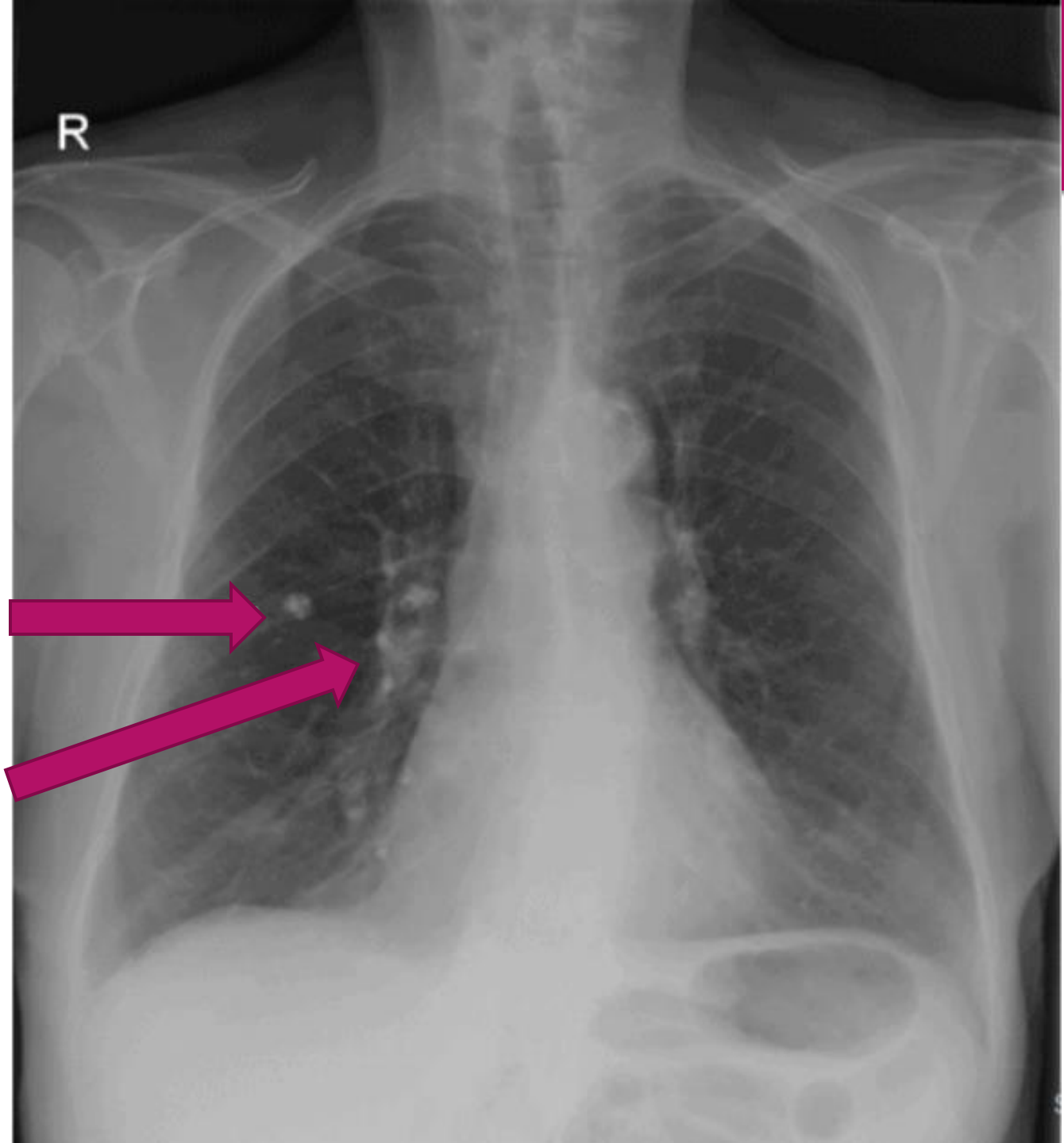
(TB granuloma)

Usually sub-pleurial



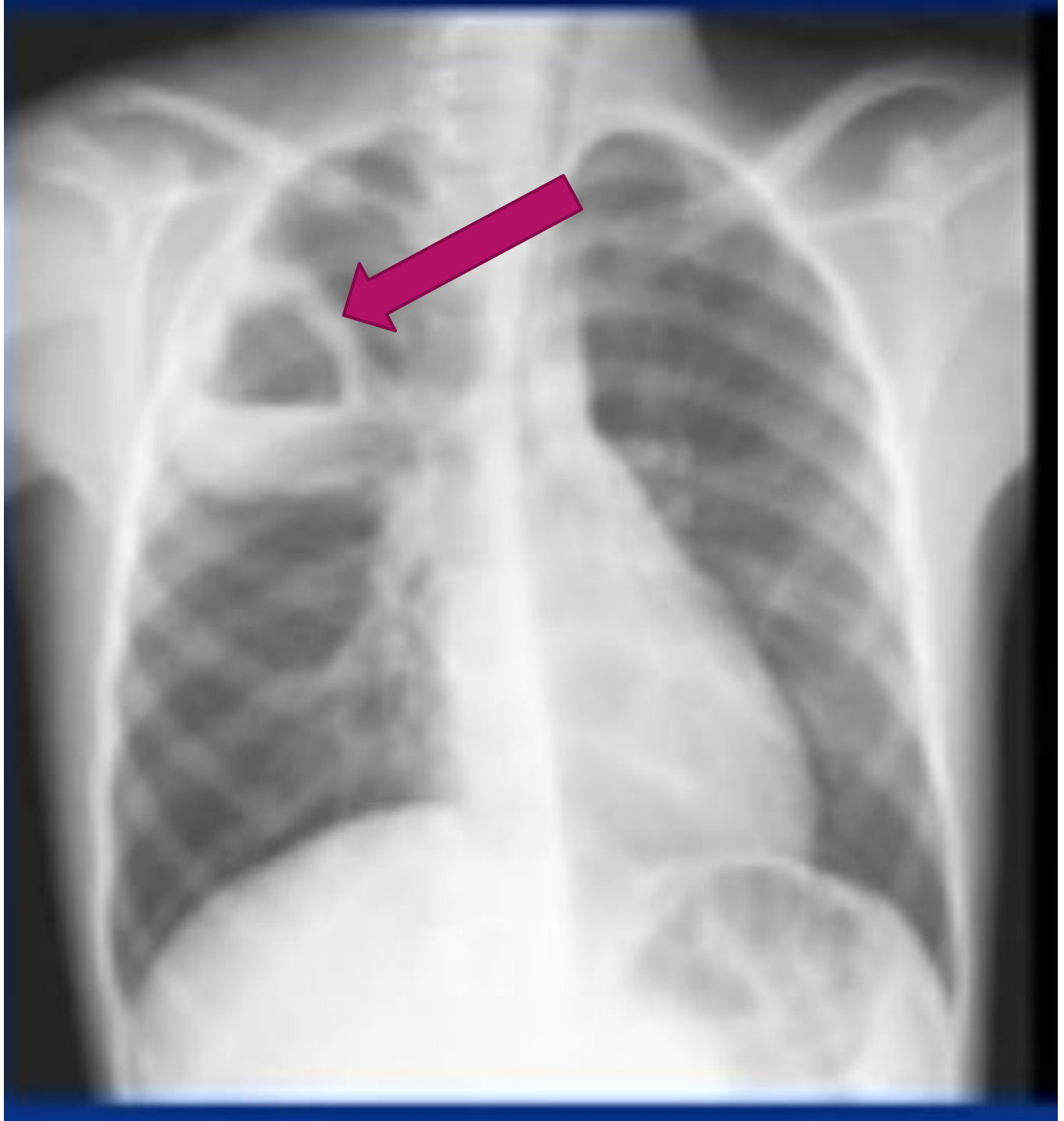
Ranke complex

Ranke complex



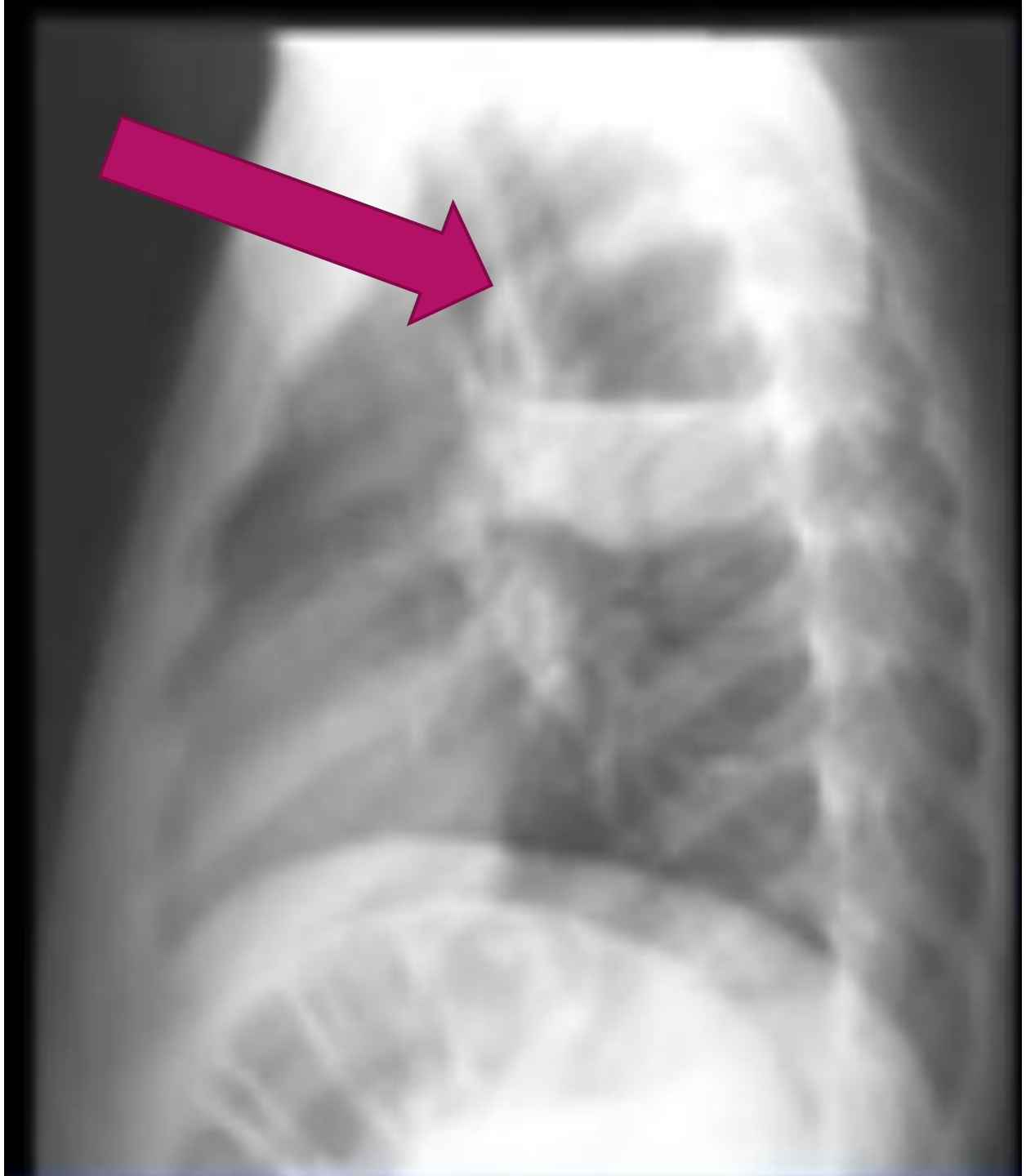
Cavitation of right lung upper lobe

(in 50% of patients with Active TB)



Cavitation of upper lobe (Active TB)

Lateral View



Multiple cavitating lung lesions in upper lobes of the lungs

(Active TB)

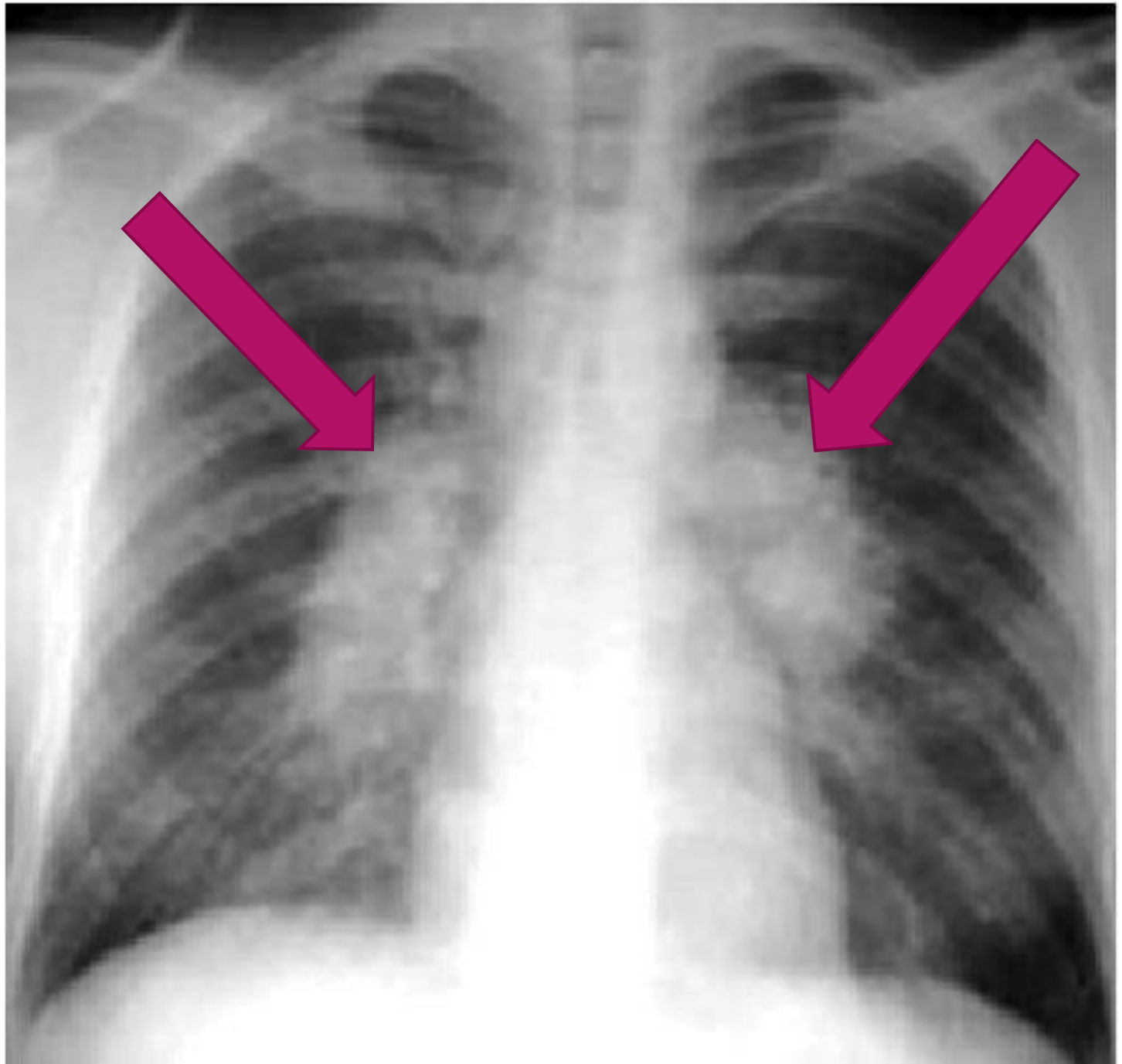
Primary TB with right apical consolidation

Lymphodenopathy:

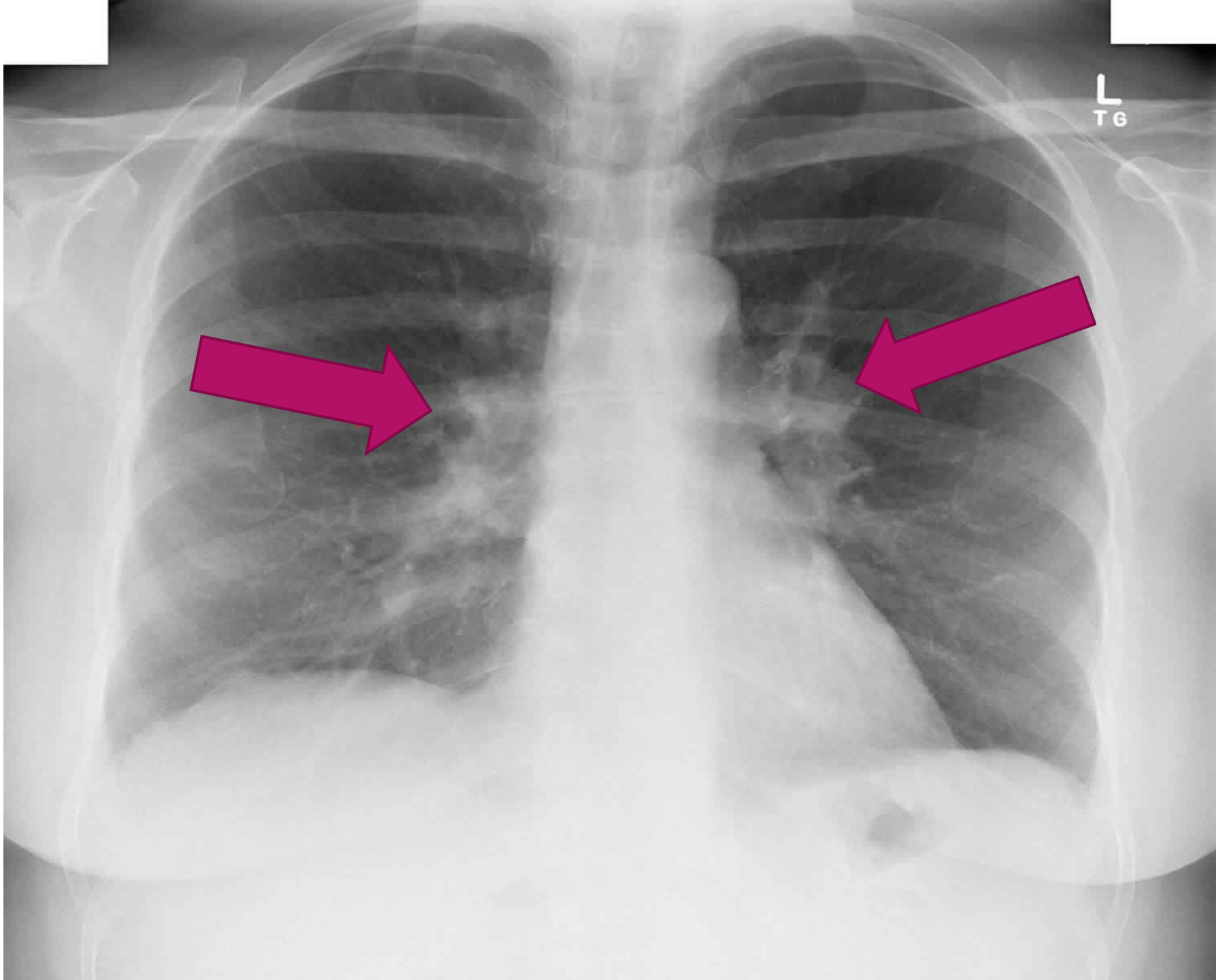
Found in 96% in children and 40% in adults diagnosed with TB.

Mostly in primary TB.

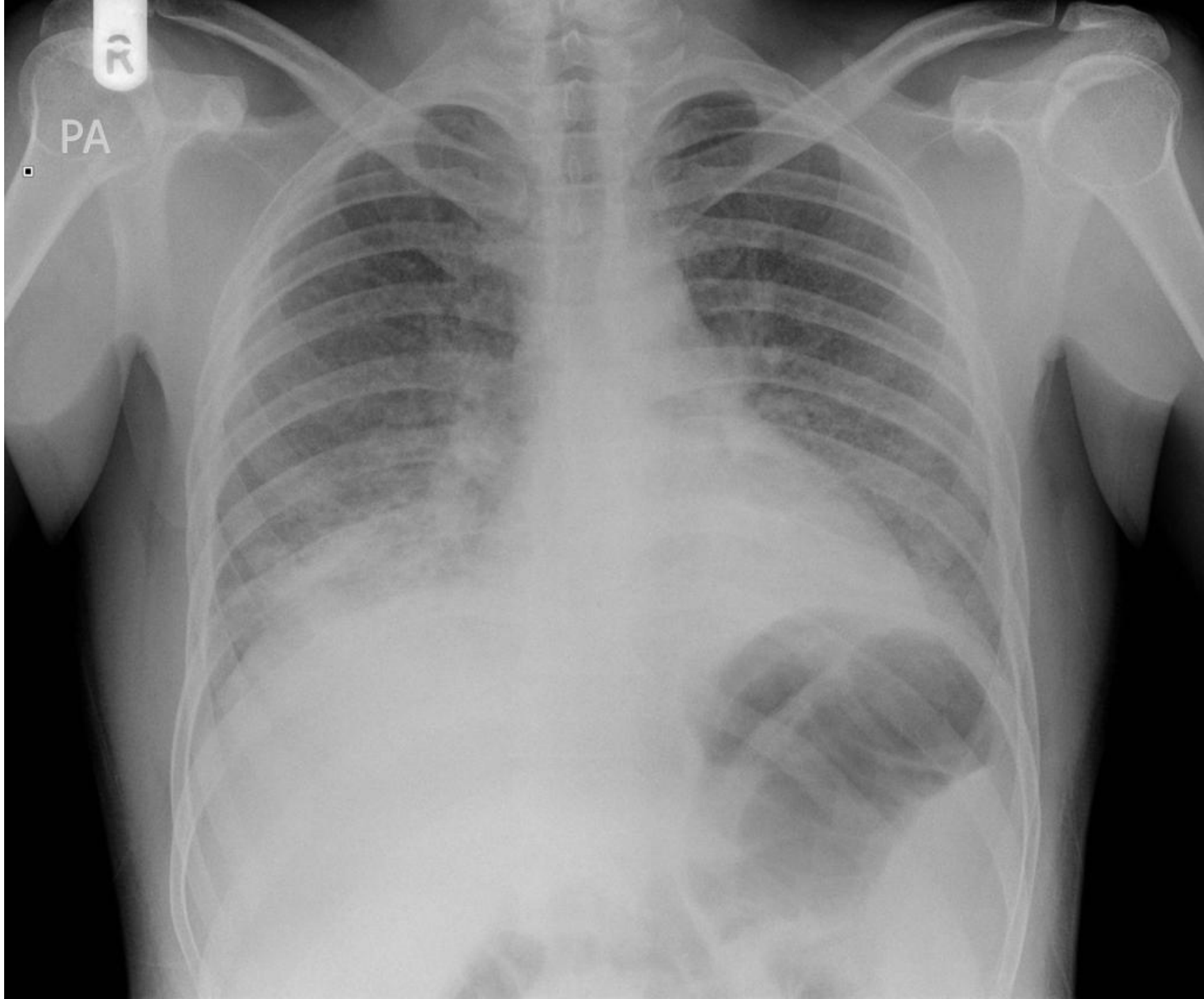
Mostly unilateral in right lung.



Hilar lymphadenopathy



Pleural effution



Miliary TB

- Miliary TB is a life-threatning disease caused by sudden diffuse dissemination of large number of TB Bacili through blood stream (hematological stream)
- Can occur with 1RY OR 2NDRY TB
- Mainly occurs in children and young adults
- May occur in older people (insidious onset)

Pulmonary Miliary TB

- Spots distributed throughout the lung fields with the appearance similar to MILLET SEEDS------ thus the term (military TB)
- occurs when organisms draining through lymphatics enter venous blood and circulate back to Lung
- (lymphatic –-- lymphatic duct ----- venous return ----- right side of the heart ----- pulmonary artery

PRIMARY PULMONARY COMPLICATED BY MILIARY TB

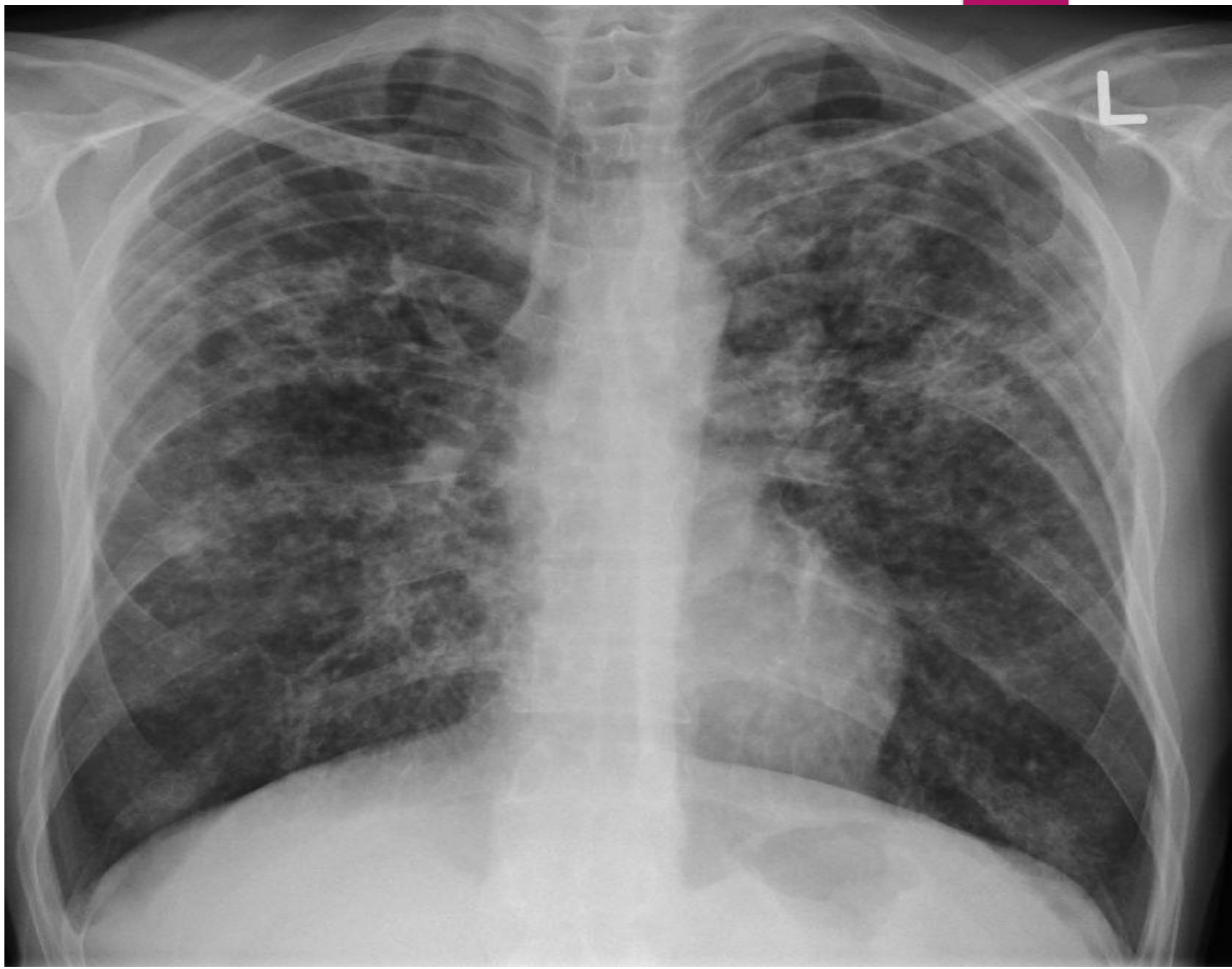
- **Primary Pulmonary tuberculosis**

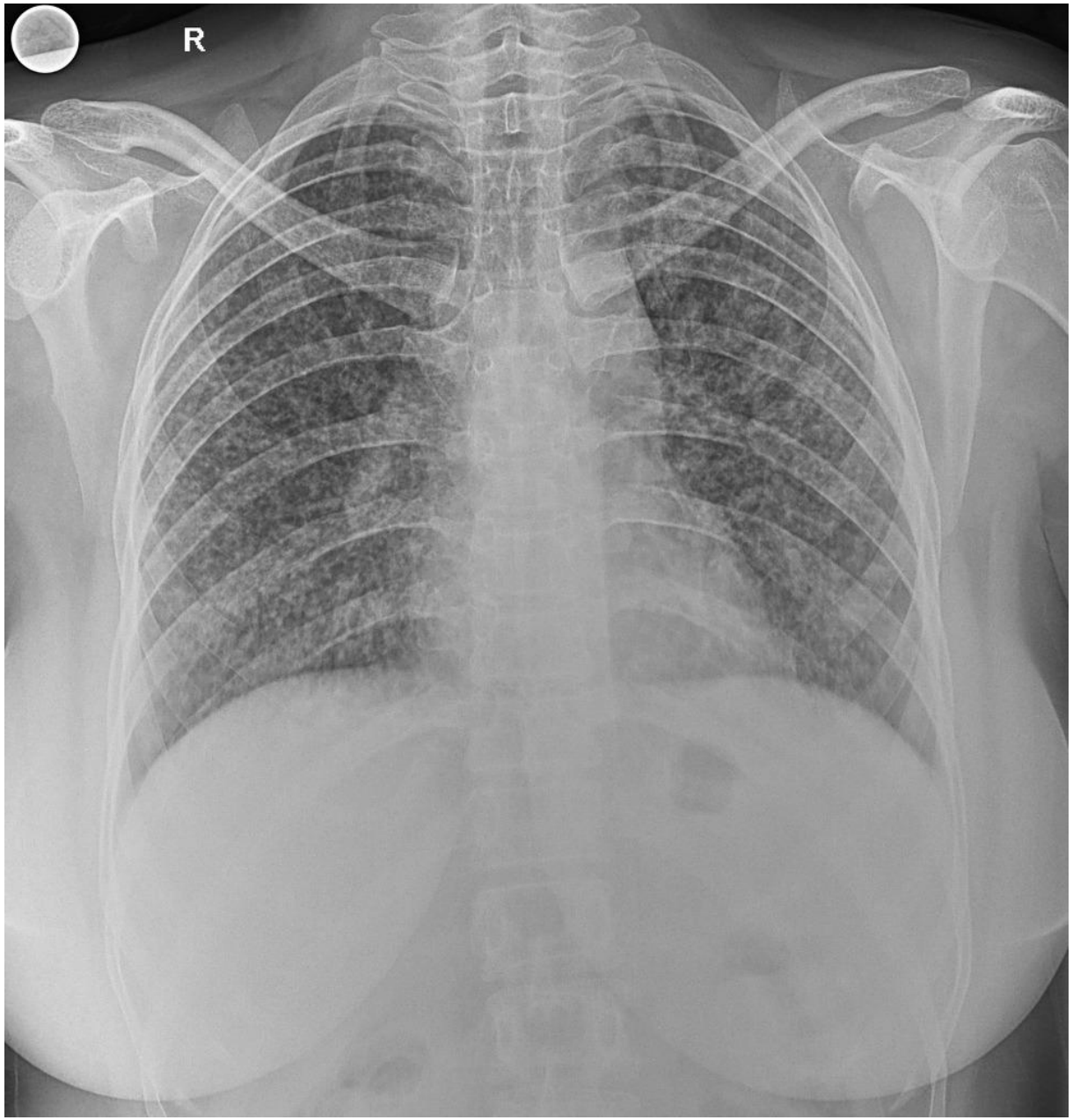
+ miliary TB

- Multiple small tan granulomas, 2 to 4 m. in size, scattered throughout the lung parenchyma.

Pulmonay miliary TB

Miliary pattern (2mm nodules) diffused throughout lung field (caseating granulomas)

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Systemic miliary TB

The organism disseminate through ARTERIAL system to every organ in the body

(bacilli erude through pulmonary veins)

Liver -------- liver tuberculosis

Spleen ------- spleen tuberculosis

Meninges ------- meningitis

Bone --------- osteomyelitis

Fallopian tube ----- salpingitis