Chest Radiology in Pulmonary Tuberculosis

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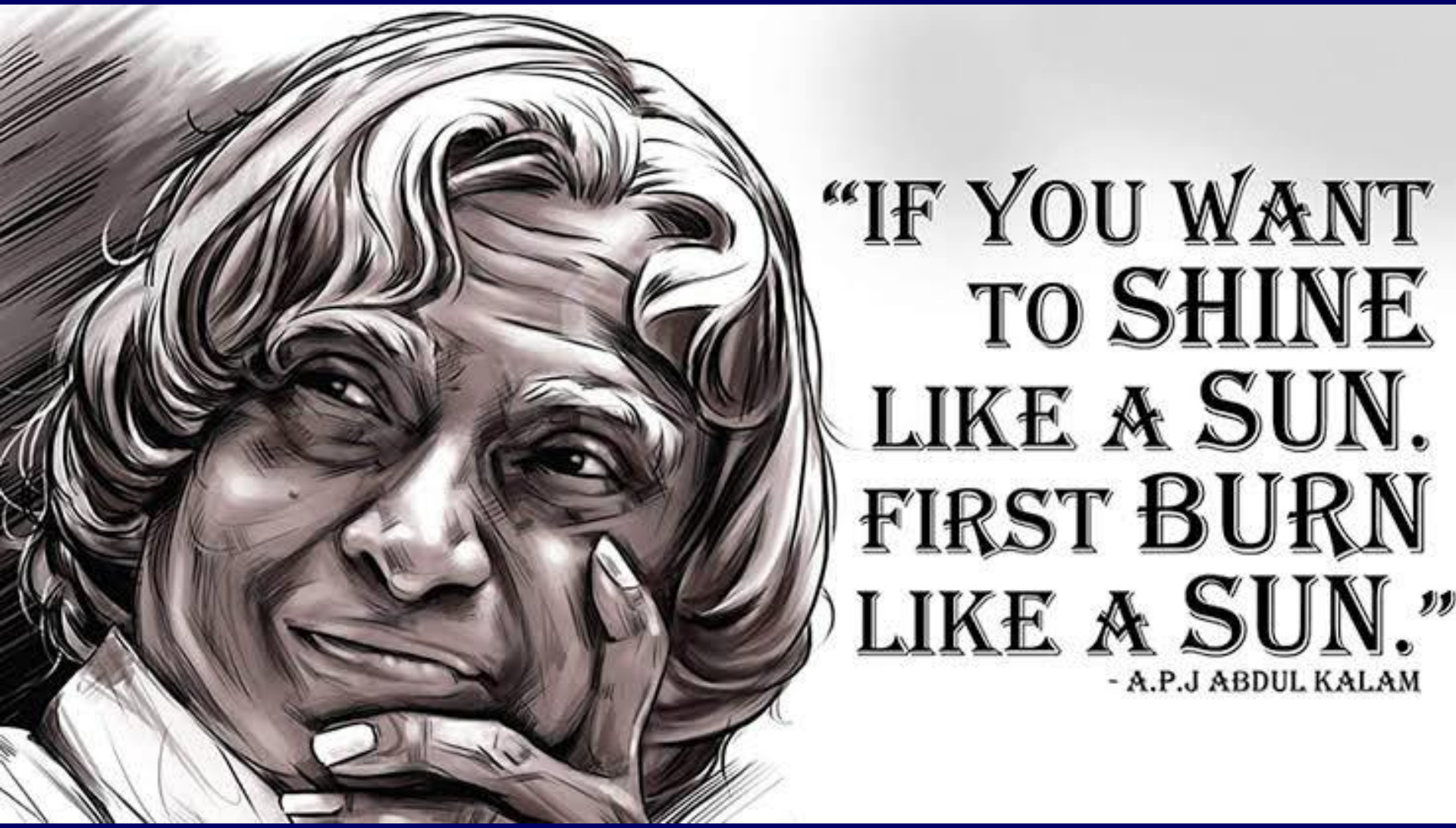

"IF YOU WANT TO SHINE LIKE A SUN. FIRST BURN LIKE A SUN."
- A.P.J ABDUL KALAM

WHO JAPAN VISIT 1989

WHO Osaka Visit Japan in 1989

K.G'S MEDICAL COLLEGE LUCKNOW

King George's Medical University, Lucknow

U.P. Rural Institute of Medical Sciences & Research, Saifai

R Prasad Lucknow

Administrative Block

Academic Block

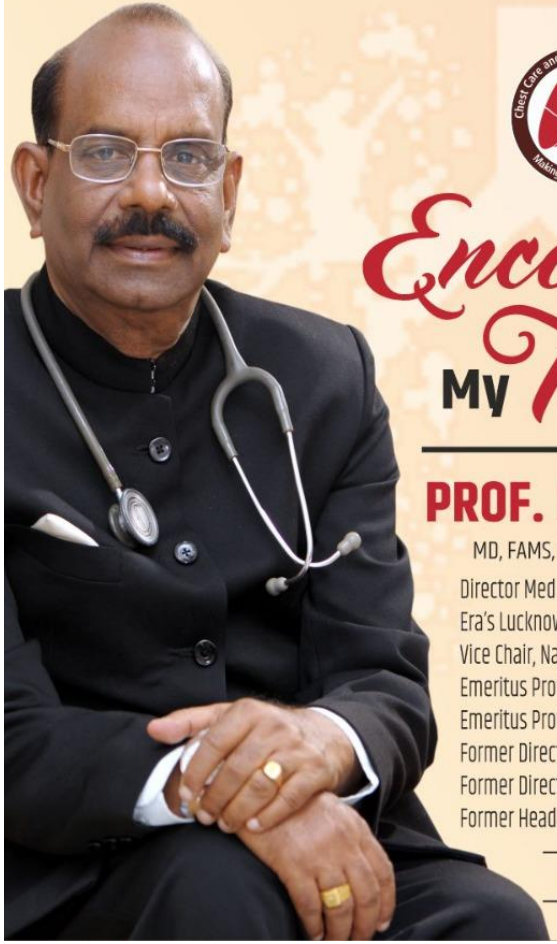
Hospital Block

Vallabhbhai Patel Chest Institute, Delhi

ERA'S LUCKNOW MEDICAL COLLEGE & HOSPITAL

“Better than a thousand days of diligent – study is one day with a great teacher”

Japanese Proverb



Chest Care and Research Society (CRS)
Making Lung & Life Better

HELP

Encounter with My Teachers

PROF. RAJENDRA PRASAD

MD, FAMS, FCCP (USA), FRCP (GLASG) FRCP (London)

Director Medical Education & Professor, Respiratory Medicine
Era's Lucknow Medical College & Hospital, Era University, Lucknow
Vice Chair, National Task Force, NTEP India
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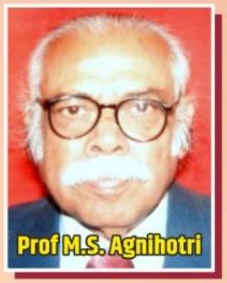
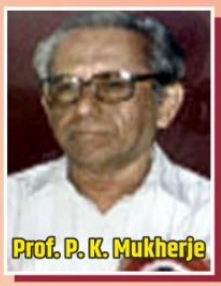
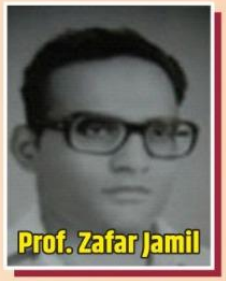
Emeritus Professor, Indian Medical Association
Former Director: Vallabhbhai Patel Chest Institute, Delhi
Former Director: U.P. Rural Institute Of Medical Science & Research, Saifai
Former Head: Department of Pulmonary Medicine, KGMU, Lucknow

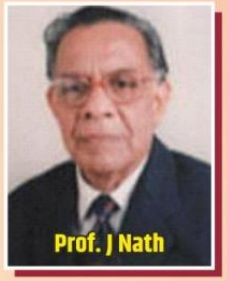
Conduct by **Vandana Tribhuwan Singh**

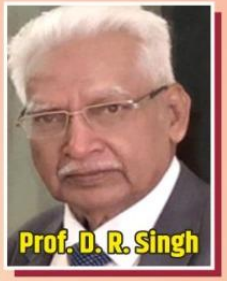

Prof. B.K. Khanna

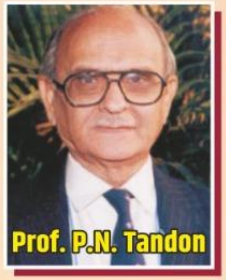

Prof M.S. Agnihotri


Prof. P. K. Mukherje

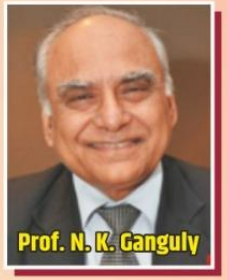

Prof. Zafar Jamil


Prof. J Nath


Prof. D. R. Singh


Prof. P.N. Tandon


Prof. Hari Gautam


Prof. N. K. Ganguly

& Many More who Contributed in my Academics & Career

Chest X Ray interpretation for U.G. Students in Hindi

Rajendra Prasad
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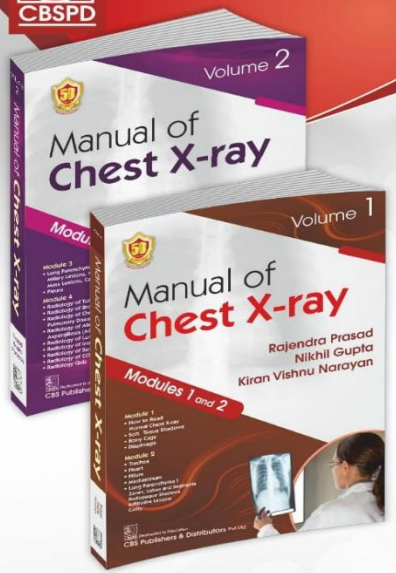

Volumes 1 and 2

Manual of Chest X-ray

Authors:

Rajendra Prasad
Nikhil Gupta
Kiran Vishnu Narayan

Salient Features

- A comprehensive manual on chest X-ray covering all the aspects of chest X-ray interpretation.
- Covers systemic reading of normal chest X-ray and various lesions in soft tissue, bony cage, diaphragm, hilum, heart, mediastinum and all the lesions of lung parenchyma and pleura.
- All chapters are organized in a systematic way for easy understanding.
- Available in print and *e*-book versions with text divided into four modules—two volumes.
- Modules and Volumes
  - Module 1 comprises reading normal chest X-rays and lesions of soft tissues, bony cage and diaphragm.
  - Module 2 comprises lesions of heart, mediastinum, hilum, cavity and infiltrations.
  - Module 3 comprises miliary, nodular, mass, calcified and various pleural lesions.
  - Module 4 comprises various chest X-ray findings of tuberculosis, bronchiectasis, COPD, sarcoidosis, interstitial lung diseases, lung cancer, allergic bronchopulmonary aspergillosis and Covid 19.
- Useful to all medical students, residents, radiologists, physicians and surgeons involved in interpretation of chest X-ray in day to day clinical practice.

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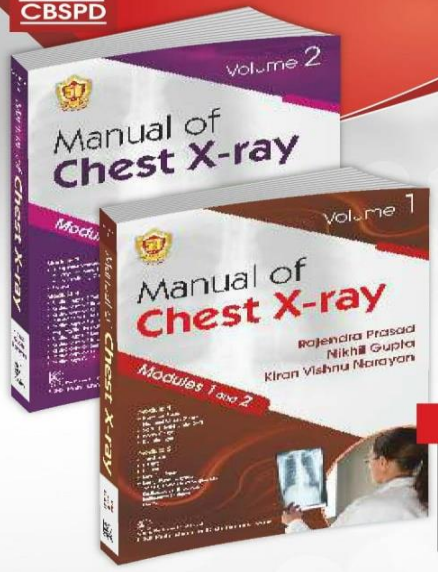

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e-book also available

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Chest Radiology in Tuberculosis

Agenda

- How to approach chest x ray
- Chest xray presentation in pul tuberculosis
- D/D of pul tuberculosis

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R Prasad Lucknow

APPROACH TO CHEST X-RAYS

Objectives

* Normal/Abnormal?
* If Abnormal?
* What is the Abnormality?

APPROACH TO CHEST X-RAY

- Systematic Approach - Read chest x-ray systematically before final interpretation (*for less experienced readers*)

- Global Approach - Read the abnormality first and then read all other points before final interpretation (*for experienced readers*)

APPROACH TO CHEST X-RAYS

Systematic Approach

- Technical Points
- Anatomical Points

APPROACH TO CHEST X-RAYS

Technical points

- Side Determination
- Plain/Contrast
- View
- Rotation
- Exposure
- Inspiratory/Expiratory

APPROACH TO CHEST X-RAYS

ANATOMICAL POINTS

- Soft Tissue
- Bony Cage
- Trachea
- Diaphragm
- Heart
- Hilum
- Mediastinum
- Fissure
- Parenchyma

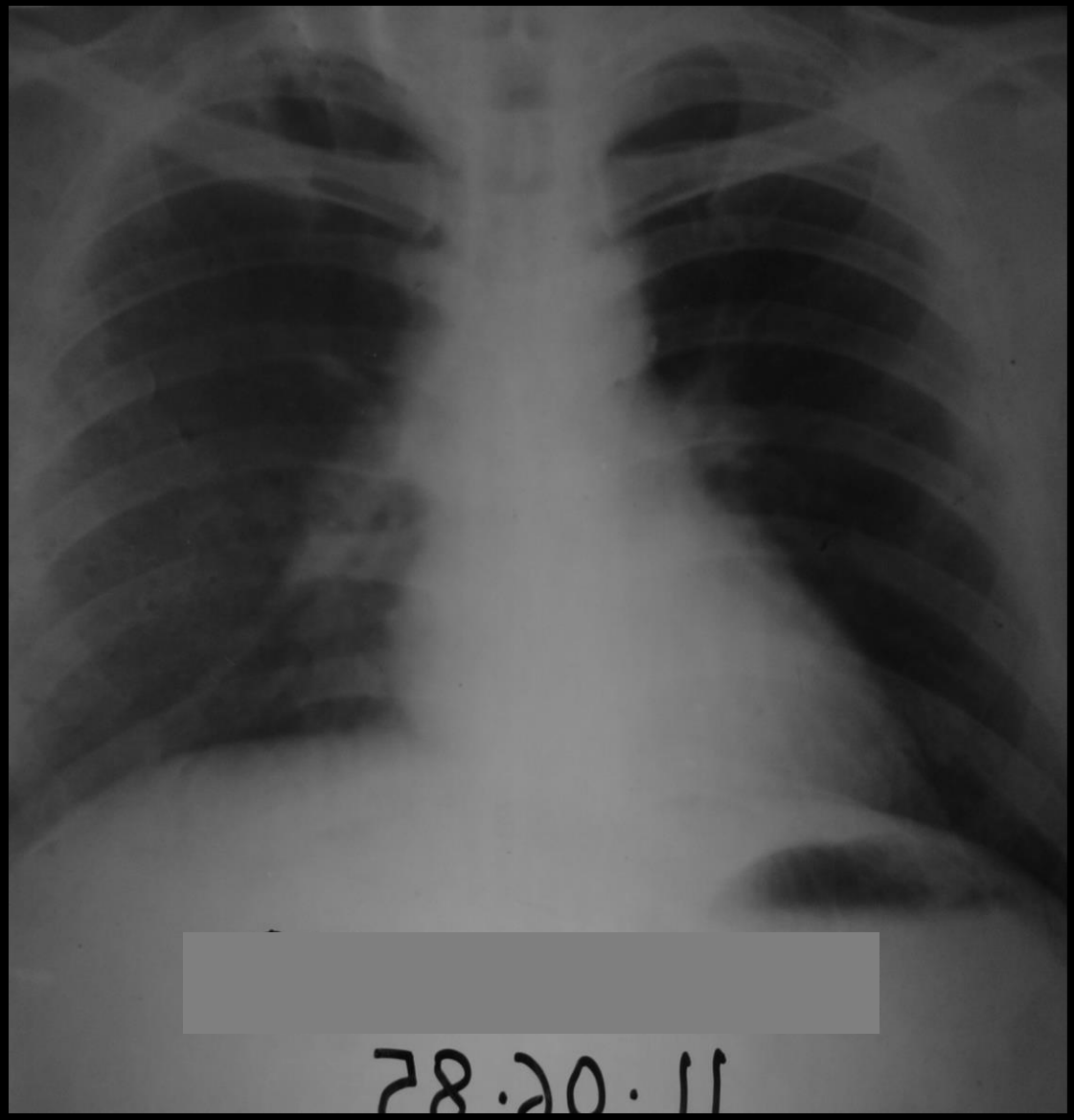
APPROACH TO CHEST X-RAYS

Technical points - Side Determination

Landmarks on Left Side

- Fundal Gas Shadow
- Apex of Heart (Lt. Ventricle)
- Aortic Knuckle

Marker on X-Ray Plate - Most Important



What is this? And why date is written wrongly?

Situs Inversus

APPROACH TO CHEST X-RAYS

P A View

Indications

Standard

A P View

Indications

- Infant
- Moribund patient
- Localization (pul.,extra pul.)
- Spine

Lateral View

Indications

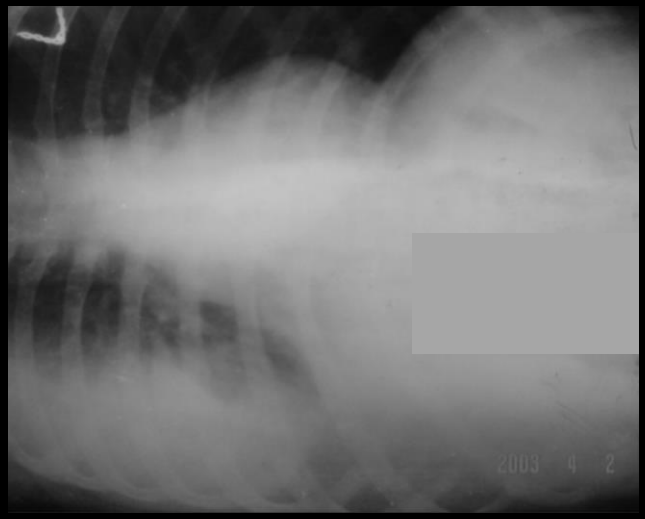
- Lobar & seg. Localization
- Retrocardiac Shadow
- Localization of Encysted Effusion
- Mediastinal Lesion
- Oblique Fissure

Lateral View

LATERAL DECUBITUS VIEW

Indications

- Infra Pulmonary Effusion
- Small Pleural Effusion
- Small Pneumothorax
- Extent of Cavity

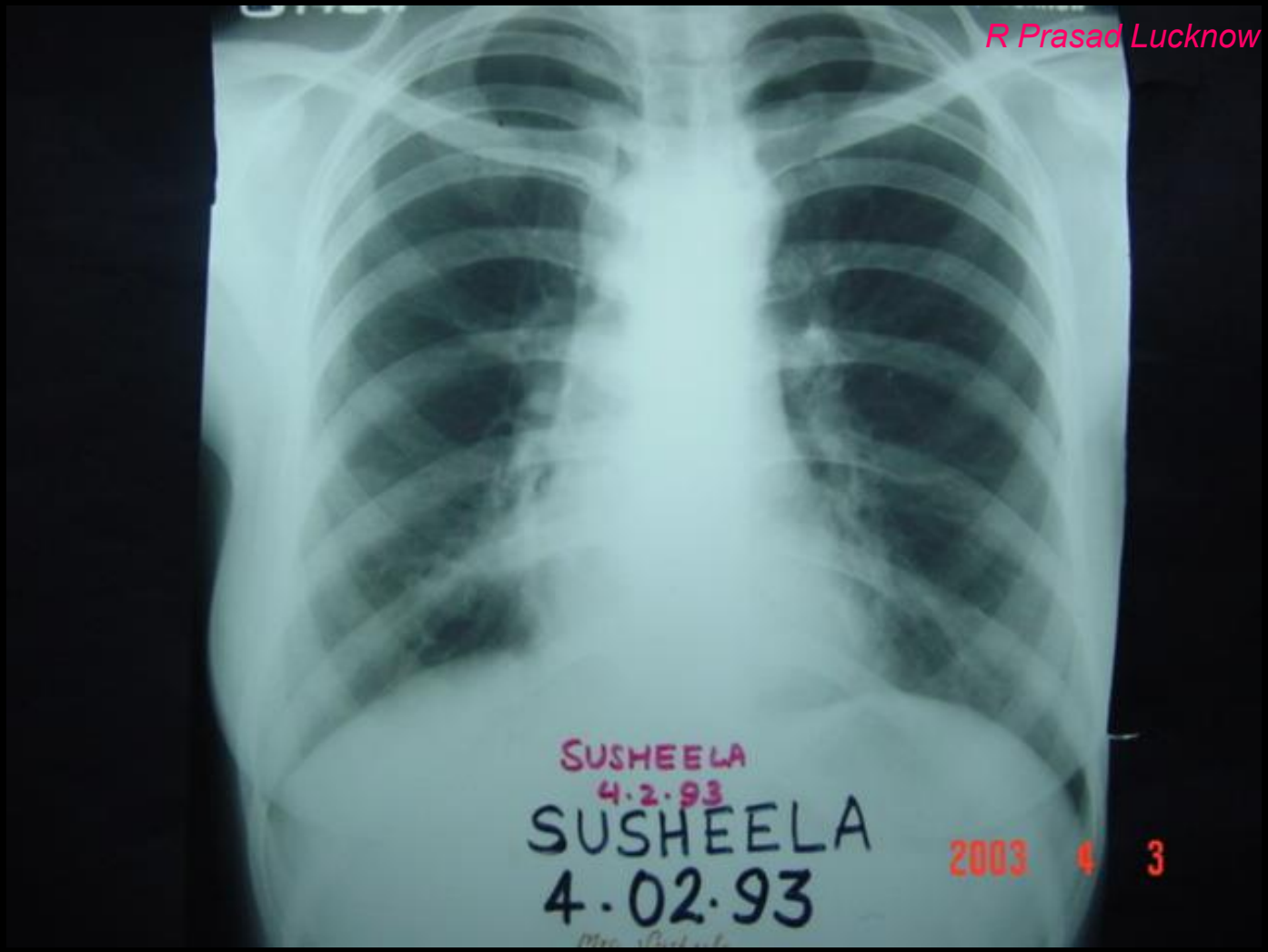


Lordotic View

X-ray tube is tilted 45 degree downward)

Indications

- Retroclavicular area of lung
- Middle lobe collapse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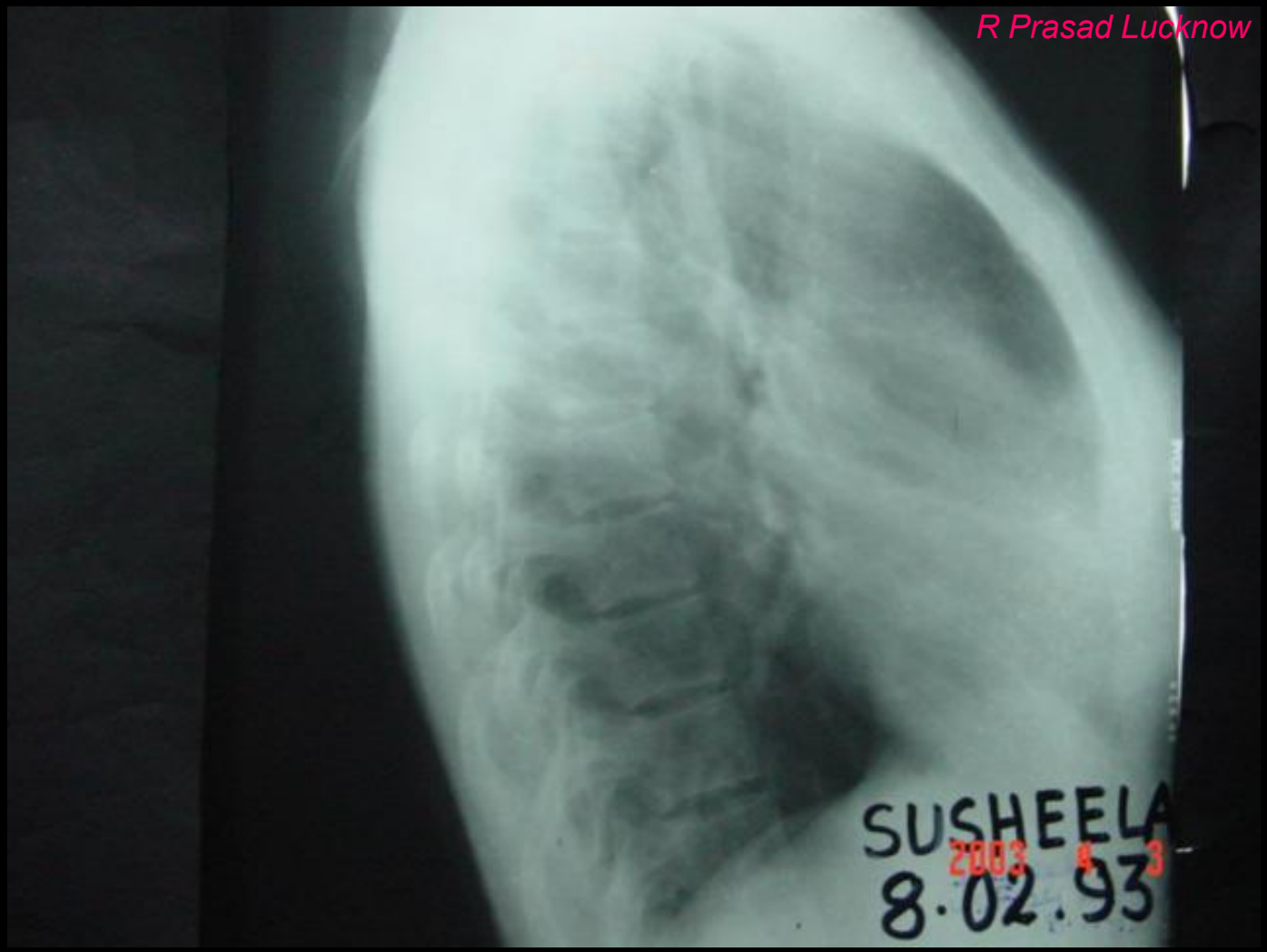
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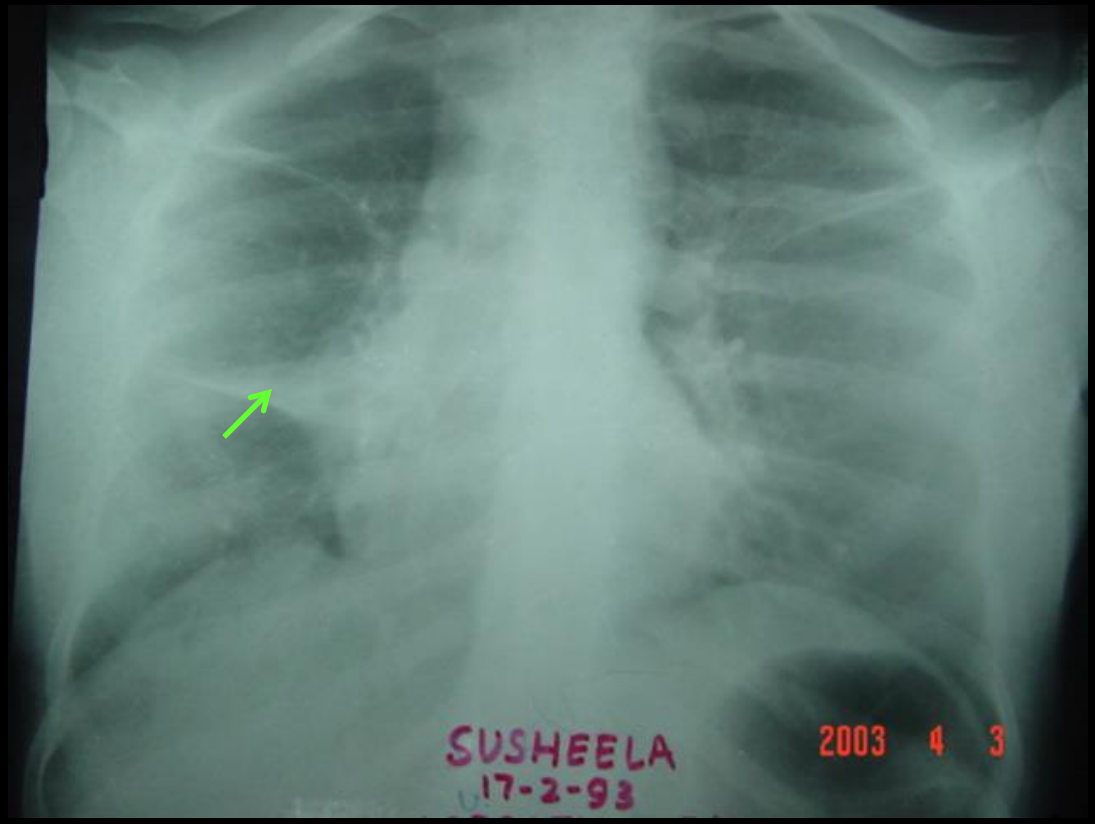
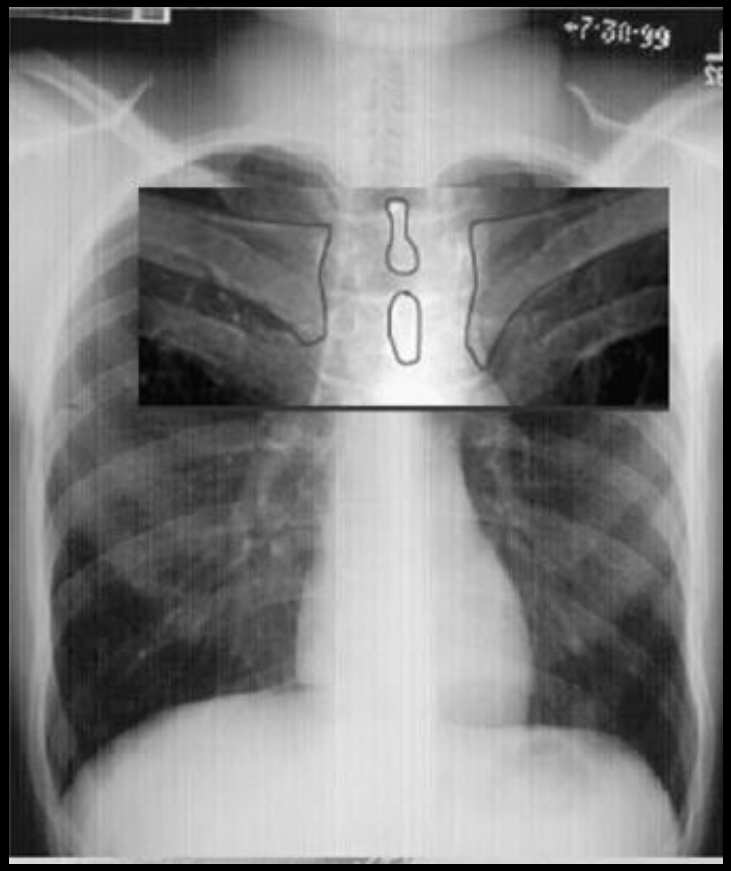
LARDOTIC VIEW



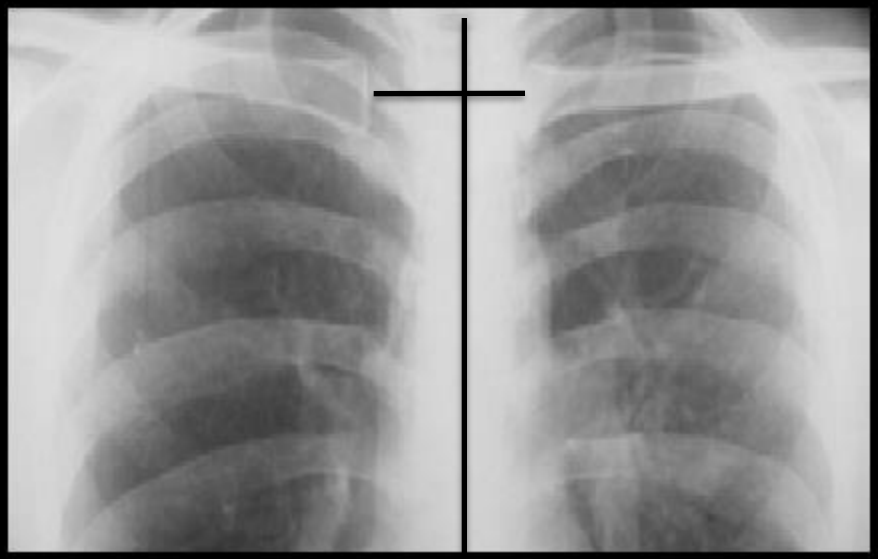
Middle Lobe Collapse

ROTATION

Determine by observing the equal distance between the ***medial clavicular head*** and the ***spinous process*** of the thoracic vertebral body



Rotation



Left Anterior oblique rotation

APPROACH TO CHEST X-RAYS

Technical points - Rotation

Anterior oblique Rotation

- Heart and Trachea shifted to opposite side
- Diaphragm raised on same side
- Hilar prominence on same side
- Lung field hyperlucent on opposite side

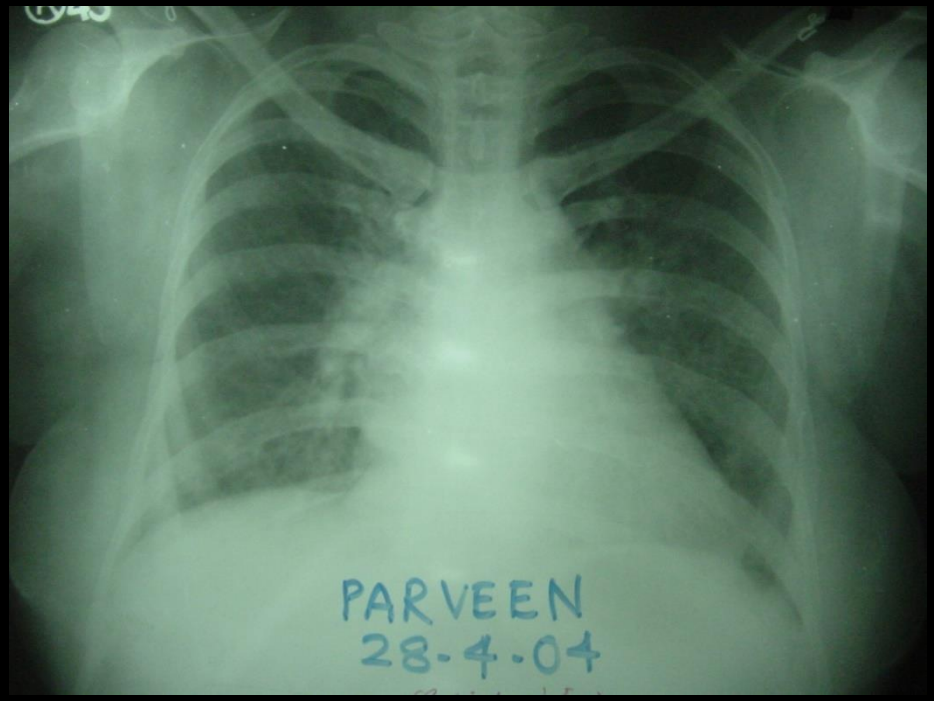
APPROACH TO CHEST X-RAYS

Technical points - Inspiratory/Expiratory Film

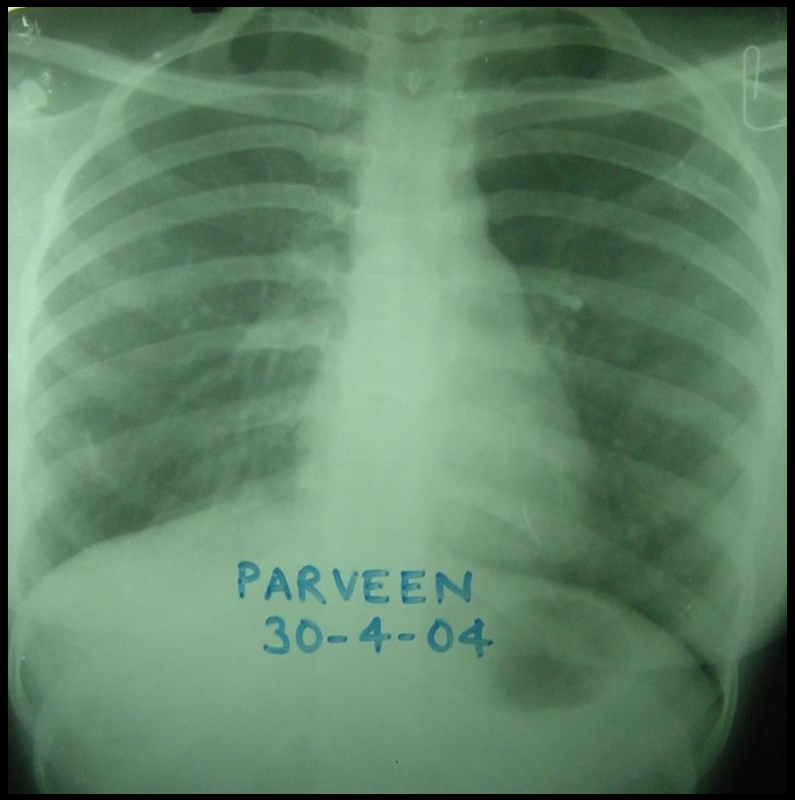
Expiratory Film

- Apparent cardiomegly
- Bilateral raised dome of diaphragm
- Clouding of lung bases

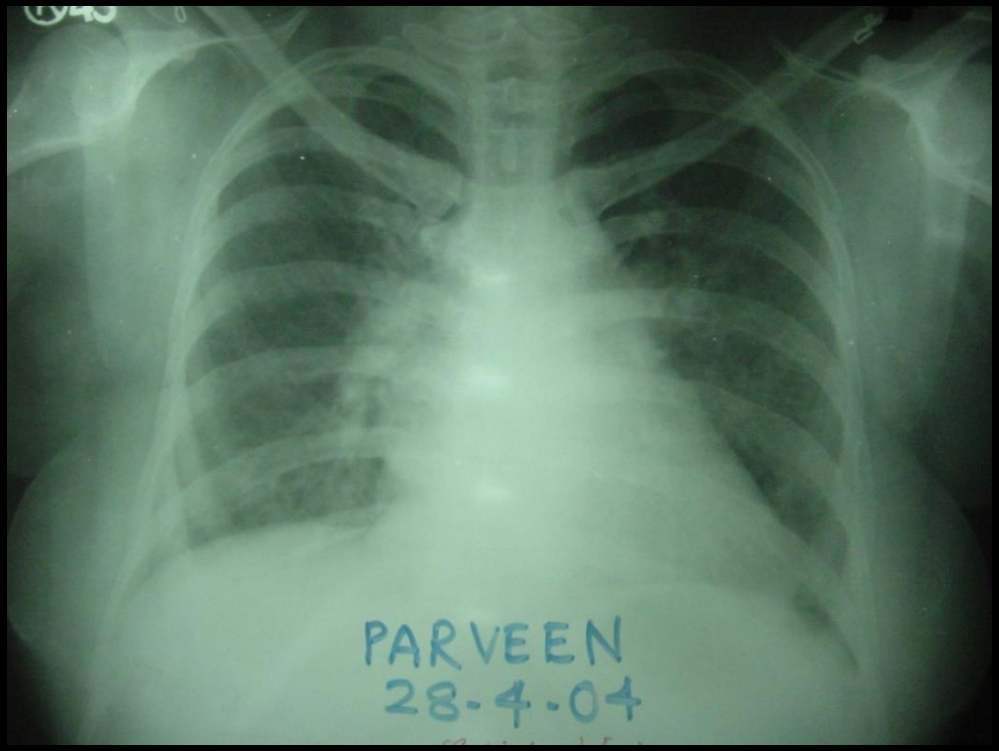
Expiratory Film



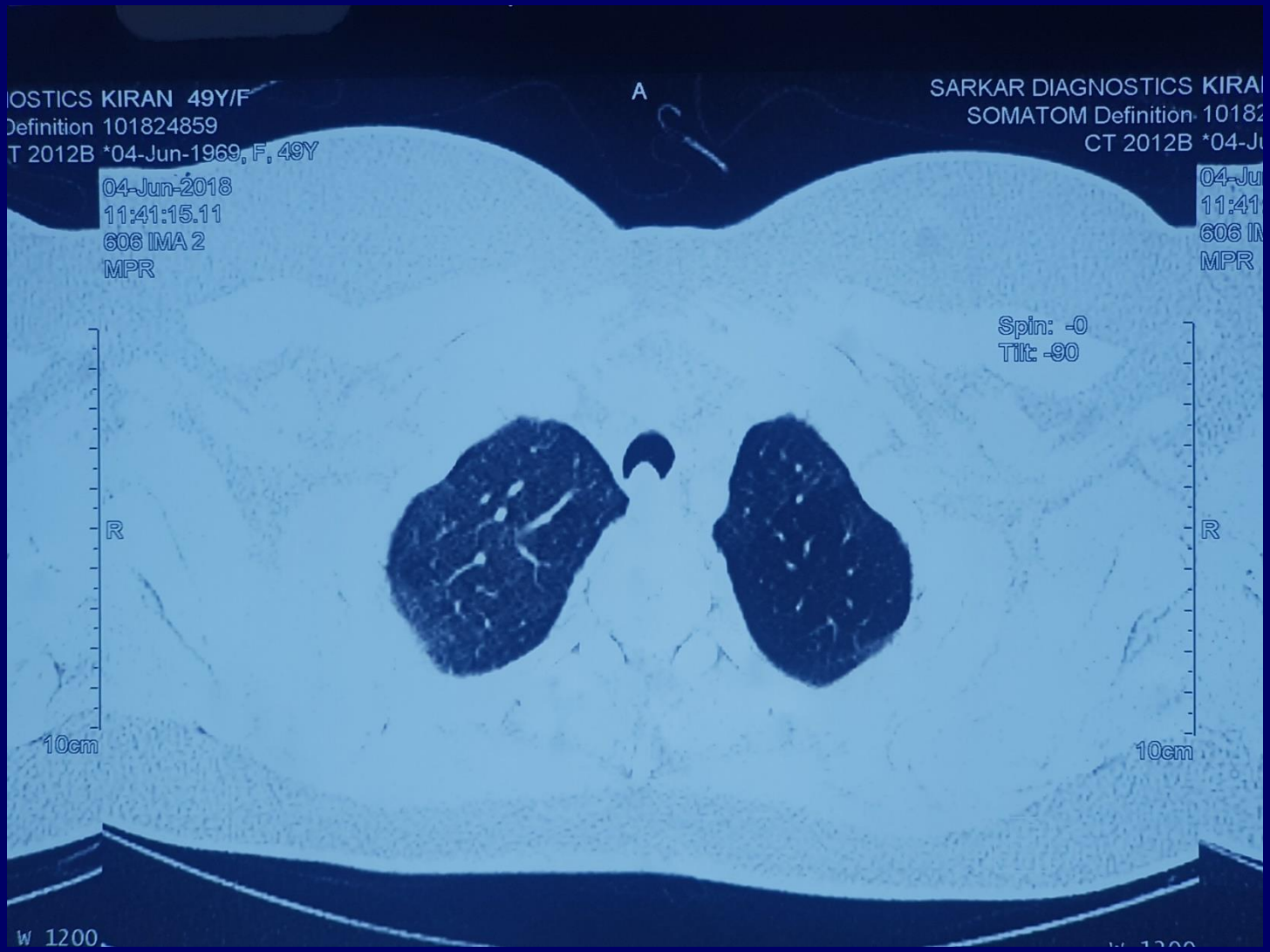
Inspiratory Film



Expiratory Film



Inspiratory Film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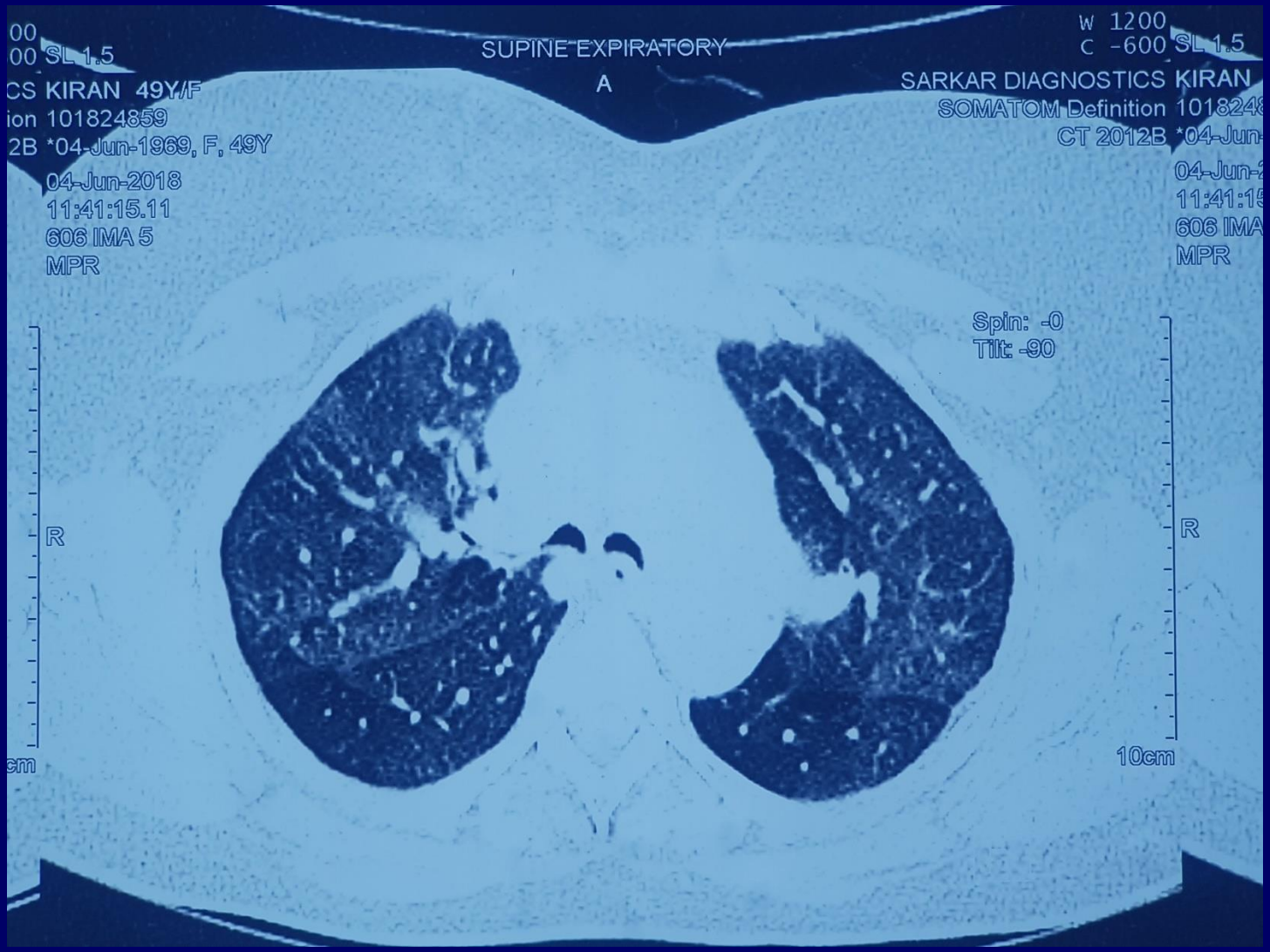
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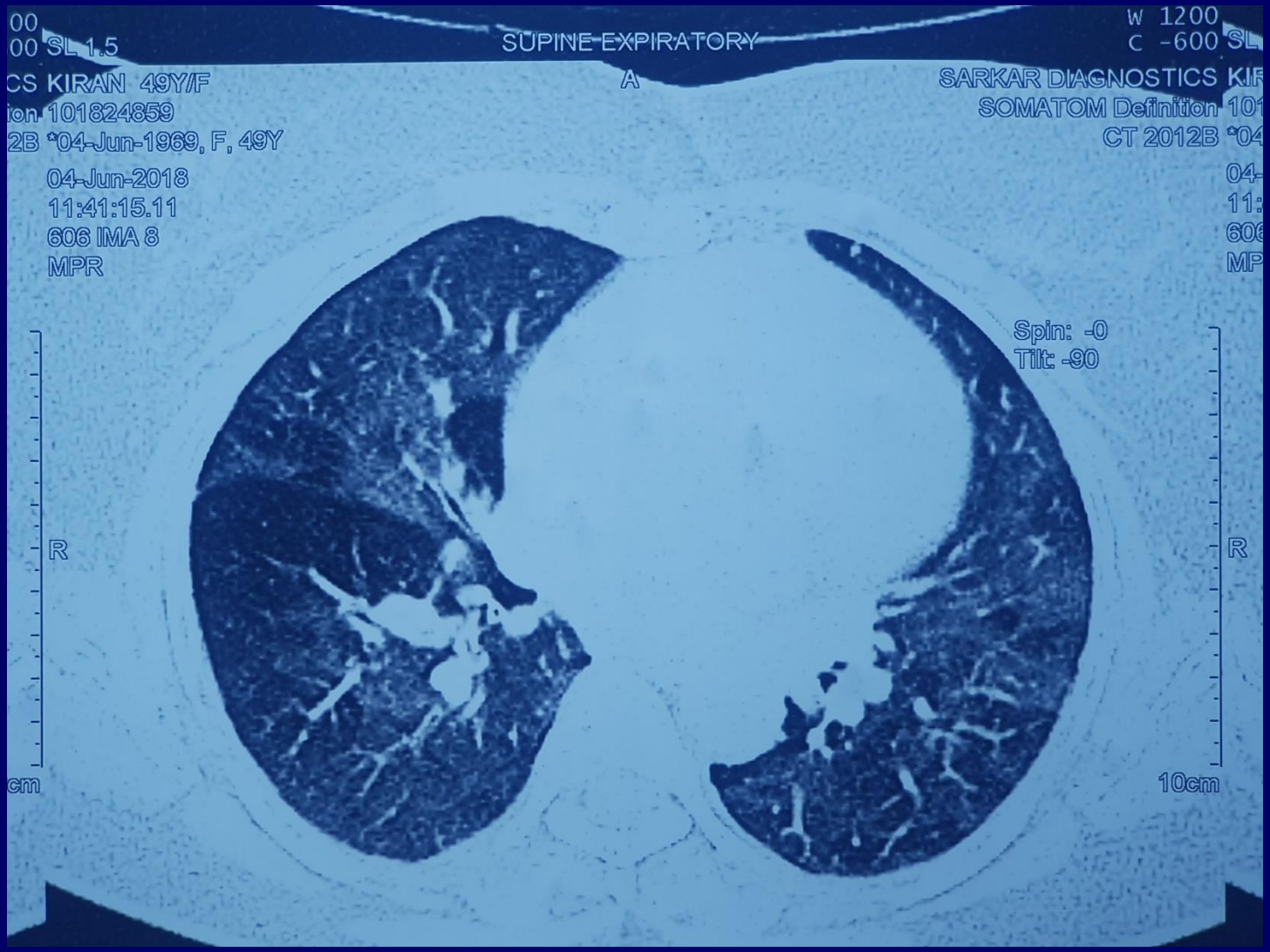
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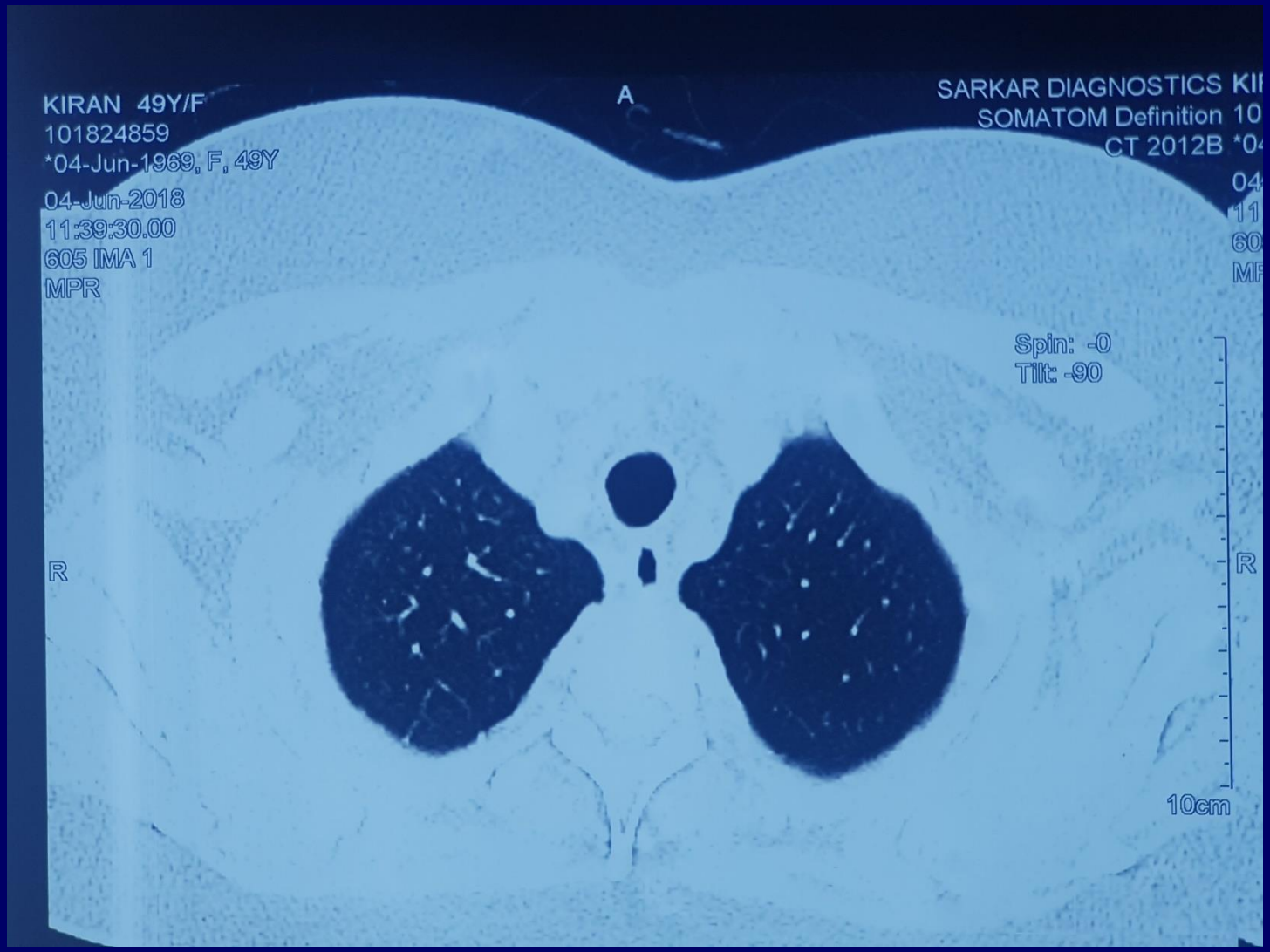
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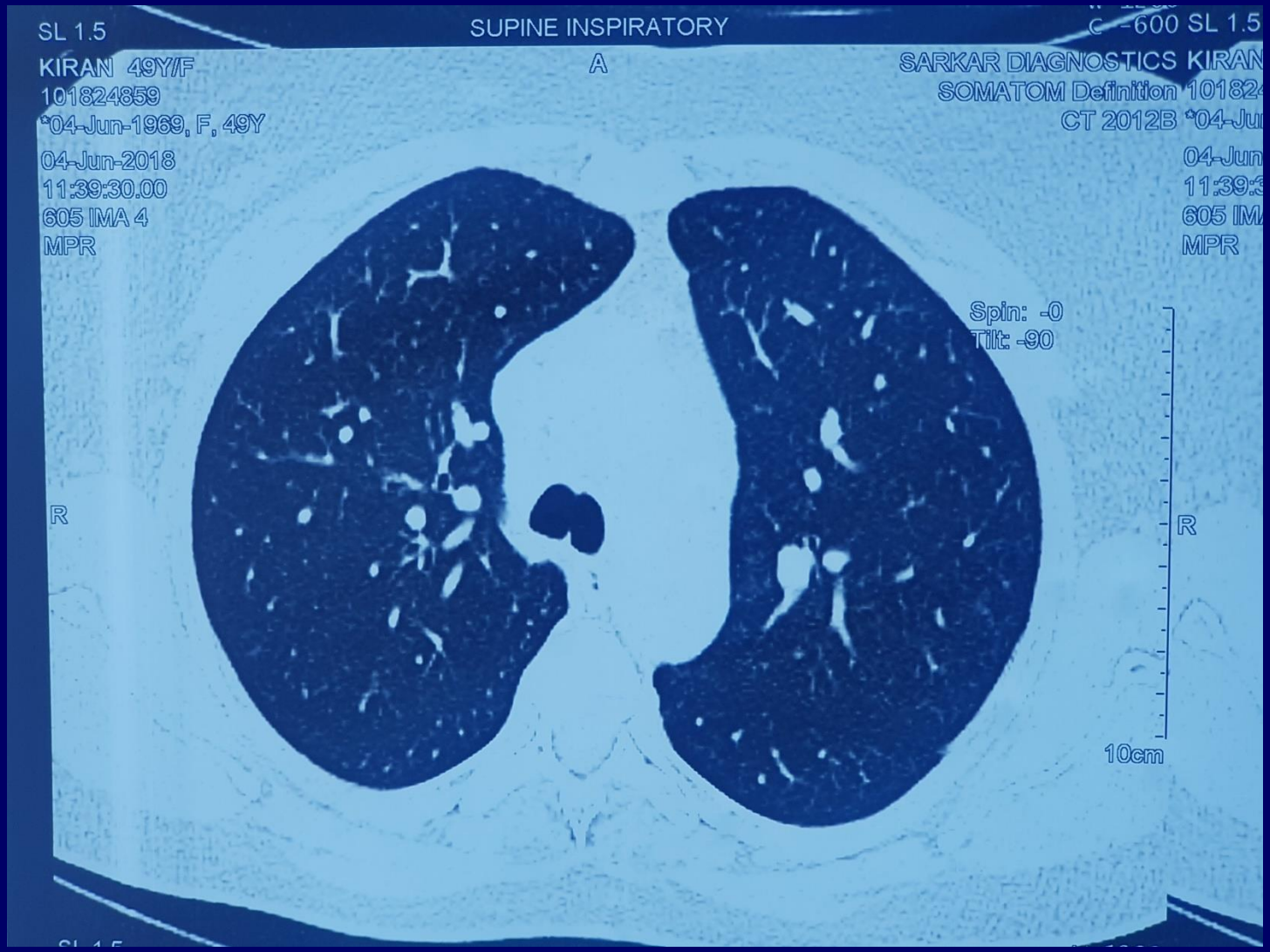
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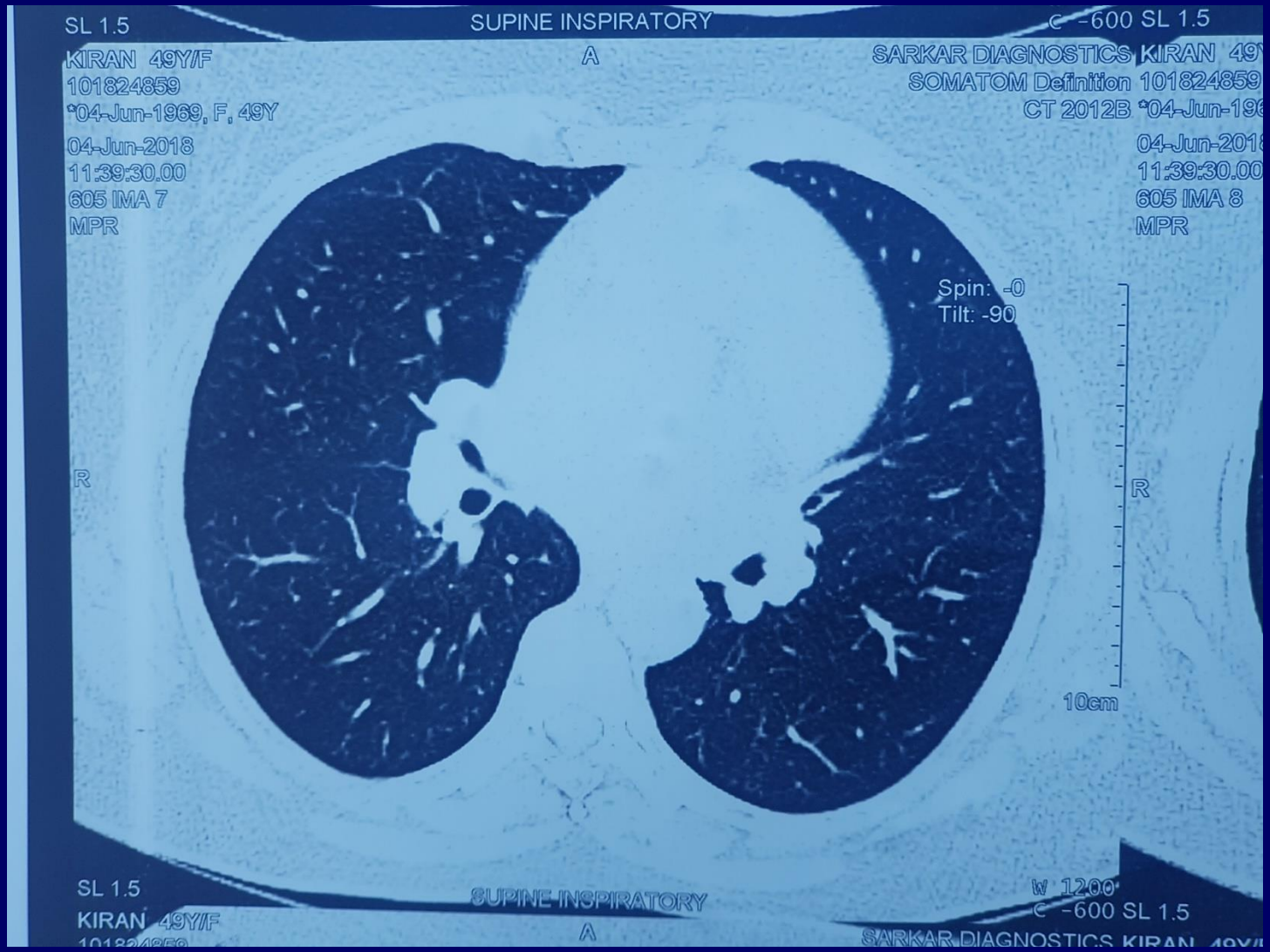
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APPROACH TO CHEST X-RAYS

ANATOMICAL POINTS

- Soft Tissue
- Bony Cage
- Trachea
- Diaphragm
- Heart
- Hilum
- Mediastinum
- Fissure
- Parenchyma

APPROACH TO CHEST X-RAYS

ANATOMICAL POINTS - Soft Tissue Shadow

- Breast Shadow
- Nipple Shadow
- Subcutaneous Emphysema
- Plaits of Hairs
- Companion Shadow
- Pace maker
- Subcutaneous Calcification (Worms, Glands)
- Pellets

Subcutaneous Emphysema

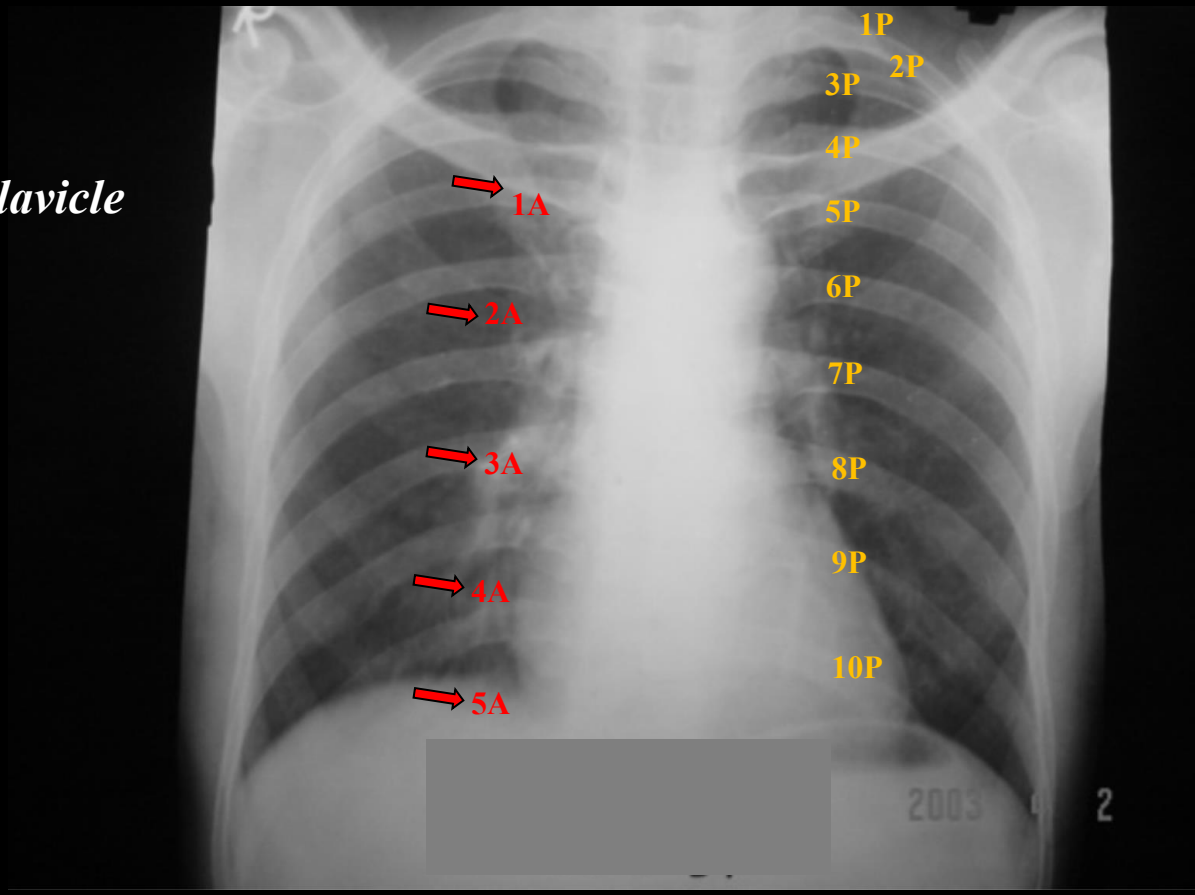
APPROACH TO CHEST X-RAYS

ANATOMICAL POINTS - Bony Cage

- Clavicles
- Ribs
- Intercostal Spaces
- Spines

How to recognize first Rib ?

First anterior end just below the clavicle



APPROACH TO CHEST X-RAYS

Anatomical Points - Diaphragm

- Position
- Shape
- Angles
  - Costophrenic
  - Cardiophrenic
- Gas under diaphragm

POSITION OF DIAPHRAGM

- Normal
- Raised - U/L, B/L
- Depressed

Normal level of diaphragm

- Right at 5-6.5 intercostal space
- Right 0.5-2.5 cm higher than left in 89%
- Left is at same / higher level than right in 9%
- Right > 3 cm higher than left in 2%

B/L Raised diaphragm

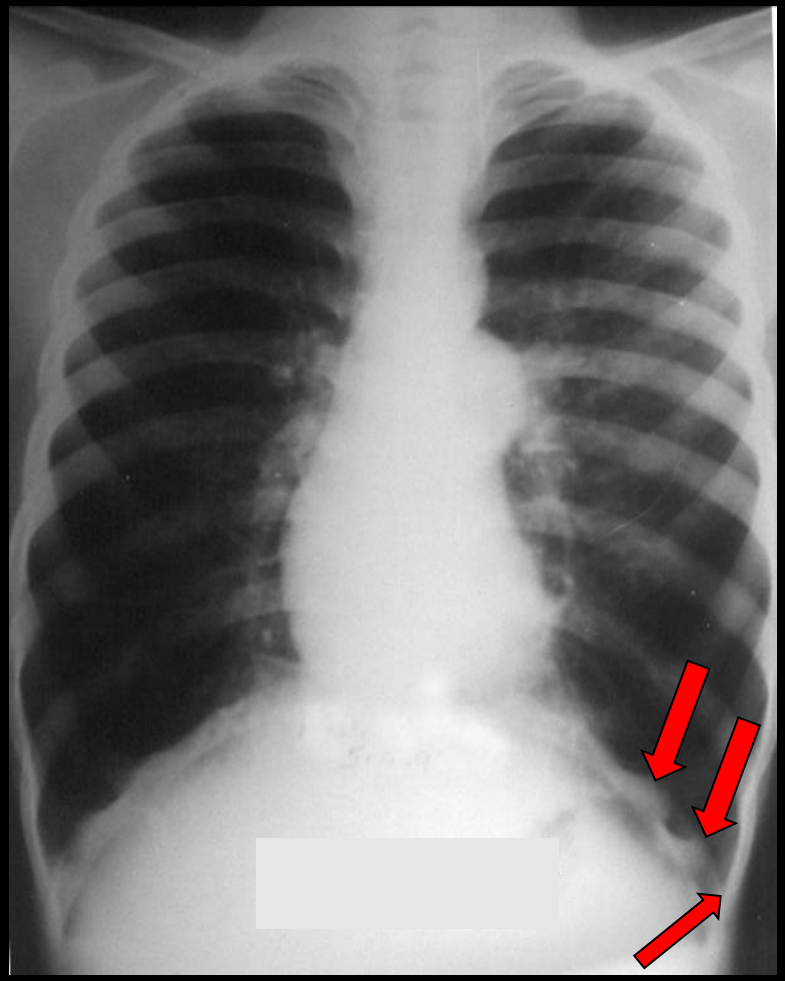
- **Technical** – Supine film, Expiratory film
- **Abdominal** – Ascitis, Pregnancy, Obesity, Mass
  Intestinal distension, Pneumoperitoneum
- **Intrathoracic** - Fibrosing alveolitis, Lymphangitis Carcinomatosis
  SLE
- **Infants**

U/L Raised Diaphragm

- Neuro paralysis
- Mechanical
- Developmental
- Spastic
- Infrapulmonary effusion

DEPRESSED DIAPHRAGM

- Chronic Obstructive Emphysema
- Tension Air Cyst of Lung
- Acute obstructive Emphysema
- Massive Pleural Effusion
- Tension Pneumothorax



Depressed both diaphragm Costrophrenic muscles slip obliterating LT CP angle

ANGLES

- Costophrenic
- Cardiophrenic

OBLITERATION OF COSTOPHRENIC ANGLES

- Pleural Effusion
- Pleural Thickening
- COPD
- Lower Lobe Consolidation
- Lower Lobe Collapse

CARDIOPHRENIC ANGLE

- Collapse of Middle or Lower Lobe or Lingular segment of Left Upper Lobe
- Hiatus Hernia
- Pleuro Pericardial Cyst
- Pericardial Pad of Fat
- Prominent Inferior Vena Cava

APPROACH TO CHEST X-RAYS

Heart

- Position
- Borders
- Size
- Shape

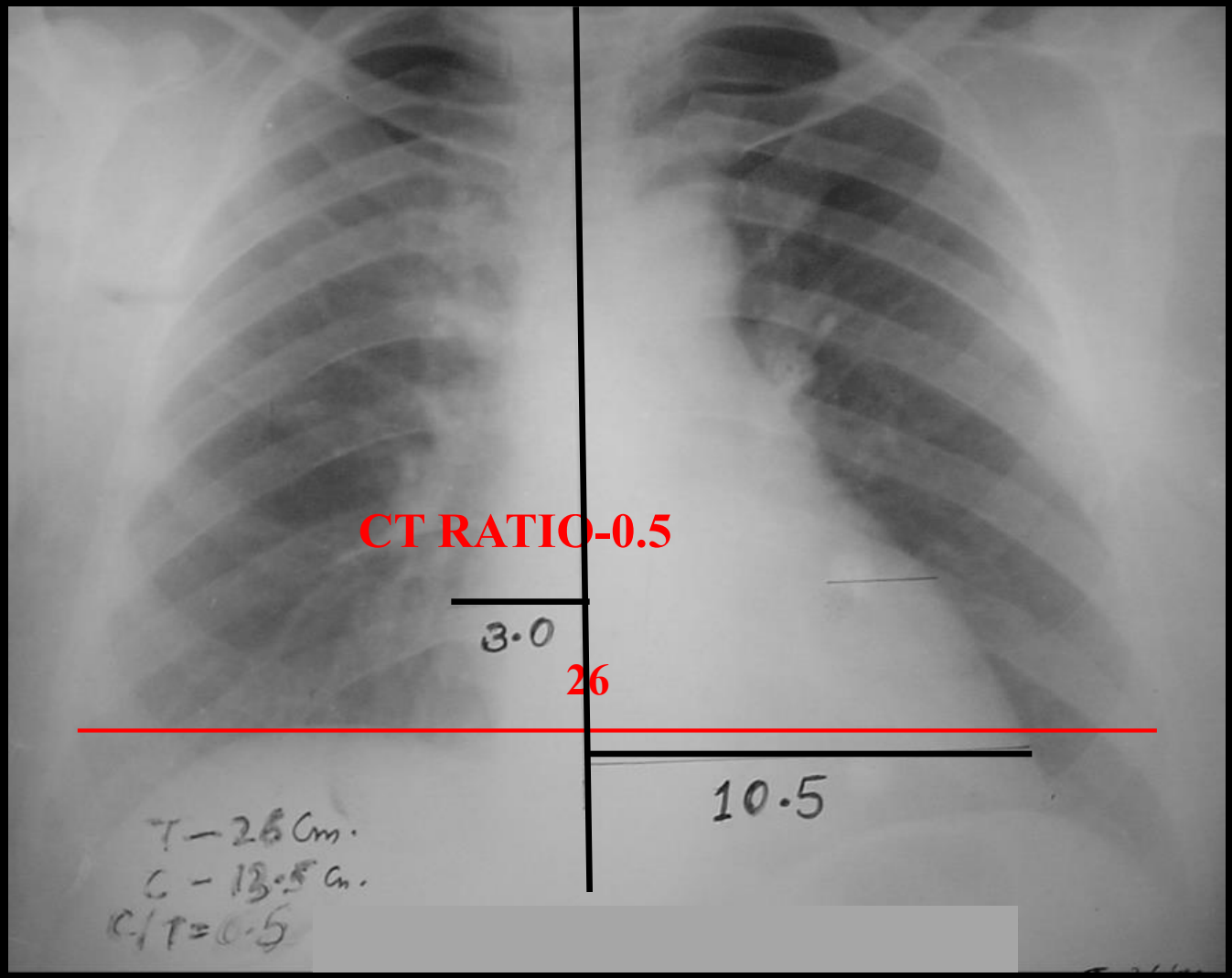
NORMAL HEART

Size of heart*

- Cardiothoracic ratio** < 50%
- Transverse diameter of the heart < 15.5cm
- Diff. between two identical X-rays <1.5cm

***Pre - requisites** : PA View in full inspiration with no rotation & scoliosis

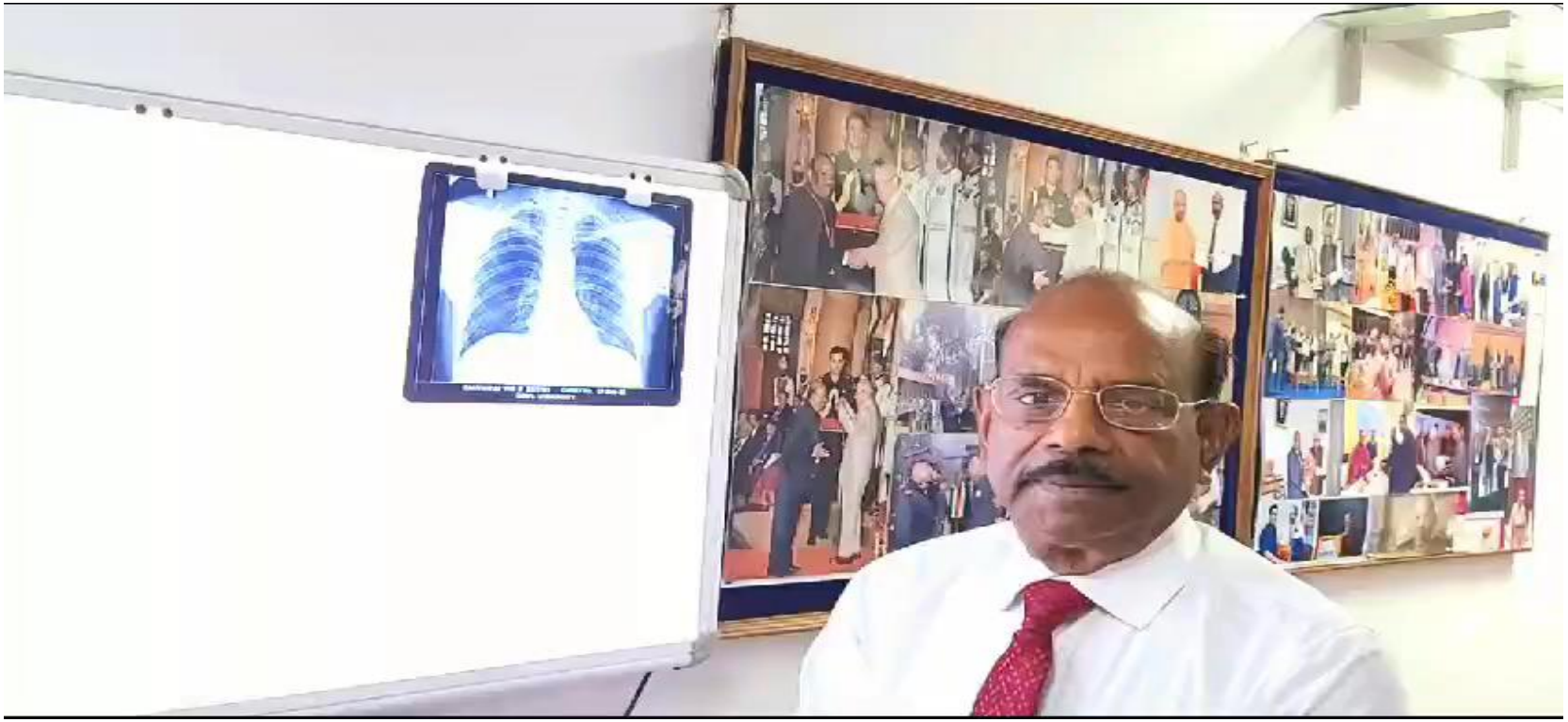
** Cardiothoracic ratio (CT ratio) Maximum diameter of heart/maximum diameter of thorax



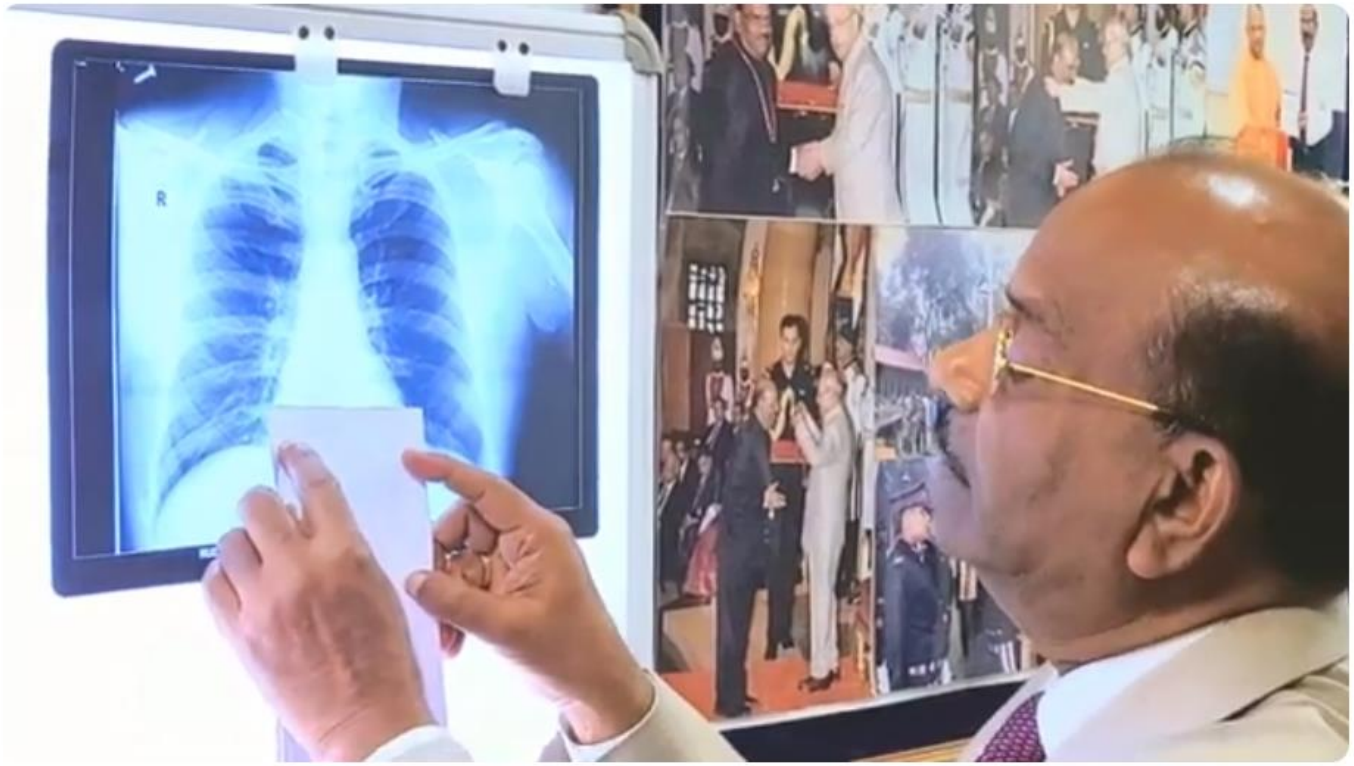
The cardiothoracic ratio is obtained by dividing the transverse cardiac diameter [sum of the horizontal distances from the right and left lateral-most margins of the heart to the midline (vertical line from spinous processes of the vertebral bodies)] by the maximum internal thoracic diameter (usually horizontal line drawn from highest point of right dome of diaphragm)

Normal cardiac size(Cardiothoracic ratio .5) in inspiratory film

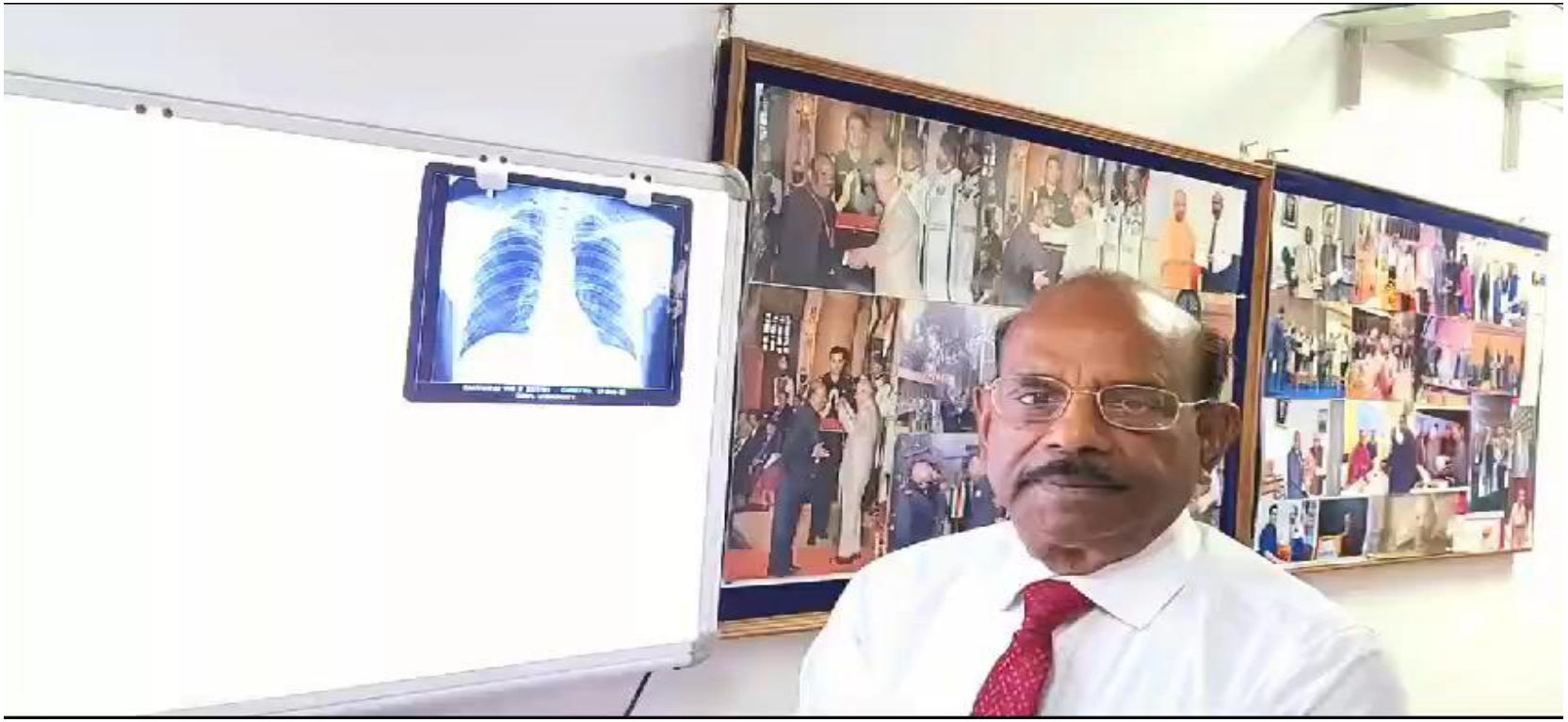
Cardiothoracic ratio measurement using paper method YouTube video in English



CARDIOTHORACIC RATIO CALCULATION SIMPLIFIED - PAPER METHOD DEVISED BY PROF. RAJENDRA PRASAD



Cardiothoracic ratio measurement using paper method YouTube video in English

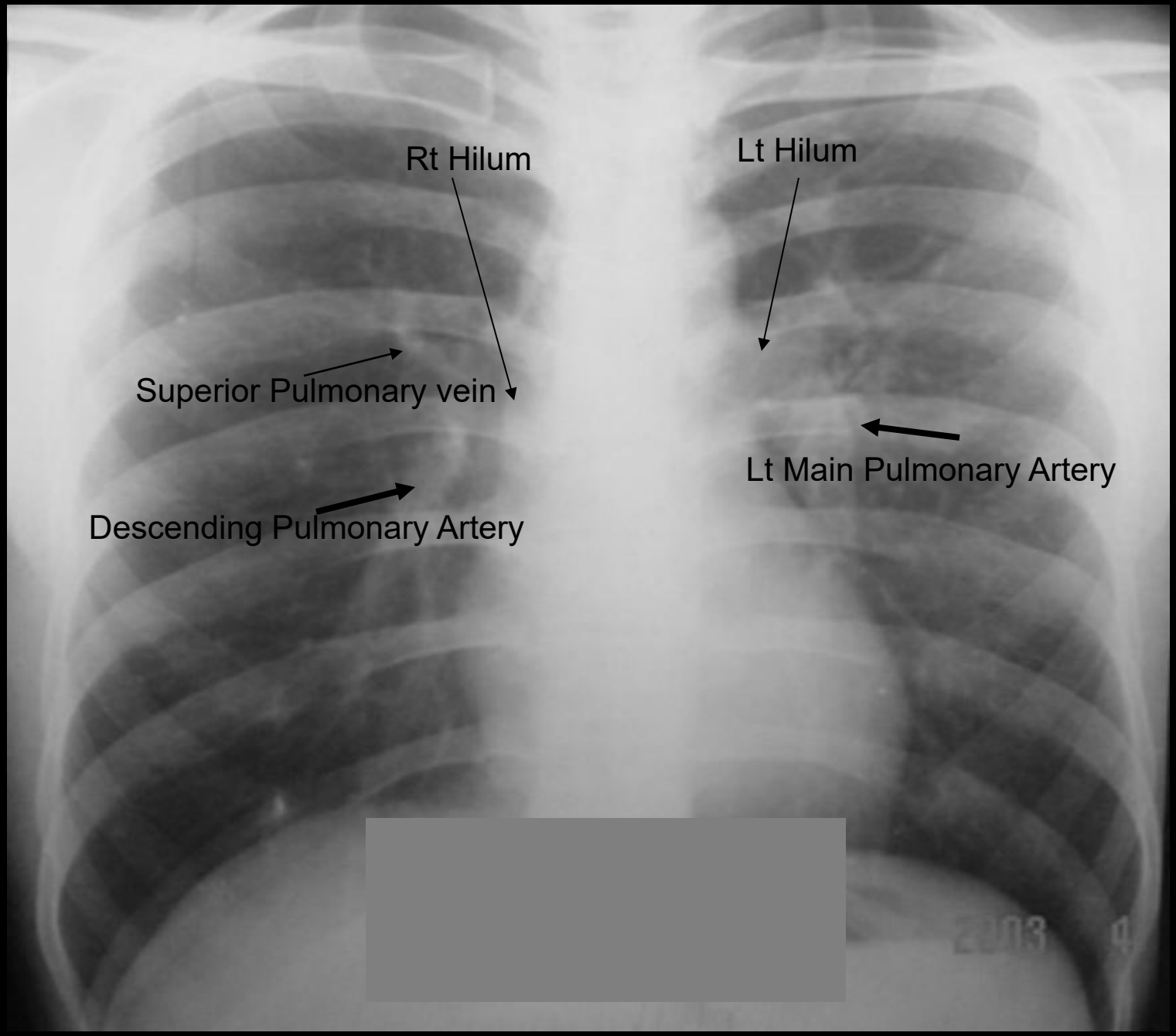


APPROACH TO CHEST X-RAYS

Hilum

Hilum composed of:

- Pulmonary arteries & main branches
- Upper lobe Pulmonary Veins
- Major Bronchi
- Lymph Nodes


Rt Hilum
Lt Hilum
Superior Pulmonary vein
Lt Main Pulmonary Artery
Descending Pulmonary Artery

HILUM

- Size
- Position
- Shape
- Radio Opacity

HILUM

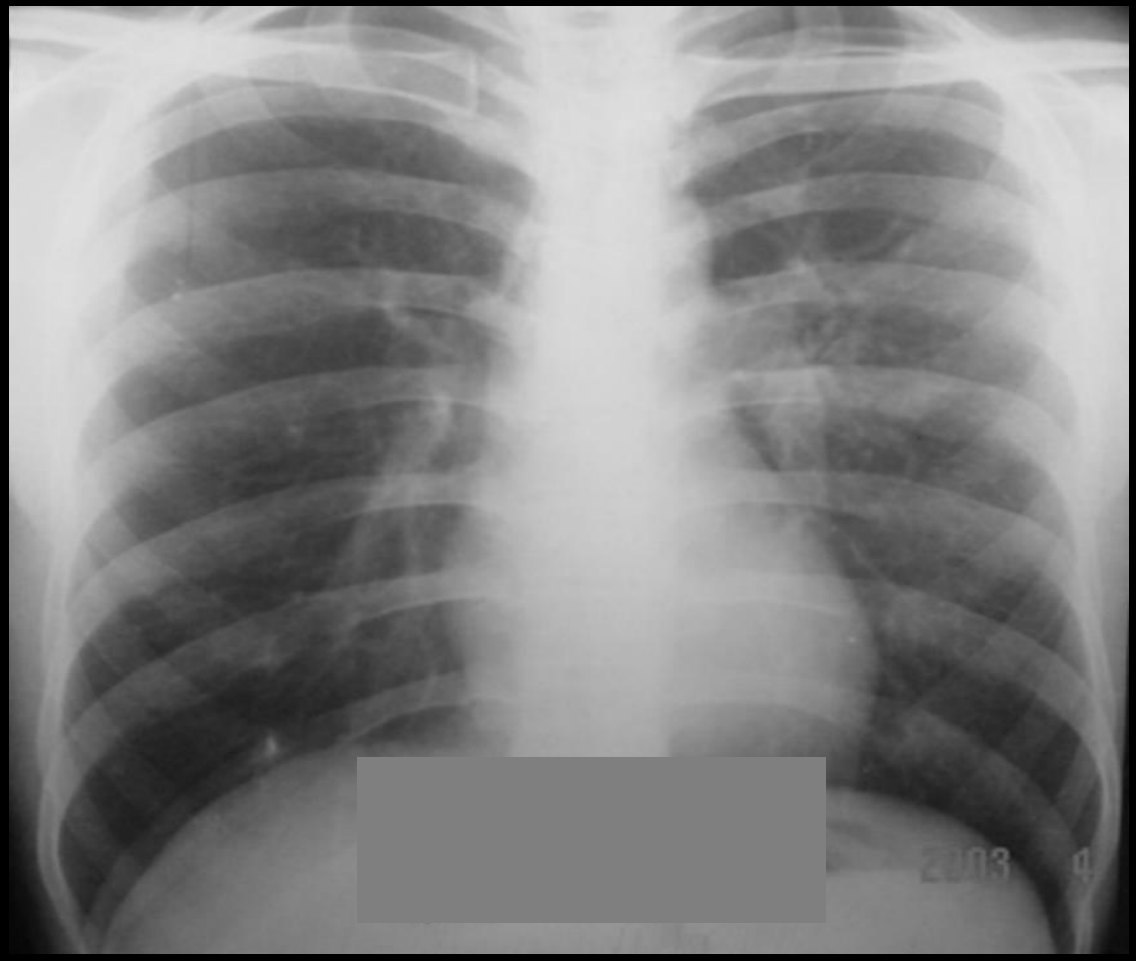
Size of hilum

- Normal
- Enlarged
  - Unilateral
  - Bilateral
- Small

ENLARGED HILUM

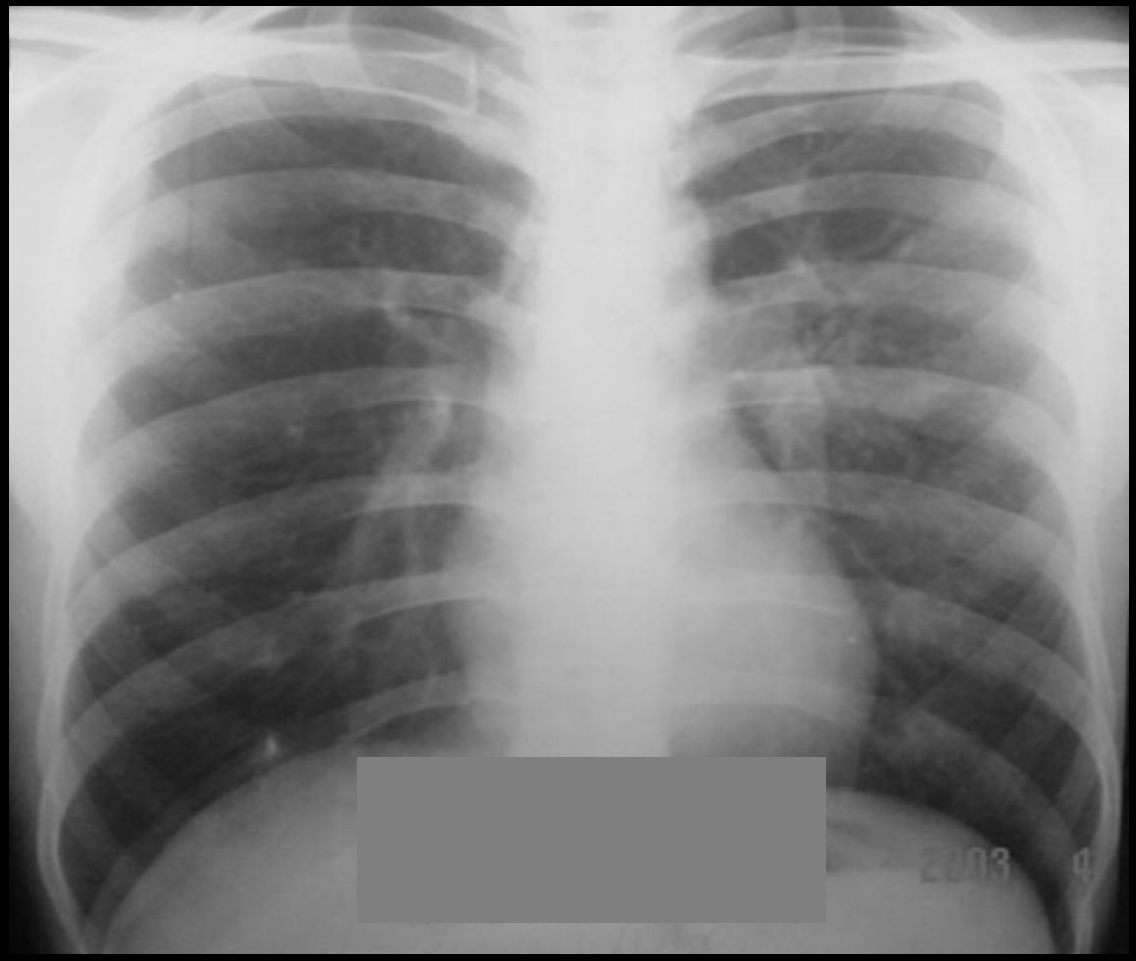
Unilateral

- Rotation
- Neoplasm
- Enlarged Lymph Node
- Pulmonary artery thromboembolism
- Pulmonary artery aneurysm
- Idiopathic congenital Dilatation
- Pulmonary valve stenosis
- Scoliosis



Is the hilum enlarged?

Always check for rotation before commenting on hilum size.



No, left hilum appears to be enlarged because of left anterior oblique rotation.

ENLARGED HILUM

Bilateral

- Expiratory film
- Lymph Node

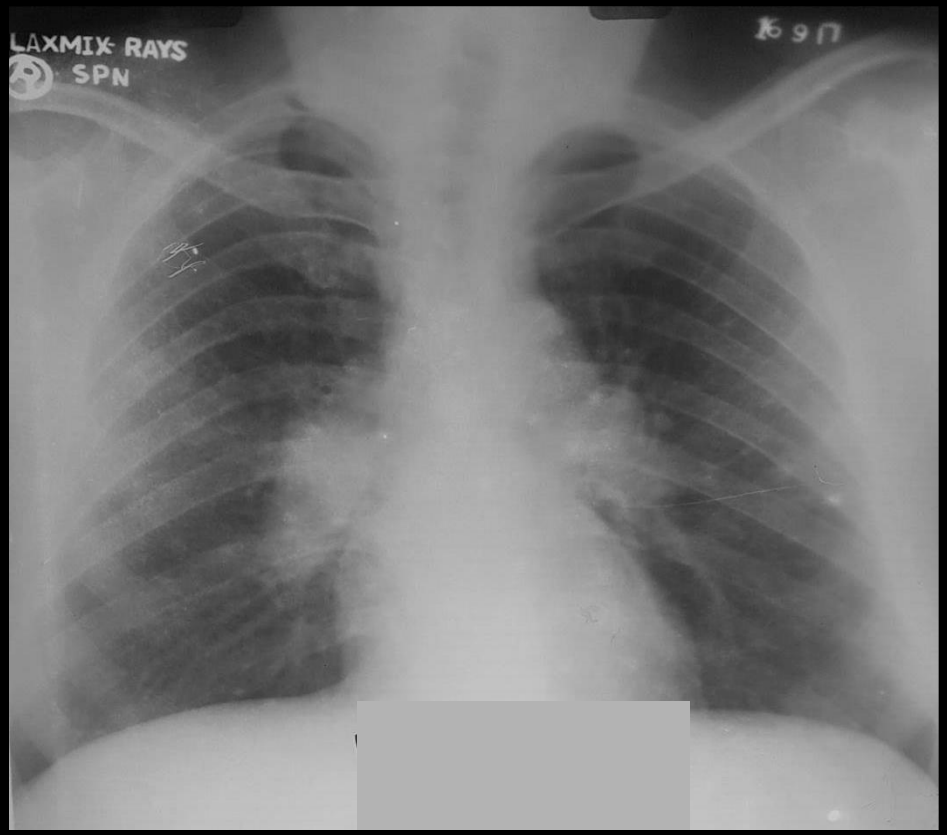
  Tuberculosis, Fungal Infection, Sarcoidosis

  Silicosis, Reticulosis,

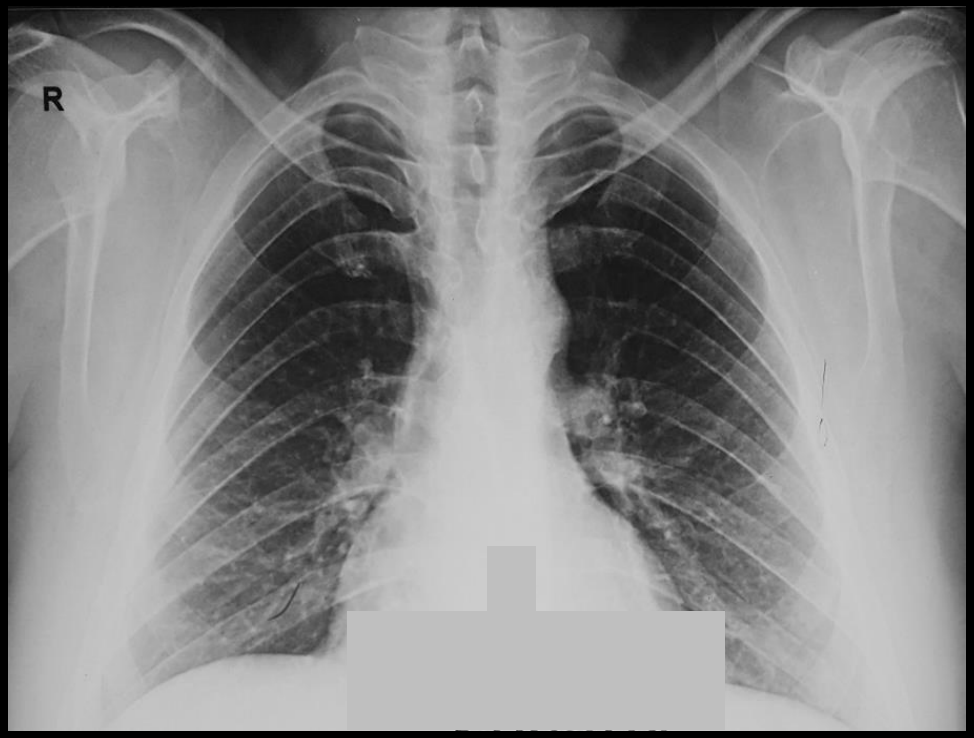
  Lymphoma, Leukemia, Metastasis
- Pulmonary hypertension
- Pulmonary Embolism
- Congenital Heart Disease (Lt - Rt Shunts)

  PDA,VSD,ASD

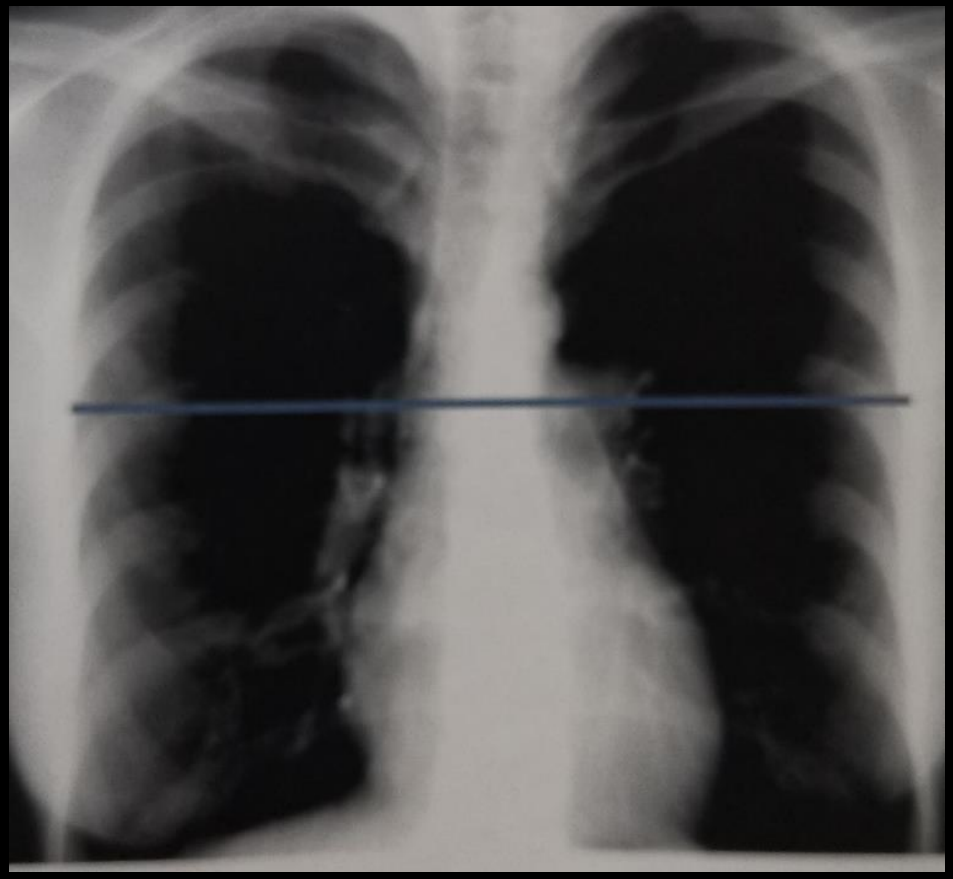
  Post operated Fallots Tetralogy
- Polycythemia



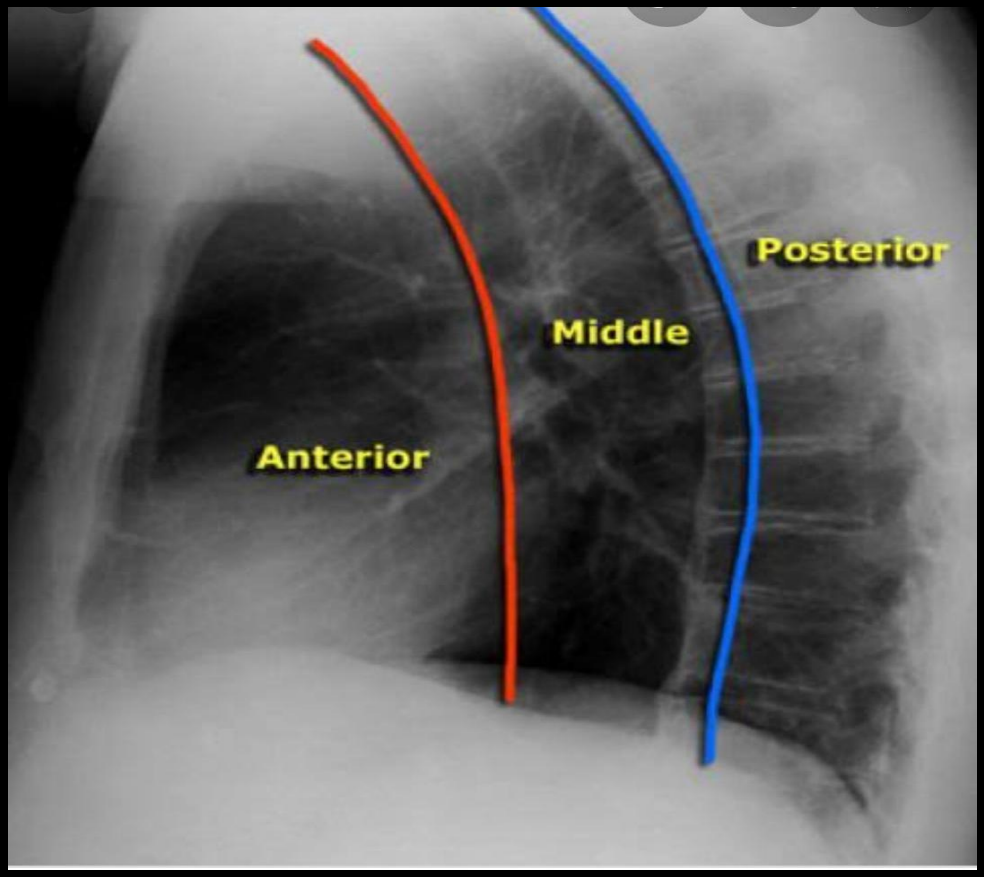
Bilateral hilar lymph node enlargement cause Sarcoidosis



Hilar lymph nodes regressed after treatment



The boundary line between the superior and inferior mediastinum is the tracheal bifurcation



On lateral x-ray

APROACH TO CHEST X-RAY

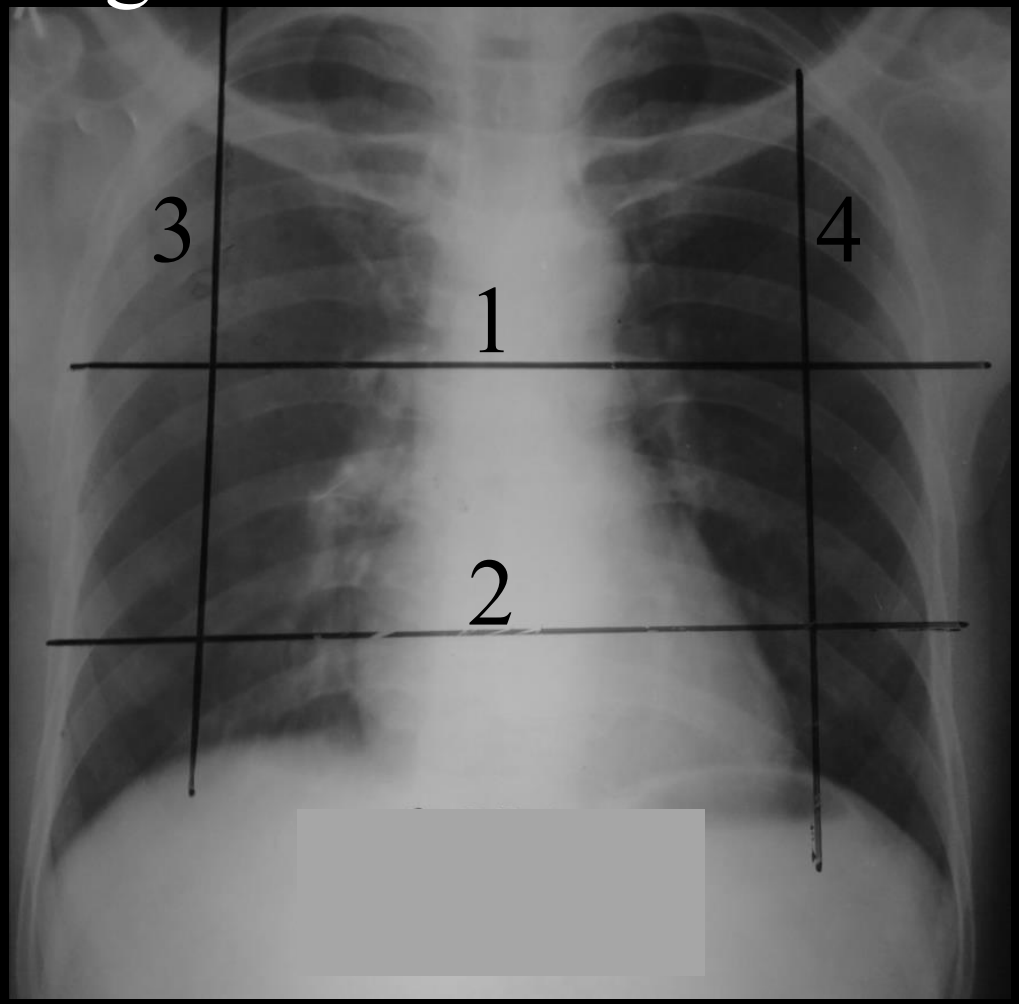
Lung Parenchyma

Right Left

Upper zone

middle zone

lower zone



Lung parenchyma is divided into 6 zones

1: Horizontal line drawn from inferior border of anterior end of 2nd rib

2: Horizontal line drawn from inferior border of anterior end of 4nd rib

3 and 4: Midclavicular line on both sides. (midclavicular line divides each zone into 2 parts: medial and peripheral.)

In the Expiratory film lower zones are not visible

APROACH TO CHEST X-RAY

Lung Parenchyma

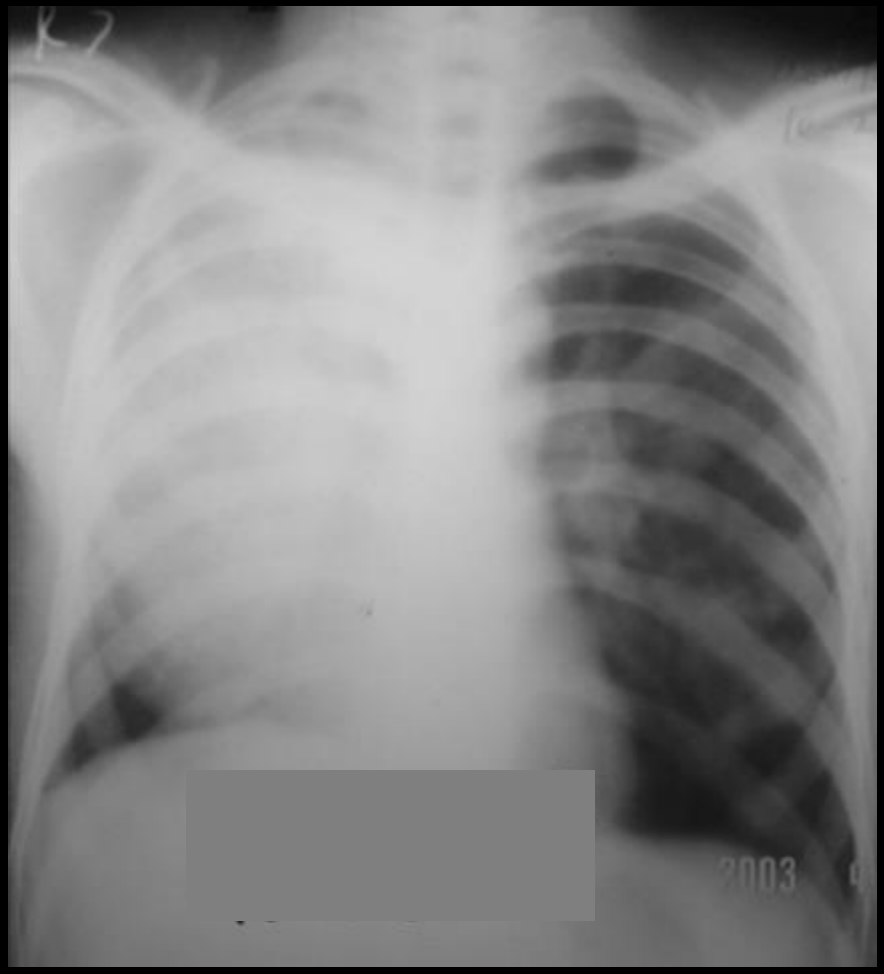
- Hemiopacity
- Hyper Translucency
- Infiltration
- Cavity
- Miliary Shadow
- Nodular Shadow
- Rounded Shadow
- Calcified Shadow

LUNG PARENCHYMA

Hemiopacity

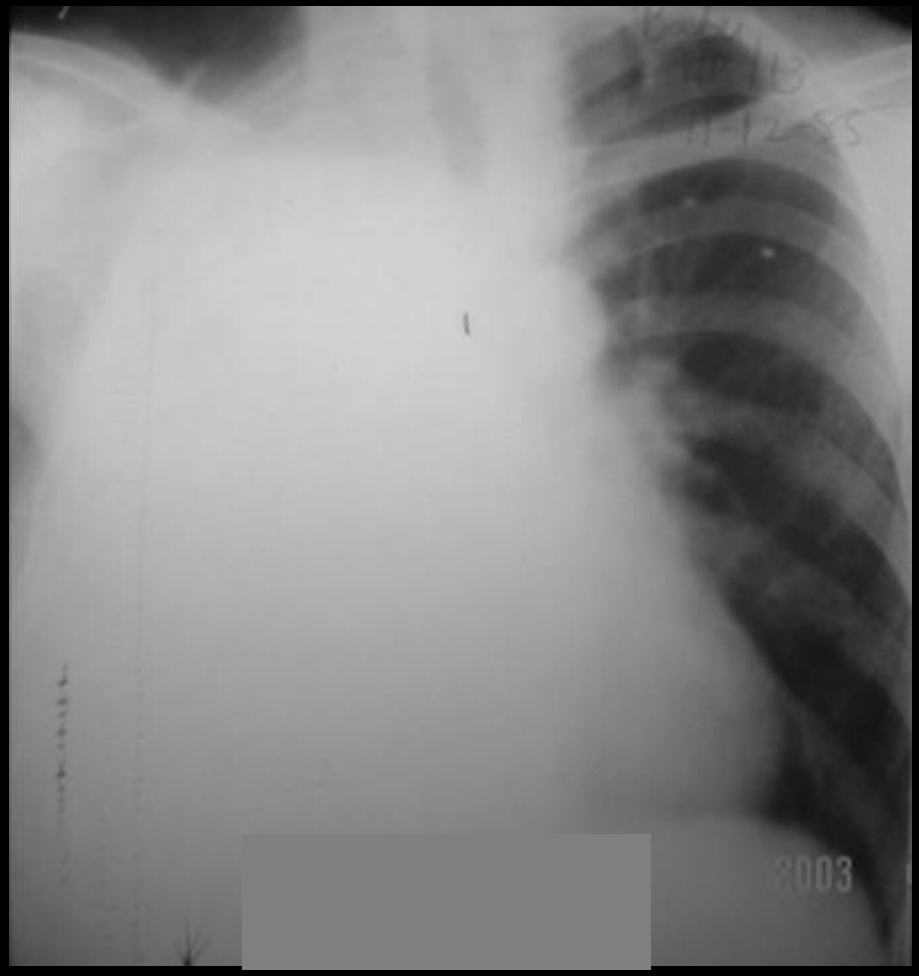
- Agenesis of Lung
- Pleural Effusion
- Consolidation
- Collapse
- Fibrosis
- Mass
- Pneumonectomy

D/D HEMIOPACITY



Radio opaque shadow with no mediastinal shift
Consolidation (Right Lung)

D/D HEMIOPACITY

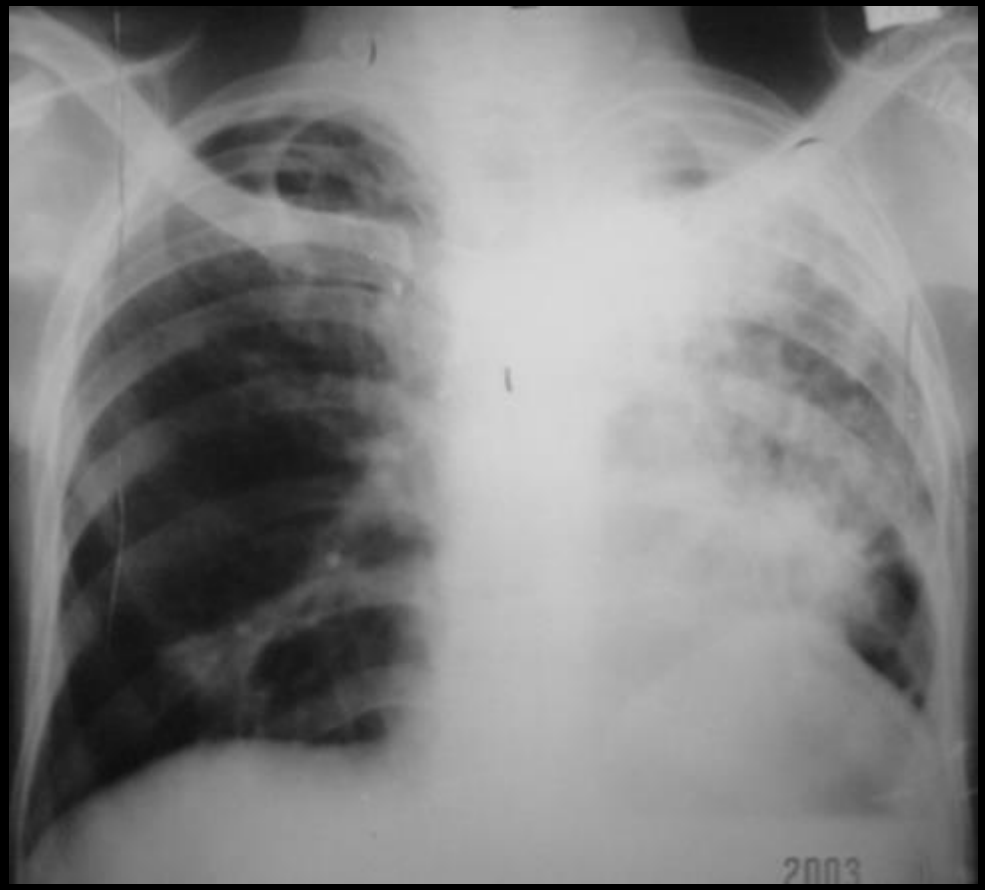


Radio opaque shadow with mediastinal shift to opposite side.
Massive Pleural Effusion (Right)

D/D HEMIOPACITY

Radio opaque homogenous shadow with mediastinal shift to same side.
Collapse (Left Lung)

D/D HEMIOPACITY



Heterogeneous radio opaque shadow with mediastinal shift to same side cause Fibrosis Left Lung

Chest Radiology in Tuberculosis

Agenda

- How to approach chest x ray
- Chest xray presentation in pul tuberculosis
- D/D of pul tuberculosis

Diagnosis of Tuberculosis

Chest X ray

- Sensitive but not specific
- Identifies persons for further evaluation
- Diagnosis of Tuberculosis cannot be established by x-ray alone
- Reliance on CXR alone may result in over diagnosis
- Quality control in terms of technical quality and physician interpretation

Murder of the Chest Xray

Chest Xray- low senstivity

Whose sensitivity

Radioligist/Pulmonologist

Chua AP, Mehta AC J Bronchol Intervent Pulmonol 2011

Diagnostic evaluation of pulmonary tuberculosis: What do doctors of modern medicine do in India ?

- Diagnostic practices of 518 doctors who prescribed ATT analysed.
- 99.8% doctors used chest x-ray while 49.2% advised chest x-ray alone for diagnosis of PTB.
- 50.6% advised sputum microscopy while none used it without chest x-ray
- Non utilization of sputum microscopy was associated with significantly higher probability of prescribing of ATT in patients with Non Tuberculous conditions (OR – 5, 95 CI- 2.7-9.8)

Prasad R et.al INT J Tuberc Lung Dis 2003;7:52-87

Various non-Tuberculous Diseases treated as PTB by doctors (n = 270)

Non-Tuberculous disease	n (%)
Bronchogenic carcinoma	14 (5.2)
Chronic Obstructive Pulmonary Diseases	11 (4.1)
Adequately treated healed PTB	10 (3.7)
Bronchiectasis	7 (2.6)
Pyogenic infection of lungs/pleura	5 (1.9)
Asthma	3 (1.1)
Mitral stenosis	3 (1.1)
Ear, nose and throat disease	2 (0.7)
Total incorrect diagnosis of PTB	55 (20.4)

Prasad R et.al INT J Tuberc Lung Dis 2003;7:52-87

A STUDY ON DISPARITY BETWEEN CHEST X-RAY REPORTING AND ACTUAL DIAGNOSIS

R. Prasad, R.GARG, S.K. Verma, S.Ojha, & R. Dawar

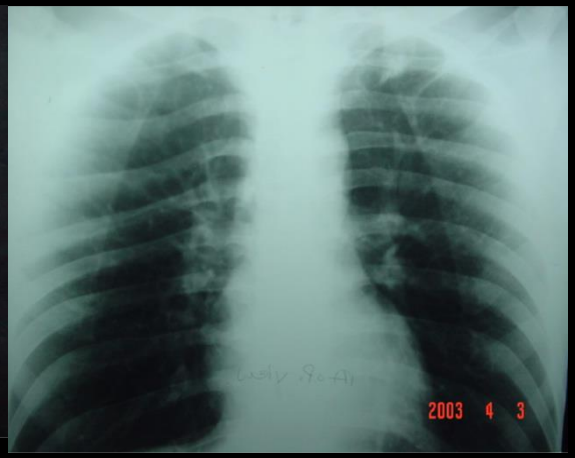
Department of Pulmonary Medicine,

K. G, s. Medical University, Lucknow

CONCLUSION

- Poor quality x-rays are common
- Over dependence on chest x-ray reports or diagnosis of chest diseases through chest x-ray alone can lead to misdiagnosis

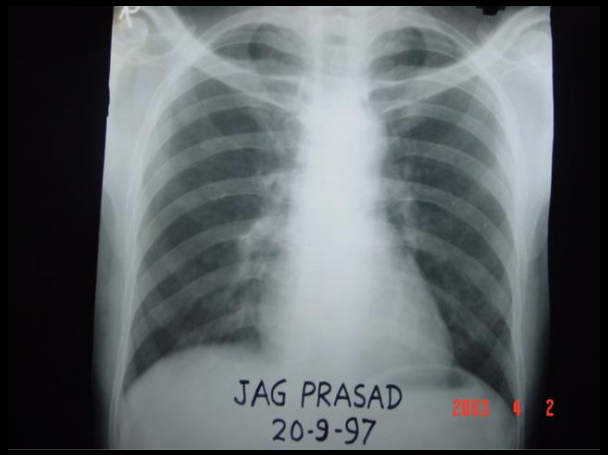
Quality of X-Ray



Poor quality chest X-Rays

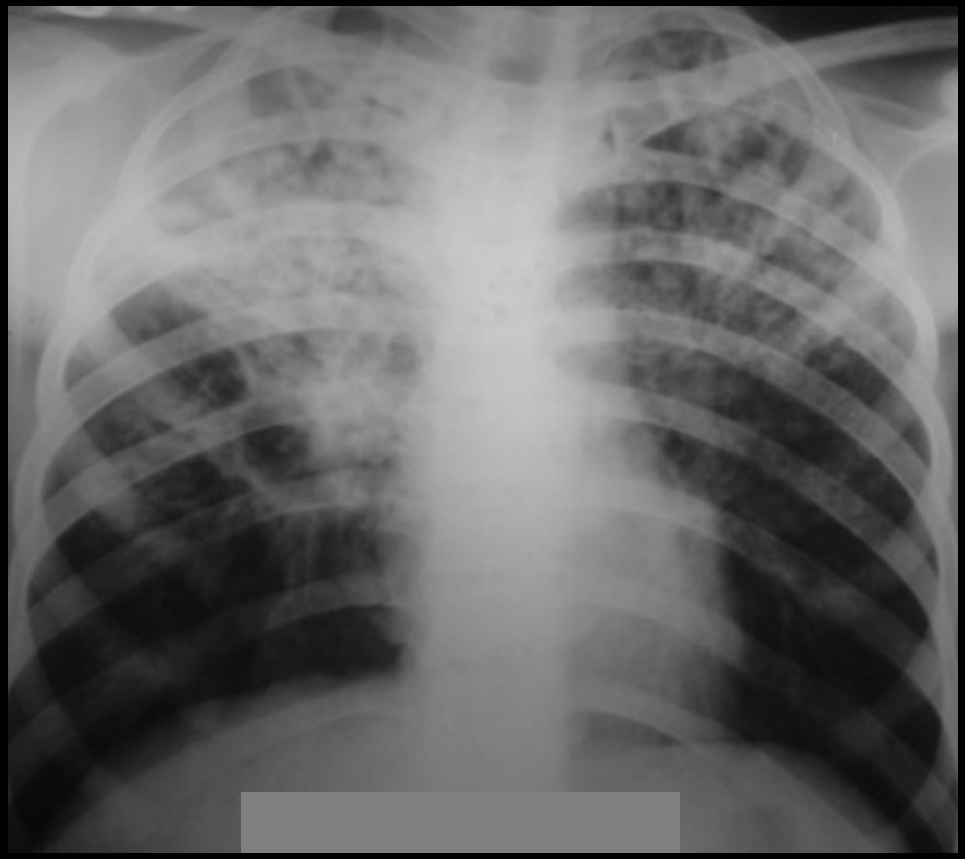
Do not try to read

Throw into dustbin



Good quality

RADIOLOGY IN TUBERCULOSIS



Bilateral Pulmonary Tuberculosis

A 40 Years-old-male presented with C/O

Fever - 3 Months
Cough - 2 Months
Hemoptysis - 2 Months
Loss Of Weight - 2 Months
Loss Of Appetite - 2 Months

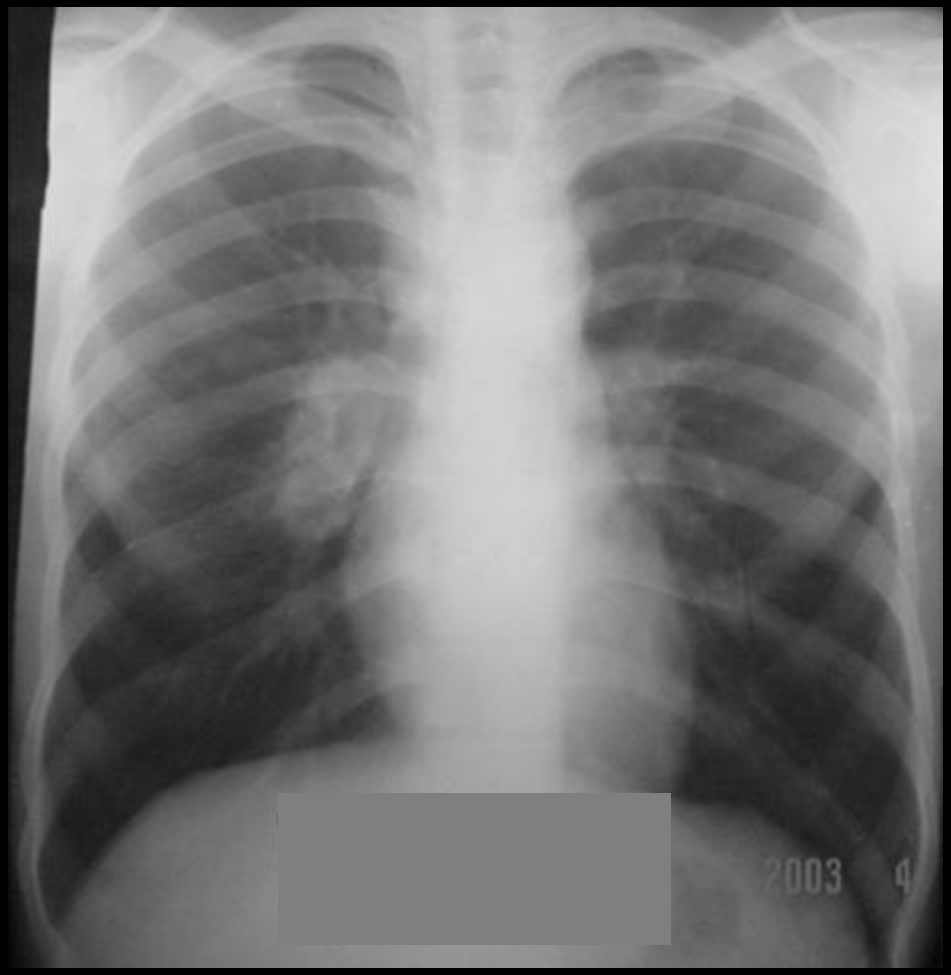
Sputum for Afb: POSITIVE

CXR –
RIGHT UPPER AND MIDDLE ZONE INFILTRATES WITH CAVITATION IN LEFT UPPER ZONE

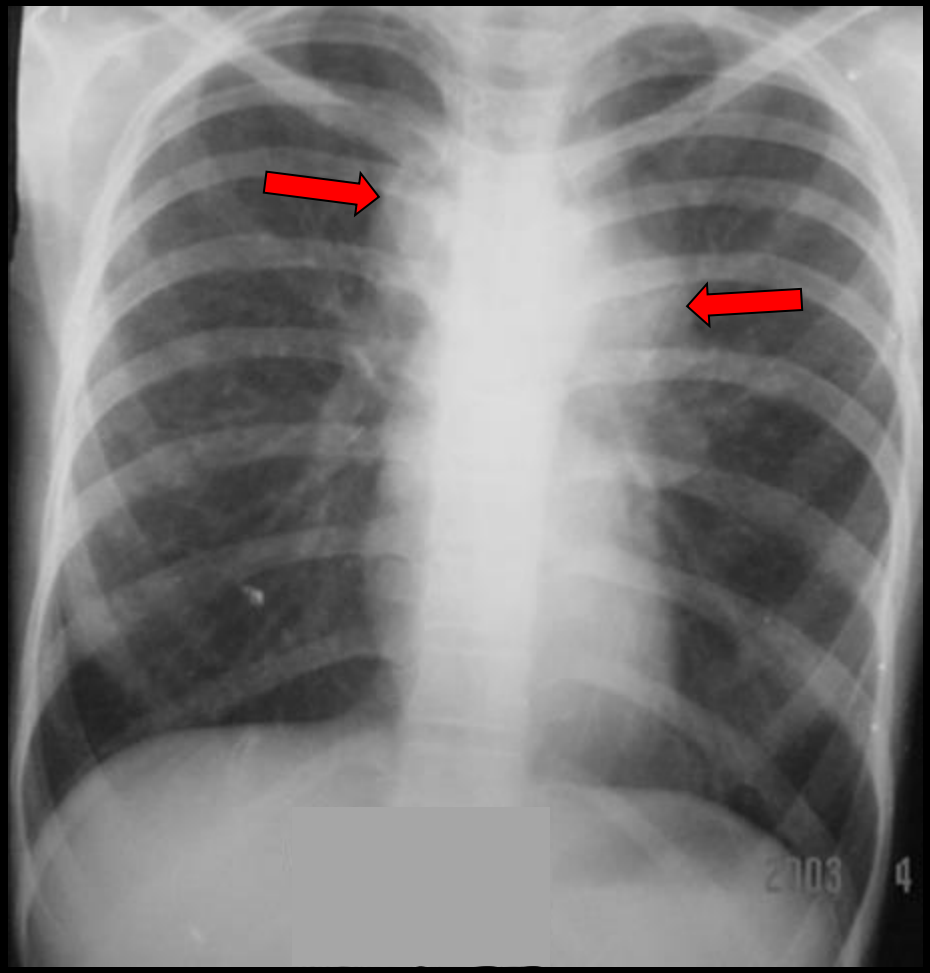
B/L Pulmonary Tuberculosis

Miliary Shadows cause Miliary TB

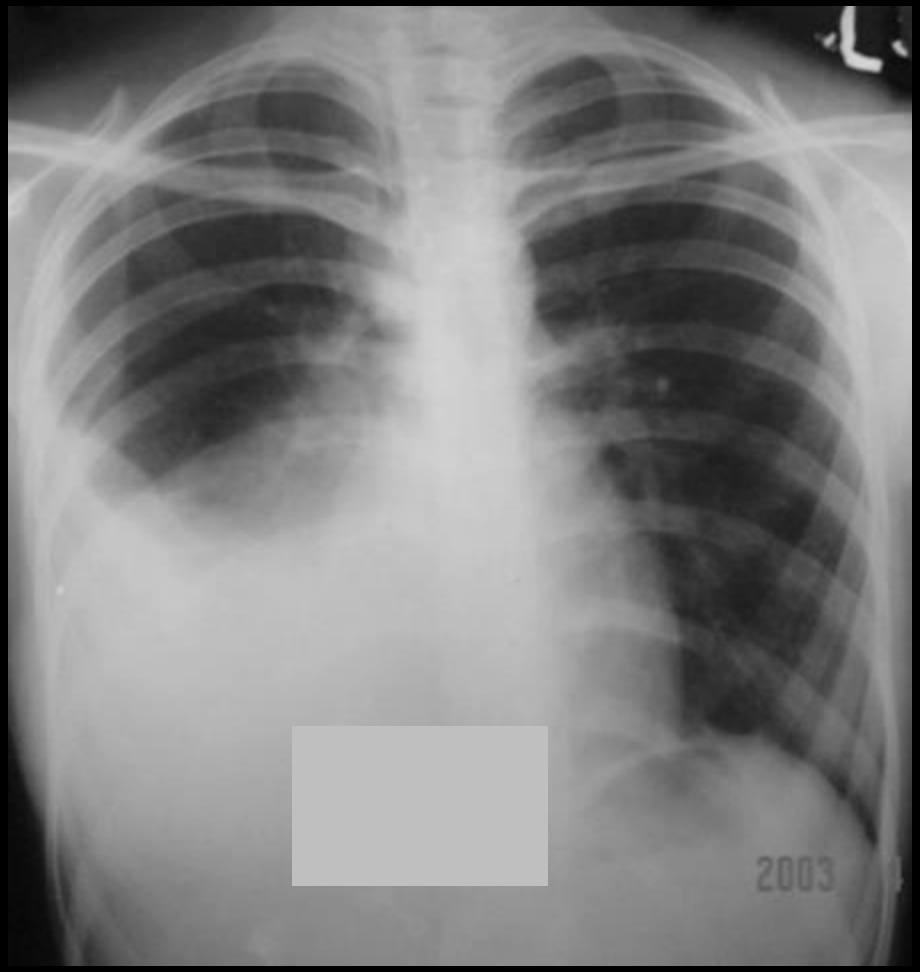
Miliary Shadows (Miliary TB)



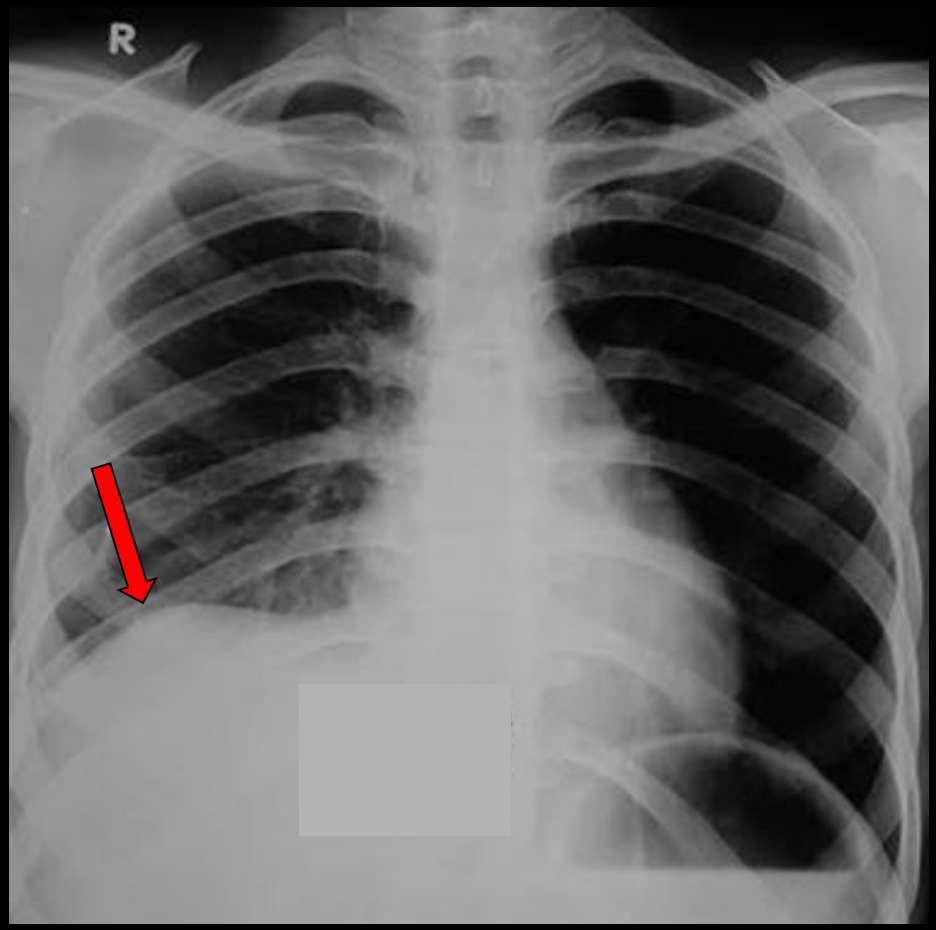
Hilar Lymphadenopathy (Right) cause Tuberculosis



Multiple mediastinal lymph node enlargement cause Tuberculosis

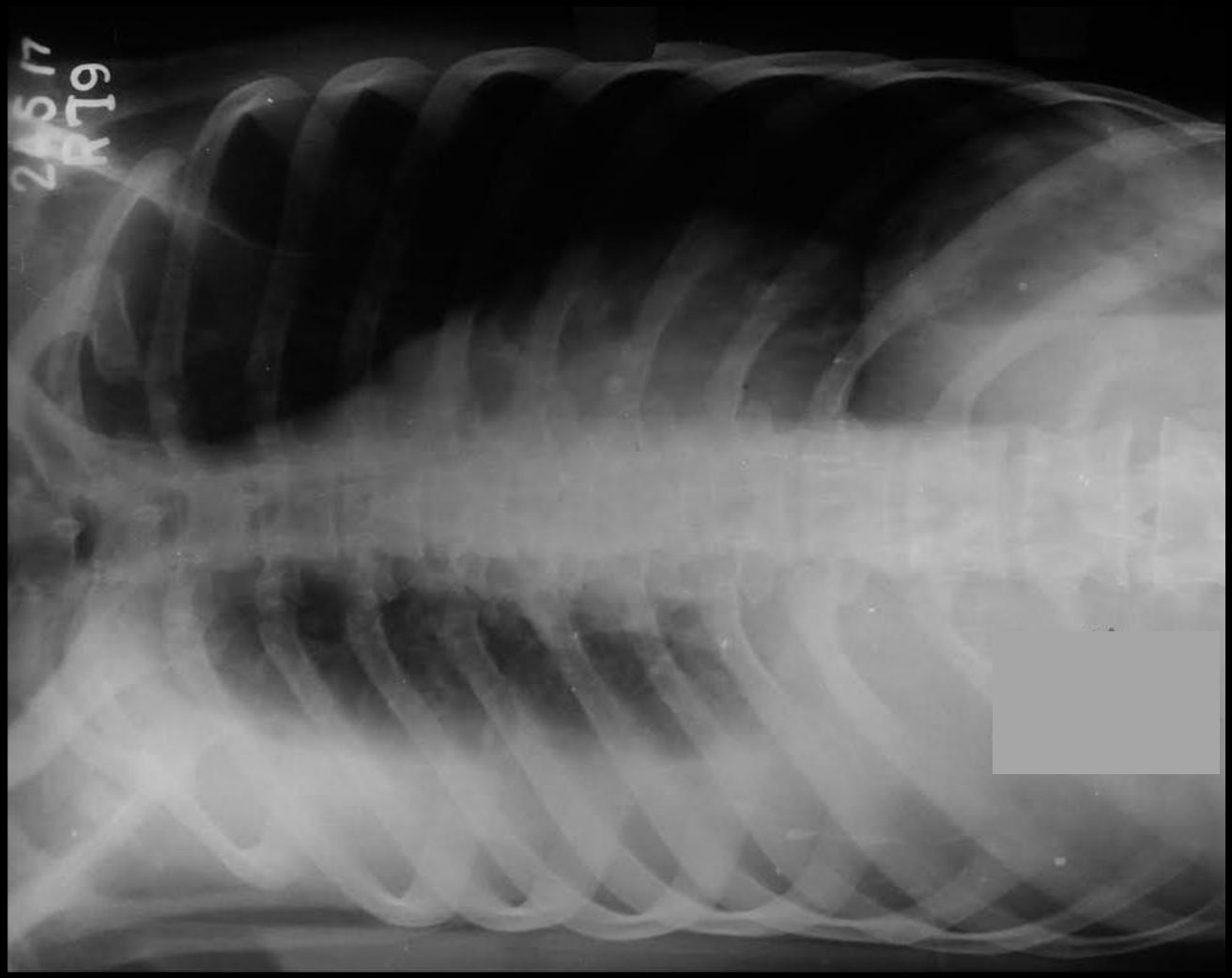


Moderate Pleural Effusion (Right) cause Tuberculosis

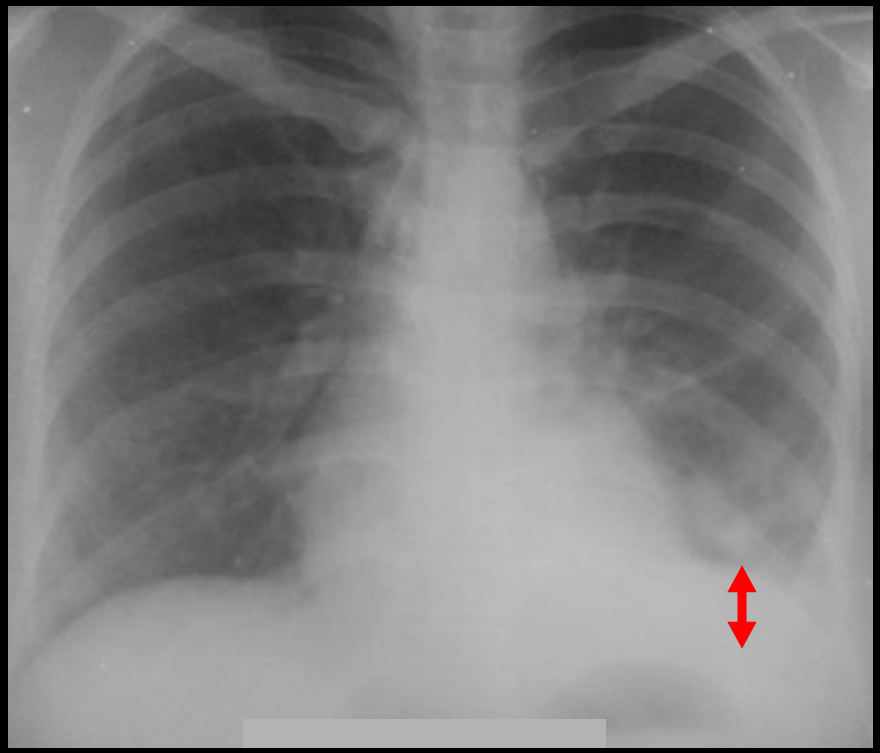


Raised dome of diaphragm with lateral shifting of highest point of diaphragm (Right)

Infrapulmonary Pleural Effusion cause Tuberculosis

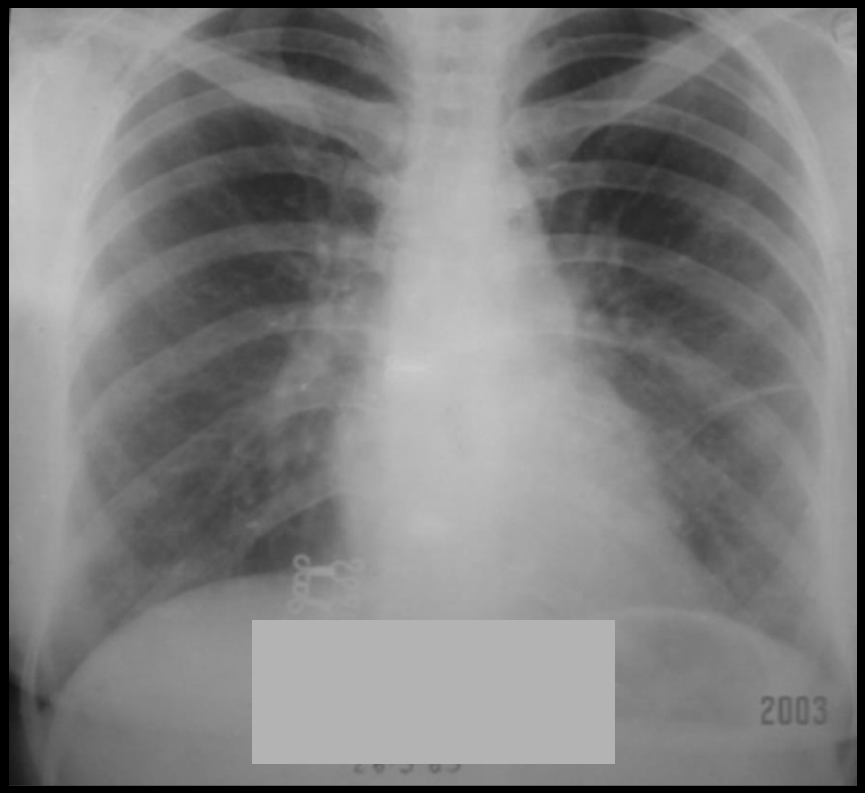


Right lateral Decubitus view shows Infrapulmonary pleural effusion (Right) cause Tuberculosis



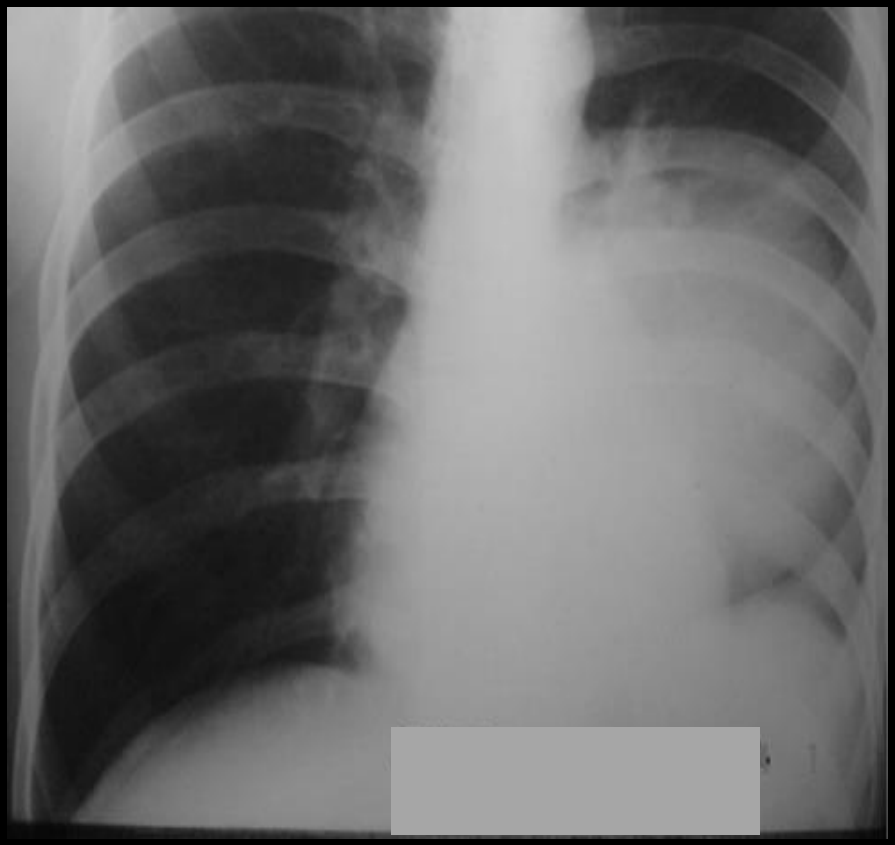
Unilateral Raised Diaphragm

Infrapulmonary Effusion (Left) cause Tuberculosis

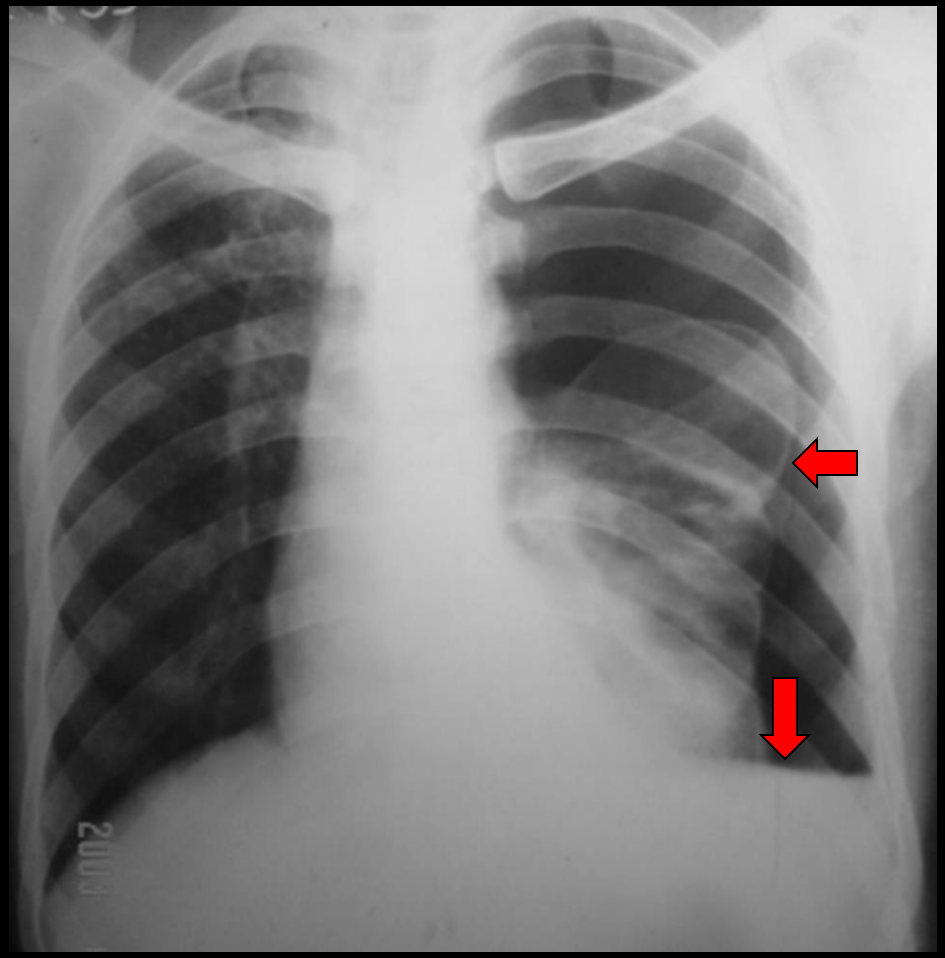


Left diaphragm normal after treatment

Encysted Pleural Effusion (Right) cause Tuberculosis

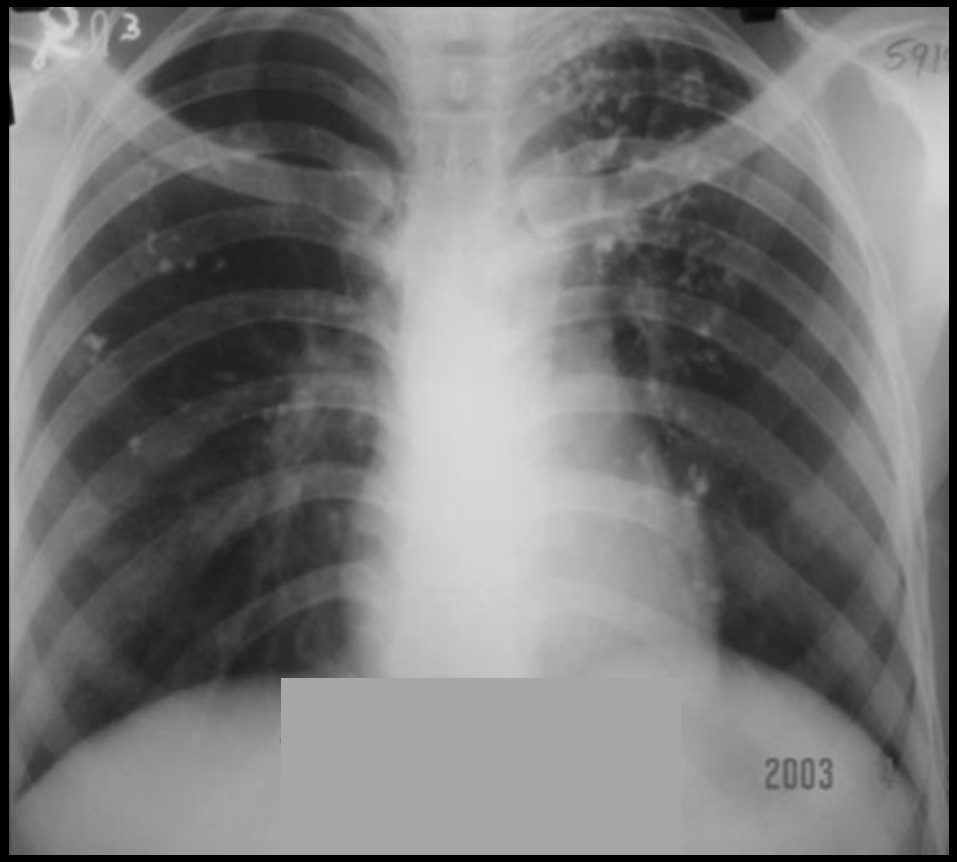


Encysted Pleural Effusion (Left) cause Tuberculosis

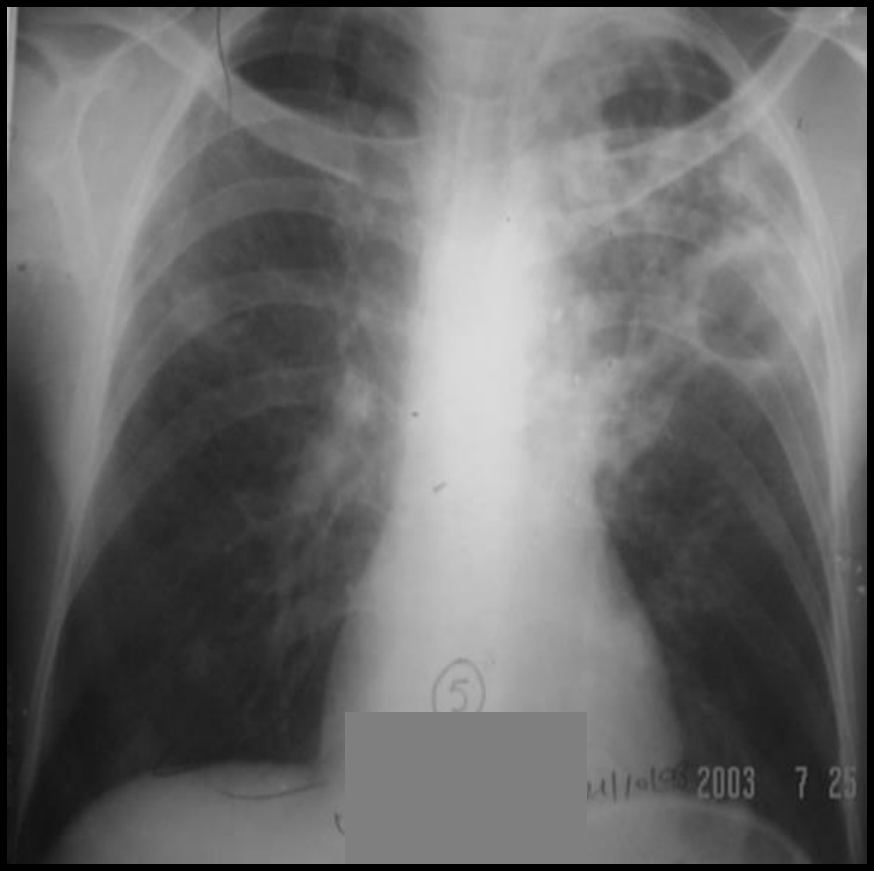


HydropneumoThorax (Left) cause Tuberculosis

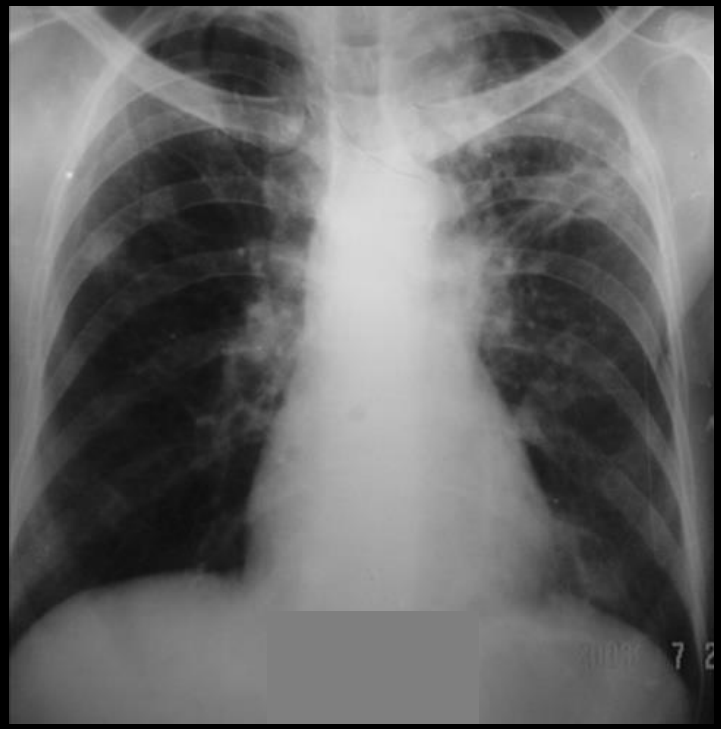
HOW TUBERCULOSIS HEALS ?



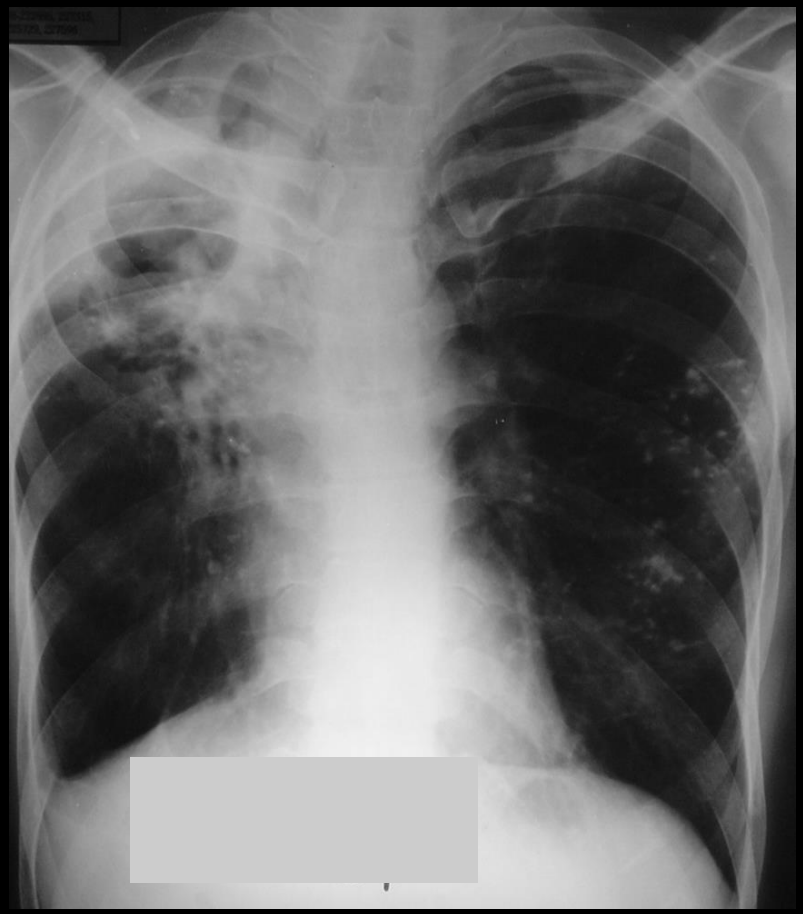
Intrapulmonary calcified shadows (Healed pulmonary Tuberculosis)



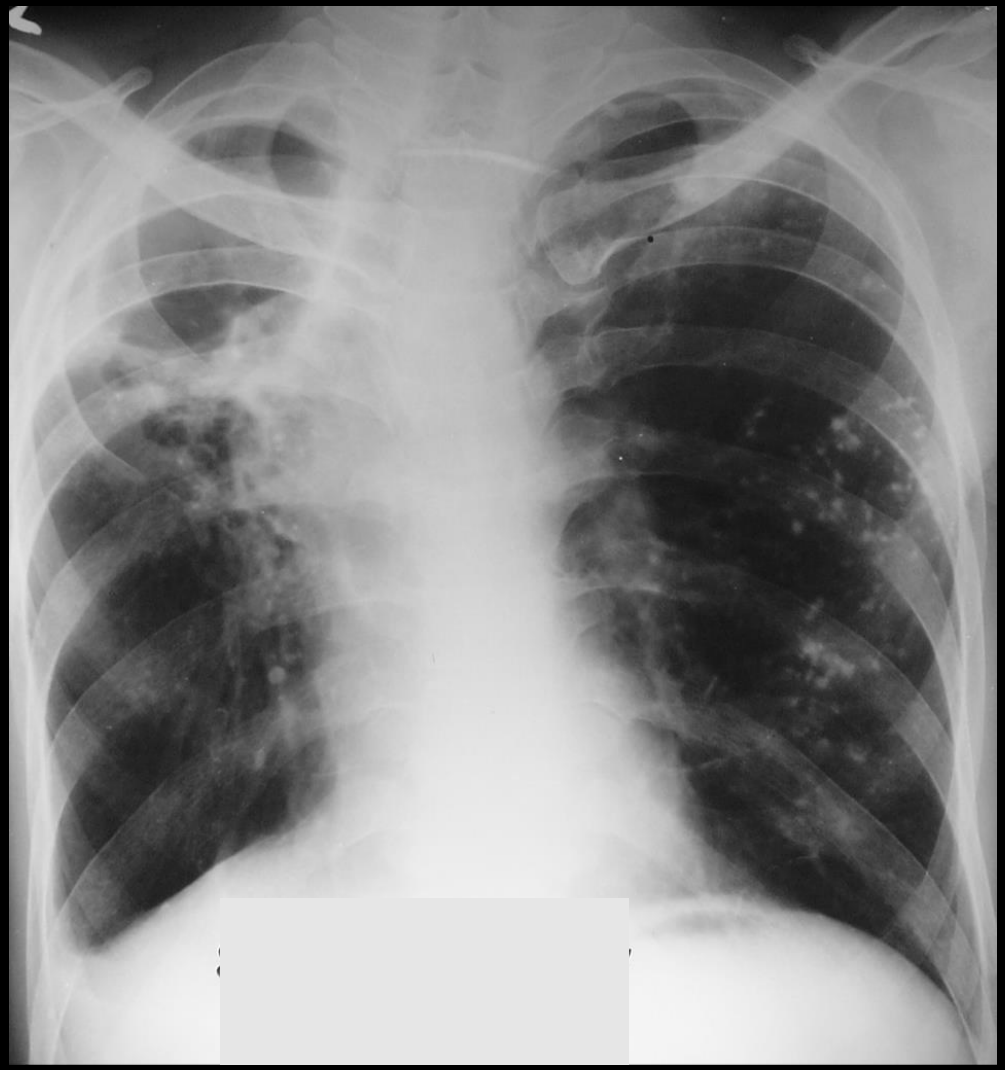
Cavity with infiltration left upper zone cause Pulmonary Tuberculosis



Healing of cavity under effective Antitubercular Treatment after 6 months.
Cavity has completely disappered, this is an example of a Close Healing of cavity



Cavity Right upper zone cause sputum positive pulmonary Tuberculosis



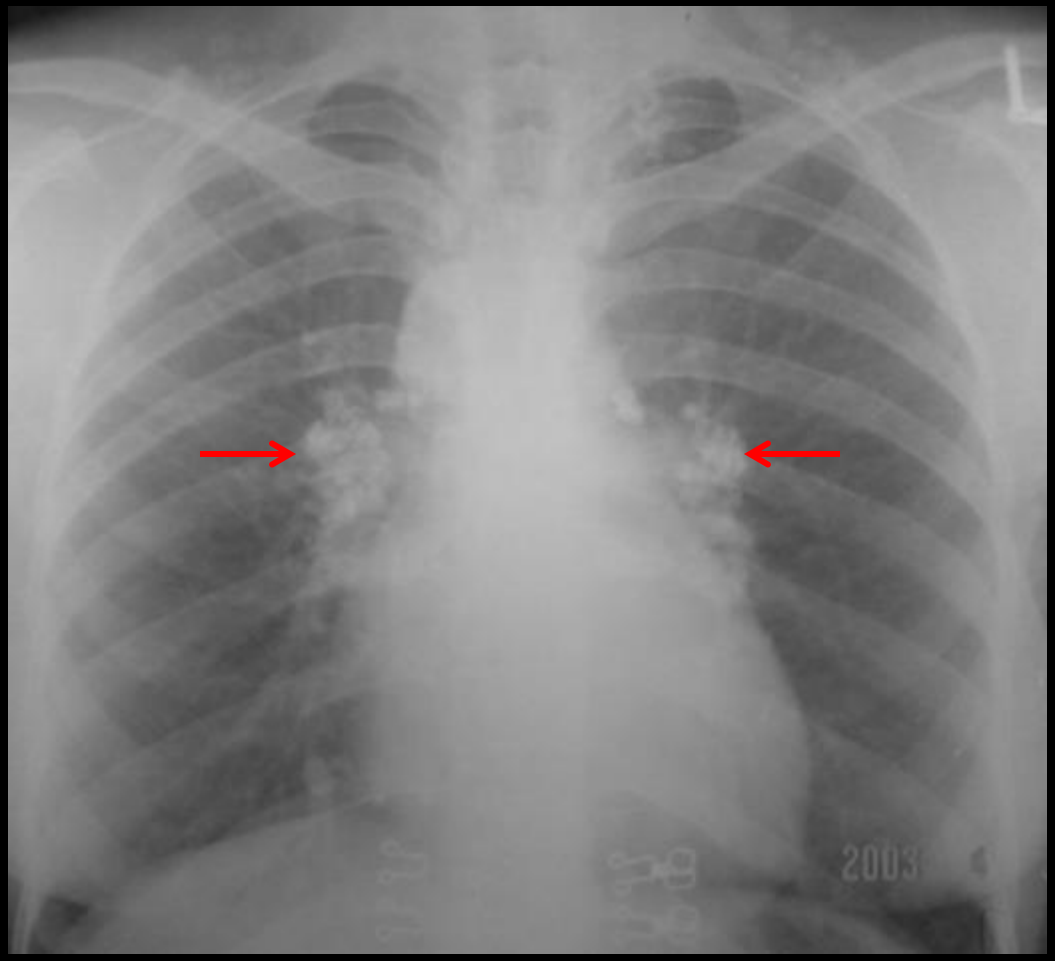
After 6 months of effective antitubercular treatment cavity became thin walled and is persisting but sputum became negative for AFB. This is an example of Open healing of cavity (Open Negative Syndrome)

50 year old male with cough and hemoptysis- 6 months (off & on) with history of adequate antitubercular treatment in past and sputum for AFB is negative

Bilateral upper zone thin walled cavities

Open Negative Syndrome (Healed Cavity)

Pleural Calcification (Right side) after adequate treatment of tubercular empyema



Calcified Hilar Glands (Bilateral)

Pleural Calcification

Thickened Pleura

Chest Radiology in Tuberculosis

Agenda

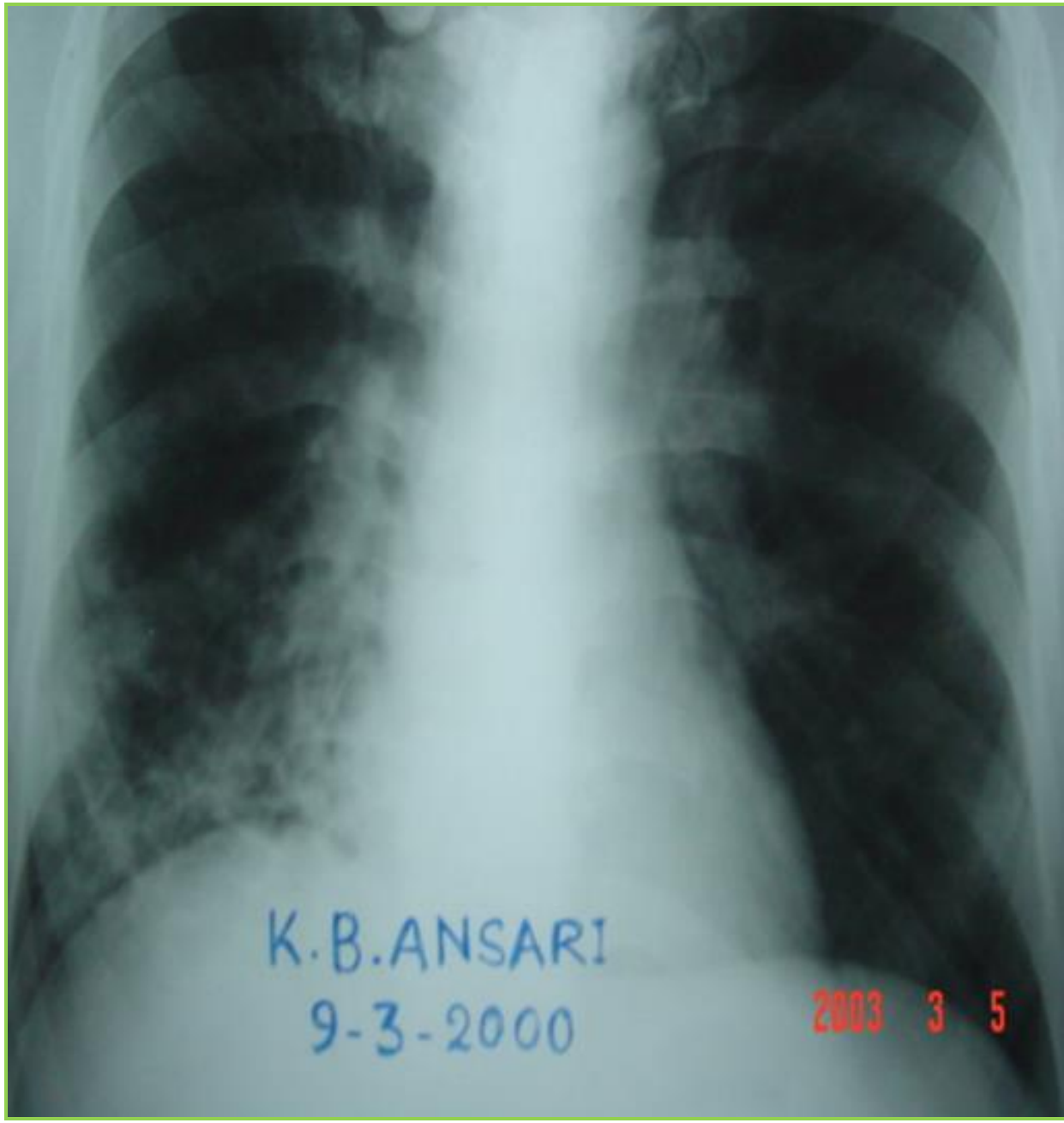
- How to approach chest x ray
- Chest xray presentation in pul tuberculosis
- D/D of pul tuberculosis

50 yr old male, non Smoker with C/O

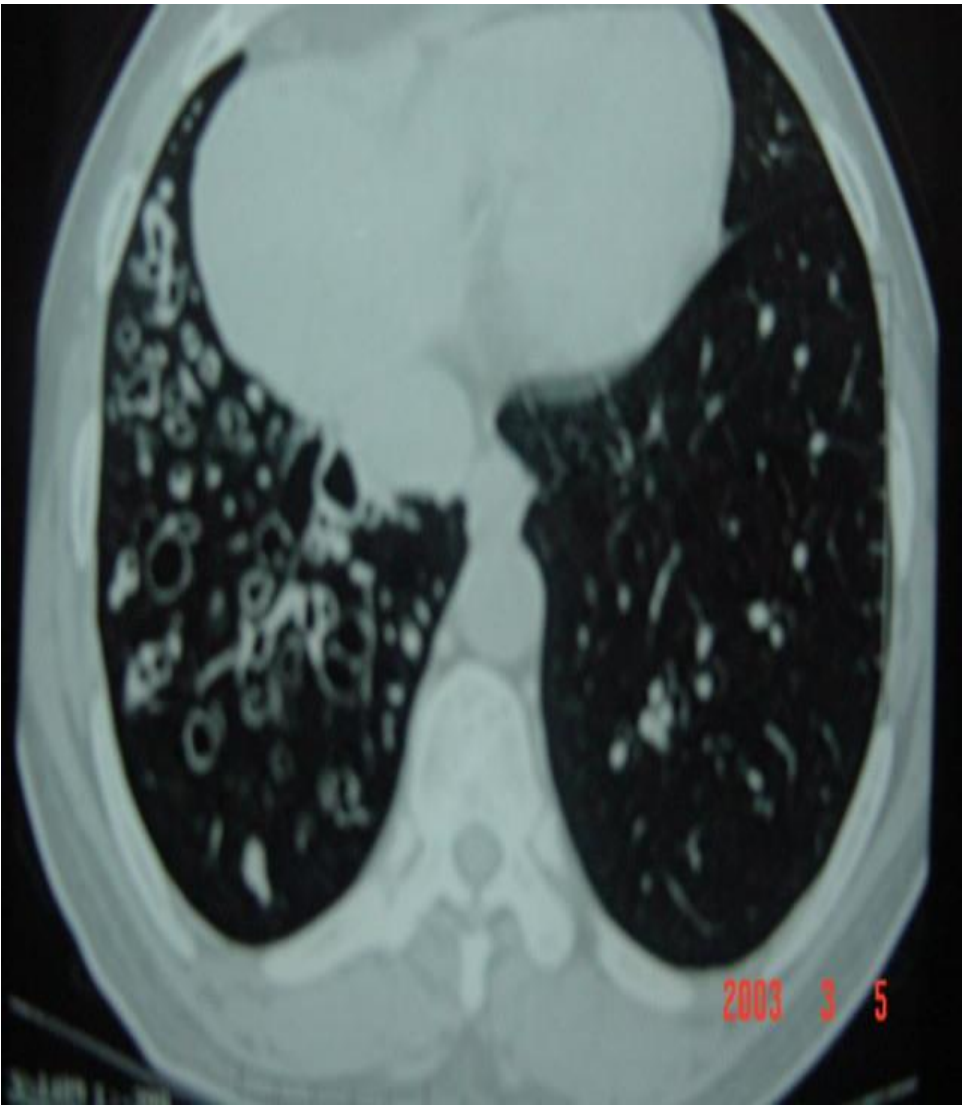
- Cough with copious expectoration - 10 years (off &on)
- Breathlessness - 4 years
- Hemoptysis - 2 years (off & on)

Chest X-Ray - Right Lower Zone Cystic Shadows(How to identify Cystic Shadow)

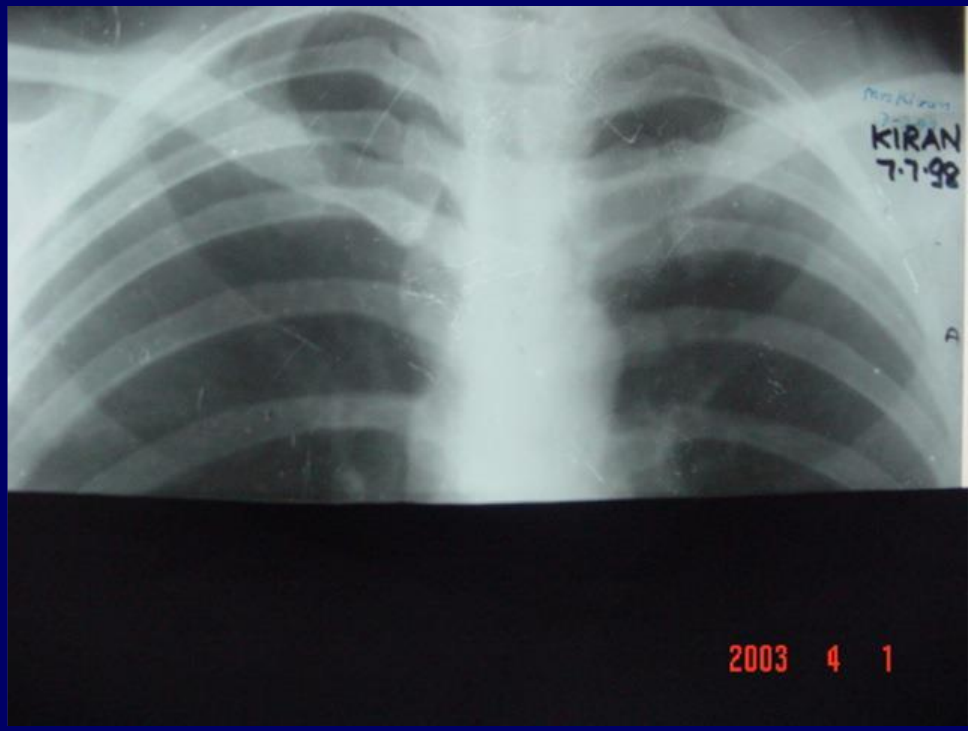
Patient was given multiple courses of ATT, but no response.



CT (Thorax) – Right middle Lower Lobe Bronchiectasis

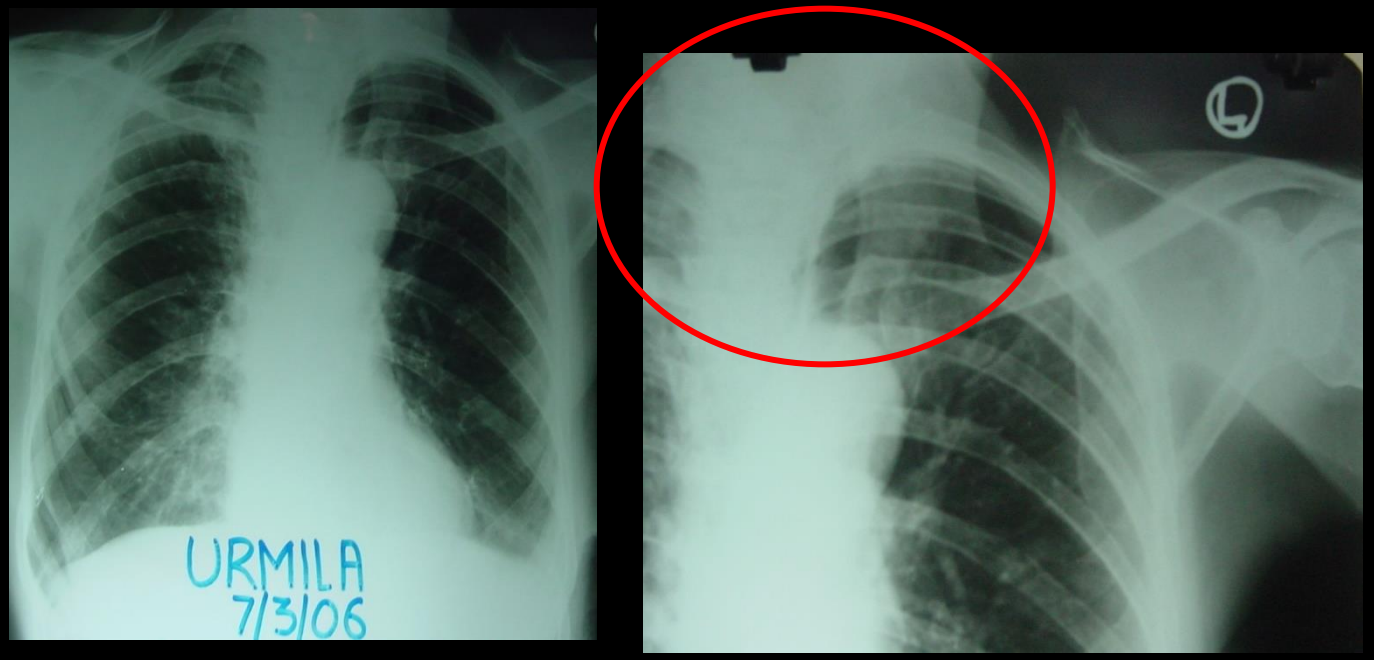


R Prasad Lucknow

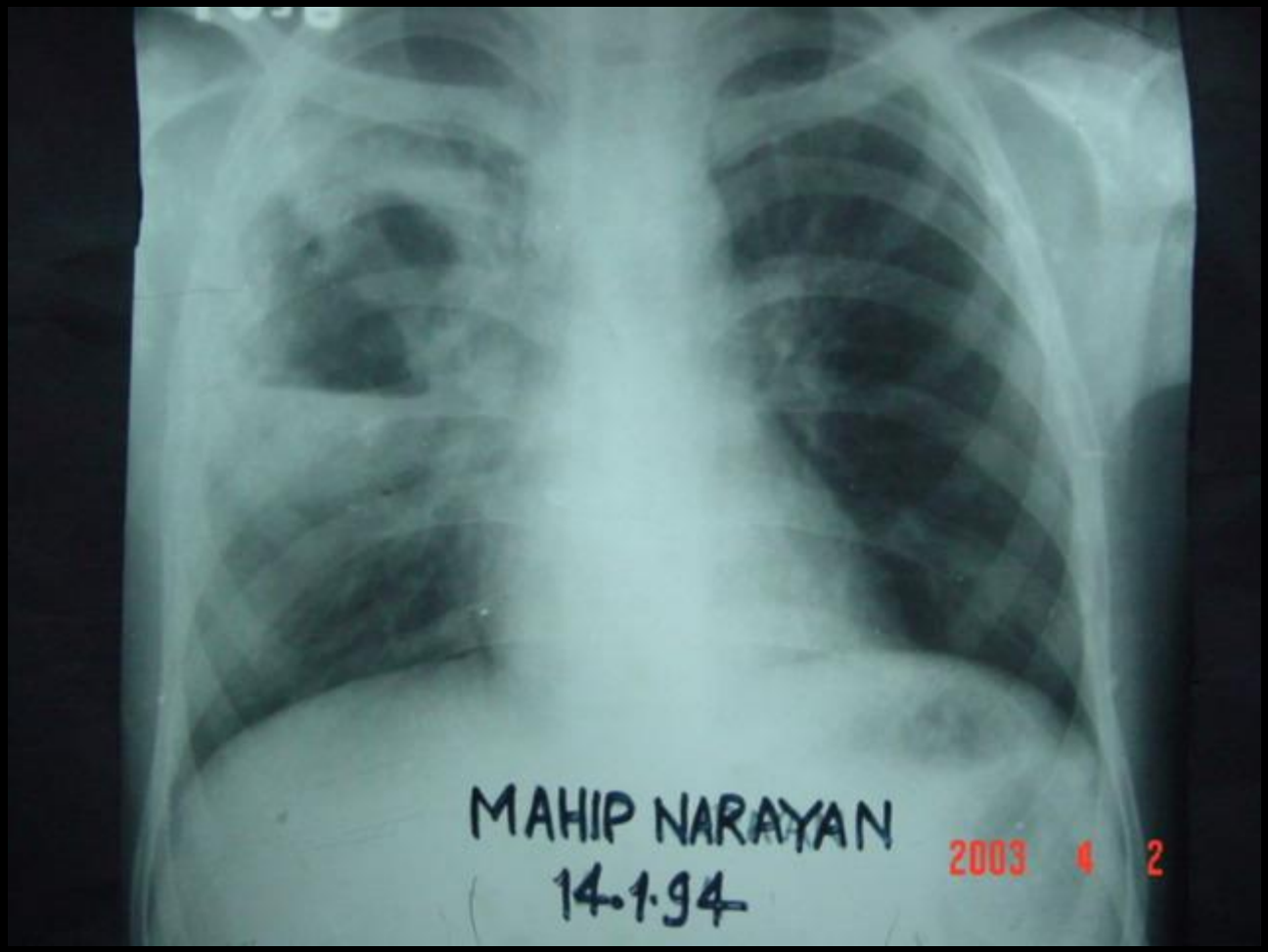


Pleete of Hairs

Plaits of hairs

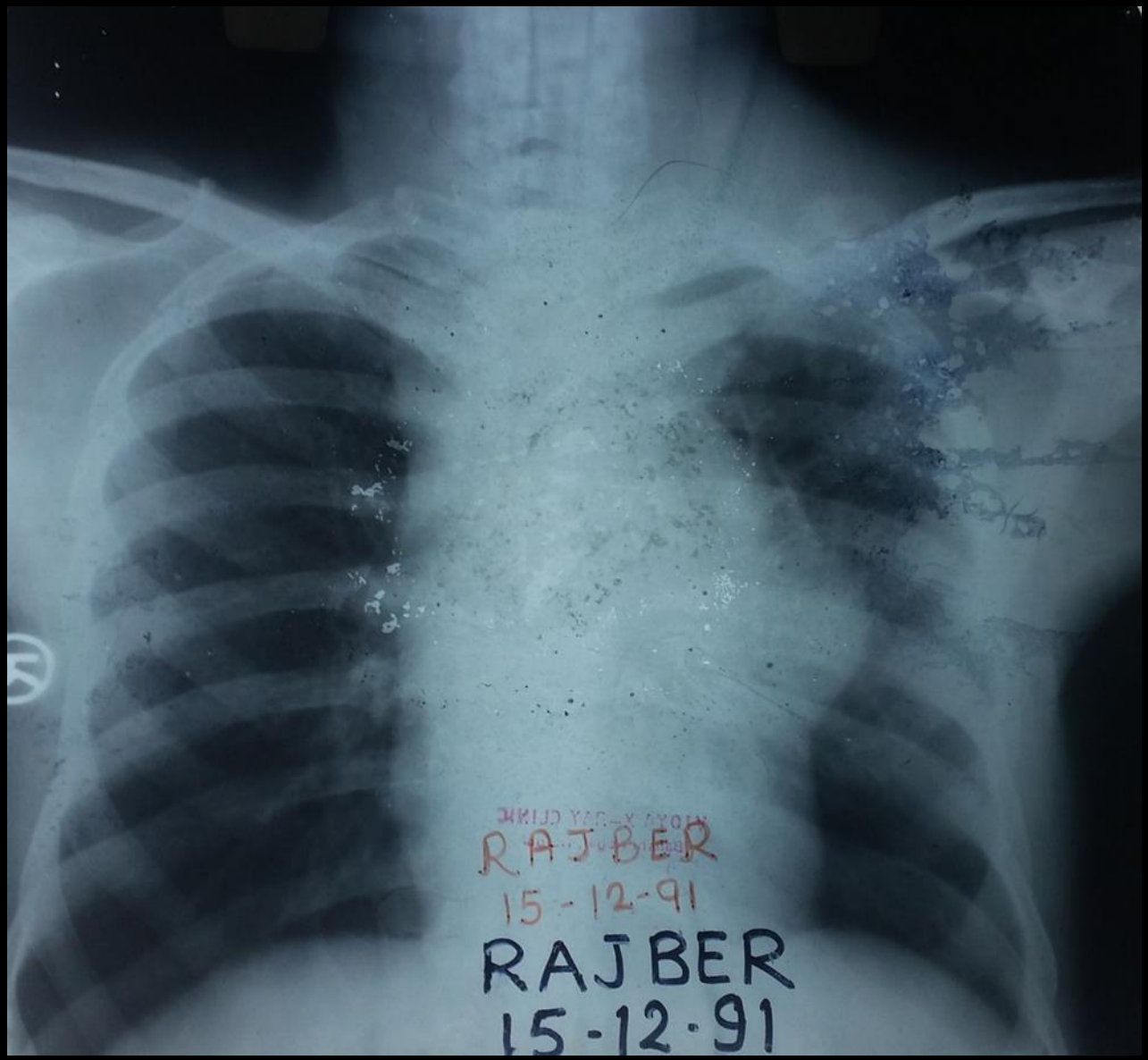


Shadow coming from outside
(Extra Thoracic Shadow)

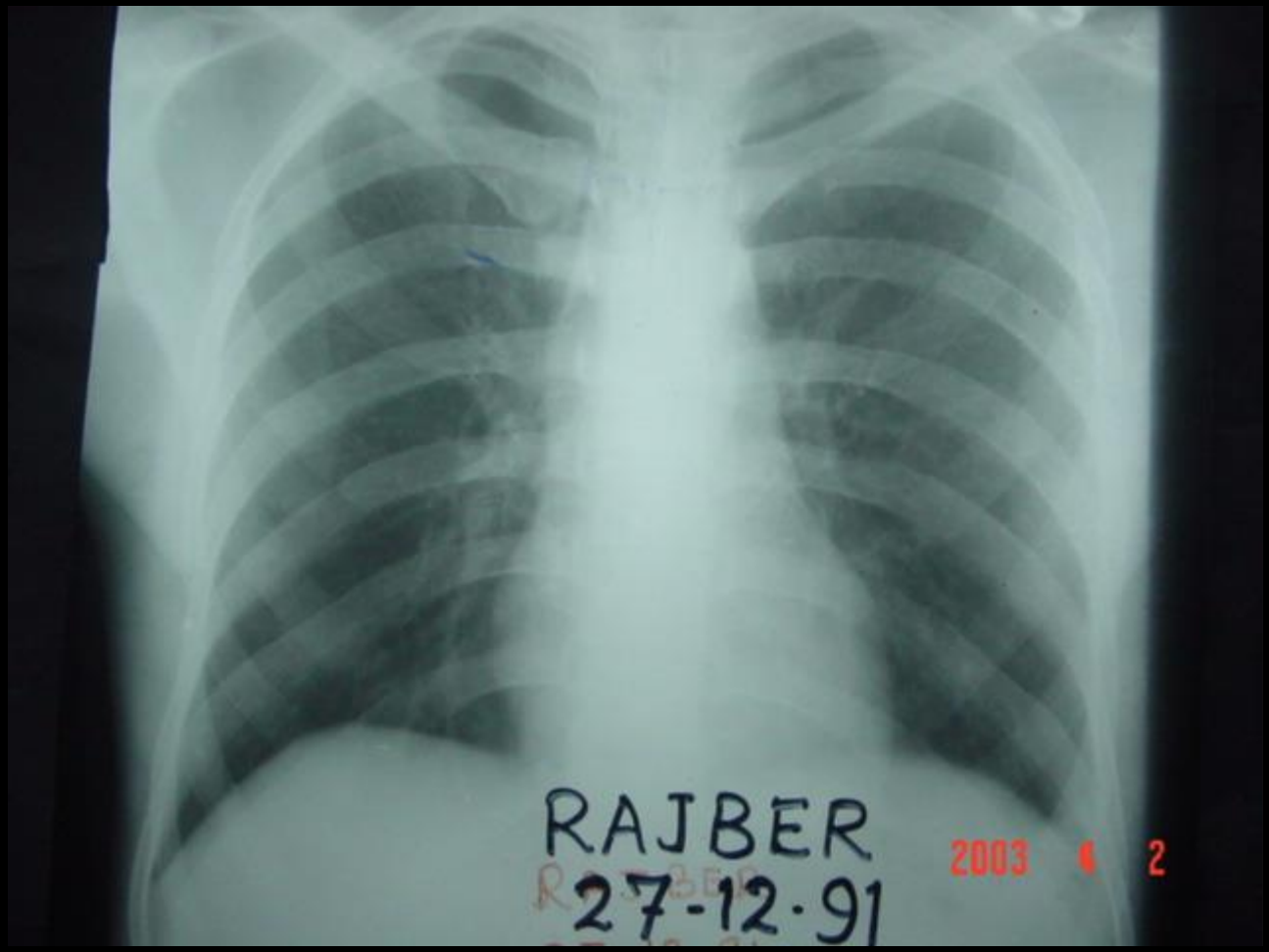


Kliebsella Pneumonia With Cavity (Right)

Kleibsella Pneumonia after t/t



Lymphoma



Lymphoma after t/t

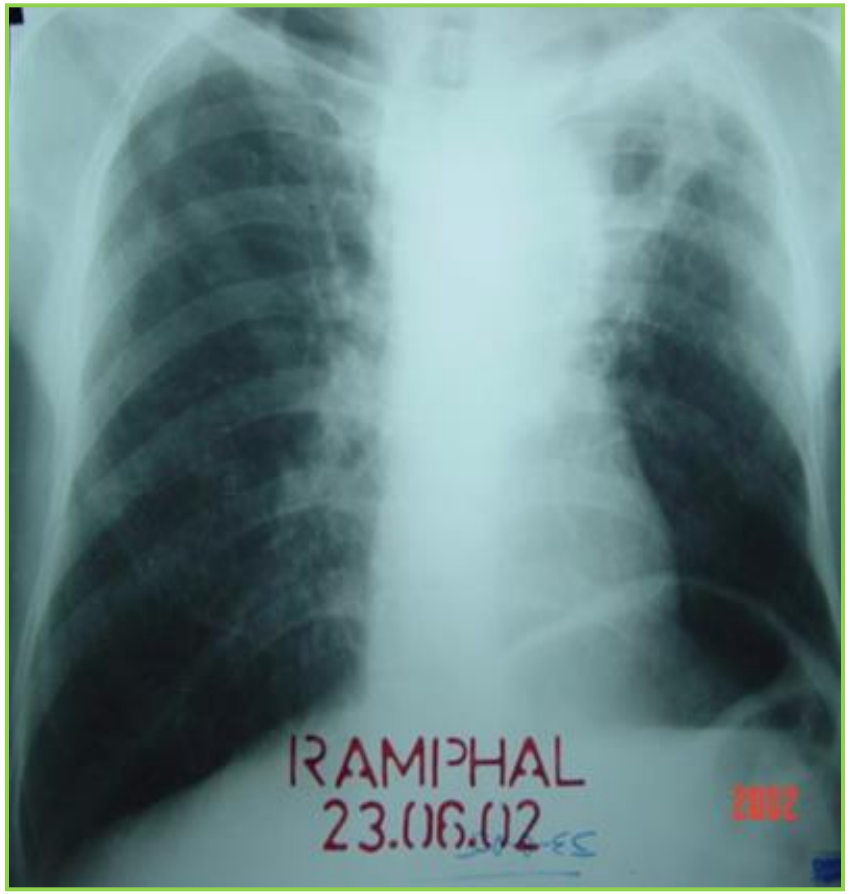
Eventration of Diaphragm

62 year old male, smoker with C/O

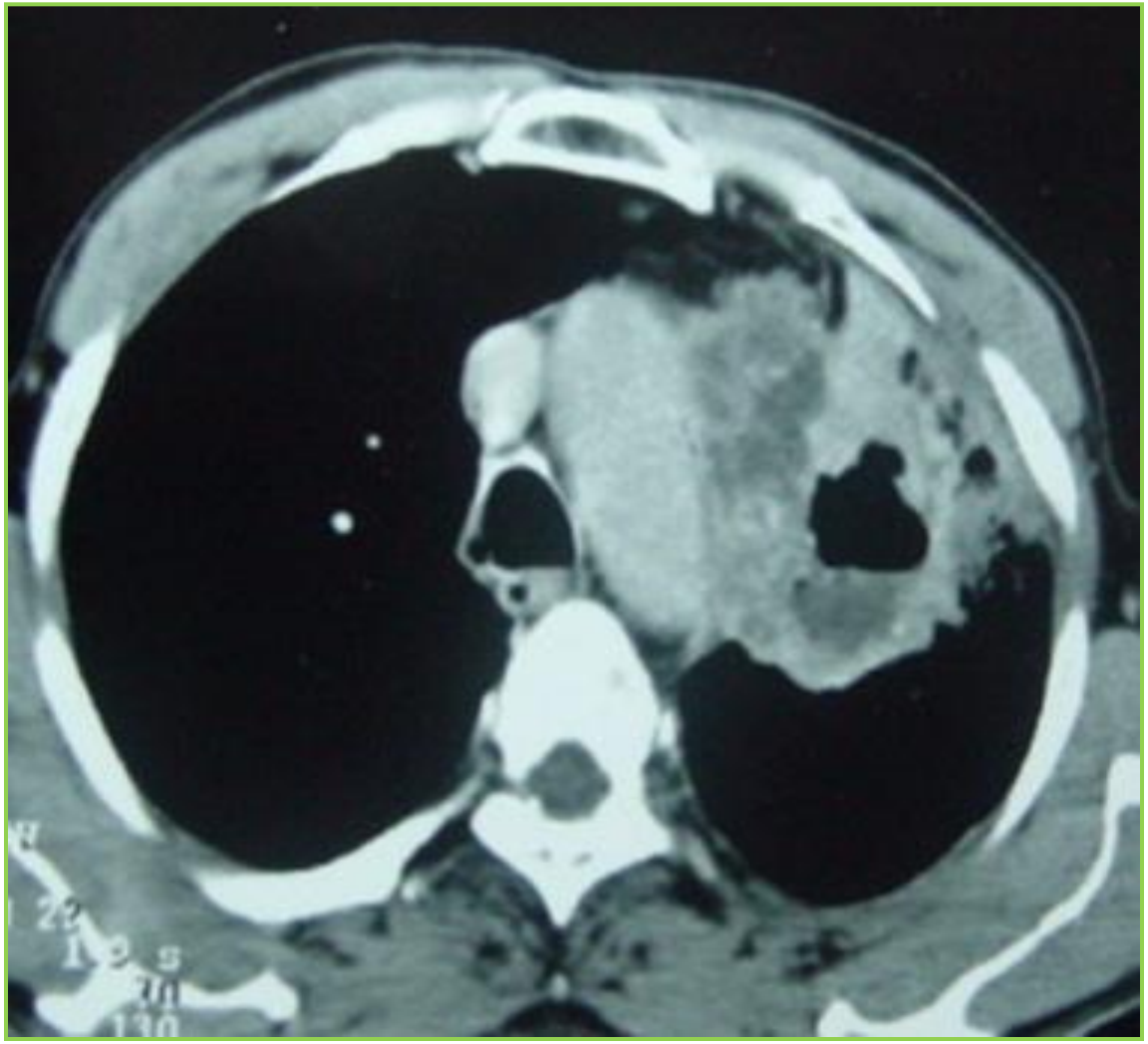
- Cough and shortness of breath - 2 months
- Left sided chest pain - 1 month

CHEST X-RAY - Left Upper Zone Cavitary Lesion With Loss Of Left Lung Volume And And Elevated Left Hemidiaphragm

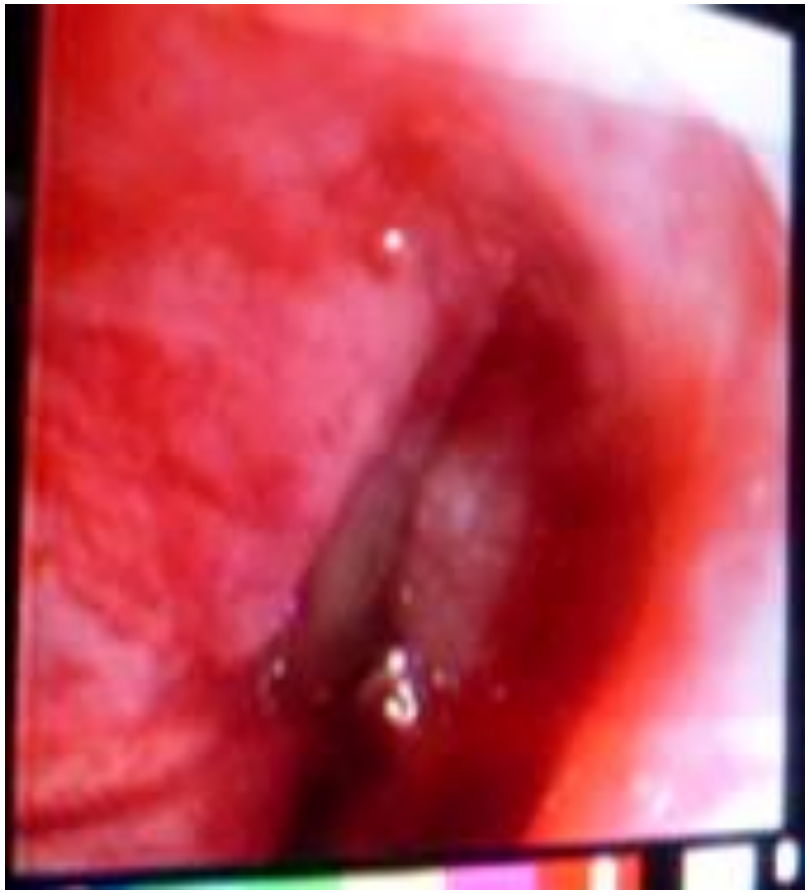
He was misdiagnosed as Tuberculosis and Put on ATT without any response

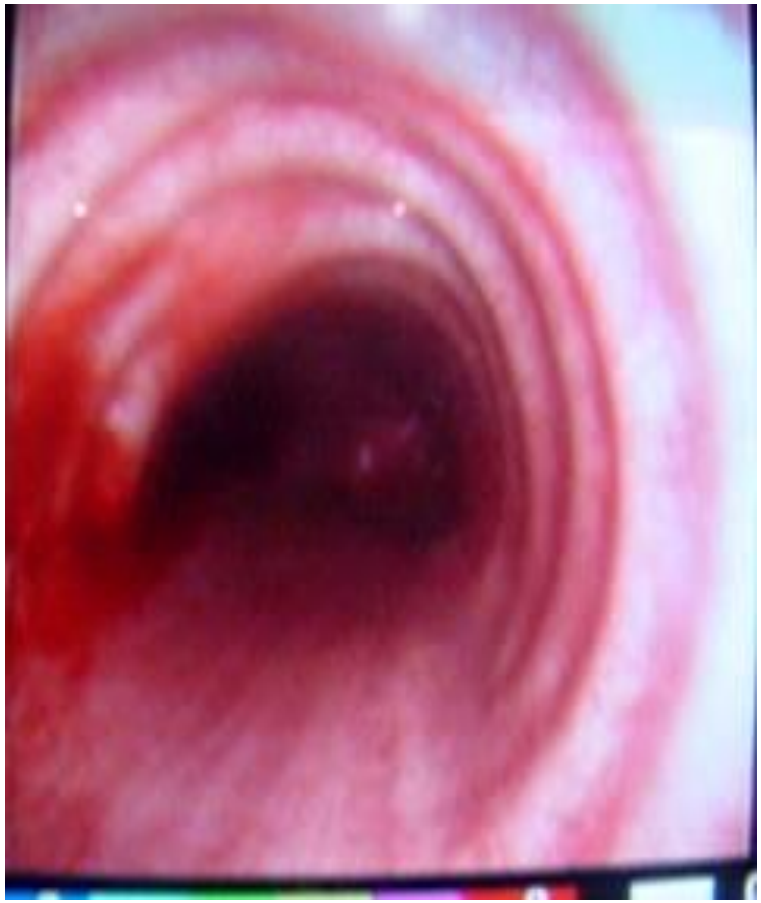


CT THORAX – Left Upper Lobe Thick-Walled Cavity Which is Eccentric and Inner Lining of Cavity is Irregular



Left Upper Lobe Bronchus opening narrowed with mass





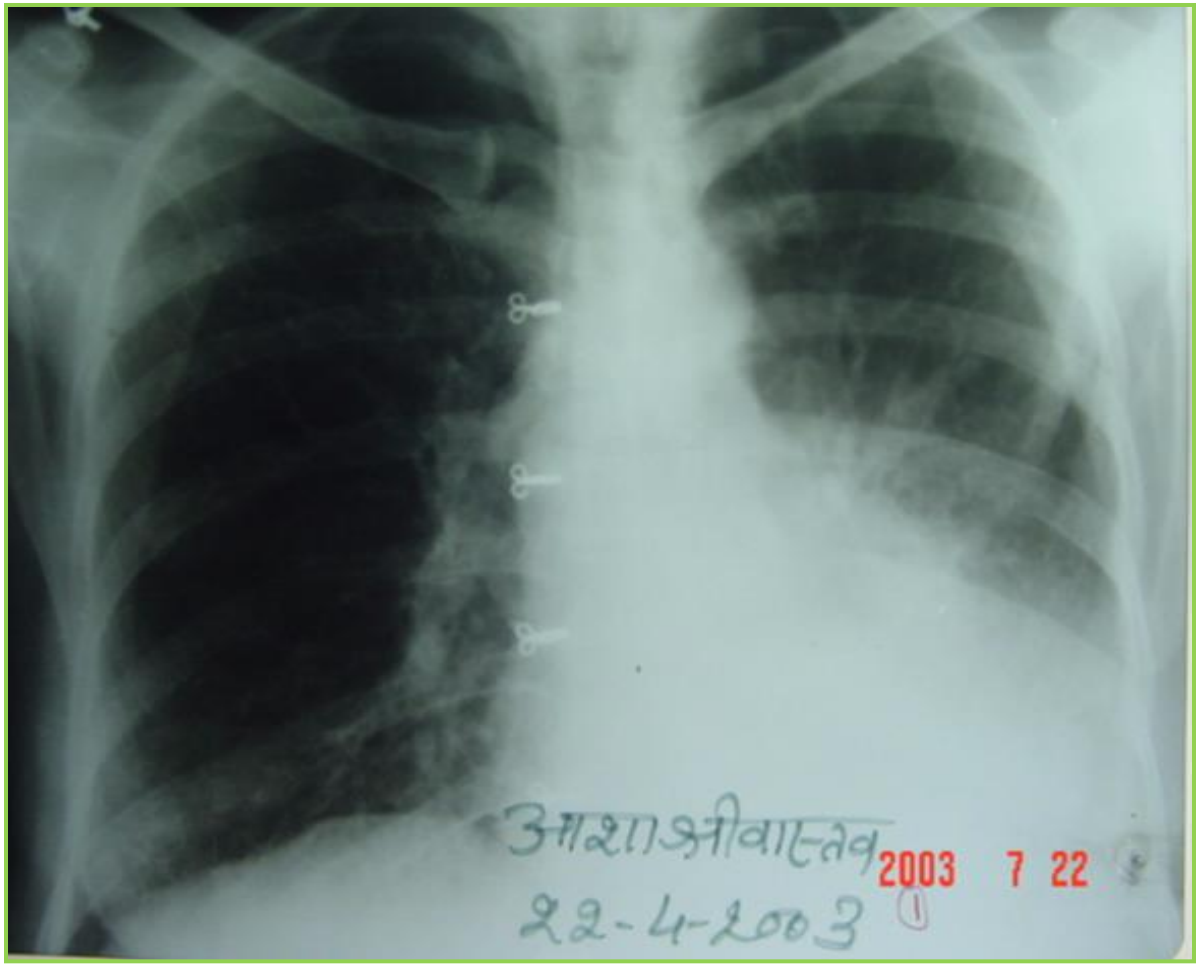
BRONCHOGENIC CARCINOMA

57yrs. Female, chronic smoker (40 bidis x 25 yrs.) presented with C/O

- Cough with expectoration **- 7 months**
- Recurrent hemoptysis (streaking) **- 7 months**
- Loss of appetite and weight **- 7 months**
- Fever (of and on) - **7 months**

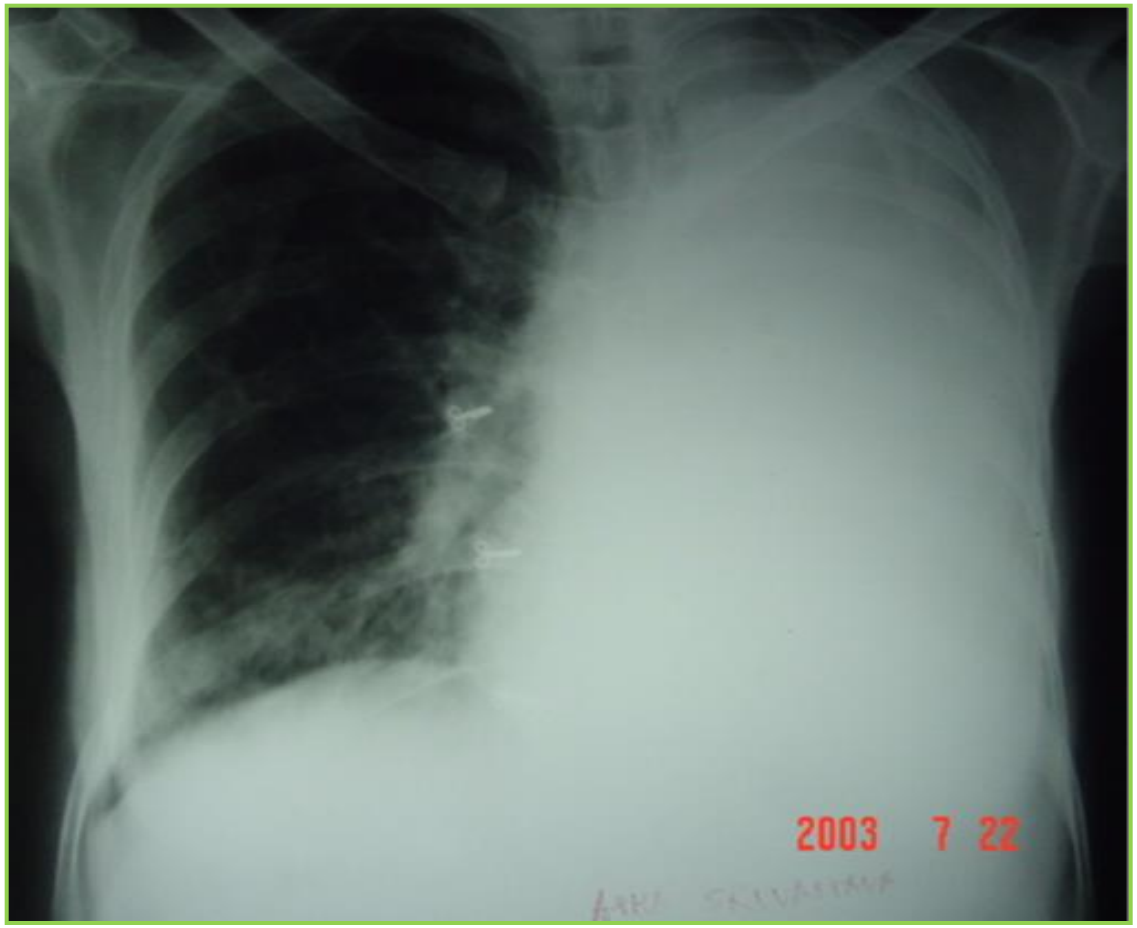
Chest X-ray – Left Lower Lobe Collapse with Pleural Effusion

Pleural fluid aspirated - Exudative



Patient was given ATT empirically but no response.

Chest X-ray - Increased Left opacity

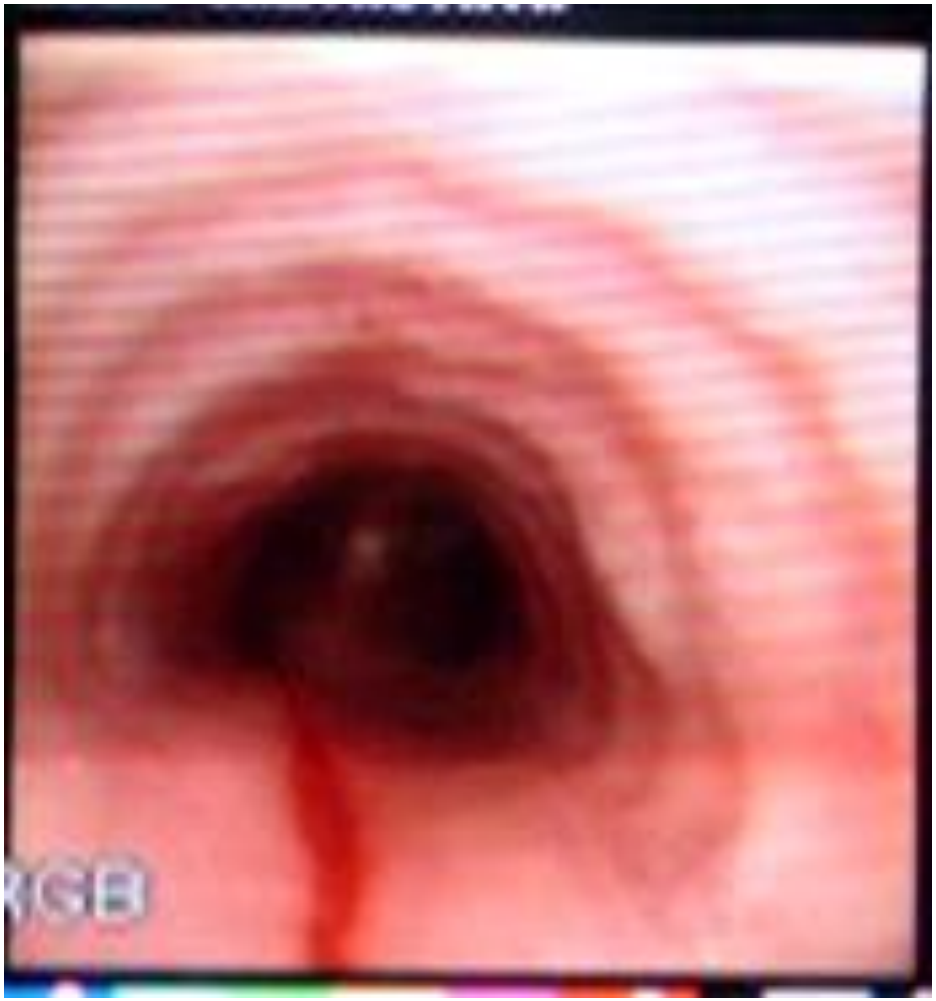


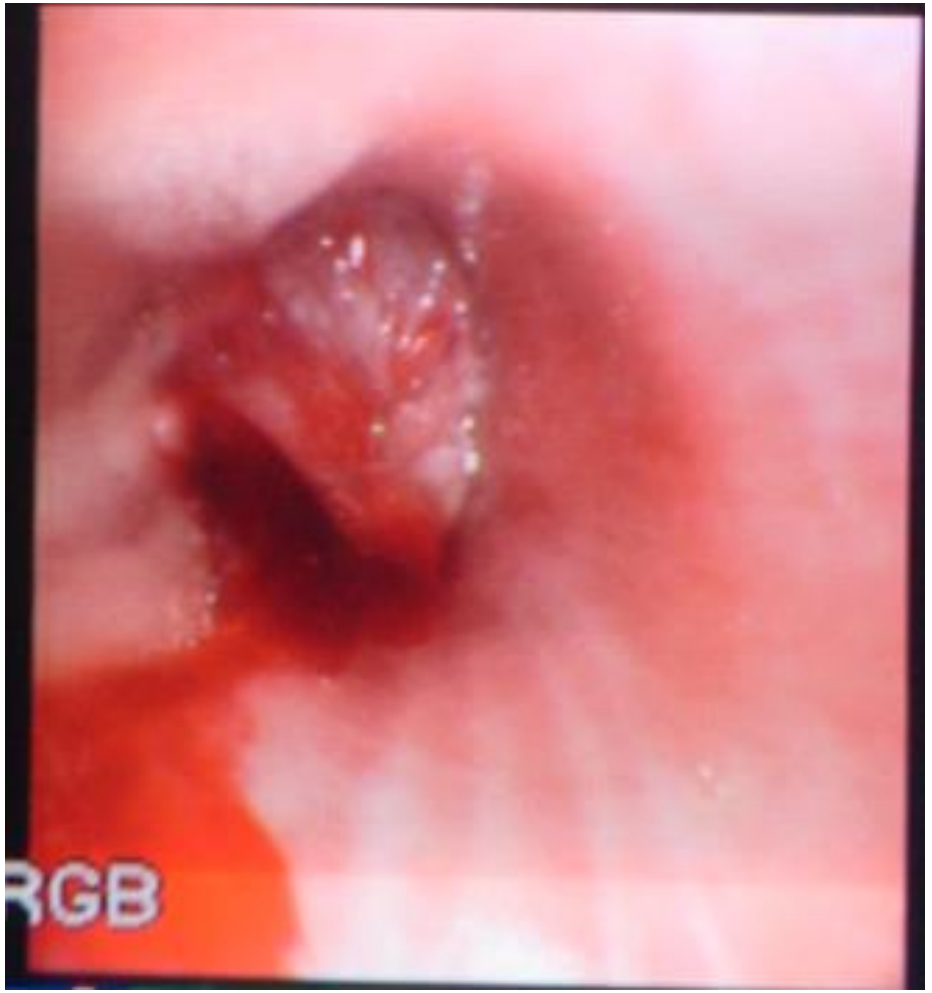
CT Thorax – Left Lung Mass with Pleural Effusion

R Prasad Lucknow

Left Lower Lobe Bronchus Obstructed By Fungating Mass

ADENOCARCINOMA





ADENOCARCINOMA LUNG

AS, 30 Y/F C/o

- Cough
- Breathlessness

25 YEAR FEMALE C/O RECURRENT DRY HACKING COUGH - 2 MONTHS

SPUTUM AFB : NEGATIVE

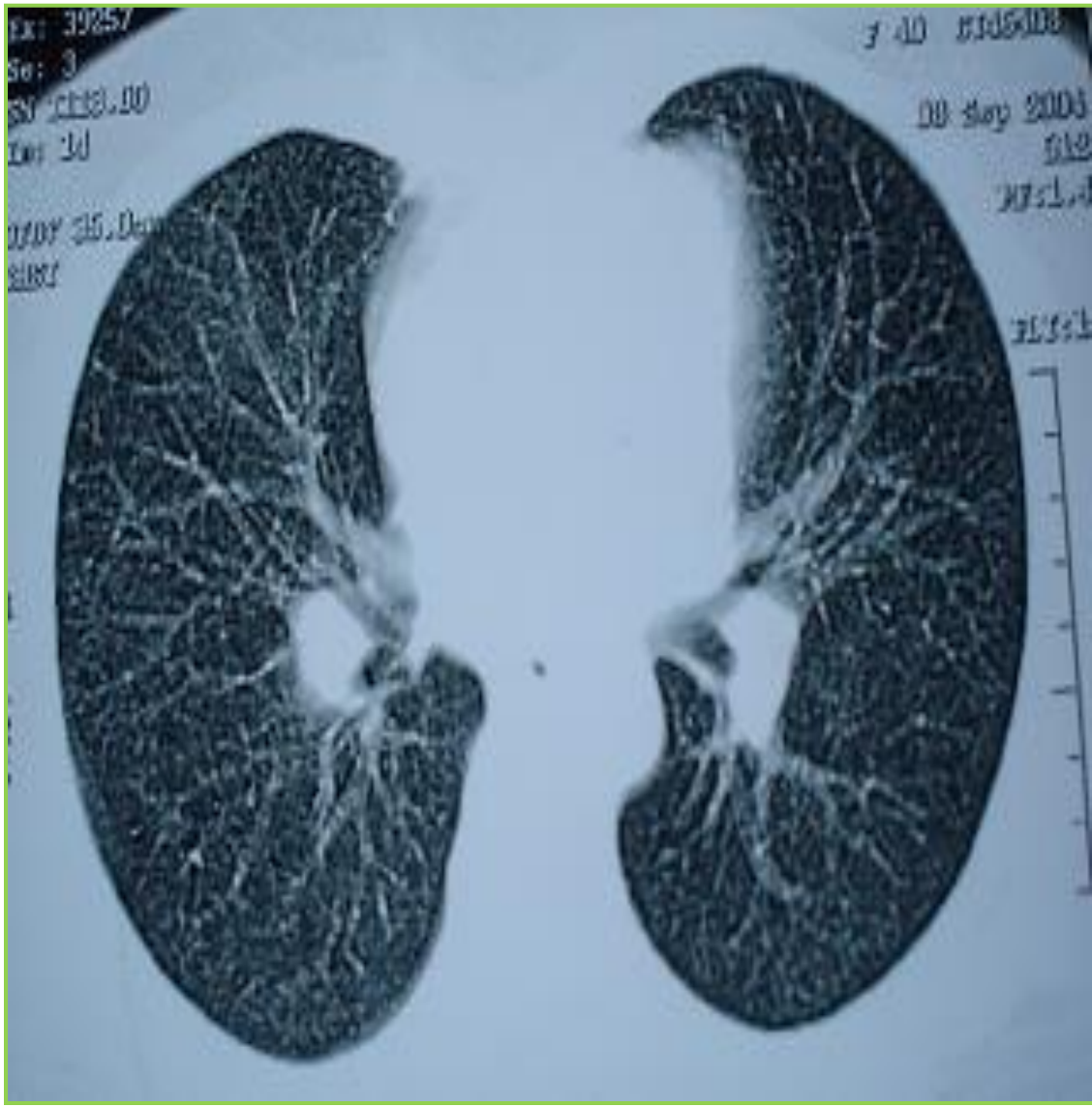
CHEST X-RAY - B/L DISCRETE NODULES INVOLVING ALL ZONES OF LUNG FIELDS WITH HILAR PROMINENCE

Investigations:

TLC = 13,900
DLC = P 30 L22 E48
AEC = 6672

CT THORAX – DIFFUSE MICRONODULAR SHADOWS

ANTI FILARIAL ANTIBODIES - INCREASED TITRES



TPE

- Savitri Devi 65 yr Female,

  Non Smoker C/O

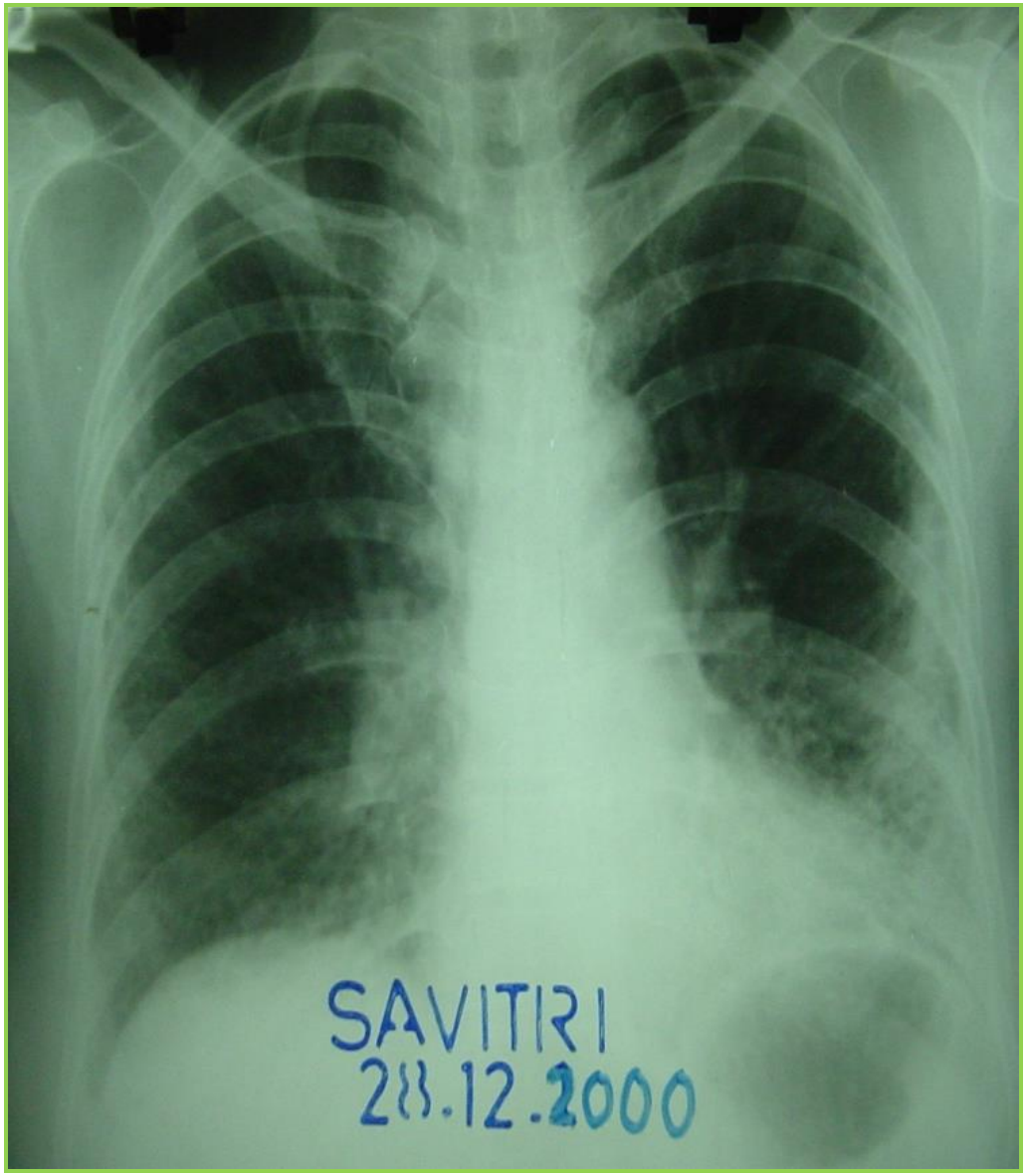
  Dry Cough - 5 Months

  Breathlessness - 5 Months

- On Examination
  - Clubbing Present
  - Bilateral basal inspiratory Crepts

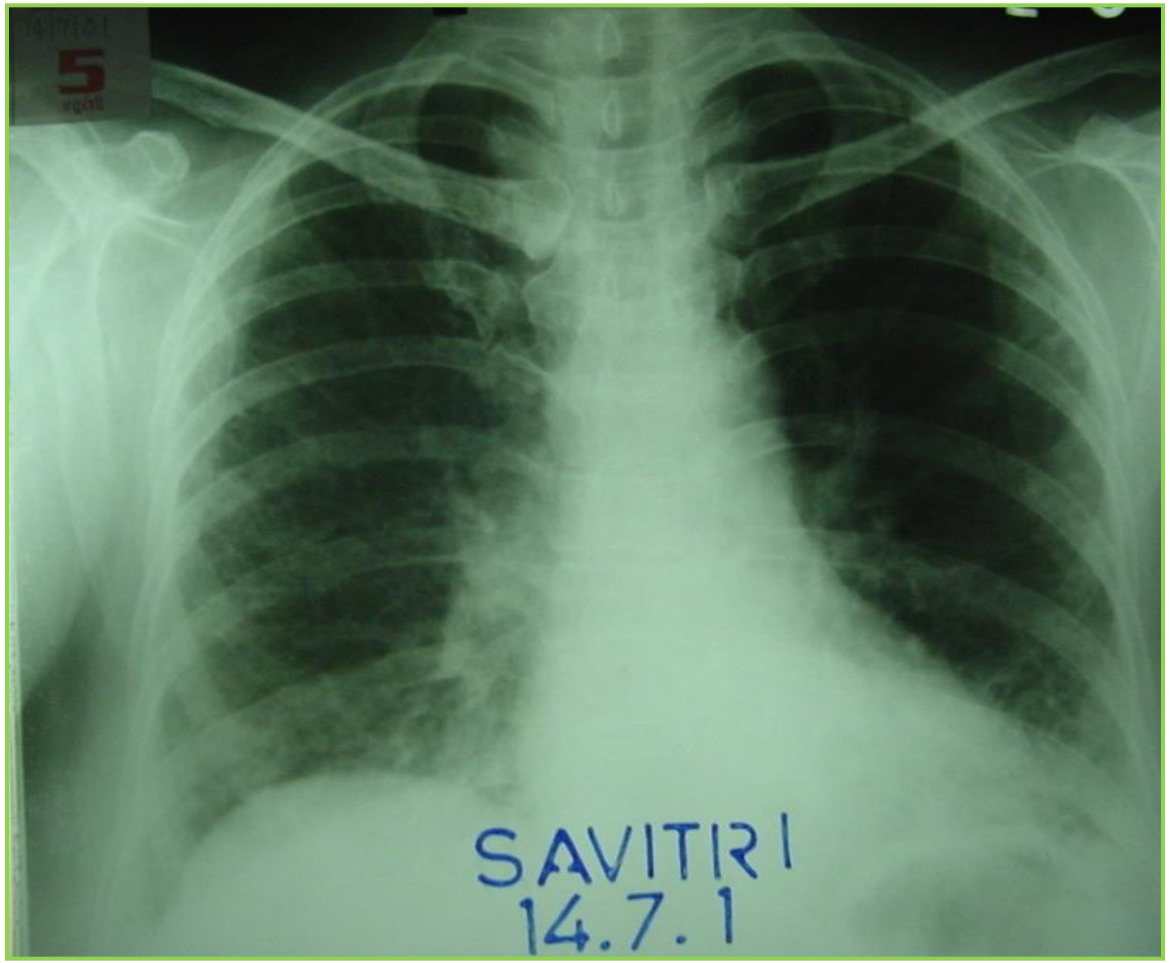
  Sputum - Not produced

- Put on ATT empirically for 6 months with no response

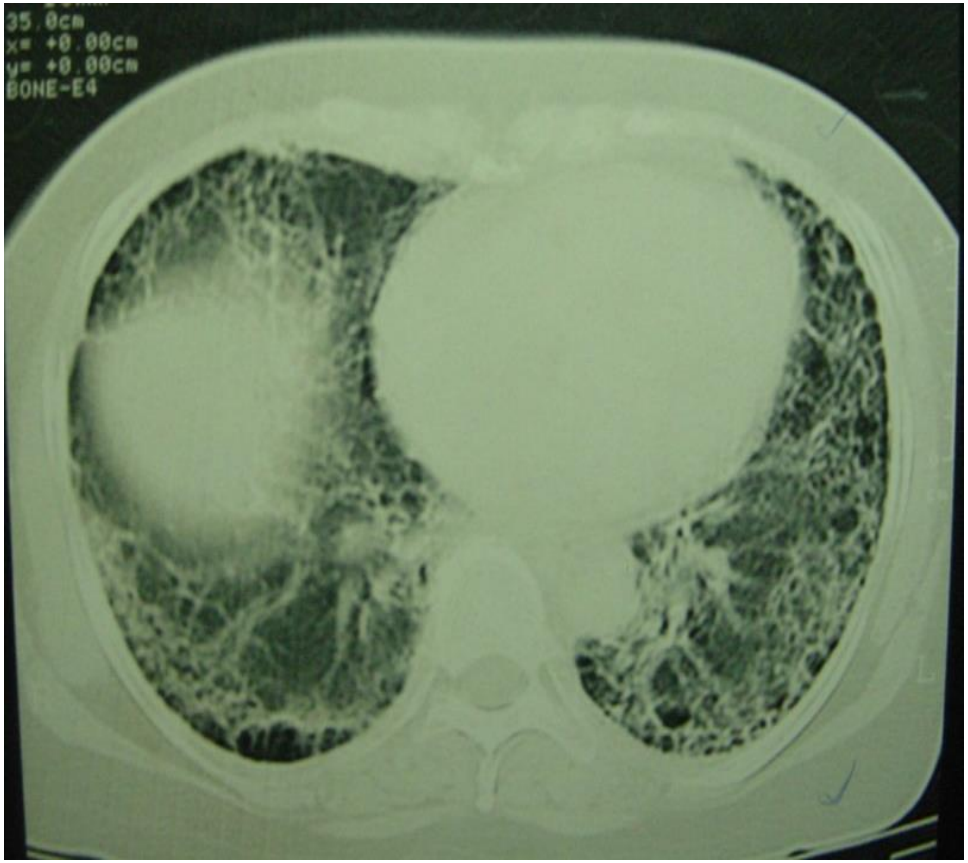


- PFT (2001)

FVC	0.68
FEV1	0.67



2001



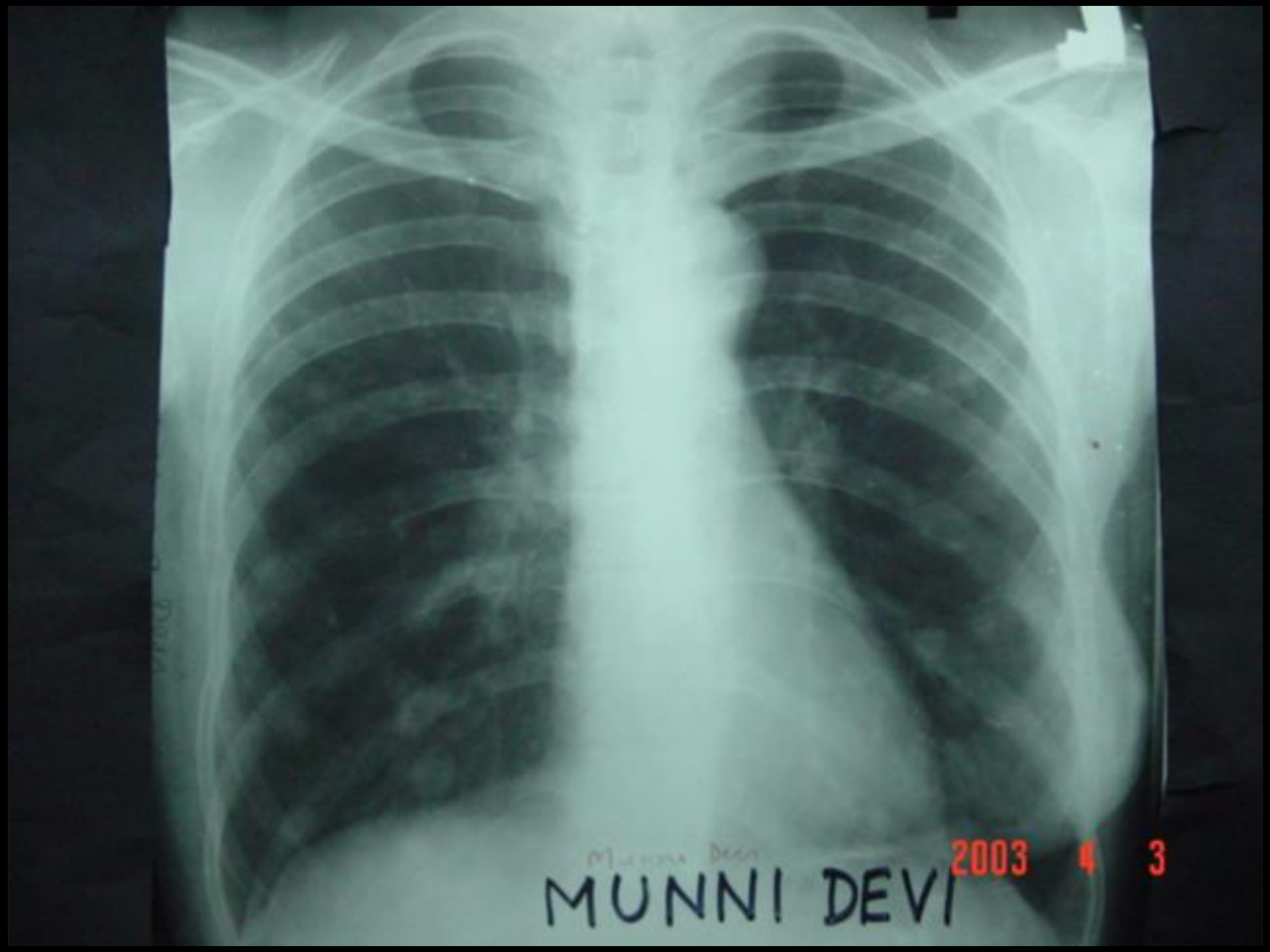
CT THORAX - B/L BASAL AND SUB-PLEURAL HONEY COMBING AND RETICULATIONS

R Prasad Lucknow

What is Diagnosis ?

Idiopathic Pulmonary Fibrosis

Nodular Shadow



Secondaries from Operated CA Breast (Rt.)

Gaurav Jain 22 yr male, Non Smoker C/O

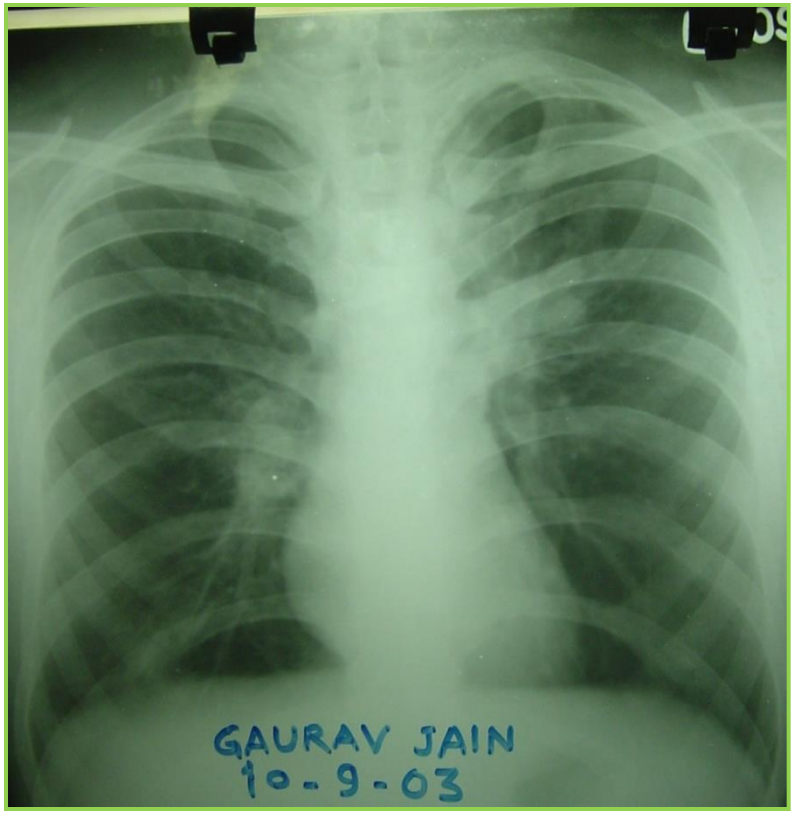
Cough - 7 Yrs.

Episodic breathlessness - 7 yrs.

Recurrent Streaking - 2 Yrs.

Loss of App. - 2 Yrs.

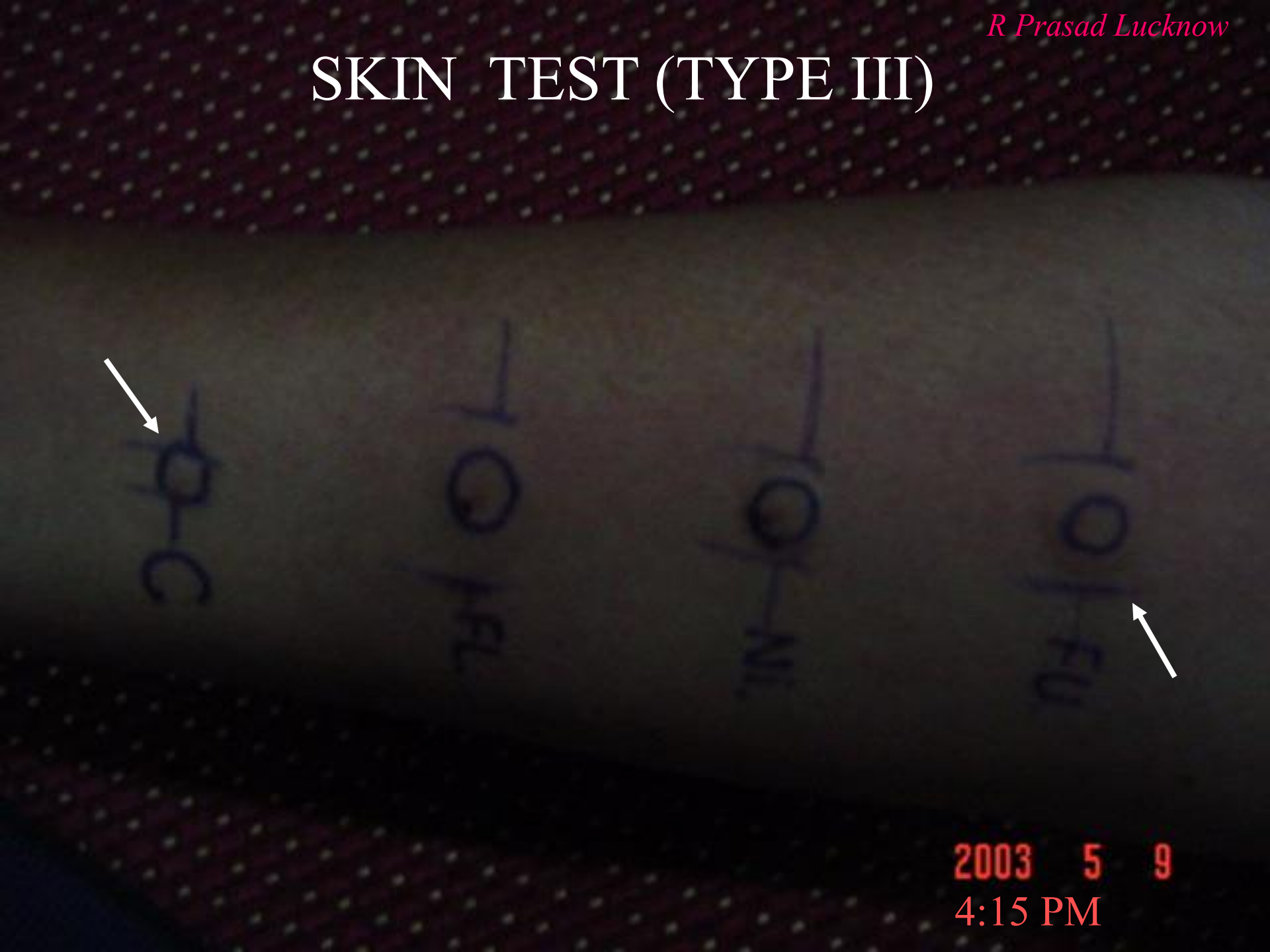
- He was given ATT for 6 Months without any response

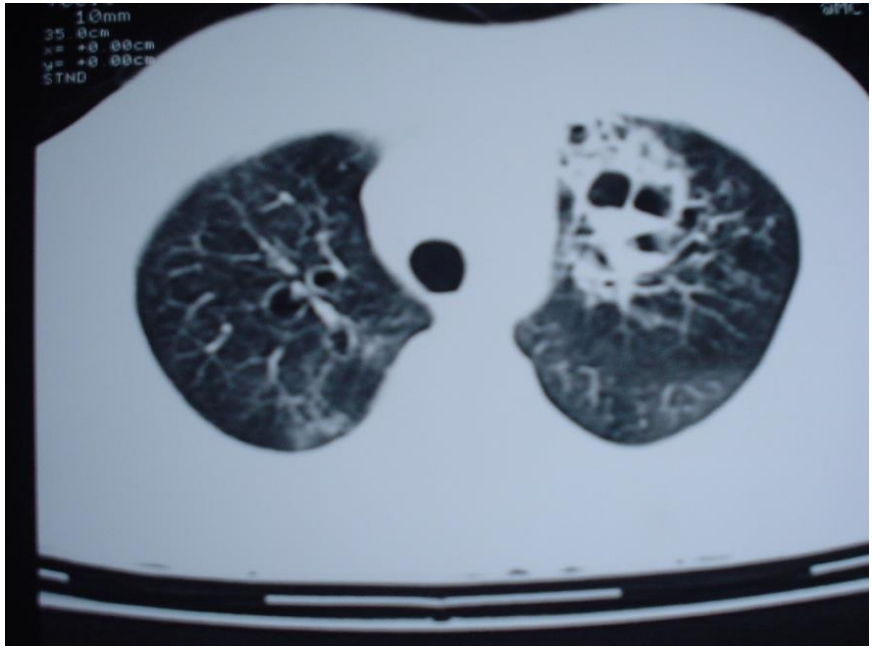


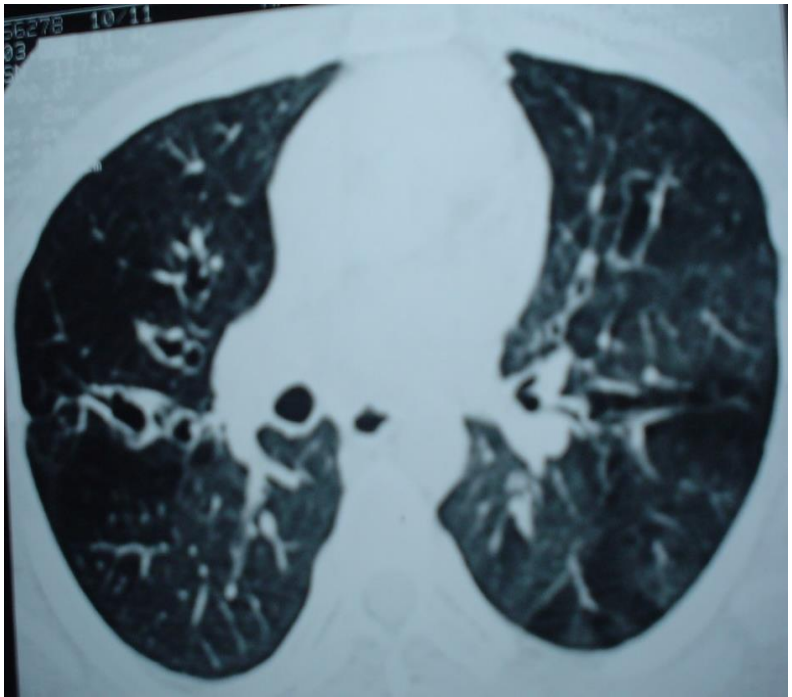
- **Sputum for AFB -Ve (Three Times)**
- **TLC** = 12,700, DLC = P 47 L2 3 E30
- **AEC** = 3710/Cubic
- Skin test to Aspergillus antigen
  - Control = 4 mm
  - AF. (Type 1) = 12 mm
  - AF. (Type 1) = 6 mm
- Total IgE = 34228 IU/ml
- IgE Against AF. =21.50 U/ml (N<.38 U/ml)
- IgG Against AF. =118 U/ml (N < 8 U/ml)
- Chest X-Ray – B/L alveolar opacities

SKIN TEST (TYPE I)

SKIN TEST (TYPE III)





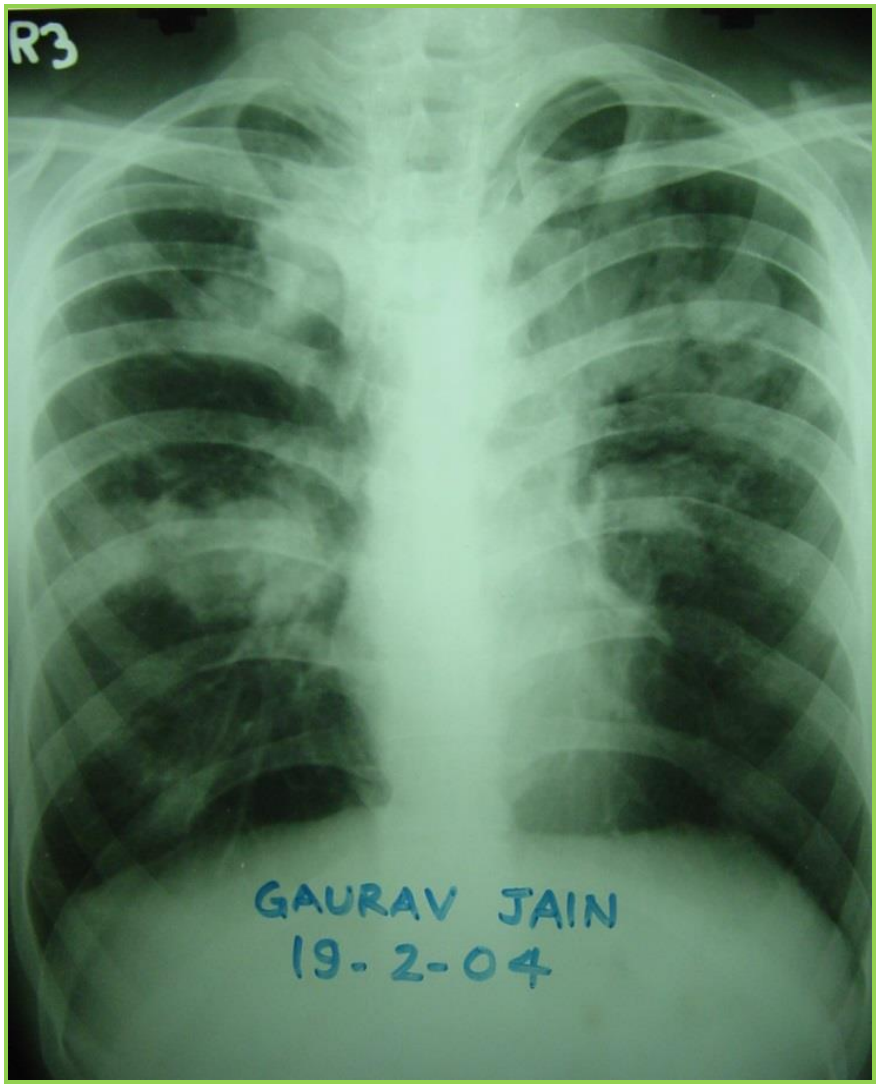


CT THORAX
- B/L Central Bronchiectasis

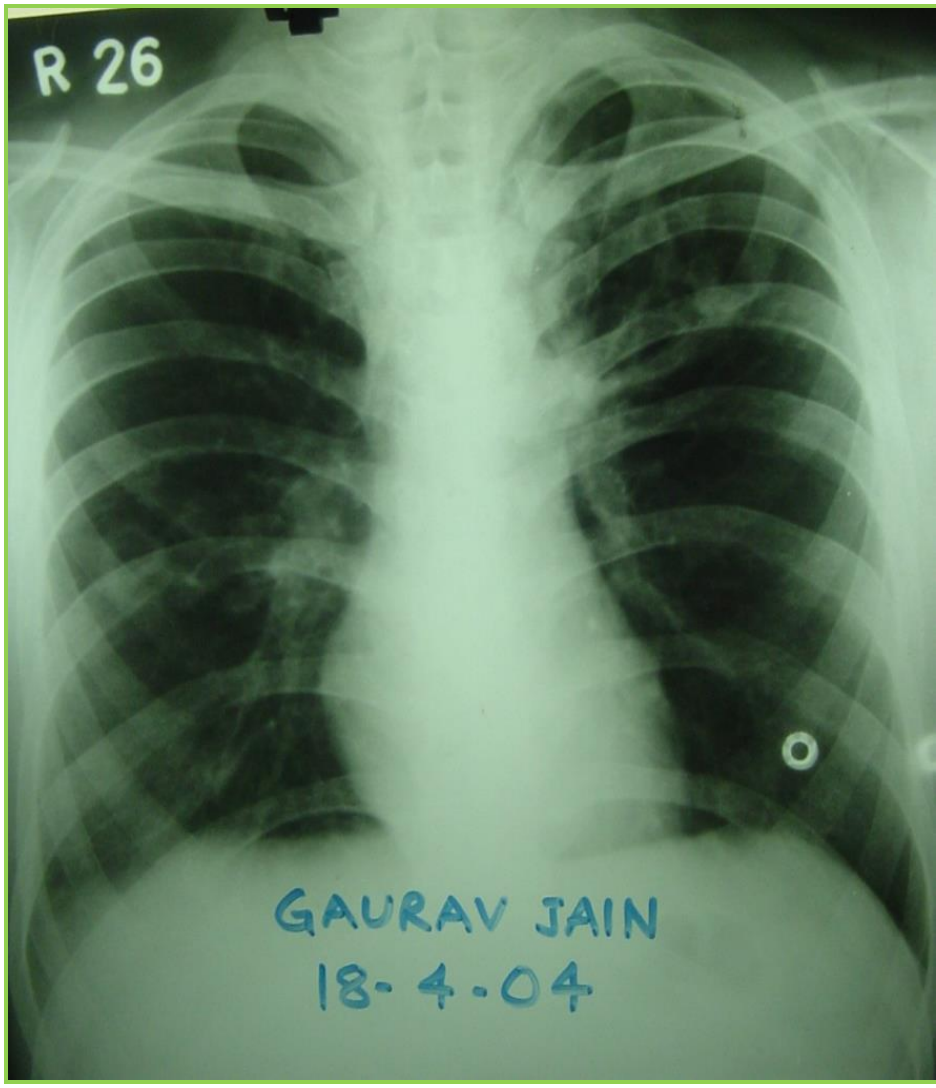
What is the Diagnosis

?

ALLERGIC BRONCHO-PULMONARY ASPERGILLOSIS



Before Tt.



After Tt.

DIAGNOSIS OF ABPA

* Asthma (mild or severe) or cystic fibrosis
* Immediate cutaneous reactivity to aspergillus antigen
* Current or previous pulmonary infiltrates
* Elevated total IgE concentration (>1 mg/L)
* Preciptin antibodies to A. fumigatus
* Peripheral blood eosinophilia
* Elevated serum IgE-a-Af and/or IgG-aAf antibodies
* Proximal bronchiectasis

Greenberger PA et al. JAMA 1997; 278:1924

Revised International Society for Human and Animal Mycology (ISHAM)-ABPA working group (AWG) consensus criteria for diagnosing allergic bronchopulmonary aspergillosis

In patients with predisposing conditions (asthma, cystic fibrosis, chronic obstructive lung disease, bronchiectasis) or *compatible clinico-radiological presentation
Essential components:
Asp fumigatus-specific IgE ≥0.35 kUA/L Serum total IgE ≥500 IU/mL
Other components (any two)
• Positive IgG against A. fumigatus • Peripheral blood eosinophil count ≥500 cells/pL (could be historical) • Thin-section chest computed tomography consistent with ABPA (bronchiectasis, mucus plugging, and high-attenuation mucus) or fleeting opacities on chest radiograph consistent with ABPA

Agarwal R et al. Revised clinical practice guidelines for diagnosing, classifying, and treating allergic bronchopulmonary aspergillosis/mycoses Eur Respir J 2024

CONCLUDING THOUGHTS

Do not treat investigations, Treat the patient as a whole

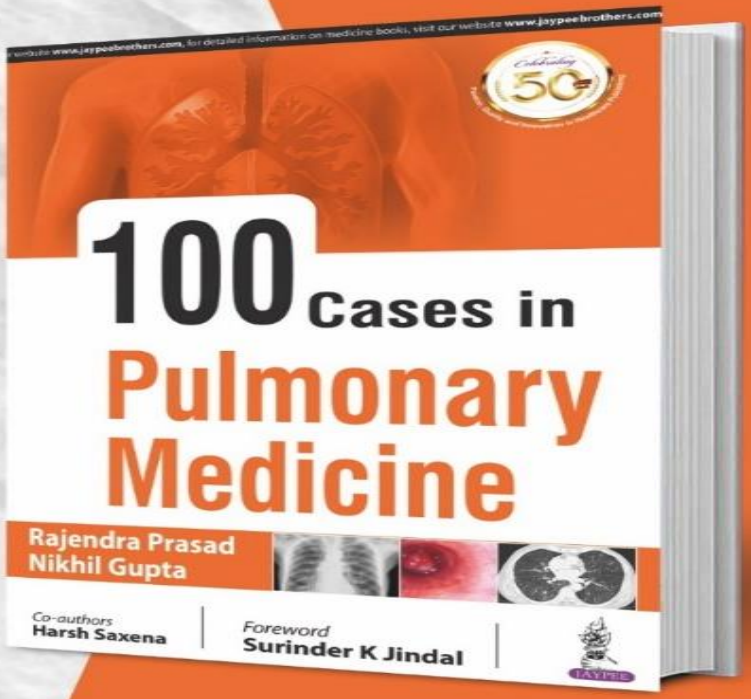
CONCLUDING THOUGHTS

Don’t be dictated by any investigations, take them as advisors along with other details of patient

Concluding thoughts

- Single X- ray not sufficient.
- Think of other views
- Think of Old x-rays
- Think of other radiological procedures
- Think of other investigations
- Think of clinical picture

NEW RELEASE



100 Cases in Pulmonary Medicine

Rajendra Prasad
MD DTCD FAMS FCCP (USA) FRCP (Glasgow) FNCCP
FICS FCAI FIAB FIMSA FCCS DSc (Honoris Causa)

Nikhil Gupta
MD (Medicine)

Key Features

- Includes interesting, challenging and educative 100 cases in Pulmonary Medicine
- Each case is followed with step by step approach to reach the final diagnosis and treatment
- Cases are dealt with lots of radiological images, making reading extremely interesting
- Book consists of lots of interesting cases on tuberculosis
- Each case report is followed by discussion of pathophysiology, clinical presentation, diagnosis, and treatment considering current evidence-based knowledge
- Also includes rare case such as pulmonary sequestration, alveolar microlithiasis etc, generally difficult to diagnose
- Best resource for both undergraduate and postgraduate medical students and consultants in pulmonary medicine.

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Handbook on
Adverse DRUG REACTIONS in TB Treatment

Salient Features

- Comprehensive well-referenced handbook, which contains a plethora of knowledge
- Defines a practical approach to every aspect of adverse drug reactions in tuberculosis treatment
- Covers all the aspects ranging from epidemiology of adverse drug reactions in new and drug-resistant patients
- Includes the case-based approach to treatment of tuberculosis, multi-drug-resistant tuberculosis (MDR-TB) and extensively drug-resistant tuberculosis (XDR-TB) in special situations such as pregnancy, renal insufficiency and liver diseases
- Chapters are organized in a systematic way for easy understanding and for practical approach with illustrative cases
- Serves as a practical guide for undergraduate and postgraduate medical students, practitioners, program managers and healthcare workers in TB control.

Rajendra Prasad MD DTCD FAMS FCCP (USA) FRCP (Glas) FNCCP FICS FCAI FIAB FIMSA FCCS DSc (Honoris Causa) is the Director of Medical Education and Professor and Head, Department of Pulmonary Medicine, Era's Lucknow Medical College and Hospital, Era University, Lucknow, Uttar Pradesh, India. He was the Director, Vallabhbhai Patel Chest Institute, University of Delhi, New Delhi; Professor and Head, Department of Pulmonary Medicine, King George's Medical University, Lucknow; and the Director, UP Rural Institute of Medical Sciences and Research, Saifai, Etawah, Uttar Pradesh. He has been International Governor of American College of Chest Physicians, USA. He has unique distinction of being President of all major scientific bodies in the field of pulmonary medicine in India. He was awarded Fellowship of the National Academy of Medical Sciences, India, American College of Chest Physicians, USA and Royal College of Physicians and Surgeons, Glasgow. He has supervised about 180 researches, and published 340 original articles, reviews and book chapters. He has written 8 books including 4 books on Tuberculosis and an Atlas on Fiber Optic Bronchoscopy based exclusively on Indian patients and presented over 1,600 guest lectures and scientific papers at various national and international meetings. He is recipient of Dr BC Roy National Award for devolving and popularizing pulmonary medicine in India.

Nikhil Gupta MD (Medicine) is an Assistant Professor, Department of General Medicine, Dr Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh, India. He was an Assistant Professor, Department of Medicine, Era's Lucknow Medical College and Hospital, Era University, Lucknow from 2012 to 2017. He has more than 30 guest lectures and scientific papers, supervised 15 researches and published 35 original articles, review articles, case reports and book chapters. He has also co-authored 3 books on tuberculosis.

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Handbook on
Adverse DRUG REACTIONS in TB Treatment

Rajendra Prasad

Co-author
Nikhil Gupta

Foreword
D Behera

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Manual *of* TUBERCULOSIS

This book "Manual of Tuberculosis" is written with the aim of defining a practical approach to every aspect of tuberculosis. Chapters practically covers all the aspects of tuberculosis ranging from epidemiology, diagnosis and practical approach to the treatment of pulmonary as well as common extra-pulmonary tuberculosis including HIV and TB. It also covers practical approach to drug resistant including multidrug resistant tuberculosis and extensively drug resistant tuberculosis. Chapters also include prevention of tuberculosis and TB control in India. Pharmacokinetics of antituberculosis used in new and retreatment cases of tuberculosis including their doses, regimens and adverse effects are highlighted. Special chapters on case based approach to treatment of tuberculosis in special situation and MDR-TB have also been included. Chapters have been written in the background of current literature and practical experience gained from day to day dealing with different patients suffering from tuberculosis. Undergraduate, Postgraduate medical students, practitioners and program manager in TB control will find this book as practical guide.

Prof. Rajendra Prasad MD DTCD FAMS FCCP (USA) FNCCP FCAI FIAB FIMSA DSC (Honoris Causa) Director, Vallabhbhai Patel Chest Institute, University of Delhi, Delhi (India). Former Professor & Head, Department of Pulmonary Medicine, King George's Medical University, Lucknow and Former Director, UP Rural institute of Medical Sciences & Research, Saifai, Etawah, did his MBBS in 1974 & MD in 1979 from King, George's, Medical College, Lucknow. He received advance training in Pulmonary Medicine including clinical tuberculosis and TB control from Japan. He is also honorary consultant to Armed Forces Medical Services, India in Respiratory Diseases. Professor Prasad is currently Vice President of South Asia Association of Allergy, Asthma and Applied Immunology. He has been International Governor of American College of Chest Physicians (USA). He has unique distinction of being president of all major scientific bodies in the field of Pulmonary Medicine in India. Besides several prestigious fellowship of reputed National and International organization, he was awarded Fellowship of the National Academy of Medical Sciences India. He has supervised about 150 Researches and Published 225 Articles in reputed National and International Journals and books. He has presented over 1200 guest lectures, scientific papers at various National and International meetings.

Prof. Rajendra Prasad is a nationally acclaimed chest physician and tuberculosis expert, possessing nearly 4 decades' illustrious teaching and research experience with proven excellence in quality patient care. Apart from being a clinician par excellence, he is also a very popular medical teacher in Pulmonary Medicine. Prof. Prasad's contribution in the field of Tuberculosis and Multidrug Resistant Tuberculosis (MDR-TB) are widely acclaimed. He took keen interest in Revised National Tuberculosis Control Programme (RNTCP) from its inception. His dynamic leadership in academic and administrative areas has earned him a large number of awards from various International and National Scientific societies. He has been mentor of many students who are now assuming important positions in pulmonary medicine.

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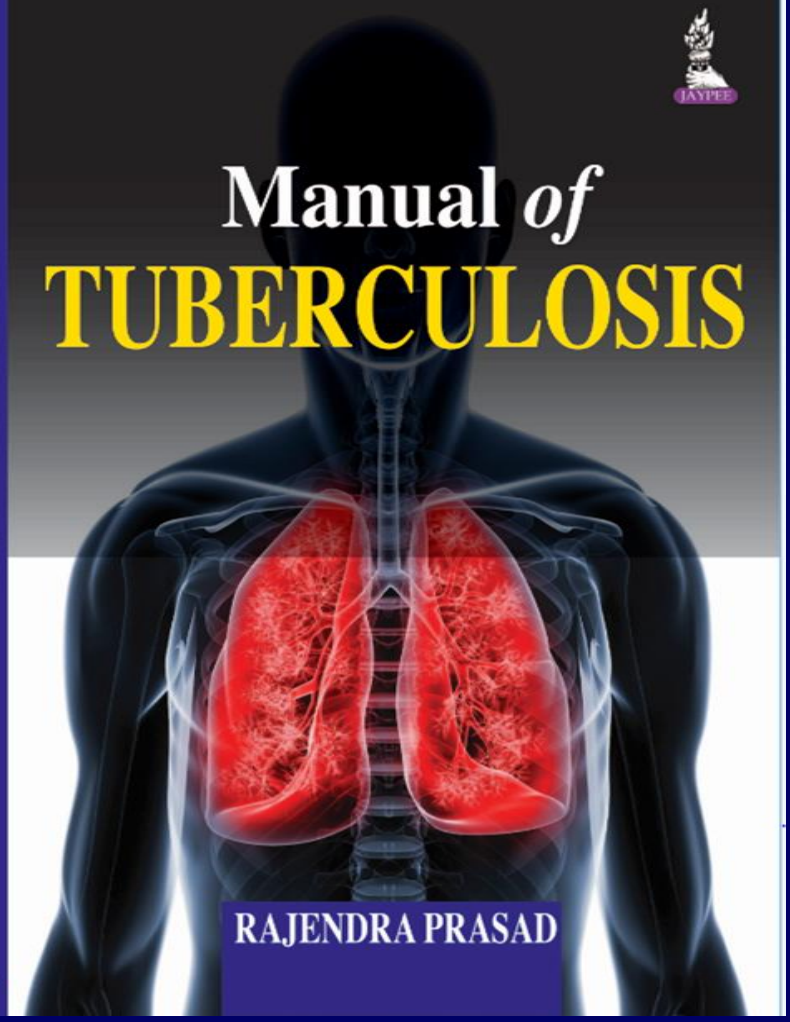

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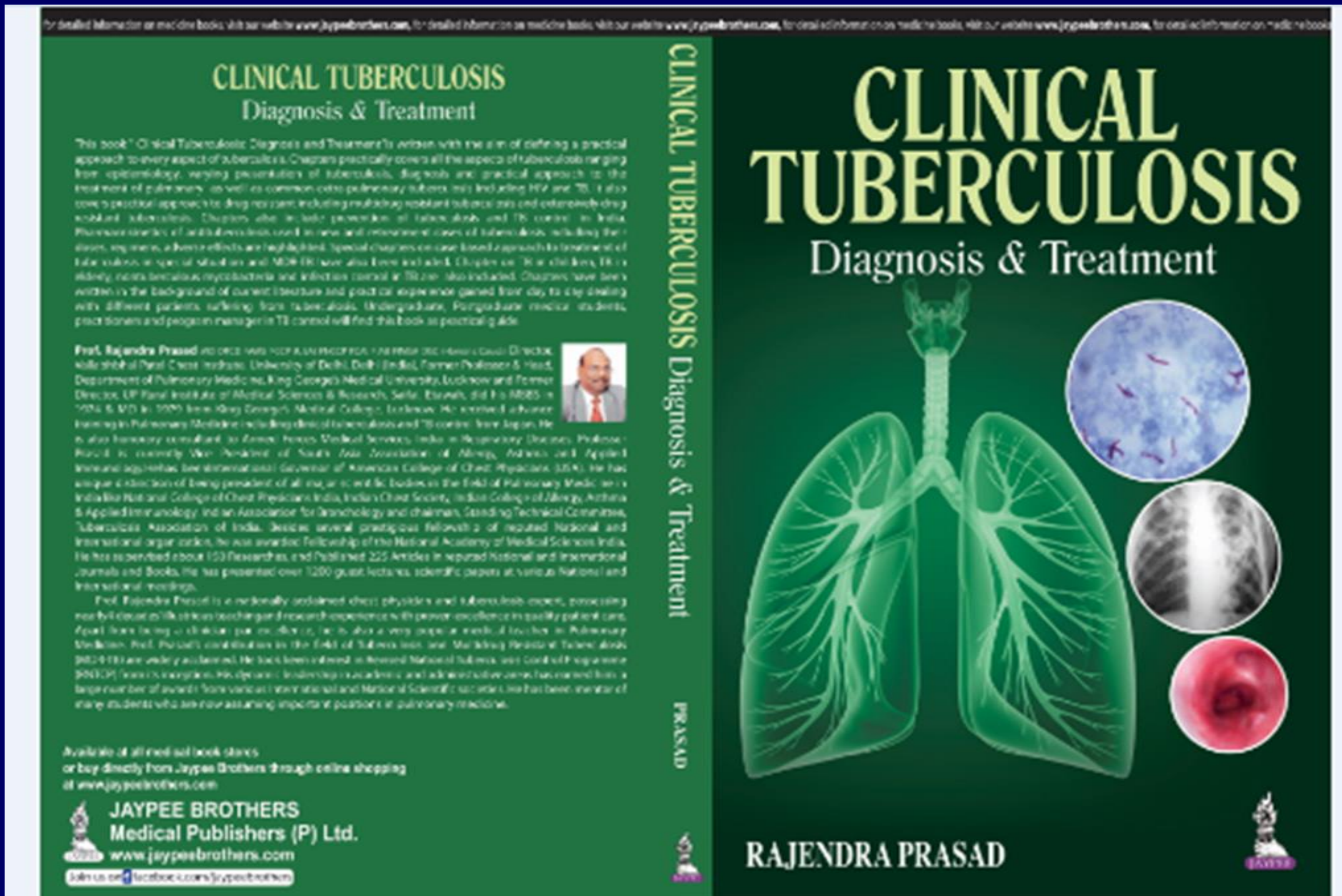
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MDR & XDR Tuberculosis

This book "MDR and XDR Tuberculosis" is written with the aim of defining a practical approach to every aspect of drug resistance tuberculosisespecially multi-drug resistant tuberculosis (MDR-TB) and extensively drug resistant tuberculosis (XDR-TB).Chapters practically covers all the aspects of drug resistance tuberculosis including MDR and XDR-TB ranging from epidemiology, diagnosis and practical approach to the treatment of MDR and XDR-TB including HIV and DR-TB. Special chapters on case based approach to treatment of MDR-TB have also been included. Chapter on DR-TB in children,DR-TB in Extrapulmonary Tuberculosis, Flouroquinolone resistance, infection control in DR-TB and Newer anti-Tuberculosis Drug are also included. Chapters have been written in the background of current literature and practical experience gained from day to day dealing with different patients suffering from drug resistant tuberculosis. Advances upto 2013 have been included making all the chapters well referenced with the latest references. Undergraduate, Postgraduate medical students, practitioners and program manager in TB control will find this book as practical guide.

Prof. Rajendra Prasad MD DTCD FAMS FCCP (USA) FNCCP FCAI FIAB FIMSA DSC (Honoris Causa) Director, Vallabhbhai Patel Chest Institute, University of Delhi, Delhi (India), Former Professor & Head, Department of Pulmonary Medicine, King George's Medical University, Lucknow and Former Director, UP Rural institute of Medical Sciences & Research, Saifai, Etawah, did his MBBS in 1974 & MD in 1979 from King George's Medical College, Lucknow. He received advance training in Pulmonary Medicine including clinical tuberculosis and TB control fromJapan. He is also honorary consultant to Armed Forces Medical Services, India in Respiratory Diseases. He has beeninternational Governor of American College of Chest Physicians (USA). He has unique distinction of being president of all major scientific bodies in the field of Pulmonary Medicine in India like National College of Chest Physicians India, Indian Chest Society, Indian College of Allergy, Asthma & Applied Immunology, Indian Association for Bronchology and chairman, Standing Technical Committee, Tuberculosis Association of India. Besides several prestigious fellowship of reputed National and International organization, he was awarded Fellowship of the National Academy of Medical Sciences India. He has supervised about 150 Researches, and Published 225 Articles in reputed National and International Journals and Books. He has presented over 1200 guest lectures, scientific papers at various National and International meetings.

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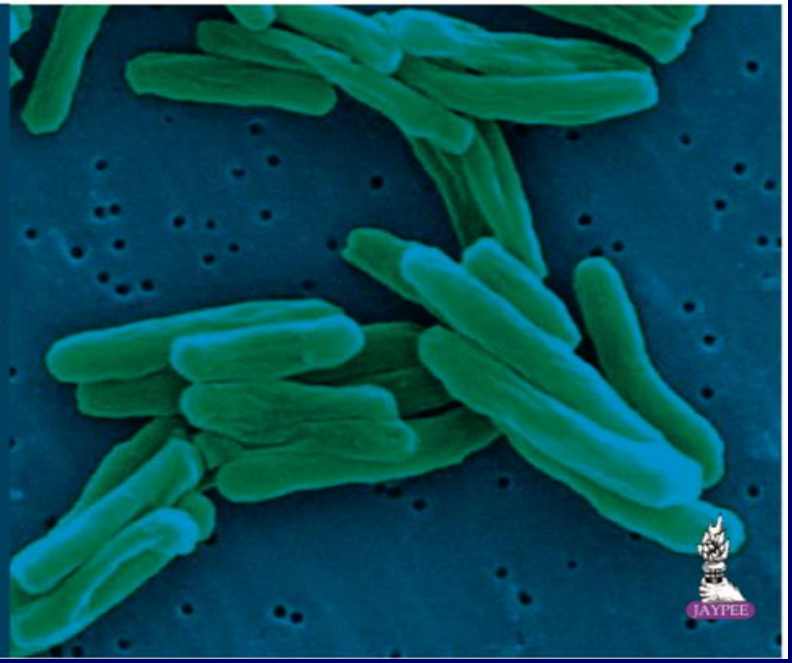

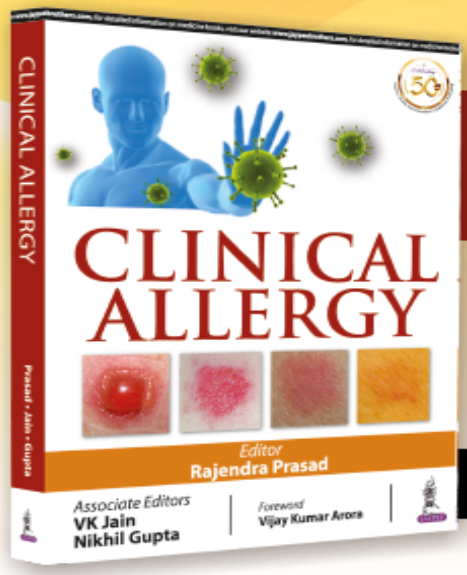

CLINICAL ALLERGY

Editor

Rajendra Prasad

MD DTCD FAMS FCCP (USA)
FRCP (Glasgow) FNCCP FICS FCAI
FIAB FIMSA FCCS DSc (Honoris Causa)

Full Colour | Paperback | 1/e, 2020
8.5" x 11" | 522 pp | 9789389129045

Salient Features

- The book is written with the aim of defining a practical approach to every aspect of Allergy.
- Chapters practically covers all the aspects of allergy ranging from epidemiology, varying presentation of allergy, diagnosis and practical approach to the treatment of various allergic diseases.
- It also covers practical approach to prevention of allergy and pediatric issues in management of allergic diseases.
- Chapters include allergic rhinitis, ocular allergy, urticaria, angioedema, atopic dermatitis, drug allergy and food allergy.
- Special chapters on latex allergy, human seminal plasma allergy, aspirin allergy, anticonvulsants hypersensitivity syndrome, hymenoptera allergy, radio-contrast allergy, local and general anesthetic allergy, cow milk allergy, sublingual immunotherapy, cluster immunotherapy and future of immunotherapy are also included in the book.
- This book also contains chapter on pollen calendar with the use of photographs of allergenic plants mainly found in India.
- The contributors of this book were chosen for their specific expertise and interest in respective areas. Chapters have been written in the background of current literature and practical experience gained from day-to-day dealing with different patients suffering from allergy.

Contents

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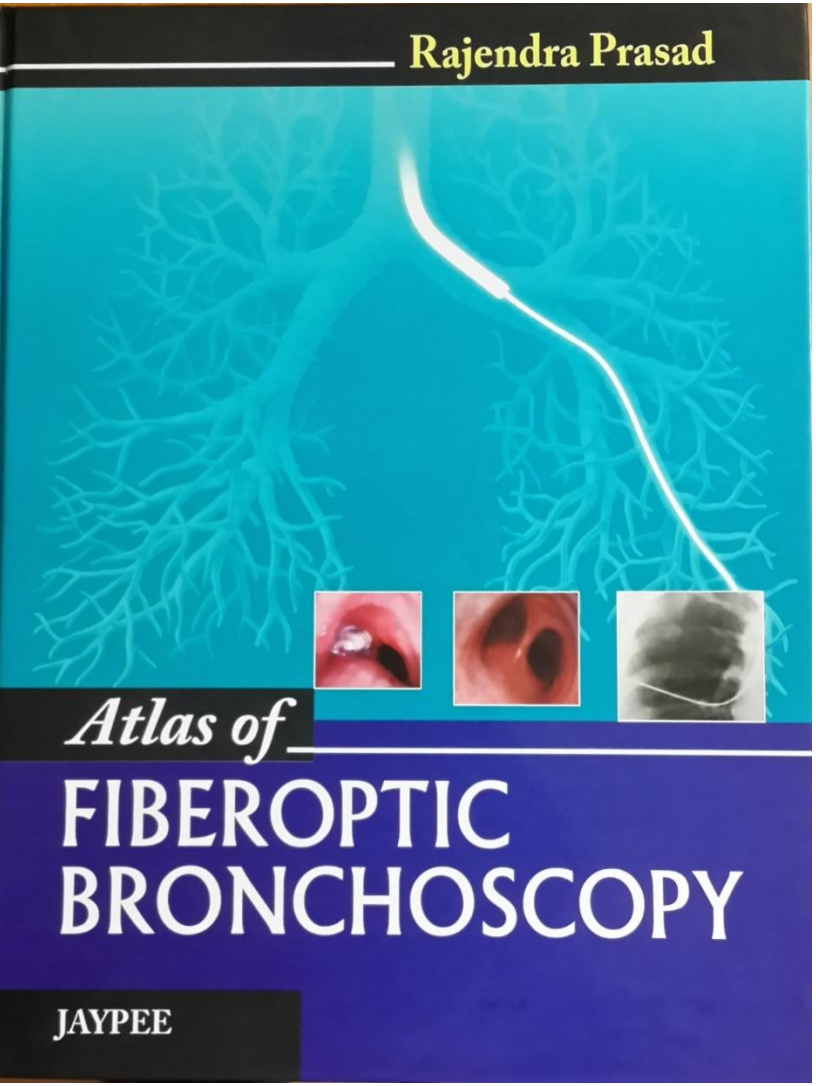
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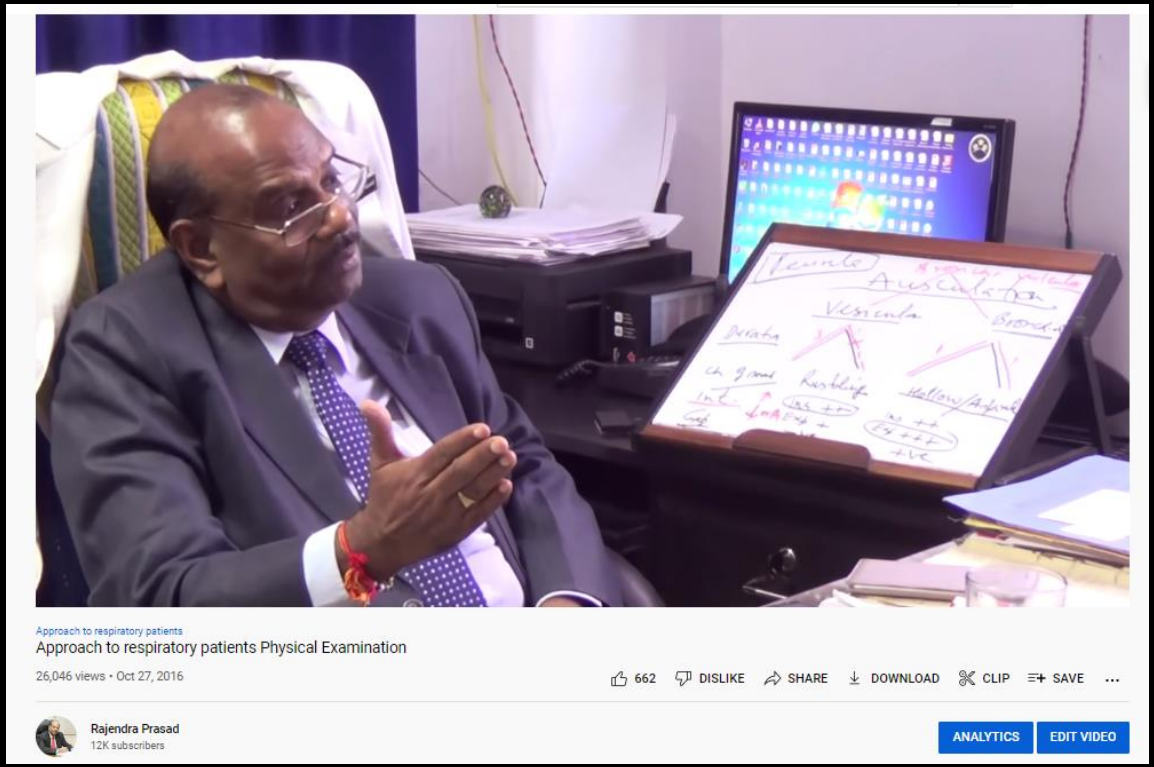
Former President of India

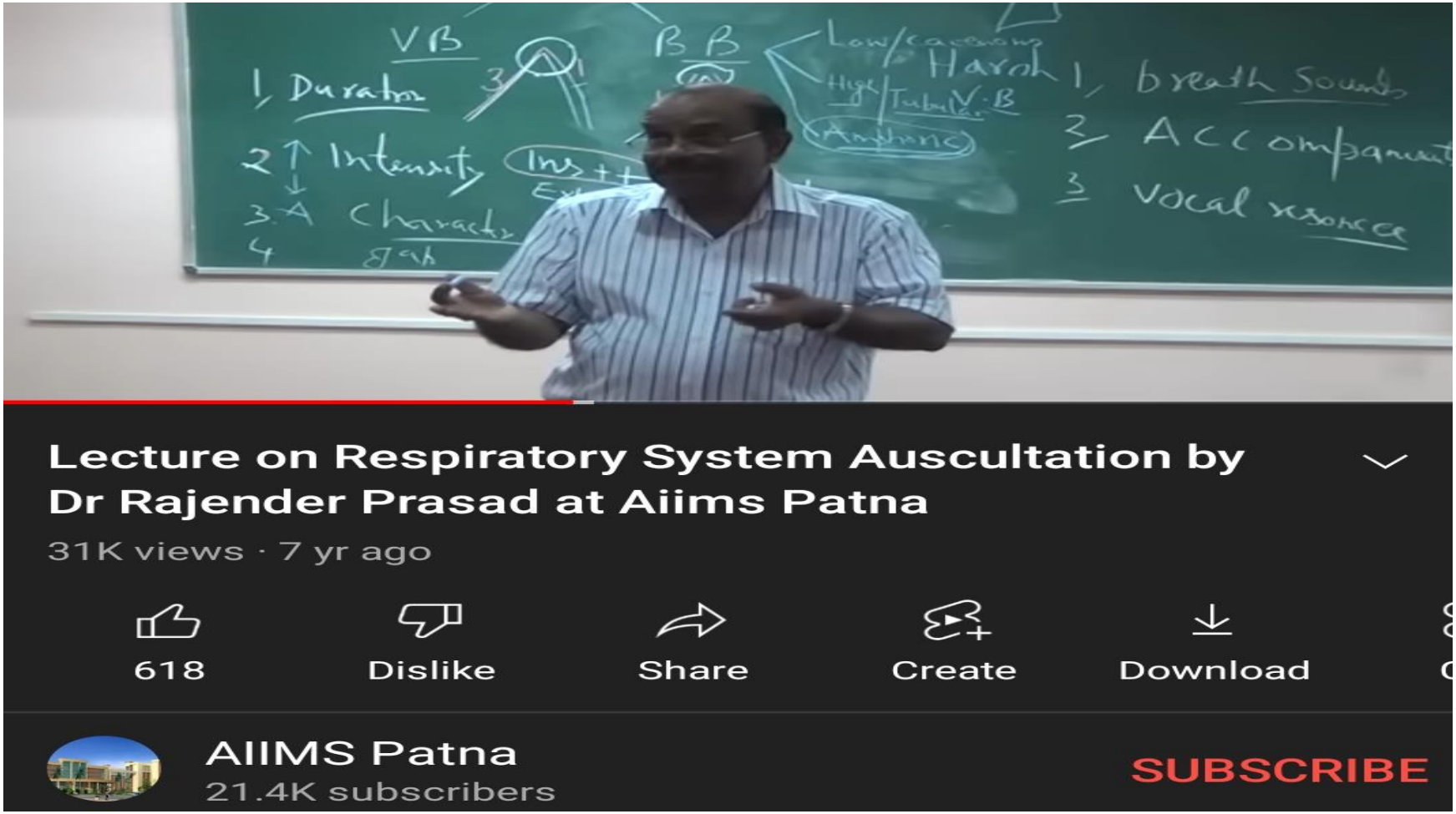
Approach To Respiratory Patients - History

https://youtu.be/iGdcPHZdjvk

Approach To Respiratory Patients Physical Examination

https://youtu.be/R9ZLd2H37So





https://youtu.be/VYU3M6aYIxU

A Doctor is a student till his death, when he fails to be a student, he dies.

Sir William Osler

“Anyone who keeps learning stays young”
Henry Ford

I am Still Learning……

Thank You

Questions

? ? ?