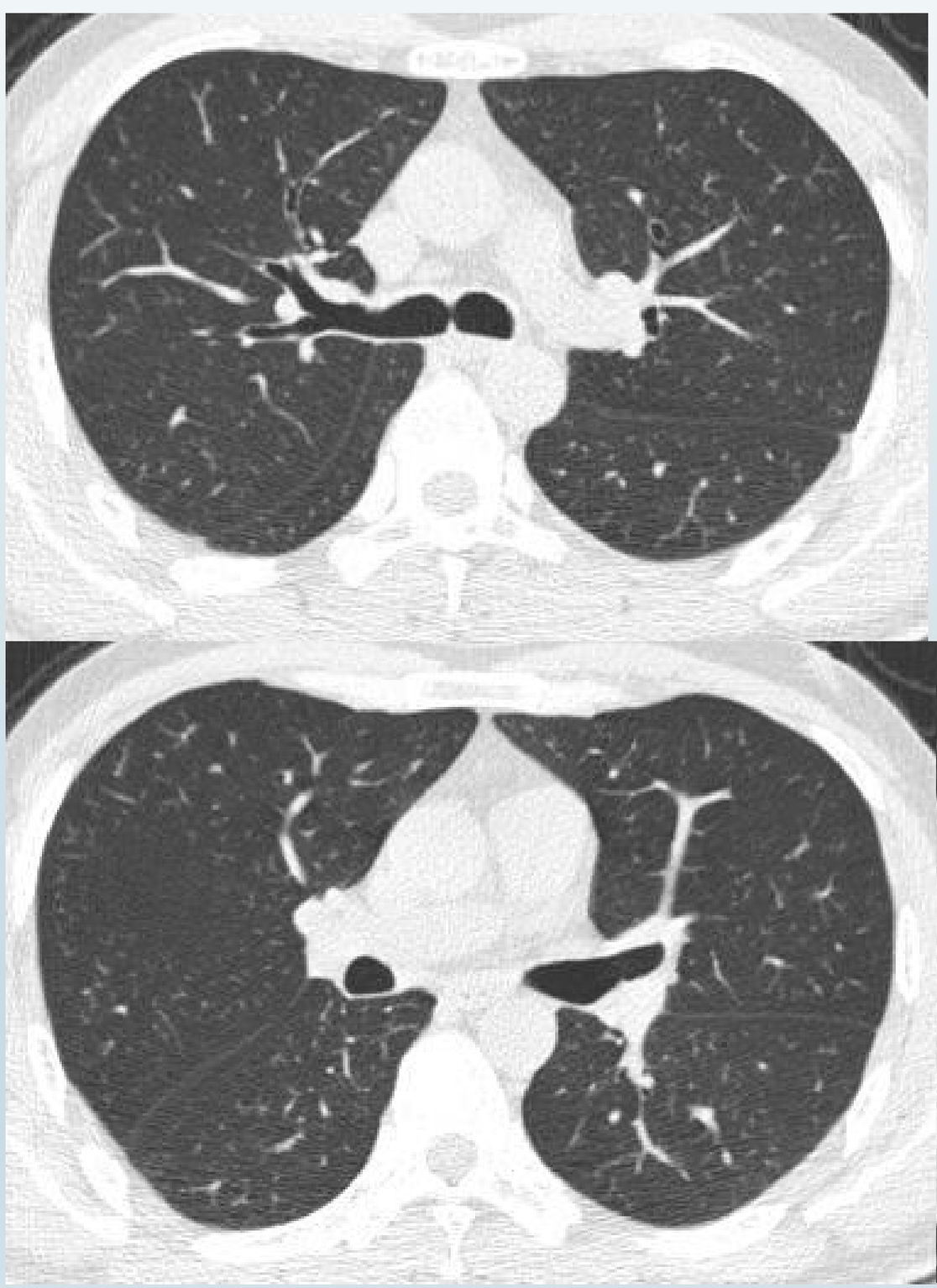
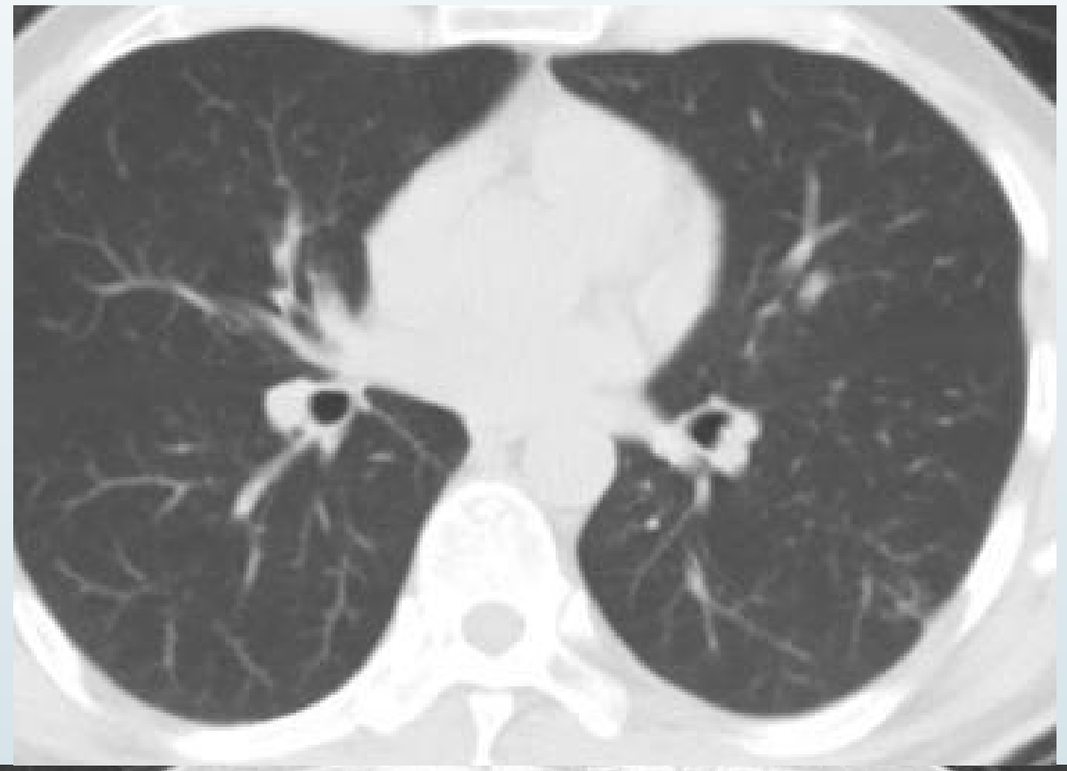
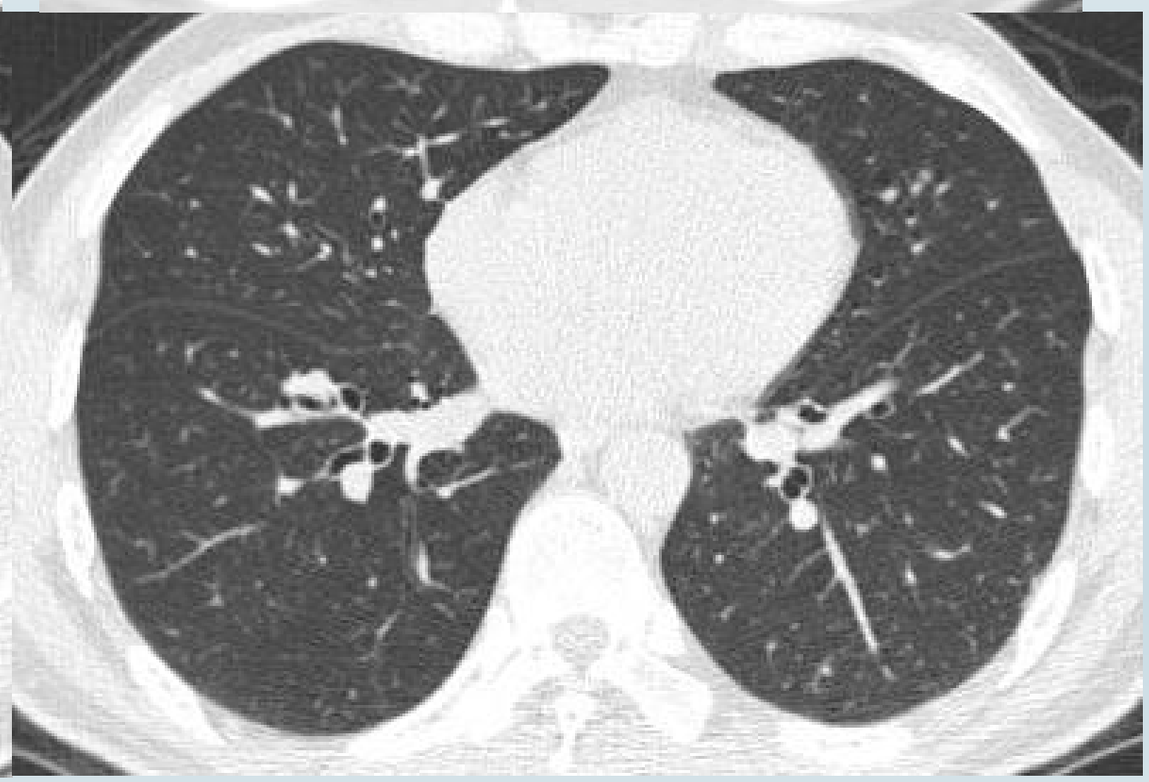
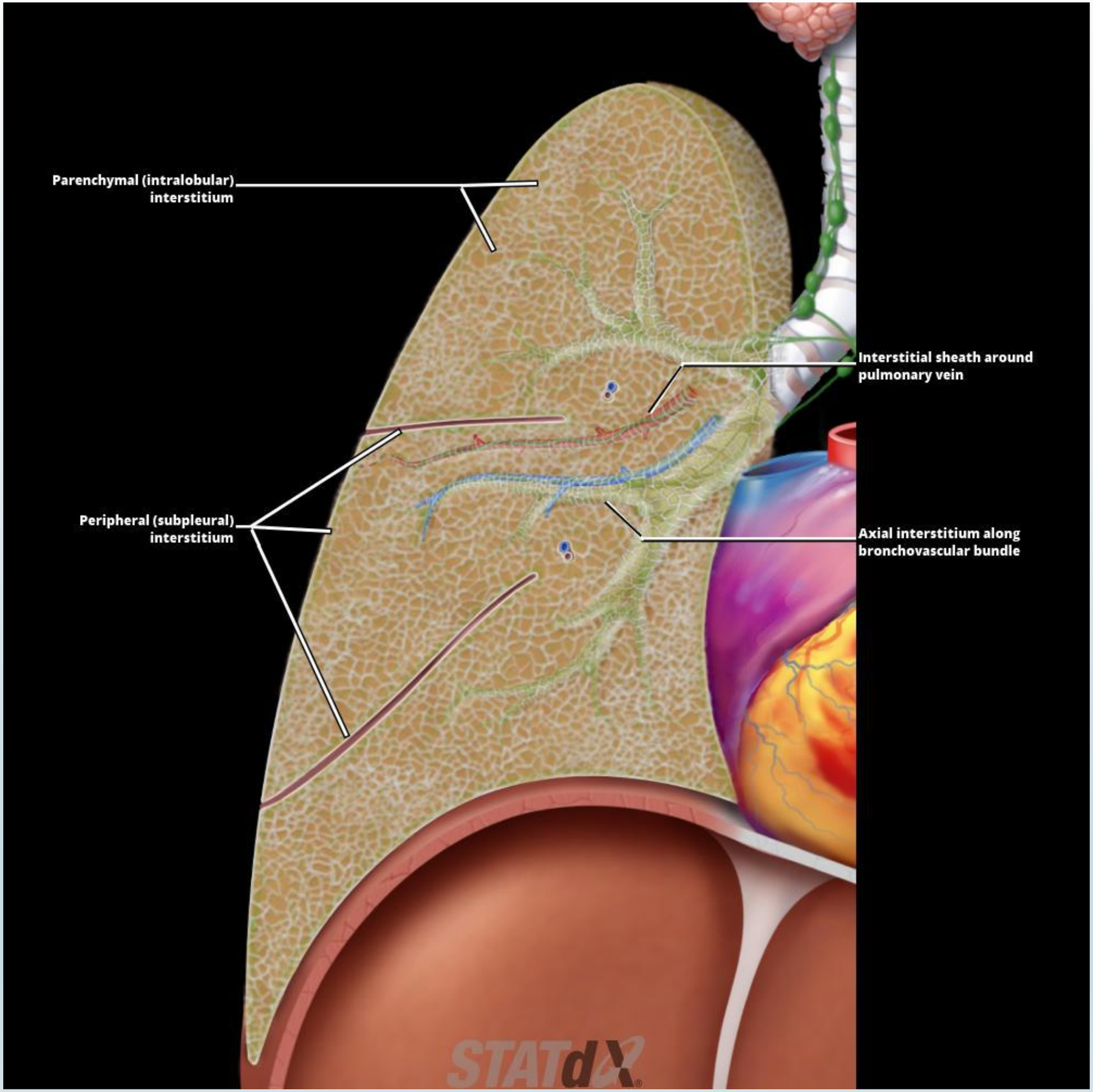
肺间质病变的影像诊断基础

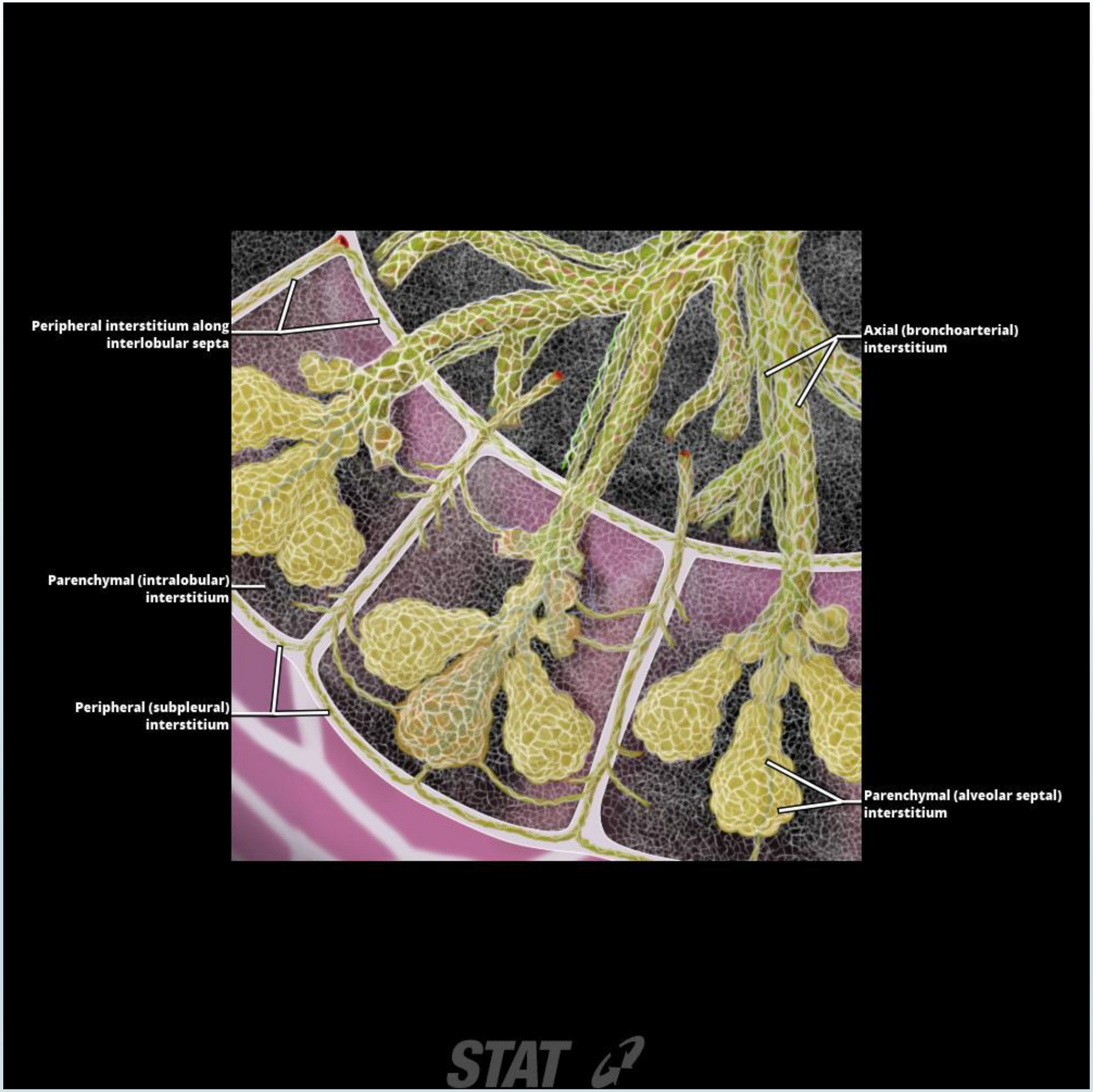
北京友谊医院放射科
贺文
2018-05-26

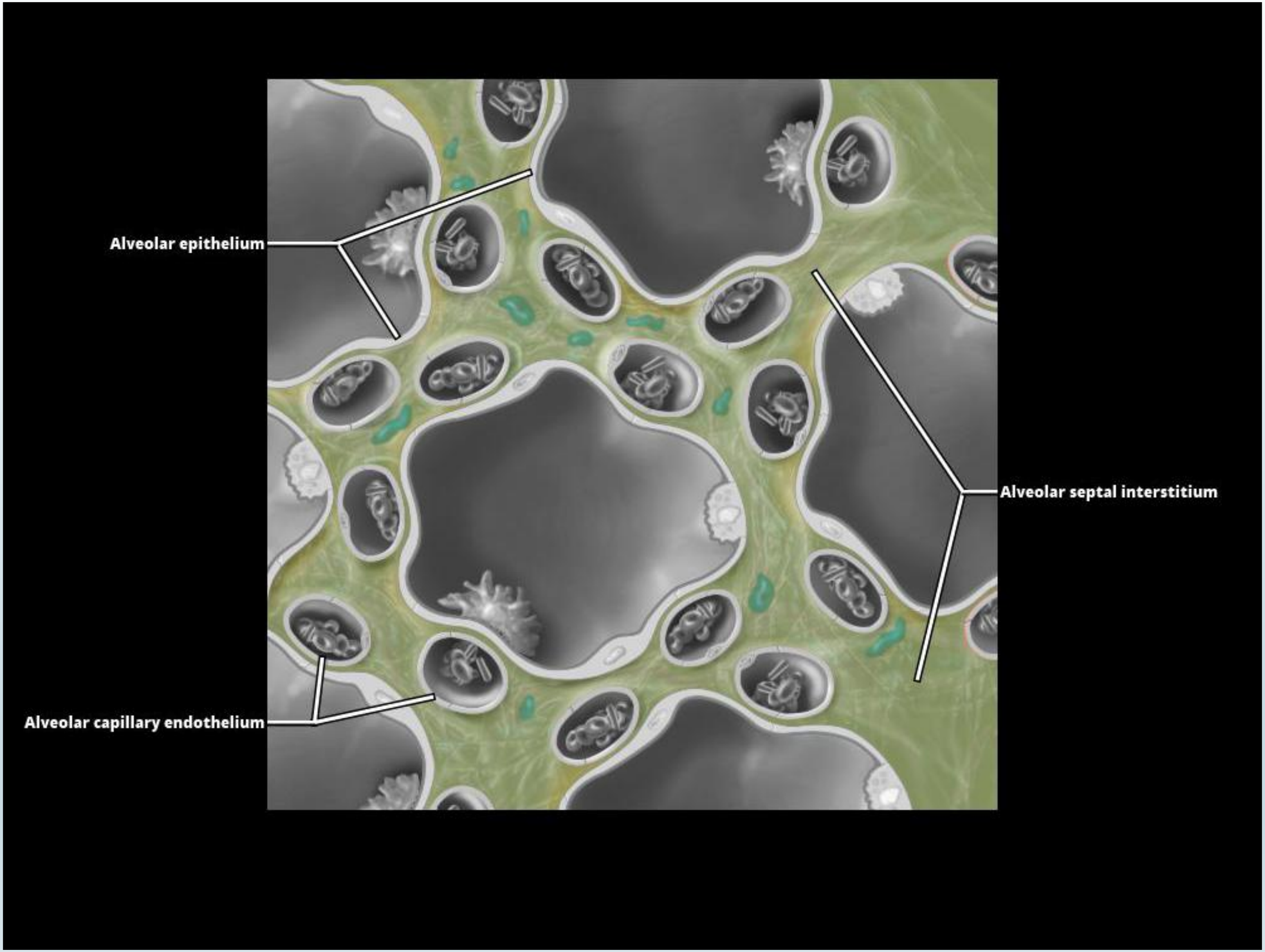


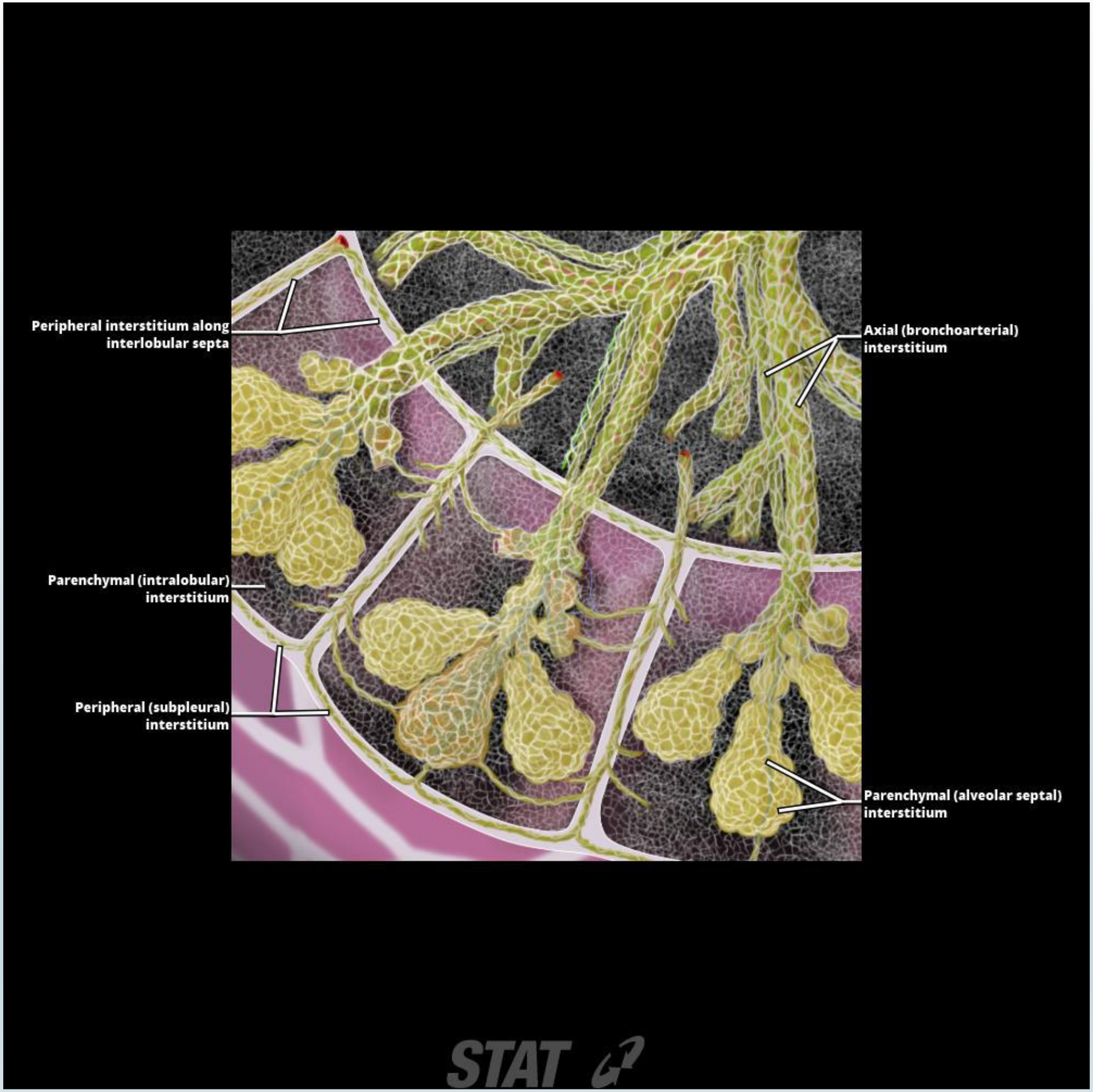





Parenchymal (intralobular) interstitium
Peripheral (subpleural) interstitium
Interstitial sheath around pulmonary vein
Axial interstitium along bronchovascular bundle
STATdx


Peripheral interstitium along interlobular septa
Axial (bronchoarterial) interstitium
Parenchymal (intralobular) interstitium
Peripheral (subpleural) interstitium
Parenchymal (alveolar septal) interstitium
STAT


Alveolar epithelium
Alveolar septal interstitium
Alveolar capillary endothelium


Peripheral interstitium along interlobular septa
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Peripheral (subpleural) interstitium
Parenchymal (alveolar septal) interstitium
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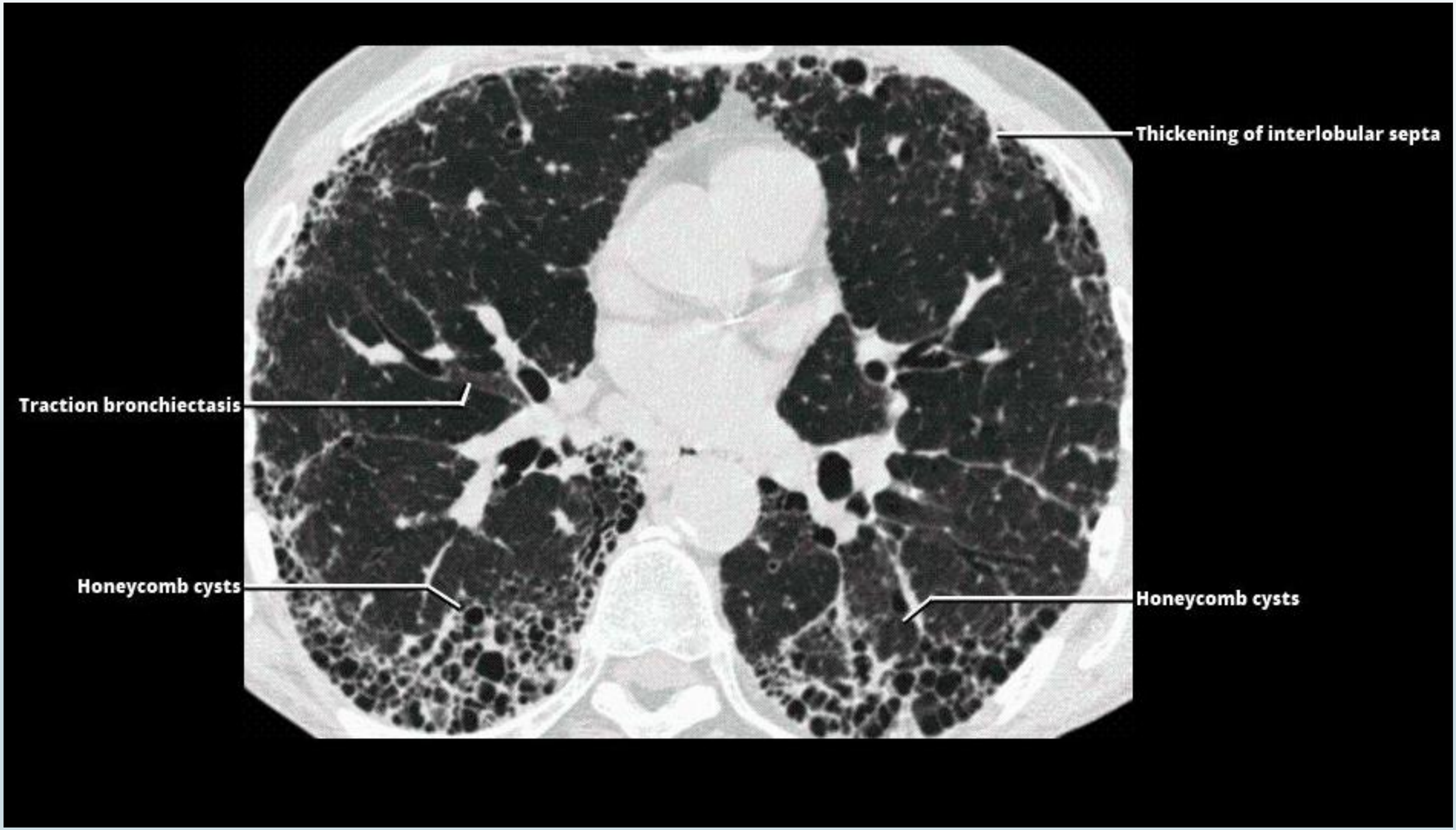
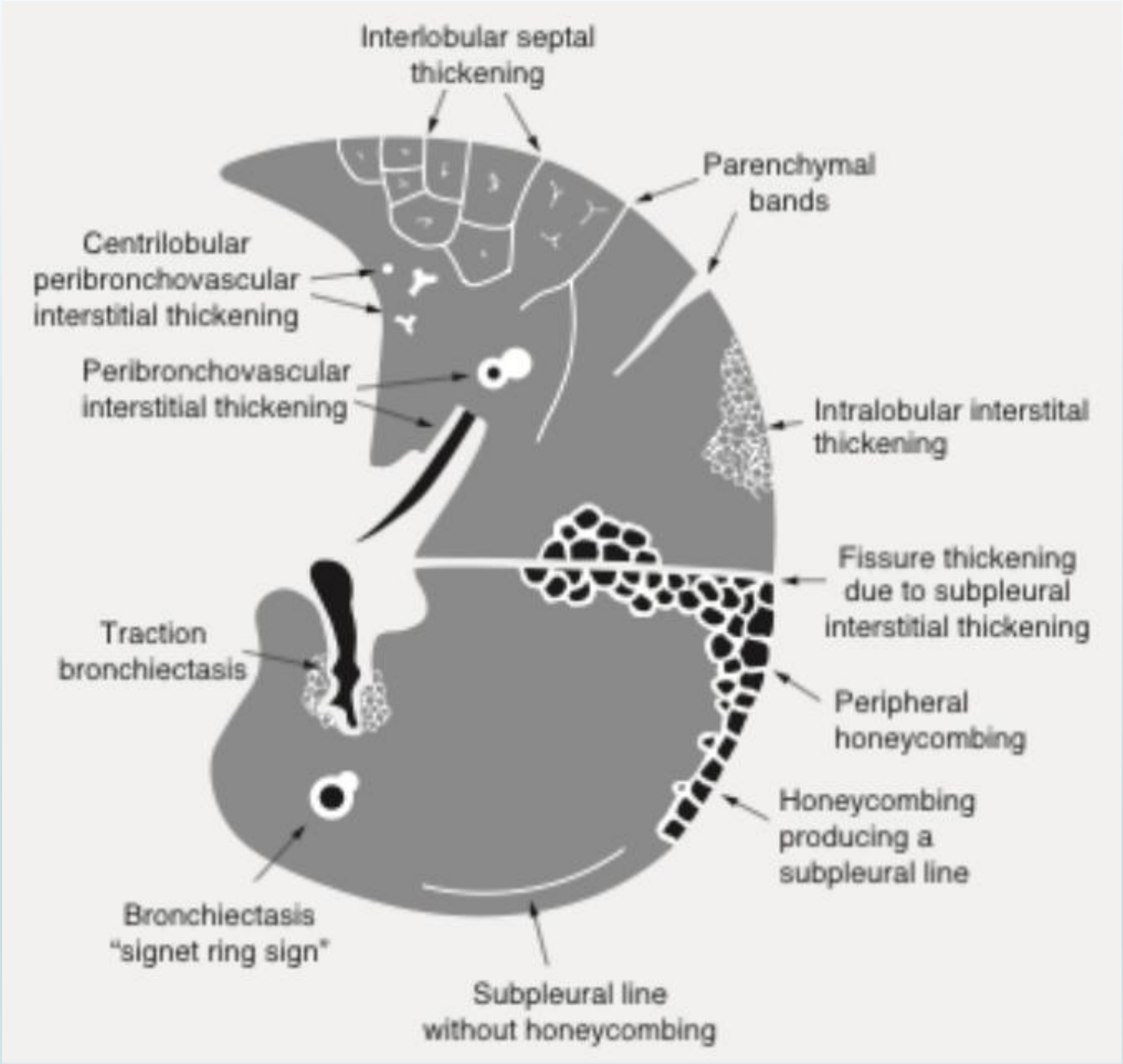
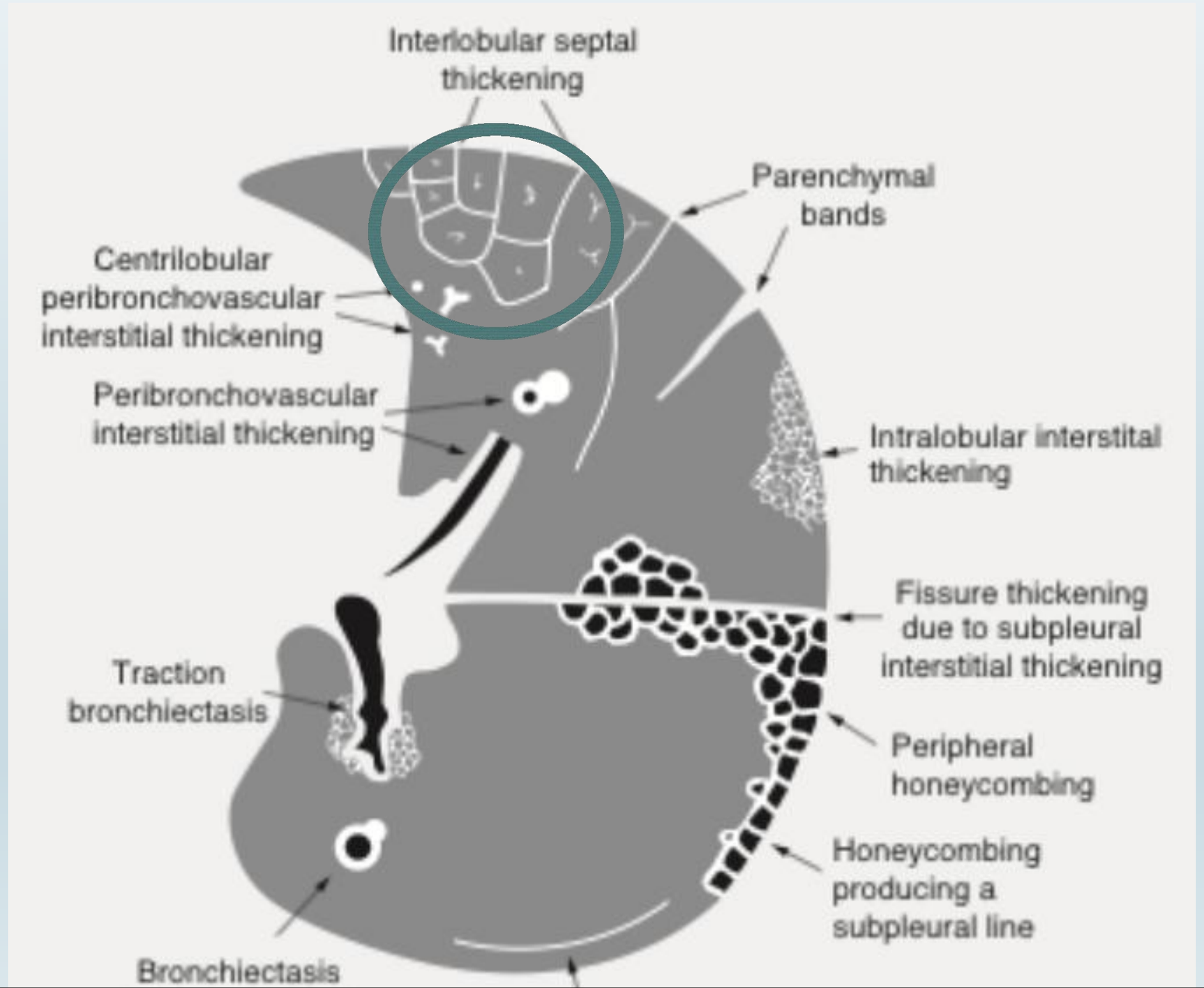

Thickening of interlobular septa
Traction bronchiectasis
Honeycomb cysts
Honeycomb cysts

- 小叶间隔增厚
- 蜂窝
- 小叶内间质增厚
- 网状影
- 界面征
- 牵拉性支气（毛细）管扩张
- 支气管-血管束增粗
- 条带病灶
- 胸膜下间质增厚
- 病变分布的诊断价值
- 磨玻璃密度病灶
- 弥漫小结节


Interlobular septal thickening
Parenchymal bands
Centrilobular peribronchovascular interstitial thickening
Peribronchovascular interstitial thickening
Intralobular interstital thickening
Fissure thickening due to subpleural interstitial thickening
Traction bronchiectasis
Peripheral honeycombing
Honeycombing producing a subpleural line
Bronchiectasis "signet ring sign"
Subpleural line without honeycombing


Interlobular septal thickening
Parenchymal bands
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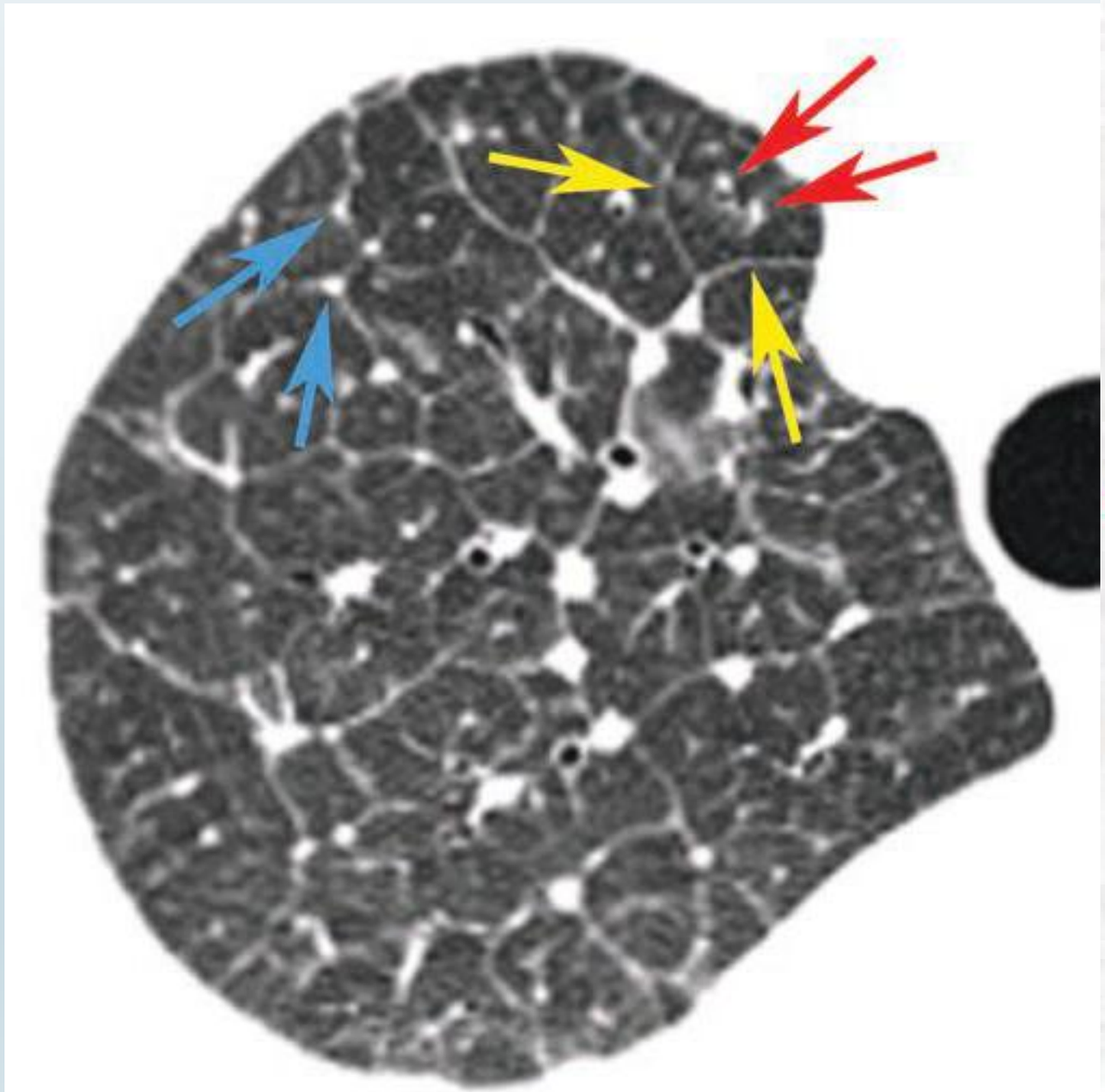
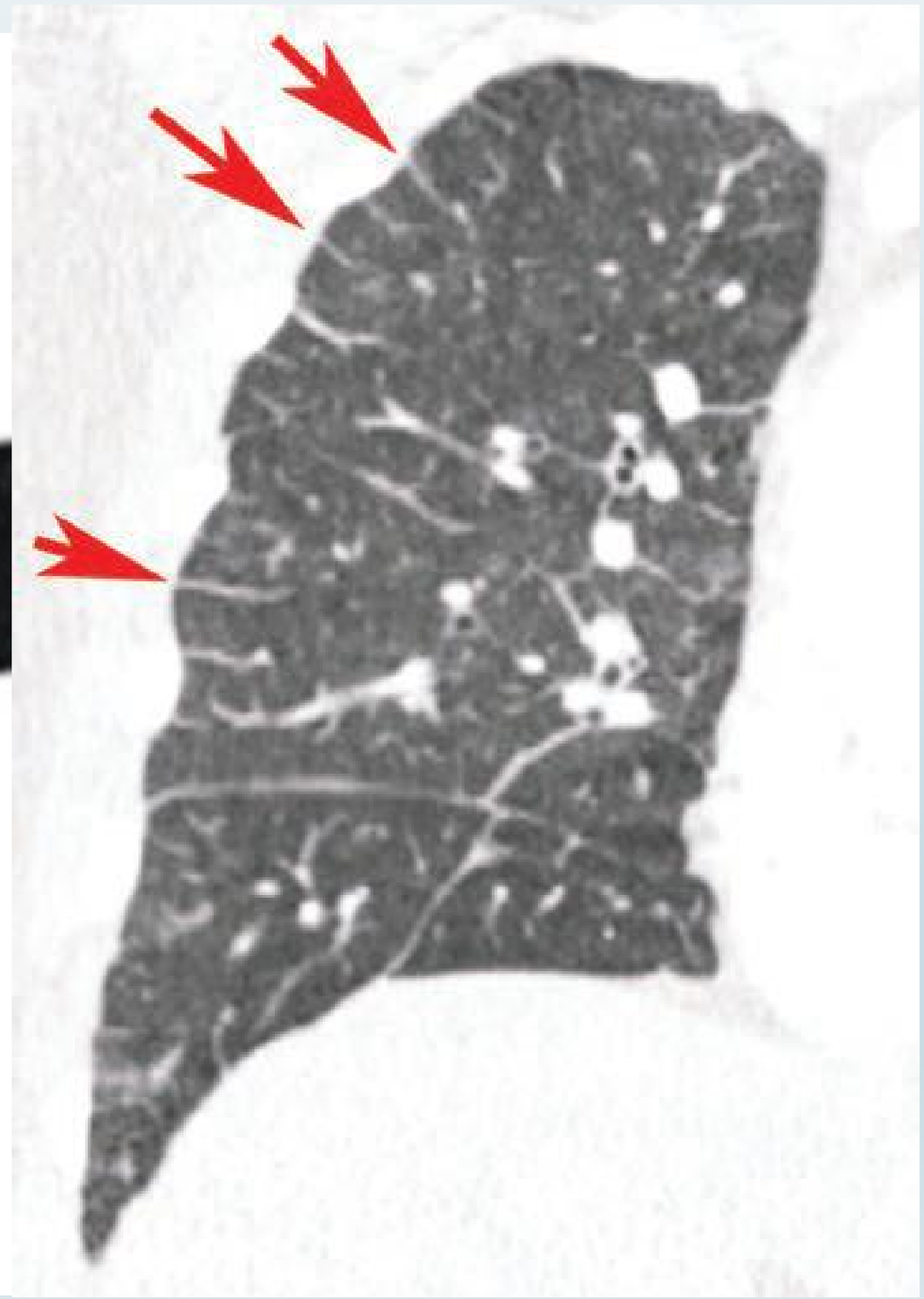
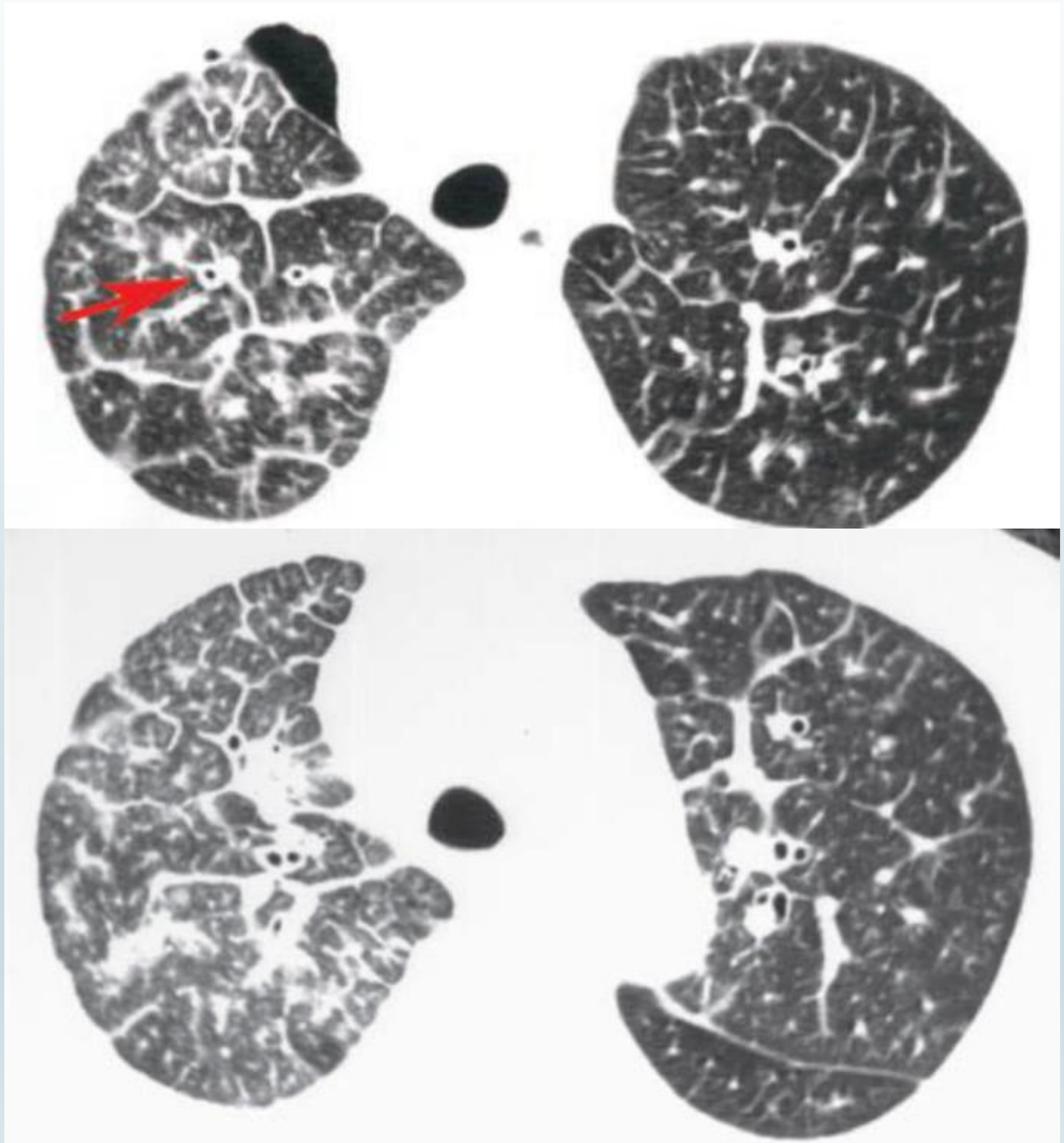
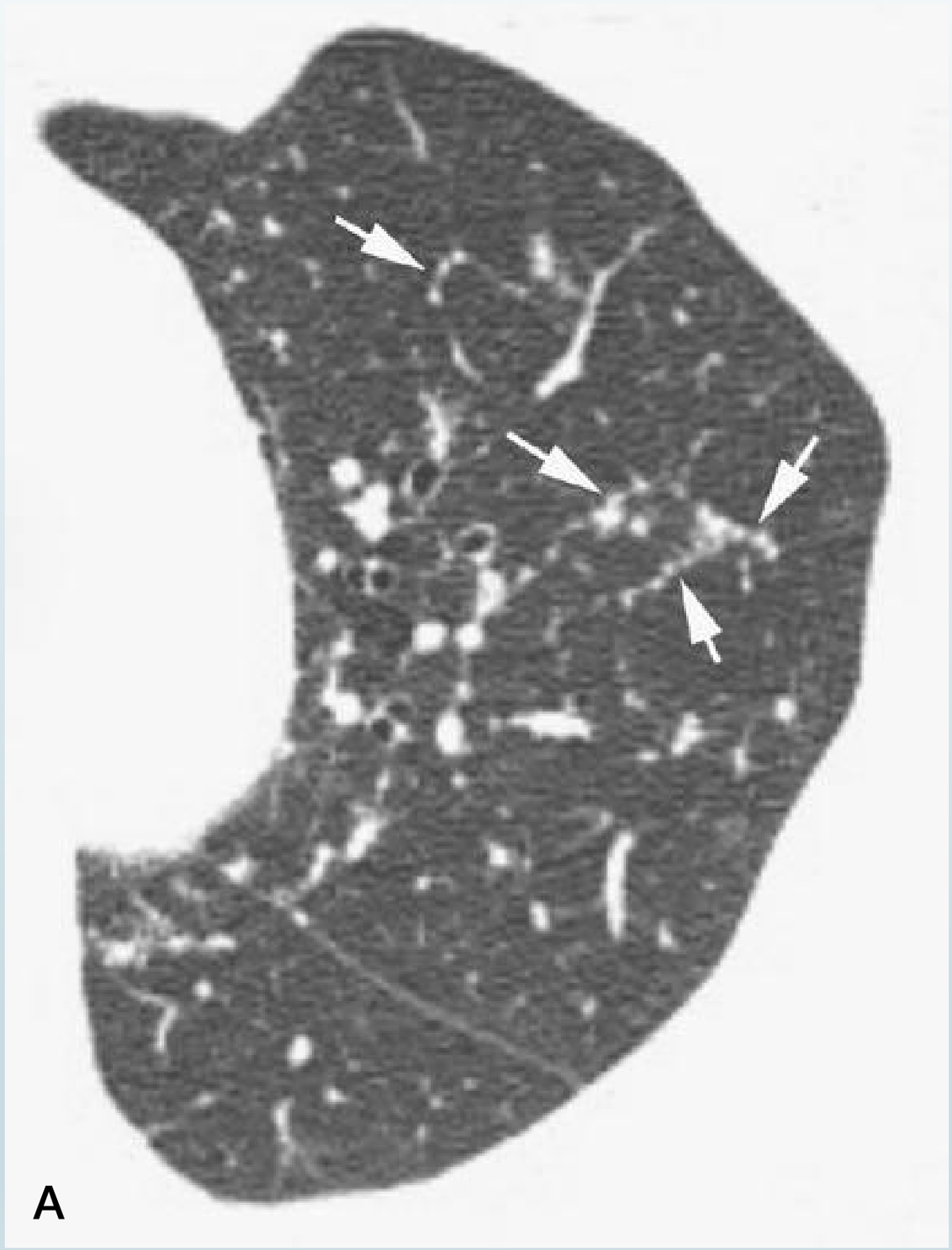
Peribronchovascular interstitial thickening
Intralobular interstital thickening
Fissure thickening due to subpleural interstitial thickening
Traction bronchiectasis
Peripheral honeycombing
Honeycombing producing a subpleural line
Bronchiectasis

小叶间隔增厚





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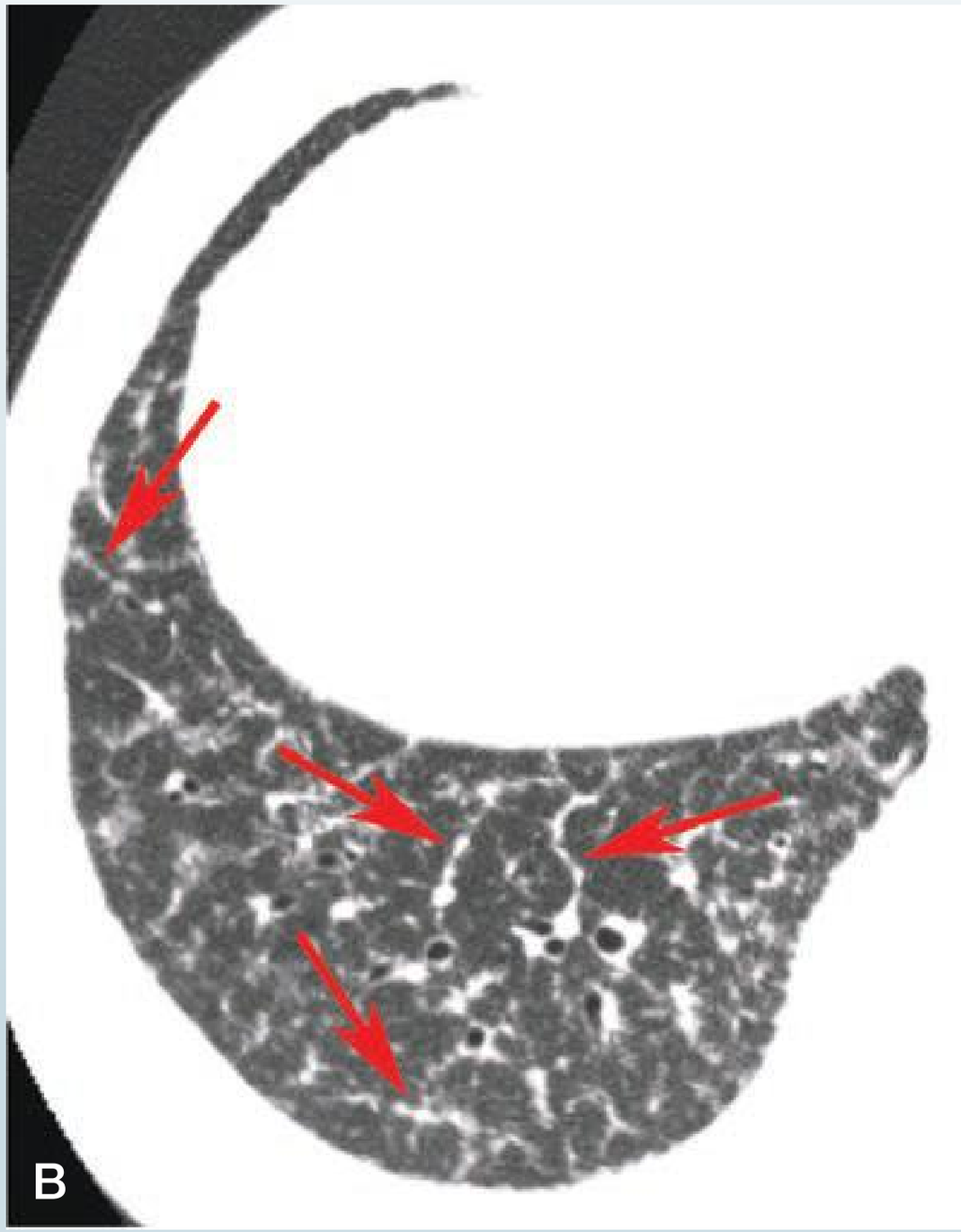
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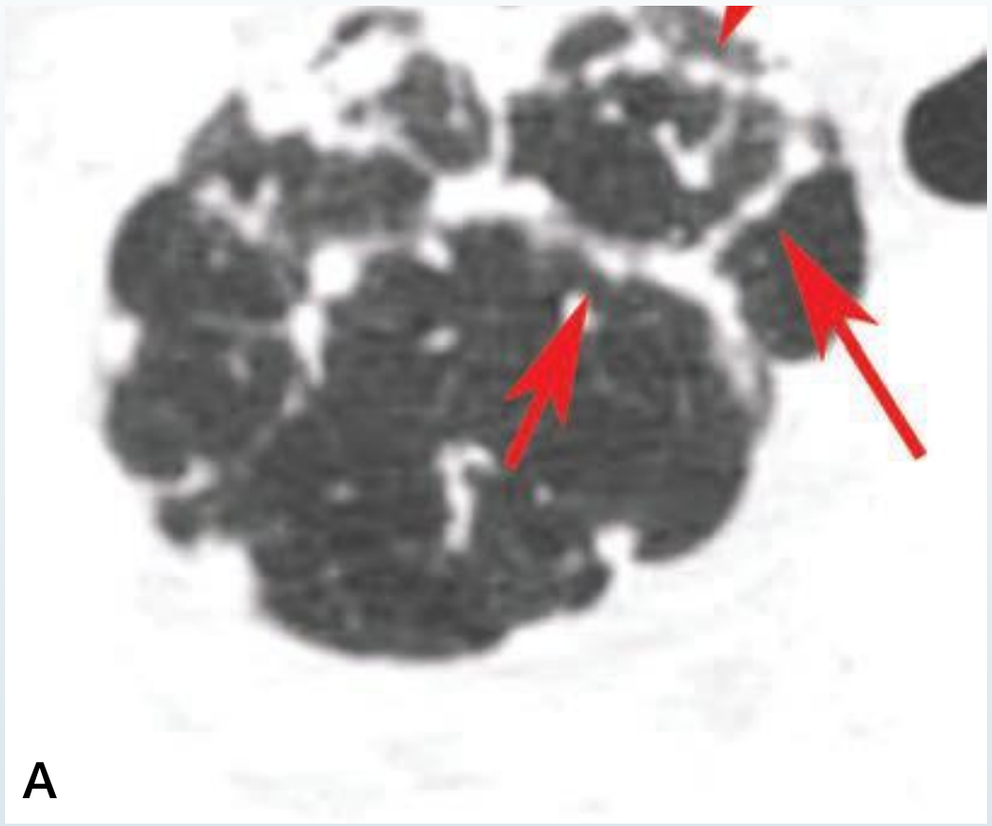
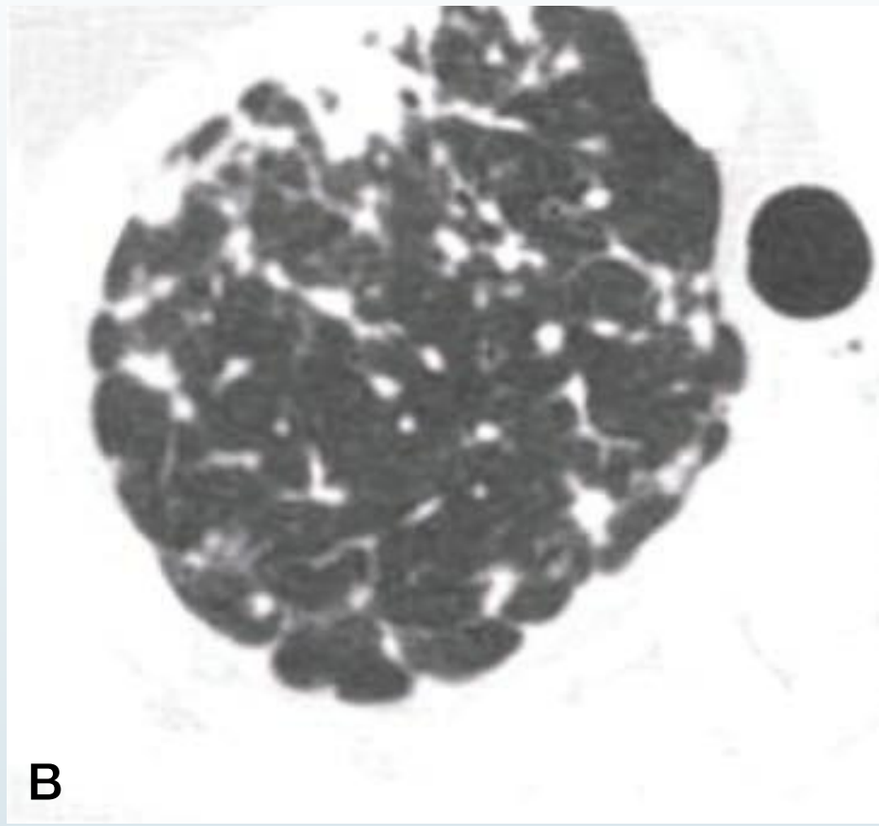




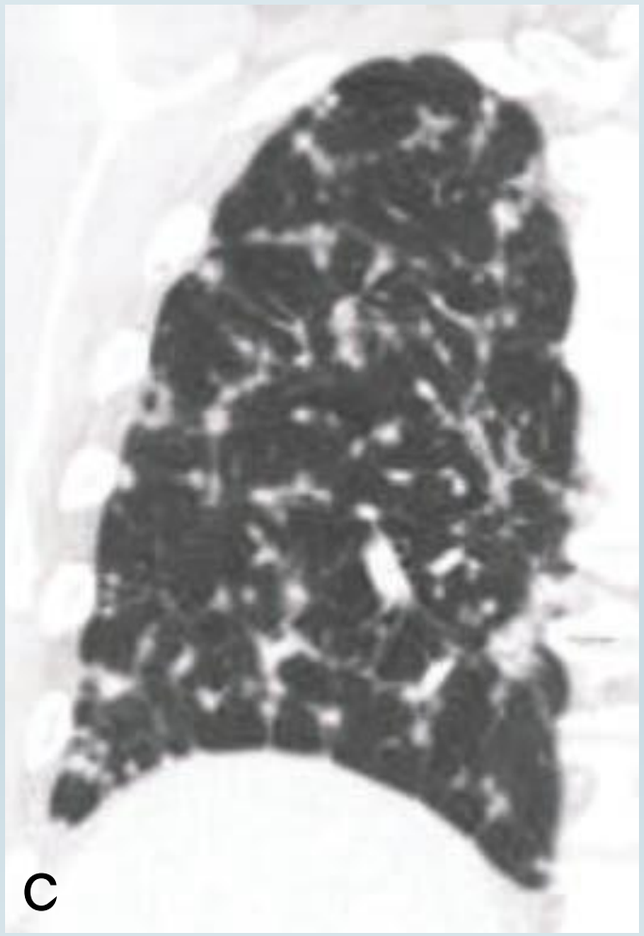
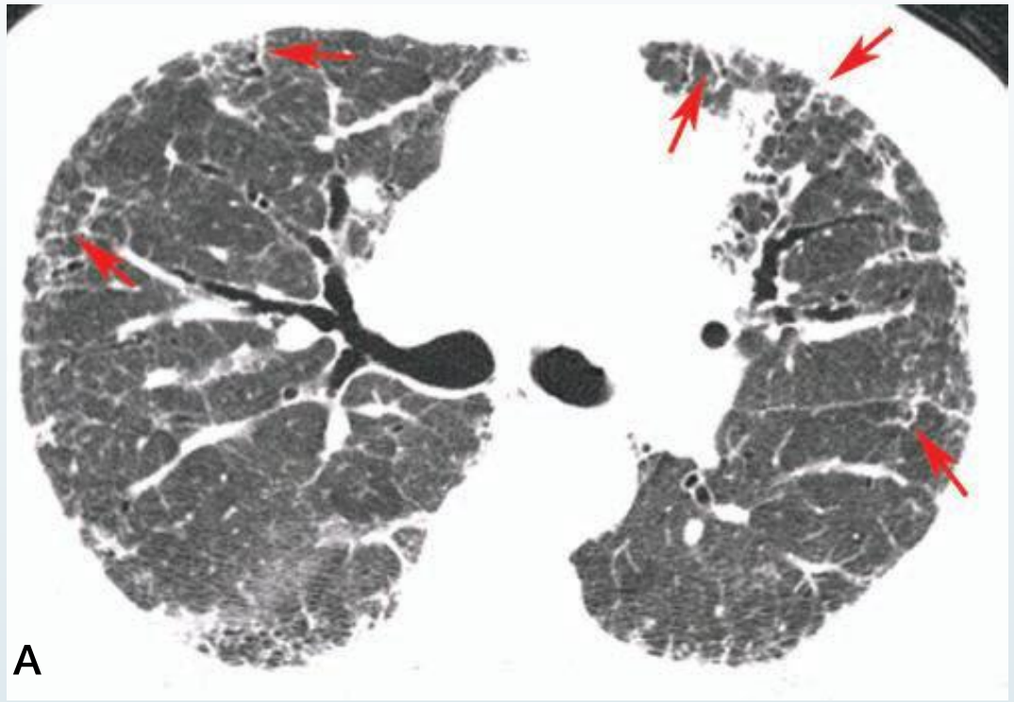
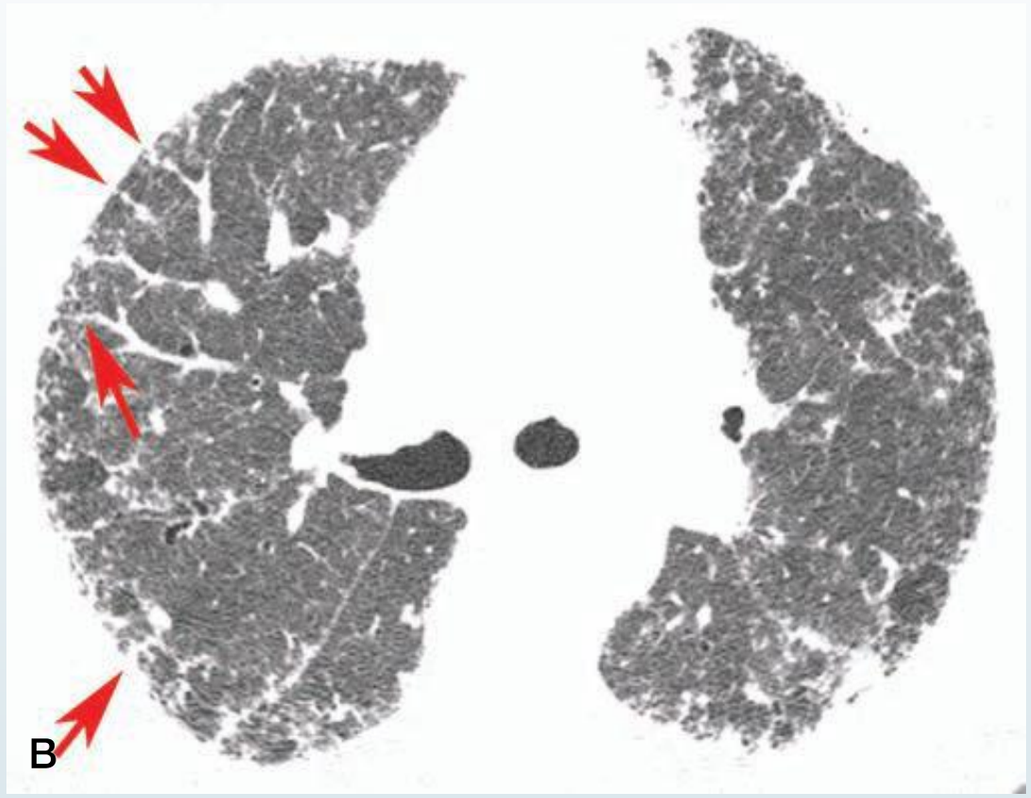
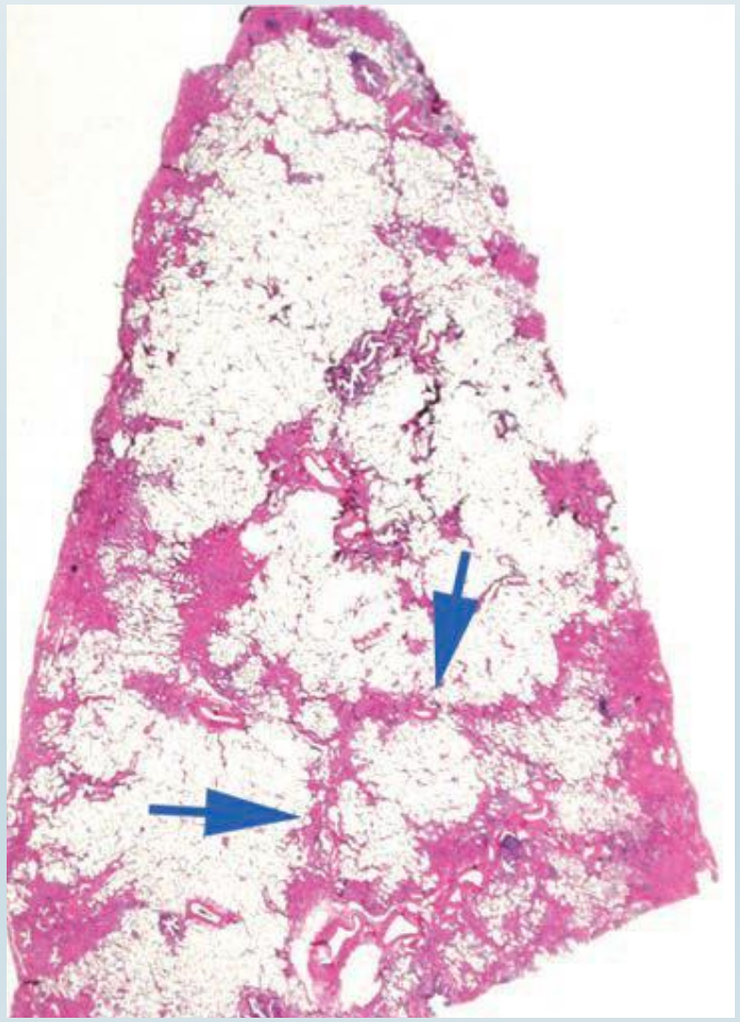


FIGURE 3-10
lymphangitic spread
septal thickening in a
Nodules are clearly vi
the lung apex (*arrow*
shown in a lung spec
of carcinoma.



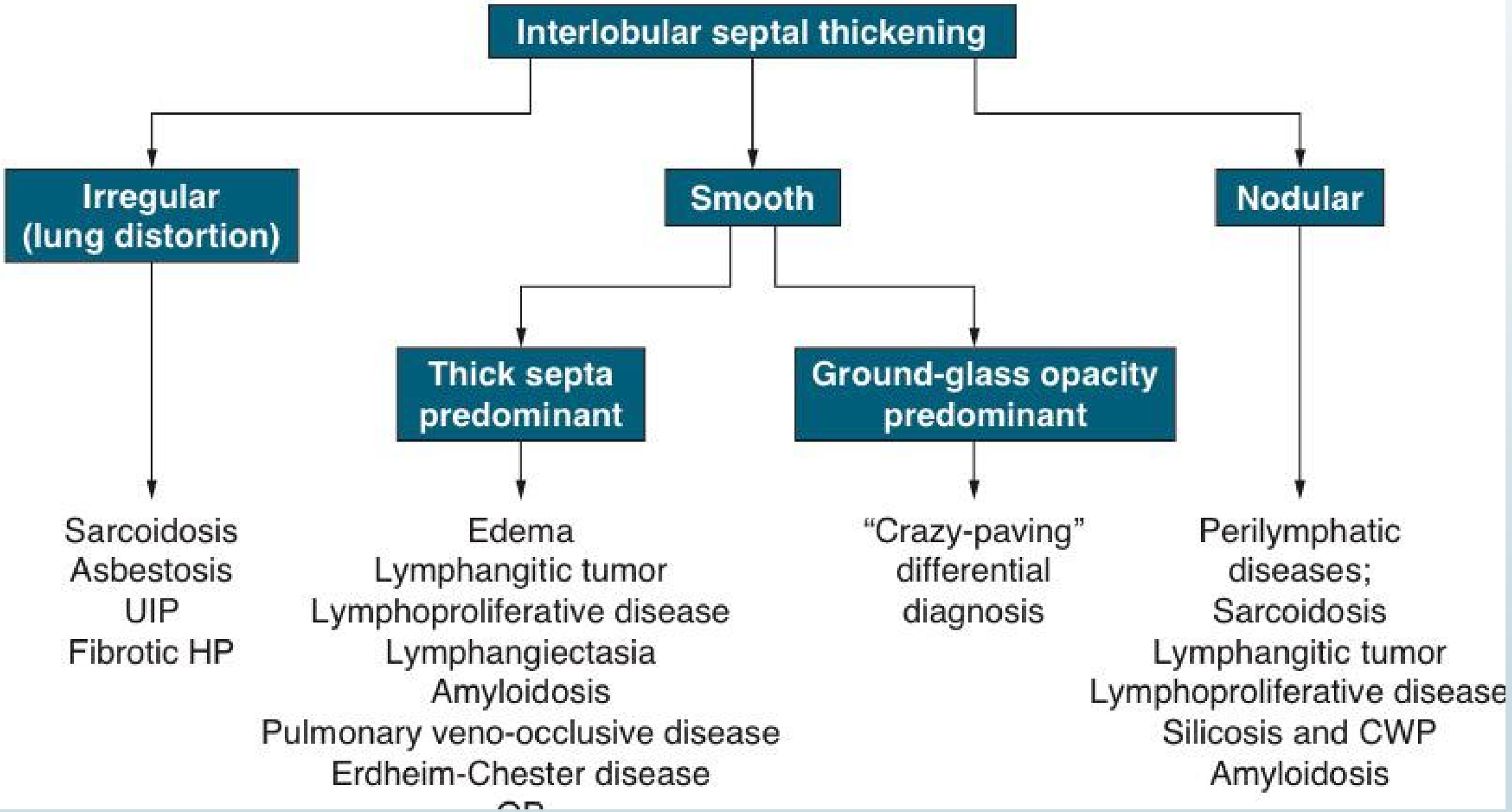


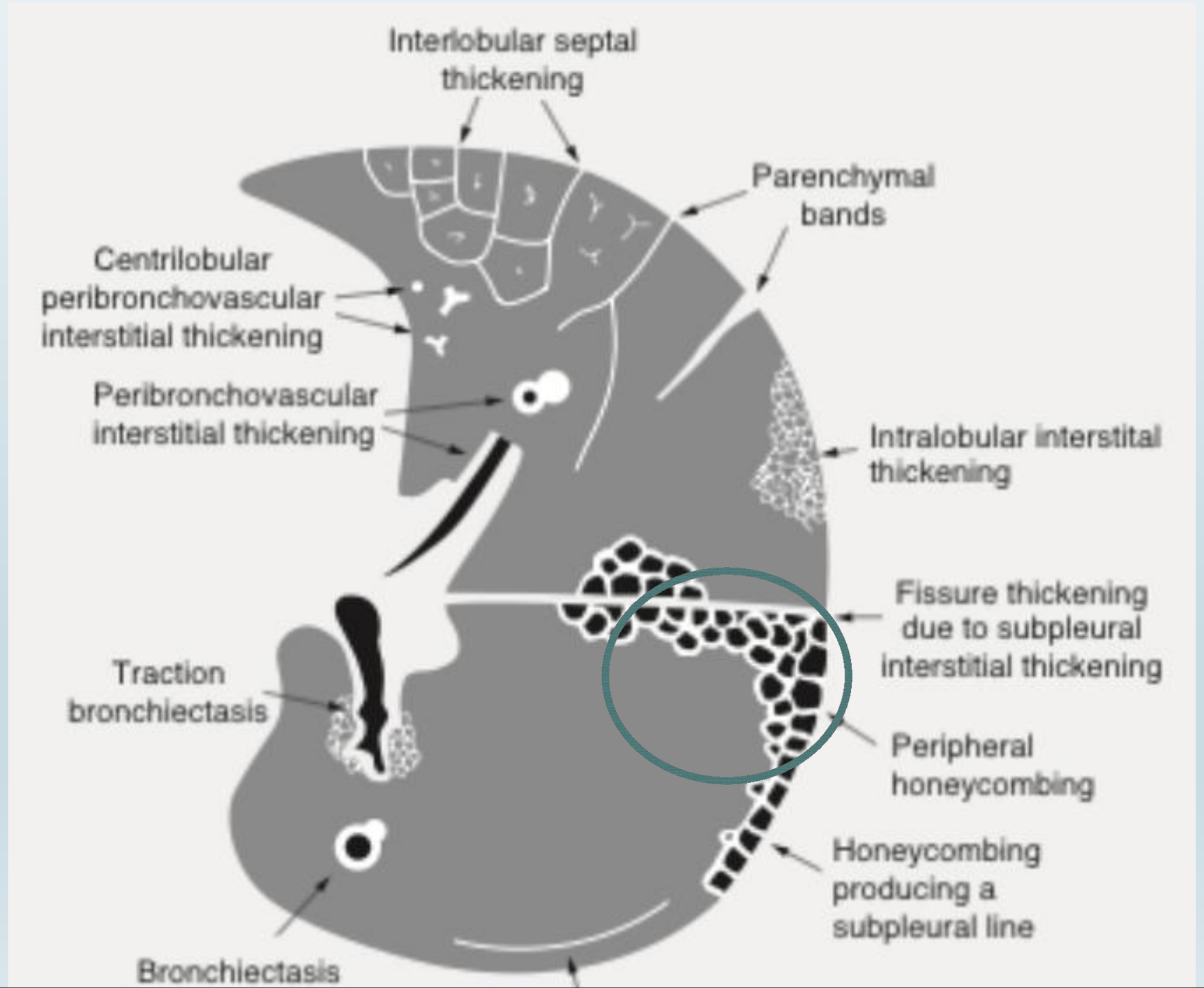


Irregular septal thickening in UIP. A: Irregular reticular opacities (*arrows*) are visible in the peripheral lung in a patient with pulmonary fibrosis related to treatment with methotrexate. These may represent irregularly thickened septa or perilobular fibrosis. B: Irregular interlobular septal thickening or perilobular fibrosis (*arrows*) in a patient with IPF. C: Histologic section in a patient with IPF. Irregular bands of fibrosis (*arrows*) are visible within the periphery of lobules, involving the interlobular septa.

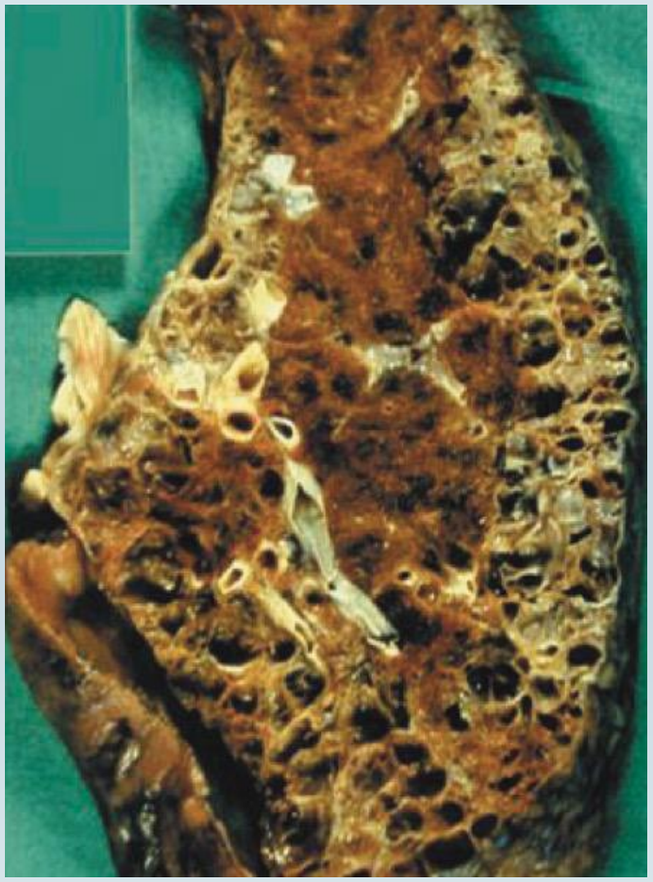
TABLE 3-1 Differential Diagnosis of Interlobular Septal Thickening

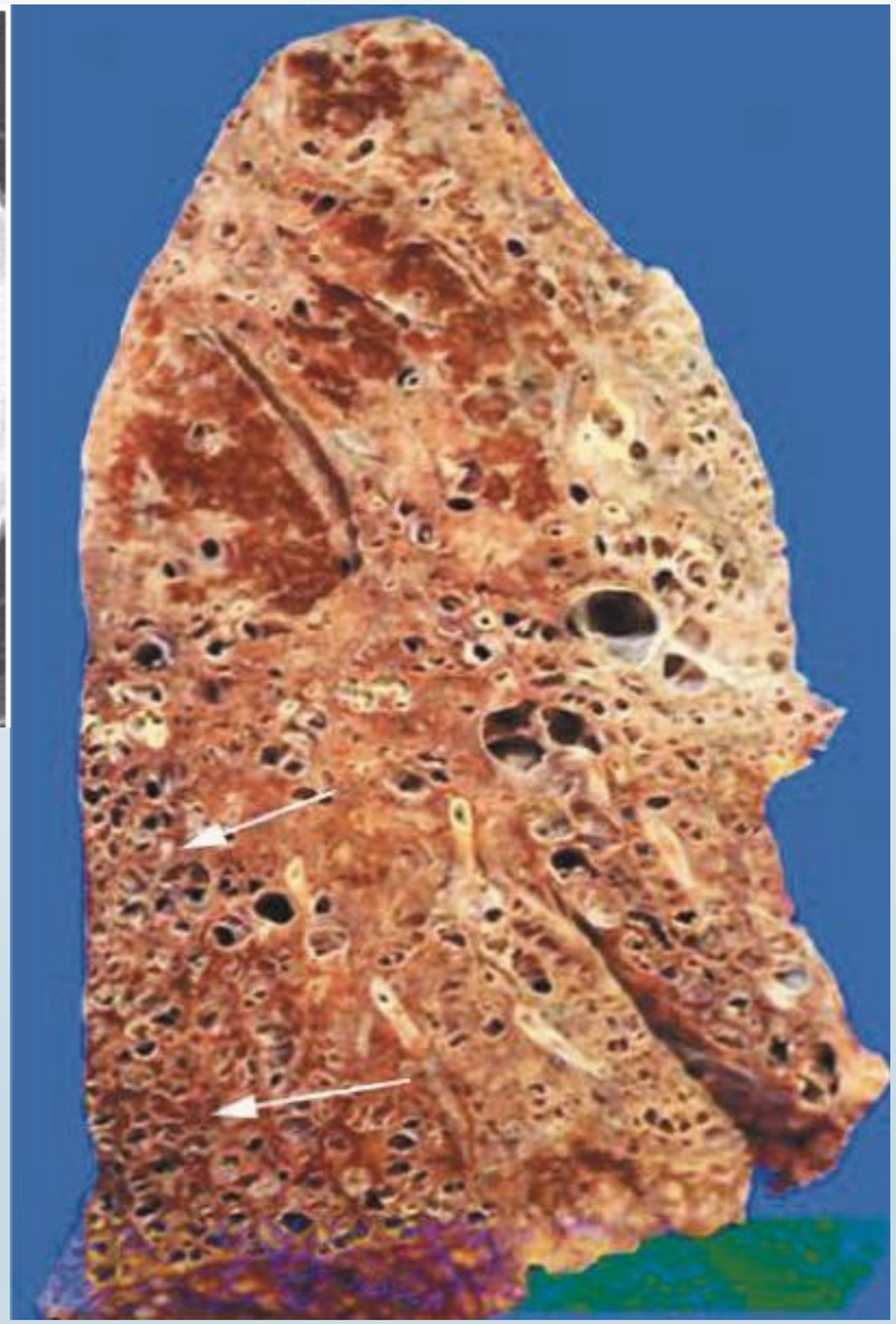
Diagnosis	Comments
Lymphangitic carcinomatosis, lymphoma, leukemia	Common; predominant finding in most; usually smooth; sometimes nodular
Lymphoproliferative disease (e.g., LIP)	Smooth or nodular; other abnormalities (i.e., nodules) typically present
Lymphangiomatosis	Rare, smooth
Congenital pulmonary lymphangiectasia	Rare, smooth
Pulmonary edema	Common; predominant finding in most; smooth; ground-glass opacity can be present
Pulmonary hemorrhage	Smooth; associated with ground-glass opacity
Erdheim-Chester disease	Rare, smooth
Pneumonia (e.g., viral, *Pneumocystis carinii*)	Smooth; associated with ground-glass opacity
Sarcoidosis	Common; usually nodular or irregular; conglomerate masses of fibrous tissue with traction bronchiectasis typical in end stage
IPF or other cause of UIP	Sometimes visible but not common; appears irregular; intralobular thickening and honeycombing usually predominates
NSIP	With findings of ground-glass opacity and reticulation
Silicosis/CWP; talcosis	Occasionally visible; usually nodular; irregular in end-stage disease
Asbestosis	Sometimes visible; irregular
HP (chronic)	Uncommon; irregular reticular opacities and honeycombing usually predominate
Amyloidosis	Smooth or nodular
OP	Perilobular pattern; thick, ill-defined "septal thickening"
Elderly patients	Some septal thickening normal

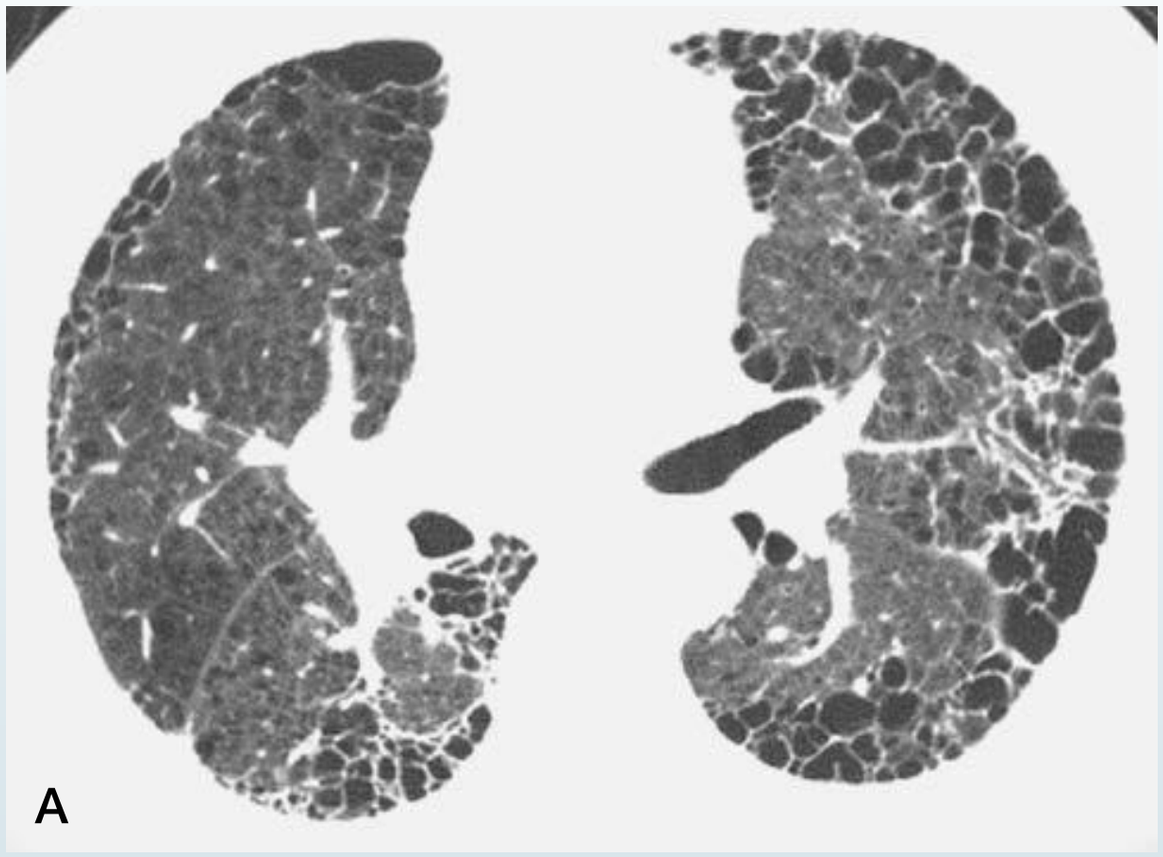

Interlobular septal thickening
Irregular (lung distortion)
Smooth
Nodular
Thick septa predominant
Ground-glass opacity predominant
Sarcoidosis
Asbestosis
UIP
Fibrotic HP
Edema
Lymphangitic tumor
Lymphoproliferative disease
Lymphangiectasia
Amyloidosis
Pulmonary veno-occlusive disease
Erdheim-Chester disease
"Crazy-paving" differential diagnosis
Perilymphatic diseases;
Sarcoidosis
Lymphangitic tumor
Lymphoproliferative disease
Silicosis and CWP
Amyloidosis

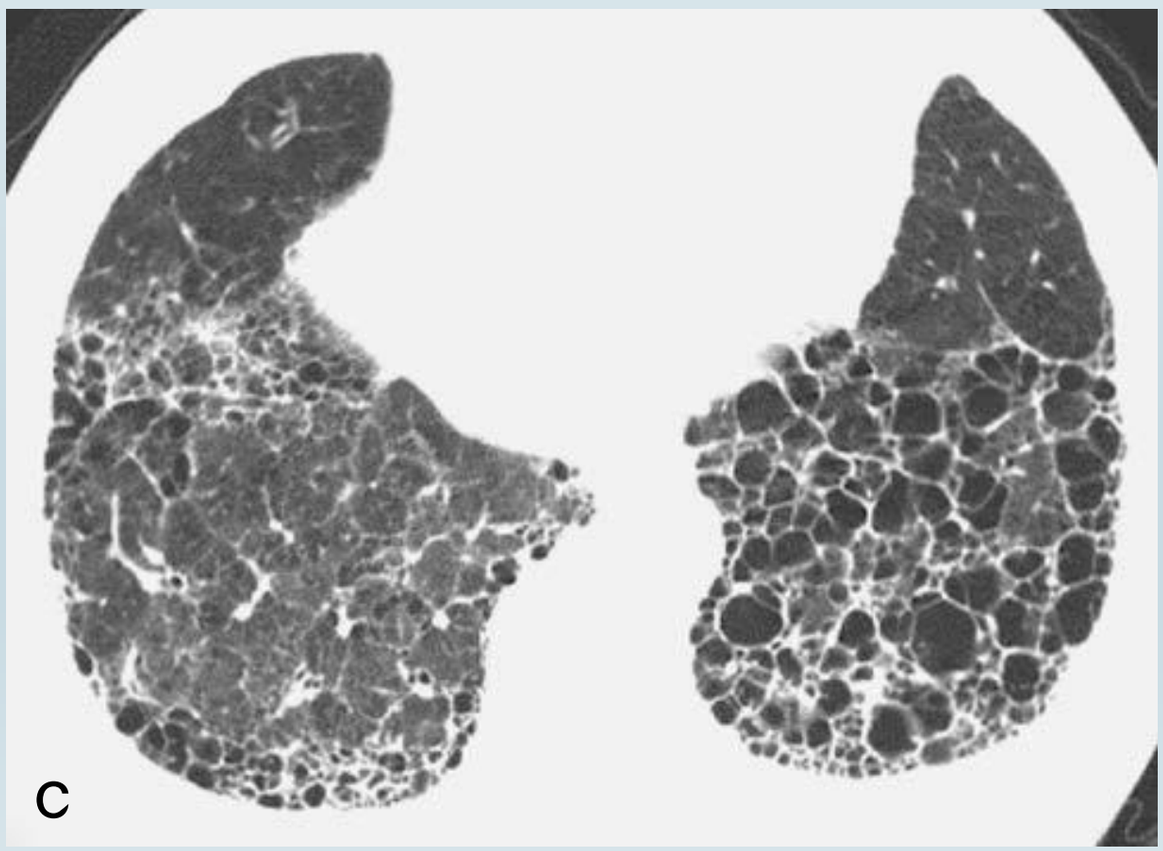

Interlobular septal thickening
Parenchymal bands
Centrilobular peribronchovascular interstitial thickening
Peribronchovascular interstitial thickening
Intralobular interstital thickening
Fissure thickening due to subpleural interstitial thickening
Traction bronchiectasis
Peripheral honeycombing
Honeycombing producing a subpleural line
Bronchiectasis

A

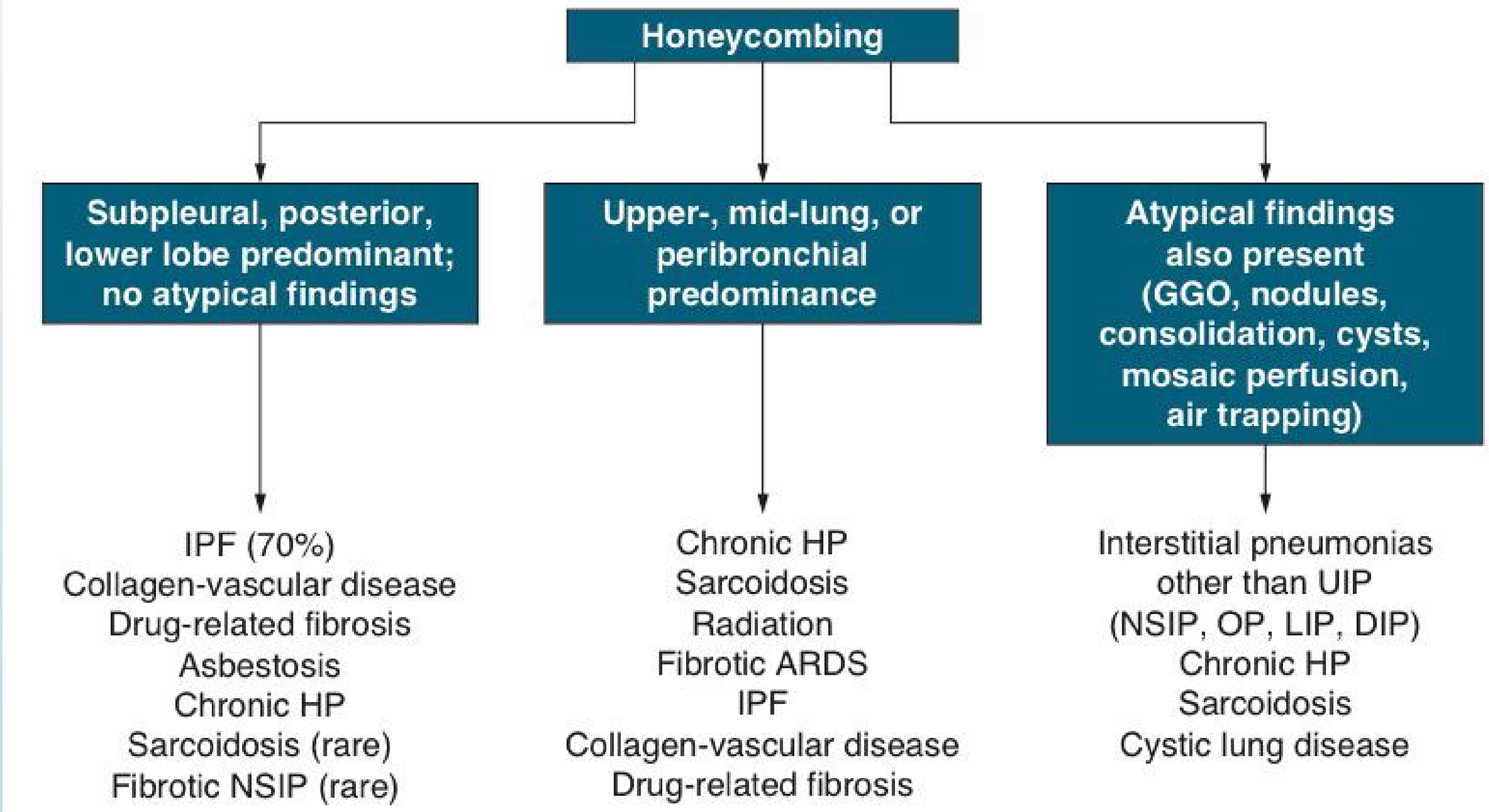






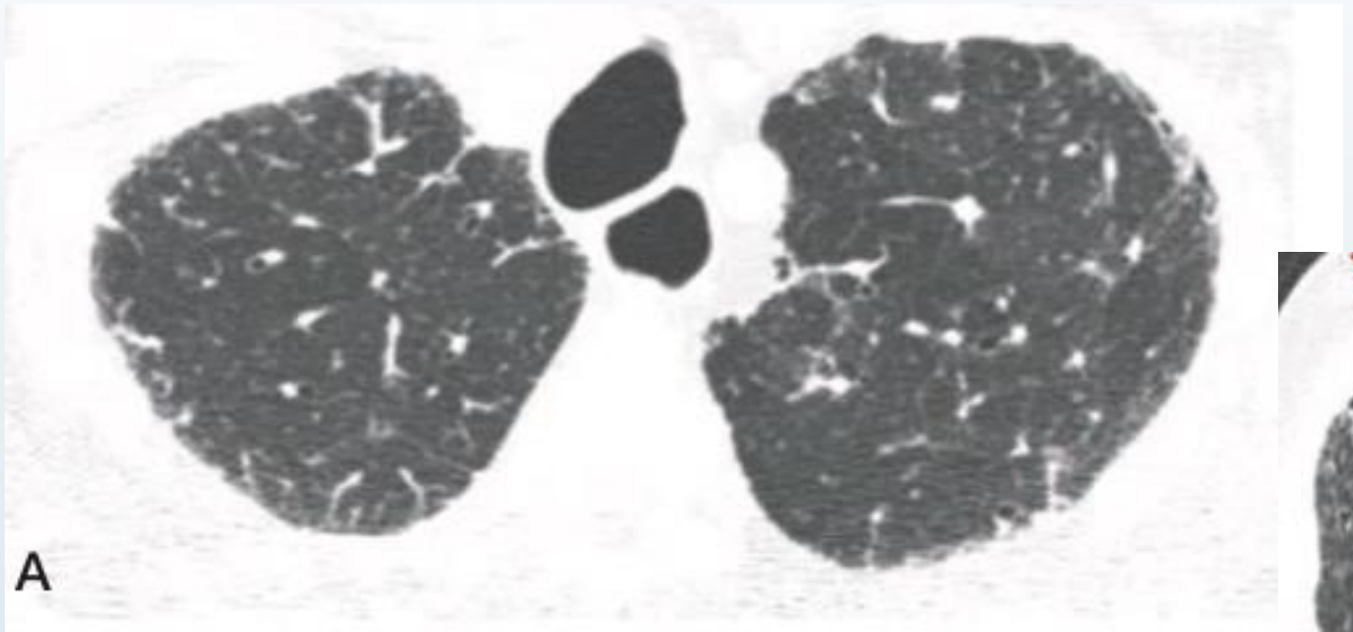


蜂窝和间隔旁肺气肿同时存在


Honeycombing
Subpleural, posterior, lower lobe predominant; no atypical findings
Upper-, mid-lung, or peribronchial predominance
Atypical findings also present (GGO, nodules, consolidation, cysts, mosaic perfusion, air trapping)
IPF (70%)
Collagen-vascular disease
Drug-related fibrosis
Asbestosis
Chronic HP
Sarcoidosis (rare)
Fibrotic NSIP (rare)
Chronic HP
Sarcoidosis
Radiation
Fibrotic ARDS
IPF
Collagen-vascular disease
Drug-related fibrosis
Interstitial pneumonias other than UIP (NSIP, OP, LIP, DIP)
Chronic HP
Sarcoidosis
Cystic lung disease

UIP的HRCT标准

1. the presence of a basal and subpleural predominance of abnormalities,
2. reticular opacities with or without traction bronchiectasis,
3. honeycombing, and
4. the absence of findings inconsistent with the diagnosis.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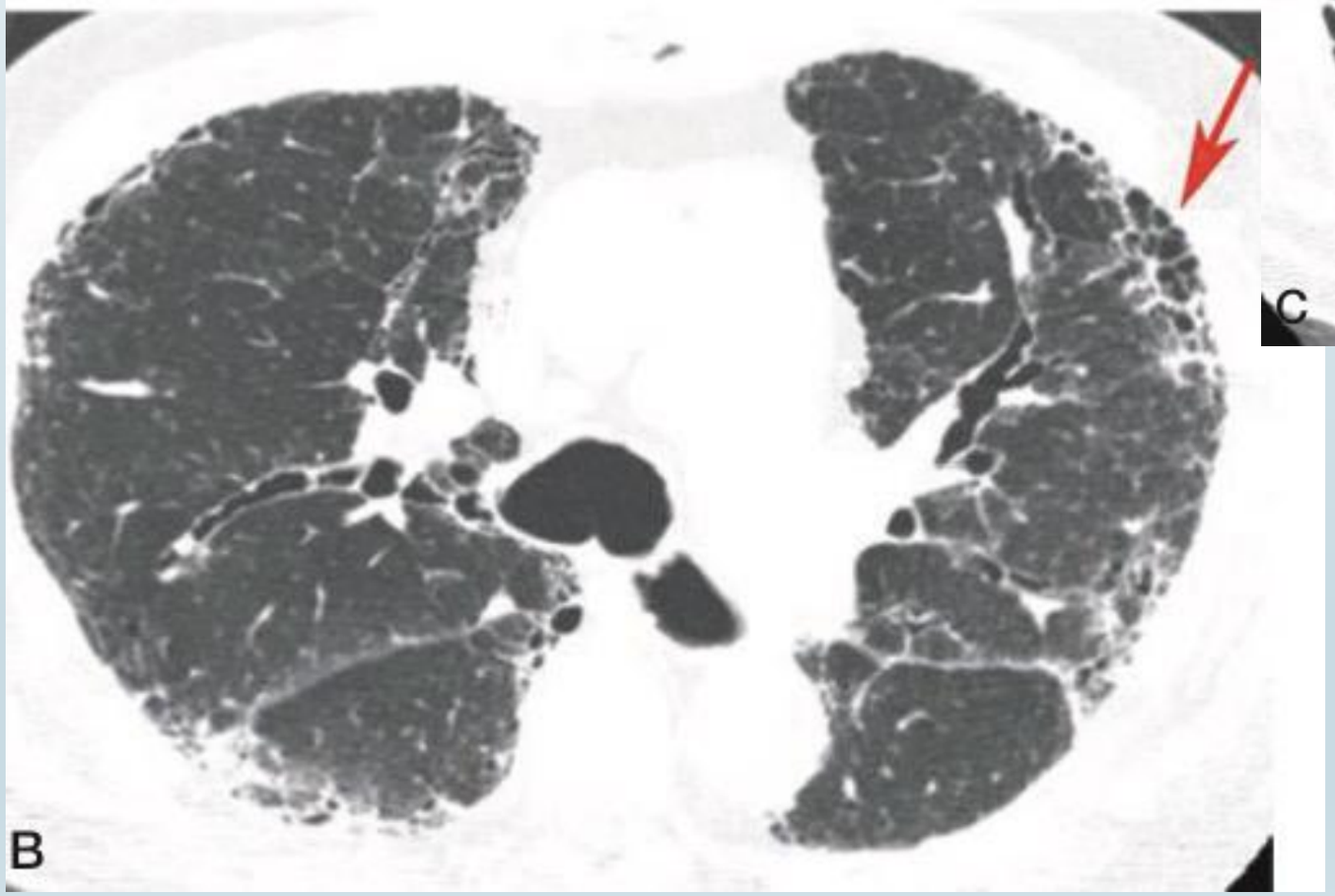
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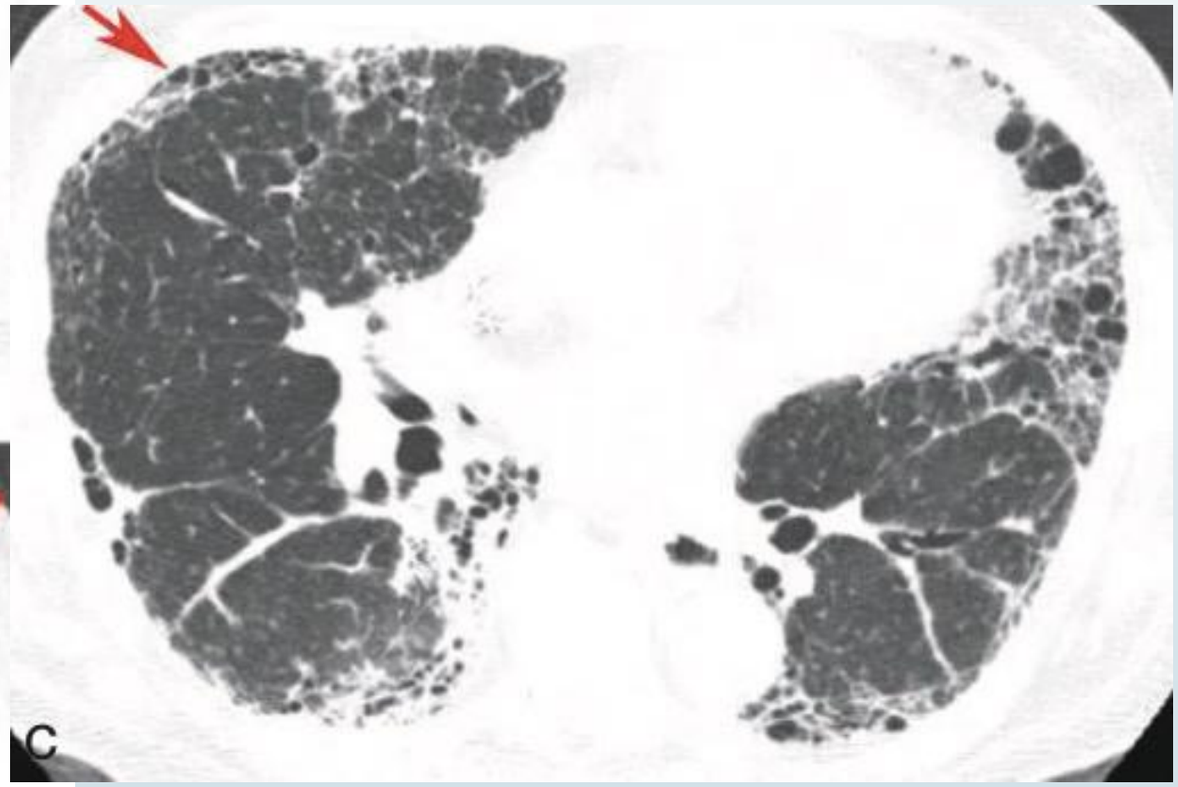

C

UIP的否定征象

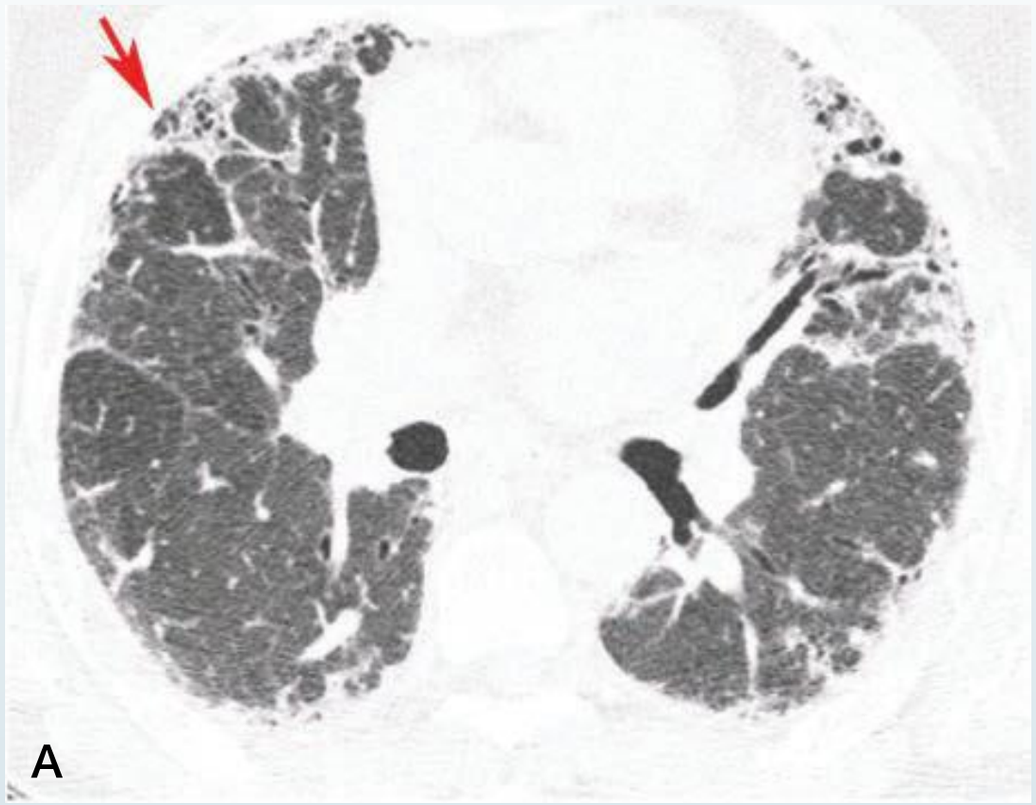
* upper- or midlung predominance of abnormalities

* peribronchovascular predominance of abnormali- ties

* extensive ground-glass opacity, exceeding reticula- tion in extent,

* profuse micronodules, bilateral and upper lobe,

* discrete cysts, not representing honeycombing,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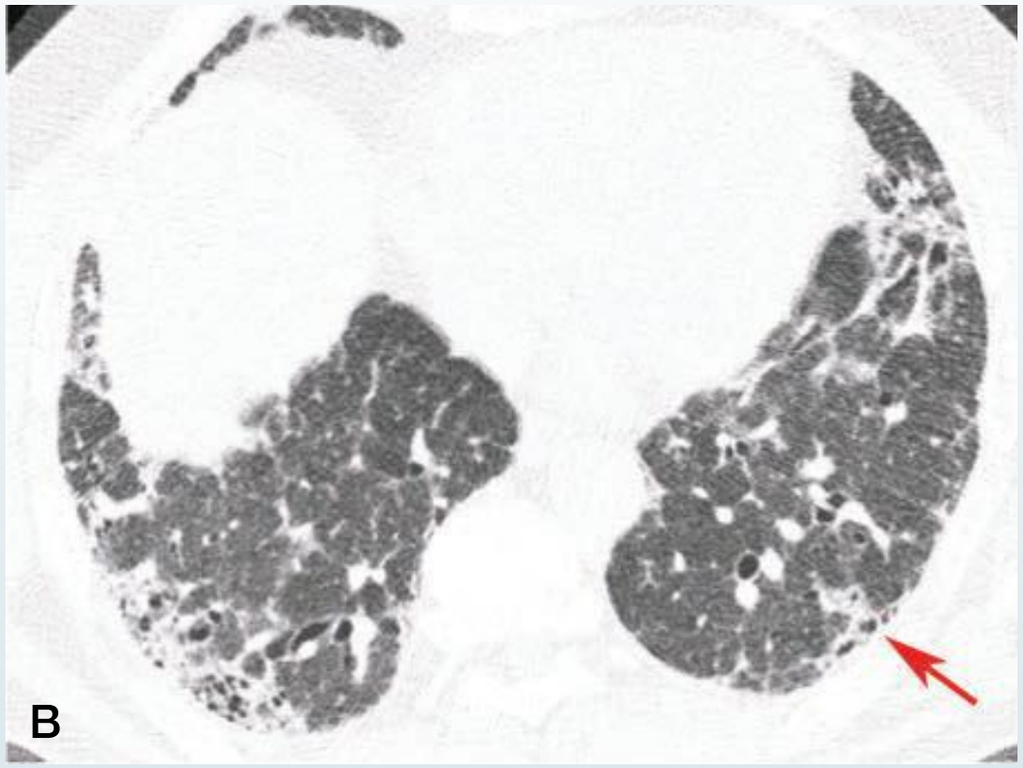
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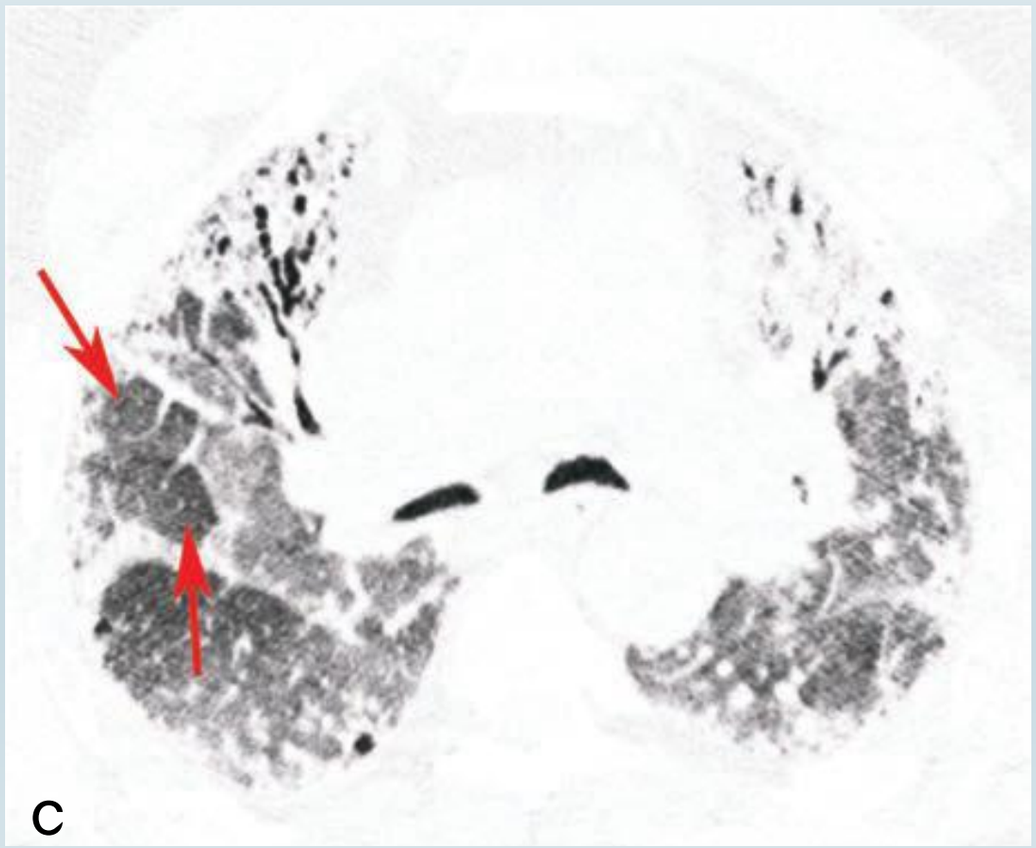
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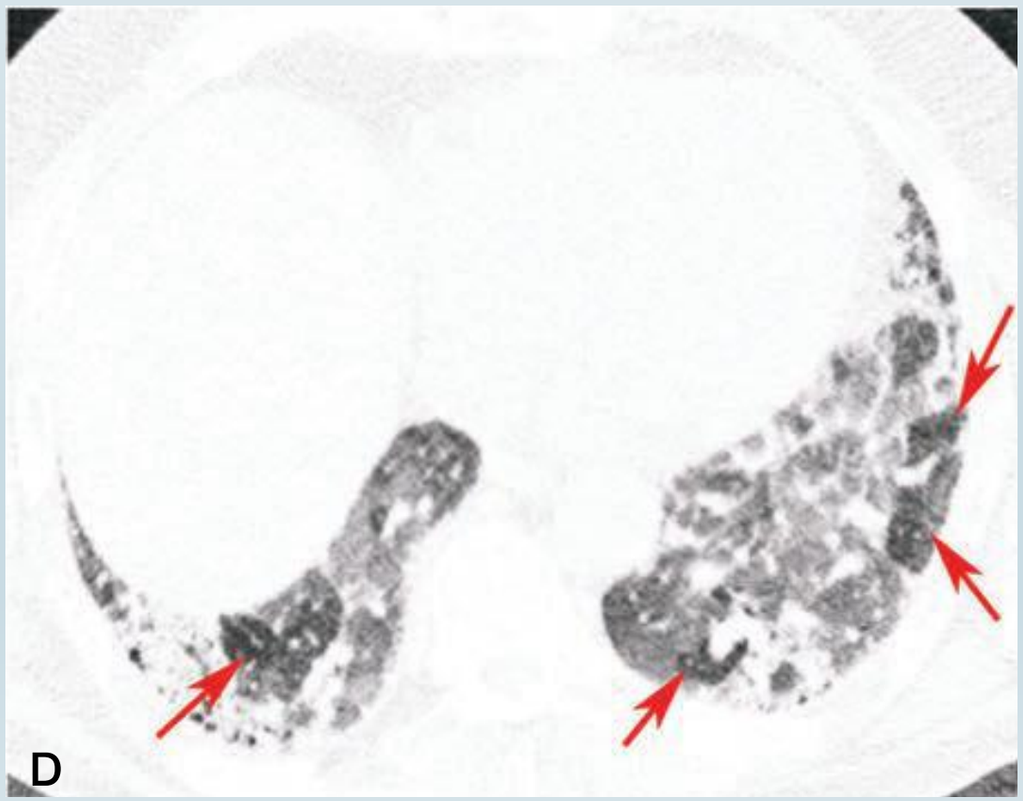
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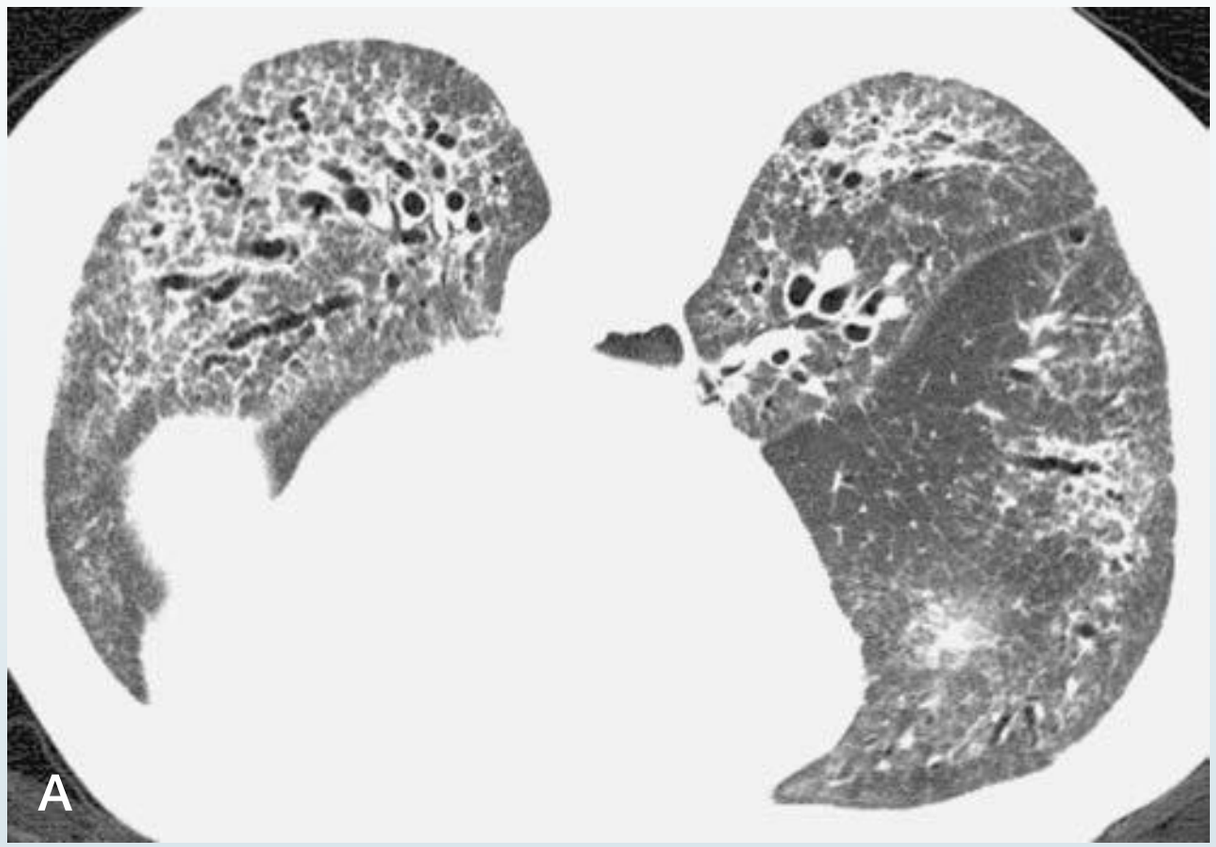
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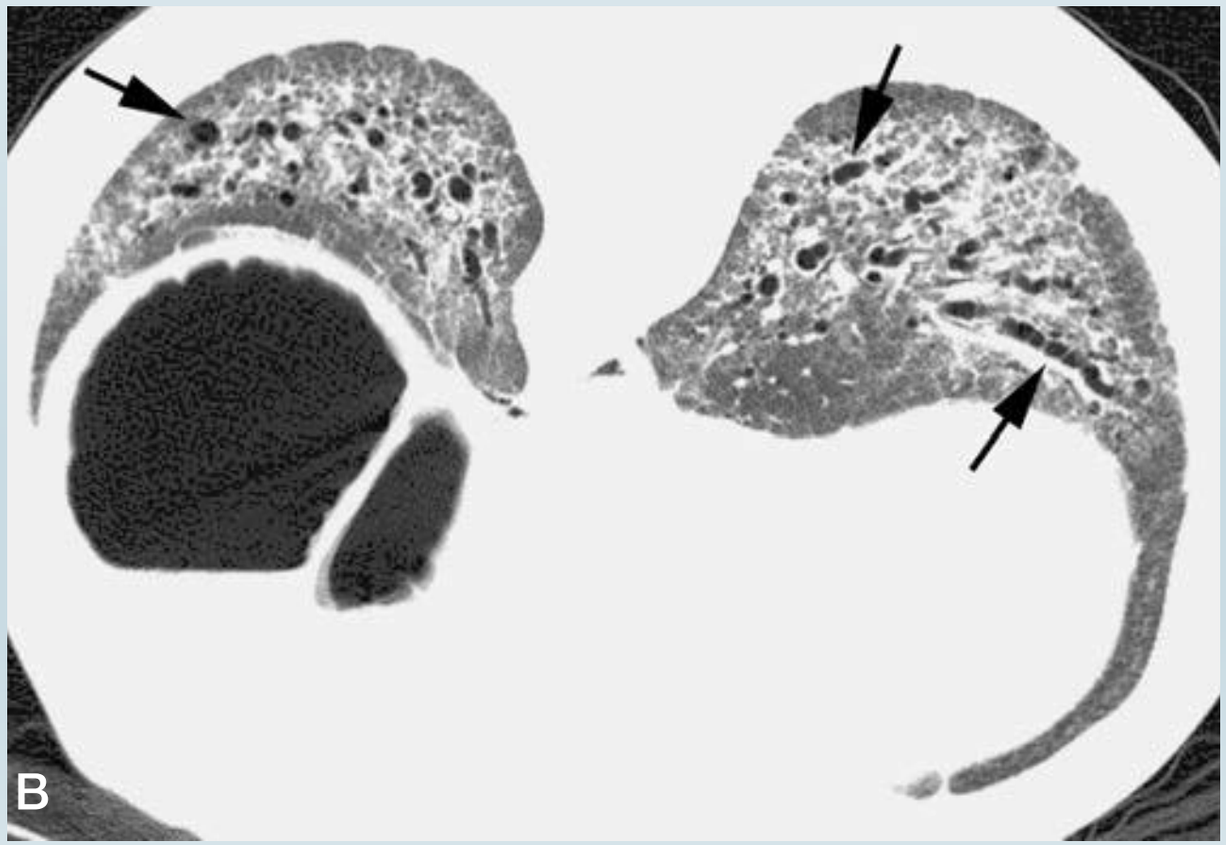
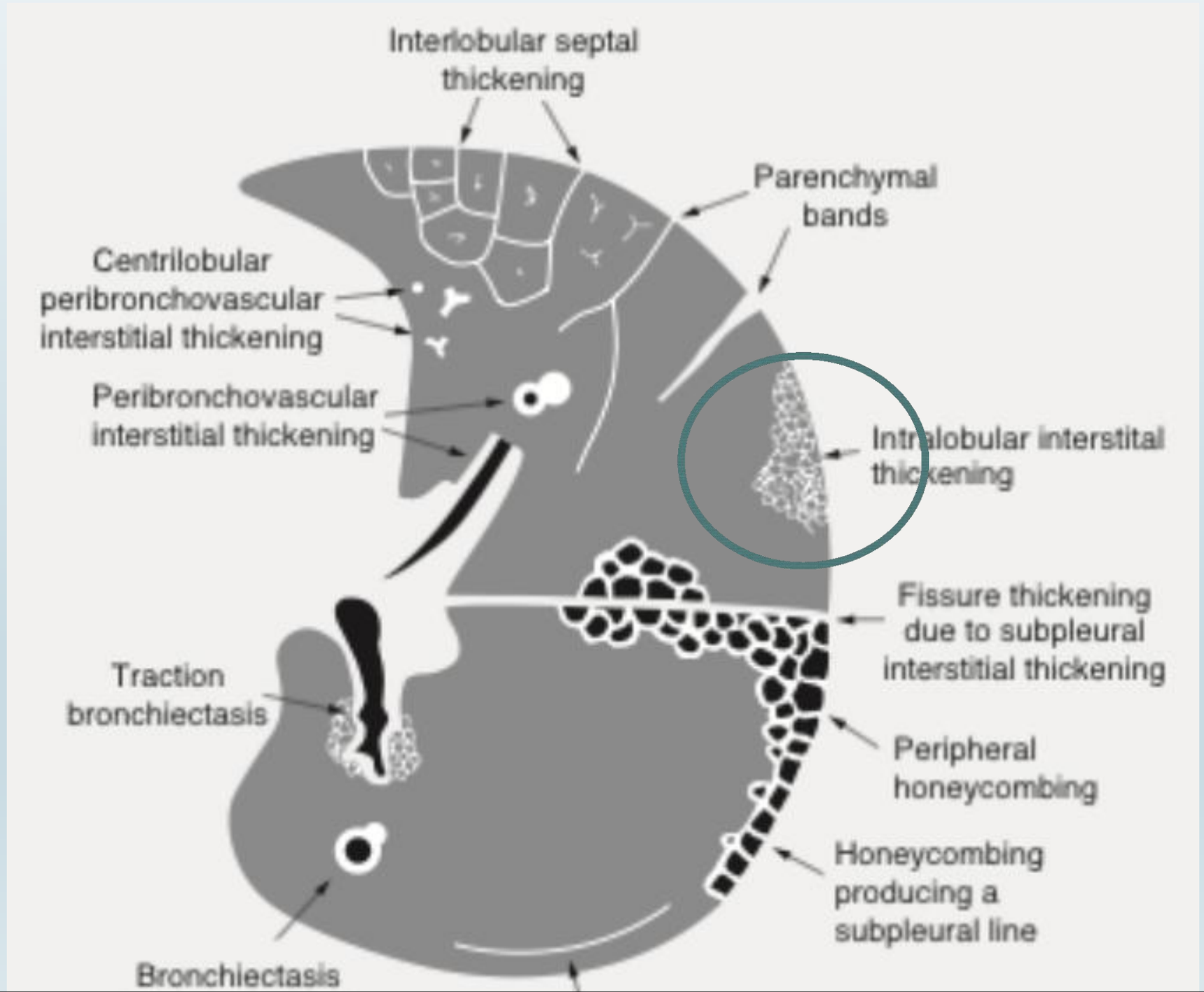

B

TABLE 3-6 Features Inconsistent with a UIP Pattern

HRCT feature	Likely alternative diagnoses
Ground-glass opacity outside areas of fibrosis, exceeding reticulation	NSIP, HP, other IPs
Mosaic perfusion/air trapping	HP
Centrilobular nodules	HP
Perilymphatic nodules	Sarcoidosis, pneumoconioses
Peripheral fibrosis with only minimal honeycombing, subpleural sparing	NSIP
Upper-lobe distribution of abnormalities	Sarcoidosis, pneumoconioses, HP
Parahilar, peribronchovascular predominance	NSIP, HP, sarcoidosis, pneumoconioses
Lower-lobe distribution of findings, not subpleural-predominant	HP, NSIP

小叶内间质增厚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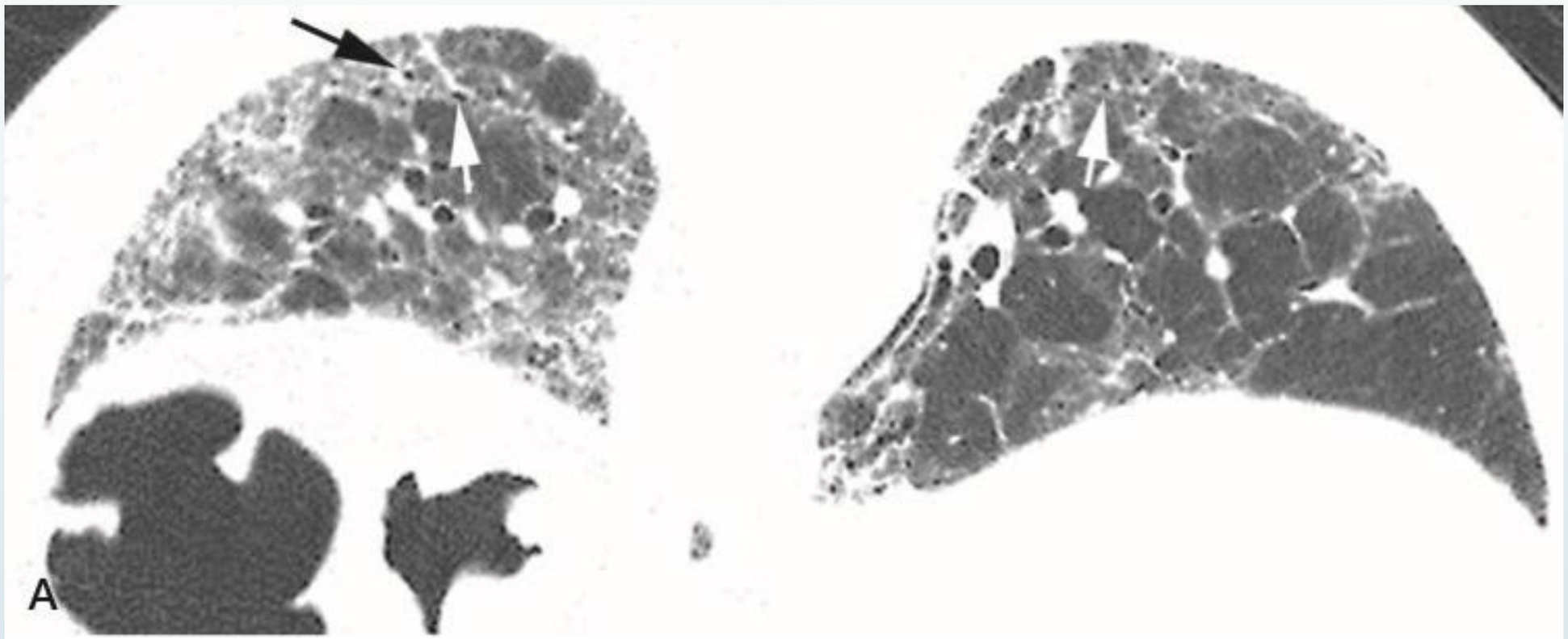
Peribronchovascular interstitial thickening
Intralobular interstital thickening
Fissure thickening due to subpleural interstitial thickening
Traction bronchiectasis
Peripheral honeycombing
Honeycombing producing a subpleural line
Bronchiectasis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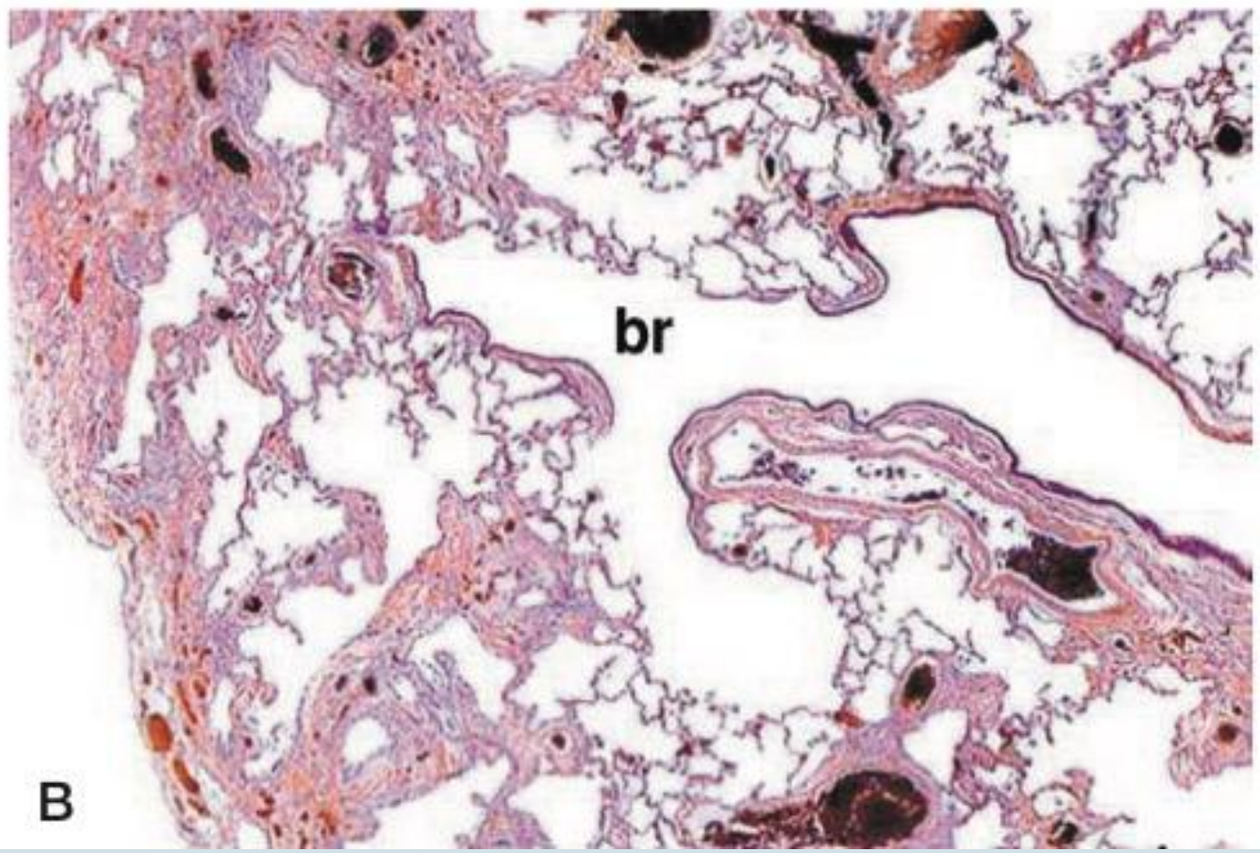
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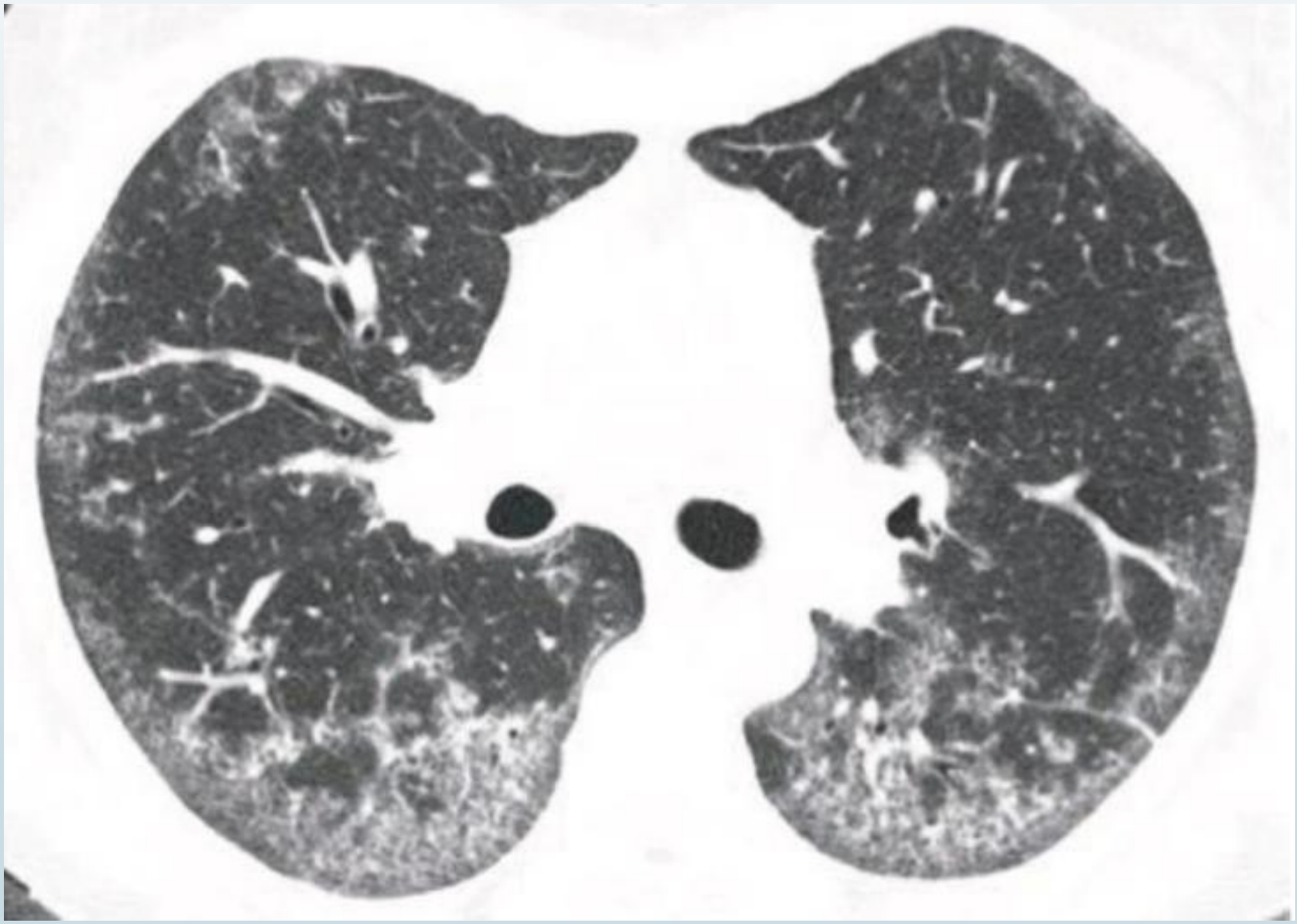
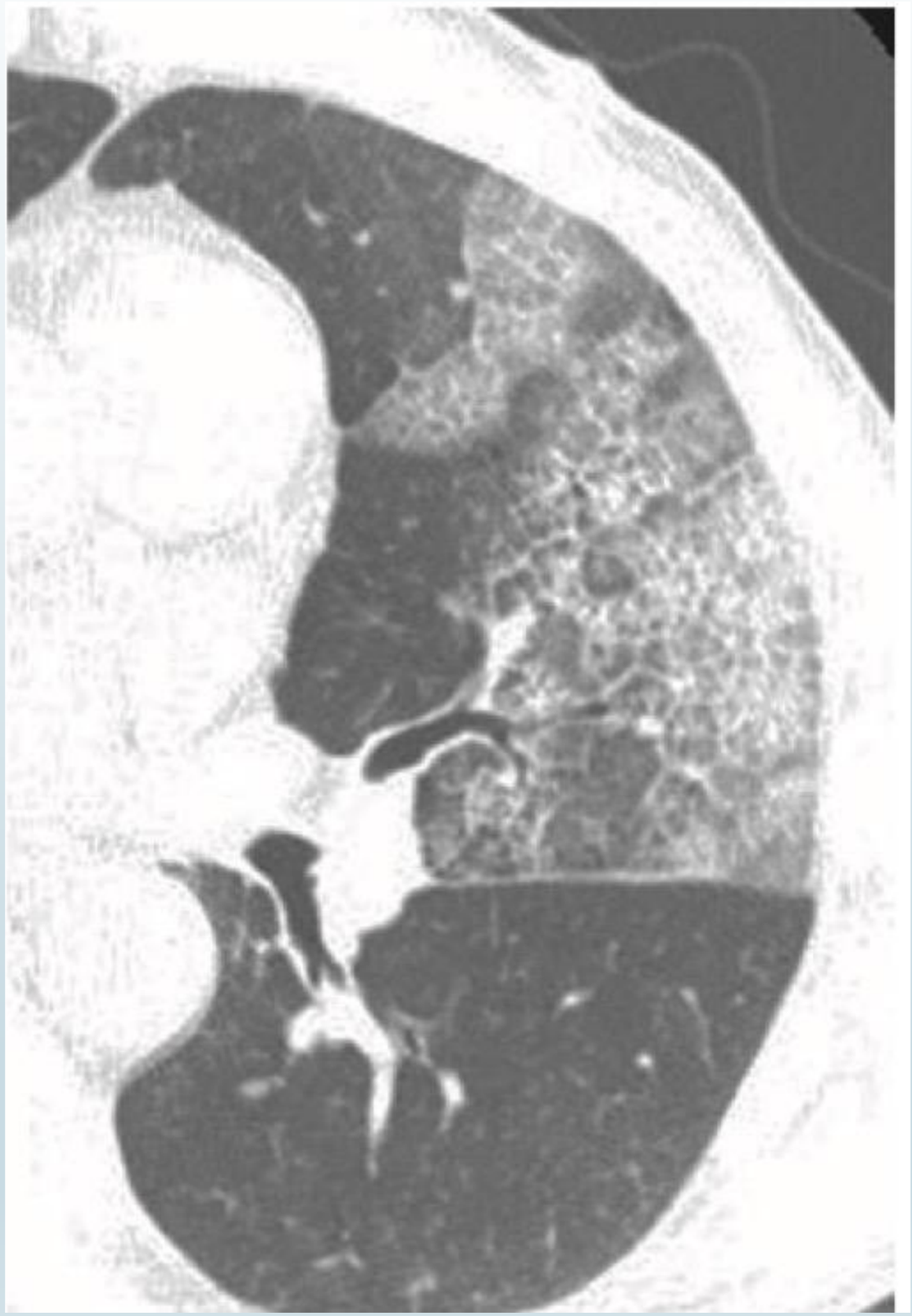




Intralobular lines

Traction bronchiectasis also present

Fibrosis

Consider causes of honeycombing and fibrotic lung disease

Septal thickening also present

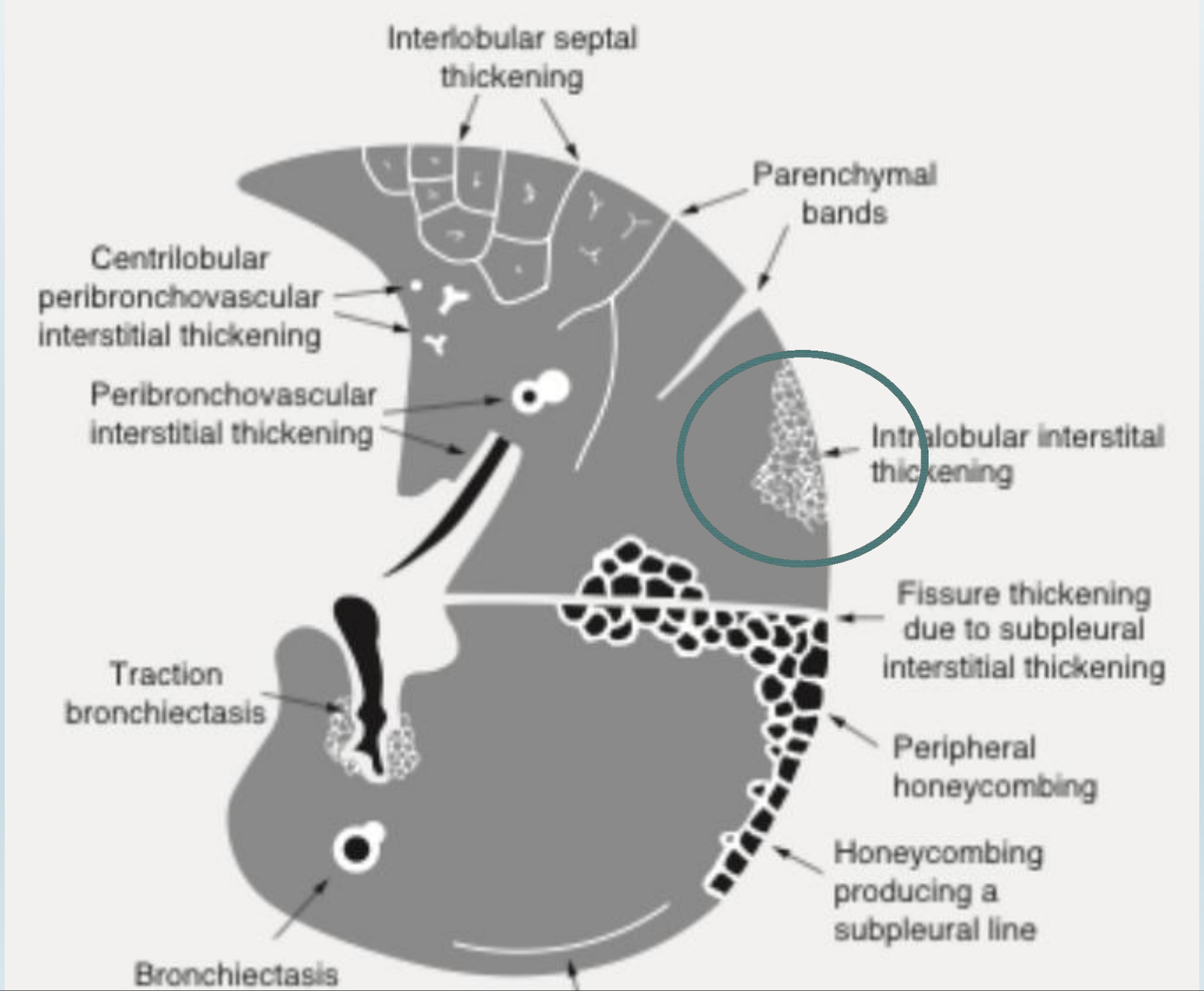
Septal thickening differential diagnosis

Ground-glass opacity also present

Infiltrative or inflammatory disease

"Crazy paving" differential diagnosis; e.g., edema
Hemorrhage
Atypical infections
Interstitial pneumonias
HP
Adenocarcinoma

非特异性网状影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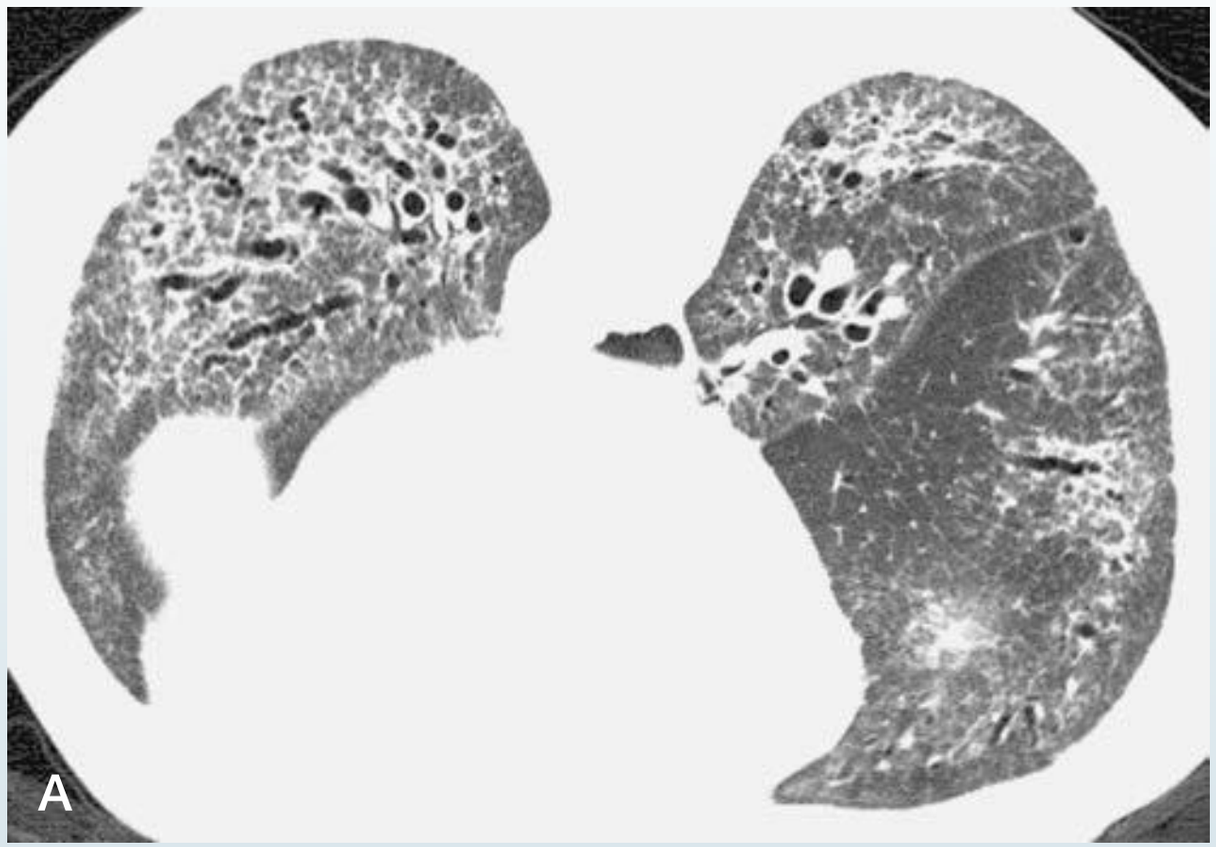
Honeycombing producing a subpleural line
Bronchiectasis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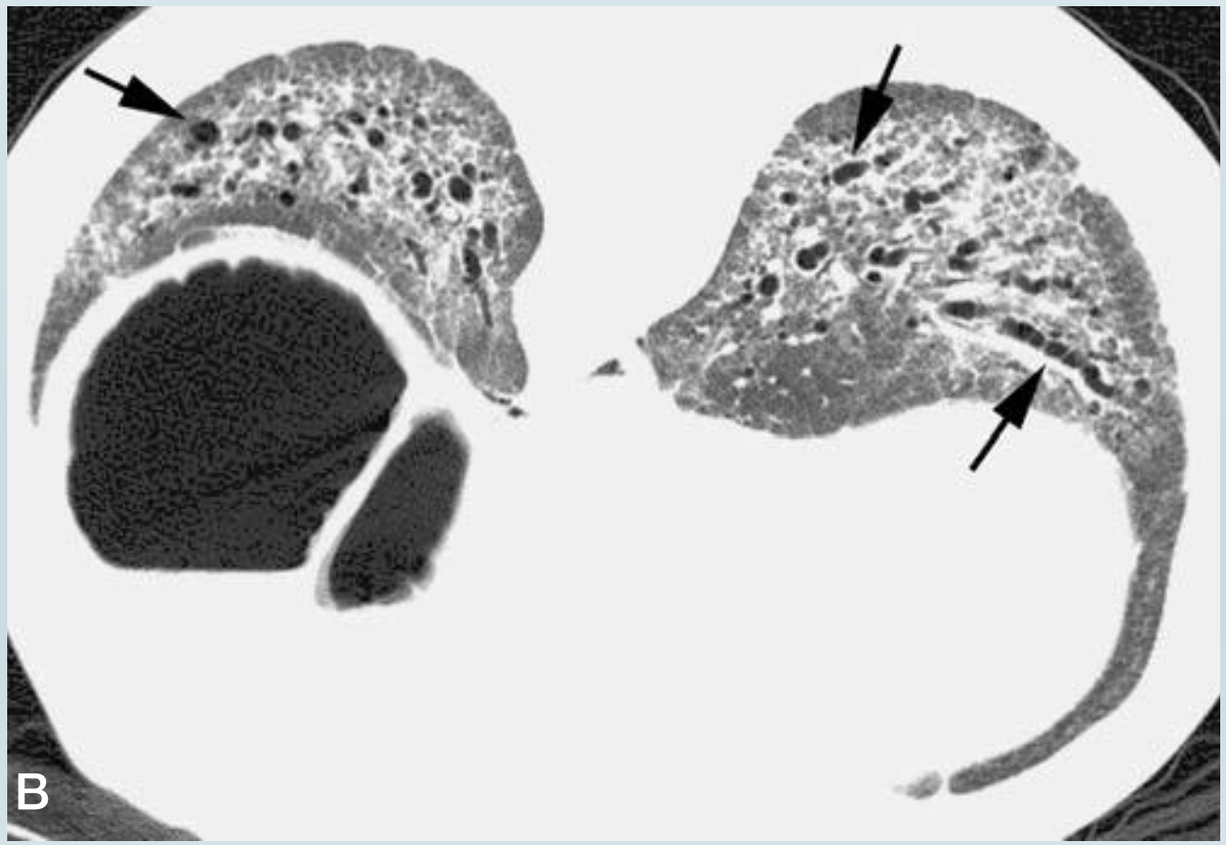
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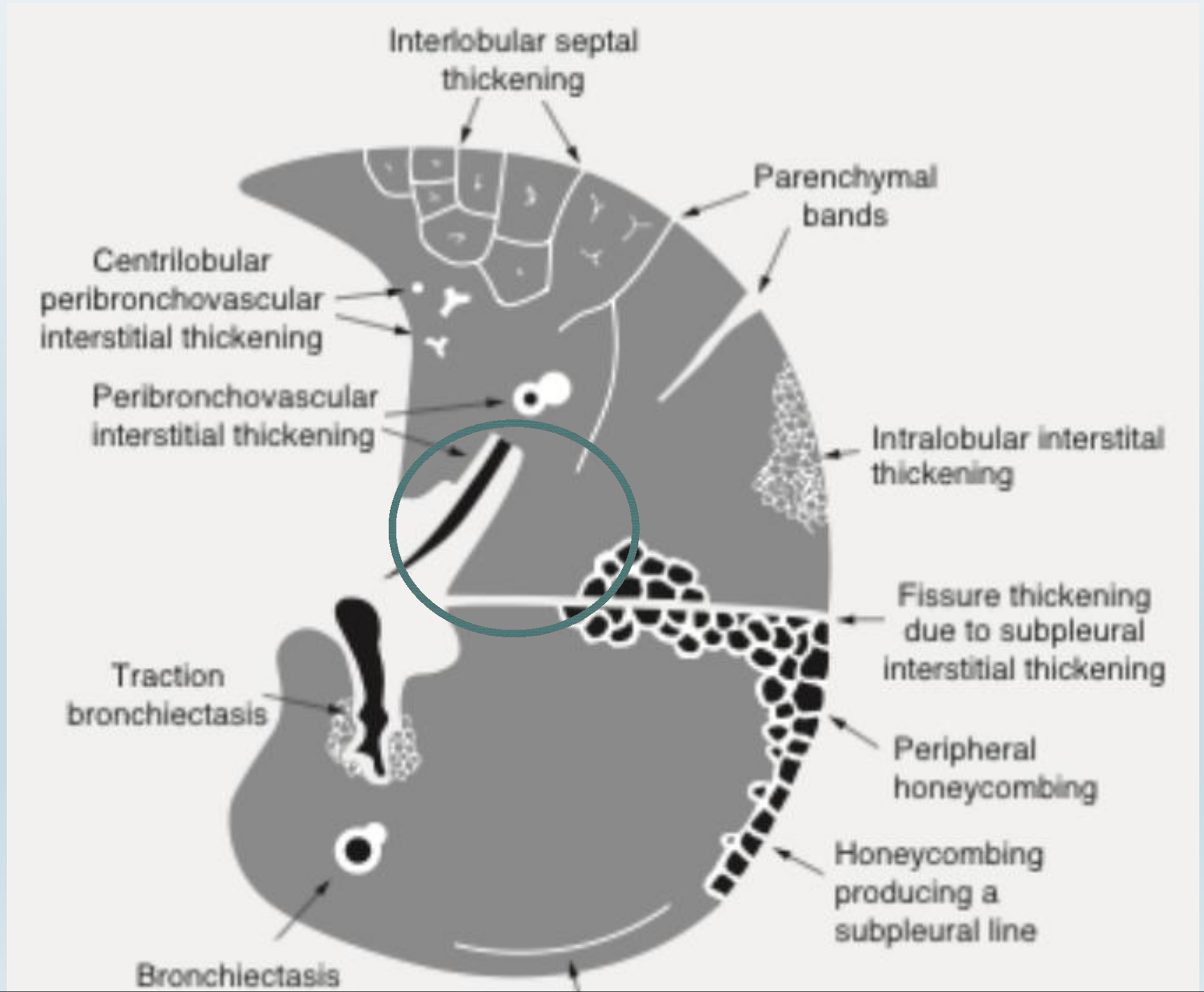
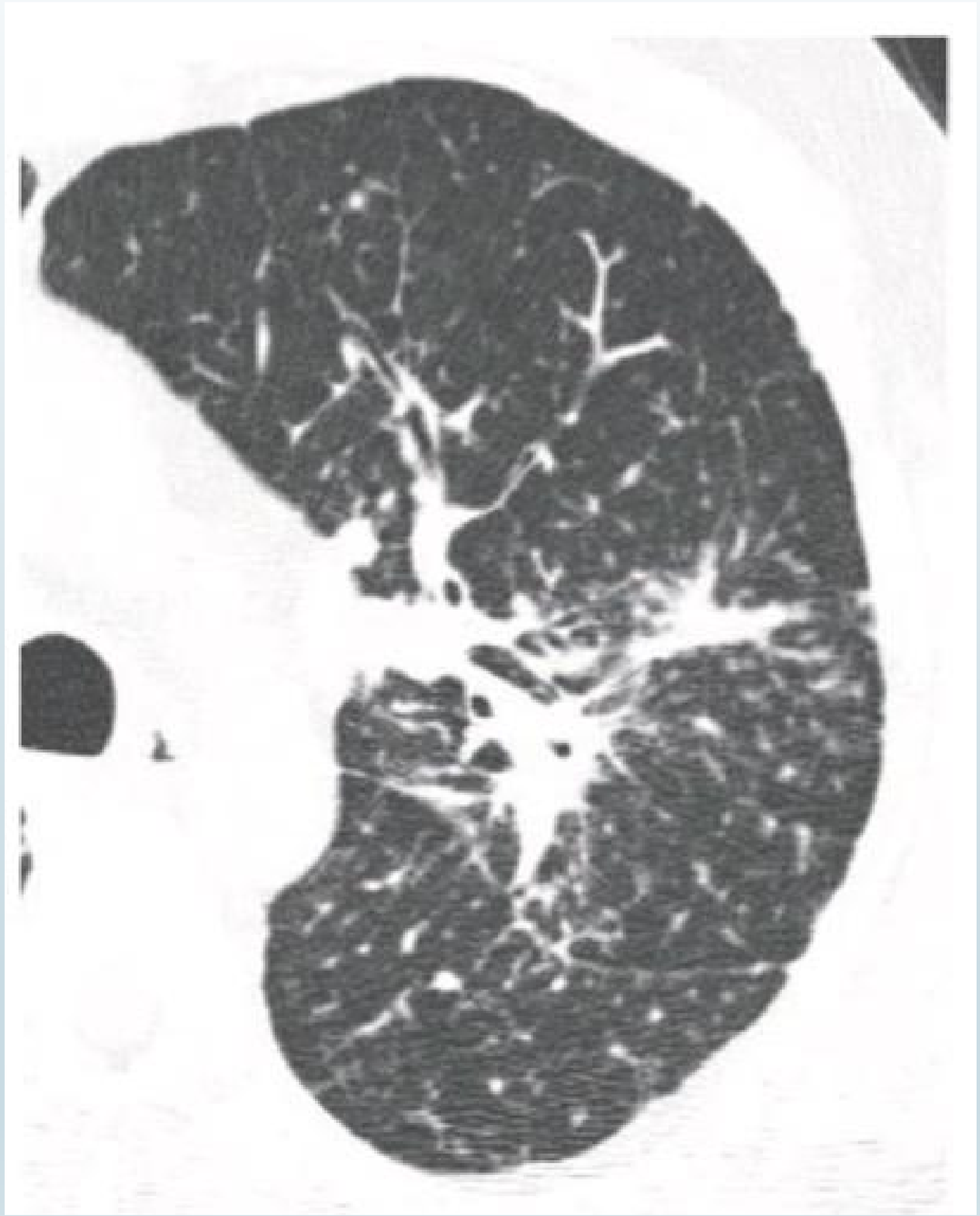
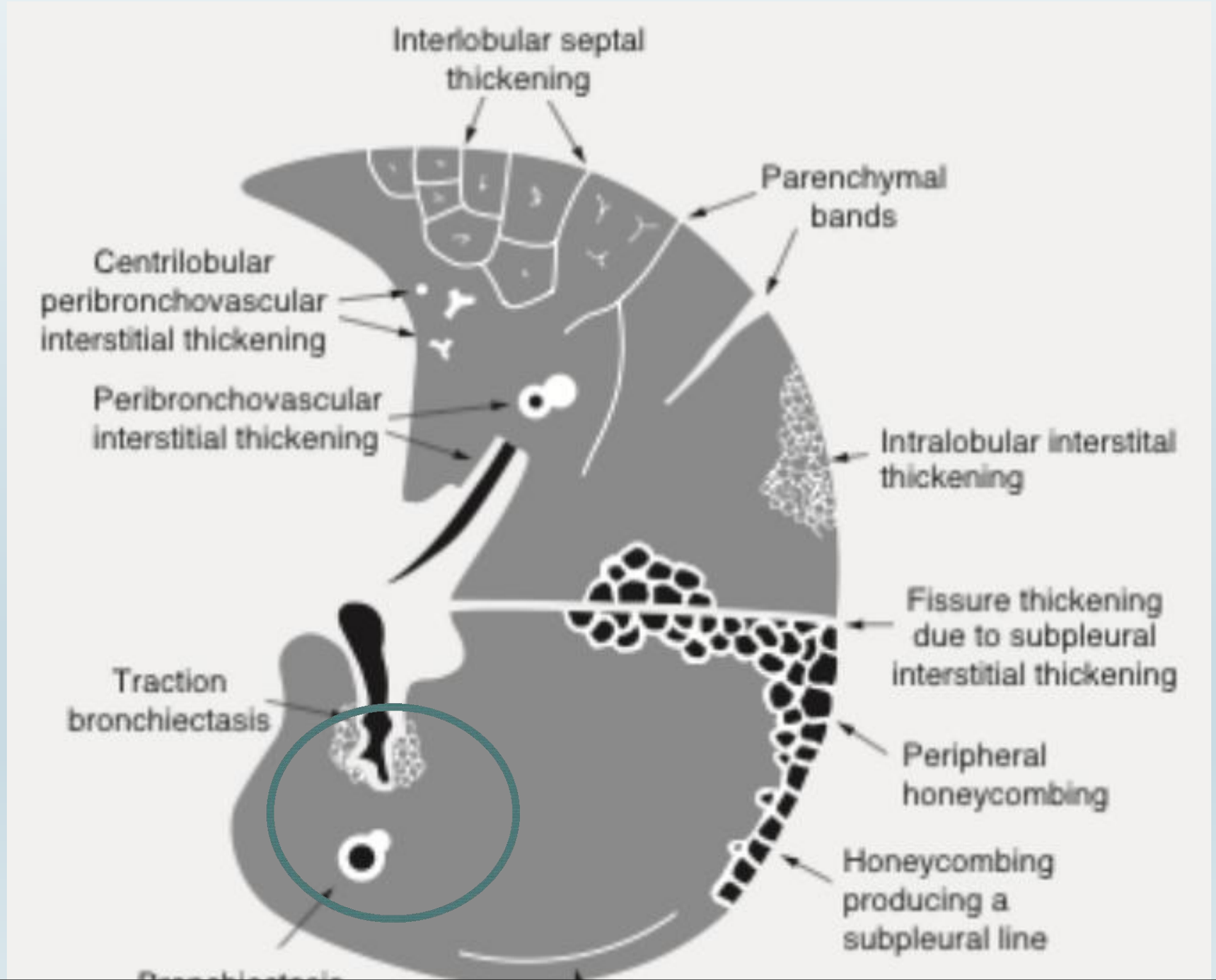
血管界面征


Interlobular septal thickening
Parenchymal bands
Centrilobular peribronchovascular interstitial thickening
Peribronchovascular interstitial thickening
Intralobular interstital thickening
Fissure thickening due to subpleural interstitial thickening
Traction bronchiectasis
Peripheral honeycombing
Honeycombing producing a subpleural line
Bronchiectasis



牵拉性支气（毛细）管扩张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Parenchymal bands
Centrilobular peribronchovascular interstitial thickening
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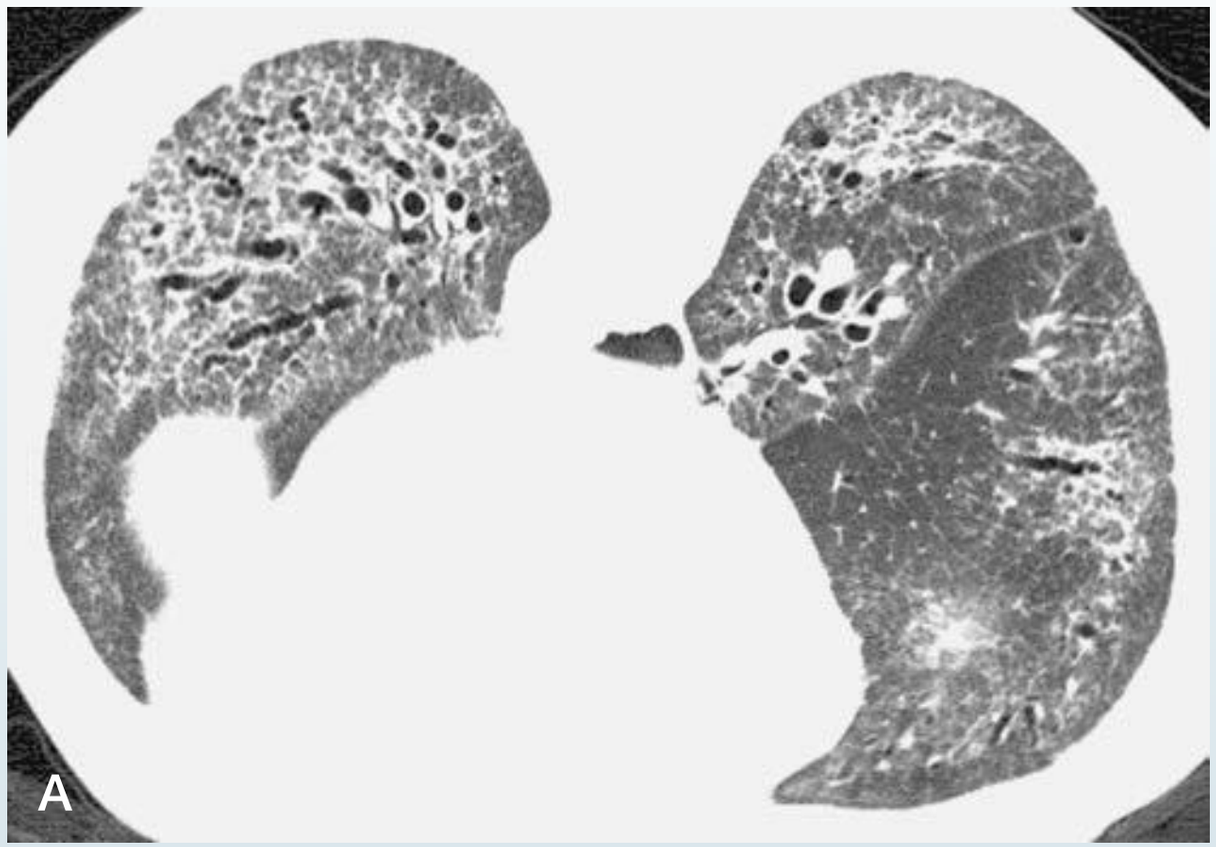
Intralobular interstital thickening
Fissure thickening due to subpleural interstitial thickening
Traction bronchiectasis
Peripheral honeycombing
Honeycombing producing a subpleural line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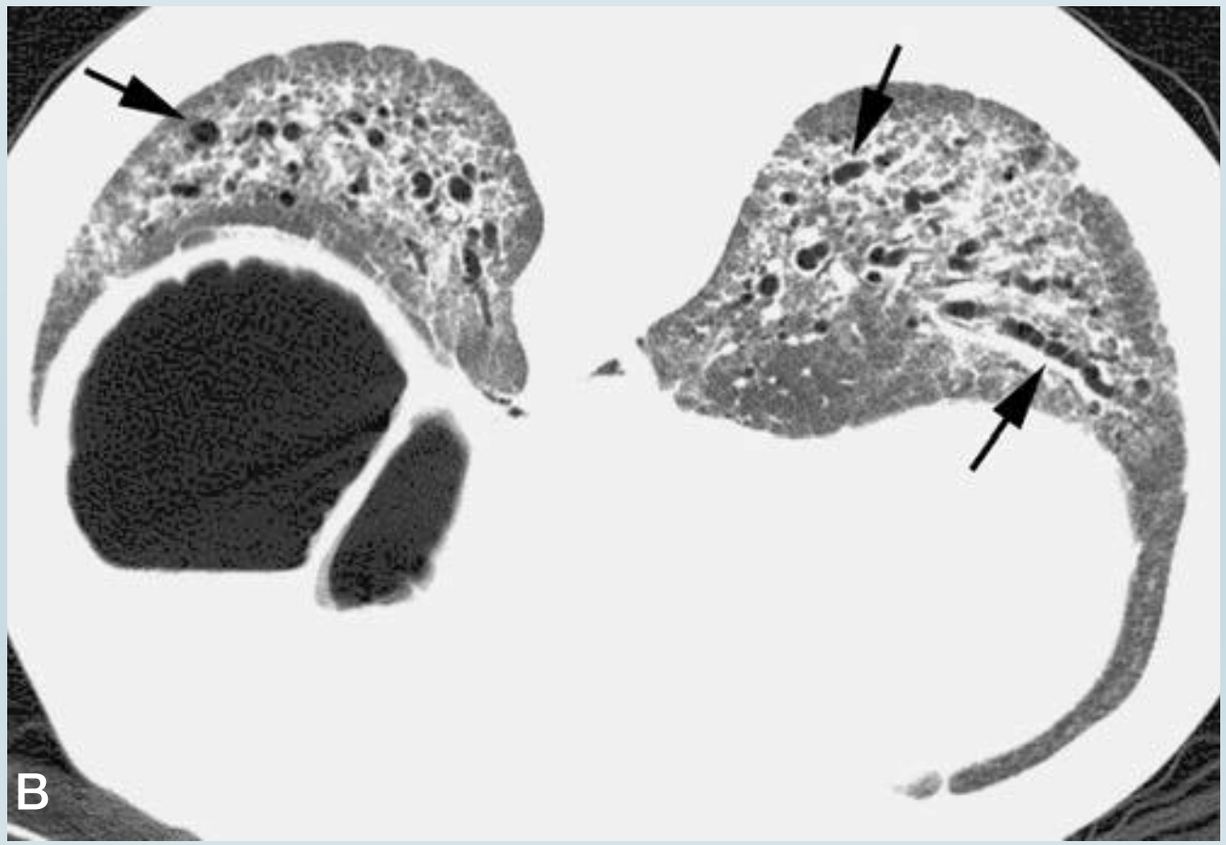
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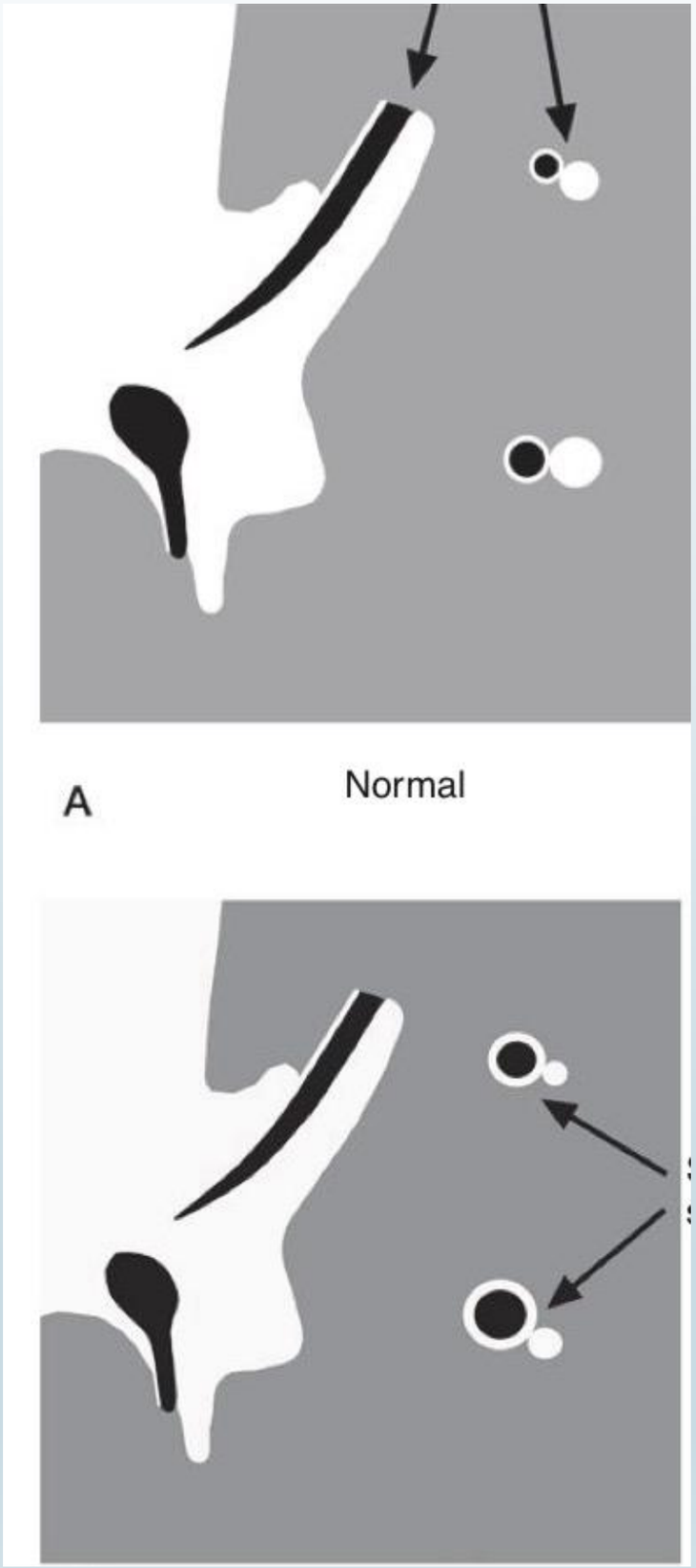
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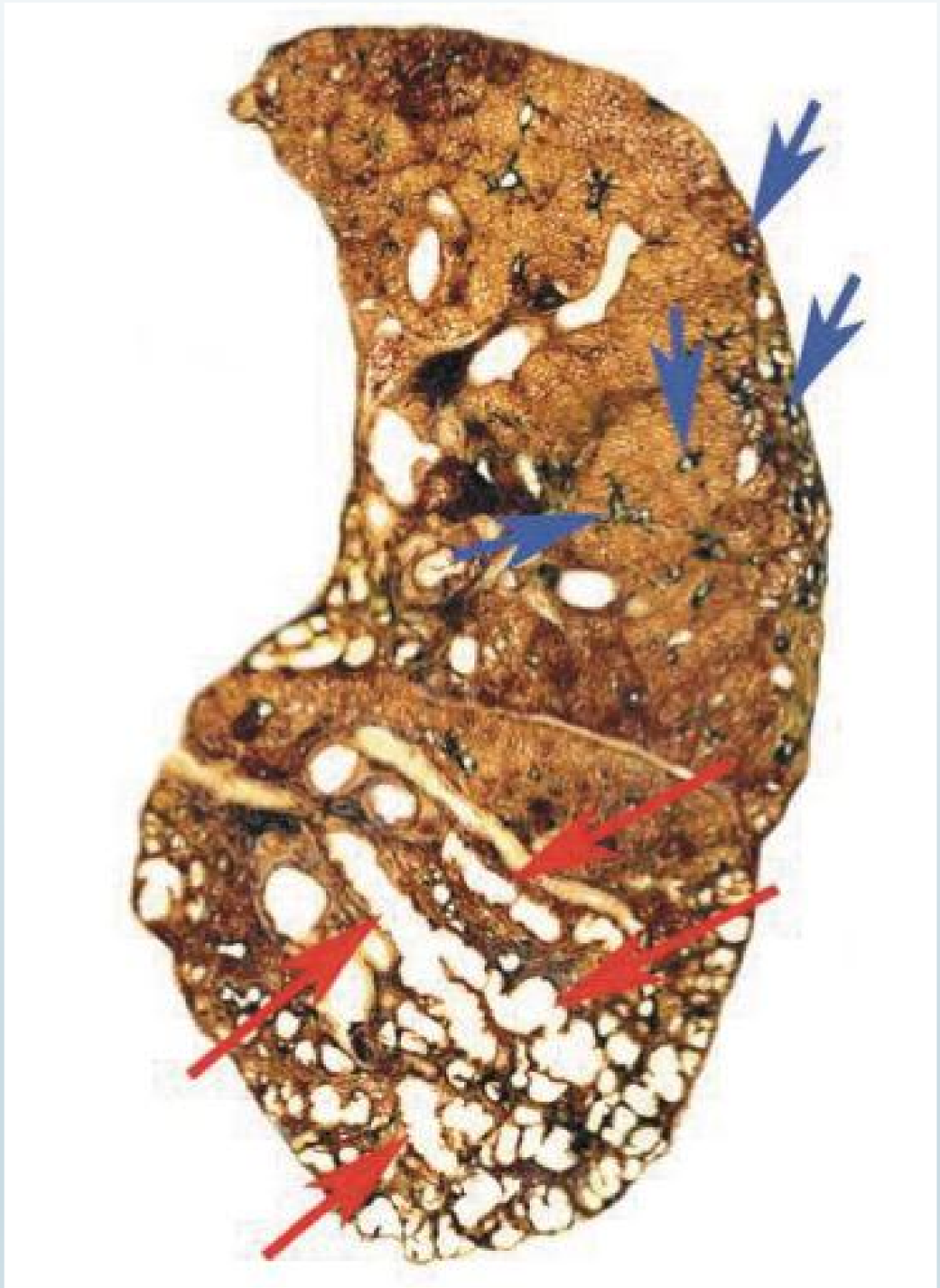
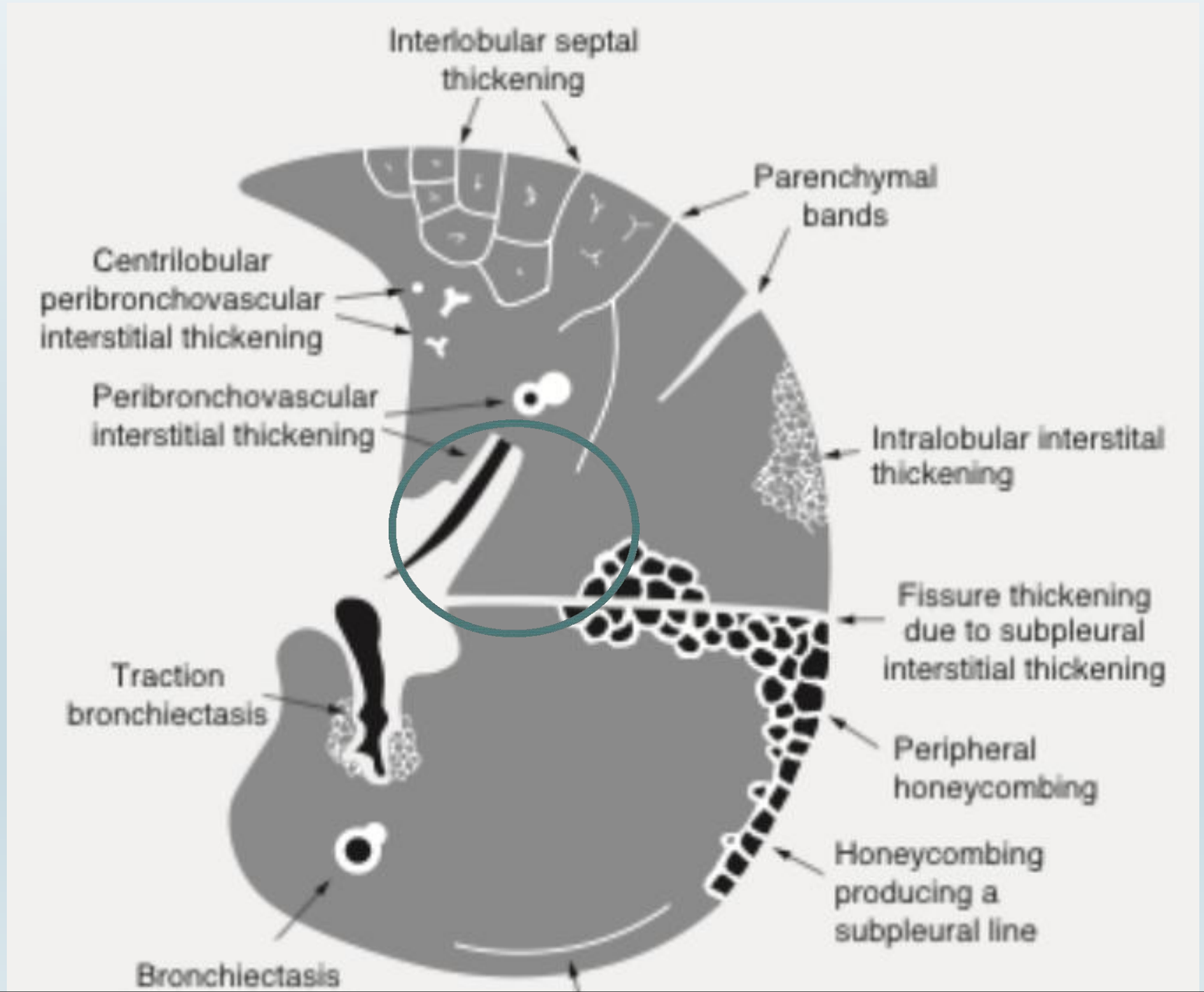
Normal



＊支气管-血管束增粗


Interlobular septal thickening
Parenchymal bands
Centrilobular peribronchovascular interstitial thickening
Peribronchovascular interstitial thickening
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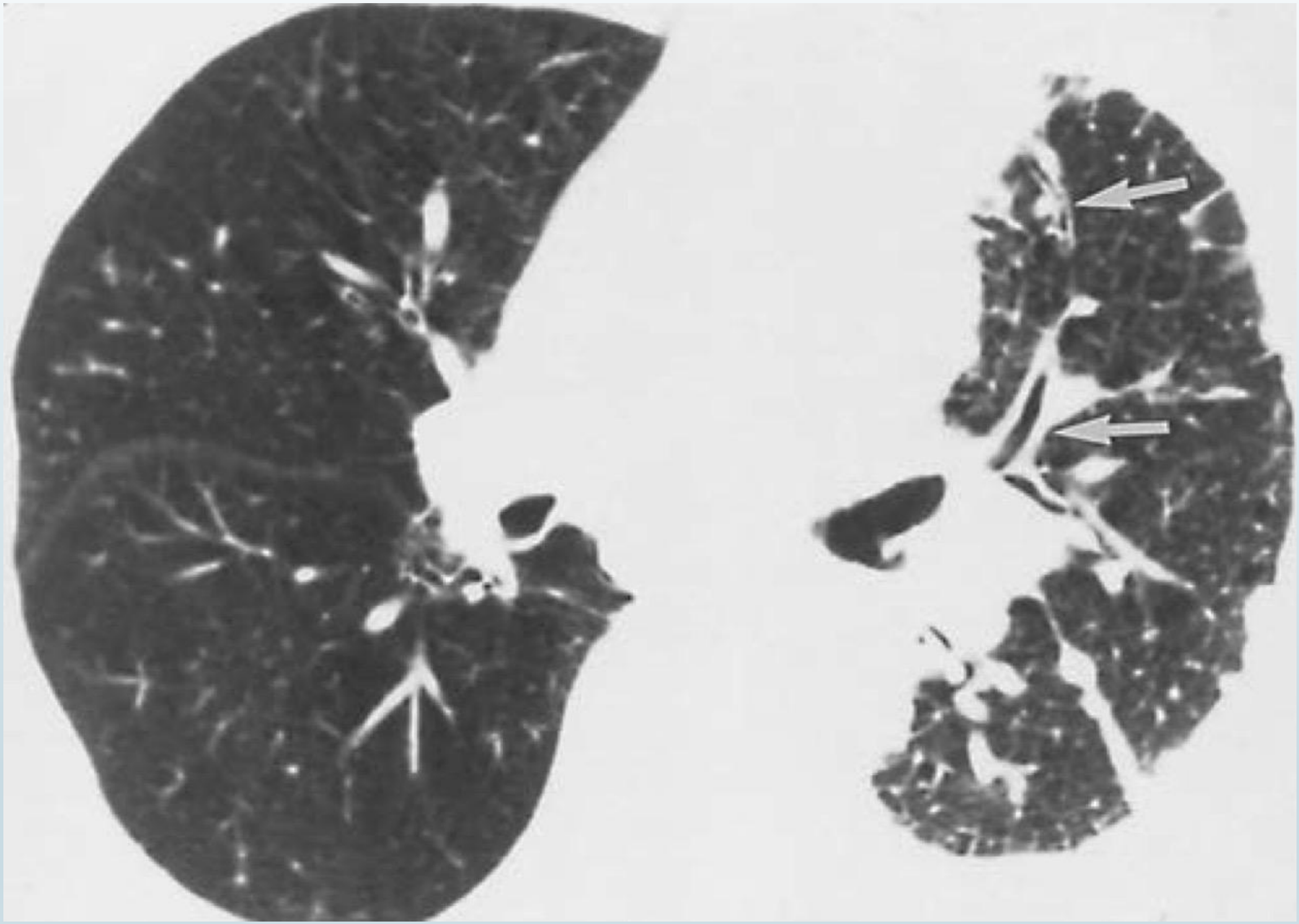
Fissure thickening due to subpleural interstitial thickening
Traction bronchiectasis
Peripheral honeycombing
Honeycombing producing a subpleural line
Bronchiectasis



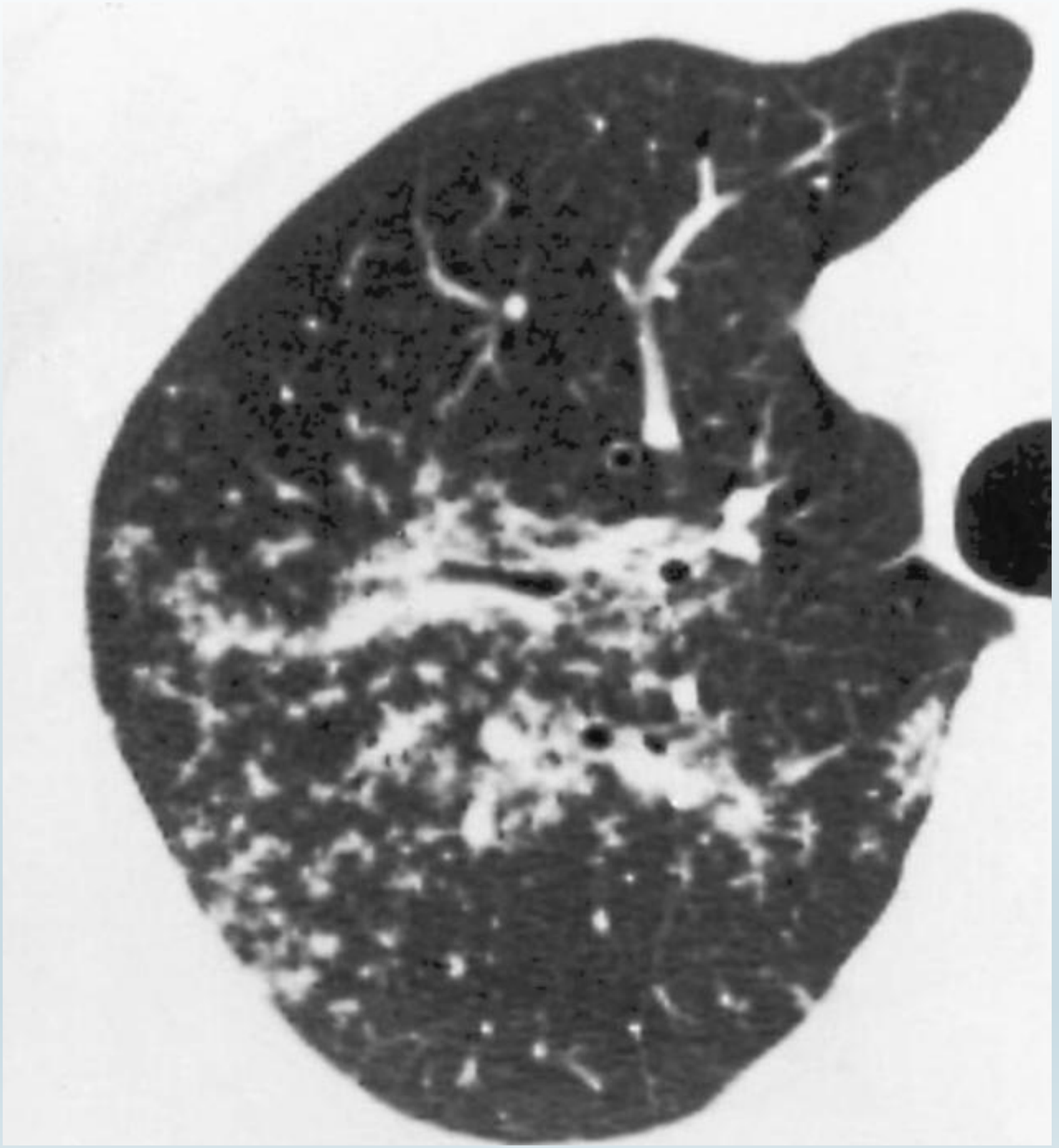
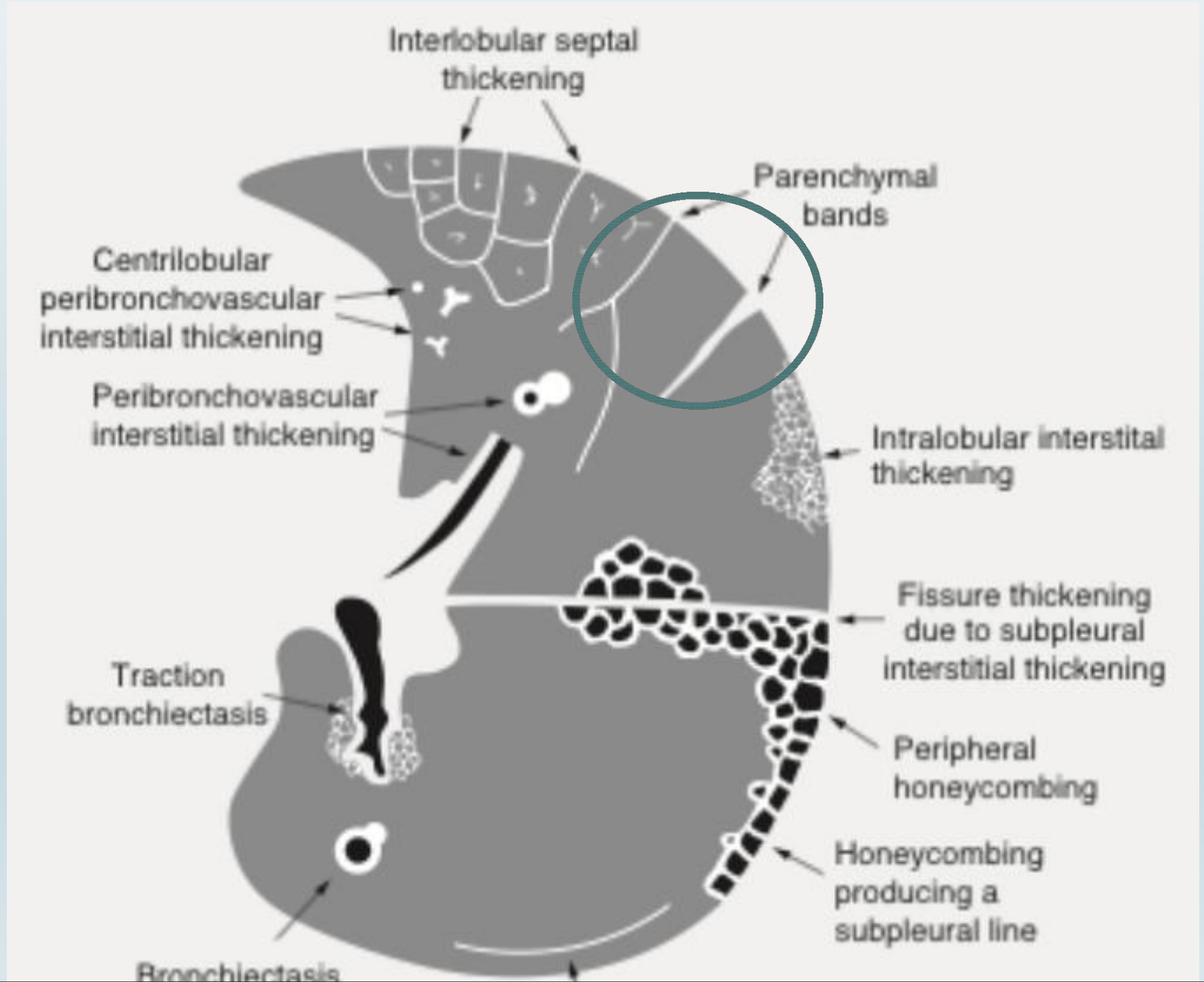
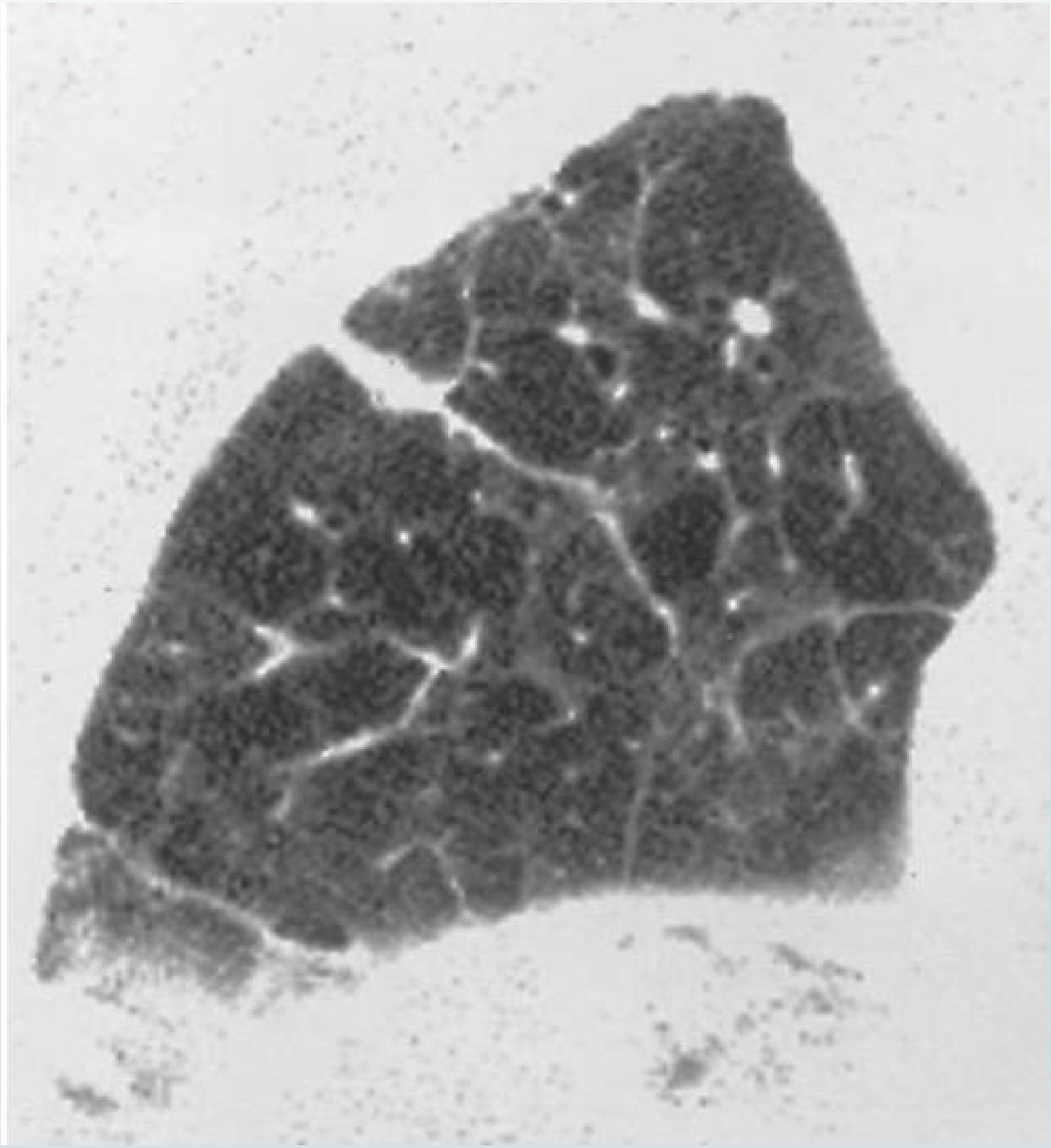


TABLE 3-8 Differential Diagnosis of Peribronchovascular Interstitial Thickening

Diagnosis	Comments
Lymphangitic carcinomatosis, lymphoma, leukemia	Common; smooth or nodular; may be the only abnormality
Lymphoproliferative disease (e.g., LIP)	Smooth or nodular; other abnormalities typically present
Pulmonary edema	Common; smooth
Sarcoidosis	Common; usually nodular or irregular; conglomerate masses of fibrous tissue with traction bronchiectasis typical in end stage
IPF or other cause of UIP	Common; often irregular; associated with traction bronchiectasis; other findings of fibrosis predominate
NSIP	With findings of ground-glass opacity and reticulation
Silicosis/CWP, talcosis	Conglomerate masses
HP (chronic)	Sometimes visible; often irregular; associated with traction bronchiectasis

条、带病症


Interlobular septal thickening
Parenchymal bands
Centrilobular peribronchovascular interstitial thickening
Peribronchovascular interstitial thickening
Intralobular interstital thickening
Fissure thickening due to subpleural interstitial thickening
Traction bronchiectasis
Peripheral honeycombing
Honeycombing producing a subpleural line
Bronchiectasis



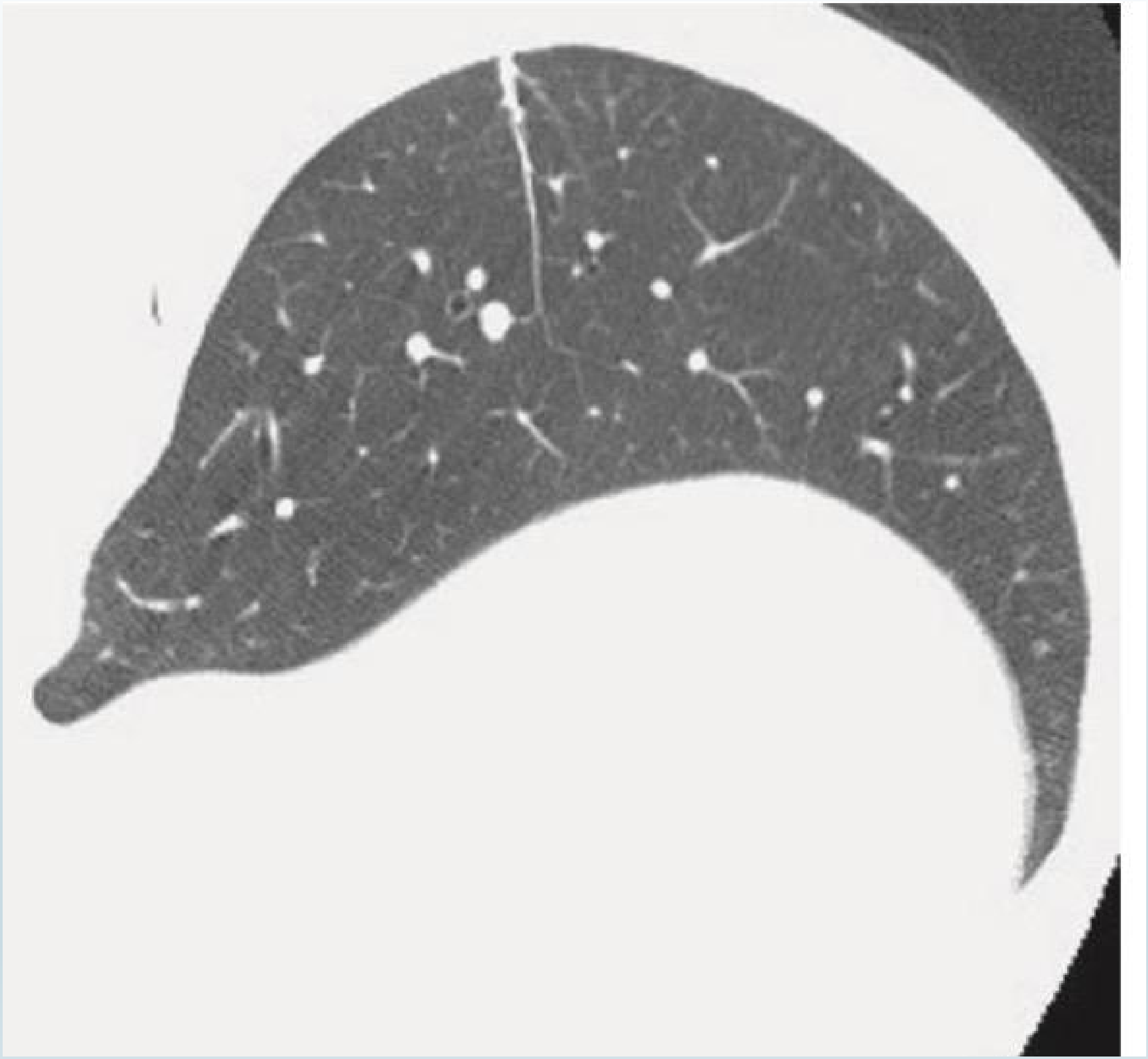
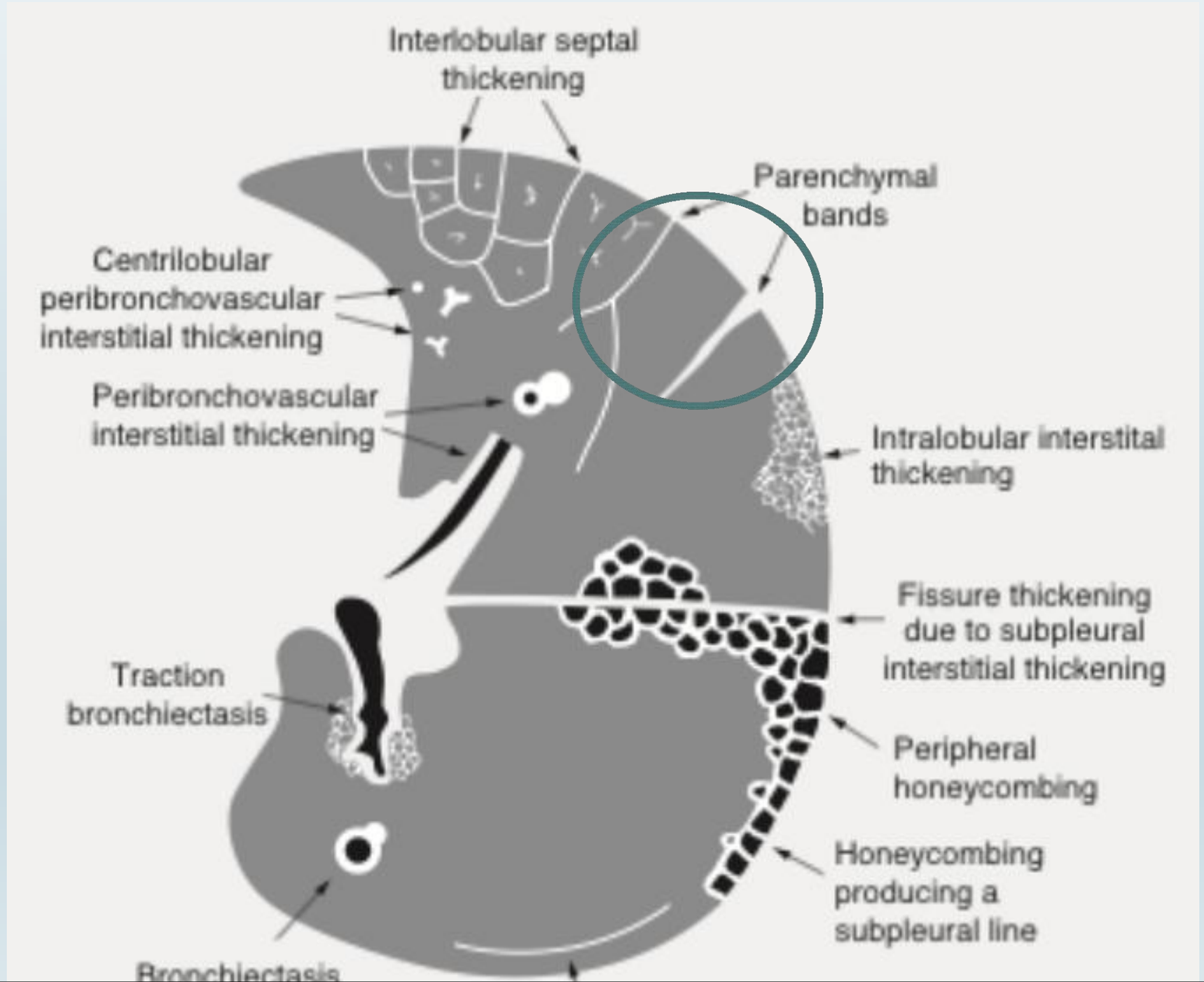
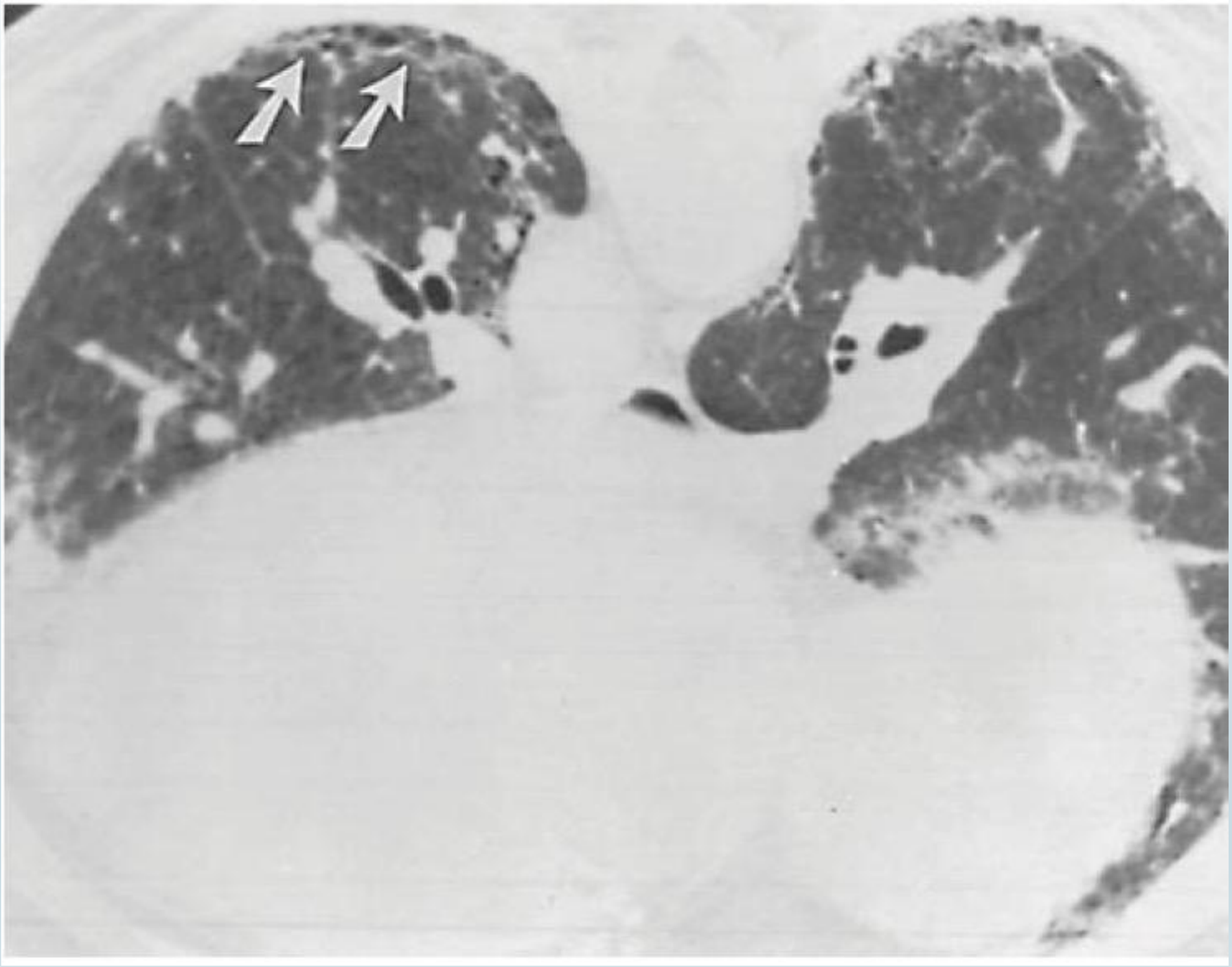


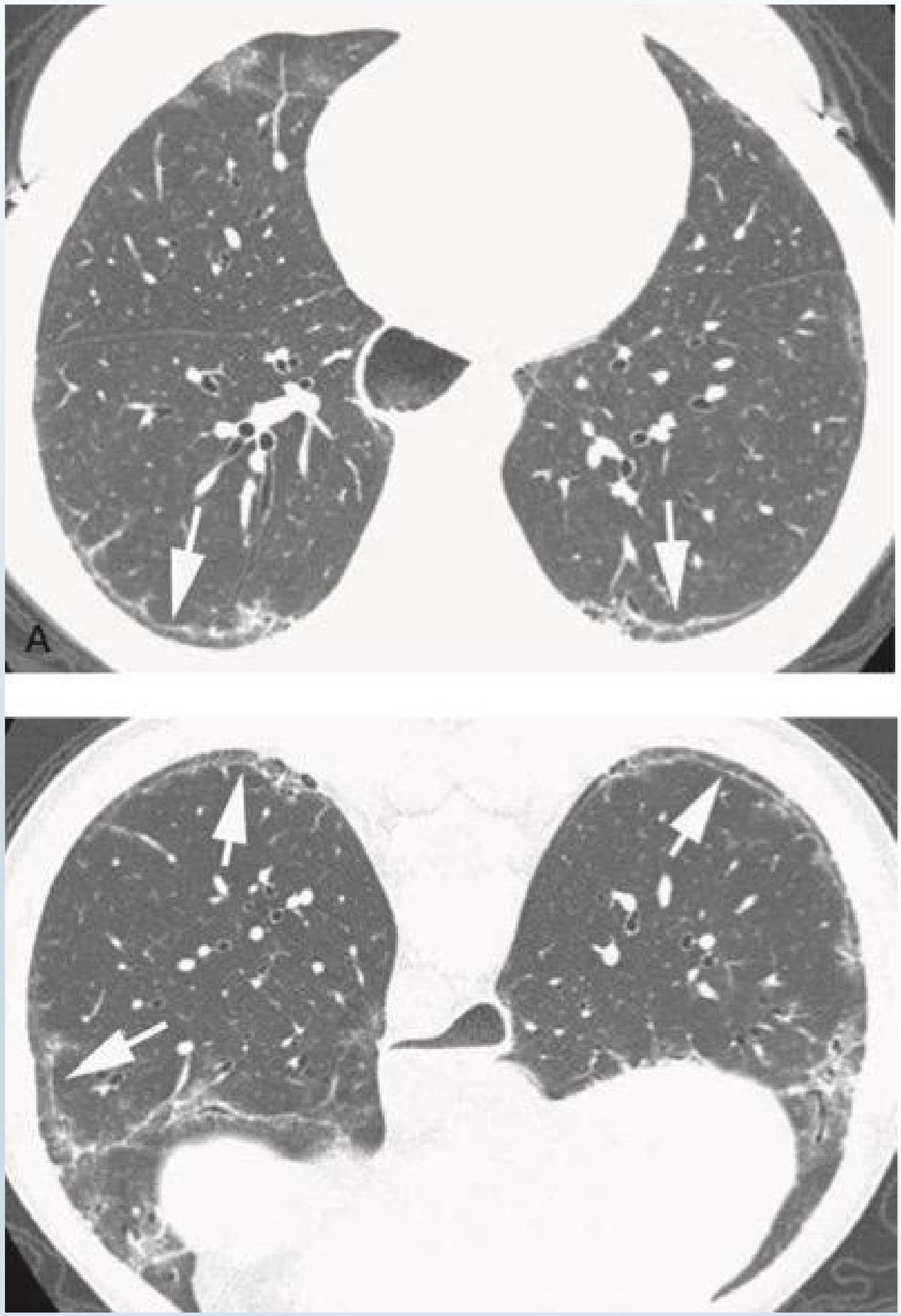
TABLE 3-9 Differential Diagnosis of Parenchymal Bands

Diagnosis	Comments
Asbestosis	Multiple parenchymal bands common; smooth; associated with thickened pleura
Sarcoidosis	Common; associated with septal thickening
Silicosis/CWP	In association with progressive massive fibrosis and emphysema
Tuberculosis	Associated with scarring
IPF or other cause of UIP	Common; often irregular; associated with traction bronchiectasis; other findings of fibrosis predominate
NSIP	With findings of ground-glass opacity and reticulation
Silicosis/CWP, talcosis	Conglomerate masses
HP (chronic)	Sometimes visible; often irregular; associated with traction bronchiectasis
Ankylosing spondylitis	Apical

条、带病症胸膜下间质增厚



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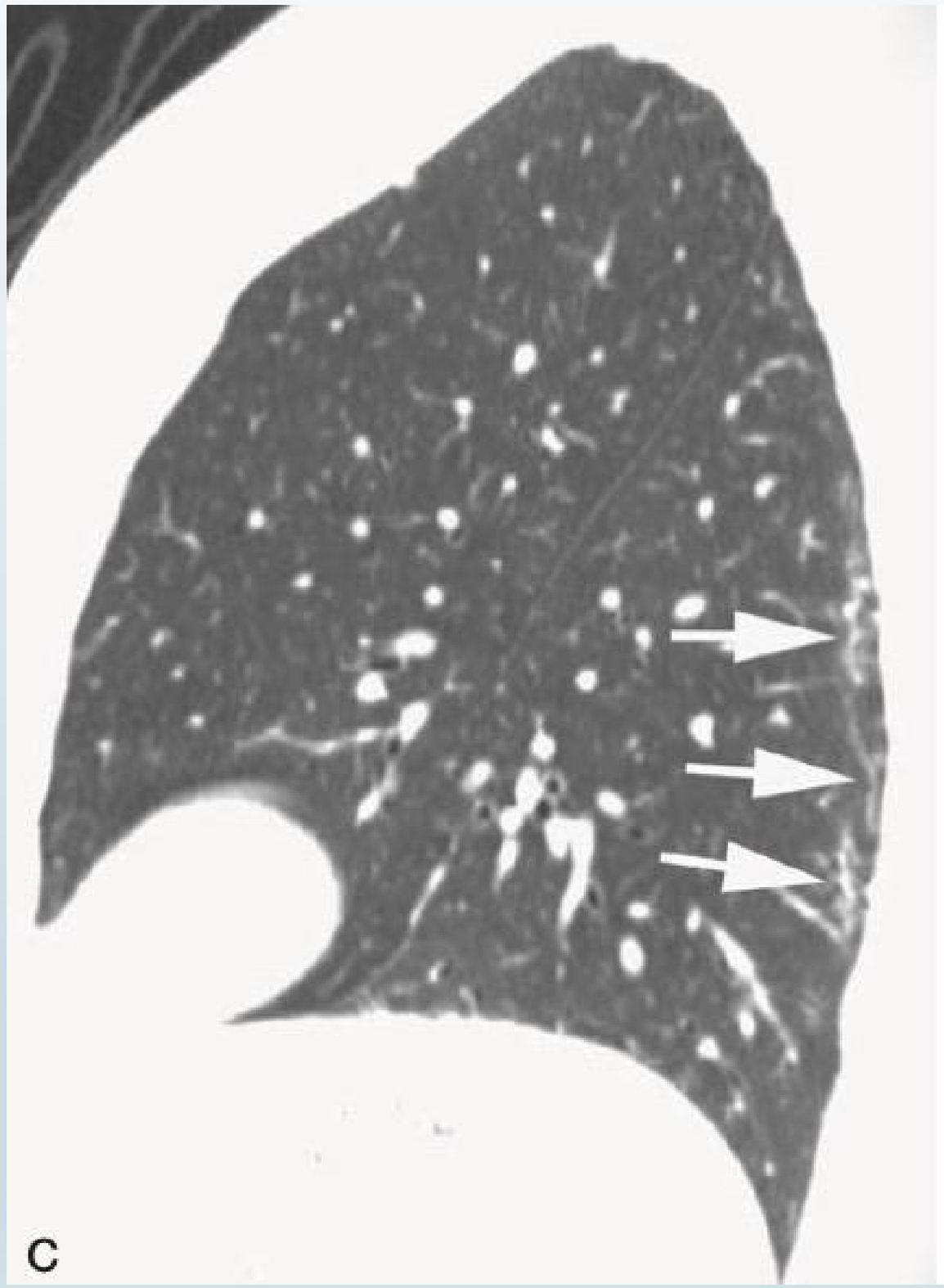
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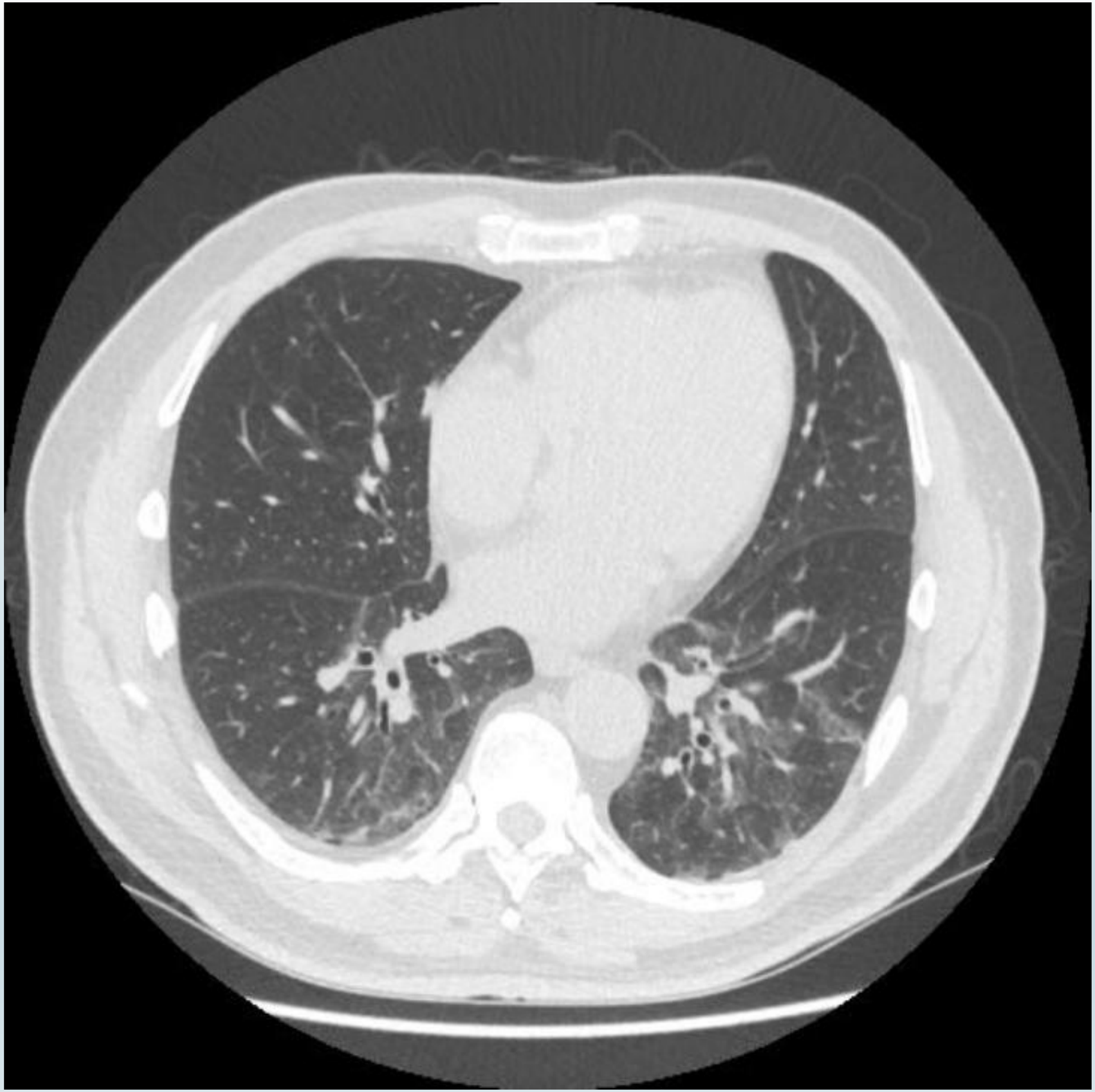
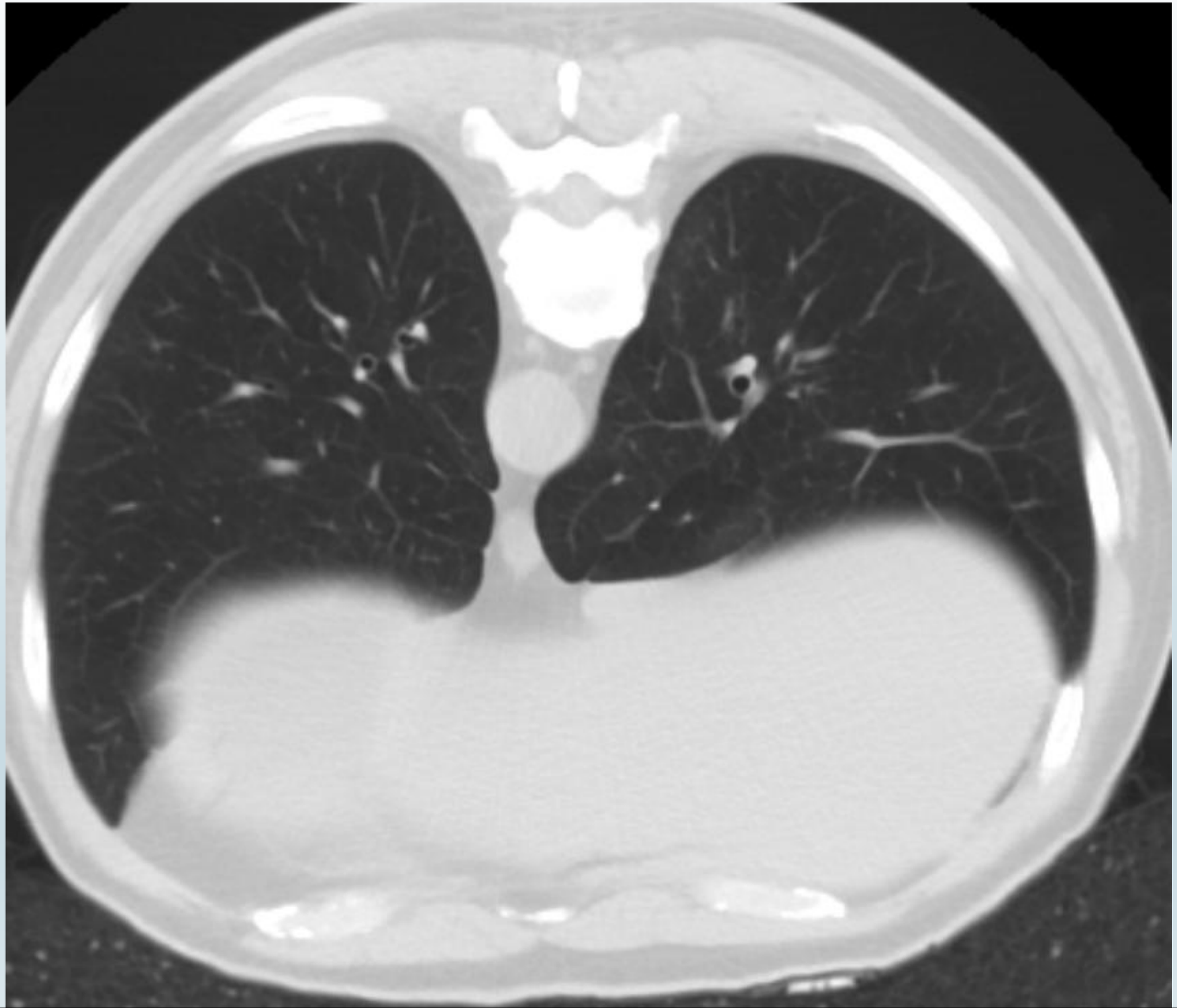




病变分布的诊断价值

TABLE 3-10 Predominance of Lung Disease on HRCT: Central Lung Versus Peripheral Lung

Lung disease	Findings
Central Lung	
Sarcoidosis	Peribronchovascular nodules; conglomerate fibrosis with traction bronchiectasis
Silicosis	Conglomerate masses of fibrosis
Talcosis	Conglomerate masses of fibrosis
Lymphangitic spread of carcinoma	Peribronchovascular interstitial thickening or nodules
HP	Peribronchovascular fibrosis in some
NSIP	Peribronchovascular fibrosis in some
Peripheral Lung	
UIP, IPF, collagen diseases, asbestosis	Subpleural fibrosis; honeycombing
NSIP in 50%	Subpleural ground-glass opacity; reticulation; subpleural sparing

TABLE 3-11 Predominance of Lung Disease on HRCT: Upper Lung Versus Lower Lung

Lung disease	Findings
Upper Lung	
Sarcoidosis	Nodules, fibrosis, conglomerate masses
Silicosis	Nodules, conglomerate masses
Talcosis	Conglomerate masses of fibrosis
Chronic HP	Mid- to upper-lung predominance typical
Langerhans cell histiocytosis	Reticulation in a few percent
Pleuroparenchymal fibroelastosis	Rare, reticulation traction bronchiectasis, honeycombing; pleural thickening
Lower Lung	
Pulmonary edema	Septal thickening
Lymphangitic carcinoma and lymphoproliferative diseases	Septal thickening
UIP, IPF, collagen diseases, asbestosis	Subpleural fibrosis; honeycombing
NSIP	Peripheral reticulation
Other IPs	Findings of fibrosis in a few

TABLE 3-12 Predominance of Lung Disease on HRCT: Posterior Lung Versus Anterior Lung

Lung disease	Findings
Posterior lung	
UIP, NSIP	Fibrosis
Asbestosis	Fibrosis
Collagen-vascular disease	Fibrosis
Silicosis	Fibrosis; conglomerate masses
Sarcoidosis	Fibrosis; conglomerate masses
Pulmonary edema	Septal thickening
Lymphangitic carcinoma and lymphoproliferative disease	Septal thickening
HP	Findings of fibrosis
Anterior lung	
Post-ARDS fibrosis	Subpleural fibrosis; honeycombing; traction bronchiectasis
Radiation fibrosis in some patients (e.g., those with breast cancer)	Reticulation; volume loss; traction bronchiectasis; honeycombing in some

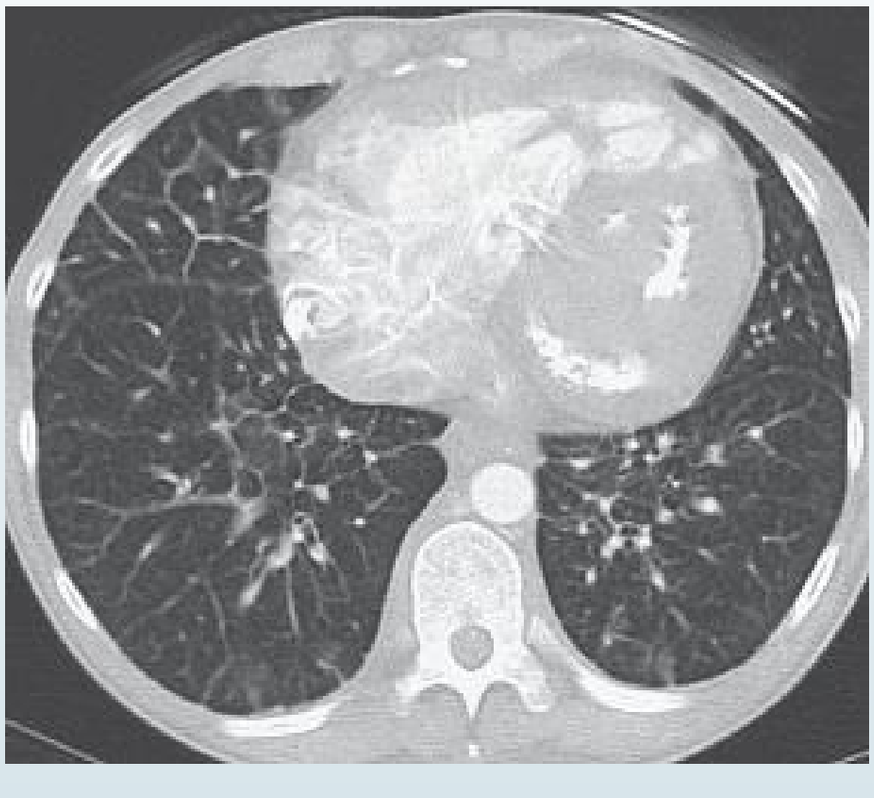


Figure 89.2

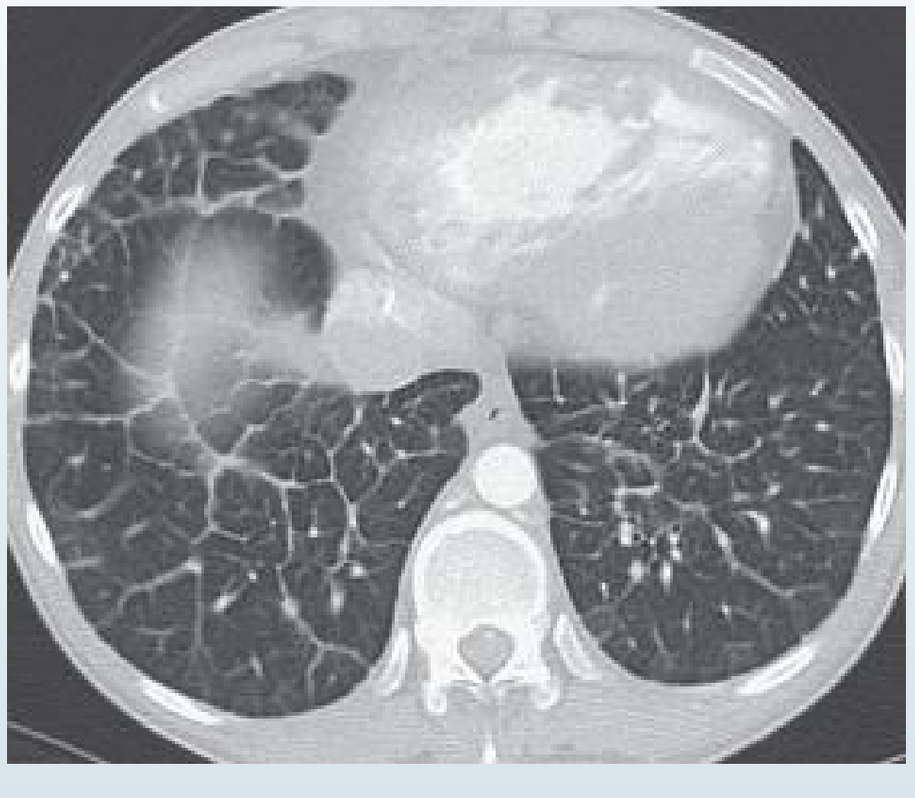
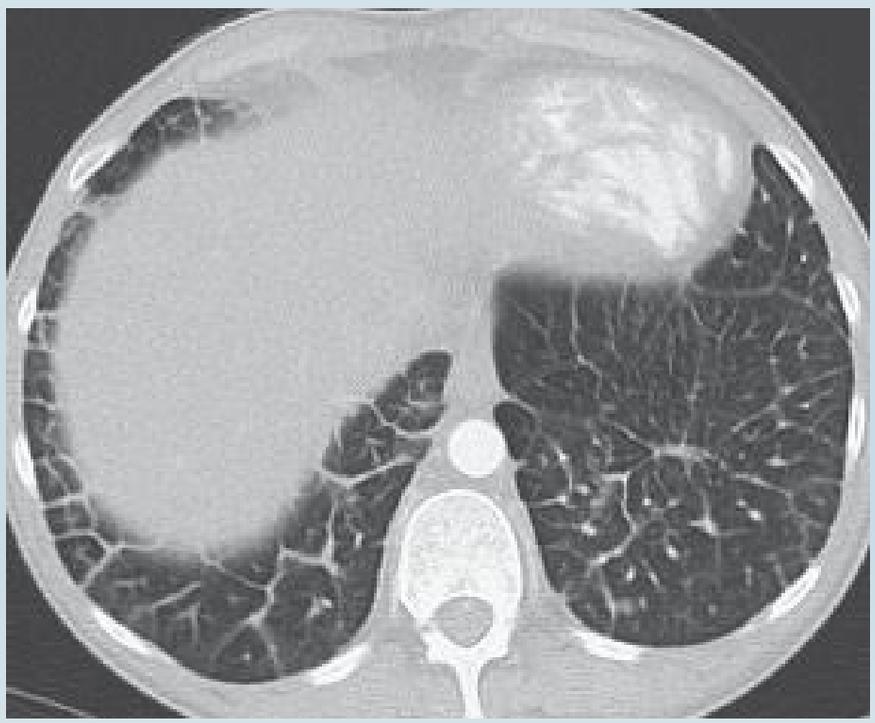


Figure 89.3



女，28，心脏病史，呼吸困难

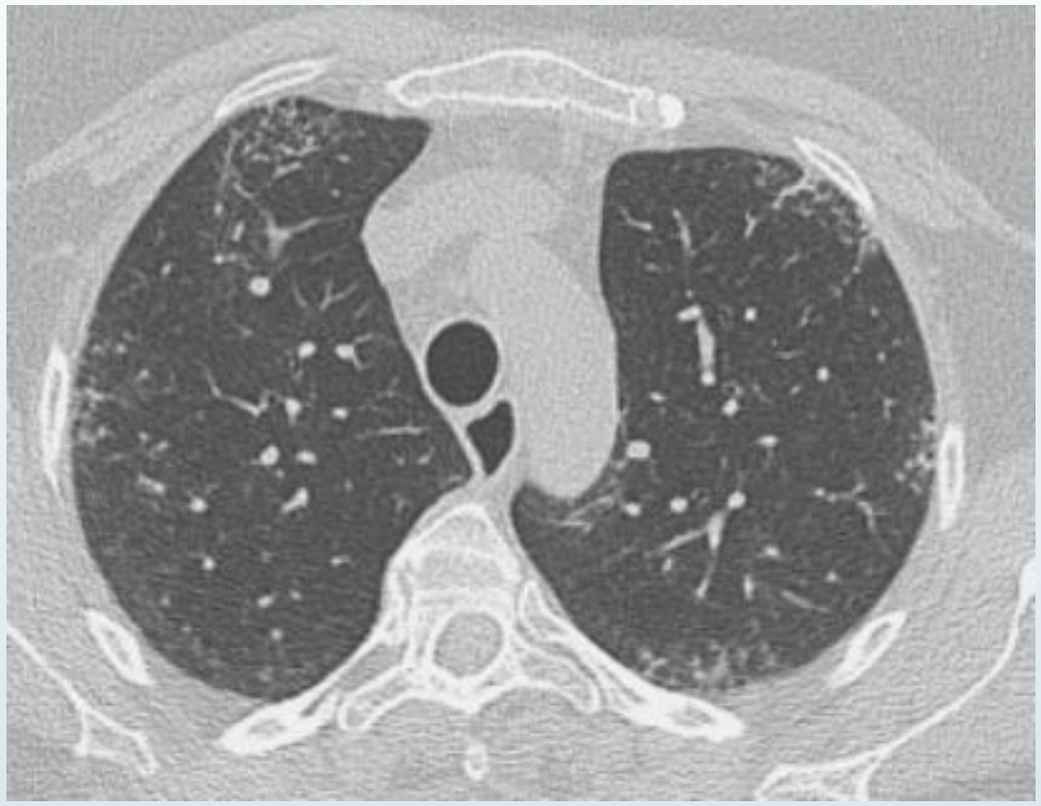


Figure 101.3

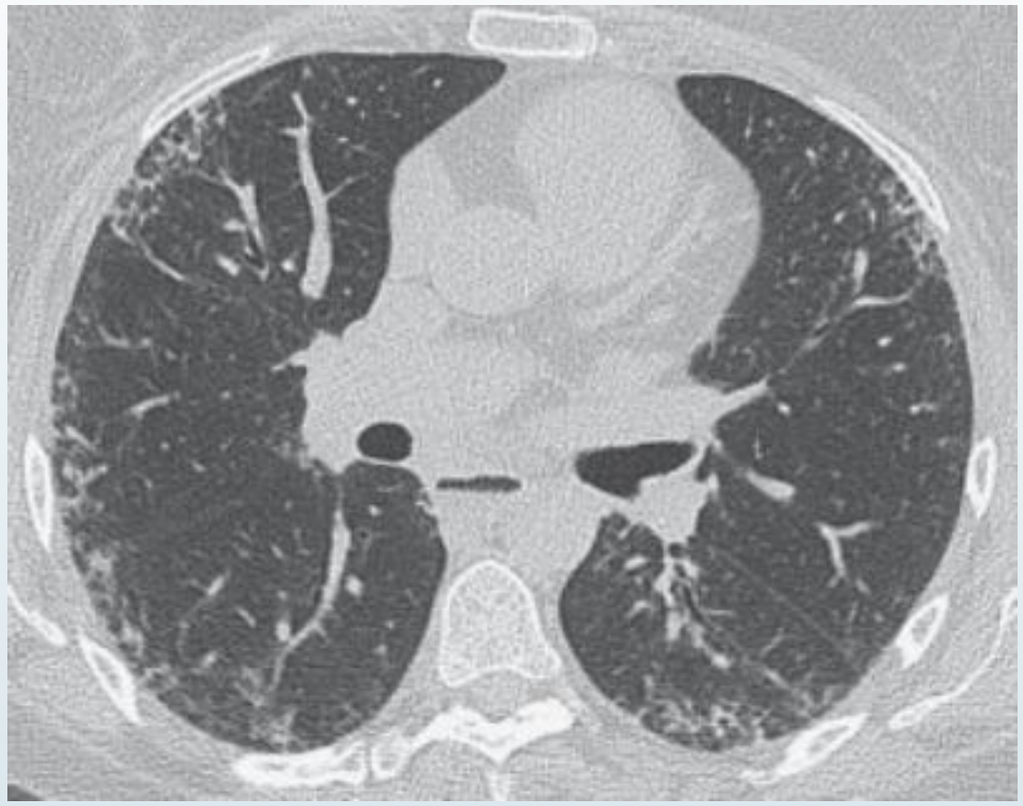
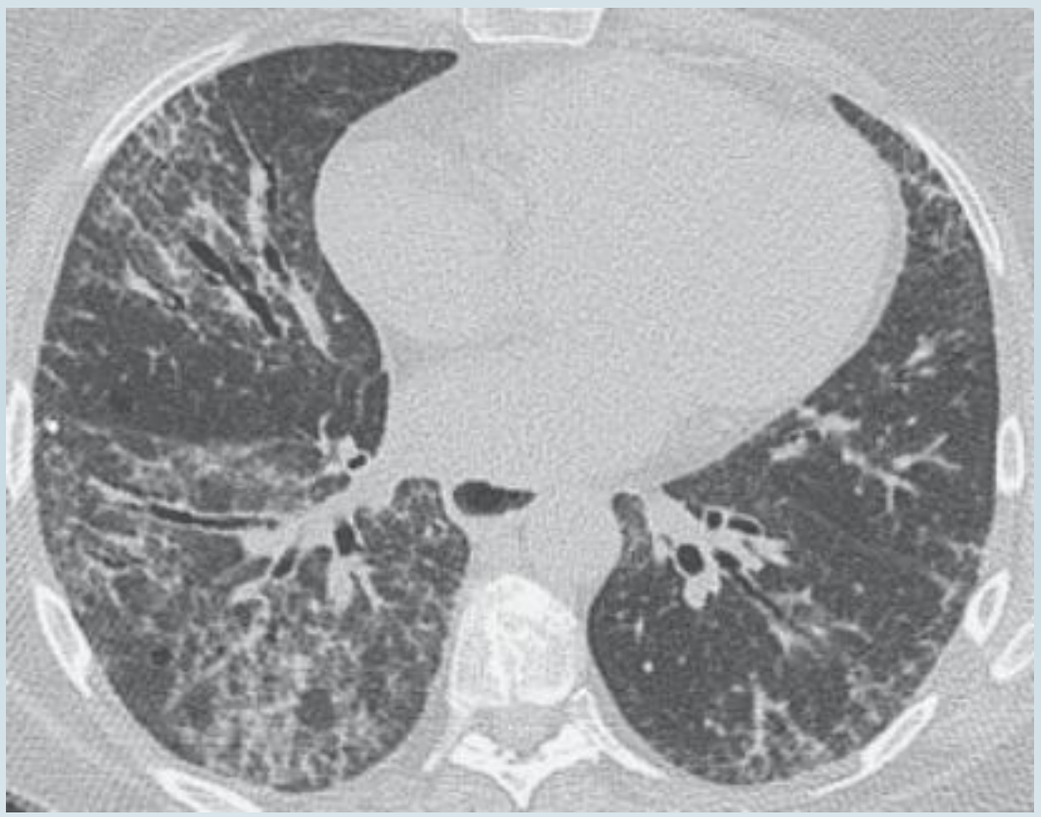


Figure 101.4

女性，44，慢性气短，混合结缔组织病。NSIP



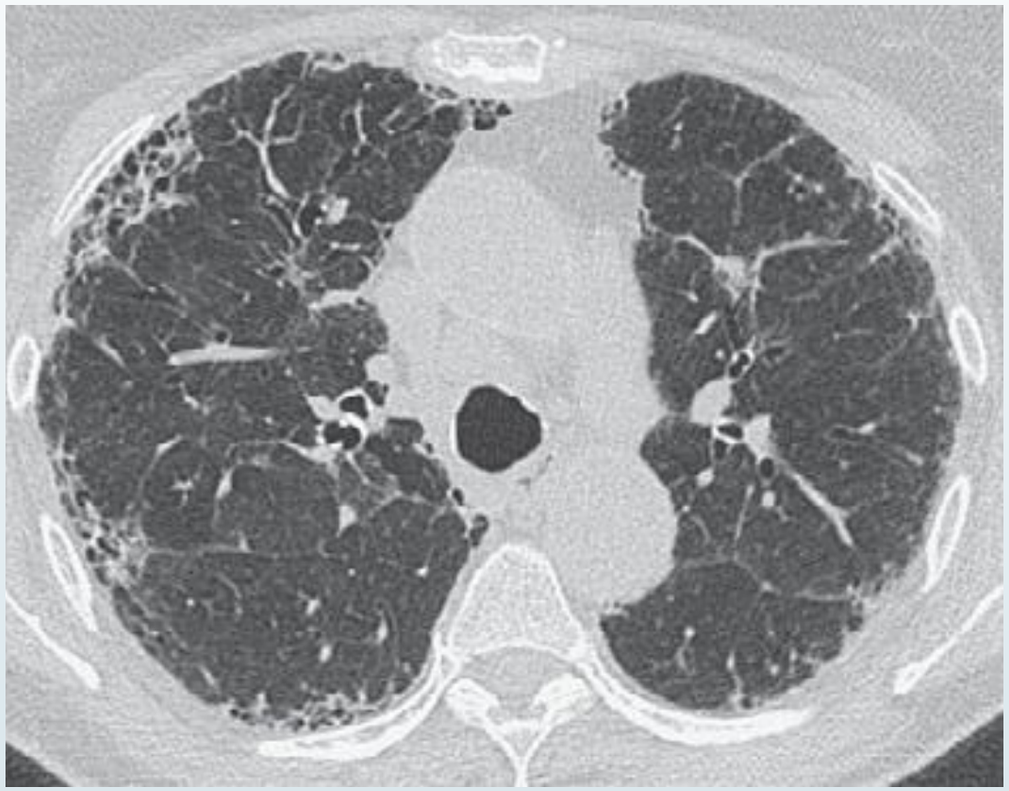


Figure 99.1

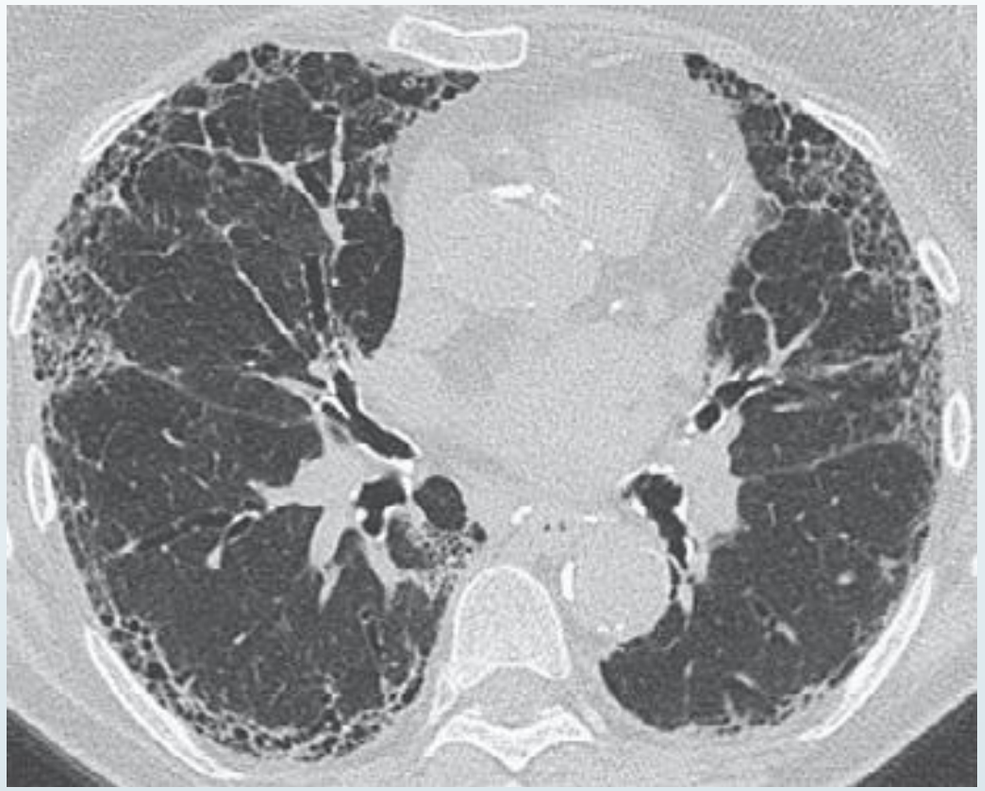
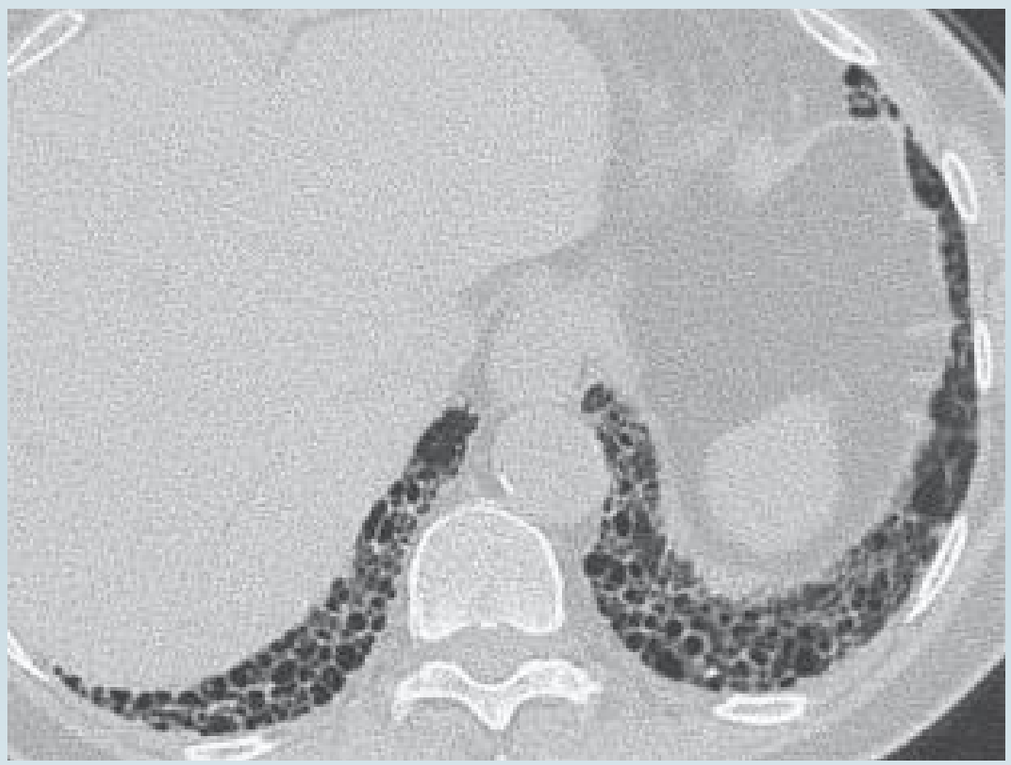
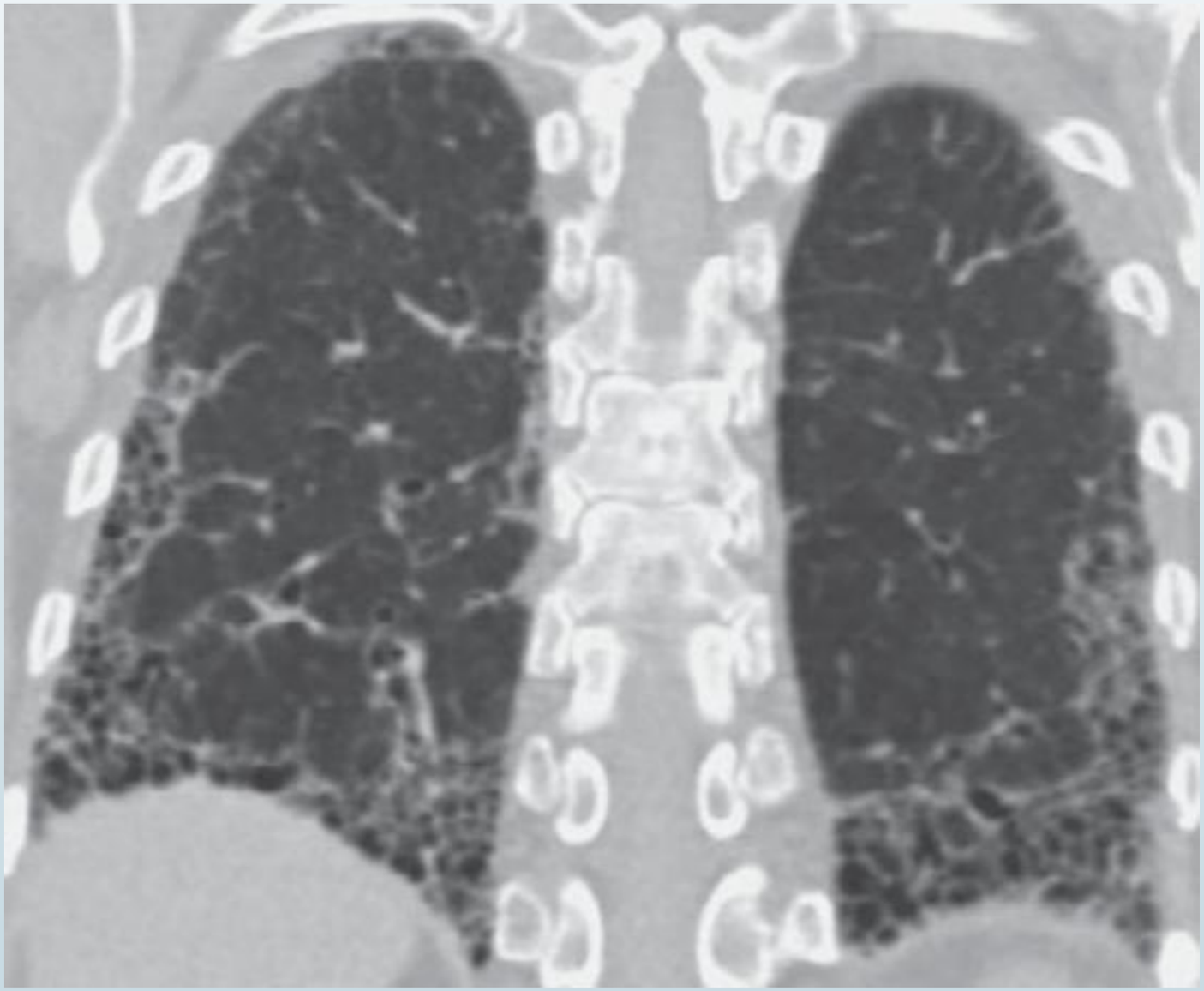
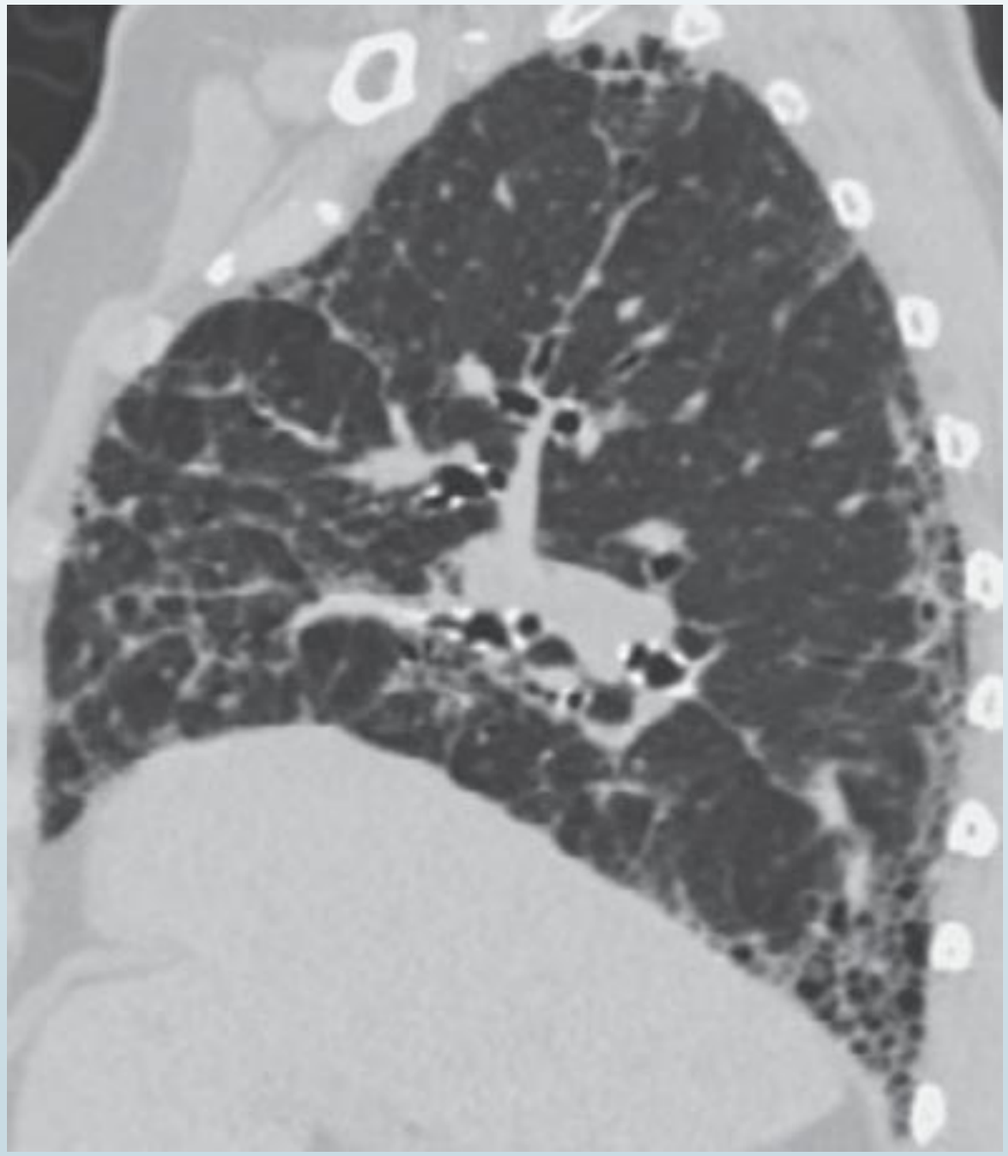


Figure 99.2

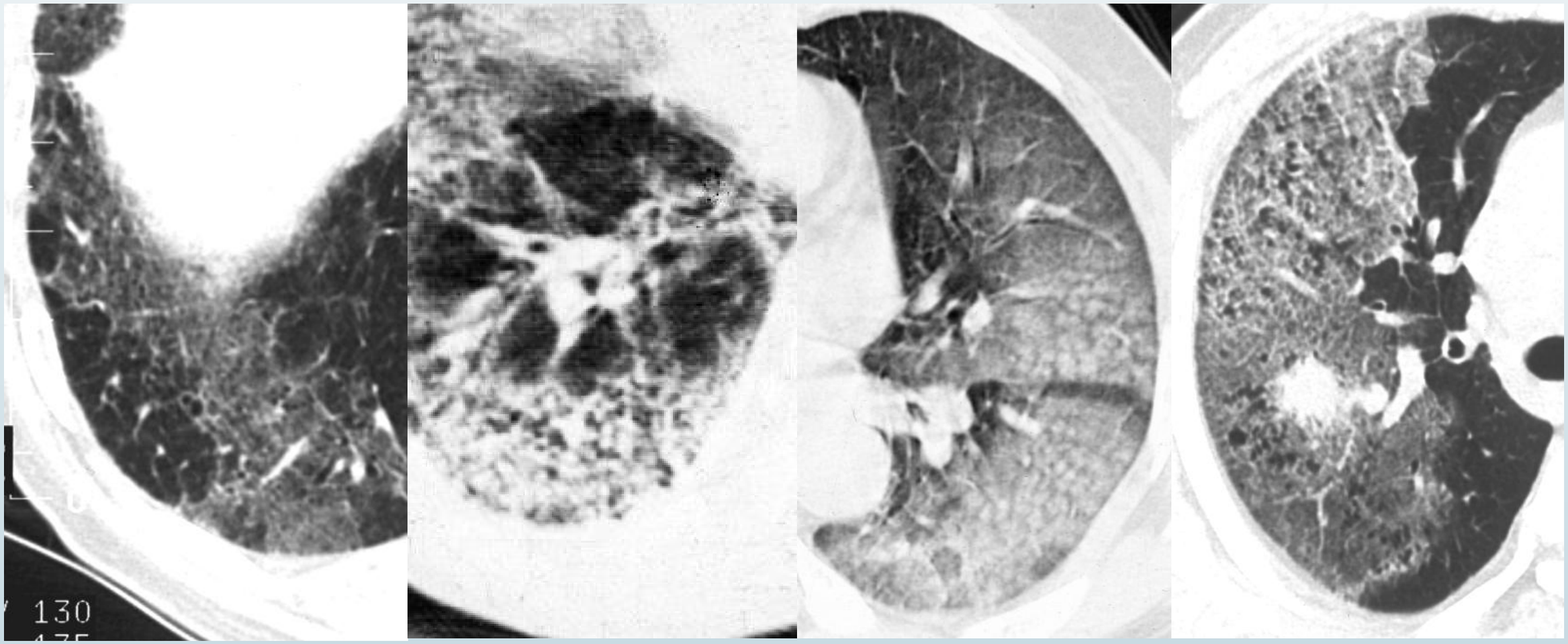


女性，70，
干咳

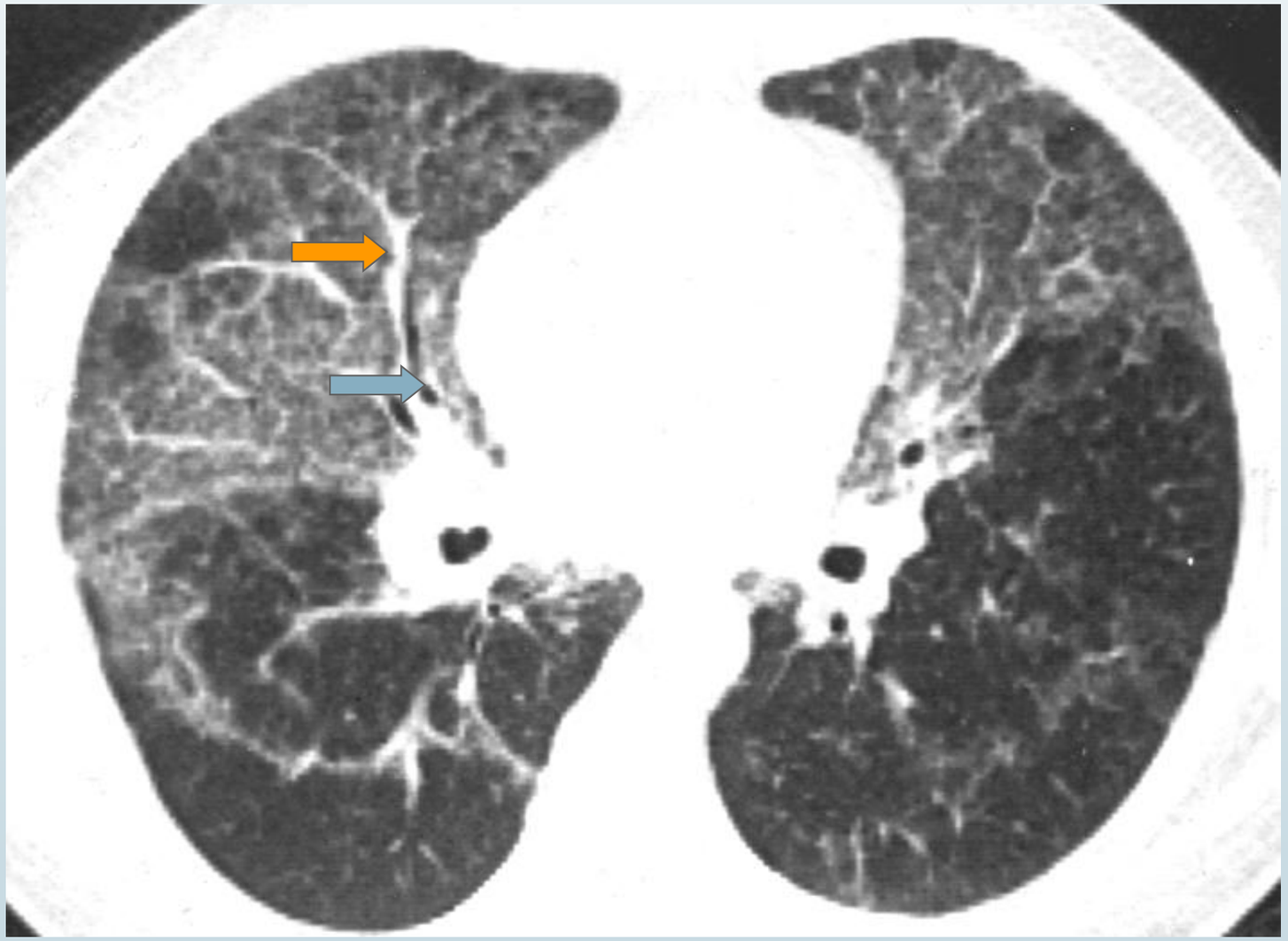




磨玻璃密度



不掩盖肺血管和支气管壁



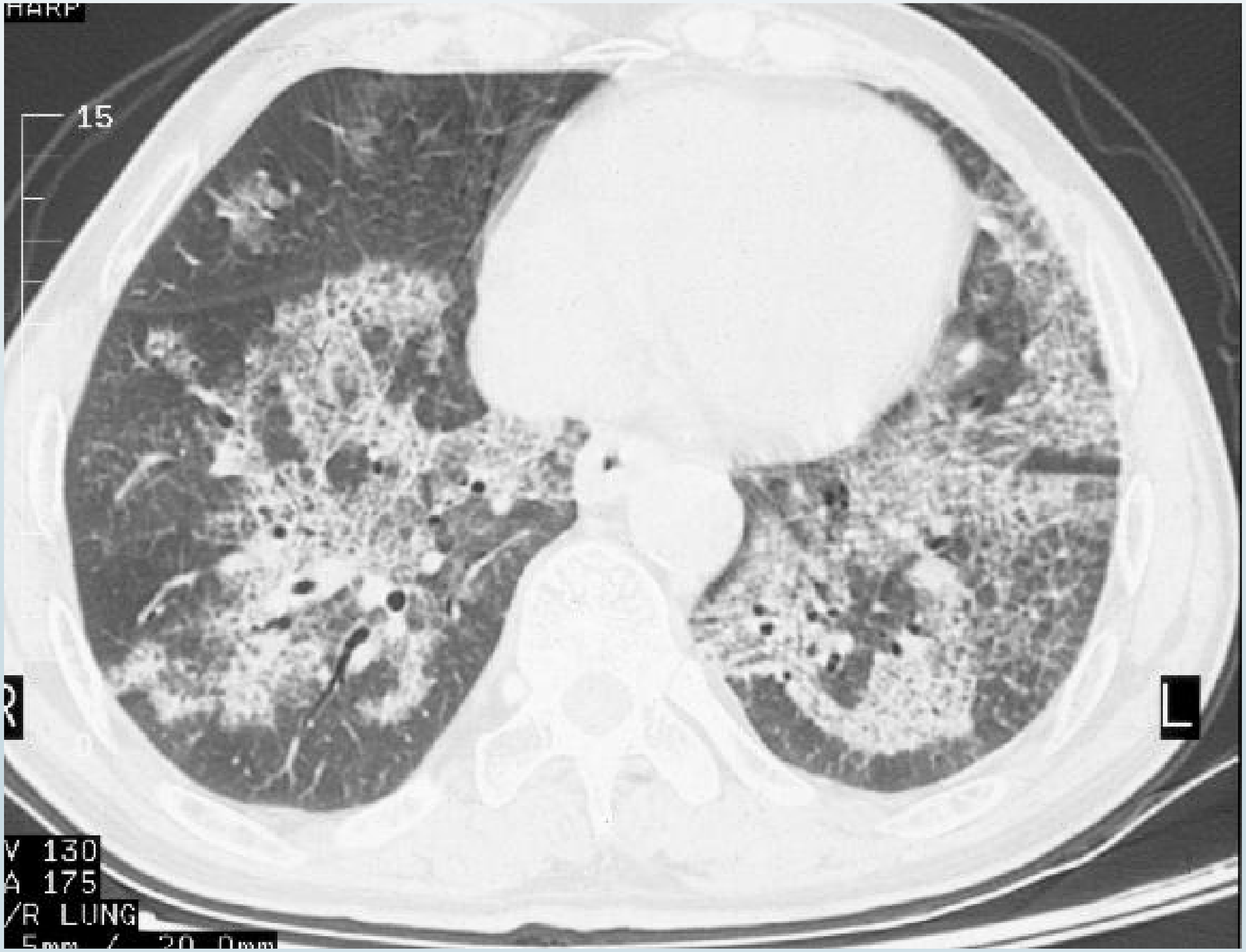
所指为血管

所指为支气管壁

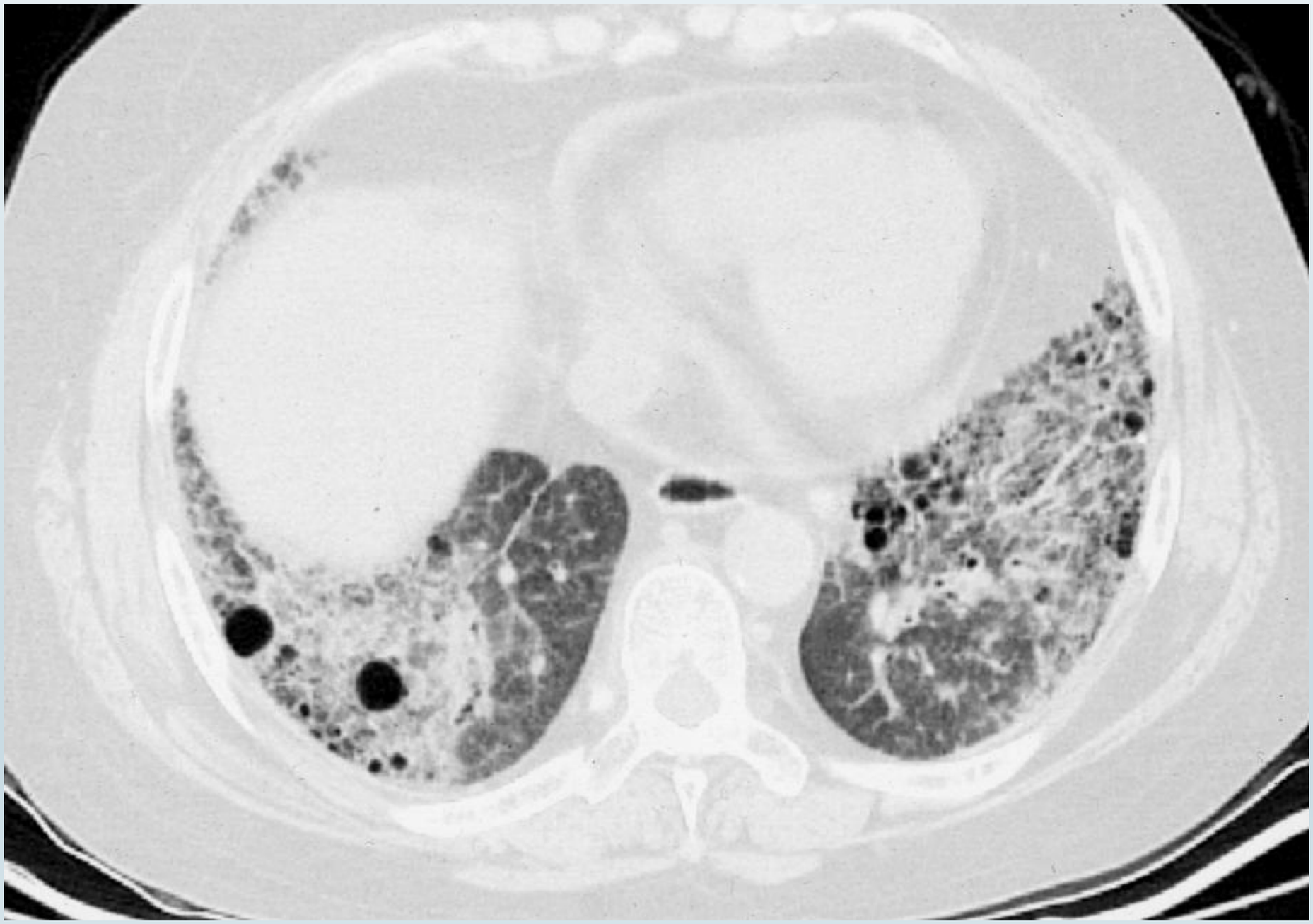
磨玻璃密度的病理意义

- 肺泡的部分添充
- 间质的增厚及其引起的肺泡部分萎陷
- 肺毛细血管血容量增加

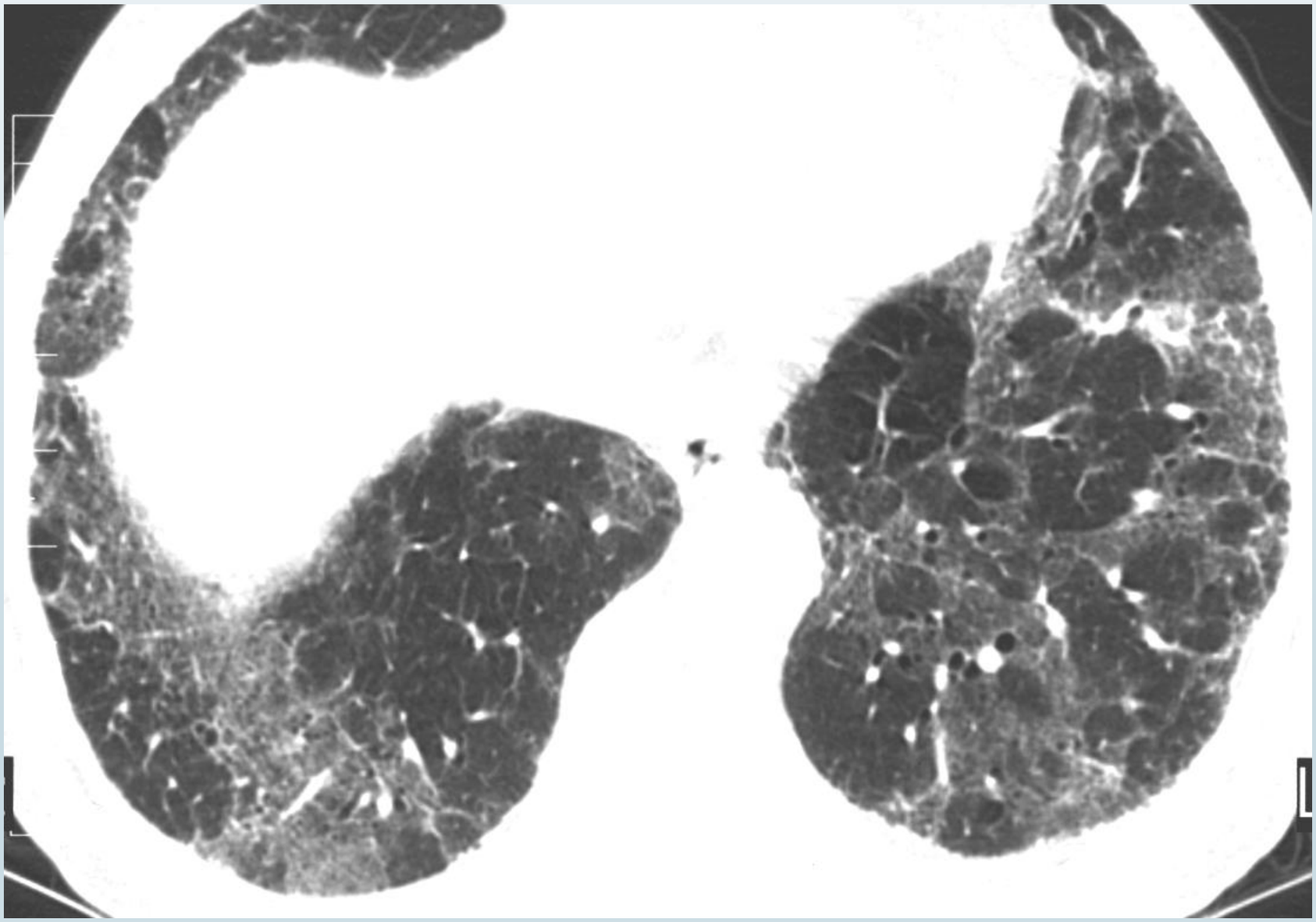
肺泡的部分添充



间质的增厚



肺毛细血管血容量增加

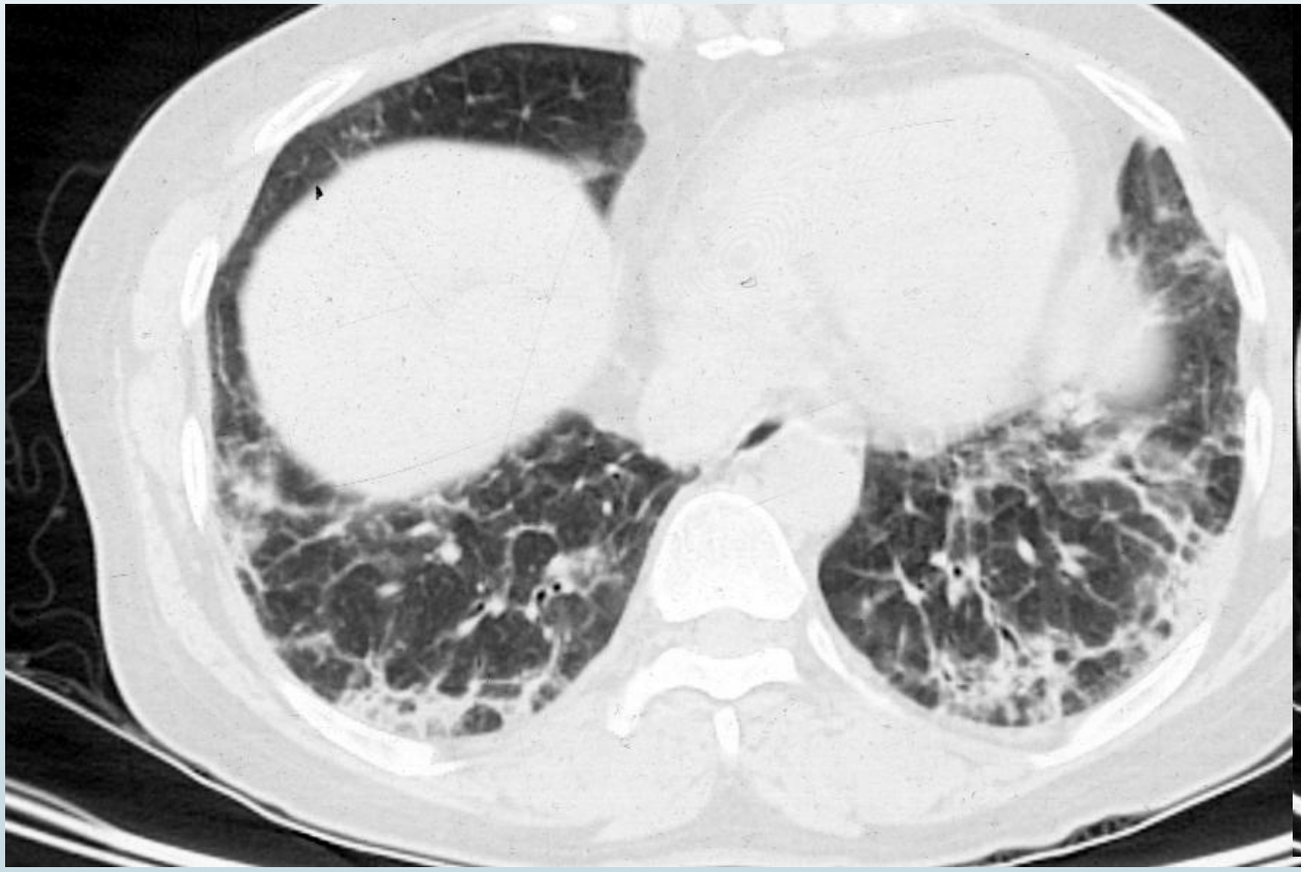


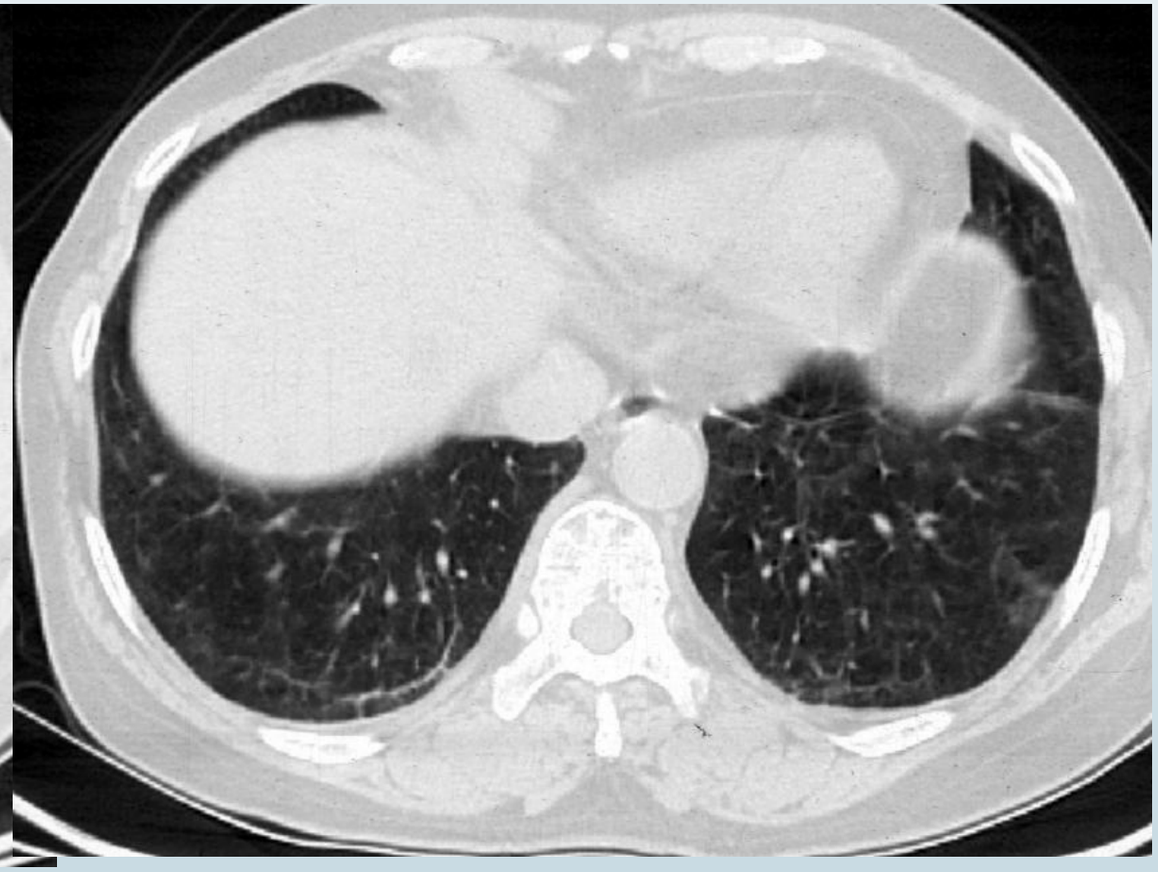
病例1

- 女性，54岁
- 咳漱，咳痰二个月，呼吸困难
- 双肺可闻及小水泡音

- HRCT扫描可见双肺中下部分布有胸膜下磨玻璃密度，未见蜂窝影伴随
- 结合病史和影象表现诊断为间质纤维化，用糖皮质激素治疗二月后临床症状缓解，肺部病灶基本消退

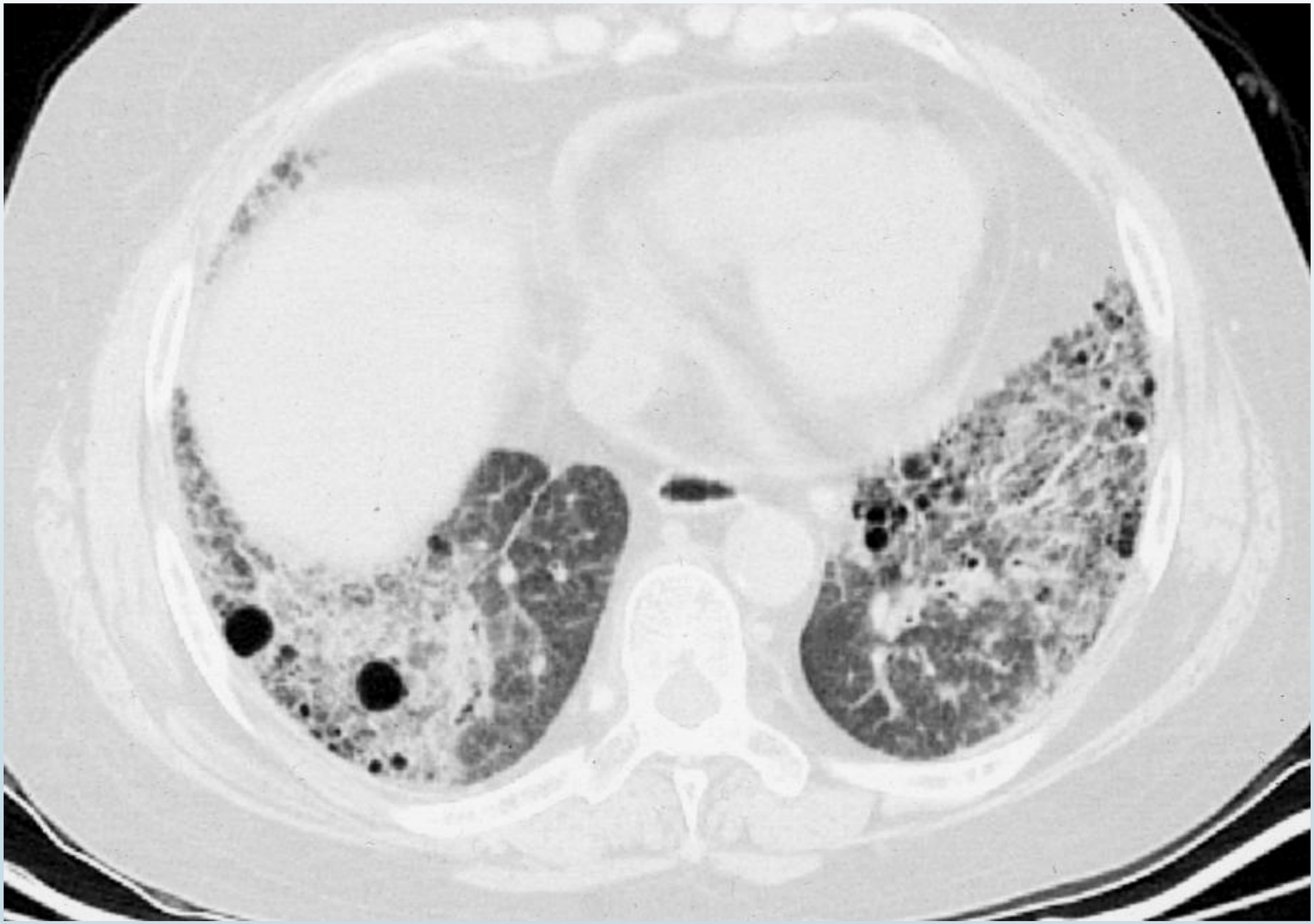
病例1

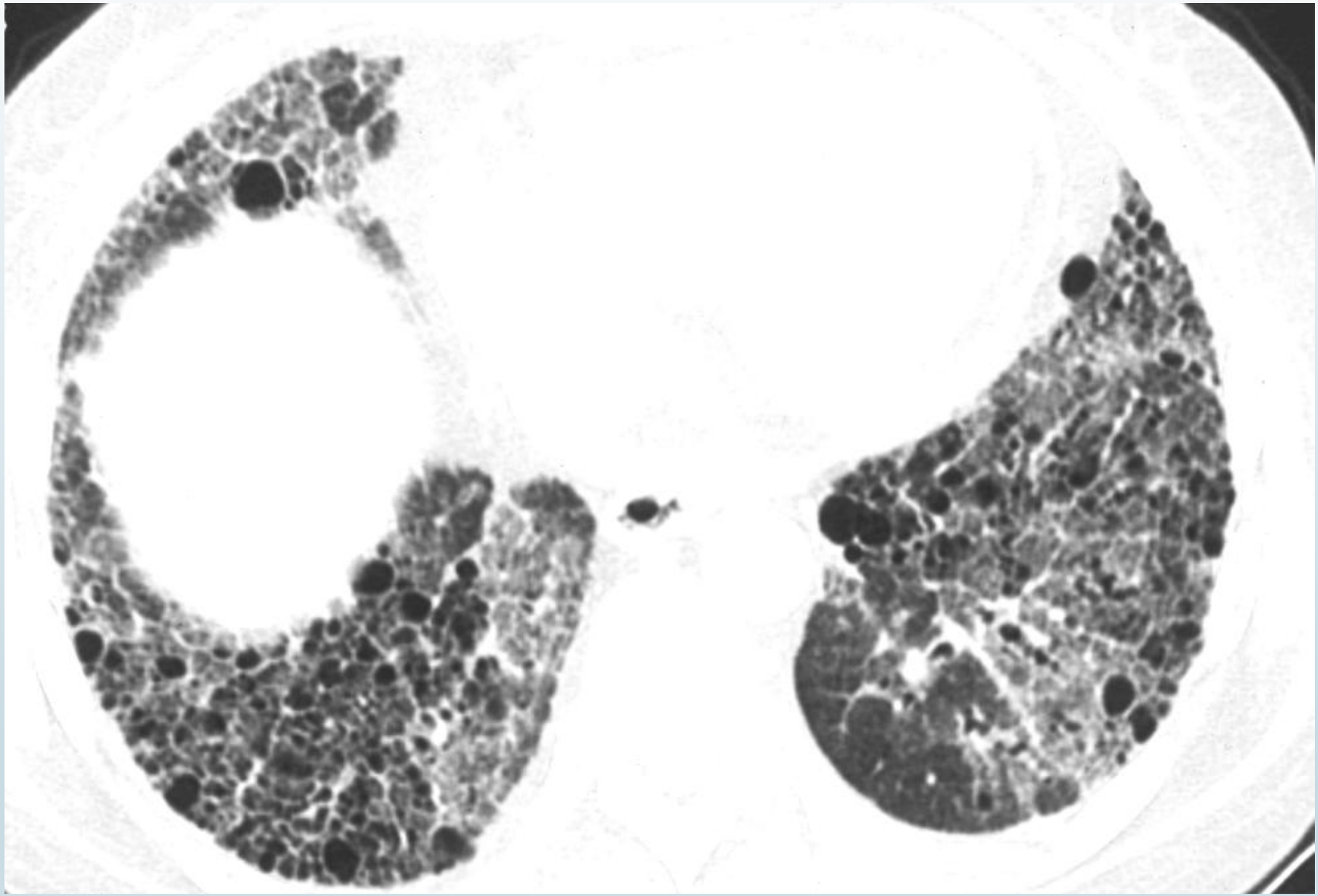




激素治疗前

激素治疗二月后

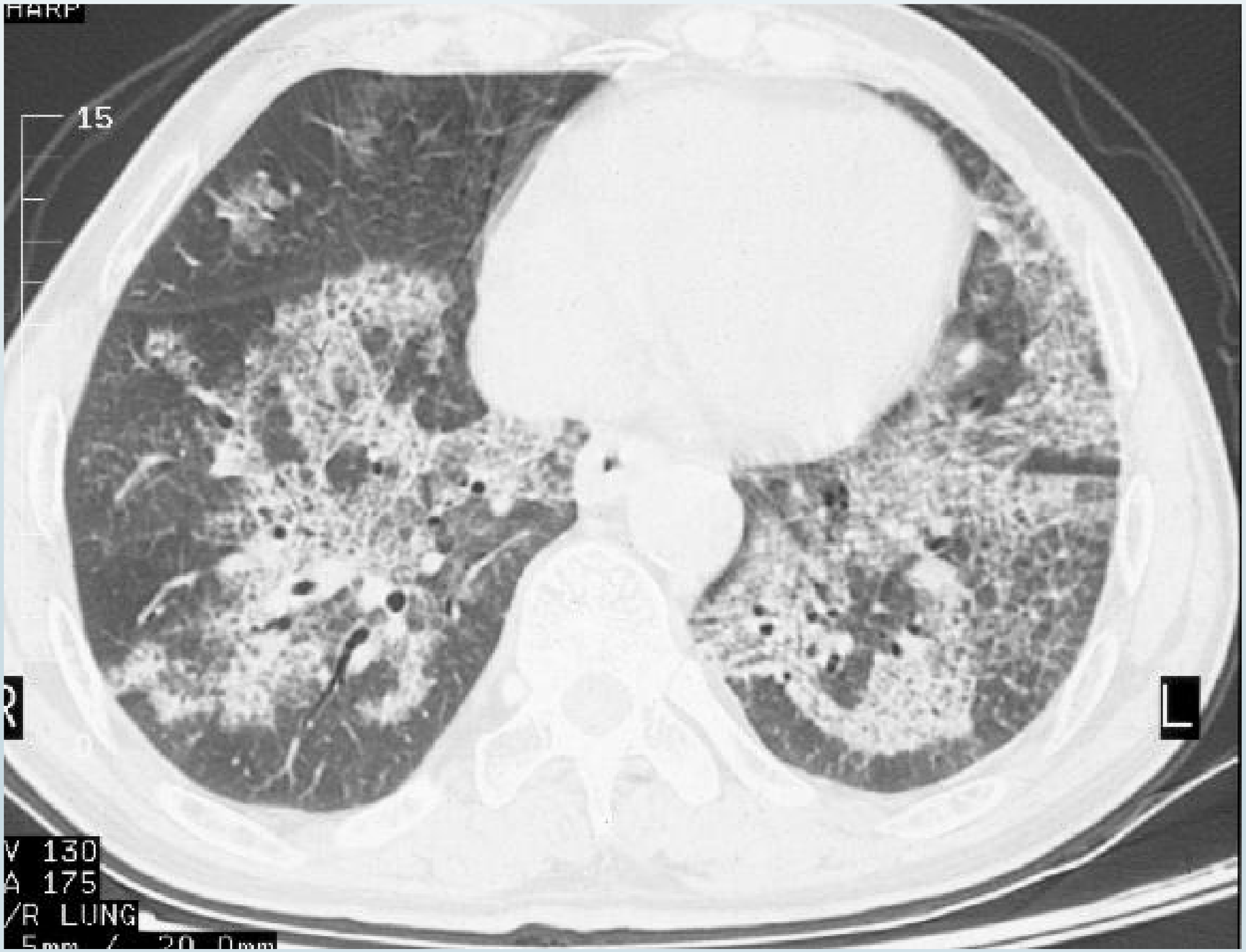




病例2

- 男性，55岁
- 轻度咳漱，咳白痰半年
- 肺部可闻及少量水泡音

- HRCT可见双肺弥漫分布斑片状磨玻璃密度，分布上以中内带为主
- 结合临床和影象，拟诊疾病有肺泡蛋白沉着症，肺泡癌，淋巴瘤，类脂质肺炎



经肺活检证实为肺泡蛋白沉着症

- 小叶间隔增厚
- 蜂窝
- 小叶内间质增厚
- 网状影
- 界面征
- 牵拉性支气（毛细）管扩张
- 支气管-血管束增粗
- 条带病灶
- 胸膜下间质增厚
- 病变分布的诊断价值
- 磨玻璃密度病灶
- 弥漫小结节

* 谢谢

* 2018-05-26