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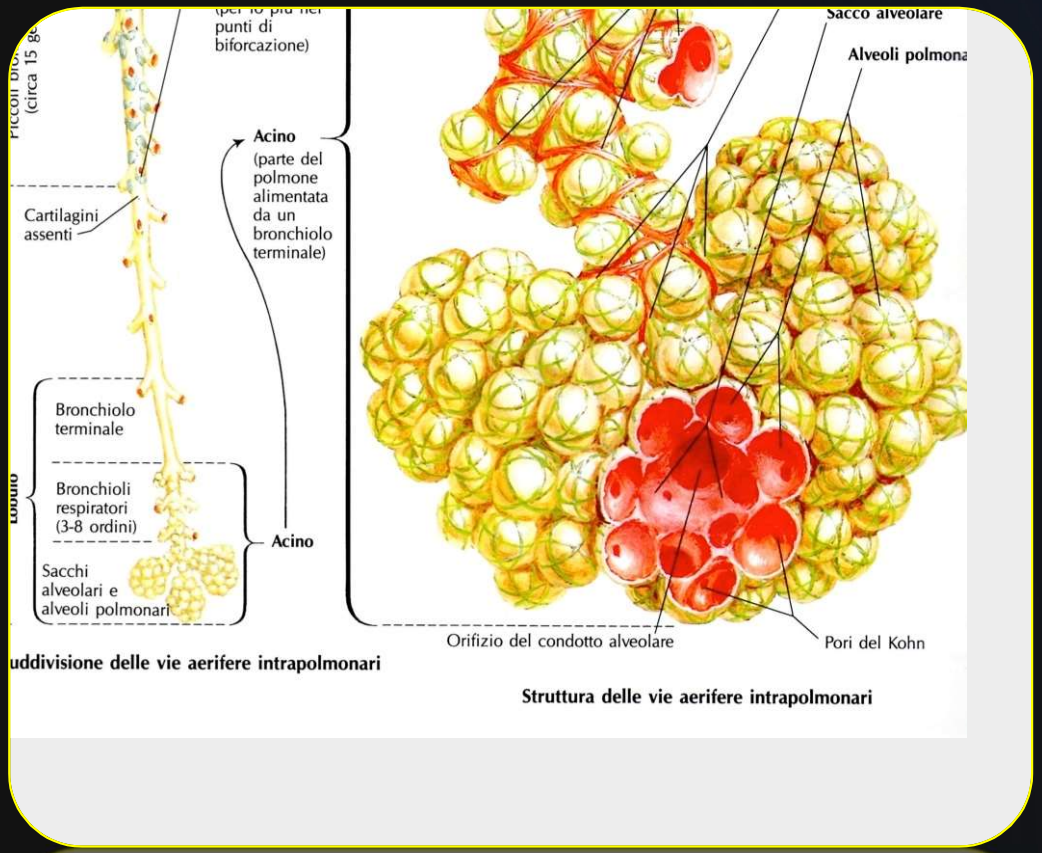
# *La radiologia nella diagnostica delle polmoniti.*

# LE POLMONITI

- **Processo infiammatorio acuto ( o subacuto) a sede polmonare caratterizzato da essudazione endoalveolare ,peribronchiolare o interstiziale.**



# LE POLMONITI

## CLASSIFICAZIONE

### Anatomo-patologica

**P. Alveolari**: estensione lobare o a focolaio , eziologia per lo più batterica.

**P. Interstiziali**: eziologia per lo più virale

**P. Necrotizzanti**: evoluzione verso l'ascessualizzazione

# LE POLMONITI

## CLASSIFICAZIONE

### Epidemiologica

- **P. Acquisita in comunità**: CAP ( community-acquired pneumonia)
- **P. Nosocomiale**: HAP (hospital-acquired pneumonia)
- **P. nell'ospite immunocompromesso**

# LE POLMONITI

## RX torace

SUPPLEMENT ARTICLE

### Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults

Lionel A. Mandell,[1,a] Richard G. Wunderink,[2,a] Antonio Anzueto,[3,4] John G. Bartlett,[7] G. Douglas Campbell,[8] Nathan C. Dean,[9,10] Scott F. Dowell,[11] Thomas M. File, Jr.[12,13] Daniel M. Musher,[5,6] Michael S. Niederman,[14,15] Antonio Torres,[16] and Cynthia G. Whitney[11]

IDSA/ATS Guidelines for CAP in Adult • CID 2007:44 (Suppl 2) • S27

# LE POLMONITI

## RX torace

The diagnosis of CAP is based on the presence of select clinical features (e.g., cough, fever, sputum production, and pleuritic chest pain) and is supported by immagine of the lunga, usually by chest radiography.
Physical examination to detect rales or bronchial breath sounds is an important component of the evaluation but is less sensitive and specific than chest Radiographs .

In addition to a constellation of suggestive clinical features, a demonstrable infiltrate by chest radiograph or other imaging technique, with or without supporting microbiological data, is required for the diagnosis of pneumonia. (Moderate recommendation; level III evidence.)

# LE POLMONITI

## RX torace

di fronte ad un sospetto fondato di polmonite l' esecuzione di RX Torace anche se auspicabile non deve essere considerata indispensabile
In presenza di decorso favorevole la radiografia di controllo non è indispensabile; tuttavia, se si decide di eseguirla, non è opportuno farla prima di 2-3 settimane dall'inizio della terapia antibiotica.
In caso di persistenza di sintomi o di segni clinici o in pazienti ad alto rischio di patologia neoplastica (es. fumatori, paz > 50 aa ecc.), una radiografia (o successive più approfondite indagini) dovrebbe essere comunque eseguita entro 6 settimane dall'episodio acuto.

Linee guida per il trattamento empirico delle CAP nell' adulto. 2003

# LE POLMONITI

## RX torace e TC

A chest radiograph can establish the presence of pneumonia, determine its extent and location, and assess the response to treatment. It can also diagnose complications like pleural effusion, pneumothorax, and abscess formation. CT may detect abnormalities that are not appreciable on chest radiograph. It is not used for the initial evaluation of pneumonia but may be used when the response to treatment is unusually slow, to look for complications, to detect underlying disease within the lung, and also to characterise any complex pneumonias.

Although not diagnostic, certain imaging findings may suggest a particular microbial cause over others

**Spectrum of imaging findings in pulmonary infections. Part 1: Bacterial and viral**© Pol J Radiol 2019

# LE POLMONITI

## TC torace

**Multidetettore con e senza iniezione di mdc**

**Ad alta risoluzione (HRTC)**

Supino
Apnea Inspiratoria

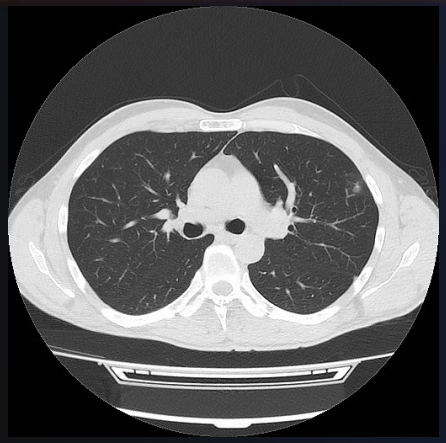
Prono
Apnea Espiratoria

# LE POLMONITI

## RX torace vs TC torace

- Minore dose radiante
- Minore sensibilità
- Minore specificità

- Bassa dose
- Maggiore sensibilità
- Maggiore specificità

# ACR Appropriateness Criteria

**Variant 1:** **Acute respiratory illness in immunocompetent patients with negative physical examination, normal vital signs, and no other risk factors. Initial imaging.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| Radiography chest | Usually Appropriate | ☢ |
| CT chest with IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| CT chest without and with IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| CT chest without IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| MRI chest without and with IV contrast | Usually Not Appropriate | O |
| MRI chest without IV contrast | Usually Not Appropriate | O |
| US chest | Usually Not Appropriate | O |

**Variant 2:** **Acute respiratory illnesses in immunocompetent patients with positive physical examination, abnormal vital signs, organic brain disease, or other risk factors. Initial imaging.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| Radiography chest | Usually Appropriate | ☢ |
| US chest | May Be Appropriate | O |
| CT chest with IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| CT chest without and with IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| CT chest without IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| MRI chest without and with IV contrast | Usually Not Appropriate | O |
| MRI chest without IV contrast | Usually Not Appropriate | O |

# ACR Appropriateness Criteria

**Variant 3:** **Acute respiratory illness in immunocompetent patients with positive physical examination, abnormal vital signs, organic brain disease, or other risk factors and negative or equivocal initial chest radiograph. Next imaging study.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| CT chest without IV contrast | Usually Appropriate | ☢ ☢ ☢ |
| CT chest with IV contrast | May Be Appropriate (Disagreement) | ☢ ☢ ☢ |
| US chest | May Be Appropriate | O |
| CT chest without and with IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| MRI chest without and with IV contrast | Usually Not Appropriate | O |
| MRI chest without IV contrast | Usually Not Appropriate | O |

# ACR Appropriateness Criteria

**Variant 4:** **Acute respiratory illnesses in immunocompetent patients with pneumonia complicated by suspected parapneumonic effusion or abscess on initial chest radiograph. Next imaging study.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| CT chest with IV contrast | Usually Appropriate | ☢ ☢ ☢ |
| CT chest without IV contrast | Usually Appropriate | ☢ ☢ ☢ |
| MRI chest without and with IV contrast | May Be Appropriate (Disagreement) | O |
| MRI chest without IV contrast | May Be Appropriate (Disagreement) | O |
| US chest | May Be Appropriate | O |
| CT chest without and with IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |

**Variant 5:** **Acute asthma exacerbation in immunocompetent patients, uncomplicated (no suspicion of pneumonia or pneumothorax). Initial imaging.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| Radiography chest | May Be Appropriate | ☢ |
| CT chest with IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| CT chest without and with IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| CT chest without IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| MRI chest without and with IV contrast | Usually Not Appropriate | O |
| MRI chest without IV contrast | Usually Not Appropriate | O |
| US chest | Usually Not Appropriate | O |

# ACR Appropriateness Criteria

**Variant 6:** **Acute asthma exacerbation in immunocompetent patients, complicated (suspected pneumonia or pneumothorax). Initial imaging.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| Radiography chest | Usually Appropriate | ☢ |
| CT chest with IV contrast | May Be Appropriate | ☢ ☢ ☢ |
| CT chest without IV contrast | May Be Appropriate | ☢ ☢ ☢ |
| US chest | May Be Appropriate | O |
| CT chest without and with IV contrast | Usually Not Appropriate | ☢ ☢ ☢ |
| MRI chest without and with IV contrast | Usually Not Appropriate | O |
| MRI chest without IV contrast | Usually Not Appropriate | O |

# SEMEIOTICA

## CAP

Patterns

- ✓ **Consolidation** (alveolar/lobar pneumonia)
- ✓ **Peribronchial nodules** (bronchopneumonia)
- ✓ **Ground Glass opacity**
- ✓ **Interstitial Pneumonia**
- ✓ **Random nodules** (hematogenous pulmunary infection)

# LE POLMONITI

## Semeiotica

Opacità alveolari

- ✓ **Forma** (rotondeggiante, nastriforme, triangolare…)
- ✓ **Densità** (omogenea /disomogenea)
- ✓ **Margini** ( mal definiti, cotonosi, netti, spiculati)
- ✓ **Distribuzione** (focale, chiazze, mono/bilaterale)
- ✓ **Dimensioni** (acinose, segmentarie, lobari)

# LE POLMONITI

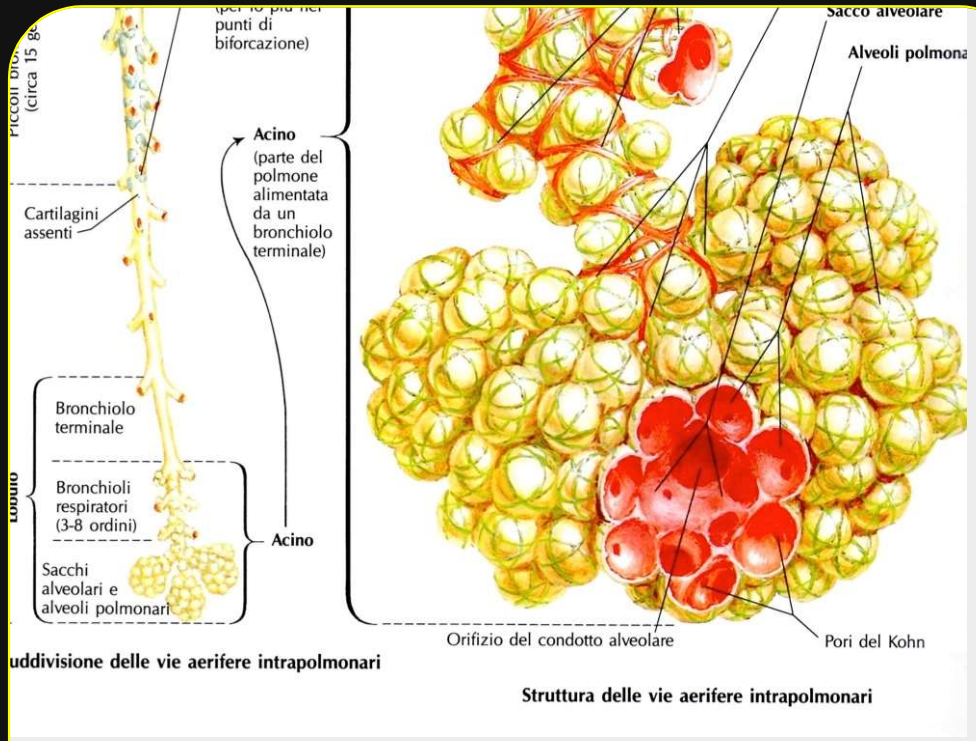
## Semeiotica

Opacità alveolari

- ✓ **Perdita di volume** **( ostruzione bronchiale)**
- ✓ **Broncogramma aereo** **(pervietà delle vie aeree)**
- ✓ **Escavazioni**
- ✓ **Contrast enhancement** **(omogeneo/disomogeneo)**

# CONSOLIDATION PATTERN

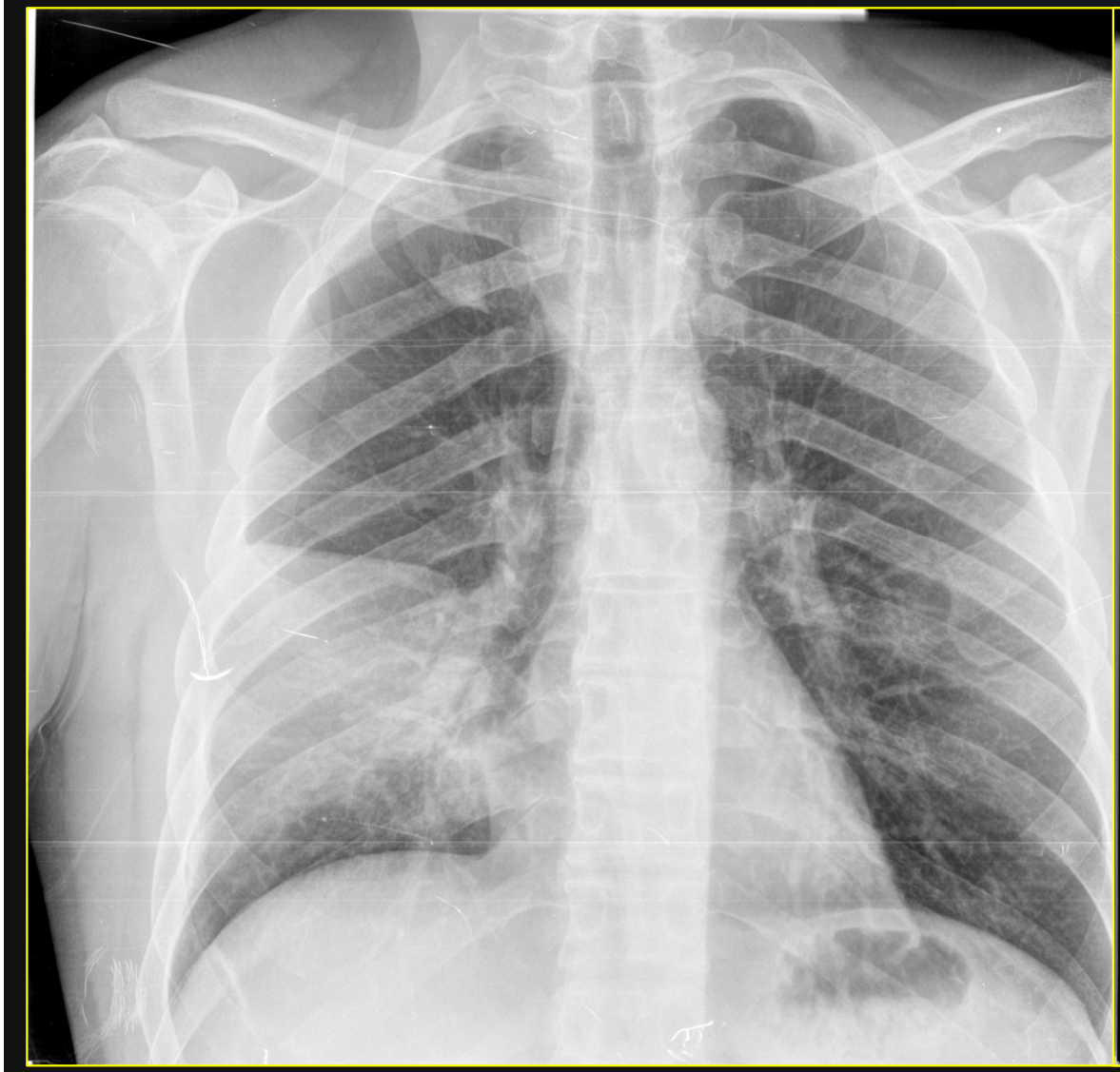
## Semeiotica CAP




- ✓ Focali
- ✓ Segmentarie
- ✓ Lobari

- ✓ Streptococco
- ✓ Klebsiella
- ✓ altri

# LE POLMONITI

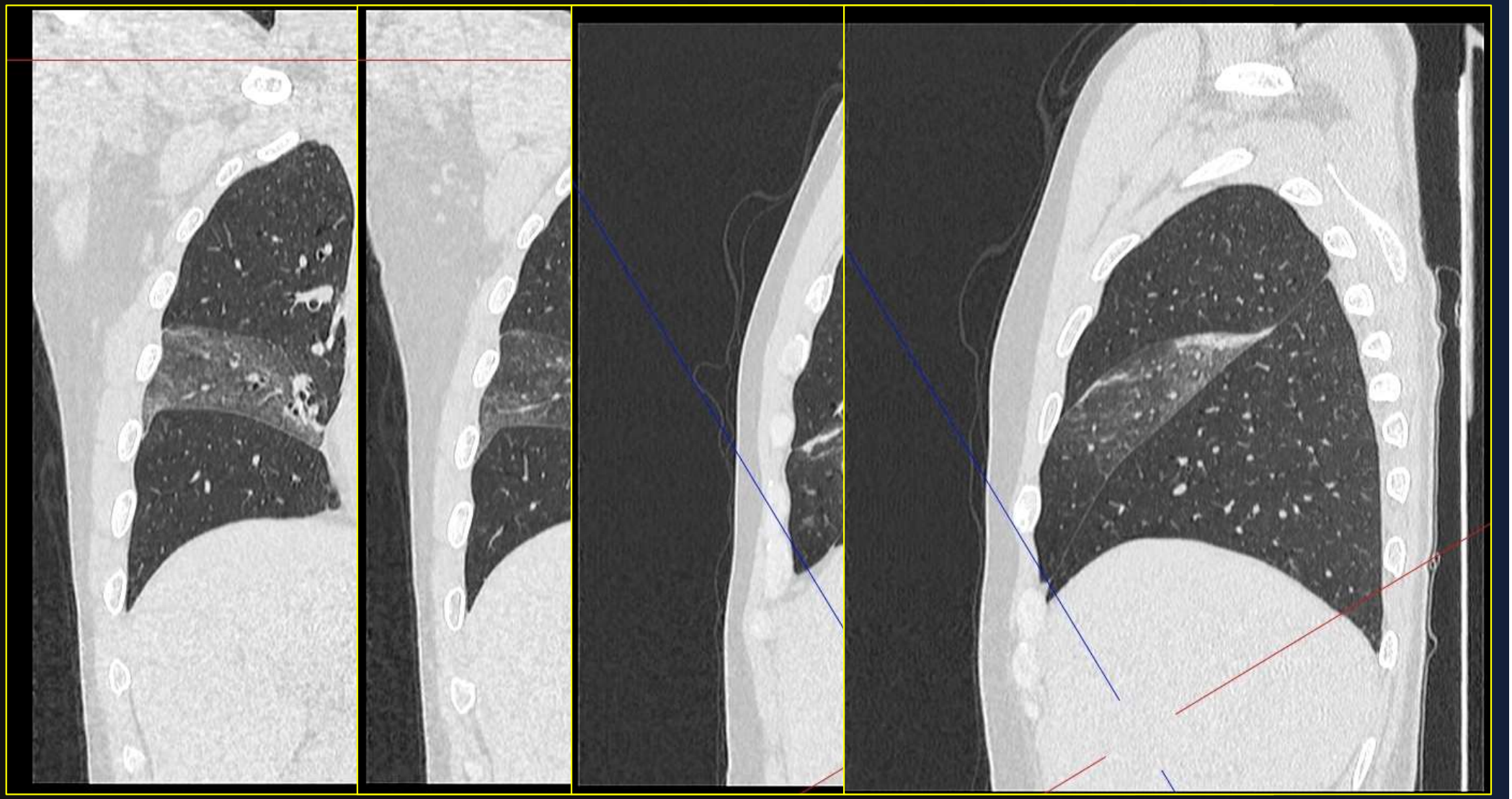


# CONSOLIDATION PATTERN

## Streptococco P.

# CONSOLIDATION PATTERN

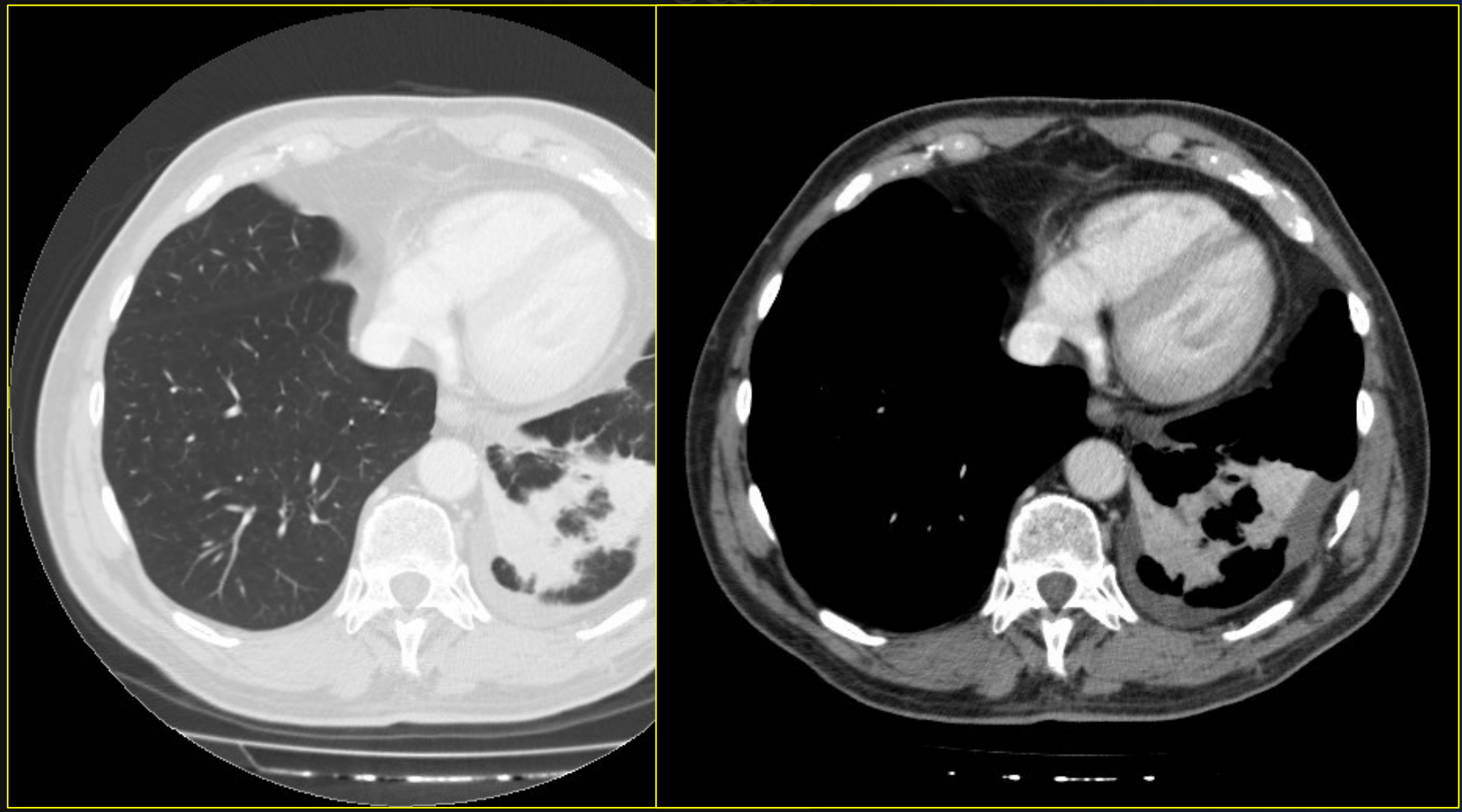
## Streptococco P.



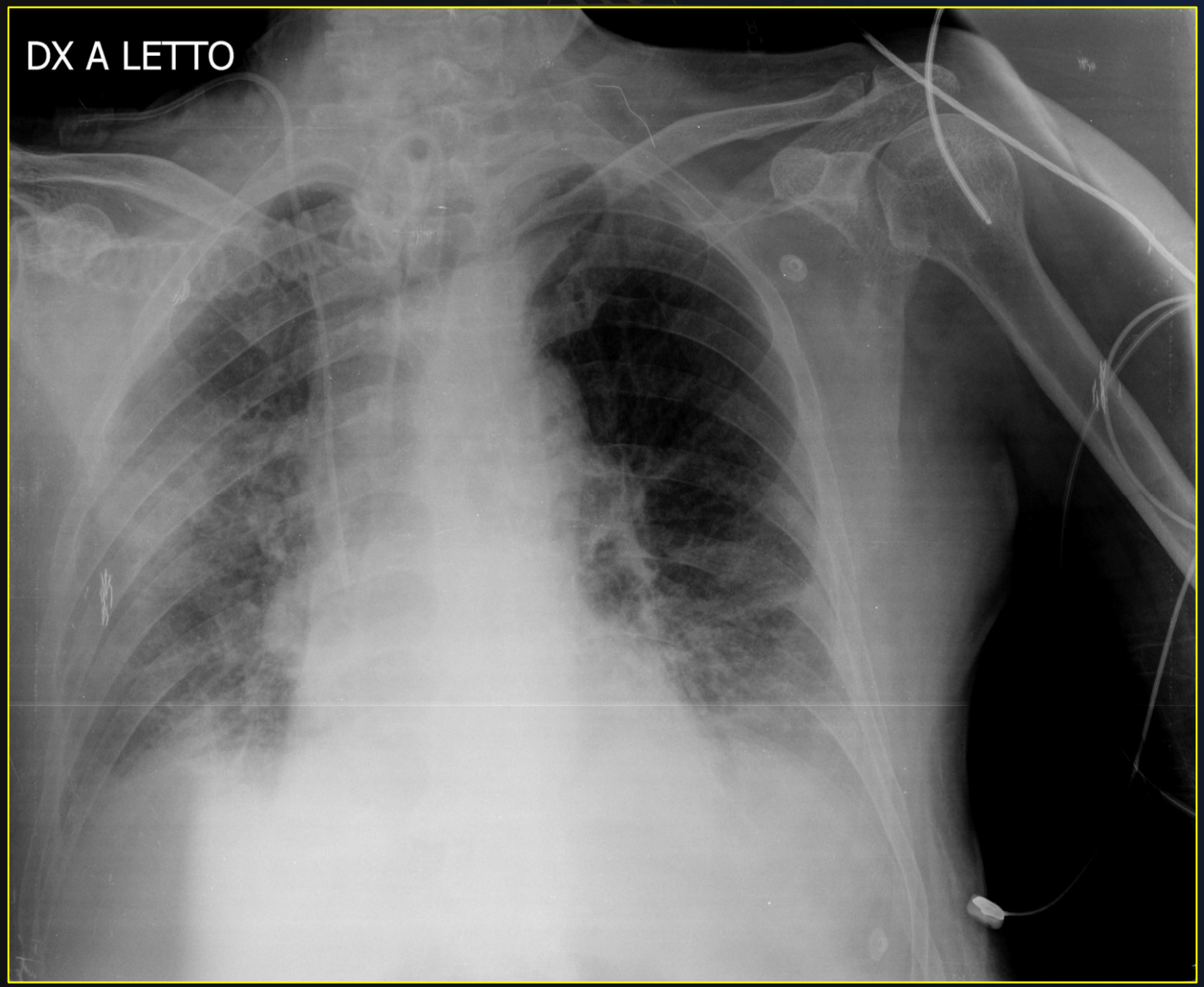
# LE POLMONITI

# CONSOLIDATION PATTERN

## Streptococco P.



# LE POLMONITI



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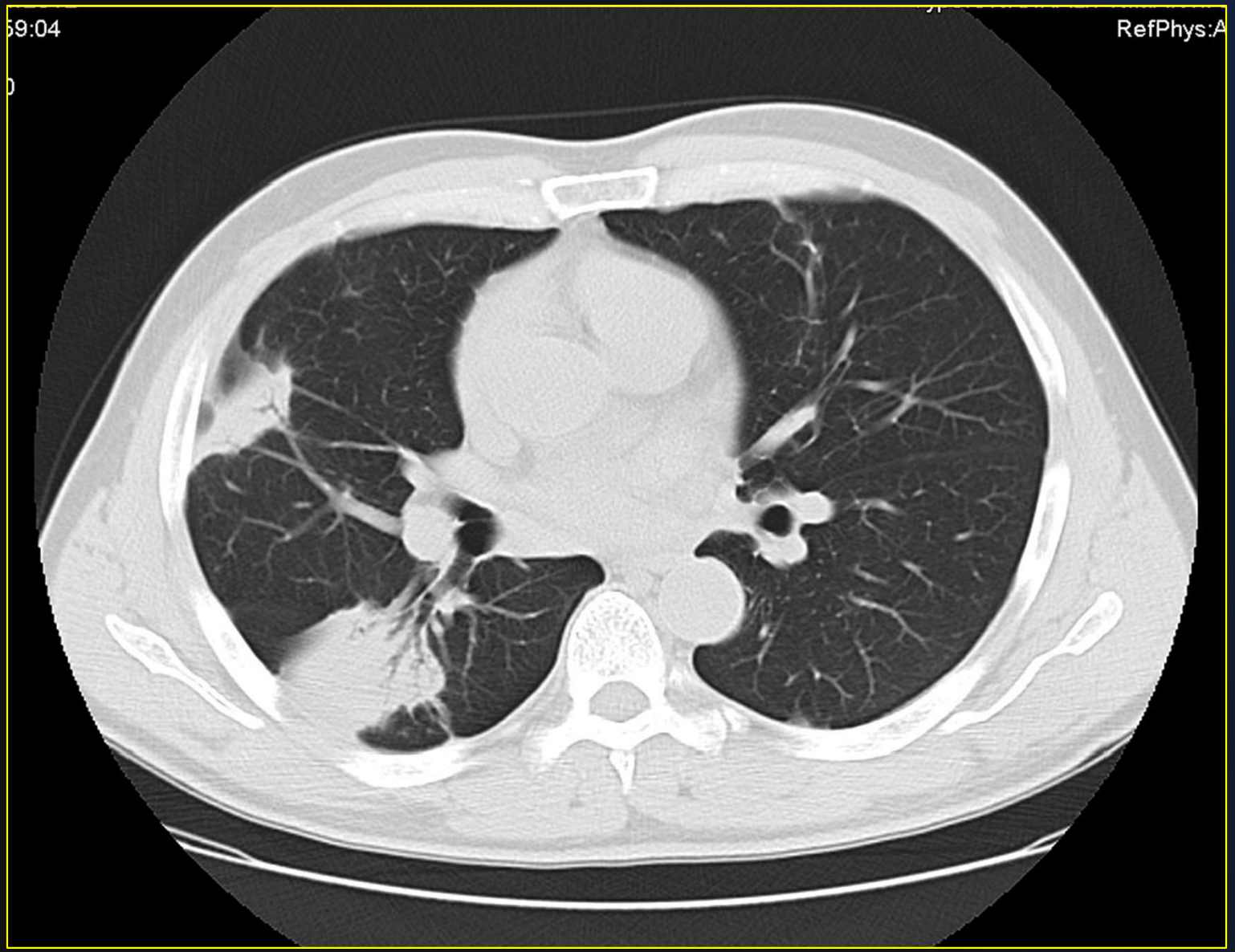
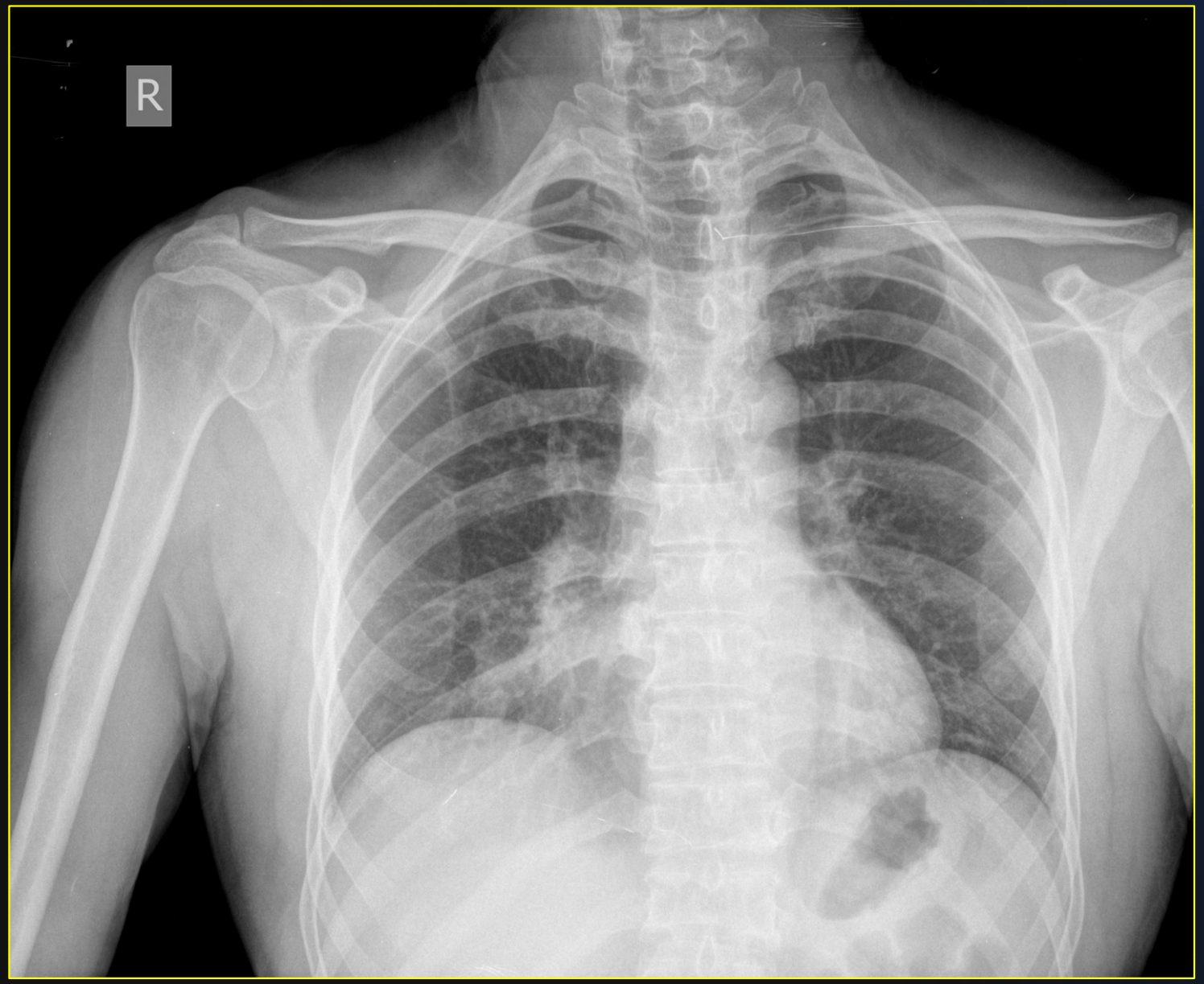


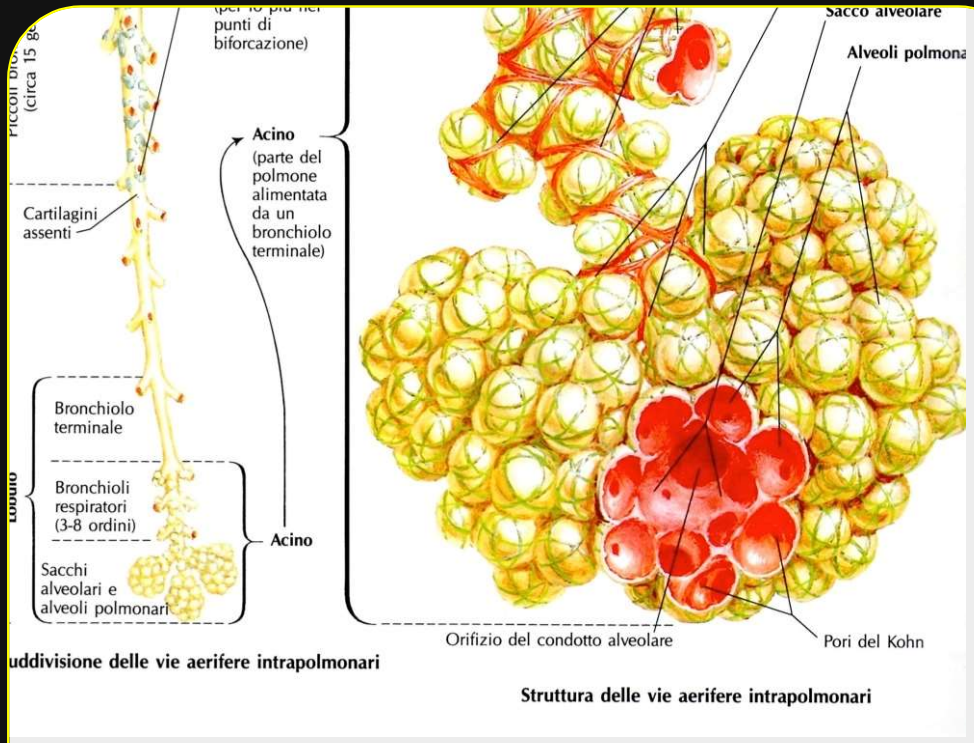
# LE POLMONITI



# CONSOLIDATION PATTERN

# PERIBRONCHIAL NODULES

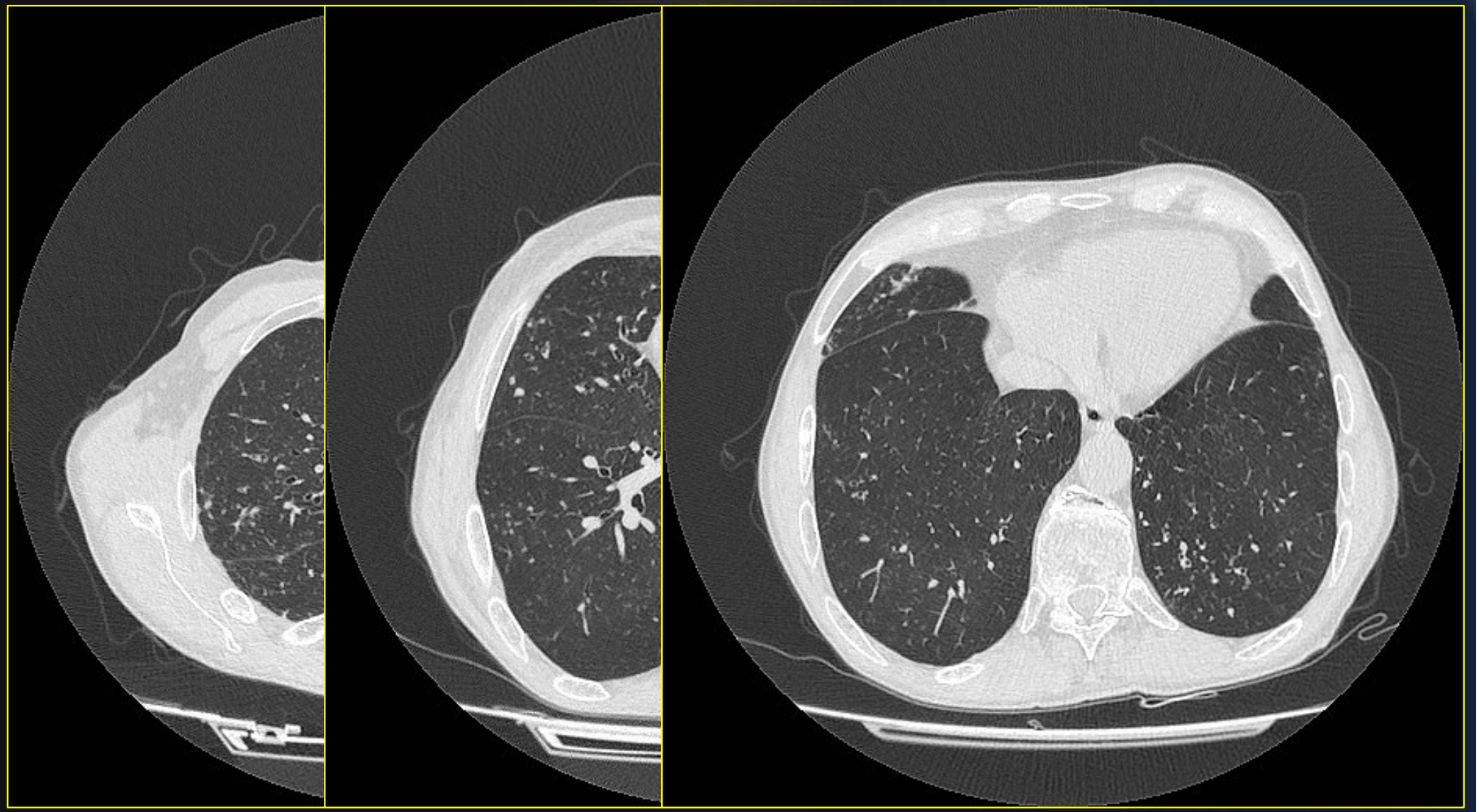
## Semeiotica CAP




- ✓ Noduli centrolobulari
- ✓ +/- consolidam. peribronch
- ✓ Coalescenza nodulare
- ✓ Ispessimento parete

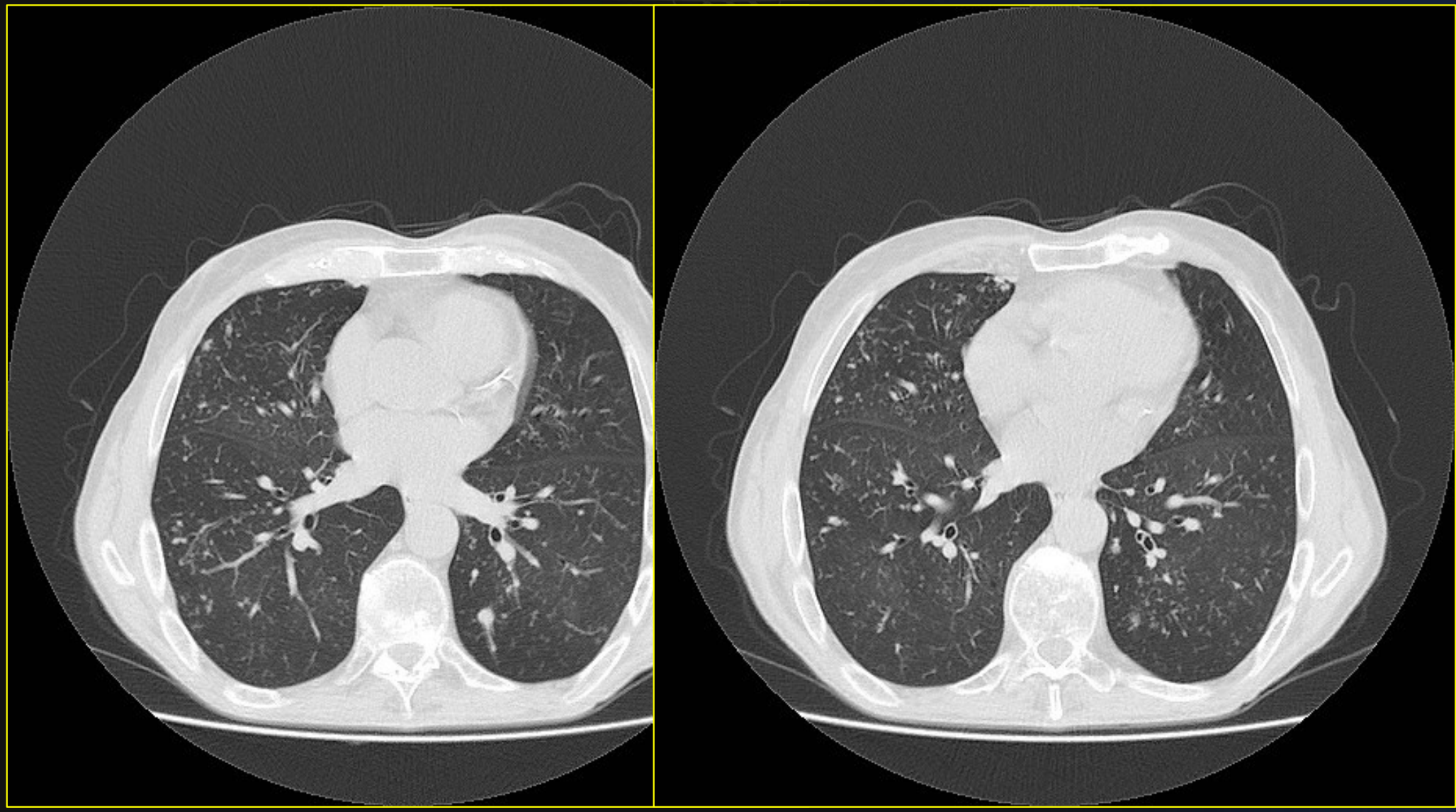
- ✓ H. influenzae
- ✓ Mycoplasma P.
- ✓ TBC
- ✓ Virus

# PERIBRONCHIAL NODULES

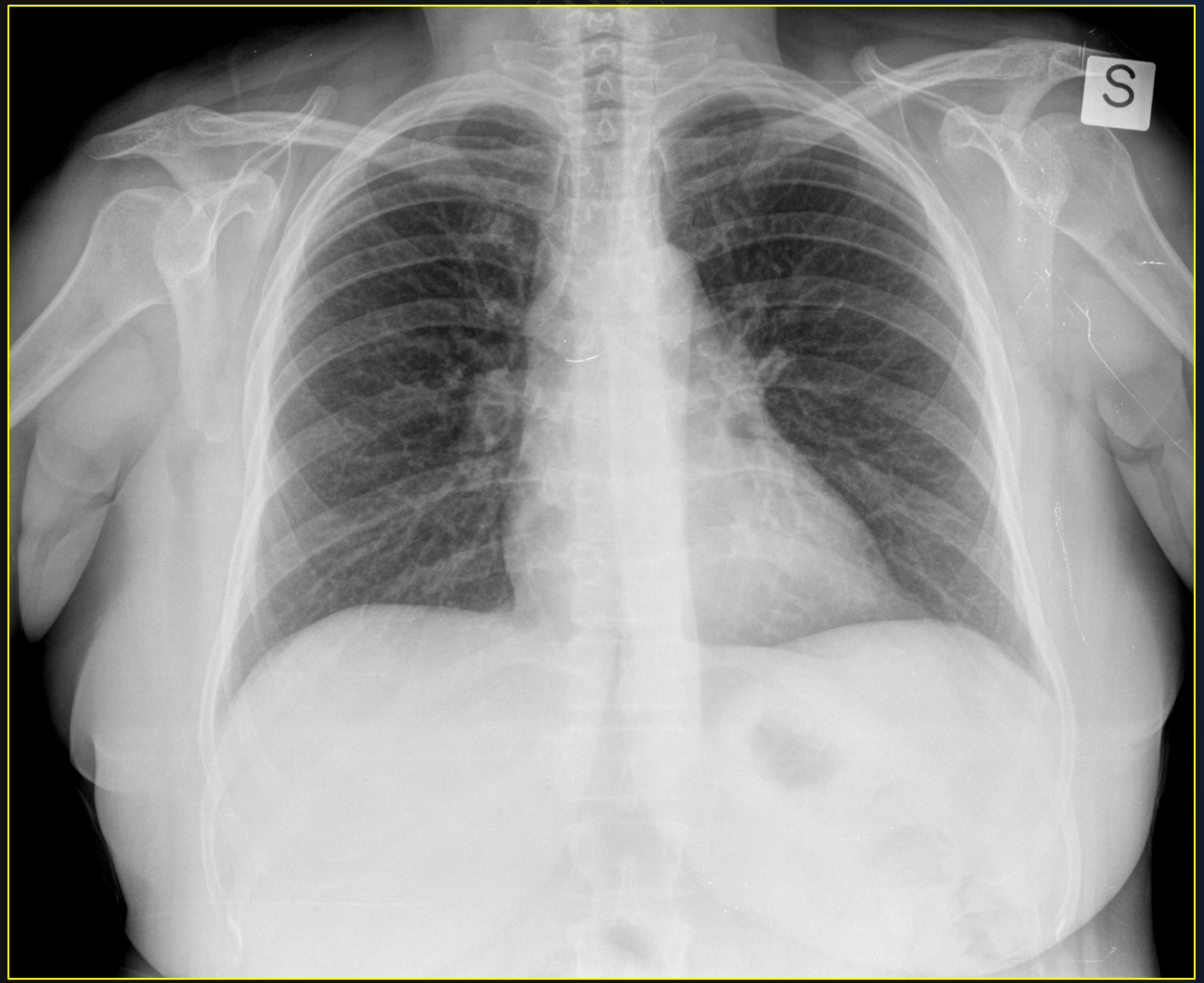


# PERIBRONCHIAL NODULES

## Mycoplasma P.

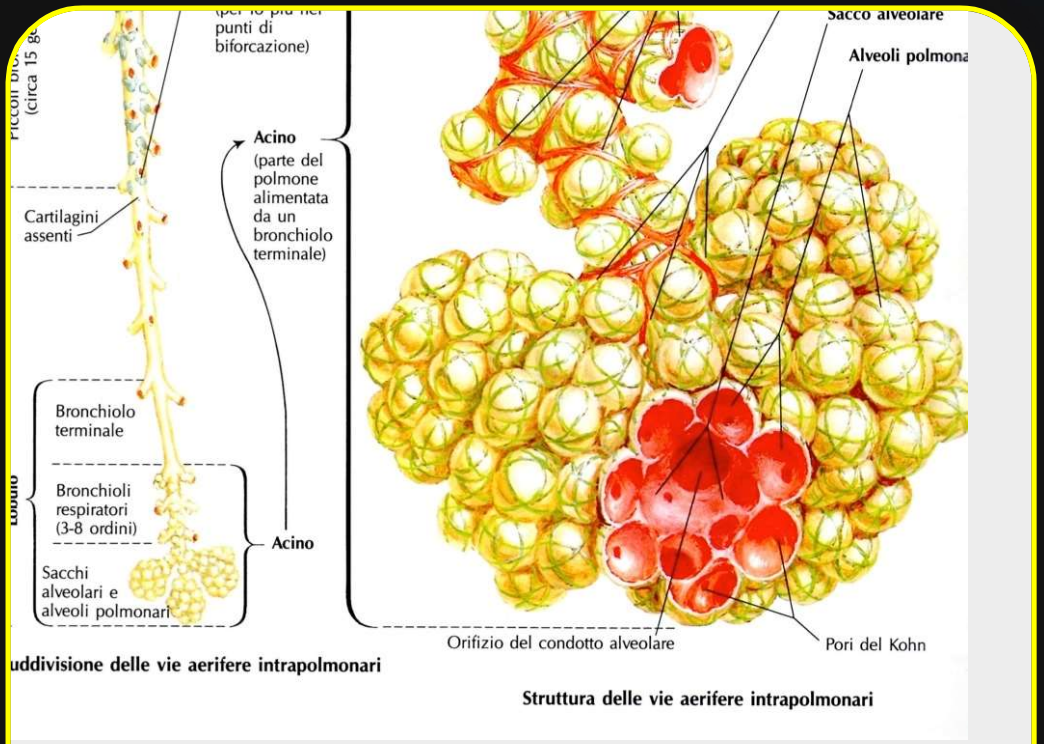


# LE POLMONITI



# GROUND-GLASS PATTERN

## Semeiotica CAP



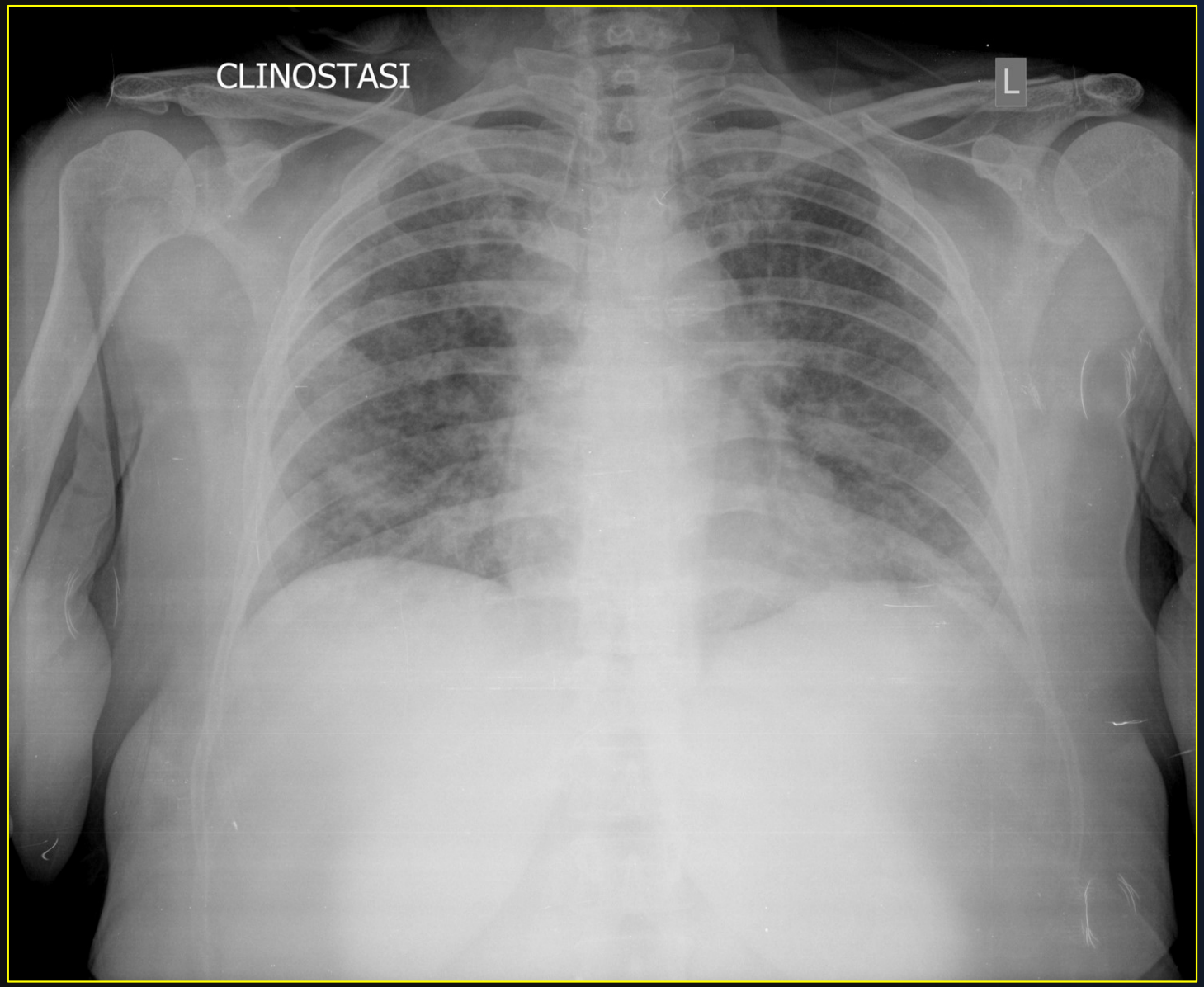

uddivisione delle vie aerifere intrapolmonari

Struttura delle vie aerifere intrapolmonari

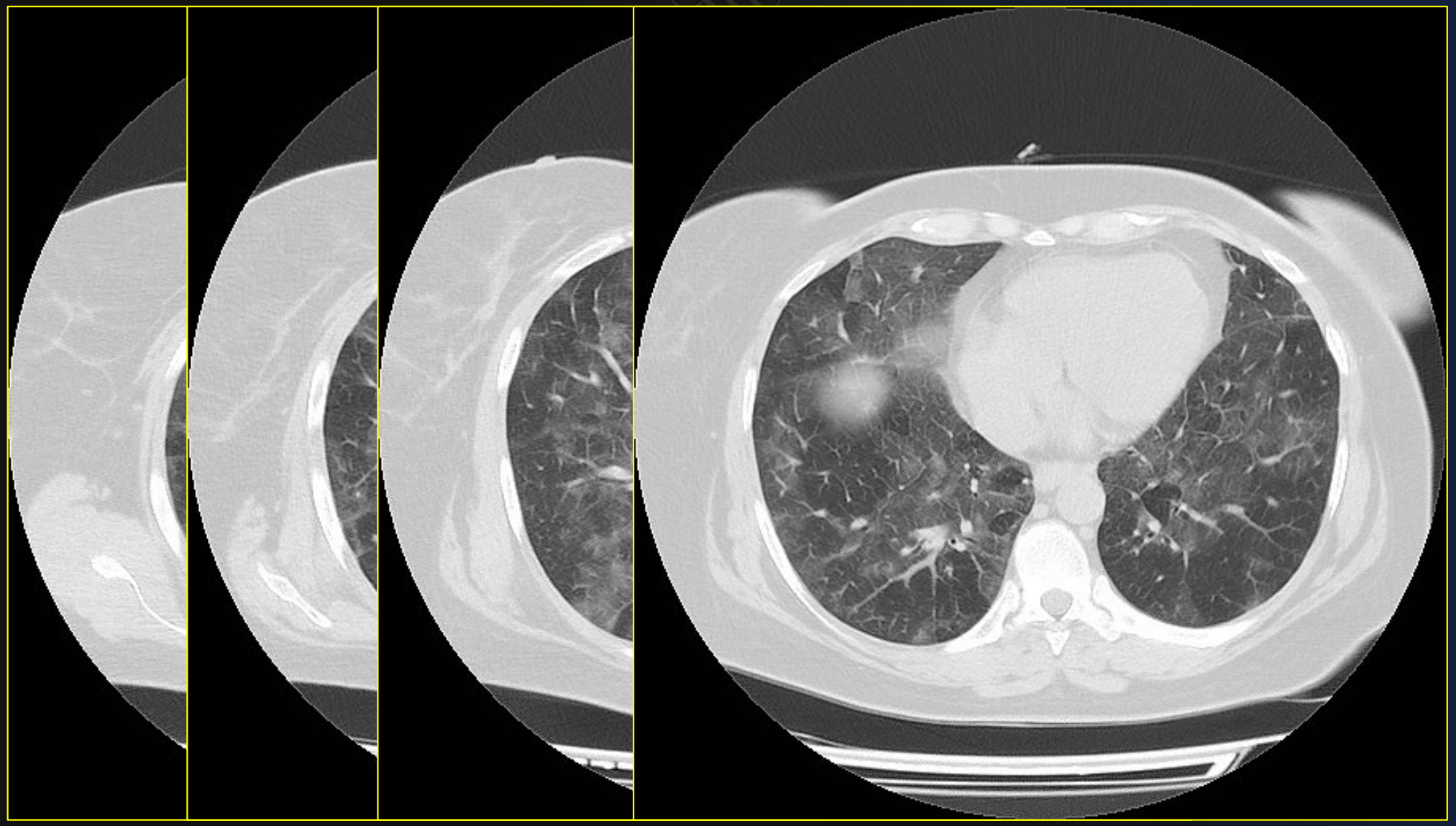
- ✓ Incompleto filling alveolare
- ✓ Infiltrato interstiziale

- ✓ Pneumocystis Jirovecii
- ✓ Mycoplasma P.
- ✓ Virus etc

# LE POLMONITI



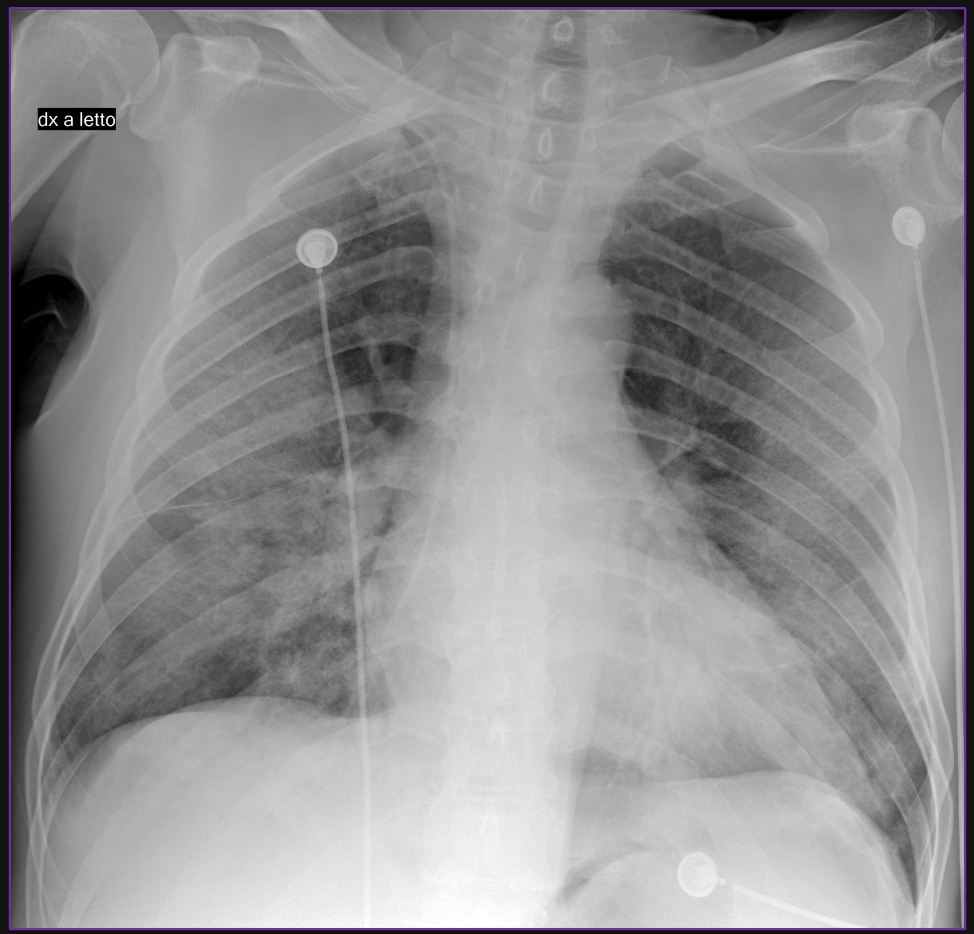
# GROUND-GLASS PATTERN

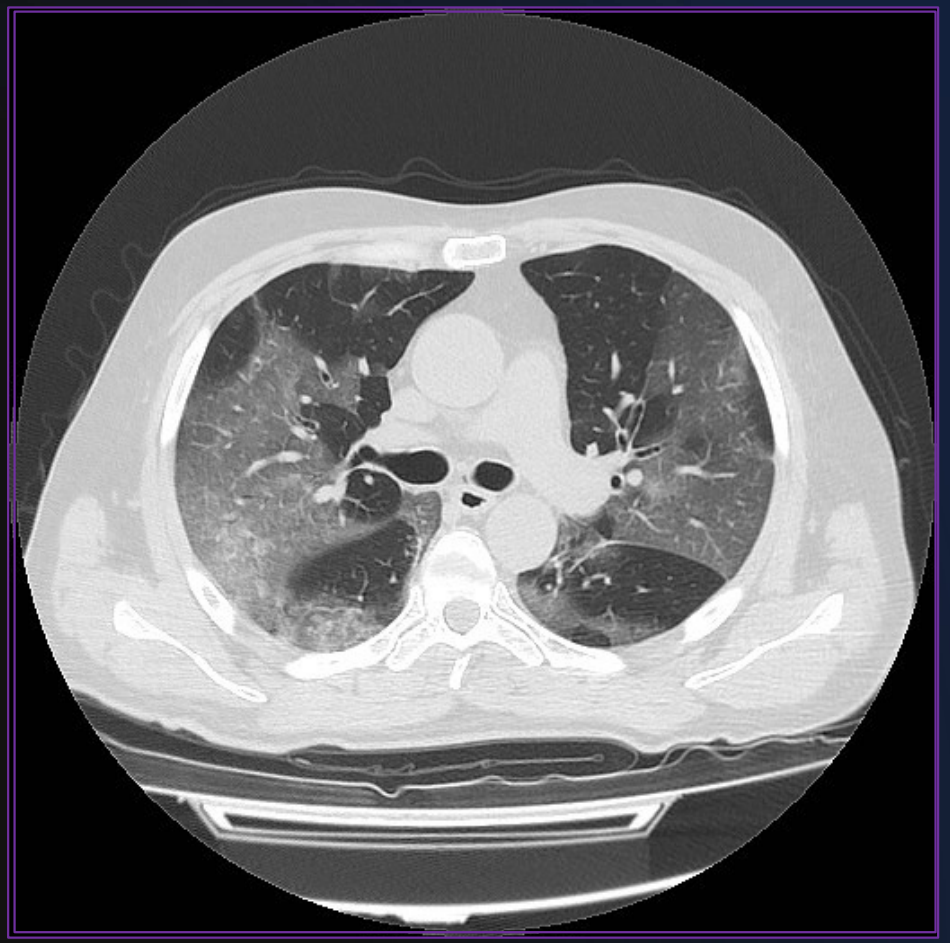


# COVID-19
## *RX vs TC*

**RX torace**

**TC torace senza mdc**



# COVID-19
## *Semeiotica*

## *GGO*

- ✓ Bilaterale
- ✓ Simmetrica
- ✓ Subpleurica
- ✓ Lobi inferiori
- ✓ Focali /confluenti

# GROUND-GLASS PATTERN

## Pneumocystis Jirovecii

# INTERSTITIAL PNEUMONIA

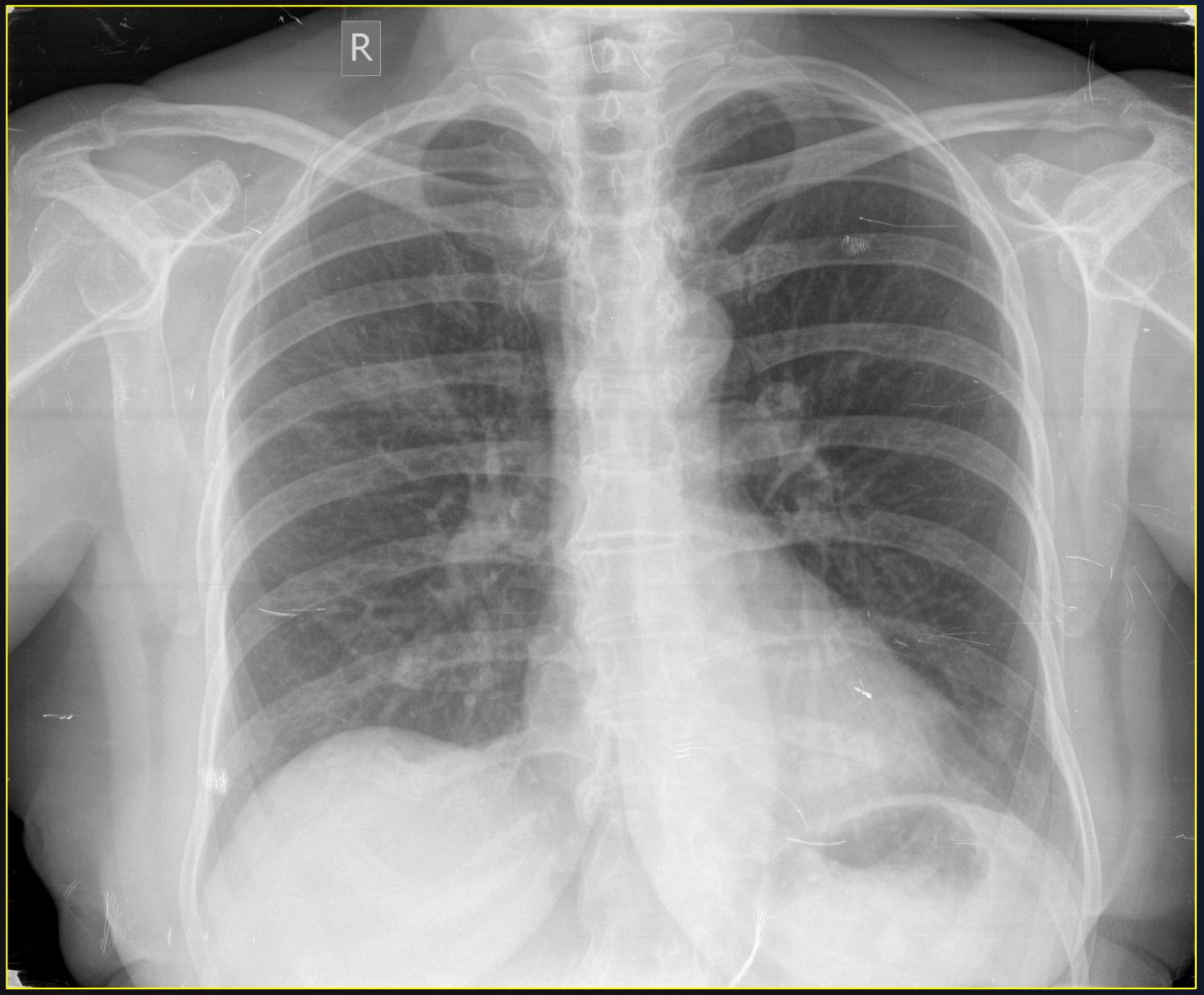
## Semeiotica

Ispessimento interstiziale

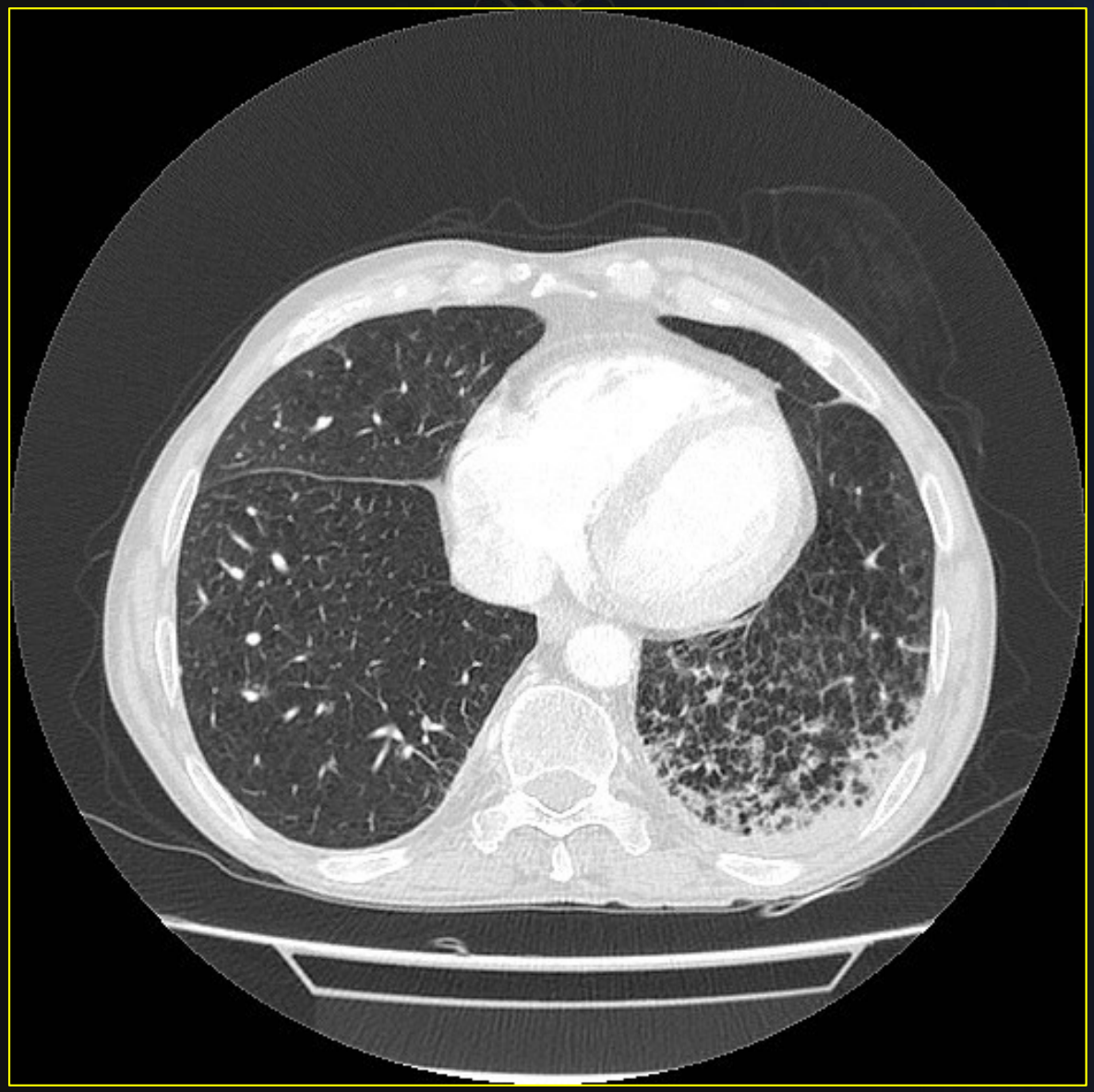
- ✓ **Reticolare** ( **Mycoplasma/fibrosi polmonare idiopatica** )
- ✓ **Noduare** (**miliare, virali/sarcoidosi,silicosi,MTX**)
- ✓ **Reticolo-nodulare**
- ✓ **Liscia** (**edema, linfangite**)
- ✓ **Vetro smerigliato** (**virali, Pseudocystis,edema/fibrosi**)

**Aspecificità**

# LE POLMONITI

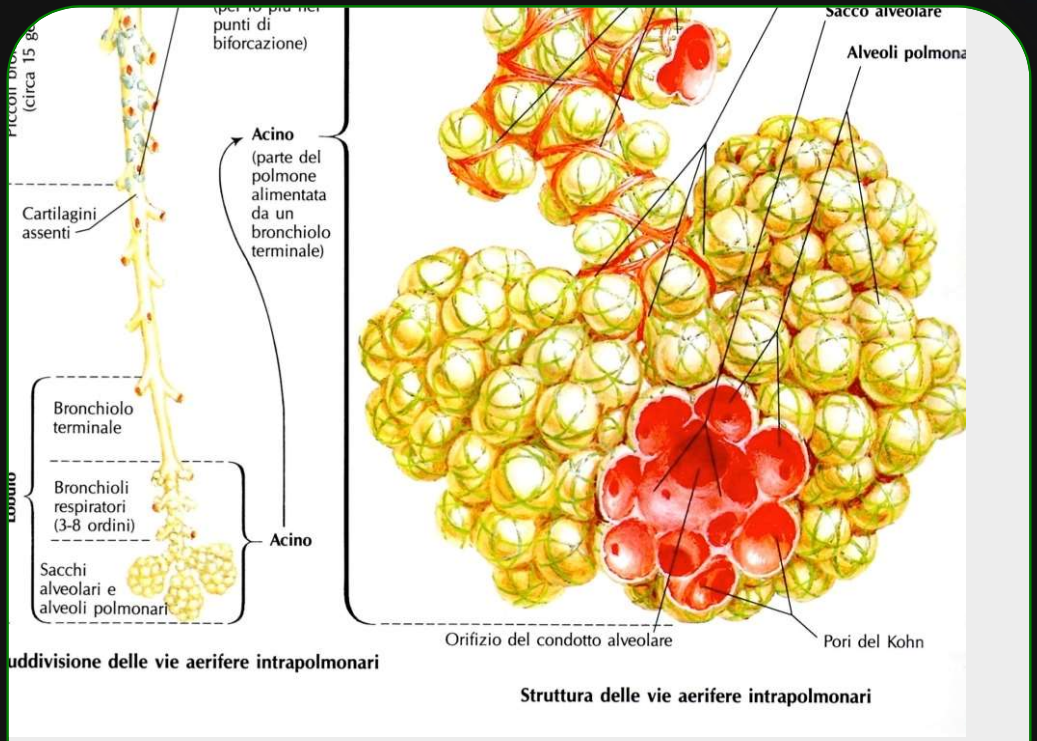


# INTERSTITIAL PNEUMONIA



# RANDOM NODULES

## Semeiotica CAP



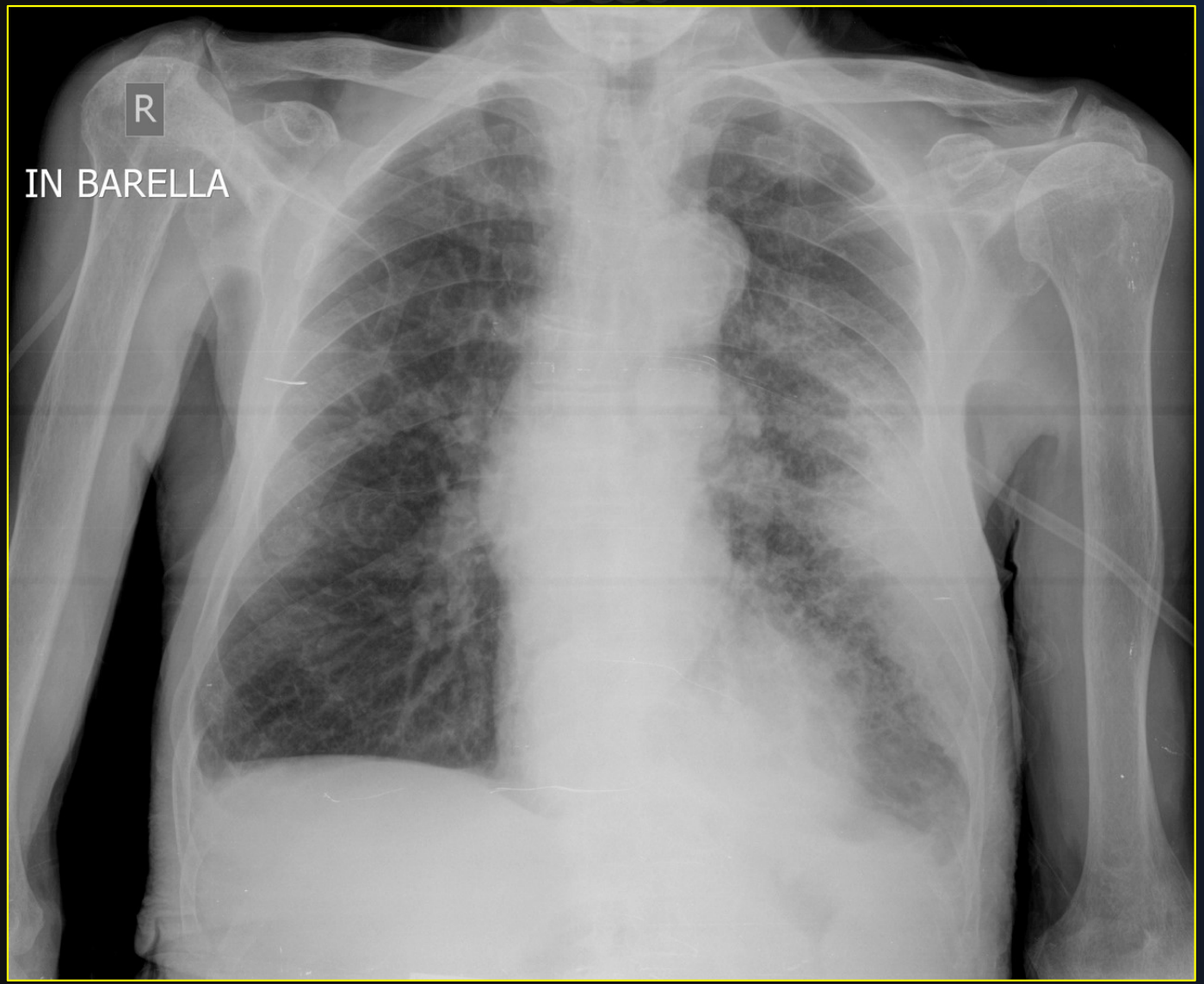

- ✓ **Disseminazione miliare**
- ✓ **Infiltrato granulomatoso**

- ✓ **TBC**
- ✓ **Varicella**
- ✓ **Funghi**
- ✓ **etc**

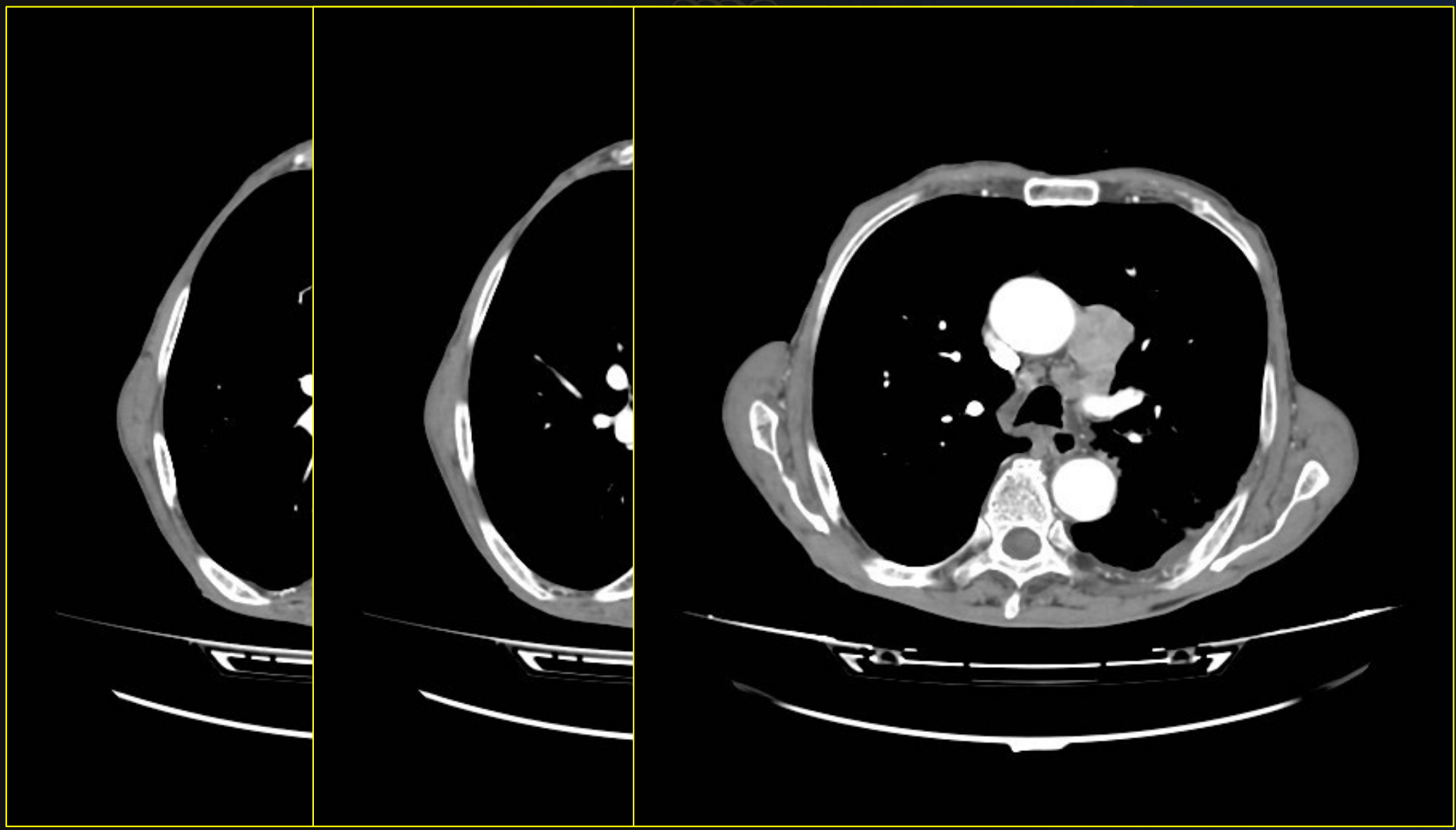
# RANDOM NODULES

## TBC miliare

# DIAGNOSI DIFFERENZIALE

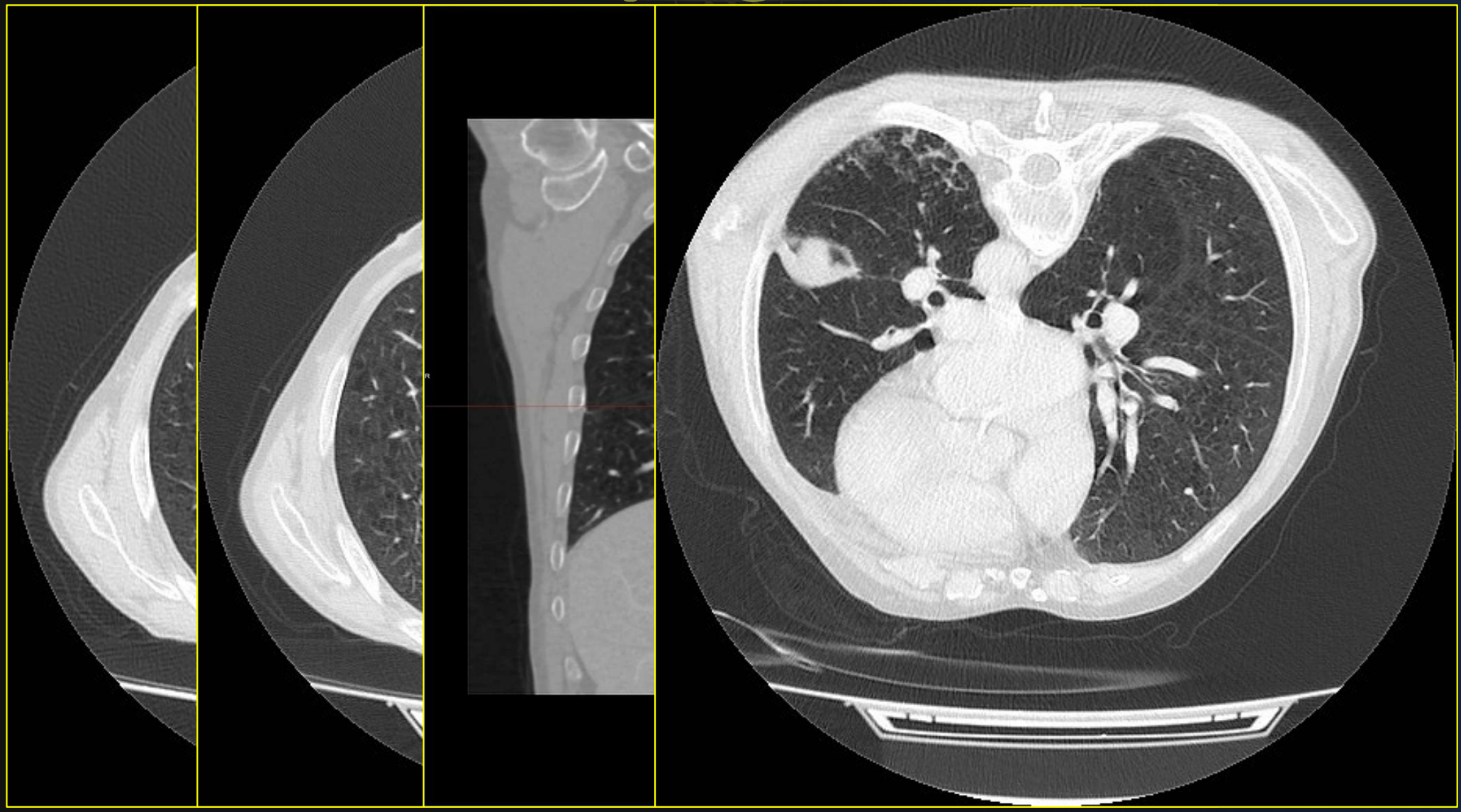


# DIAGNOSI DIFFERENZIALE

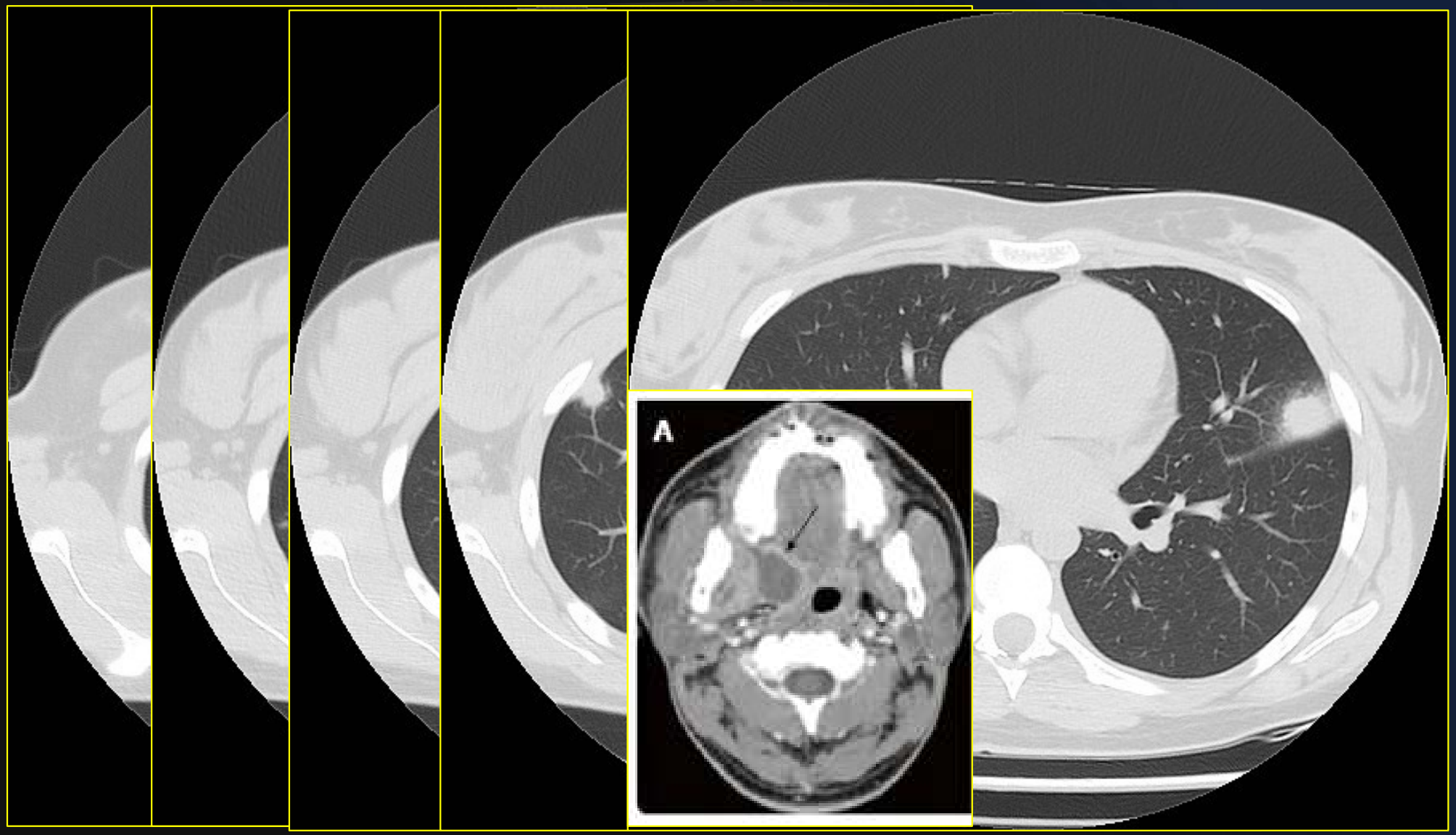


# DIAGNOSI DIFFERENZIALE

## Aspergillus

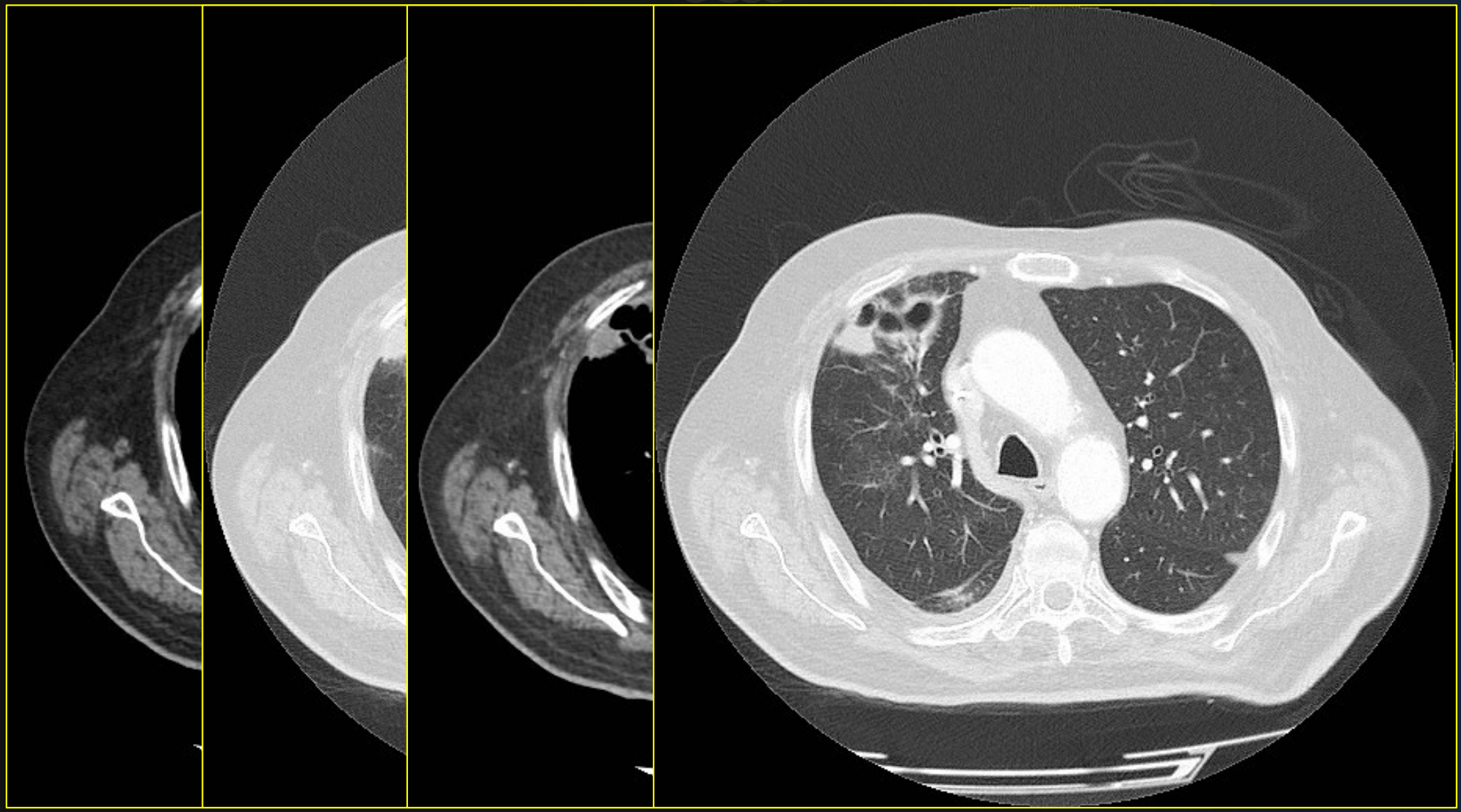


# PANORAMICITA’



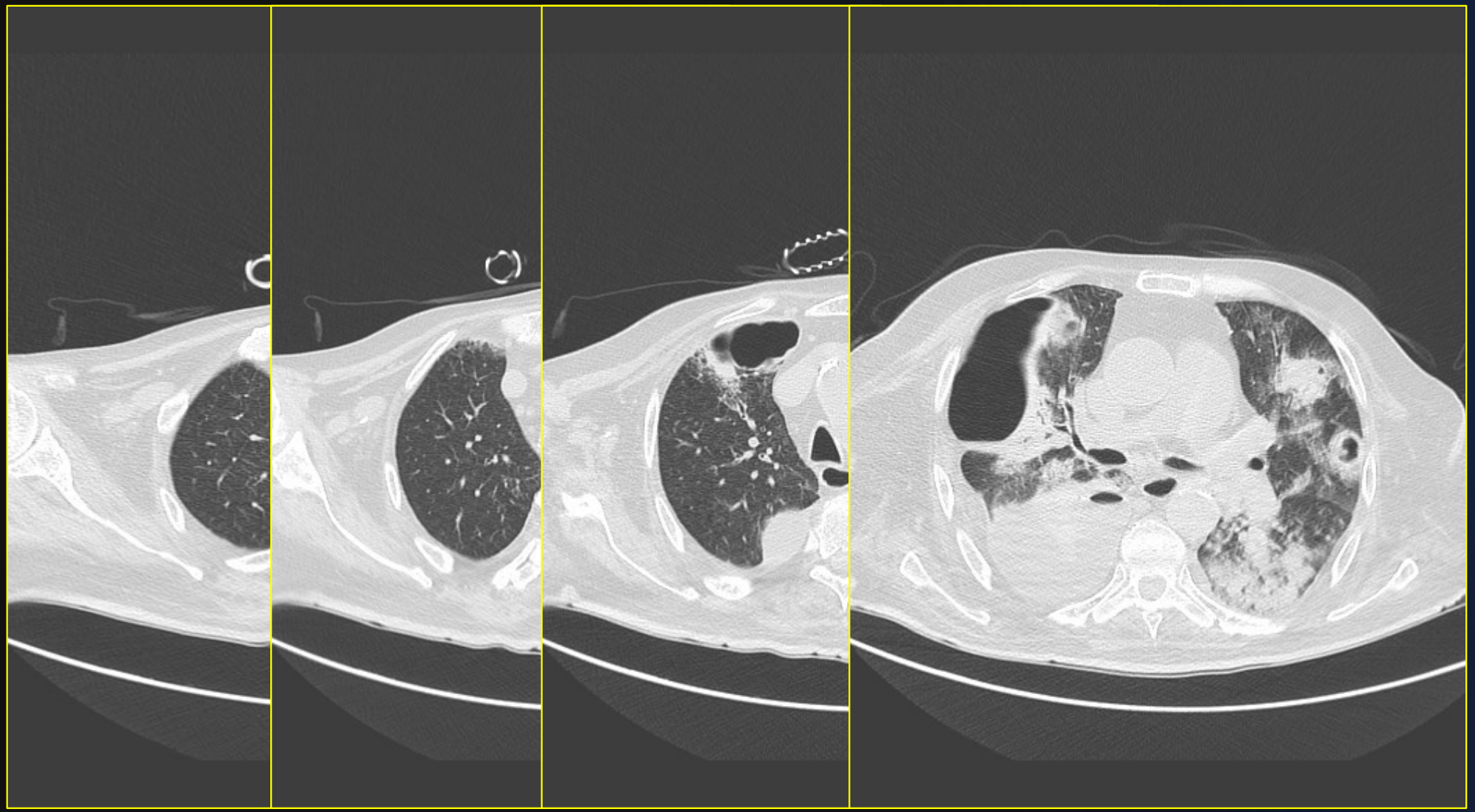
# FOLLOW UP

## Staphylocco

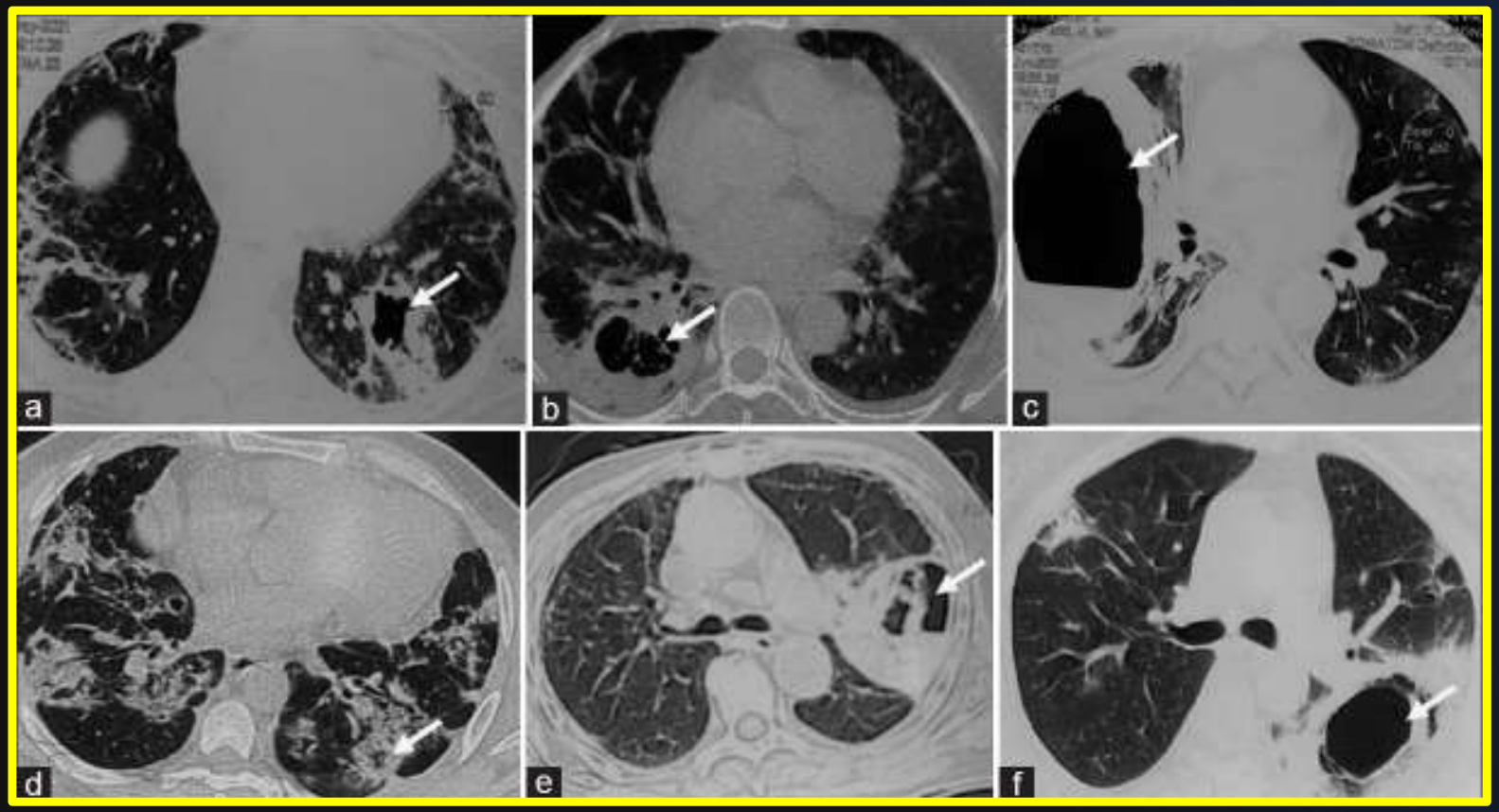


# FOLLOW UP

## Staphylocco



# COVID-19
## *Complicanze*




Pulmonary cavitation in follow-up COVID 2019 cases: An etiological perspective.2022
Singh P(1), Tiwari S(1), Yadav A(1), Singh S(2), Thareja S(3), Mohimen A(4), Dhull P(5), Ahuja NB(6), Mitra D(7)

# CONCLUSIONI

Individuazione

Diagnosi/ DD

Follow up

Anamnesi
Esame obiettivo
Laboratorio

# Grazie !


LET'S TAKE
a
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