

Саратовский государственный  
медицинский университет  
имени В. И. Разумовского

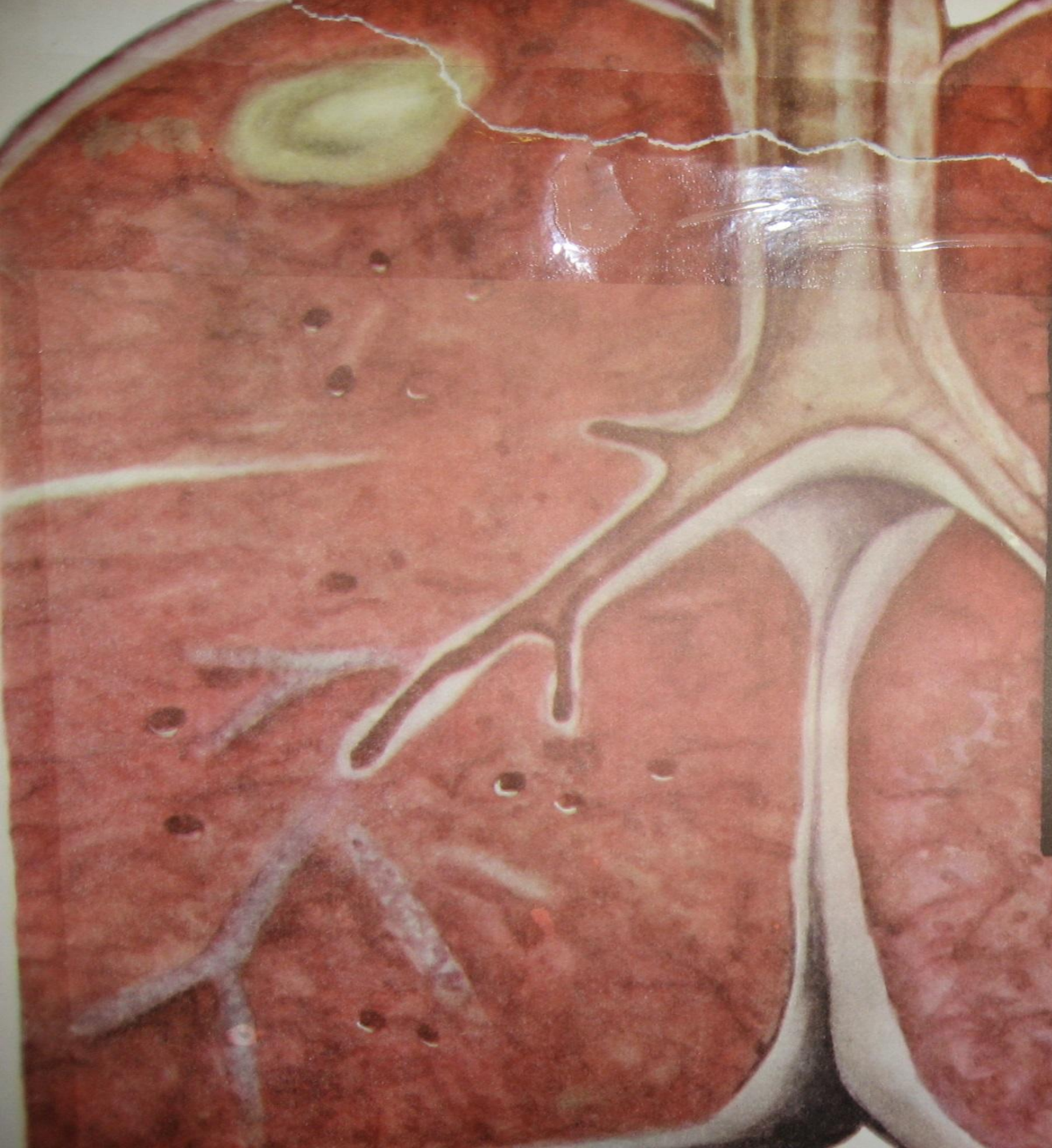
# LUNG TUBERCULOMA

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# Lung tuberculoma

- Lung tuberculoma unites etiologically various capsulated caseous foci of more than 1 cm in diameter
- The prevalence of tuberculoma among all forms of pulmonary tuberculosis is

6-10 %.



# THE LUNG TUBERCULOMA

- The lung tuberculoma has the distinctive original clinical and anatomical display of secondary form of the pulmonary tuberculosis.
- It is characterized by the development of the dense caseous focus (some time several focuses) in lungs, of rounded forms, sharply outlined from surrounding tissue by fibrotic capsule.

# CONDITIONS FOR FORMATION OF TUBERCULOMAS

- Physically active people.
- Decreased virulence and pathogenicity of Mycobacterium.
- Increased resistance of the organism to Mycobacterium.
- Social factors:
  - Male sex.
  - Age 20-40 years.

# The source of tuberculoma formation

is mainly of two forms of pulmonary tuberculosis:

- infiltrative-pneumonic and focal.
- Besides this, tuberculoma forms from cavernous pulmonary tuberculosis by means of filling the cavity with caseous masses.
- Filled cavities refer to tuberculoma only conditionally, as the filling of a cavity occurs mechanically, while tuberculomas are an original phenomenon in lung tissue.

# PATHOMORPHOLOGICAL CLASSIFICATION OF TUBERCULOMAS.

- Infiltrative-pneumonic tuberculoma
- Caseoma
- Pseudotuberculoma

# INFILTRATIVE-PNEUMONIC TUBERCULOMA

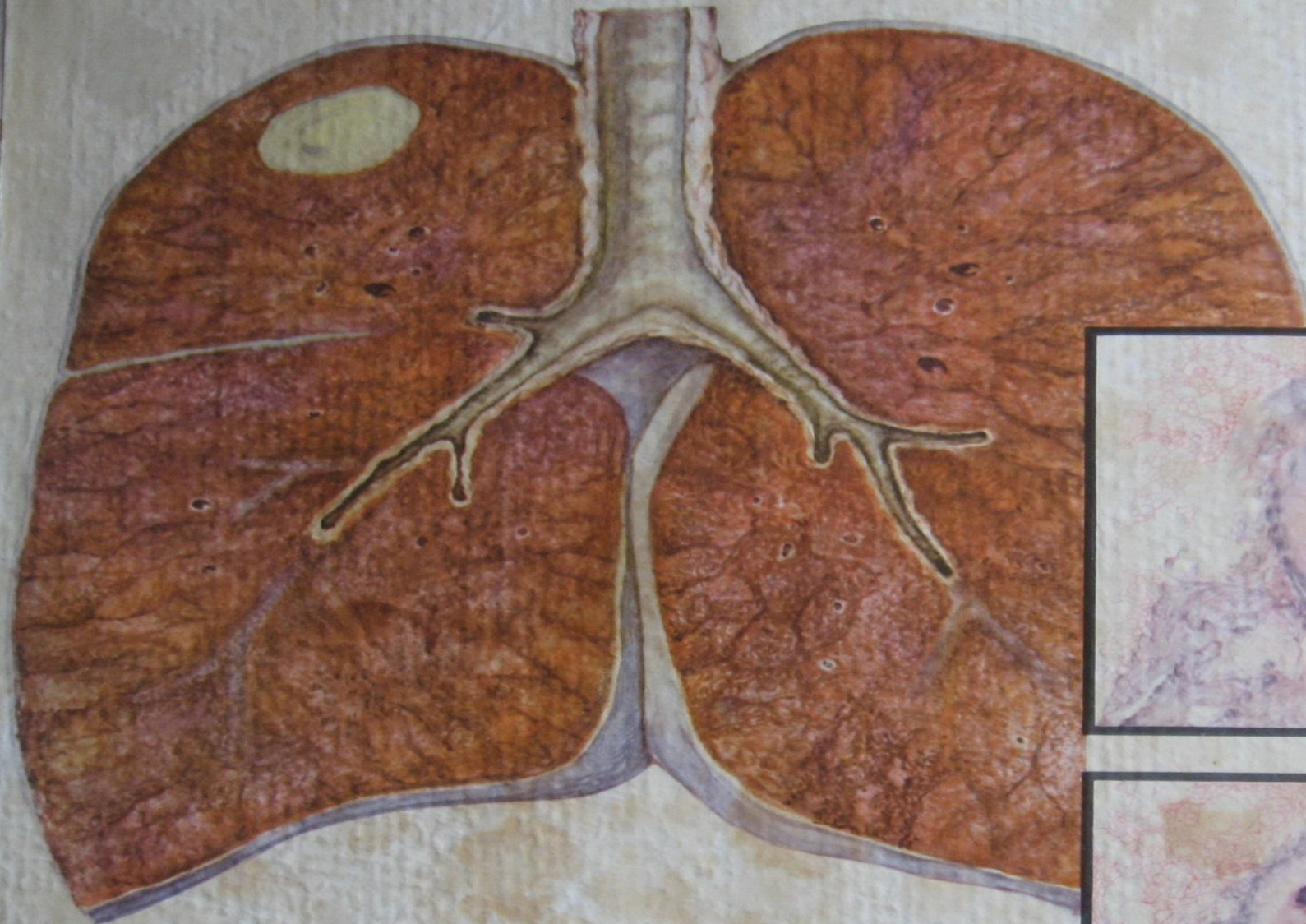
- Presents as a round focus of pneumonia, containing masses of clotty necrosis, clearly limited from the surrounding lung tissue.
- The capsule is weakly expressed.
- Usually as a result of infiltrative tuberculosis.

# CASEOMA

□ Big focus of caseous pneumonia surrounded by a fresh capsule.

□ Types:

1. Solitary homogenic caseoma (massive caseous focus inside the capsule)
2. Solitary layered caseoma (alternation of layers of caseous masses with layers of connective tissue).
3. Conglomerated caseoma (multiple caseous foci surrounded by one capsule).

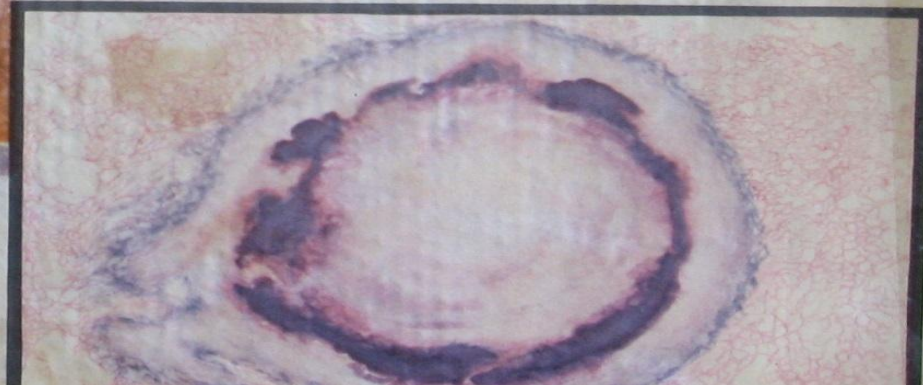


# ГИСТОТОПОГРАММЫ

Солидарная гомогенная туберкулема

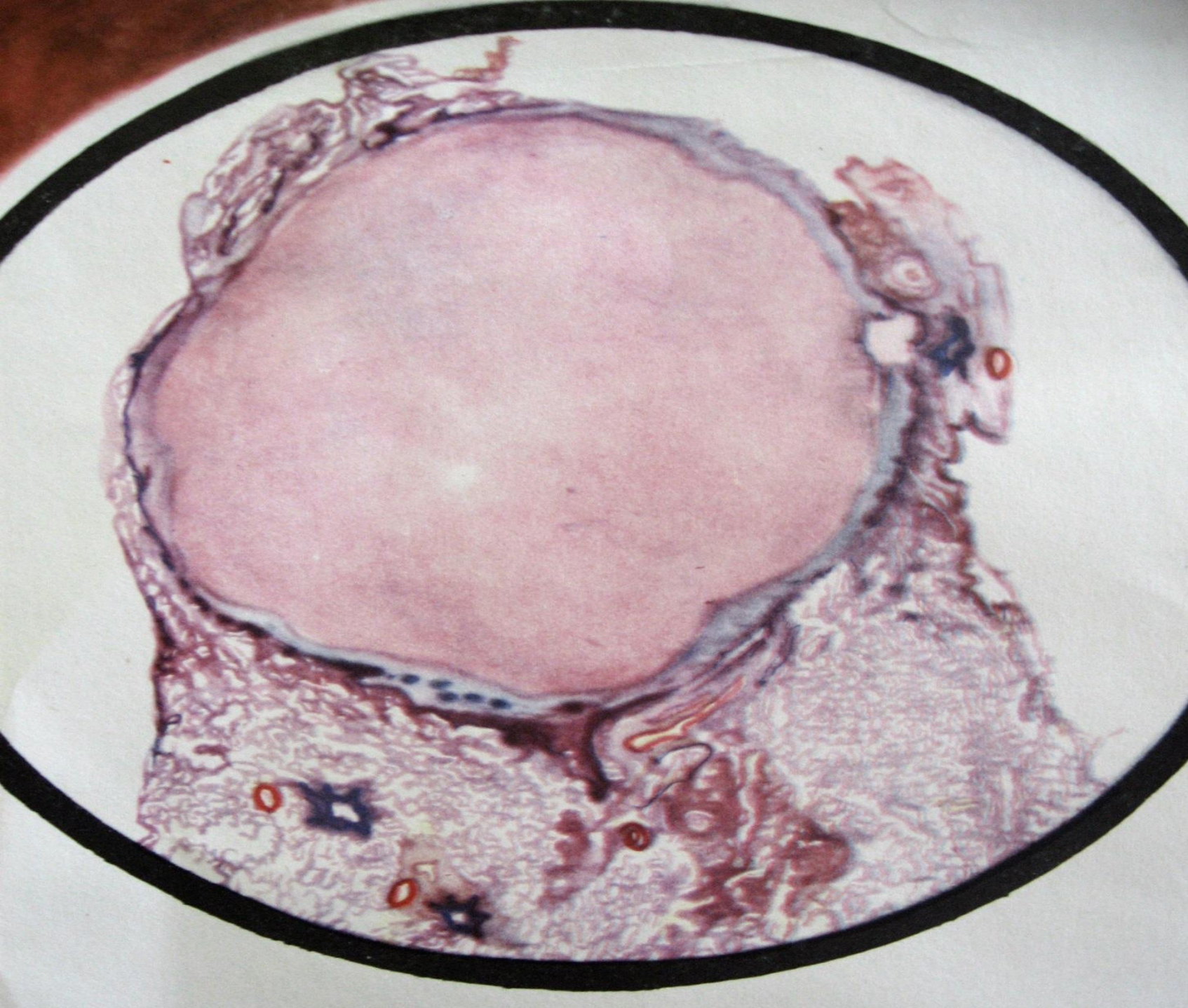


Солидарная слоистая туберкулема

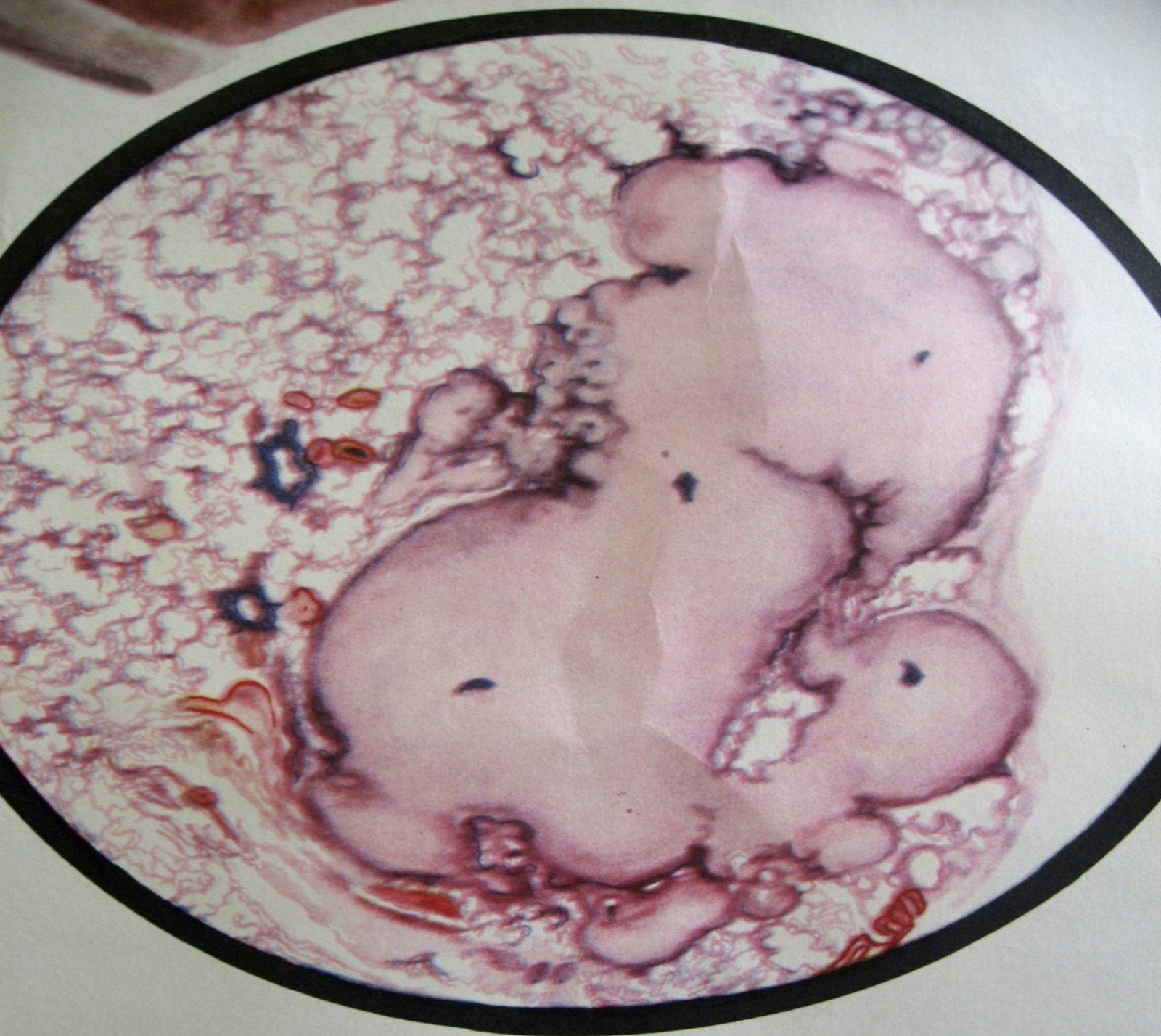


ТУБЕРКУЛЕМА В ВЕРХНЕЙ ДОЛЕ ПРАВОГО ЛЕГКОГО

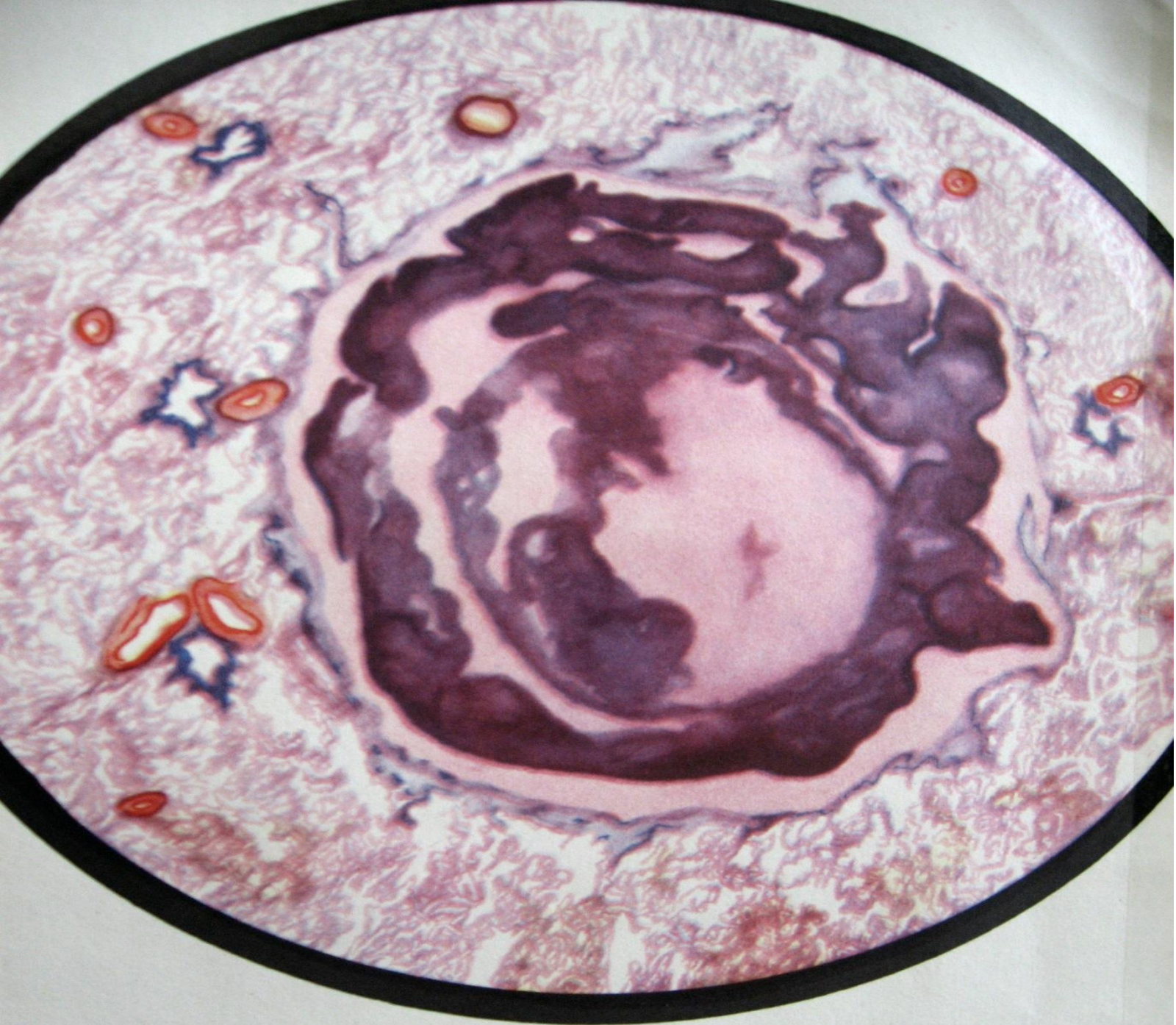
**Tuberculoma (solitary (homogeneous) and layered)**



**Tuberculoma  
(solitary)  
(homogeneous)**



Conglomerated  
tuberculema



**Lauered  
tuberculoma**

# PSEUDOTUBERCULOMA

- Only revealed in case of dynamic observation of the patient and histological examination of material after operation.

# There are three clinical variants of tuberculoma course:

## 1. progressing,

- described by occurrence of disintegration at some stage of illness,
- perifocal inflammation around tuberculoma,
- bronchogenic dissemination in surrounding lung tissue.

# **Variants of the tuberculema aggravation:**

- 1)** development of the perifocal inflammation;
- 2)** cavitation - discharge of the caseous masses from a cavity, through draining bronchus.

## 2. stable –

- absence of tuberculoma X-ray changes
- or rare aggravations without signs of tuberculoma progressing;

### 3. regressing tuberculoma

is characterized by its

- slow reduction in size,
- with subsequent formation of focus or group of foci, induration field or combination of these changes.

# PREVALENCE OF TUBERCULOMA

- The prevalence of tuberculoma among all forms of pulmonary tuberculosis is 6-10 %.
- This tendency is explained by the fact that vast infiltrative pneumonic processes, under treatment and increased body resistance, become limited, condensed, lose their aggravated course.
- However, the process does not heal completely and precisely outlined dense formation remains.

# Clinical pattern

- As tuberculoma itself is a parameter of high body resistance, patients with this form of pulmonary tuberculosis frequently are revealed accidentally, at fluorography examinations,
- preventive examinations, and
- in presence of other diseases.
- Practically, patients have no complaints.

# Physical examination

- **At physical examination** of a patient, there are no pathological signs in lungs.
- Crackles are heard only at massive flare-up with extensive infiltrative changes in lung tissue around tuberculoma.

# CURRENT OF THE DISEASE

## 1. *Start of the disease:*

- Debut of the disease is asymptomatic.
- The method of revealing tuberculomas is usually active i.e. prophylactic fluorography.

## 2. *Stable period:*

- Satisfactory condition of the patient.
- No infringement of general work capacity.
- Still asymptomatic.
- Physical examination reveals no pathological findings.

# CURRENT OF THE DISEASE

## 3. *Period of progression:*

- Moderate expression of symptoms of tuberculous intoxication.
- Appearance of “chest” symptoms.
- Physical examination reveals:
  - Dullness of percussion sounds.
  - Localised rales.

# CURRENT OF THE DISEASE

## 4. *Period of regression:*

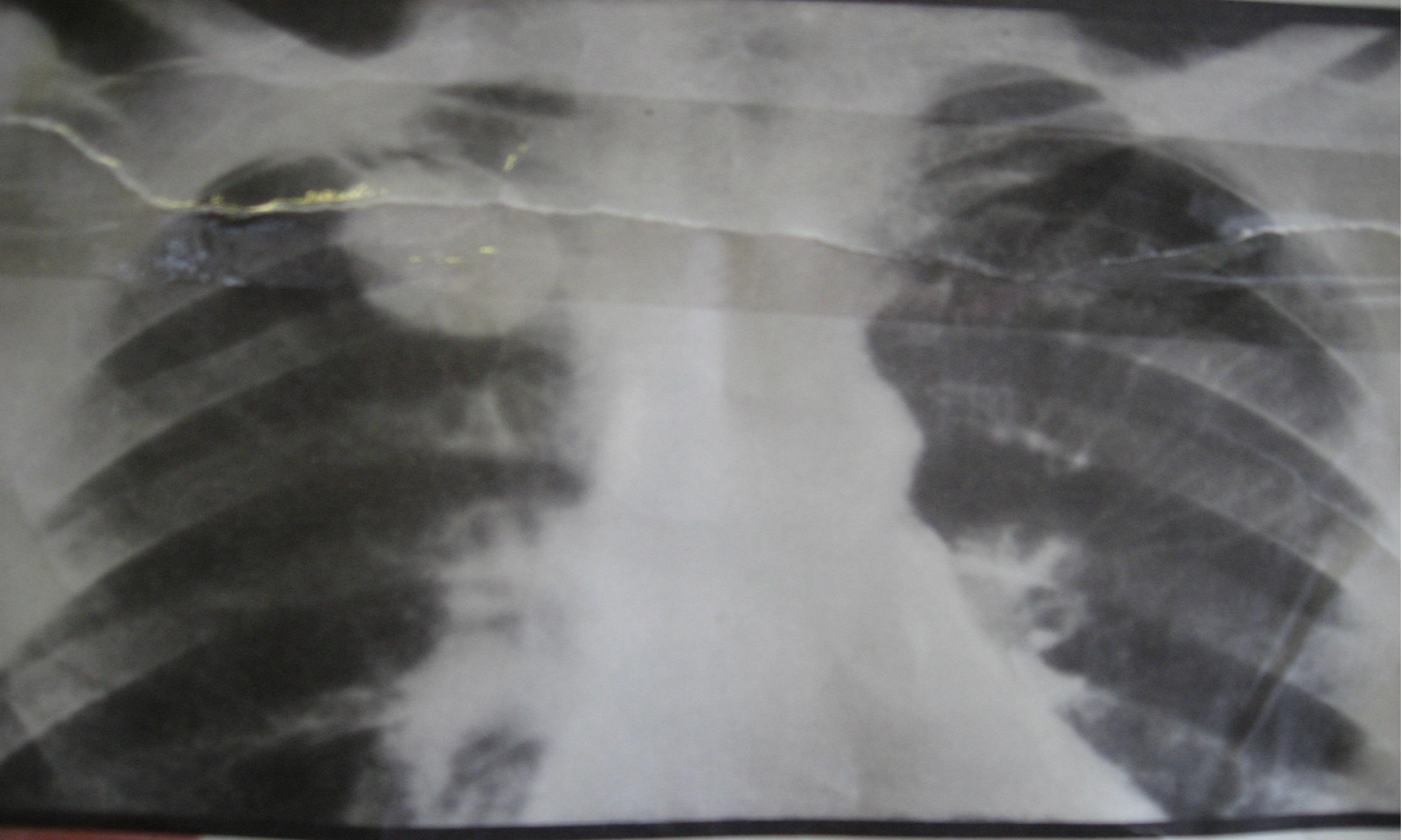
- Reversal of symptoms.
- The tuberculoma gradually decreases in size, becomes indurated and deposition of calcium crystals may also occur.
- Carnification may also occur.
- Conglomerated tuberculoma may fragment into foci.

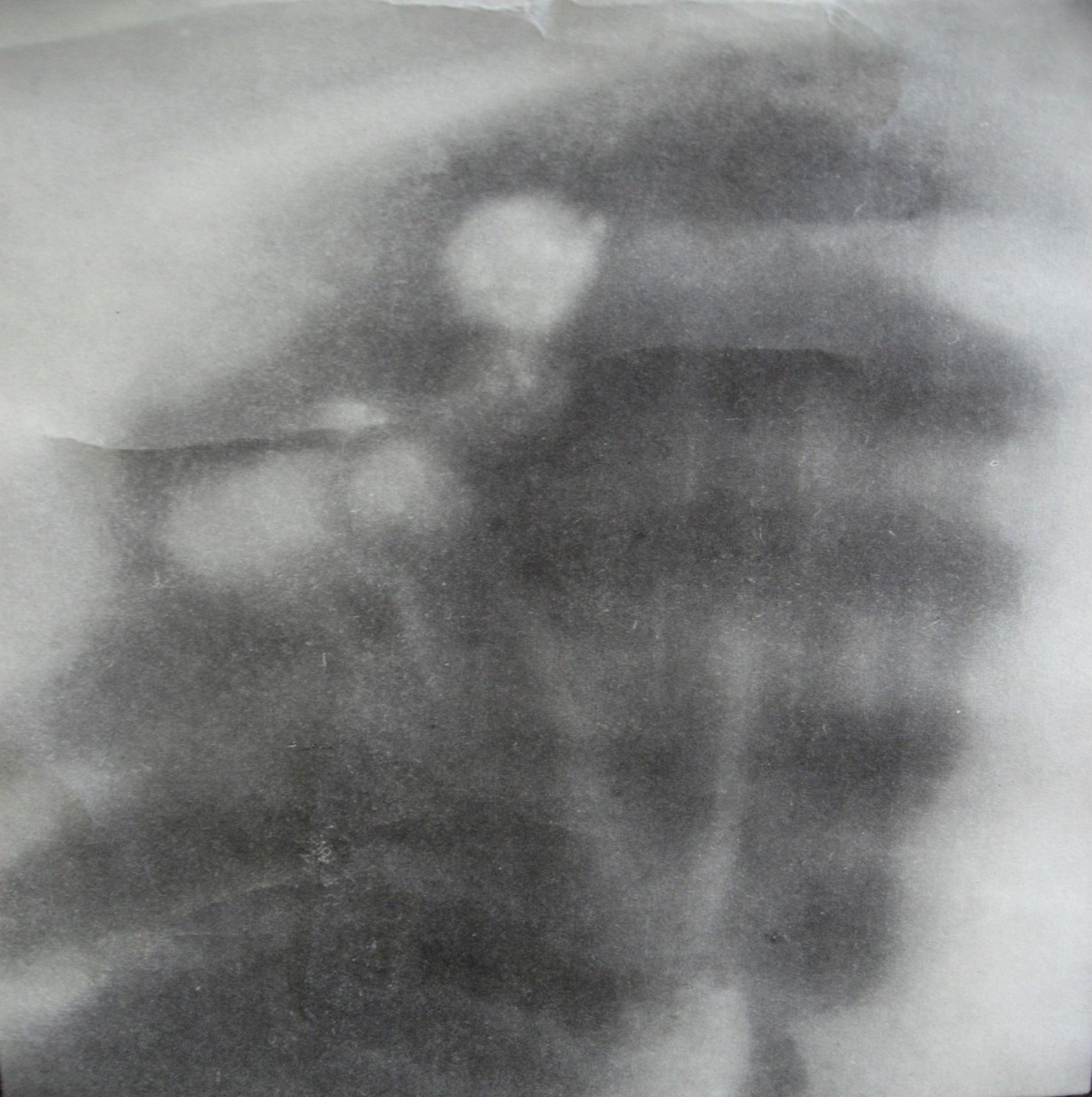
# Physical examination

- At physical examination of a patient, there are no pathological signs in lungs.
- Crackles are heard only at massive flare-up with extensive infiltrative changes in lung tissue around tuberculoma.

# X-ray picture of tuberculoma

- X-ray image of tuberculoma looks like rounded shadow with precise contours.
- Inside focus enlightenment could be observed due to disintegration.
- Sometimes perifocal inflammation and small amount of bronchogenic focuses, and calcification sites can be defined.

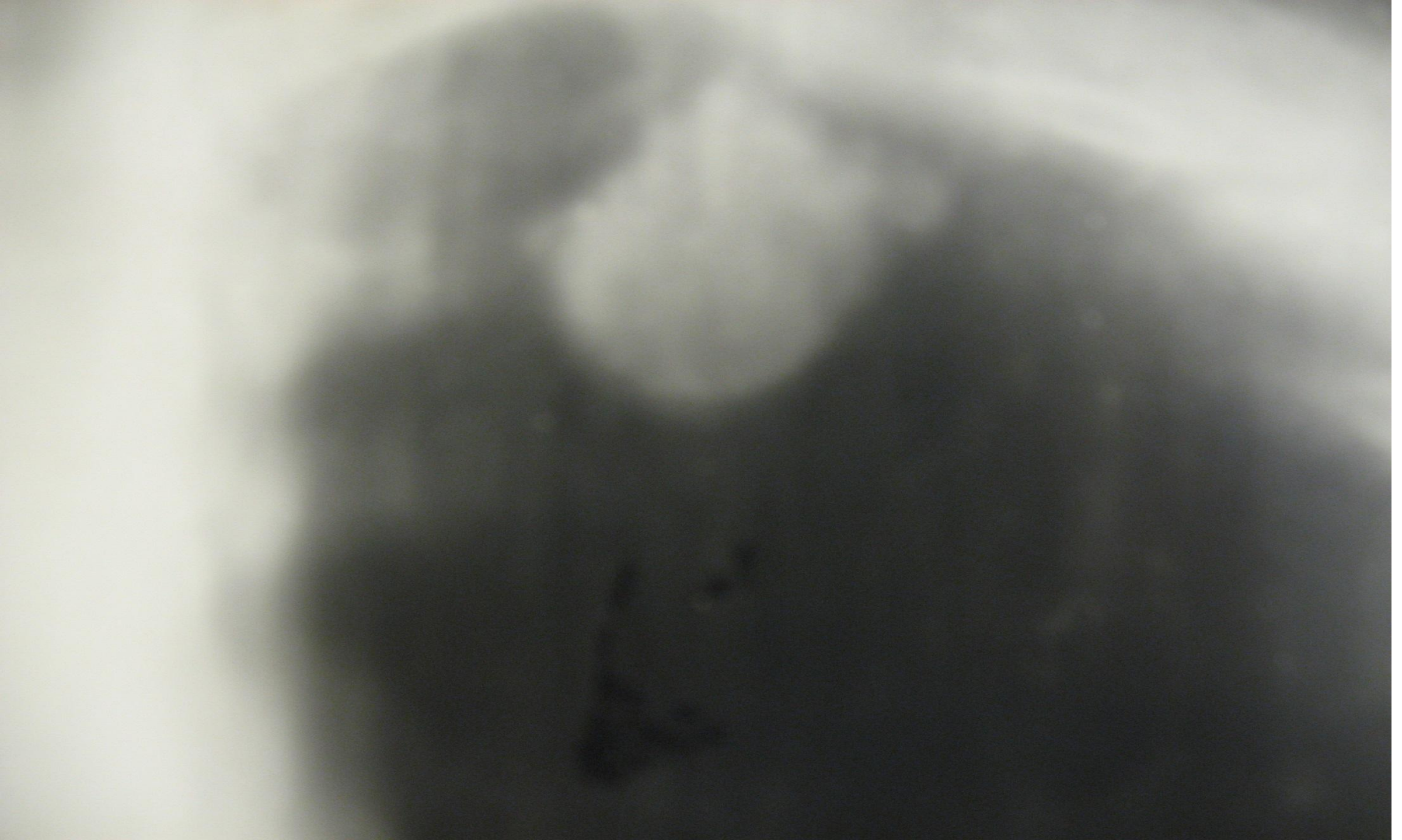


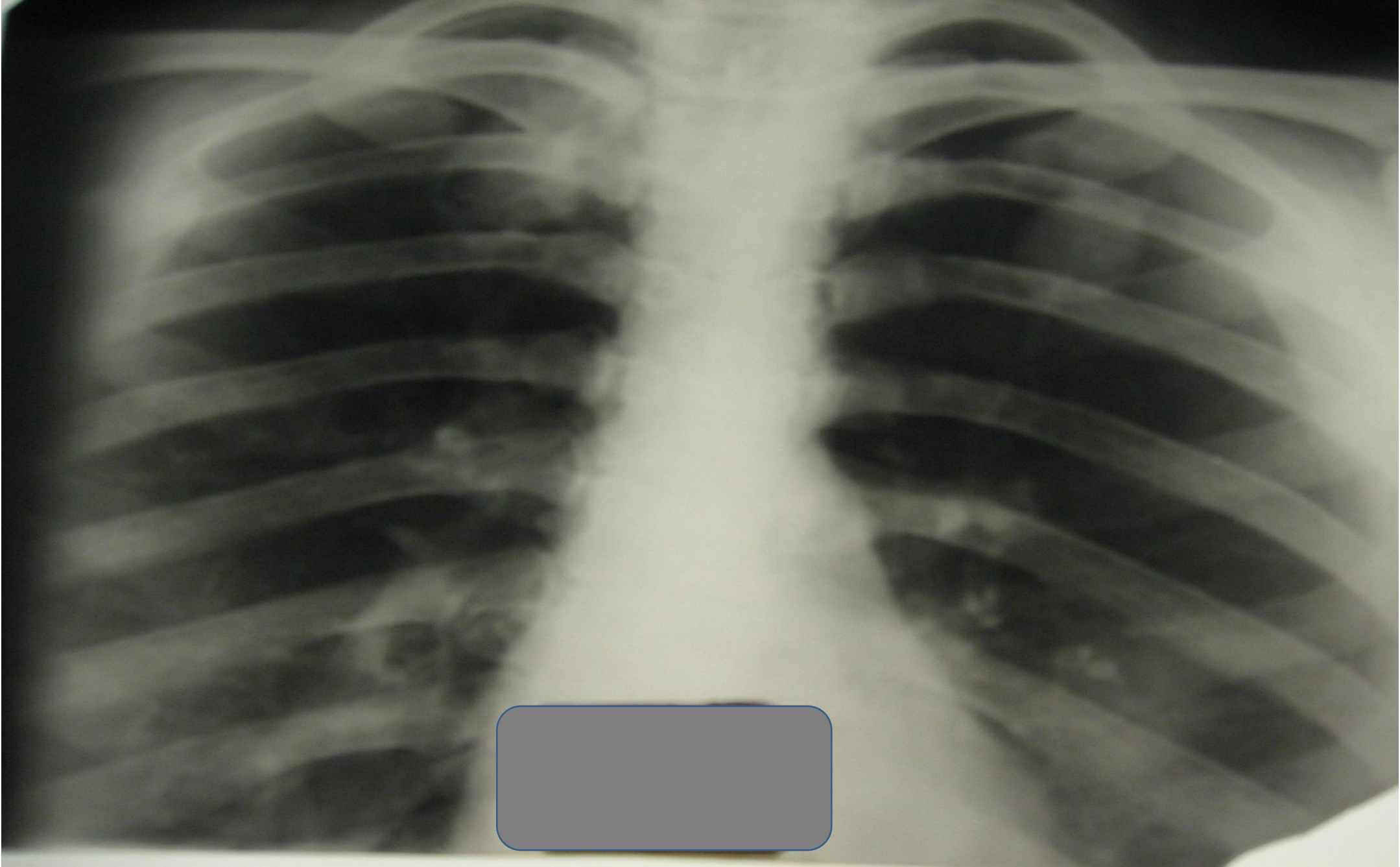


**Tuberculomas of the  
right lung upper lobe**

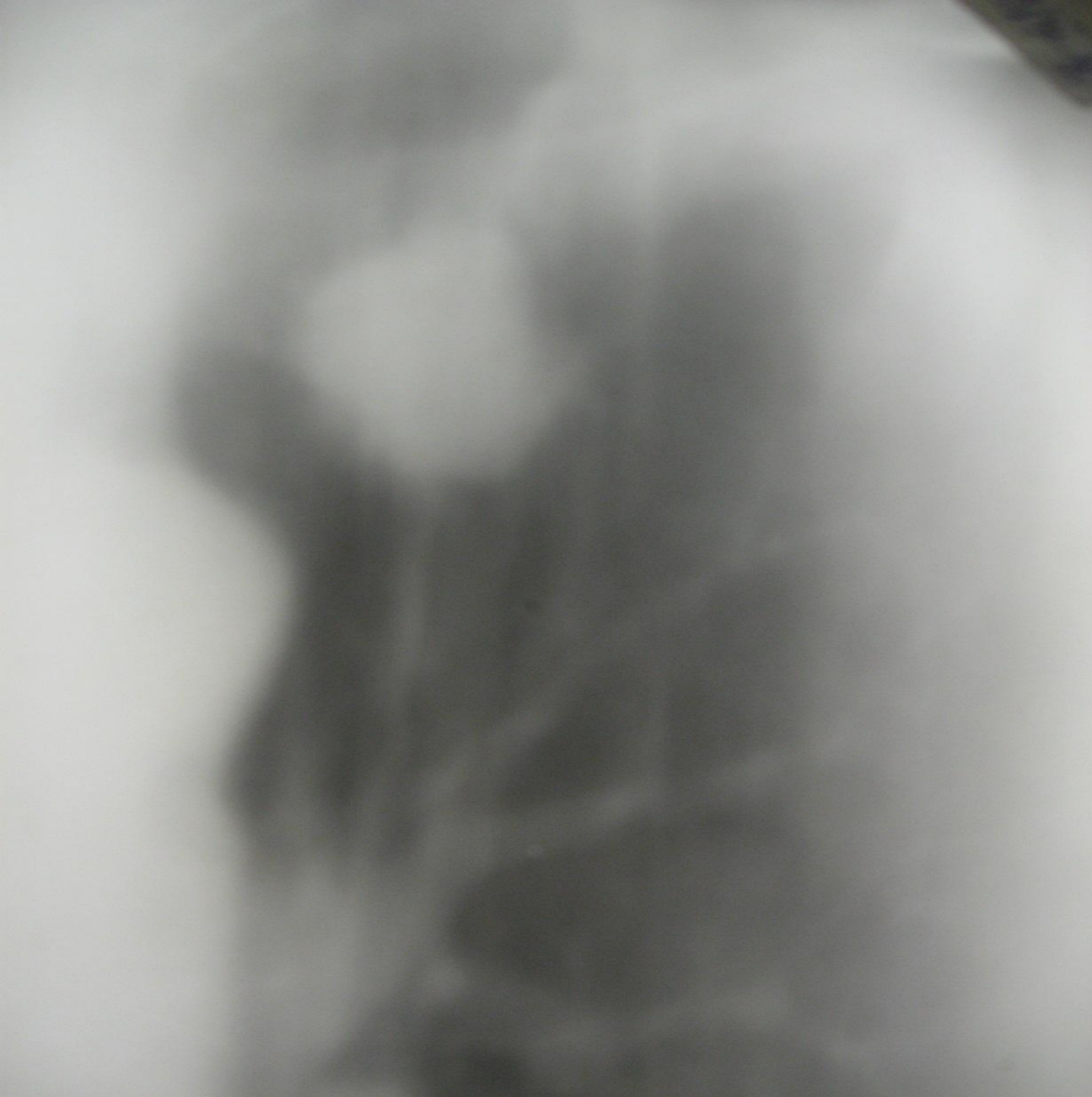
# TUBERCULOMA IN THE PHASE OF DISINTERGRATION

- Characterised by eccentric localisation of semi-lunar shaped or beam-shaped zones of enlightenment around the medial edge of the tuberculoma.
- This is accompanied by communication of the tuberculoma with the lung root due to formation of broncho-vascular channels.

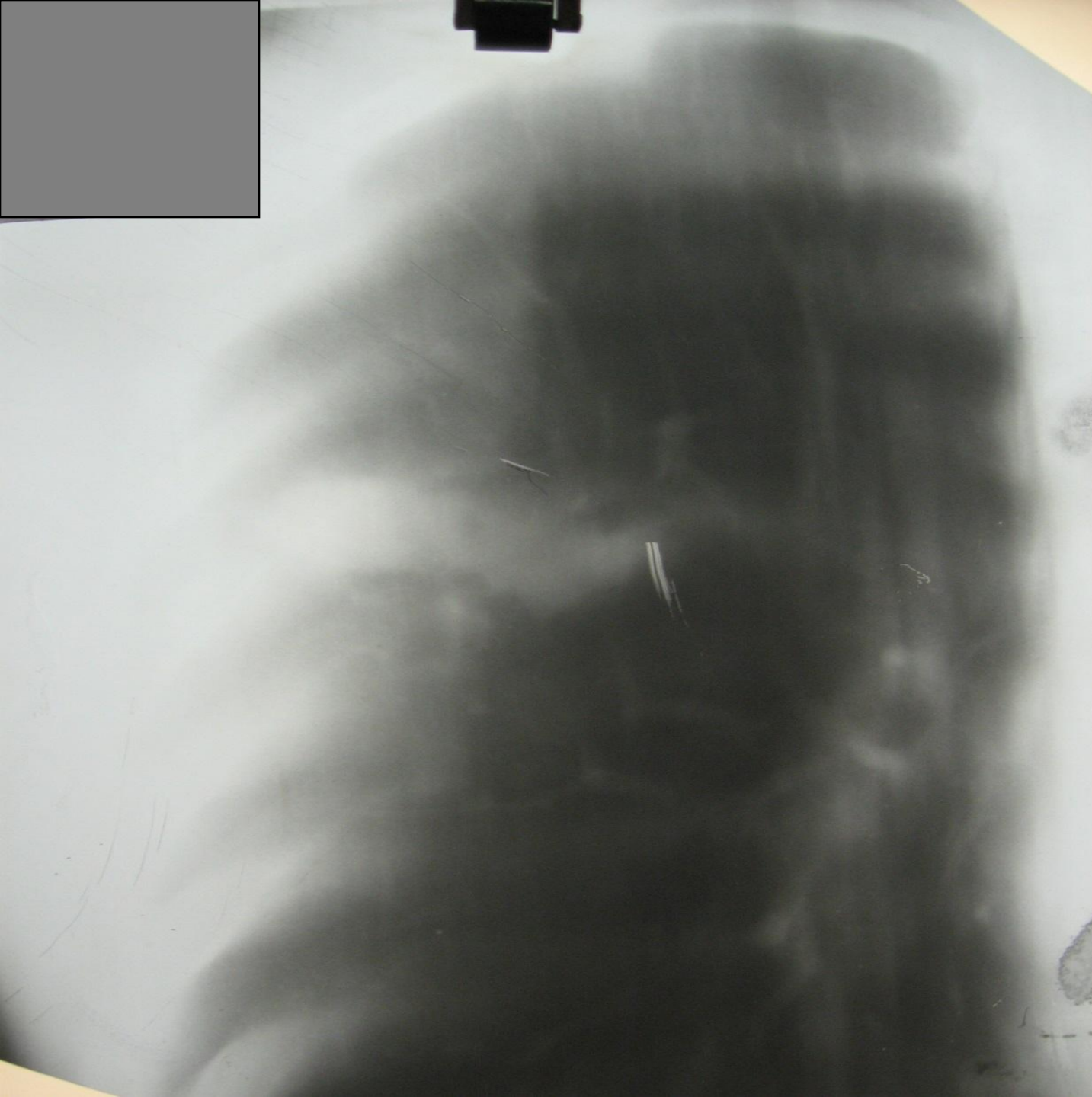




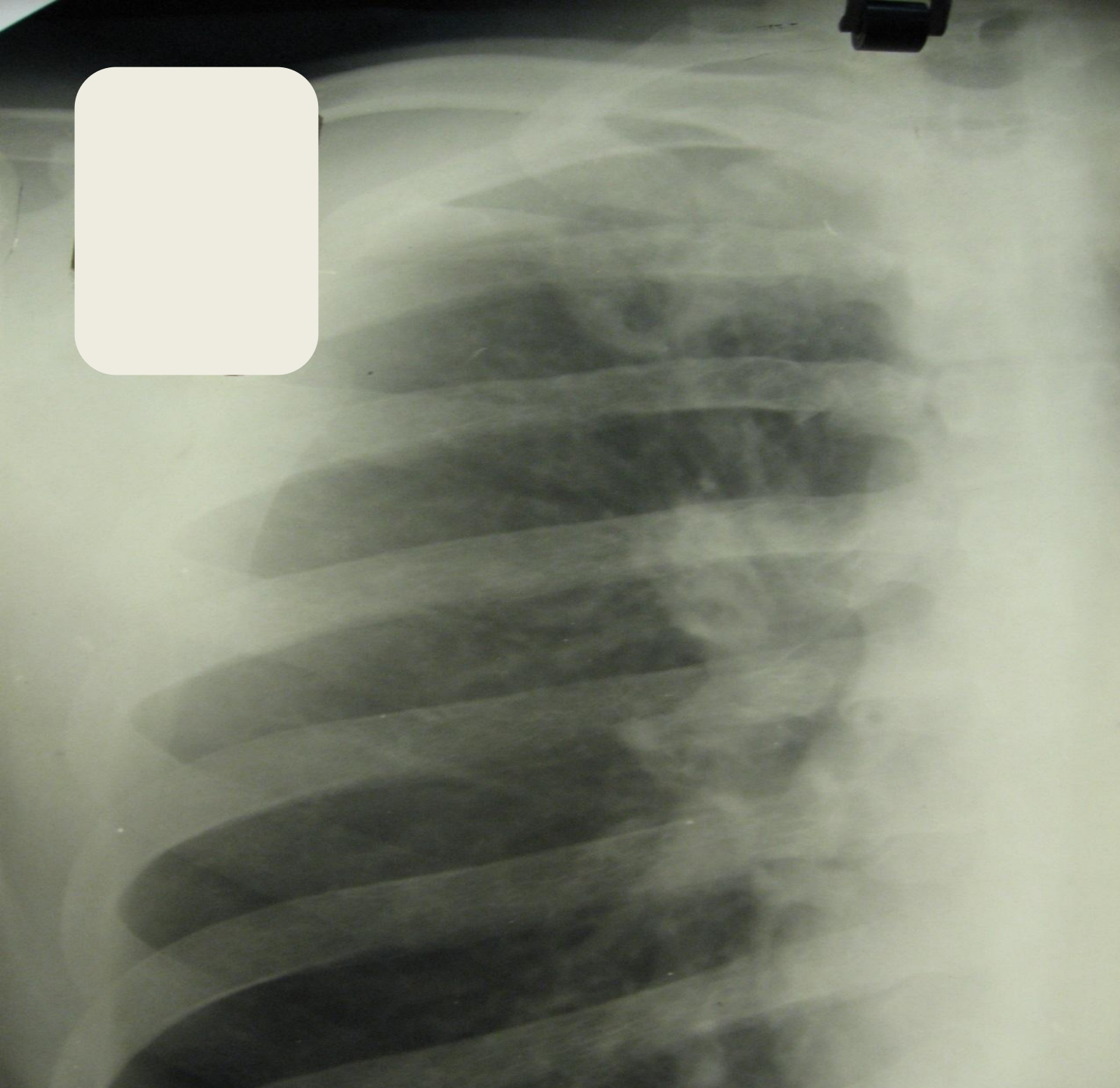
**Tuberculoma of the left lung (upper lobe)**



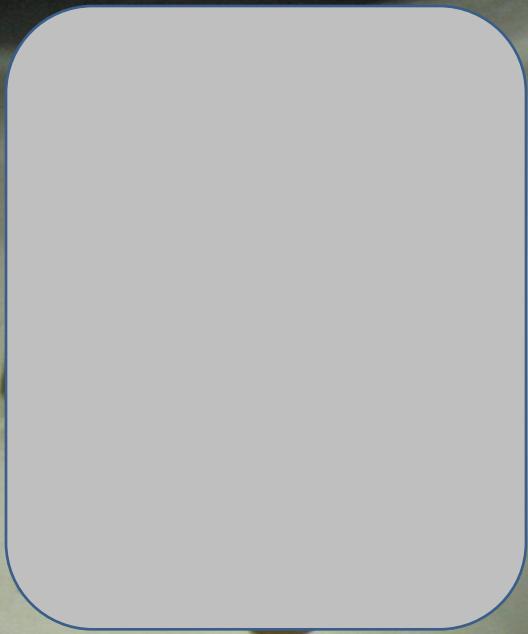
**Tuberculoma of the left  
lung (upper lobe)**

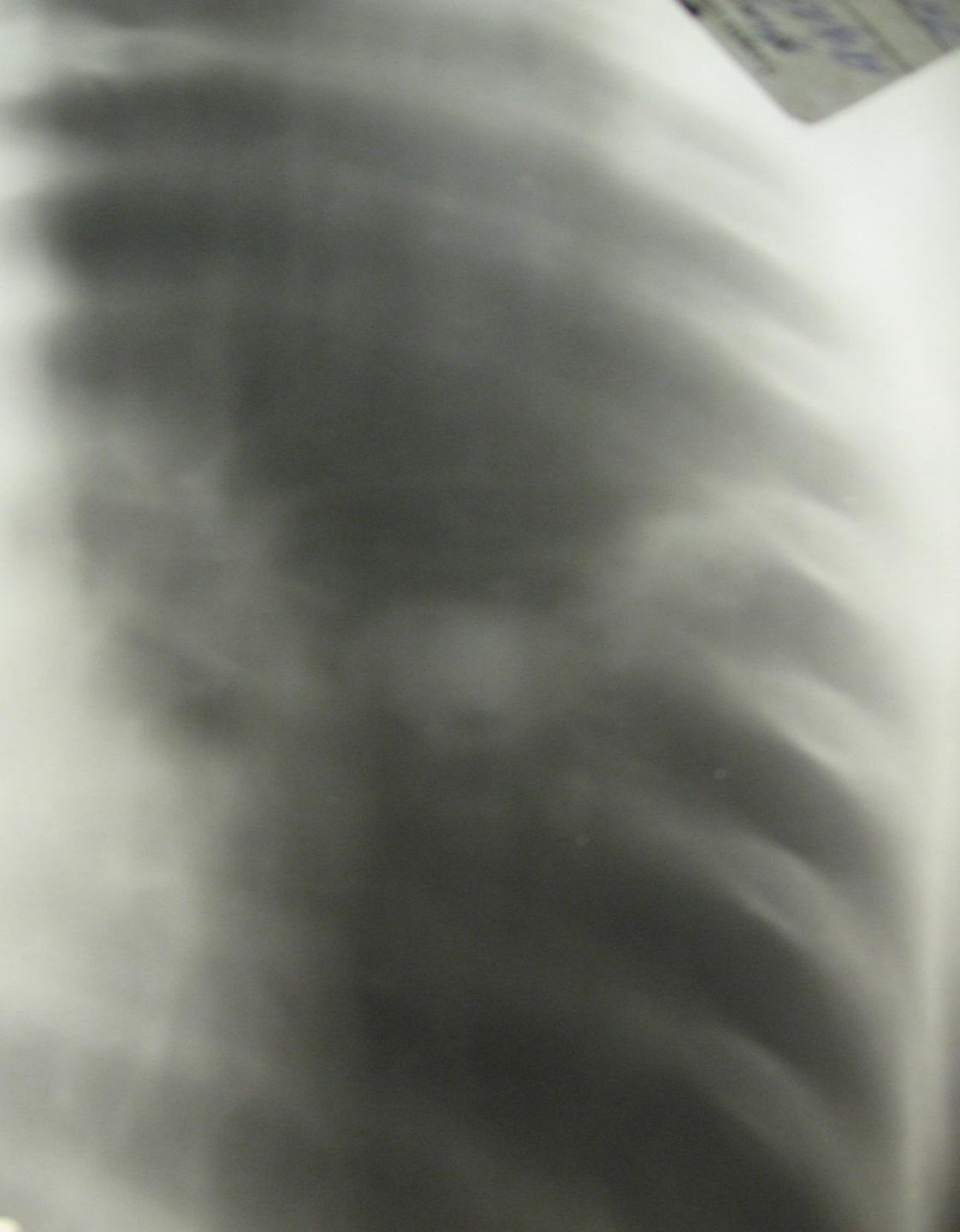


**Tuberculoma of the  
right lung (upper lobe)**

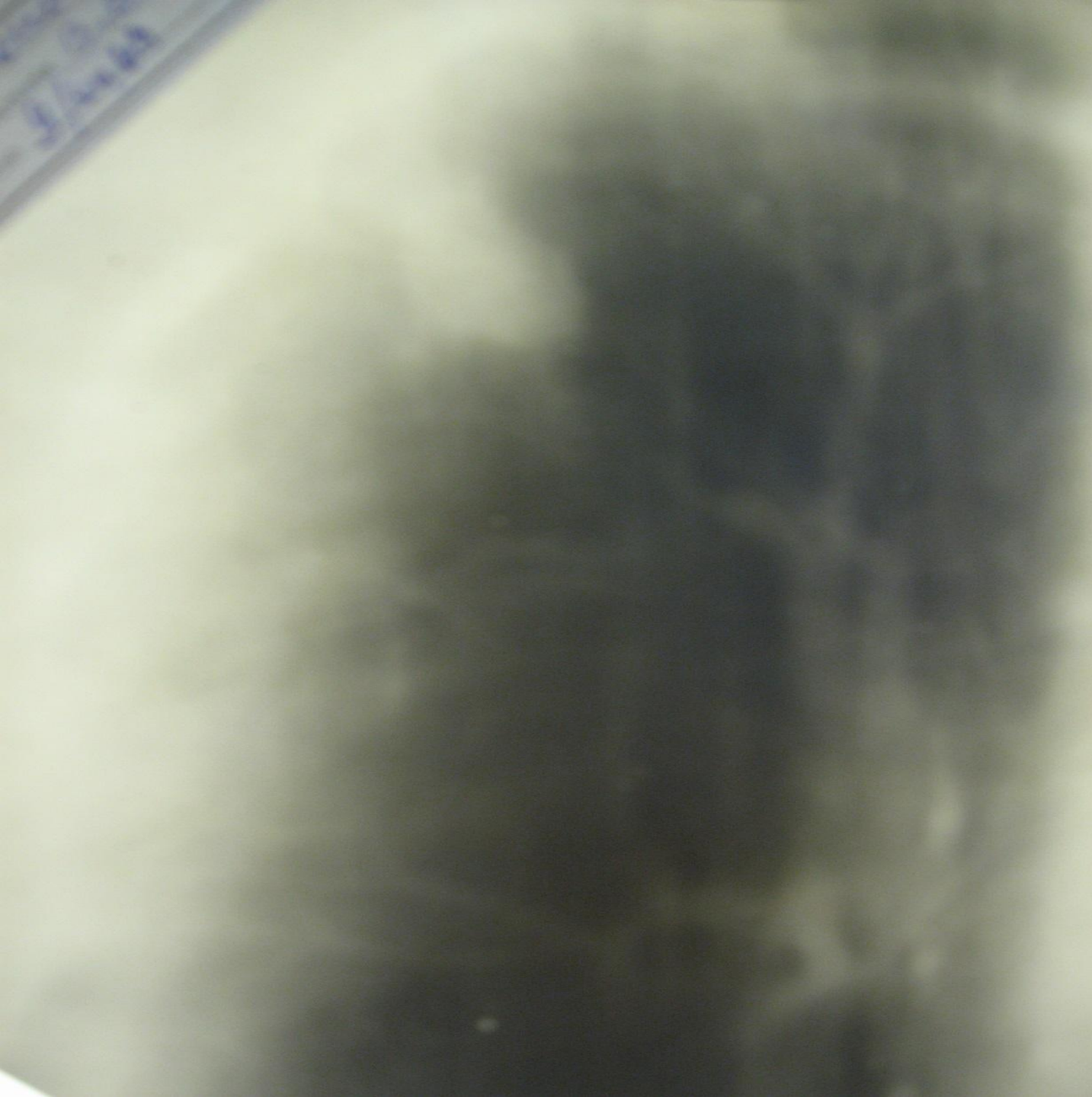


**Tuberculoma of the right lung (upper lobe) in the phase of disintegration**

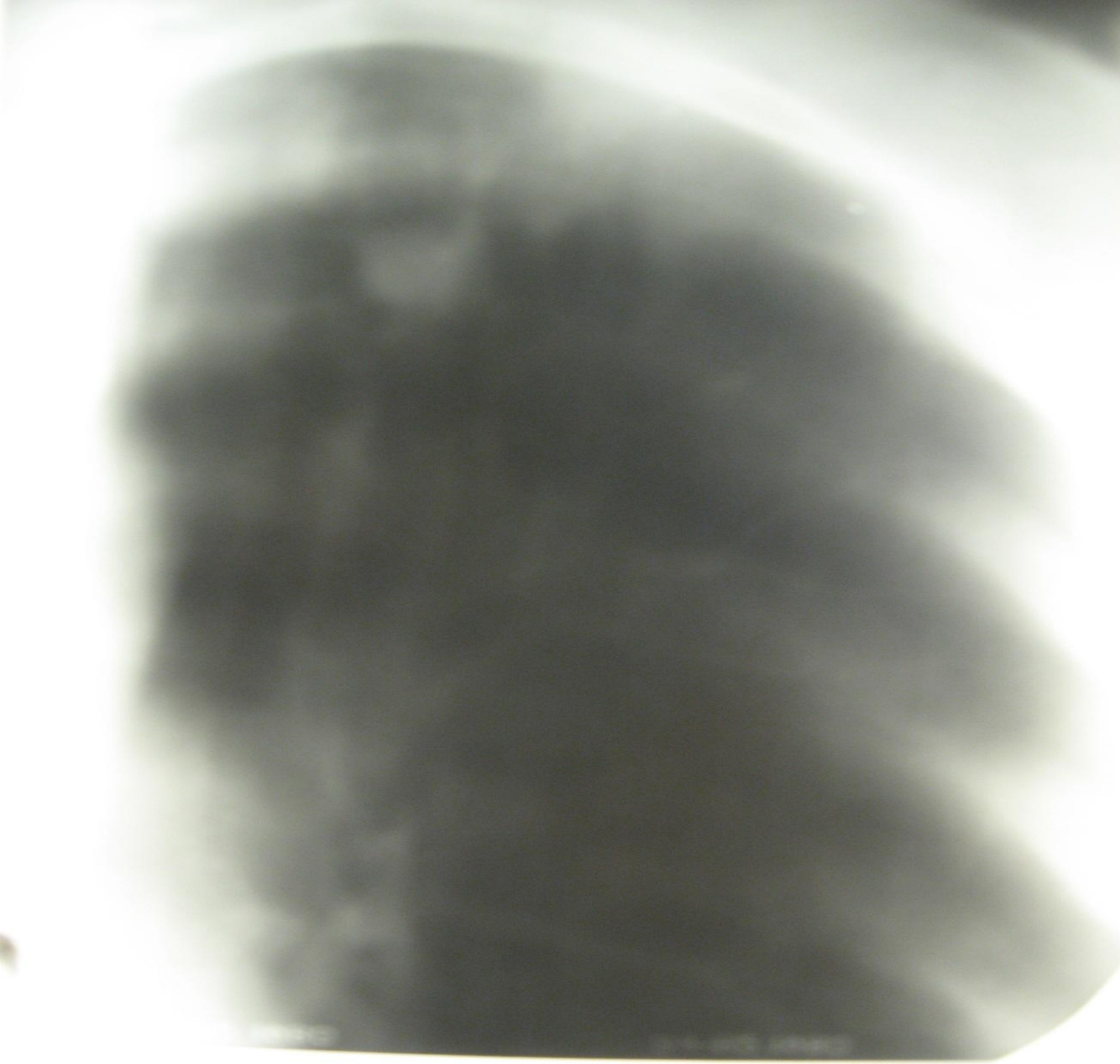




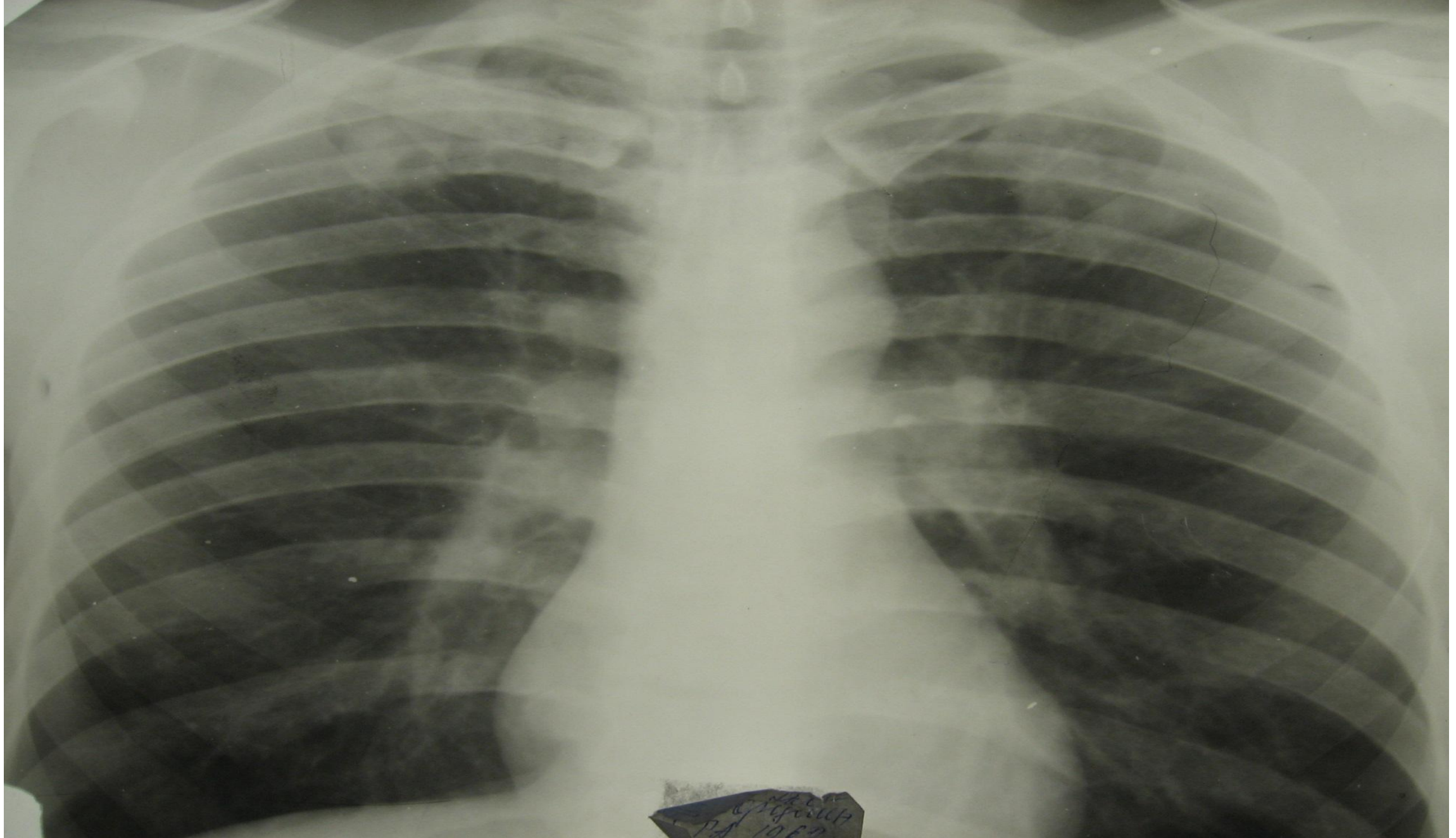
**Tuberculoma of the left  
lung in the phase of  
disintegration**



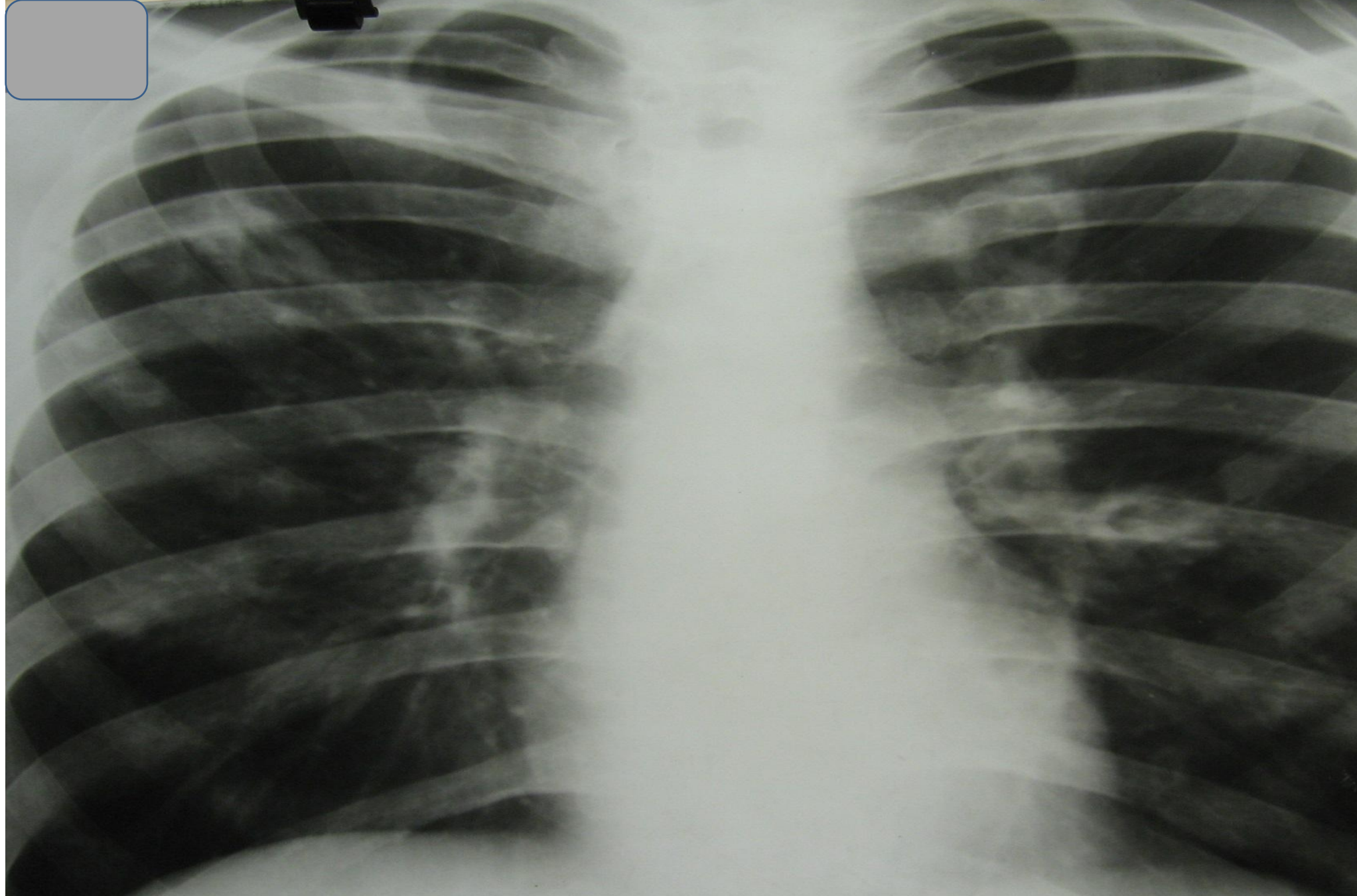
**Tuberculoma of the  
right lung upper lobe**



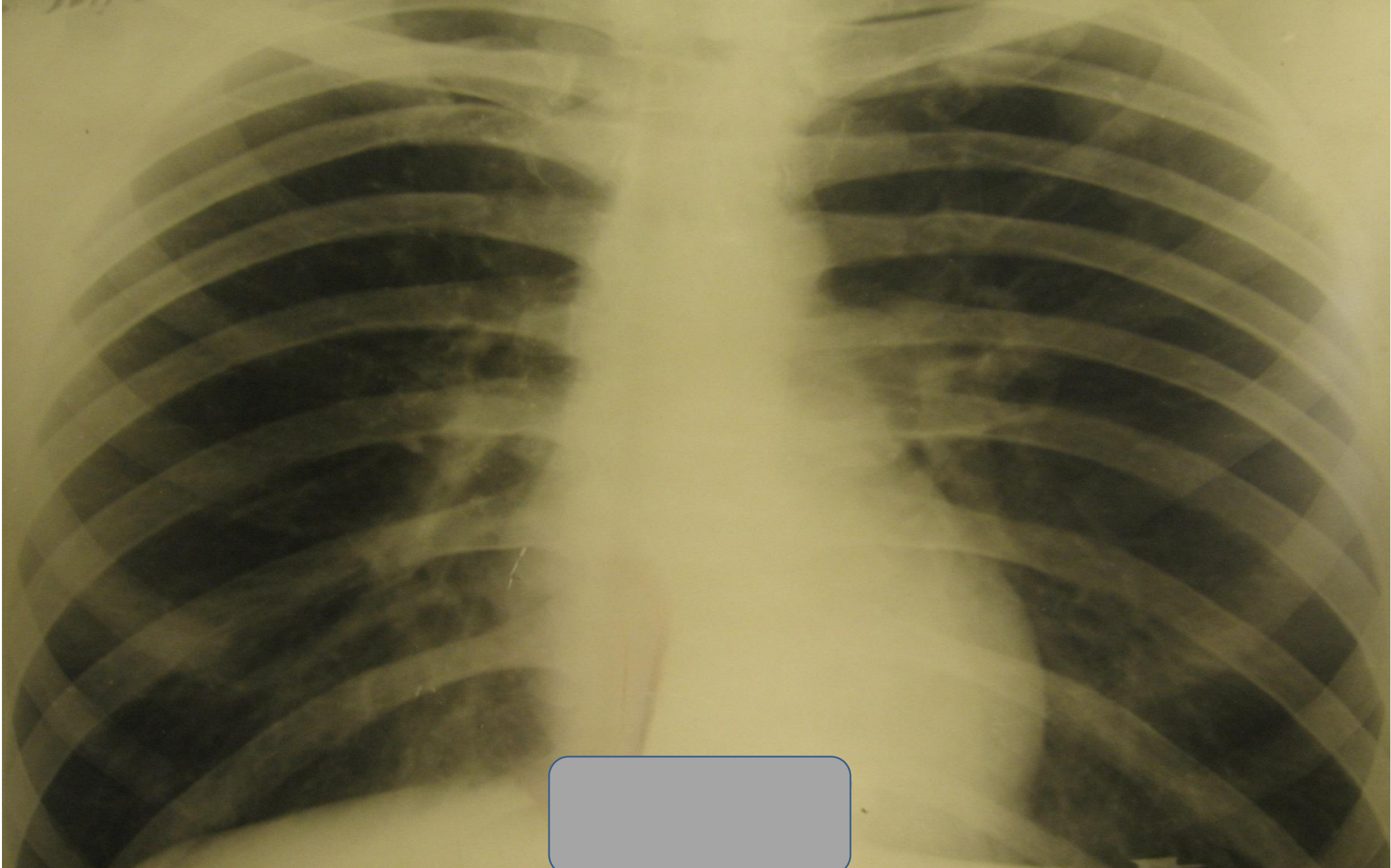
**Tuberculoma of the  
left lung  
(upper lobe)**



**Tuberculomas of the lungs (upper lobes) in the phase of disintegration**



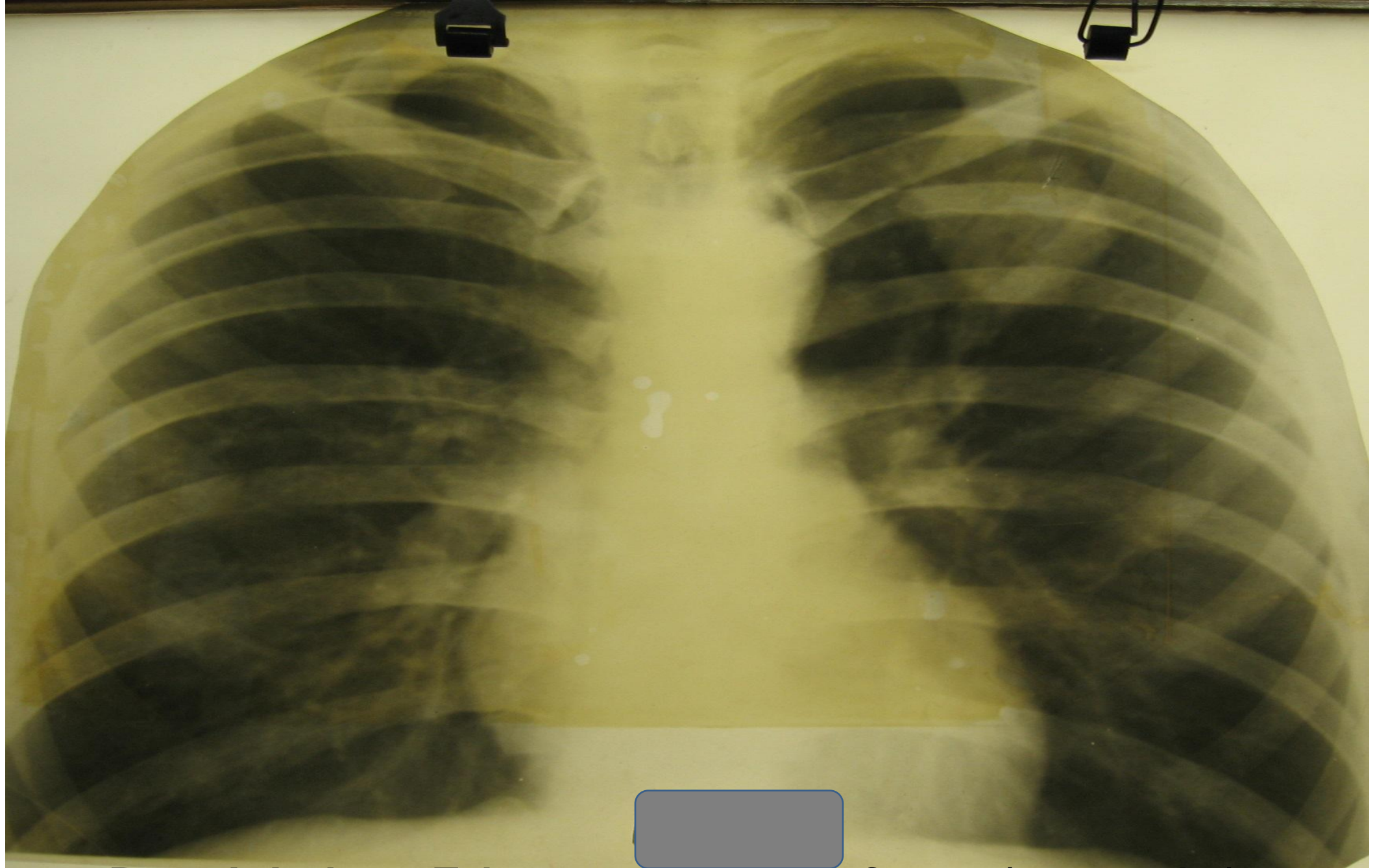
**Tuberculomas (multiple) of the lungs in the phase of disintegration**



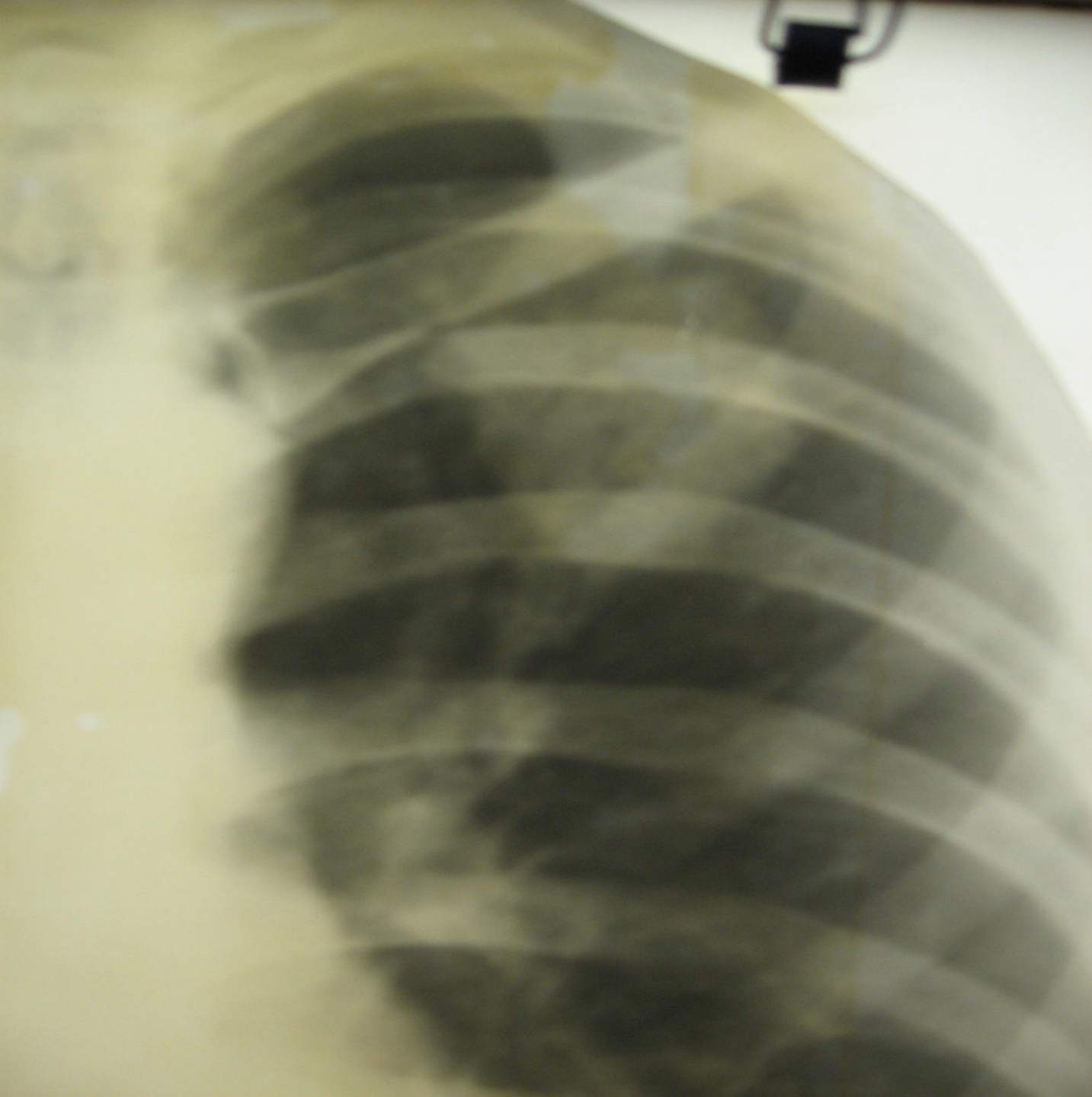
**Tuberculoma of the left lung (upper lobe)**



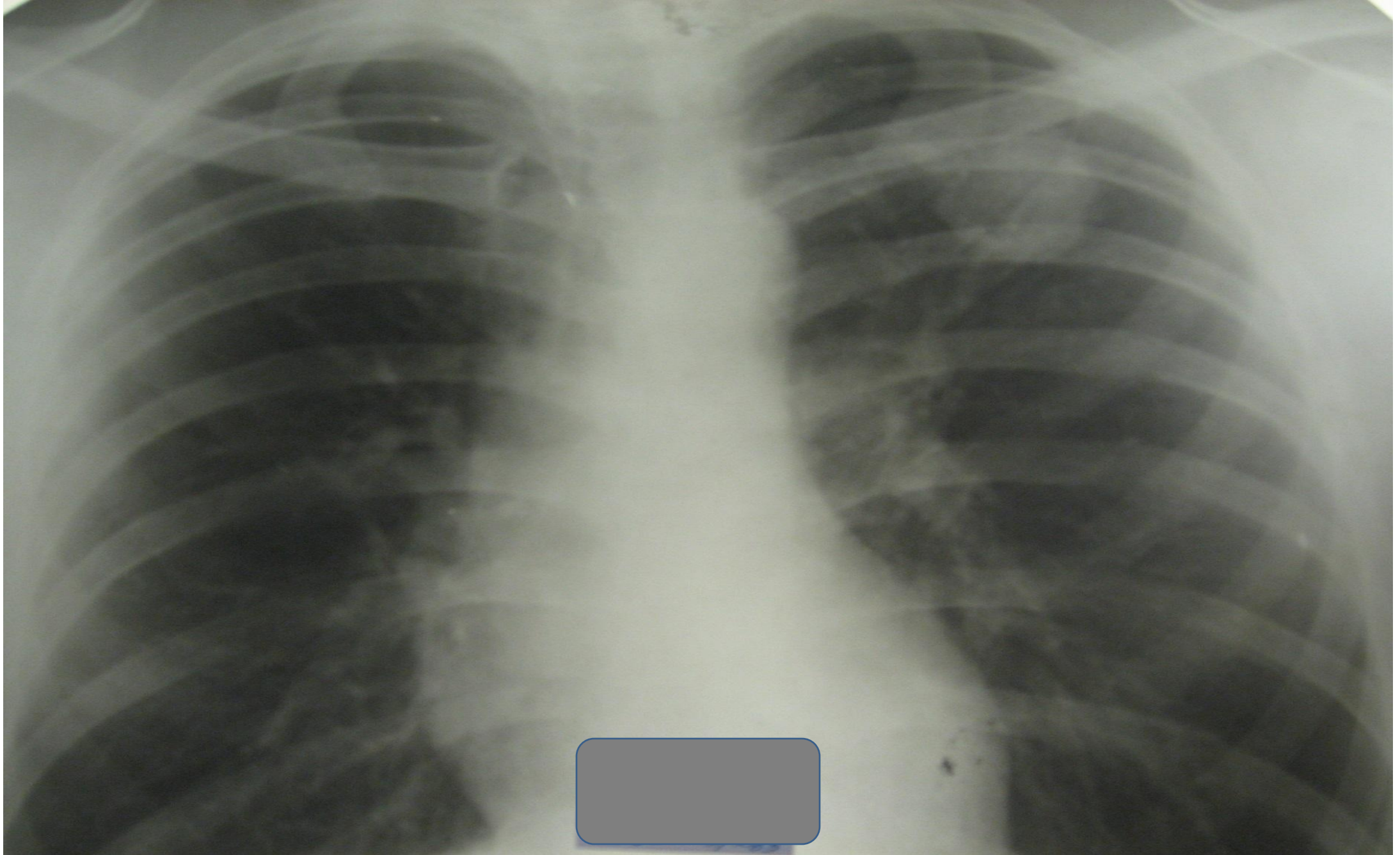
**Tuberculoma of the  
right lung upper lobe**



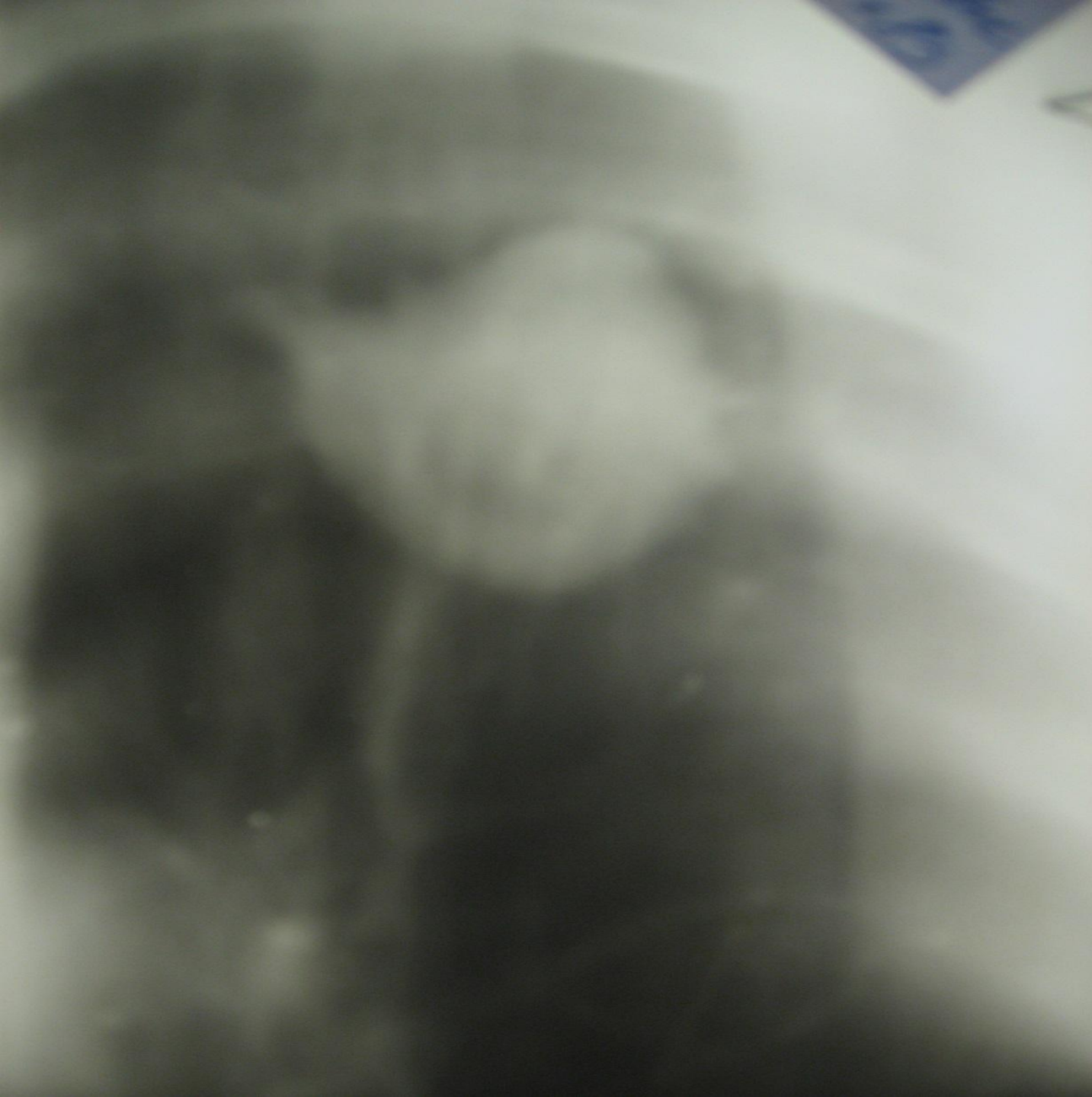
**Pat. I.A.A, June. Tuberculoma of the left lung (upper lobe)**



**Pat. I.A.A.  
Tuberculoma of the left  
lung upper lobe**

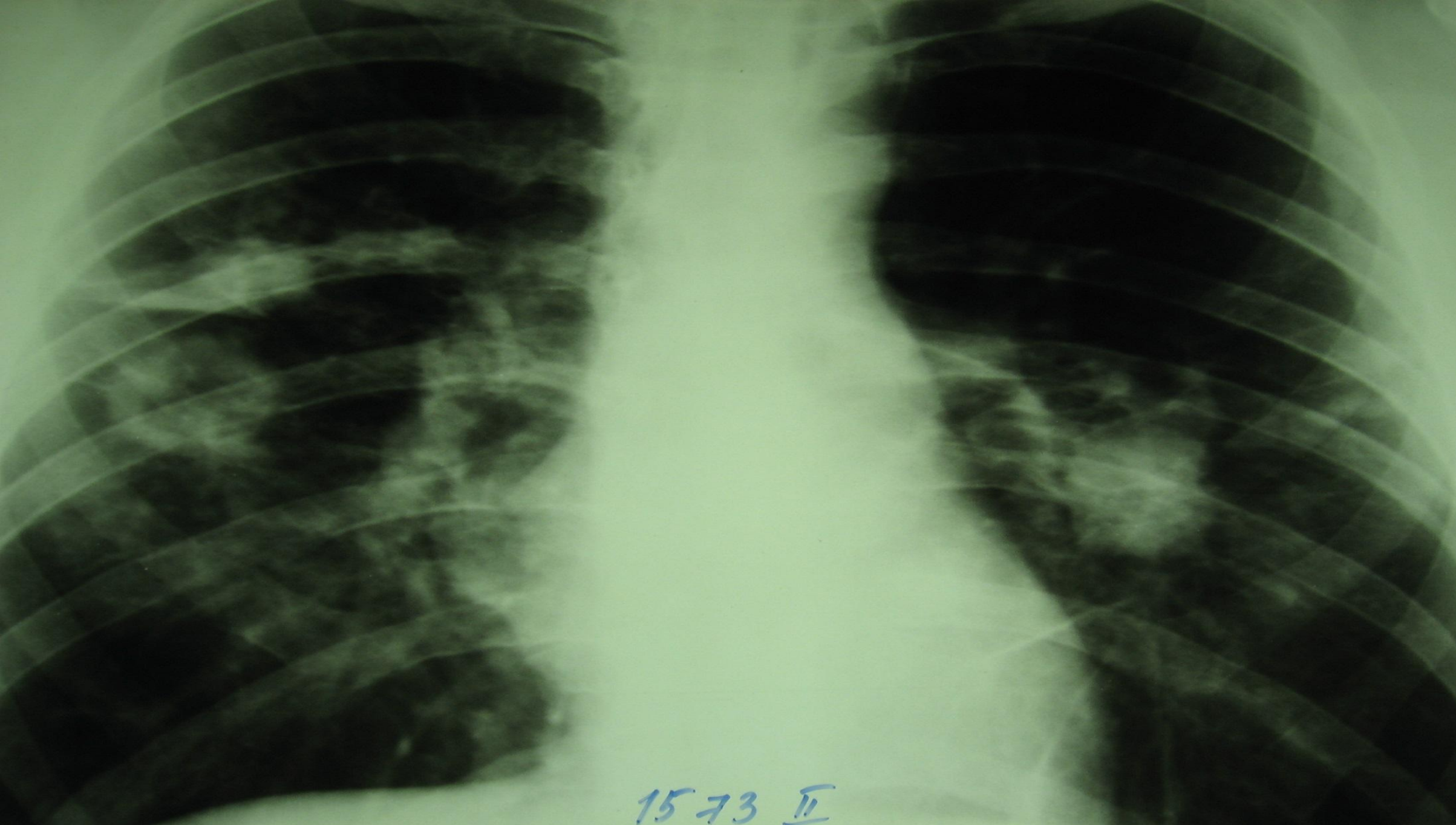


**Pat. I.A.A, October. Tuberculoma of the left lung In the phase of disintegration**

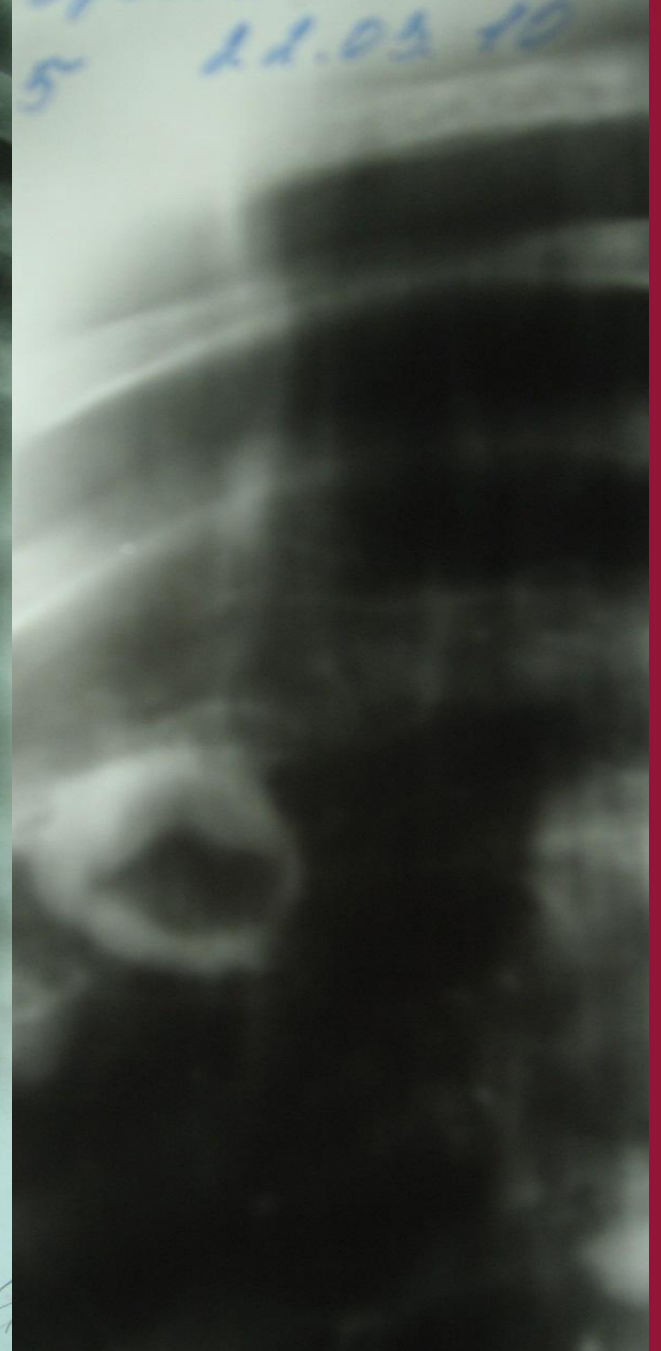
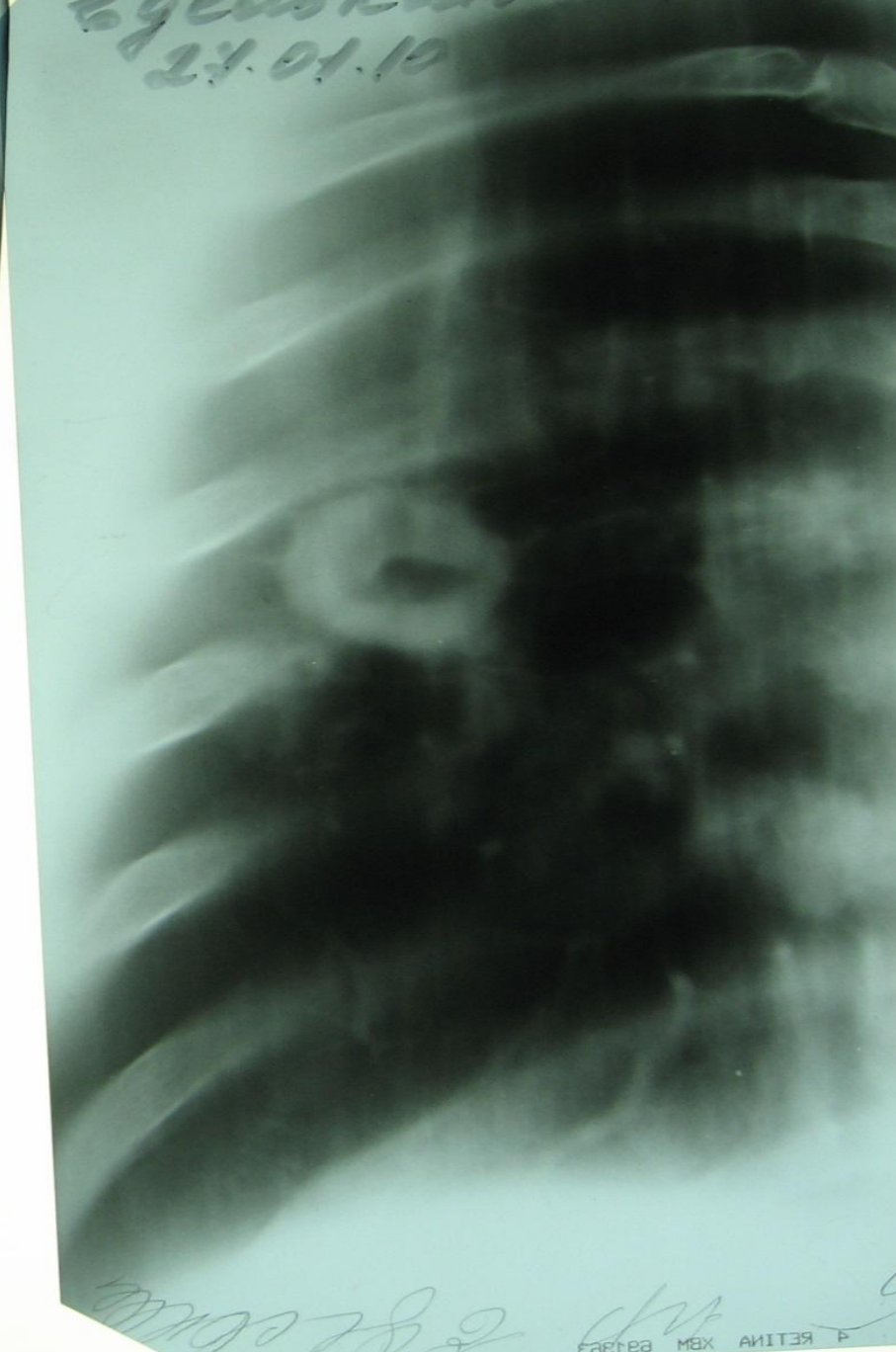
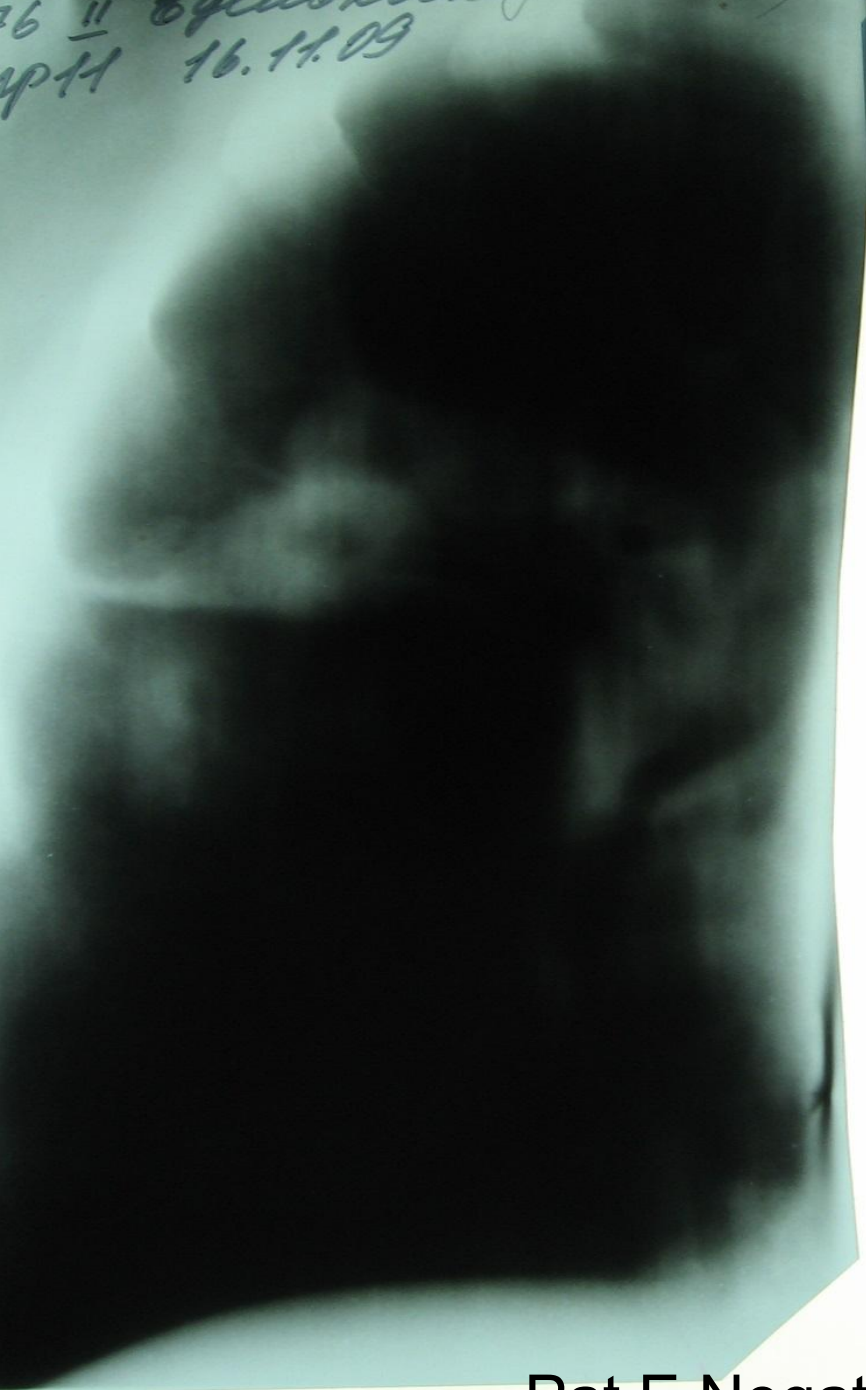


## **Tomogram**

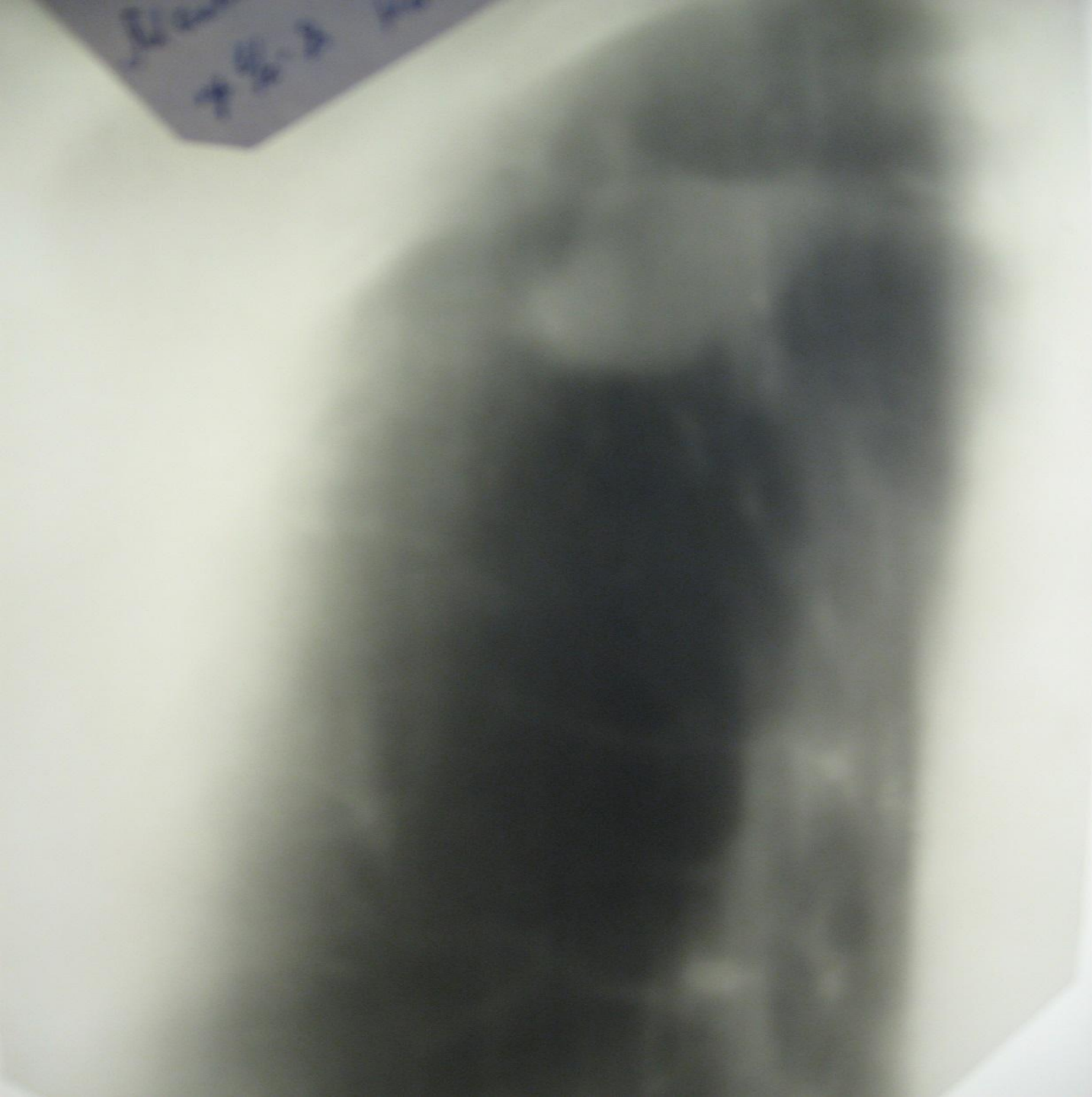
**Tuberculoma of the left  
lung upper lobe**



Pat E. Multiple Tuberculomas. Diabetes Mellitus. MDR

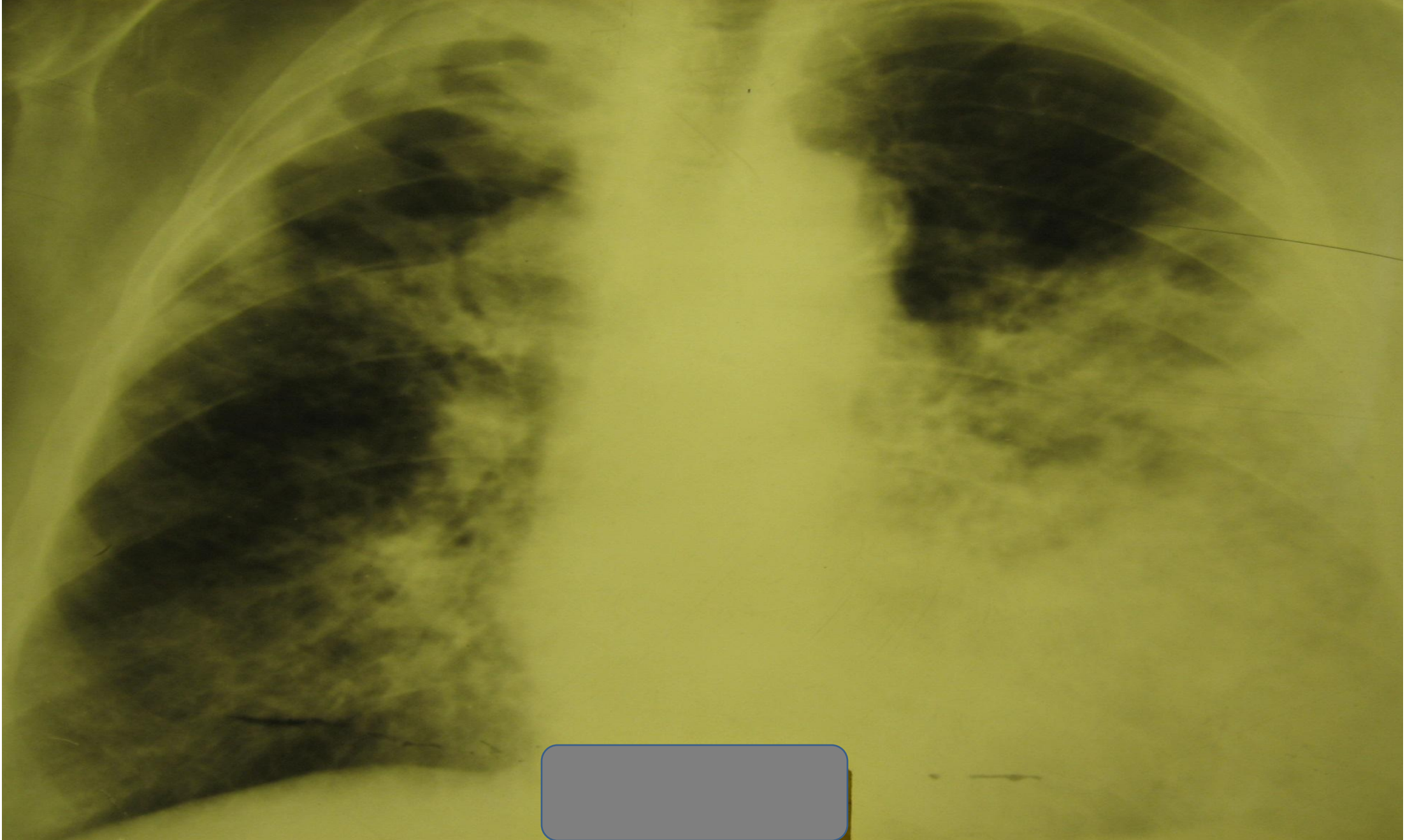


Pat E Negative Dynamics Diabetes Mellitus. MDR

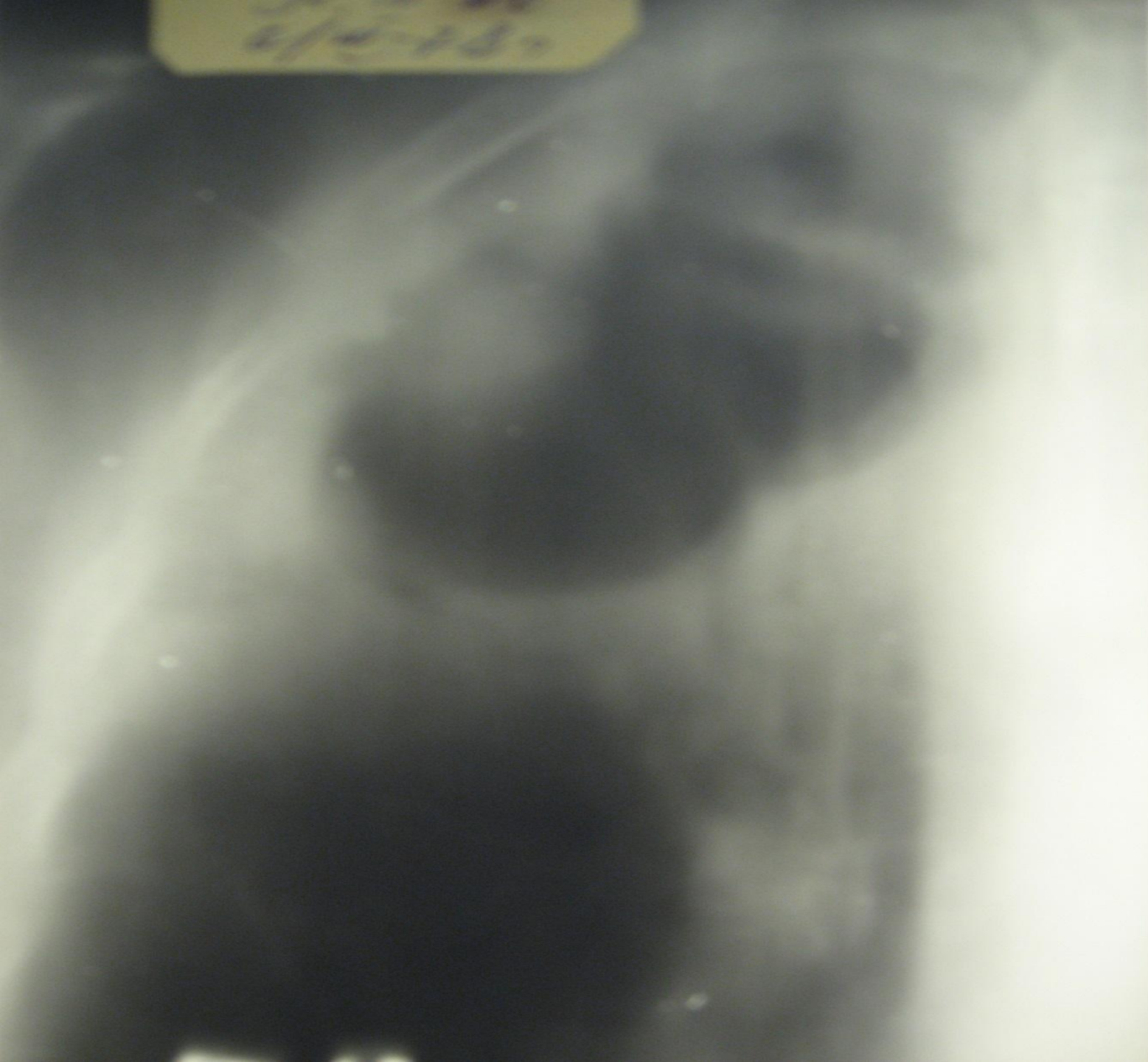


**Tuberculoma of the  
right lung  
(upper lobe)**

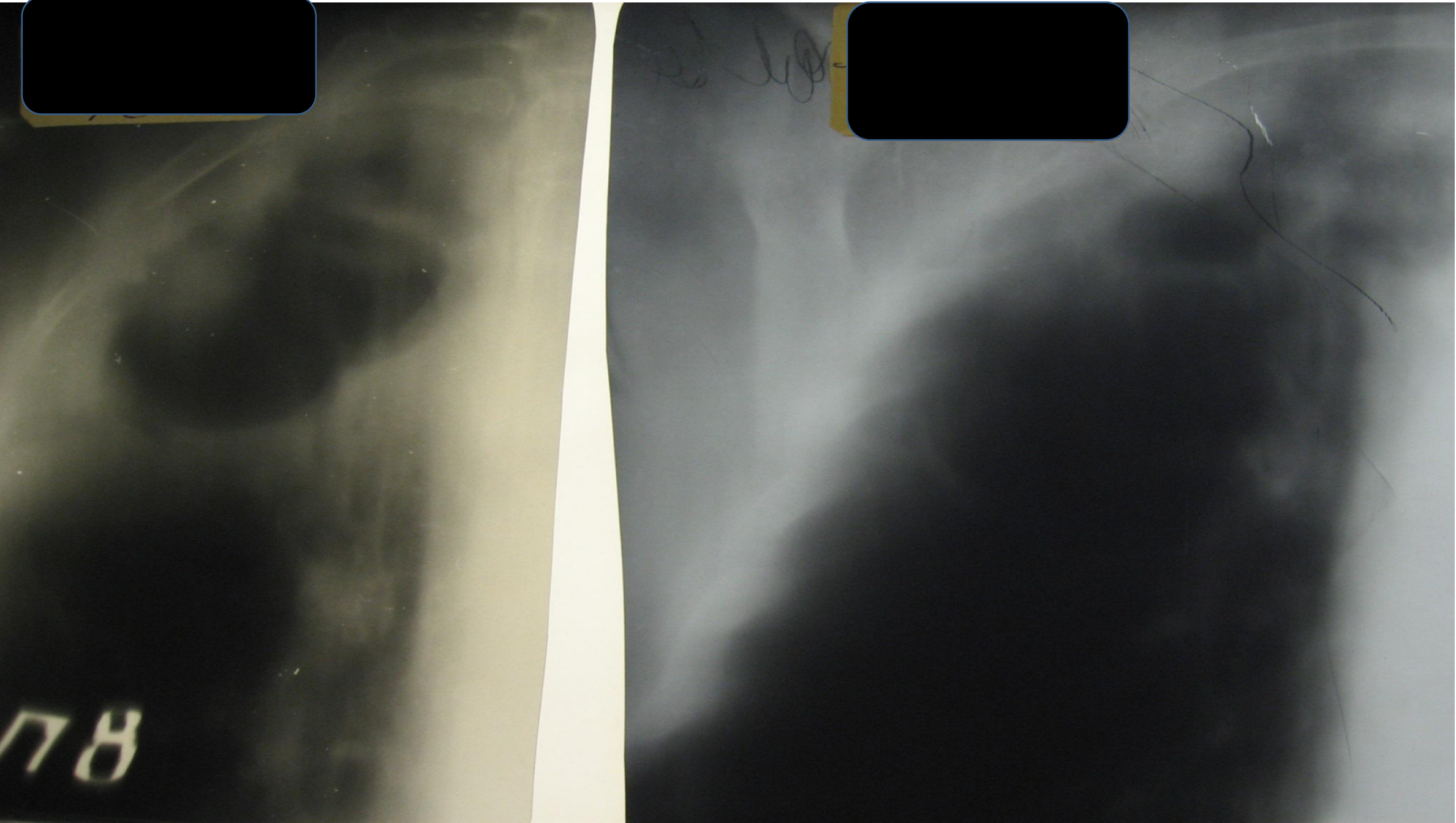
**Pat M. (July)**



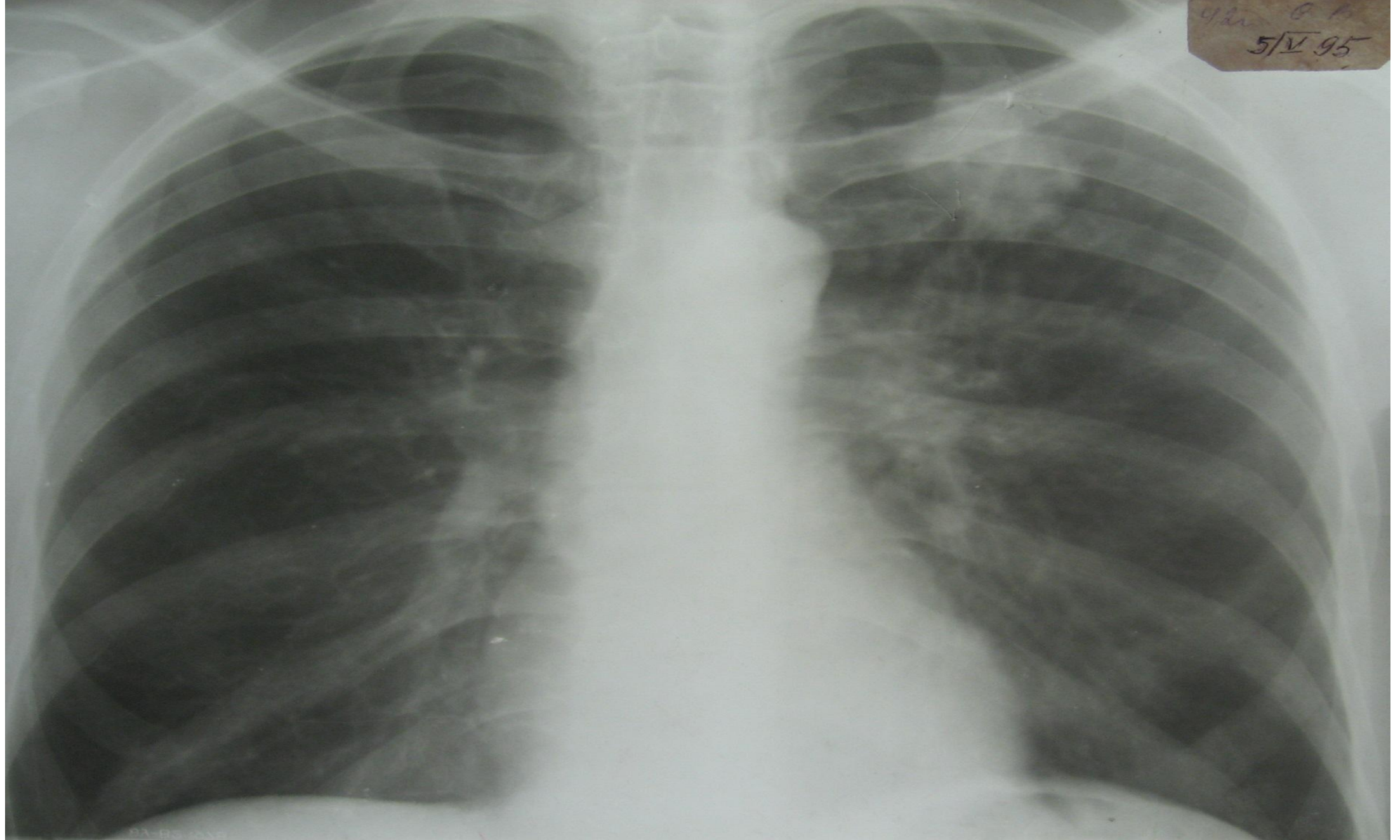
**Pat M. March, ( 8 months later).**



**Pat M. March.  
Tomogram.**



**Pat M. March. Dynamics    March - May**



**Tuberculoma of the left lung (upper lobe) Pat. G., May.**

# LABORATORY FINDINGS

- General blood analysis may reveal no significant changes:
  - Lymphocytosis in 20% of the cases.
- Ziel-Nelseen staining of sputum:
  - In the absence of disintegration the sputum is Mycobacterium positive in 10-15% of the cases.
  - In the presence of disintegration the sputum is Mycobacterium positive in 70% of the cases.

# BLOOD PICTURE

Blood picture is also without peculiarities.

- Sometimes moderate elevation of ESR and
- moderate leukocytosis are observed at acute stages.

# **Mycobacterium tuberculosis**

- Mycobacterium tuberculosis is not found in sputum at stable course of tuberculoma.
- Discharge of bacilli exists in tuberculoma at presence of disintegration if there is connection with drainage of bronchus.

# Tuberculin tests

- Patients with lung tuberculoma in most cases positively react to tuberculin.
- Mantoux test is often hyperergic.

# Treatment

- Before the discovery of antituberculosis drugs, the forecast of tuberculoma was bad.
- Tuberculoma gave massive flare-up with subsequent transition in heavy forms of pulmonary tuberculosis.
- Now course of tuberculoma regresses or proceeds chronically without aggravations among 80% of patients.

# Treatment

- When tuberculoma is diagnosed the patient must be hospitalized for long term treatment.
- Surgery is recommended if disintegration is present in tuberculoma and the patient continues to expectorate MBT and there is no desirable results to long therapy.

# TREATMENT

- General principles of treatment of TB patients but the antiTB drugs do not penetrate into the tuberculoma.
- Surgical treatment is more effective.

# Chemotherapy

## Режимы химиотерапии

Режим	Фазы курса химиотерапии	
	Интенсивная	Фаза продолжения
I	2–3 H R Z E[S]	4*H R / 4*H R E 5***H R E
II	3 Km /Am [Cm] R Z Fq [E] [Pto/ Eto]	6 R Z Fq [E] [Pto/Eto]
III	2–3 H R Z E	4*H R 5***H R E
IV	8Cm Lfx Z Cs/Trd PAS Pto/Eto [ Km/Am] [E] [Mfx] [Bq]	12–18 Lfx Z Cs/Trd PAS Pto/Eto [ E] [Mfx]
V	8Cm Mfx [Lfx] Z Cs/Trd PAS Bq*** Lzd [E] [Pto/Eto] [Amx Imp Clr Mp]	12–18 Mfx [Lfx] Z Cs/Trd PAS [Lzd] [E ] [Pto/Eto] [Amx Imp Clr Mp]

# Surgical treatment.

- Usually operation is made with minimal removal of lung tissue. It is segmental resection.
- Surgical treatment is used also in cases, when there is no certainty that the patient has tuberculosis because it is difficult to differentiate tuberculoma from other lung diseases, especially tumor.

# Differential diagnostics

# Differential diagnostics

X-ray picture of tuberculoma is isolated rounded focus in lung tissue. It's typical for many diseases.

Practically patients more often have

- cancer of lung,
- benign tumors,
- pneumonia complicated by an abscess, and
- parasitic lung diseases

# Differential diagnostics

It is necessary

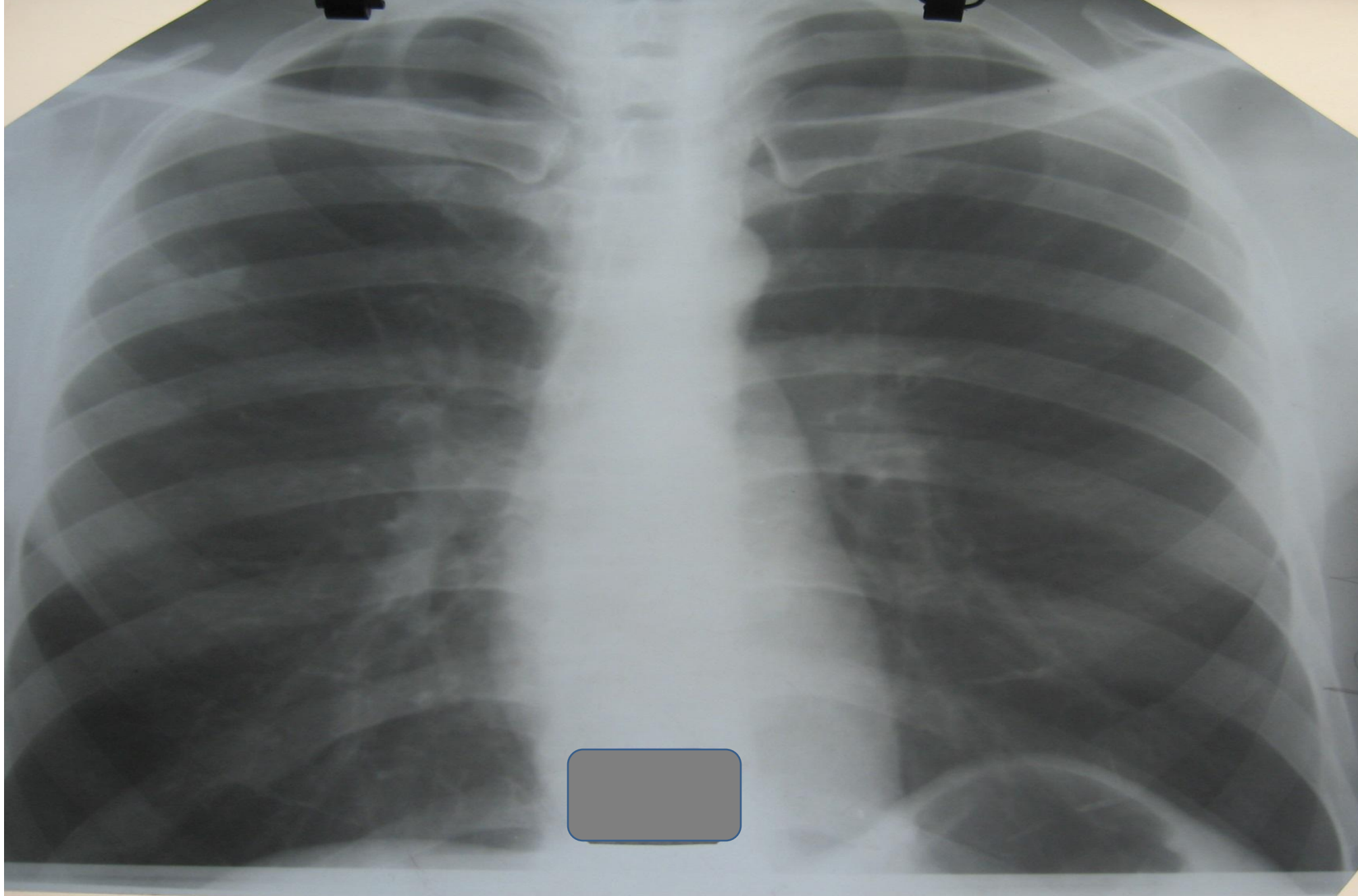
- to collect detailed anamnesis,
- carefully examine all organs and systems of the patient to differentiate one disease from another.
- X-ray examination is especially important.
- Sputum is investigated for MBT, atypical cells and fungi.
- In some cases pneumonocentesis is made.
- The ex juvantibus treatment of tuberculosis is often used and if the focus in lungs under the influence of specific treatment decreases, it testifies its tubercular origin.

# Differential diagnostics

For diagnosis of tuberculoma,

- Computer tomography
- bronchological examination with catheter biopsy and
- puncture of bifurcation lymph nodes has received high development.

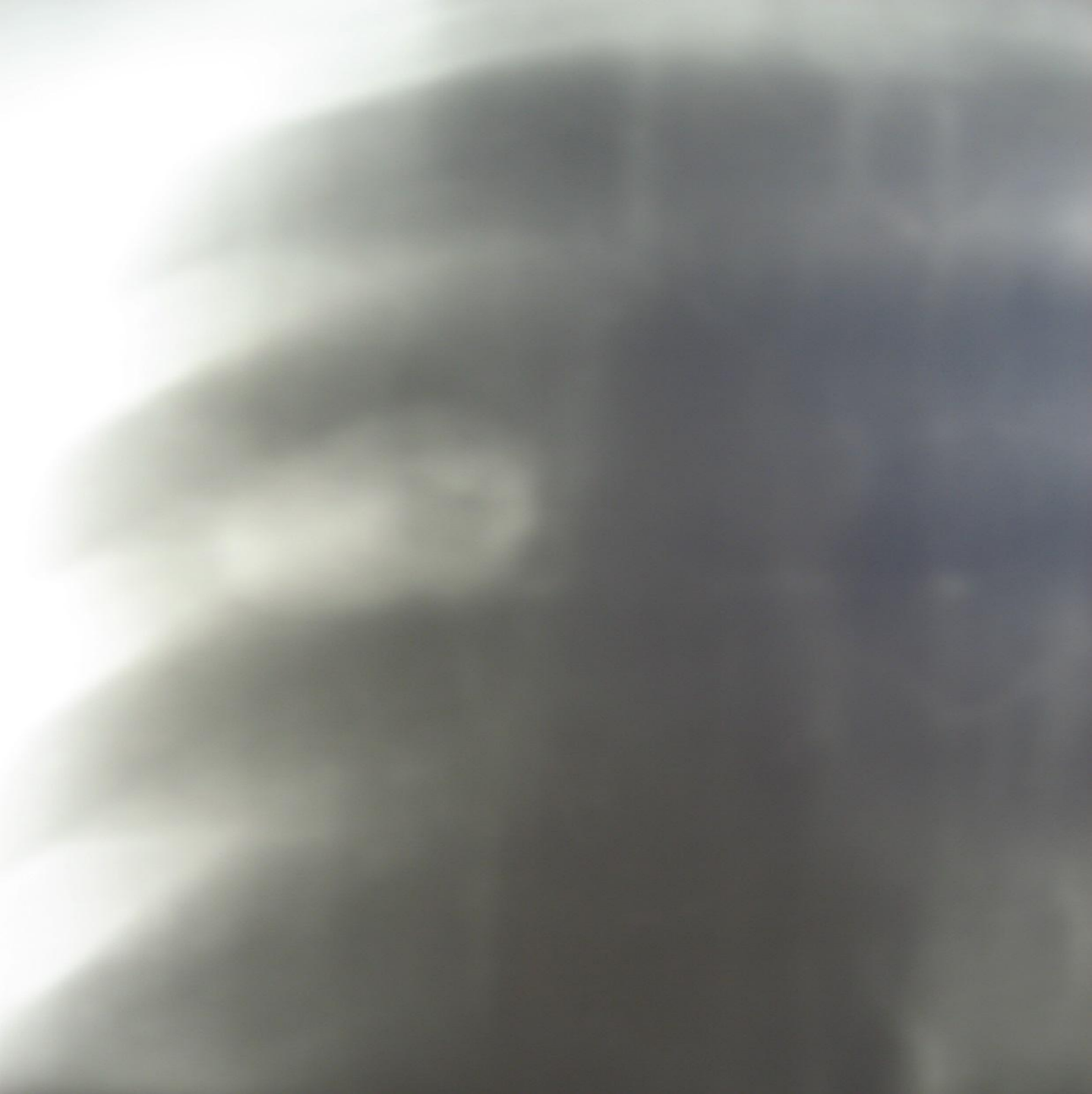
These techniques allow to put correct diagnosis almost in 90% of cases.



**Pat. T., May**



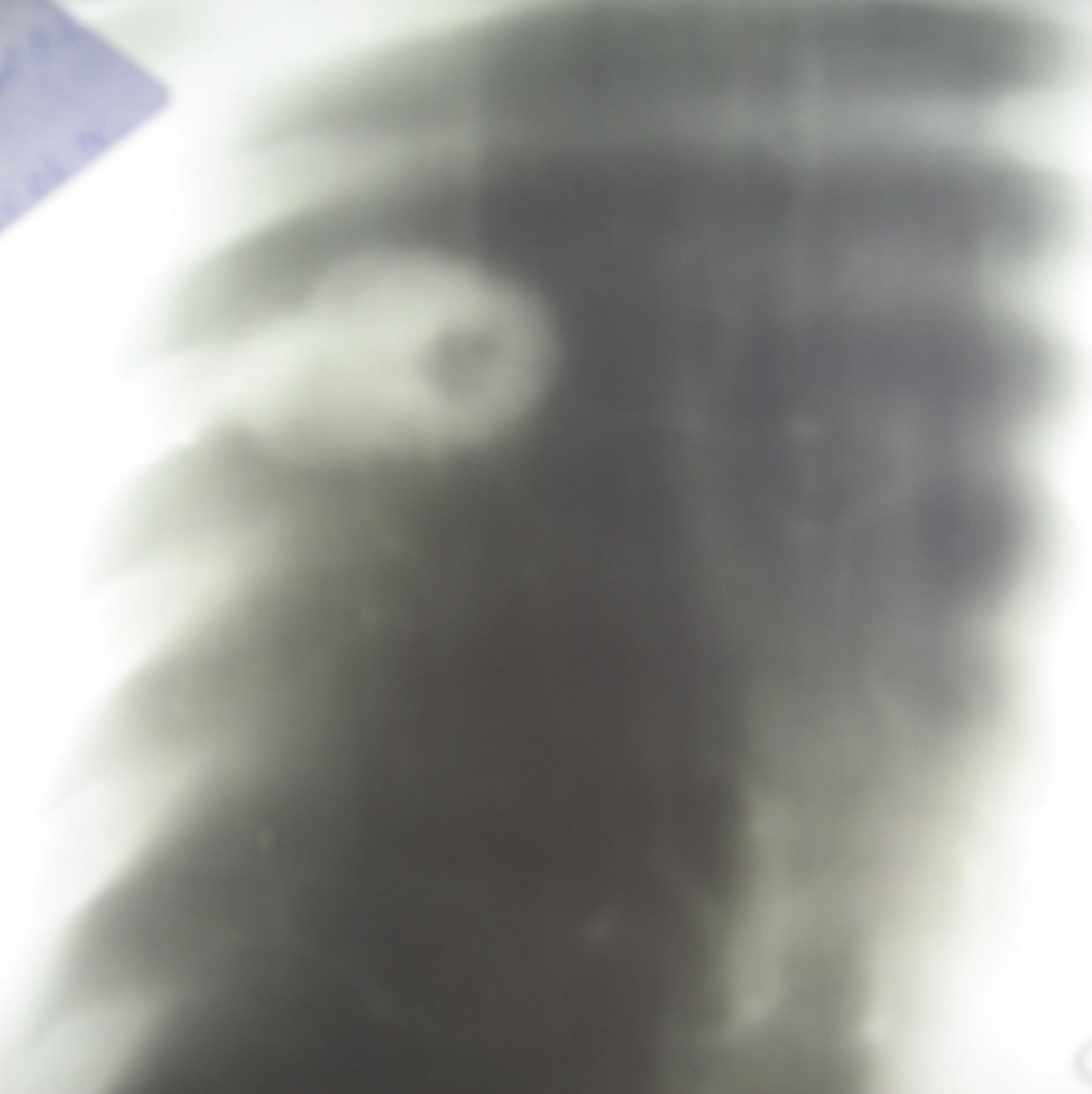
**Pat. T., December**



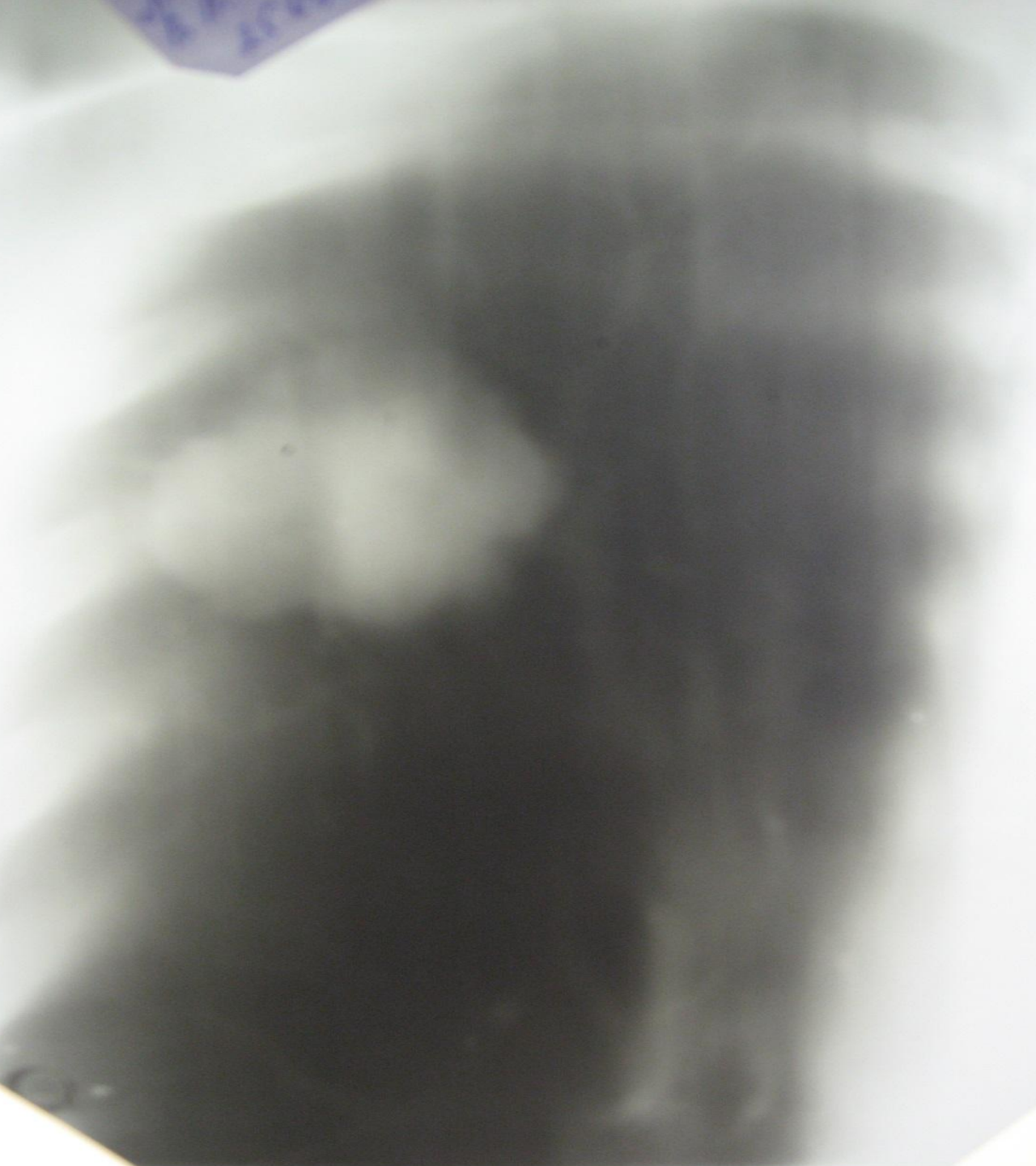
**Pat. T., February**



**Pat. T.,  
September**



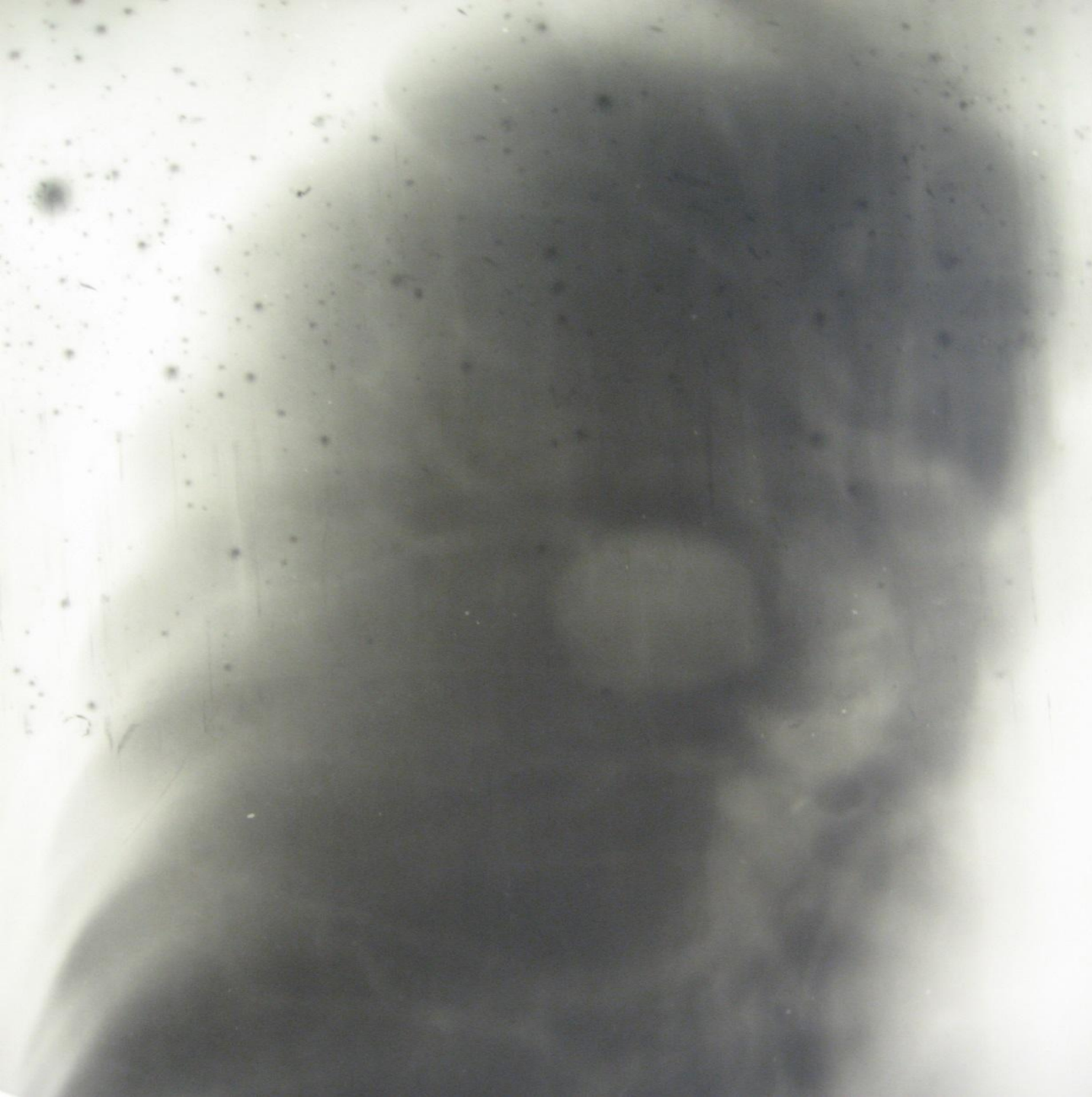
**Pat. T.,  
September**



**Pat. T.,  
September**



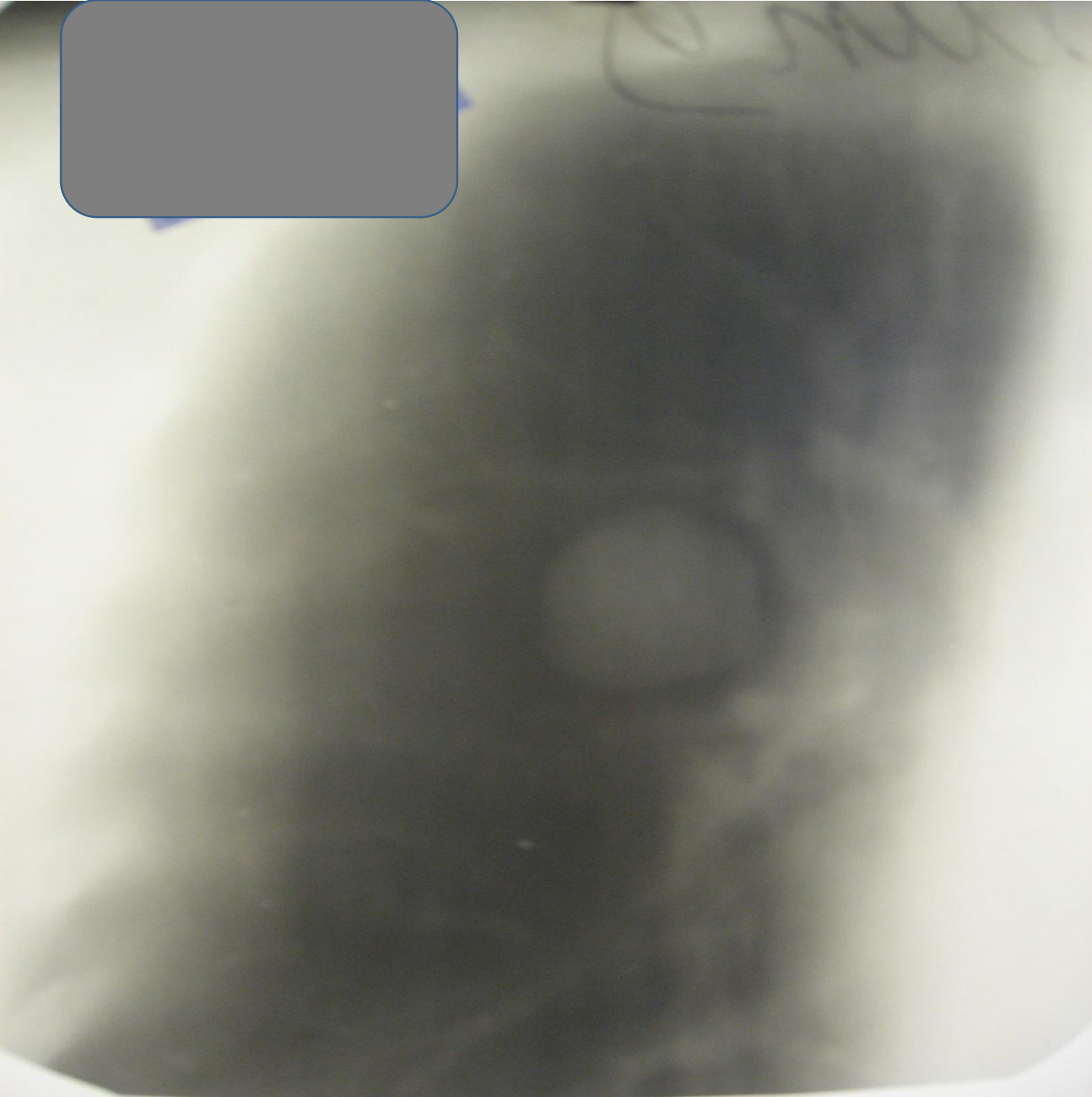
Benign tumor



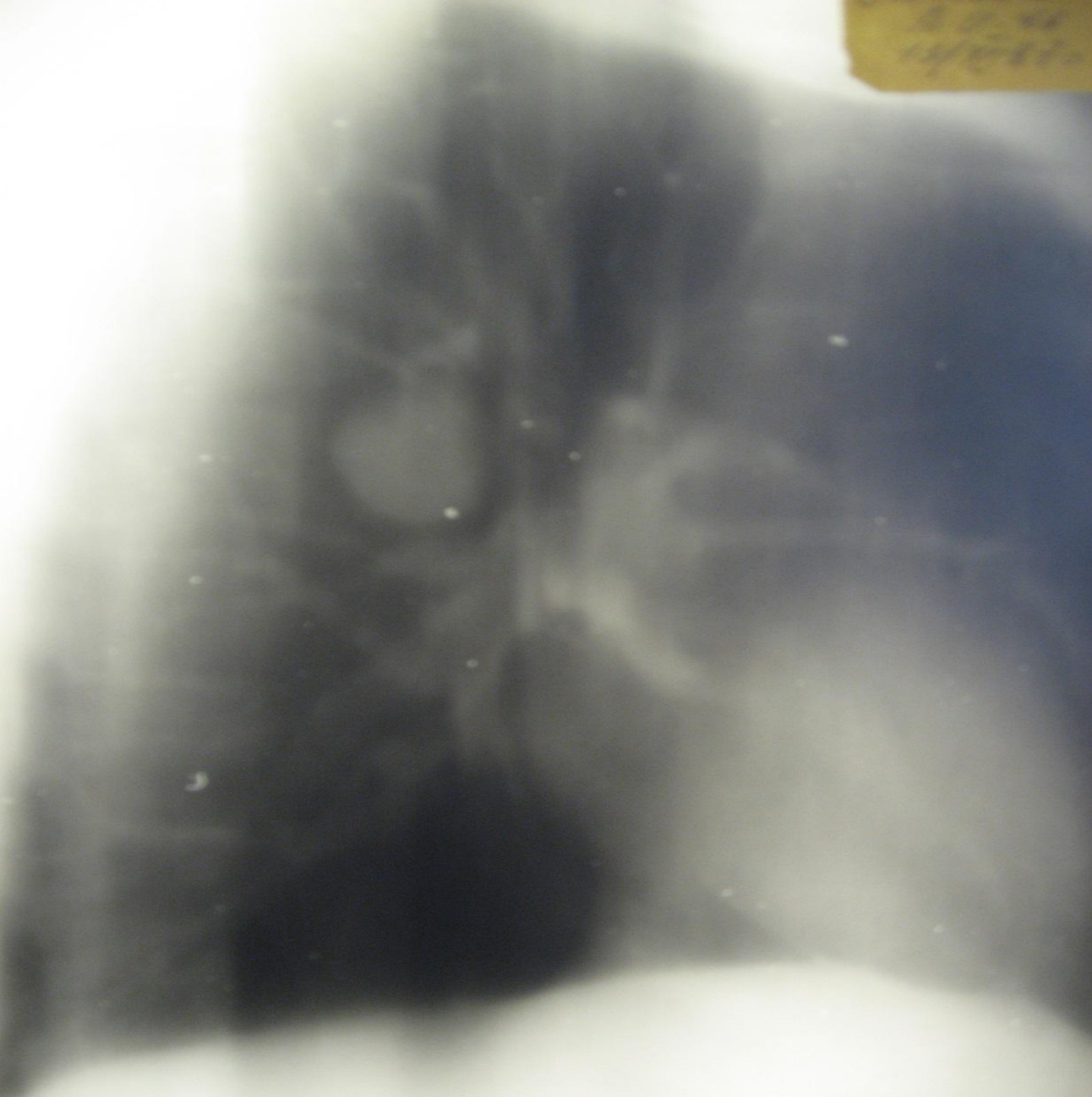
**Pat. L.,  
tomogram**



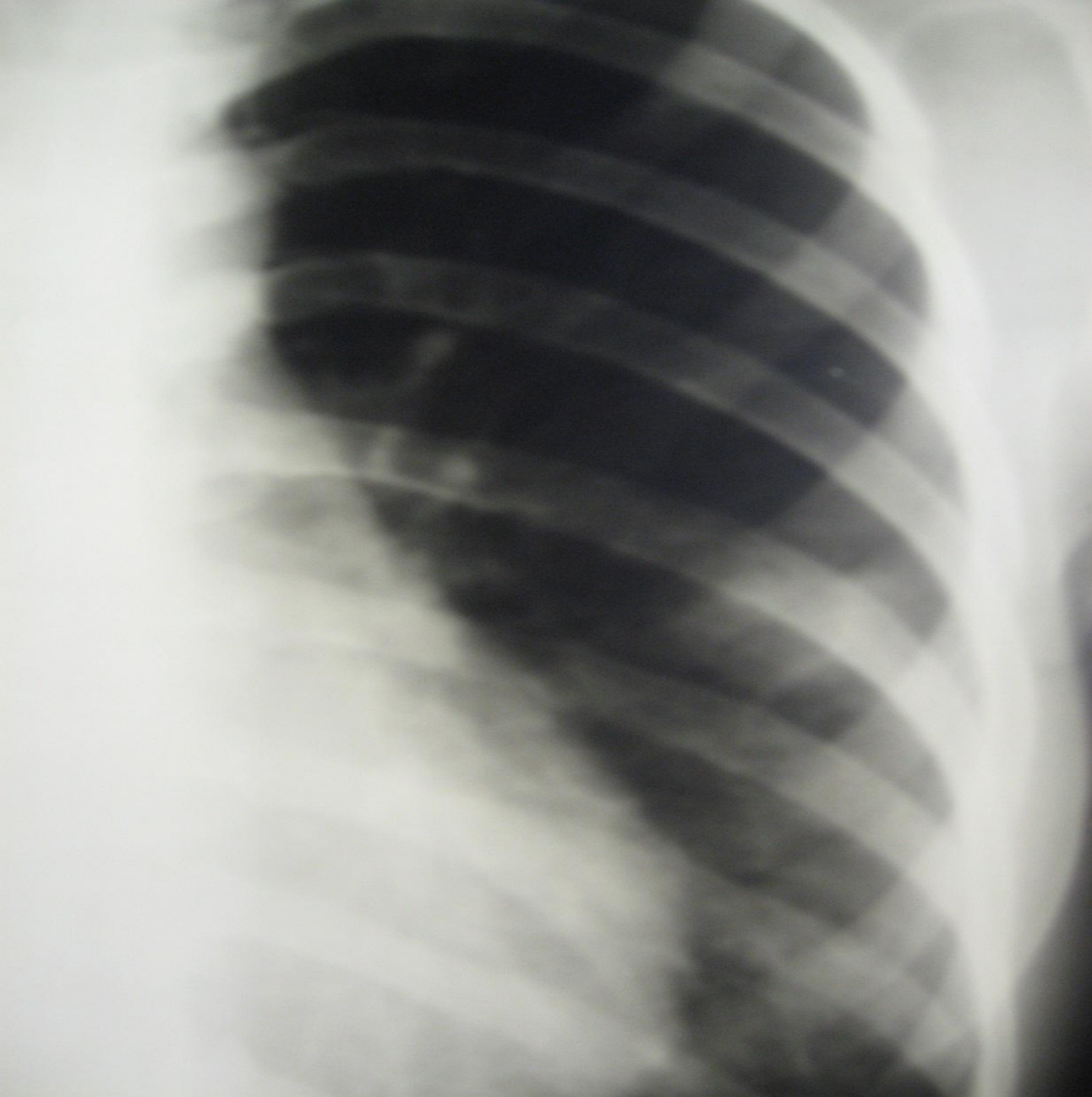
**Pat. L.,  
6 years later**



**Pat. L.,  
Tomogram  
6 years later**



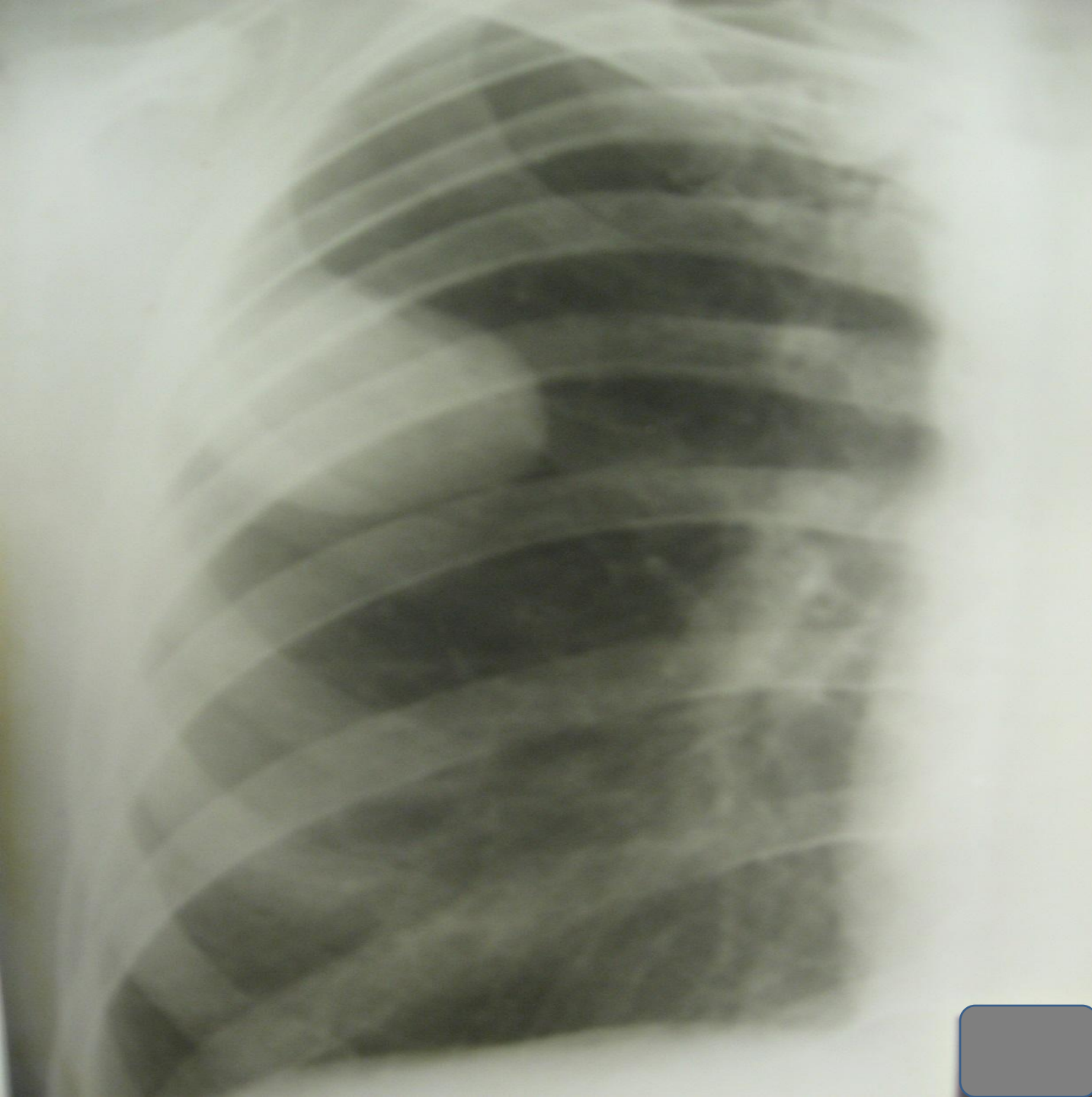
**Pat. L.,  
Profile X-ray**



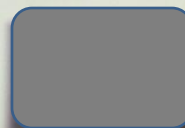
**Pat. K.**  
**Echinococcus**

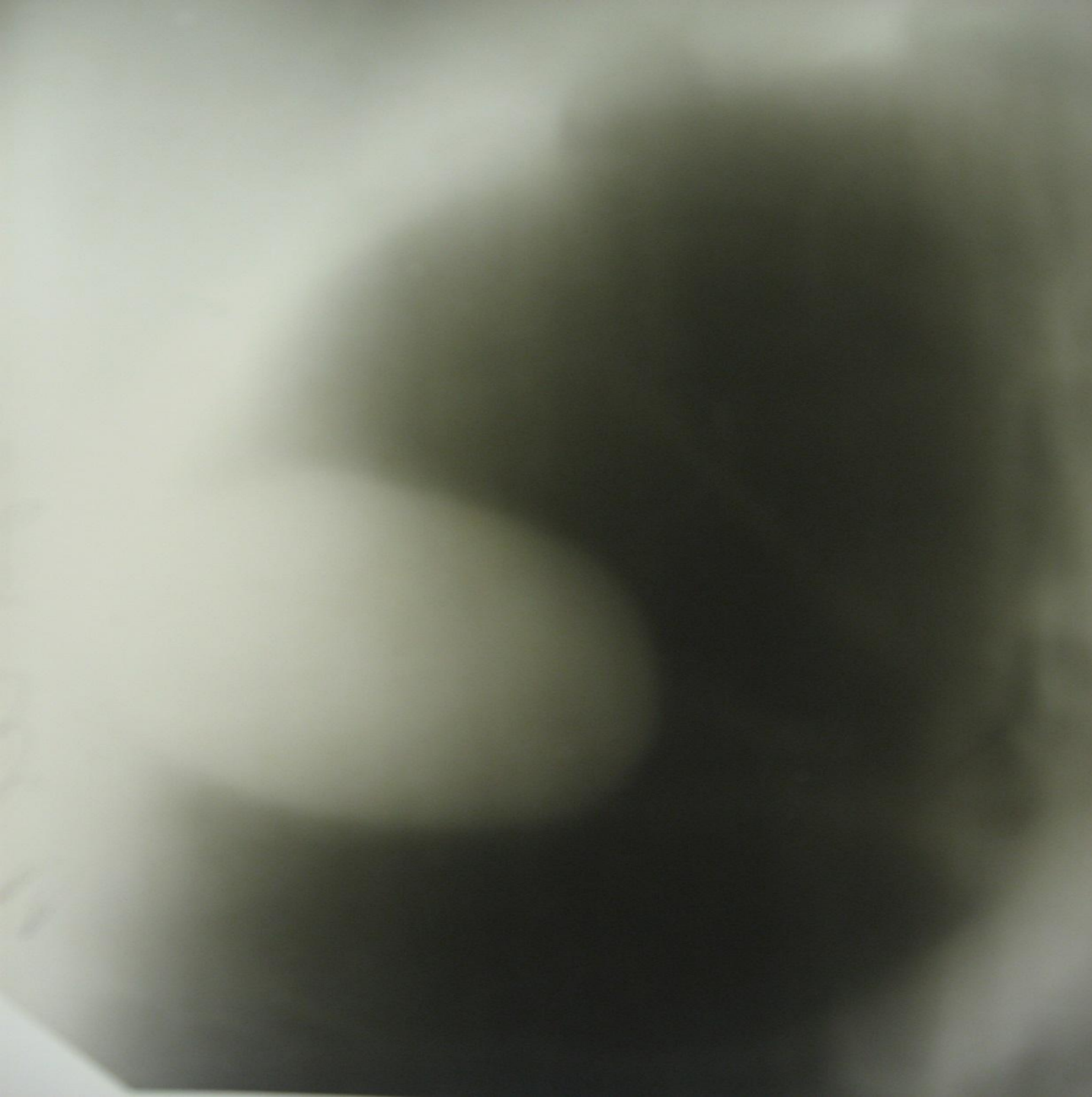


**Pat. K.  
Echinococcus  
Tomogram**

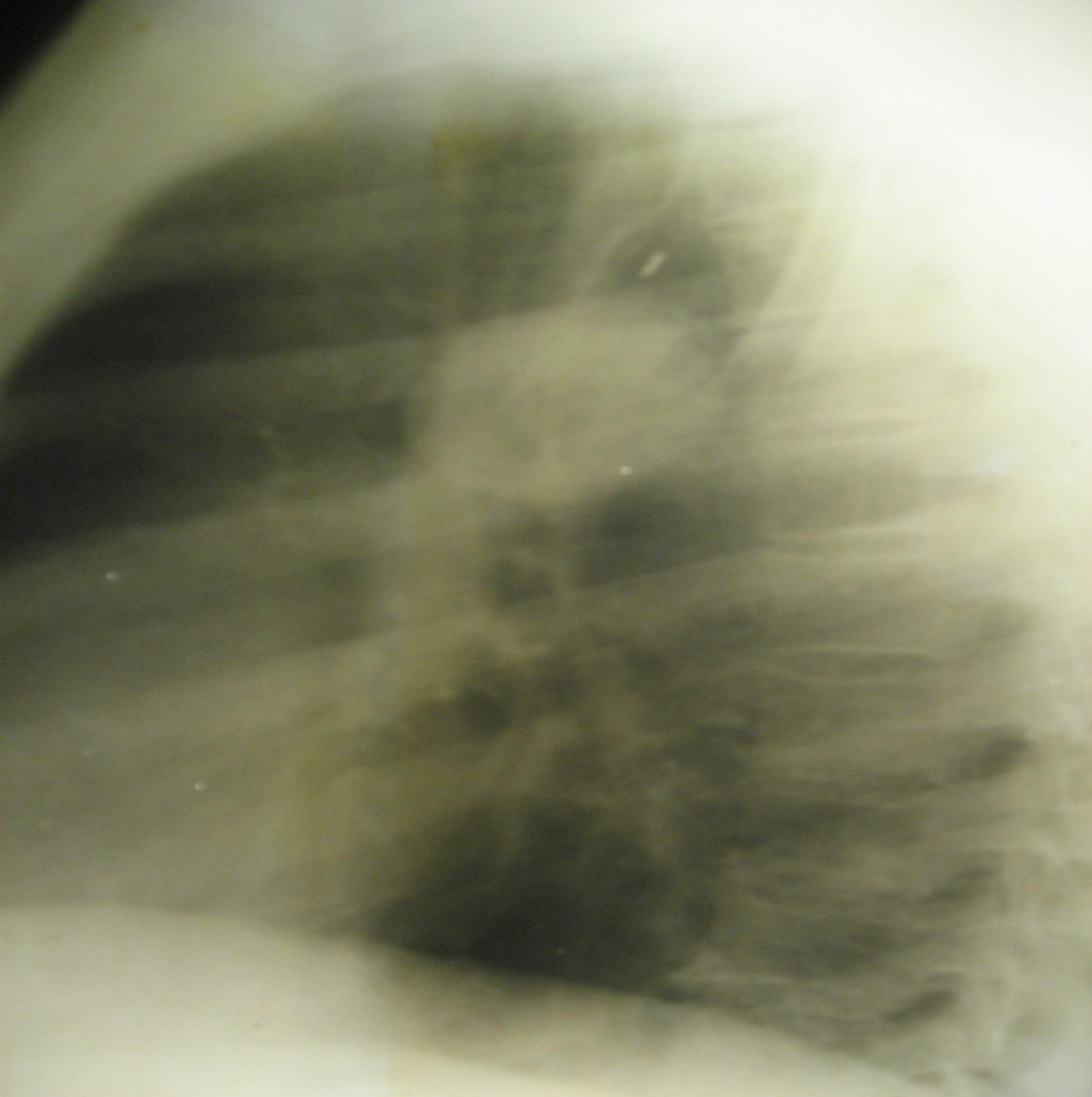


**Pat. G.  
Echinococcus**

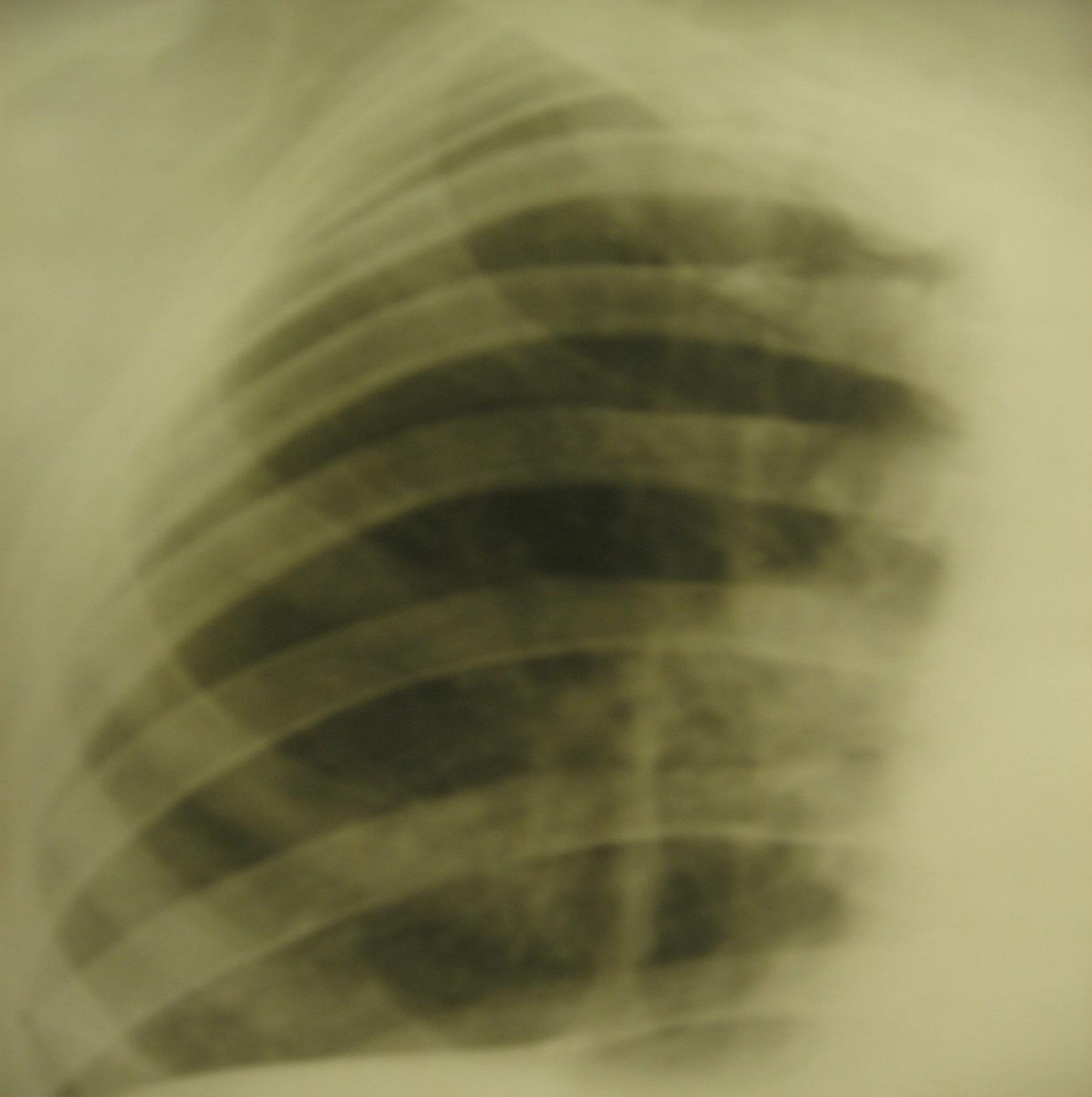




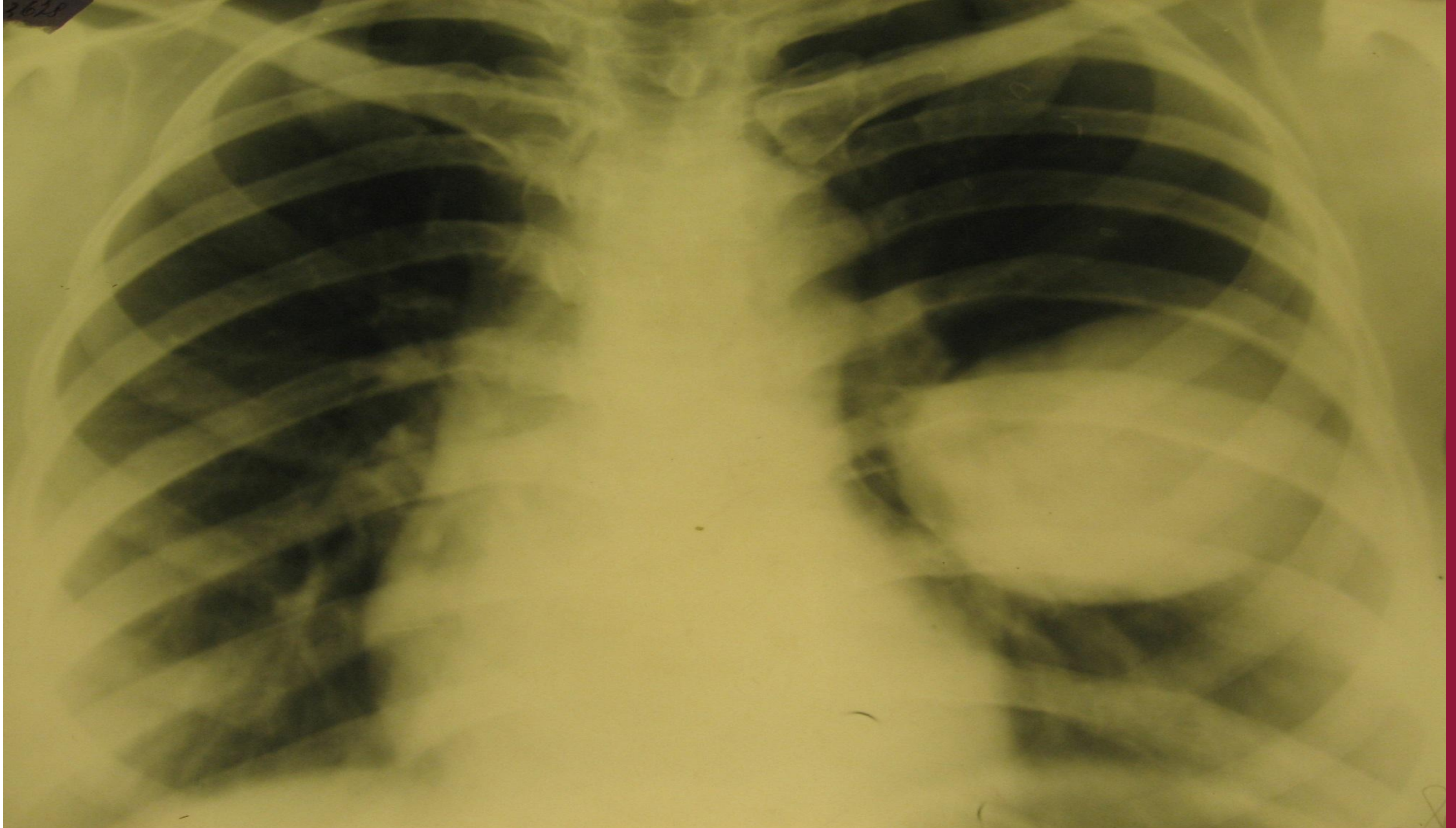
**Pat. G.  
Echinococcus**



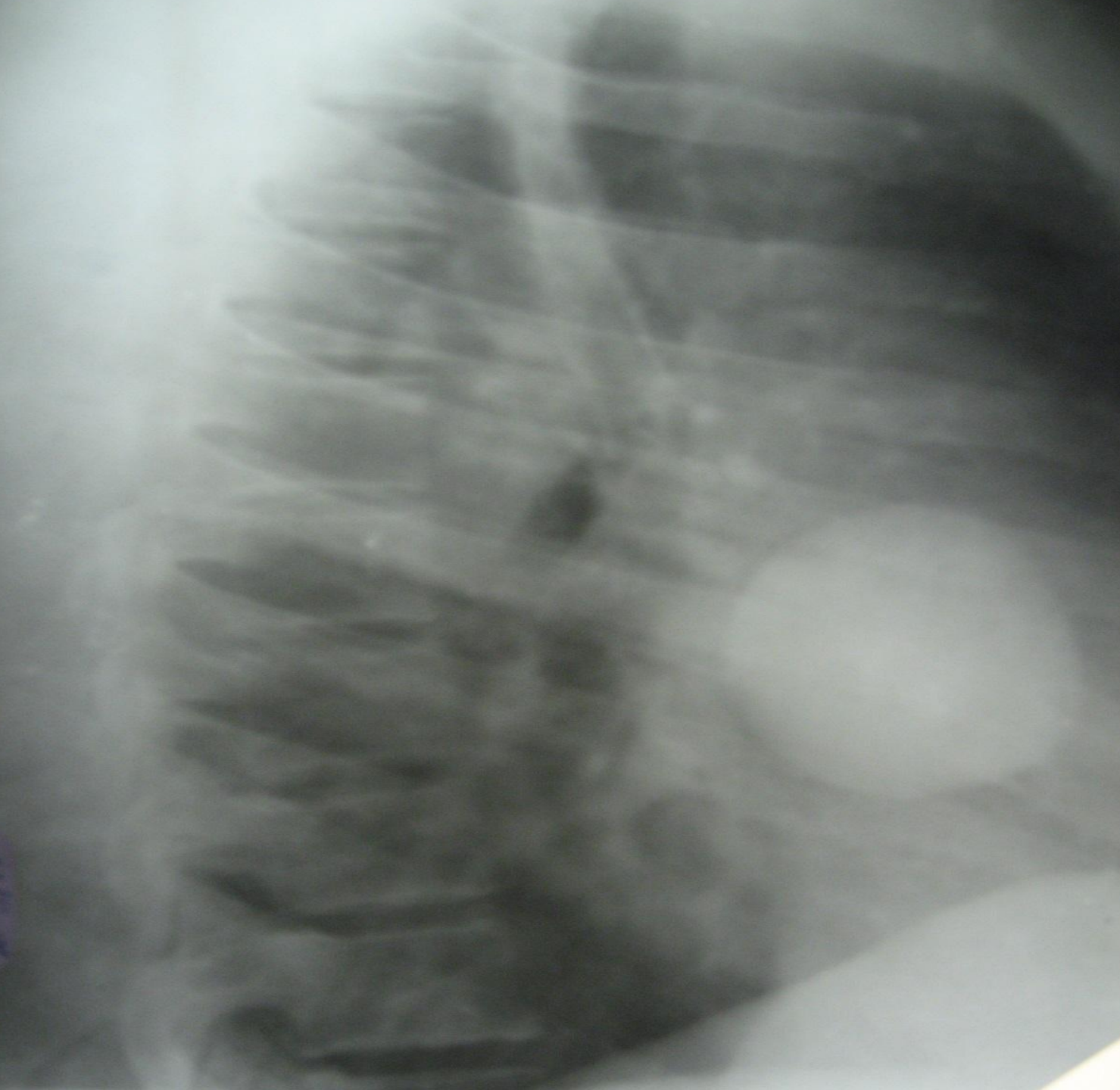
**Pat. G.**  
**Echinococcus**  
**Profile FiLm**



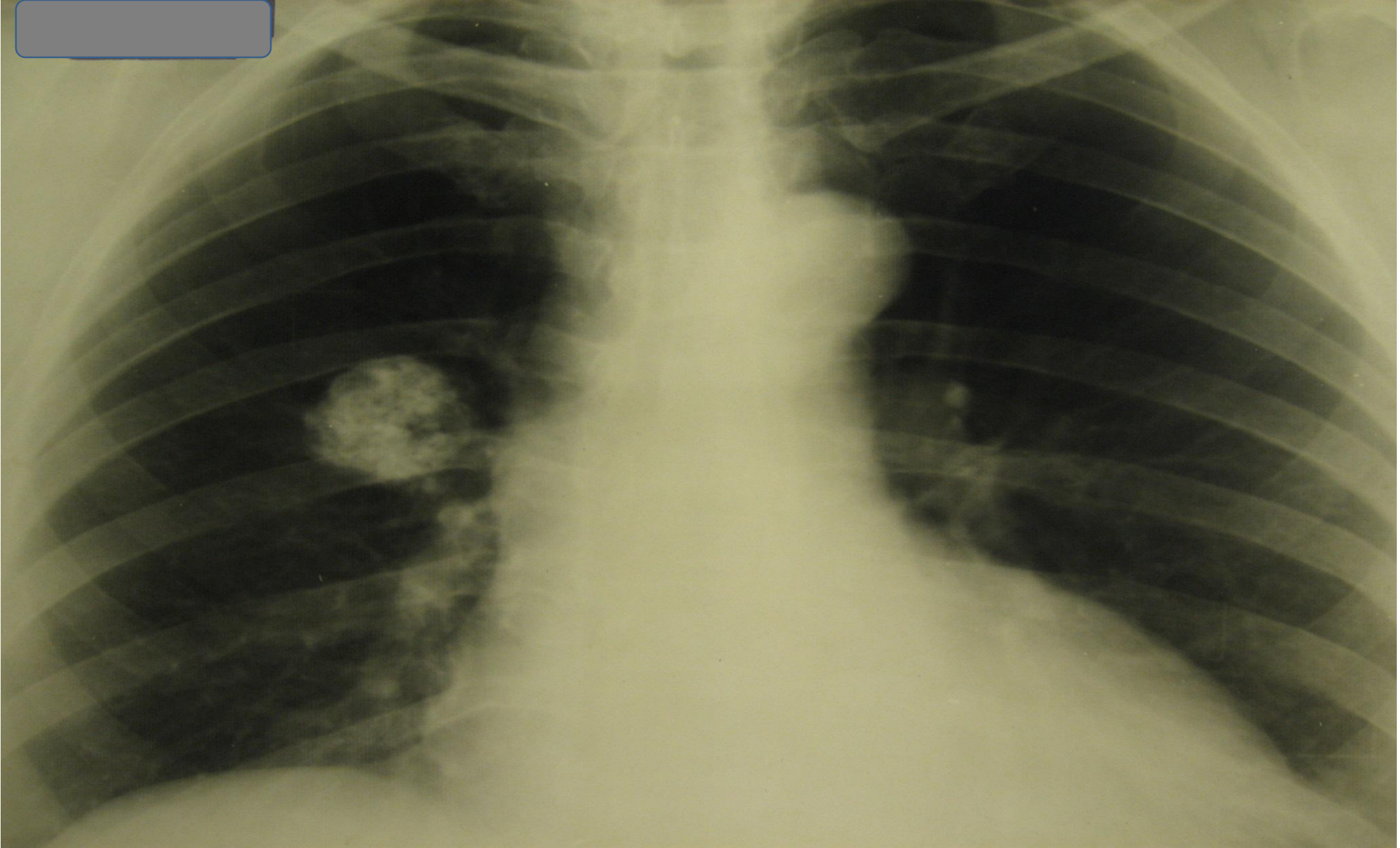
**Pat. G..**  
**After operation**



**Pat. B. Echinococcus**



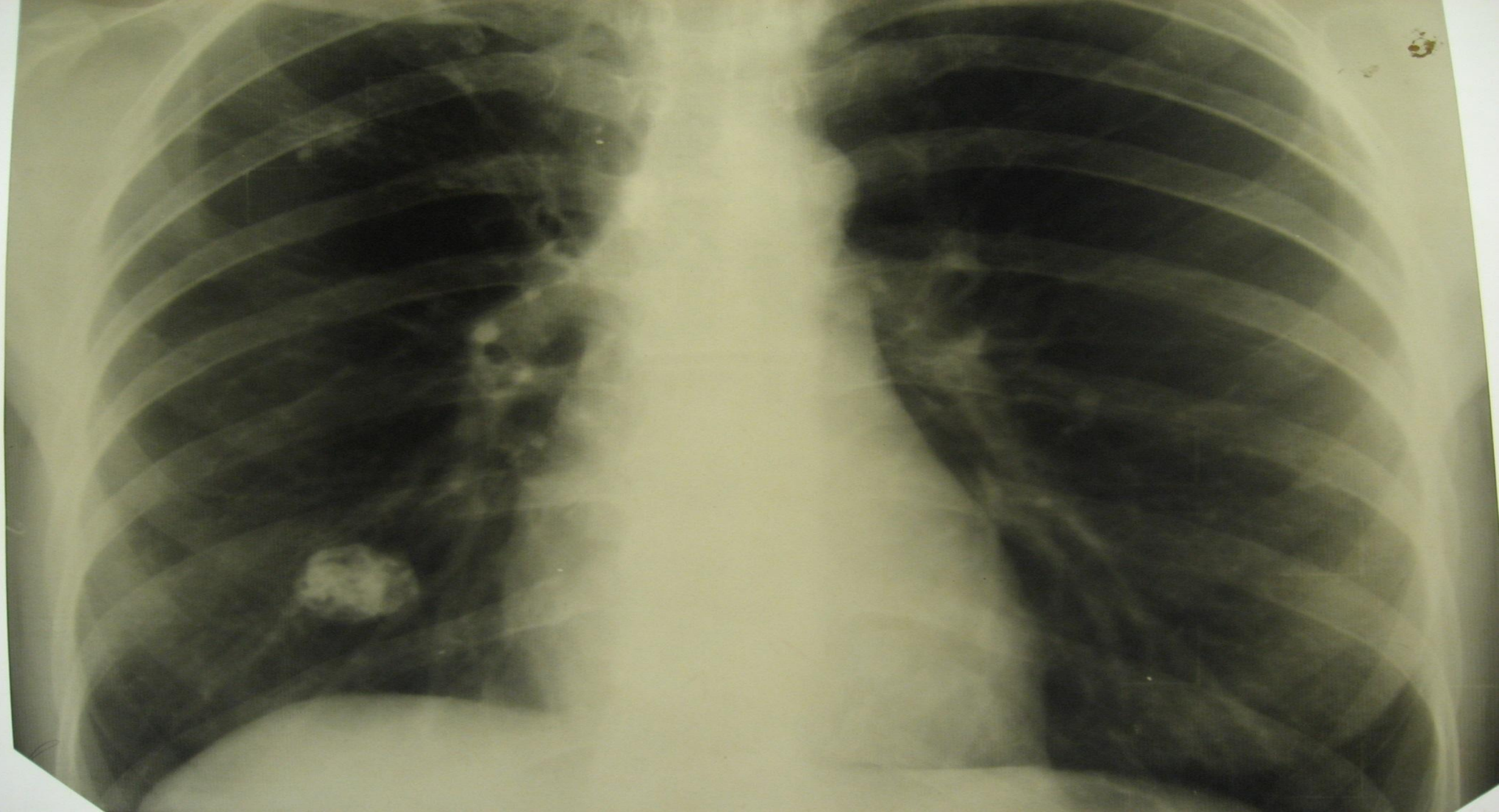
**Pat. L. Echinococcus**  
**Profile Film**



**Pat. Sh. . Enchondroma**



**Pat. Sh. . Enchondroma**



**Pat. P. . Enchondroma**



THANK YOU!