Hipersensitivite Pnömonisi Olgusu

Prof. Dr. Talat KILIÇ
İnönü Üniversitesi Tıp Fakültesi Göğüs Hastalıkları AbD

30.11.2024

DİYARBAKIR

Öykü

* 53 yaş kadın hasta
* Malatya
* Evhanımı
* Nefes darlığı;15 yıldır var, son 2 yıldır artmış
* Öksürük; 2 aydır
* Balgam; 2 aydır, az miktarda, beyaz renkli var.

Özgeçmiş ve Soygeçmiş

* Sigara:5p-yıl(bir haftadır bırakmış),
* 20 yıl önce hayvancılıkla uğraşmış,
* Evde mahabbet kuşu (daha öncede papağan) besliyormuş,
* Asbest maruziyeti yok,
* 3 defa burunda polip nedeni ile opere olmuş,
* 2018 de TİA ???
* Miğren
* Beyin MR:Periventriküler ve subkortikal derin beyaz cevherde nonspesifik gliottik odaklar.

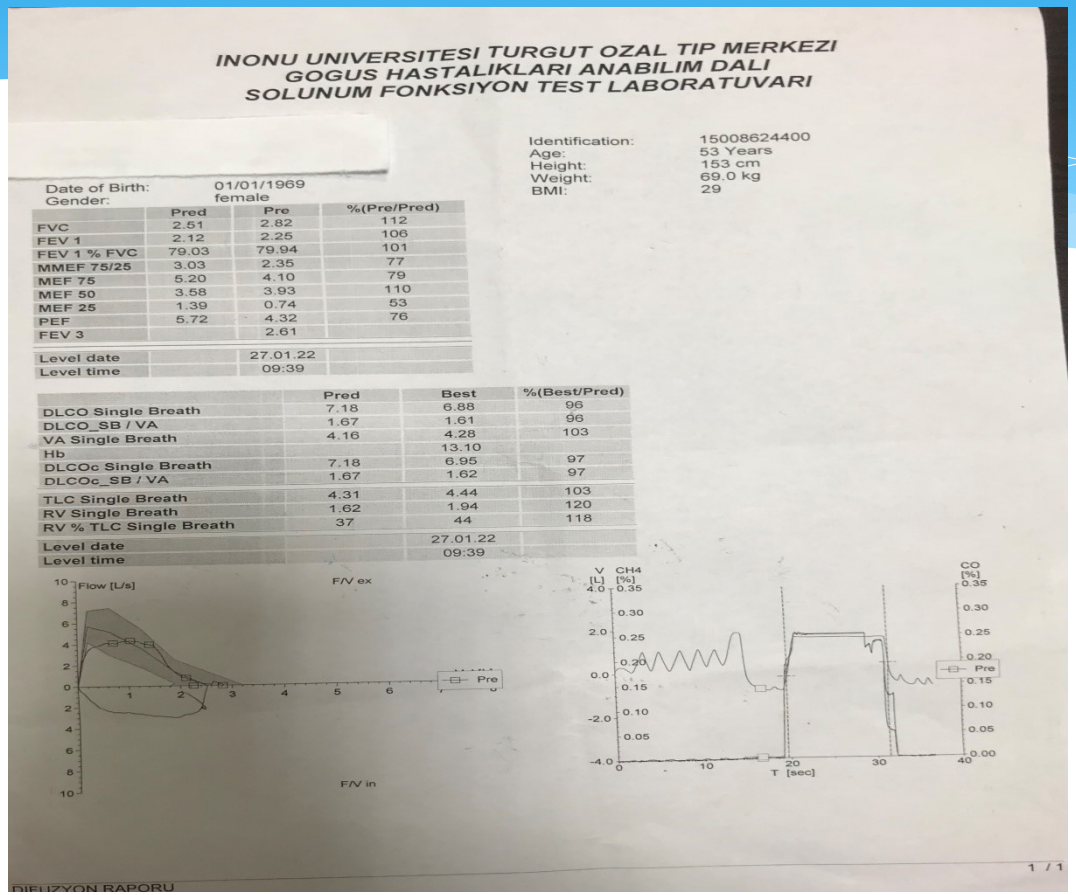
Vital Bulgular ve FM

* TA:120/70 mmHg
* N:86/dk
* S:18/dk
* Spo2:96(oda havasında)
* SS: Bilateral squeak

Laboratuvar

* CBC;normal
* Biyokimya:normal
* Kolllagen doku markırları:Negatif
* Tota IgE:635 IU/ml(N:0-87)
* Sedim:4

SFT,DLCO ve 6DYT



INONU UNIVERSITESI TURGUT OZAL TIP MERKEZI
GOGUS HASTALIKLARI ANABILIM DALI
SOLUNUM FONKSIYON TEST LABORATUVARI

Identification: 15008624400
Age: 53 Years
Height: 153 cm
Weight: 69.0 kg
BMI: 29

Date of Birth: 01/01/1969
Gender: female

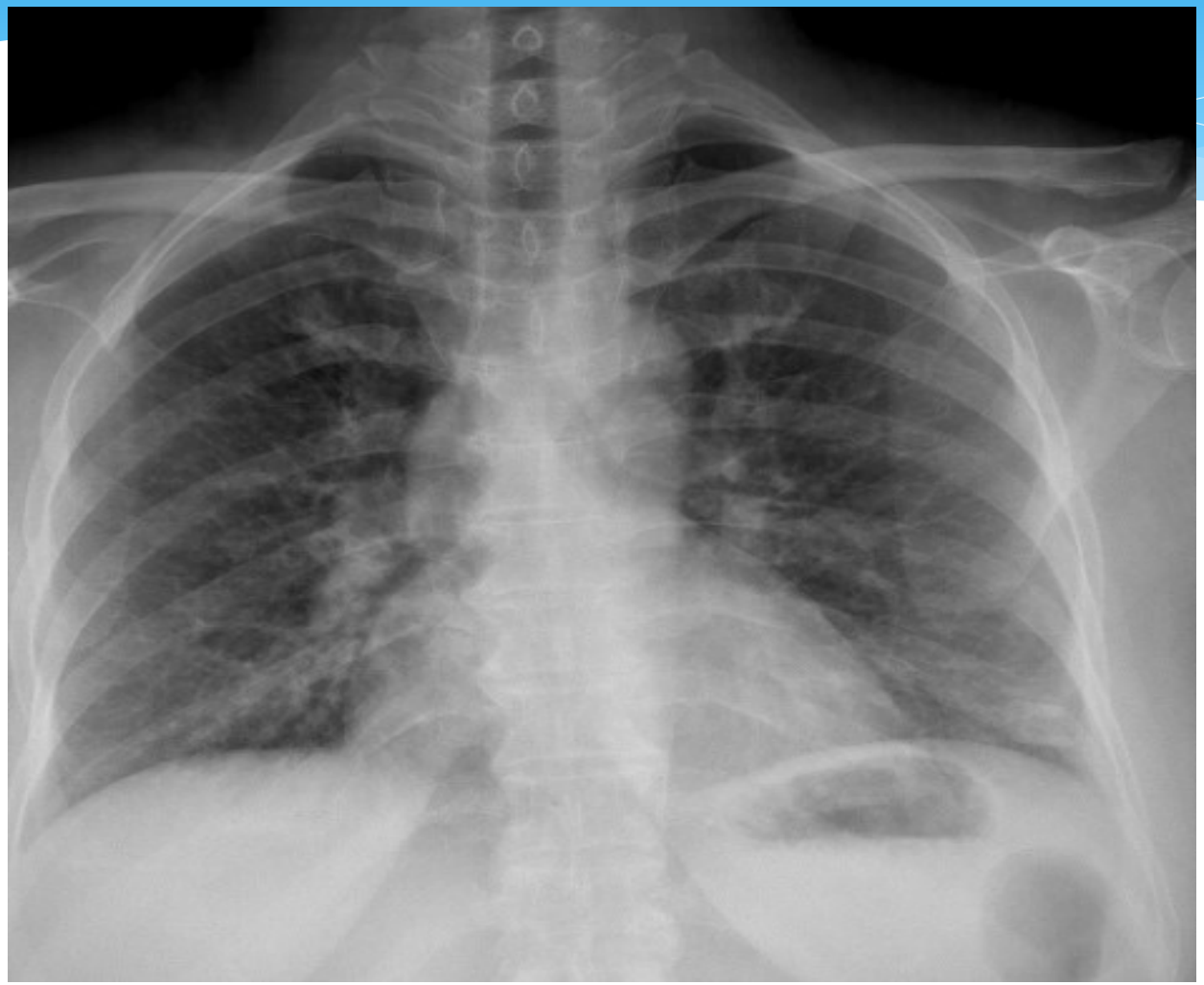
	Pred	Pre	%(Pre/Pred)
FVC	2.51	2.82	112
FEV 1	2.12	2.25	106
FEV 1 % FVC	79.03	79.94	101
MMEF 75/25	3.03	2.35	77
MEF 75	5.20	4.10	79
MEF 50	3.58	3.93	110
MEF 25	1.39	0.74	53
PEF	5.72	4.32	76
FEV 3		2.61	
Level date		27.01.22	
Level time		09:39	

	Pred	Best	%(Best/Pred)
DLCO Single Breath	7.18	6.88	96
DLCO_SB / VA	1.67	1.61	96
VA Single Breath	4.16	4.28	103
Hb		13.10	
DLCOc Single Breath	7.18	6.95	97
DLCOc_SB / VA	1.67	1.62	97
TLC Single Breath	4.31	4.44	103
RV Single Breath	1.62	1.94	120
RV % TLC Single Breath	37	44	118
Level date		27.01.22	
Level time		09:39	

DIFUZYON RAPORU
1 / 1

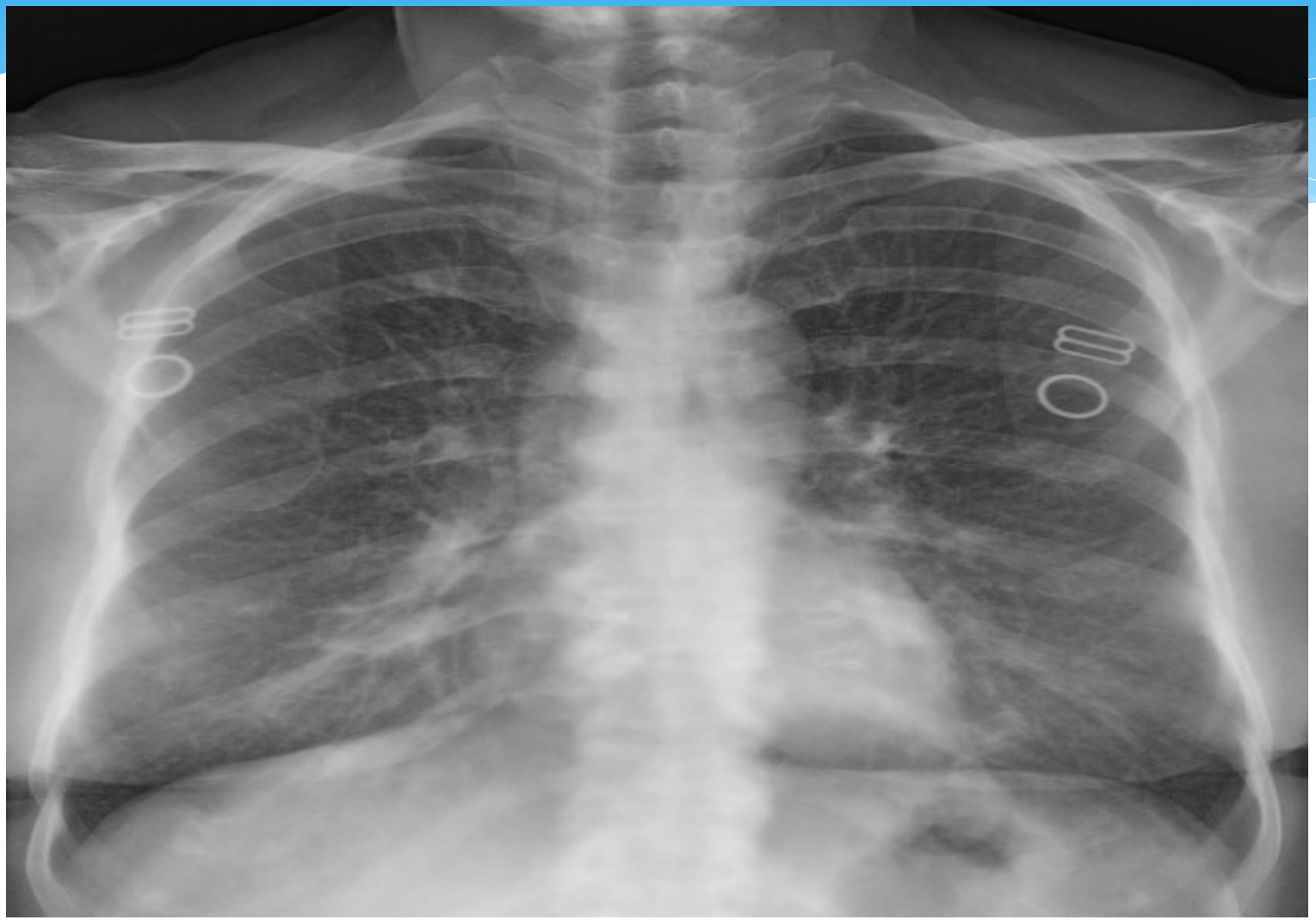
6-DYT:550 metre

Radyolojik bulgular-PA akc 2015

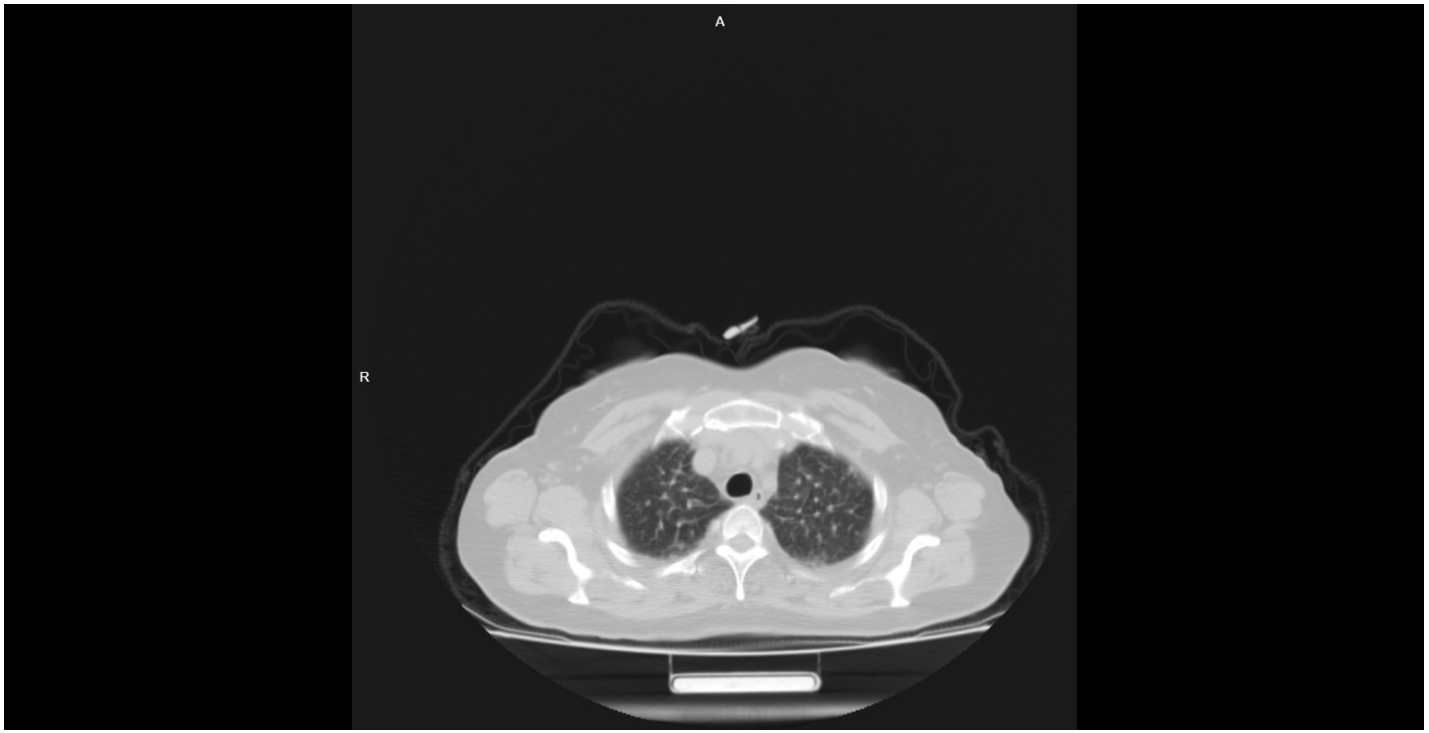


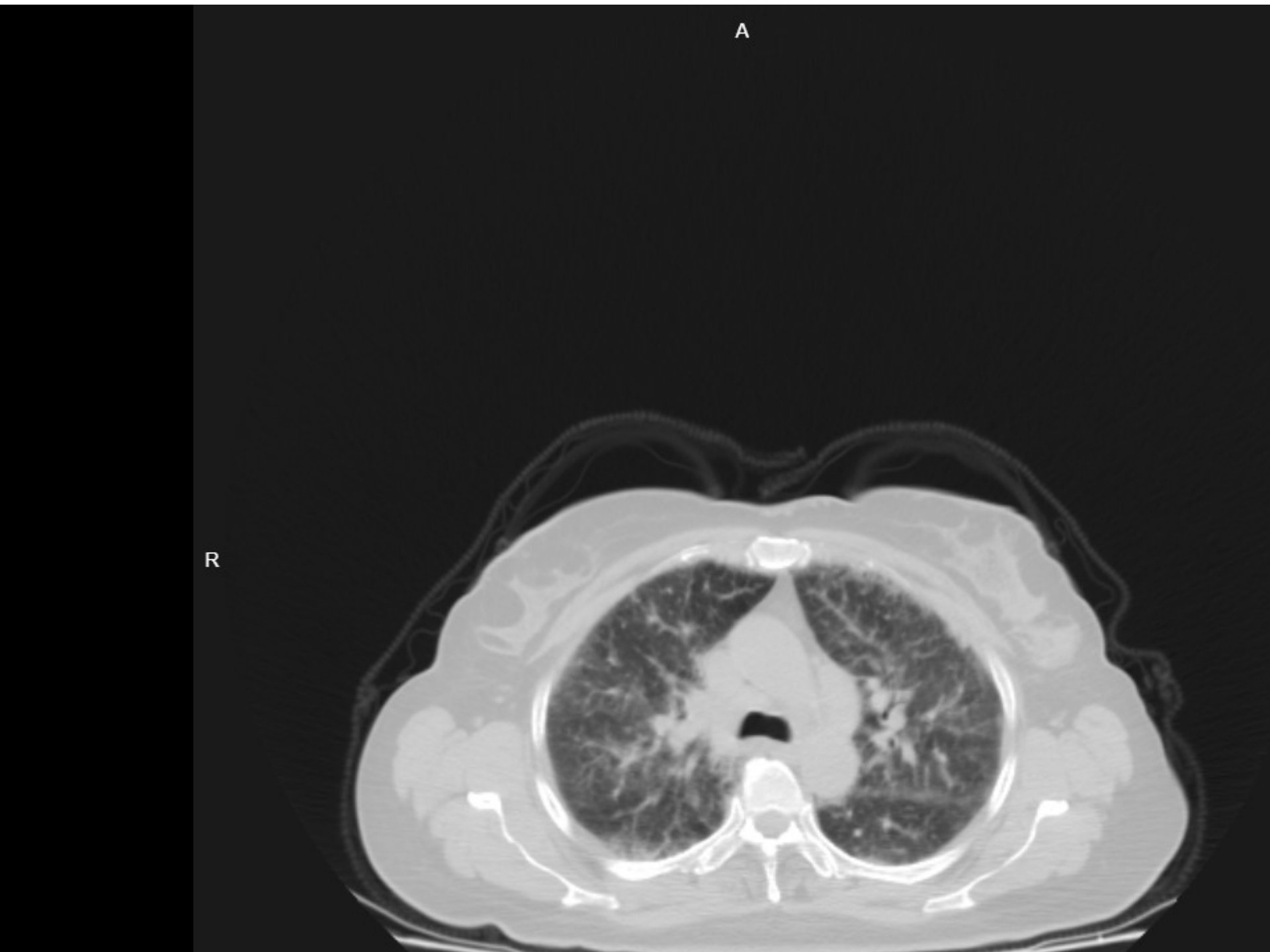
Radyolojik bulgular-PA Akc-2019

Radyolojik bulgular-PA Akc-Şubat 2022



Toraks BT-26 ocak 2022

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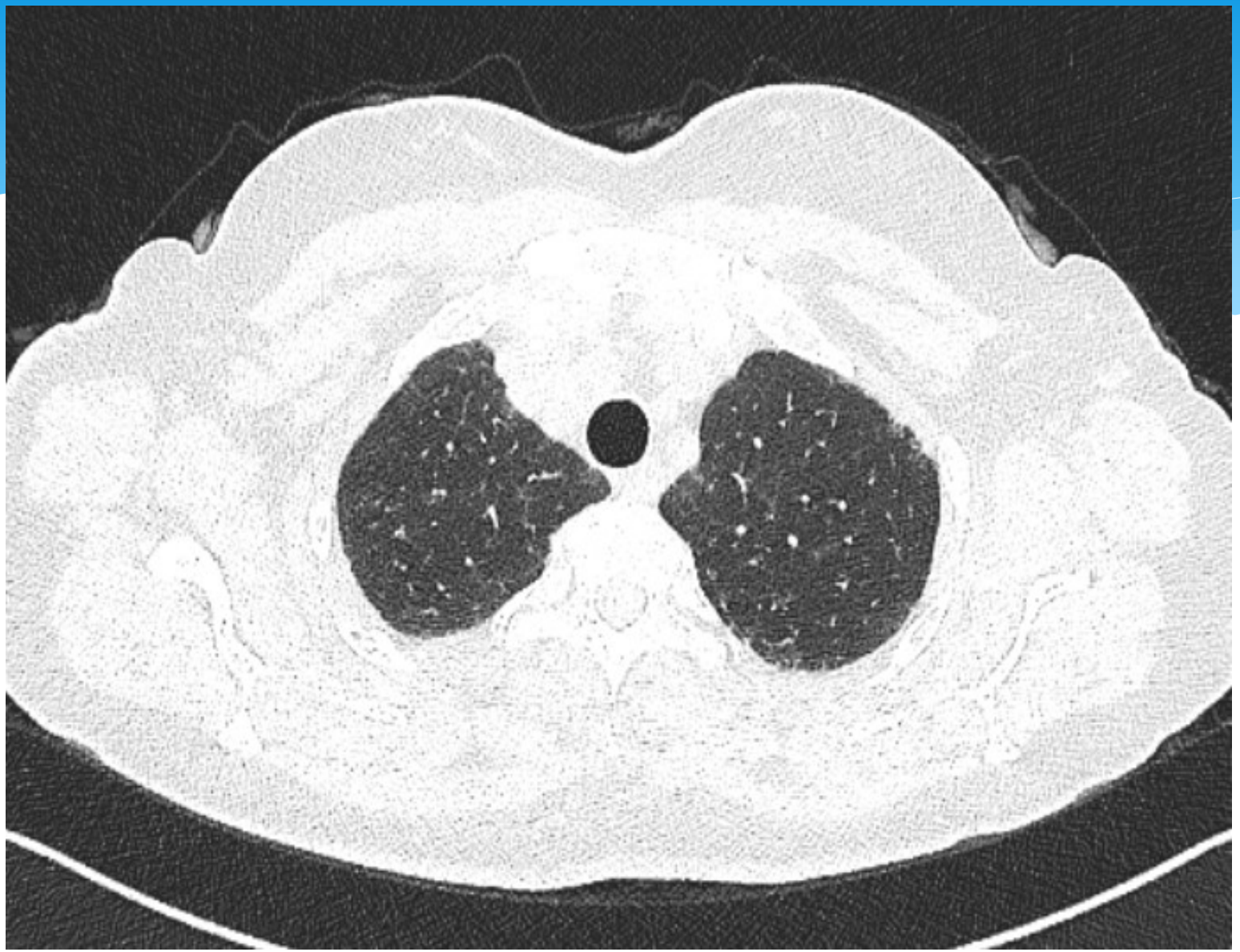
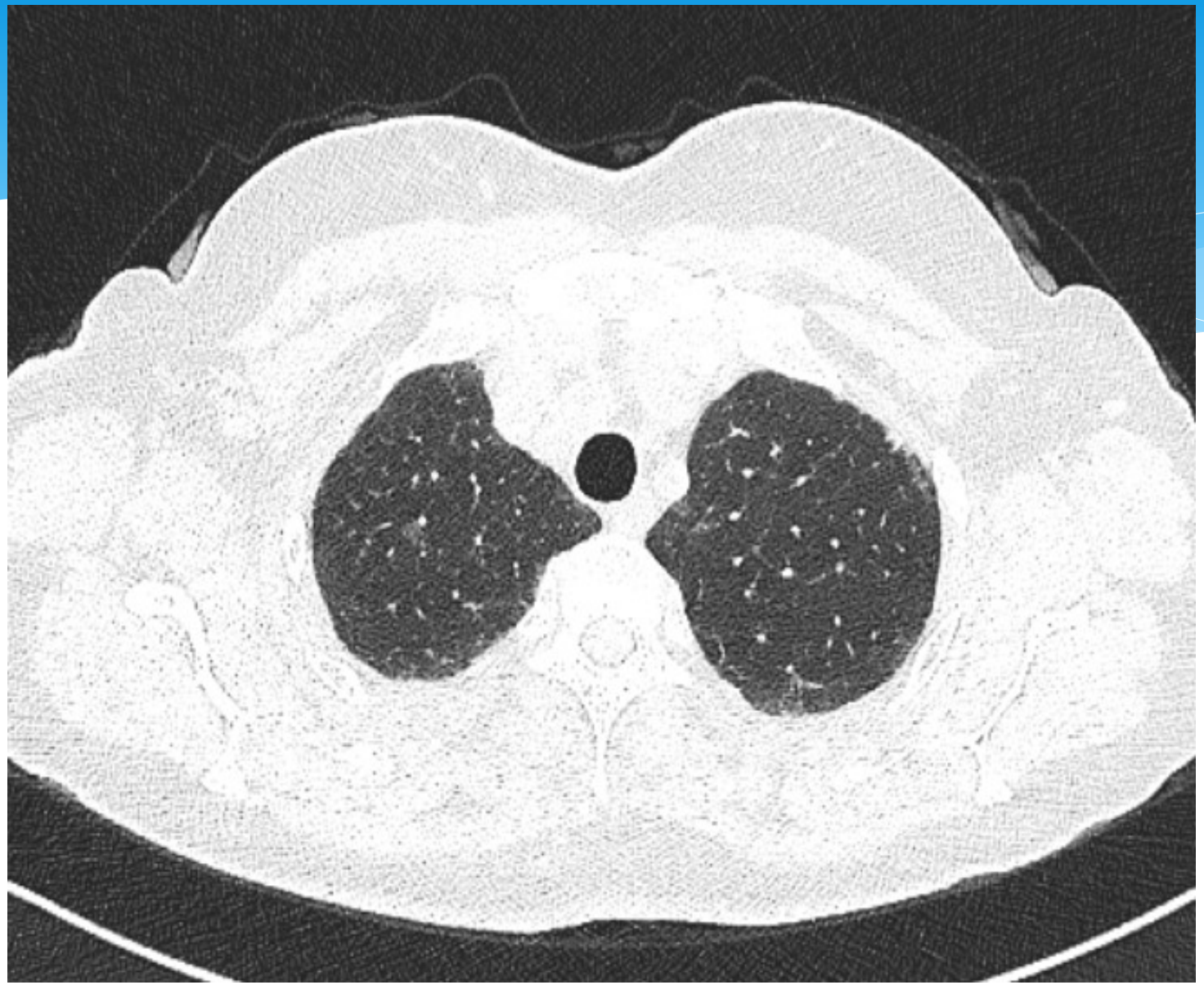
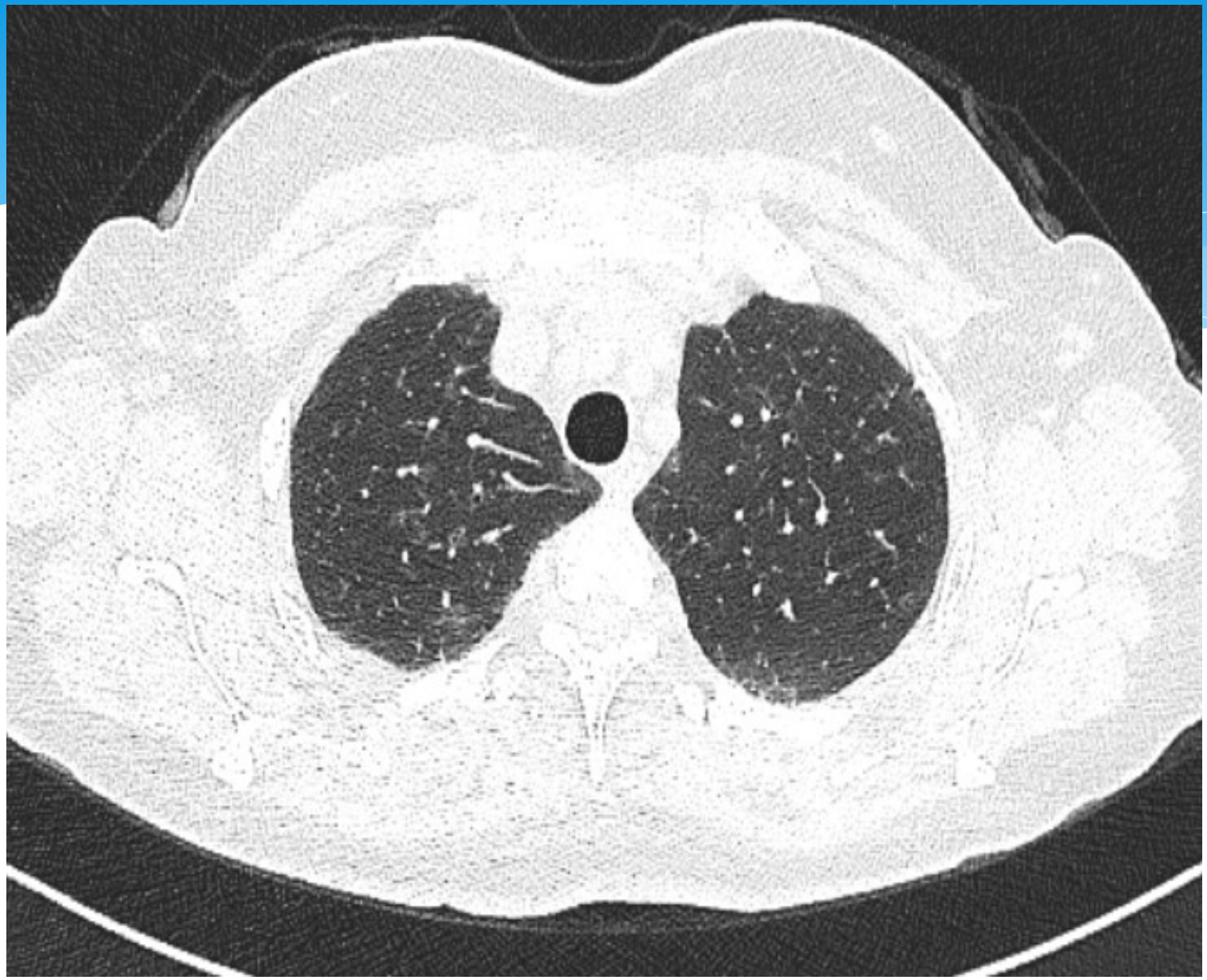
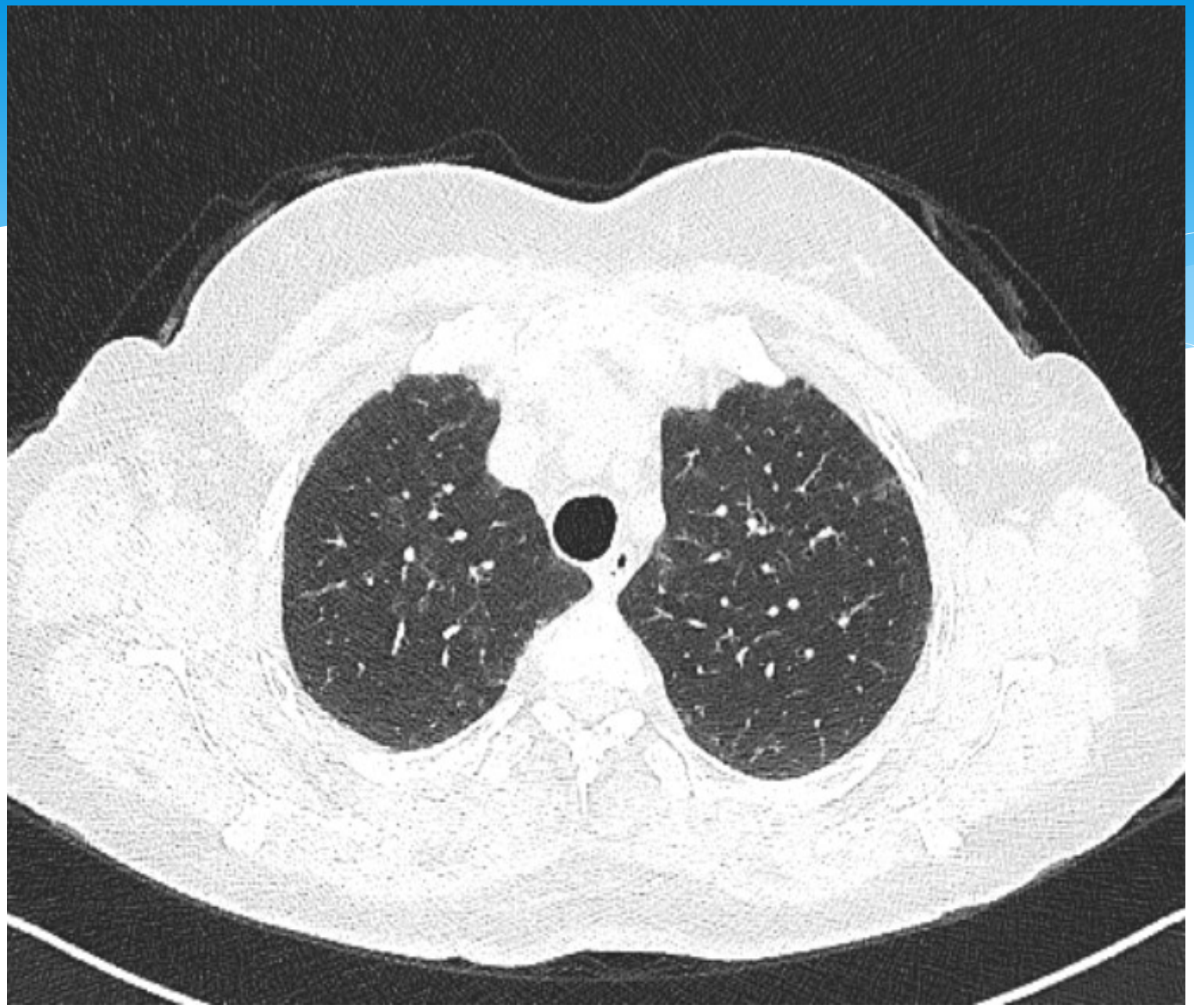
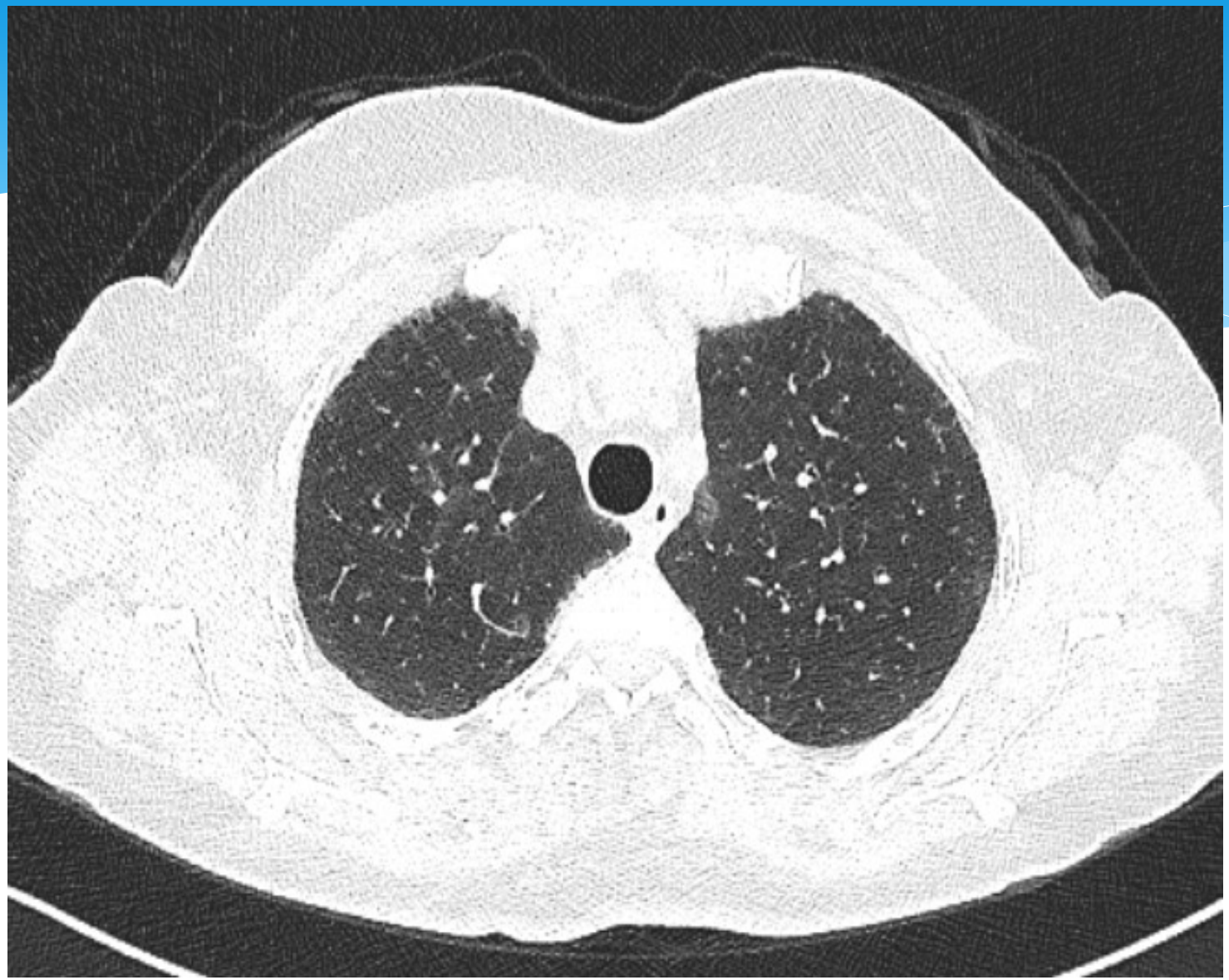
9 Mart 2022 HRCT

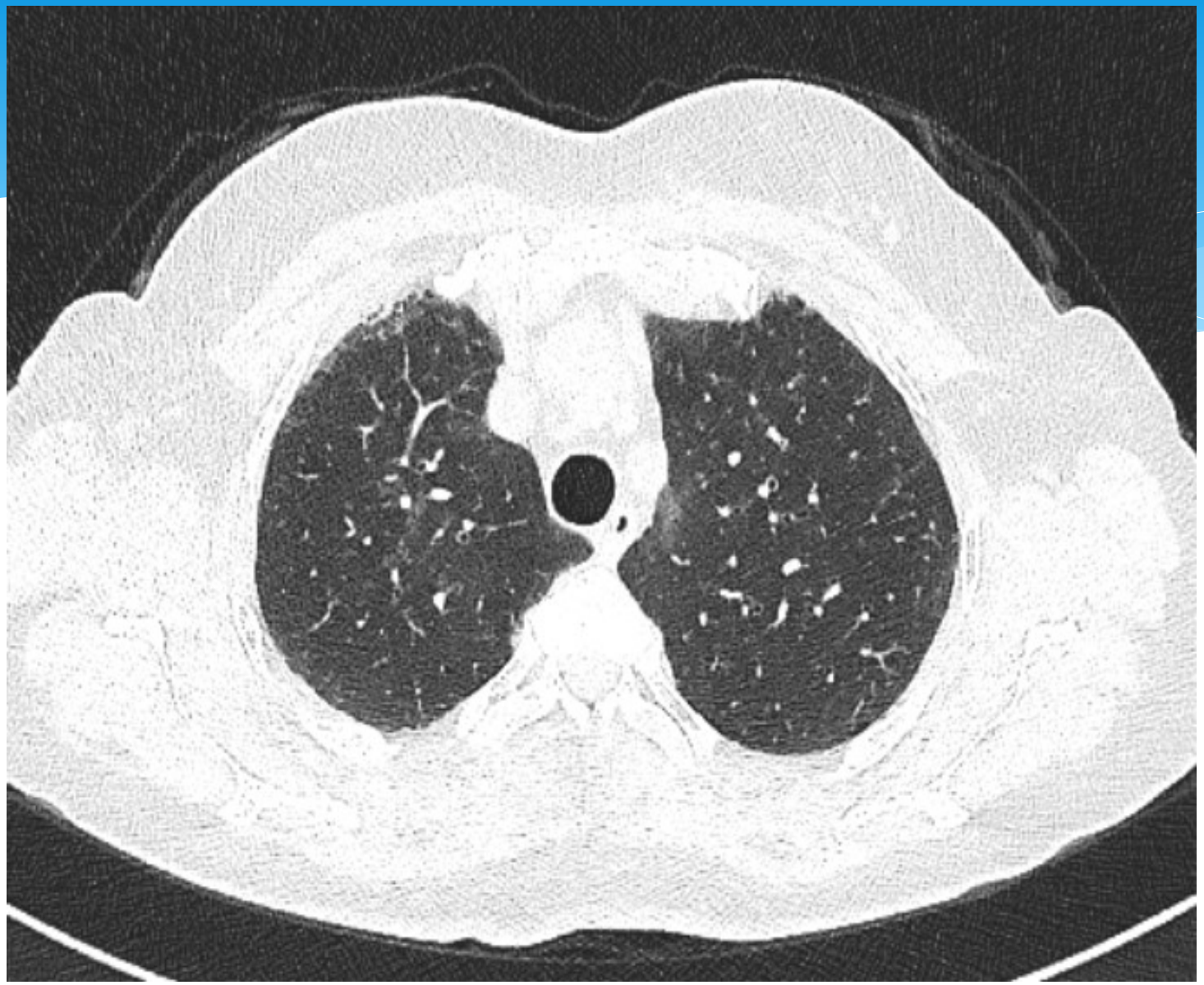


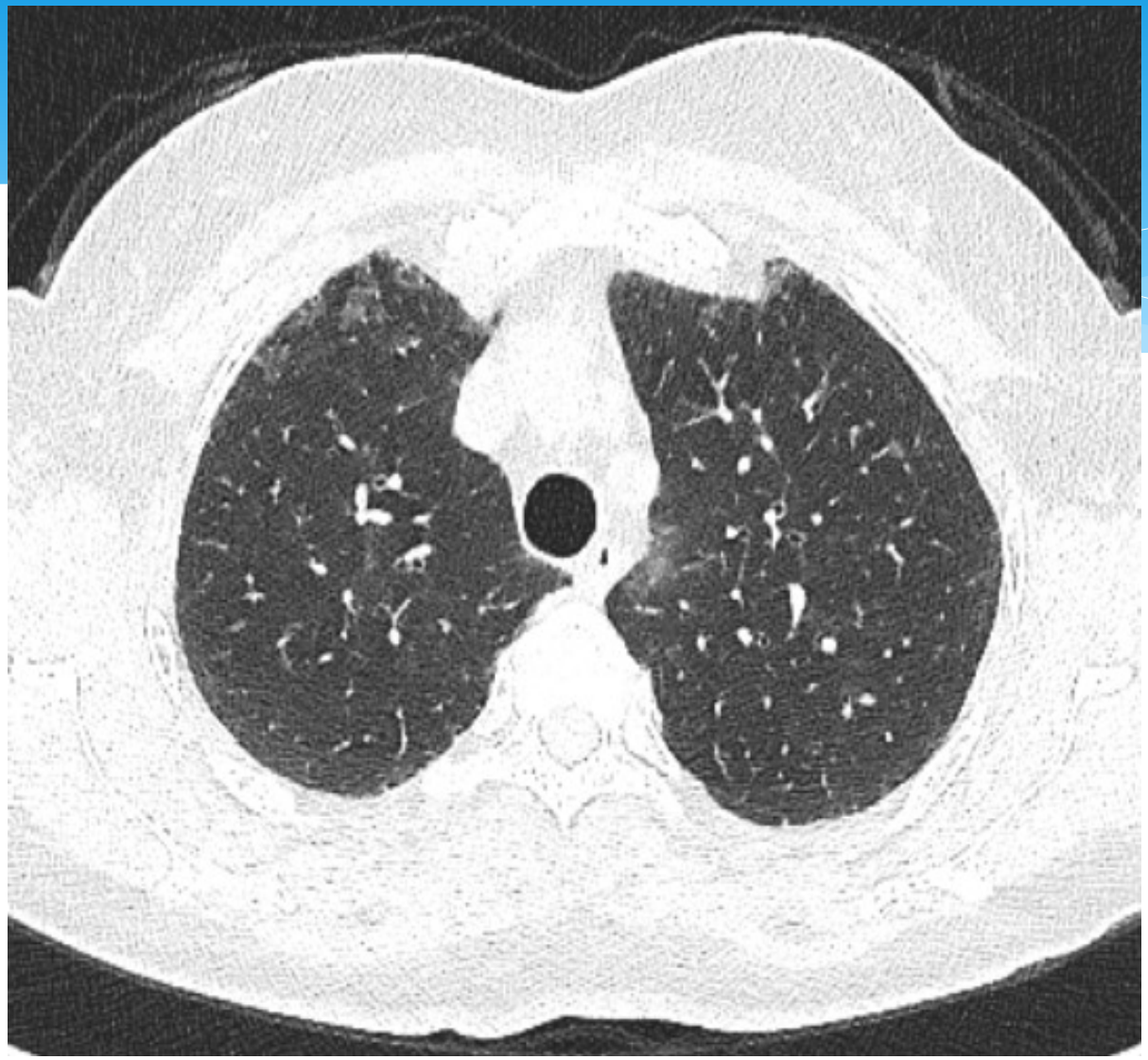


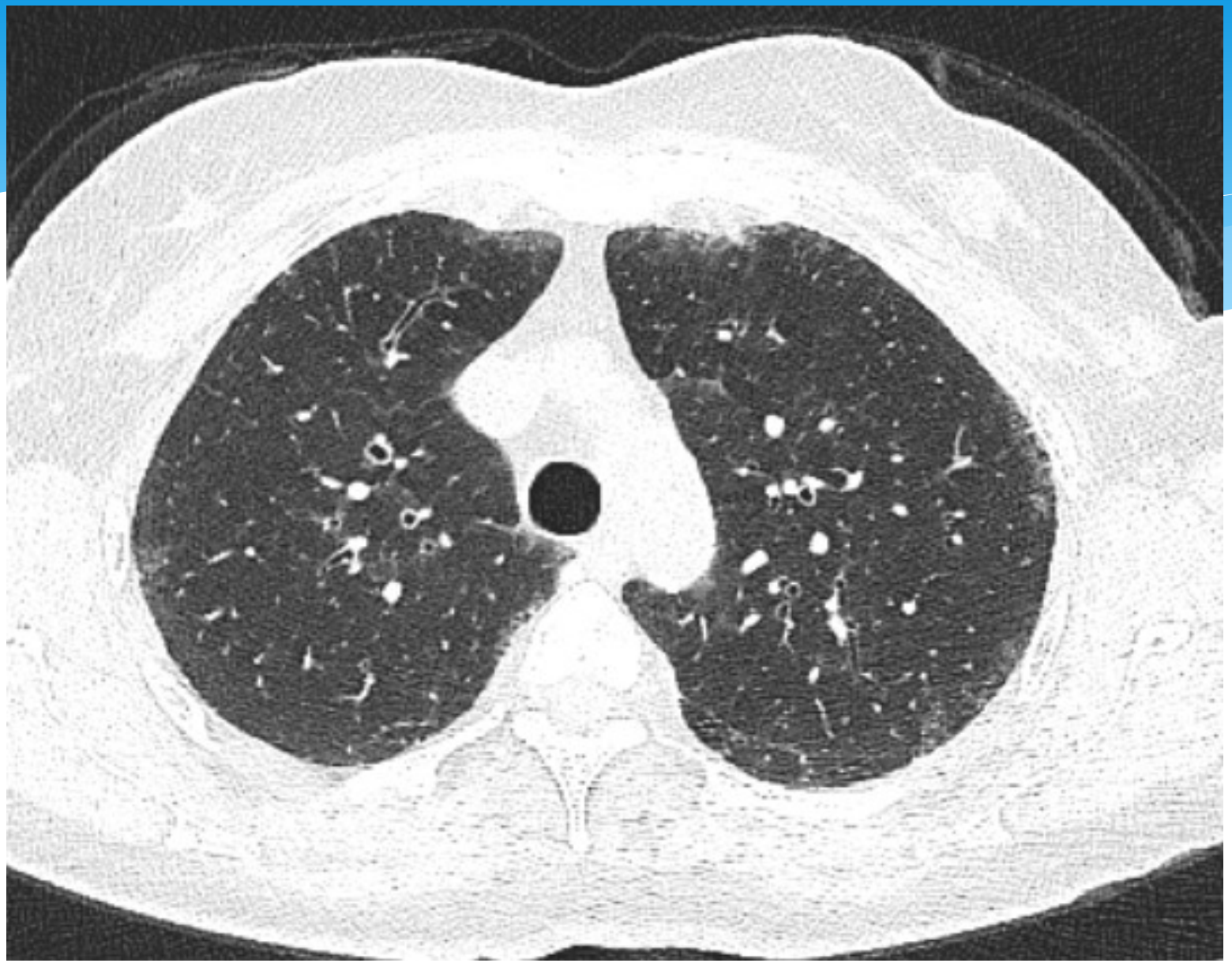


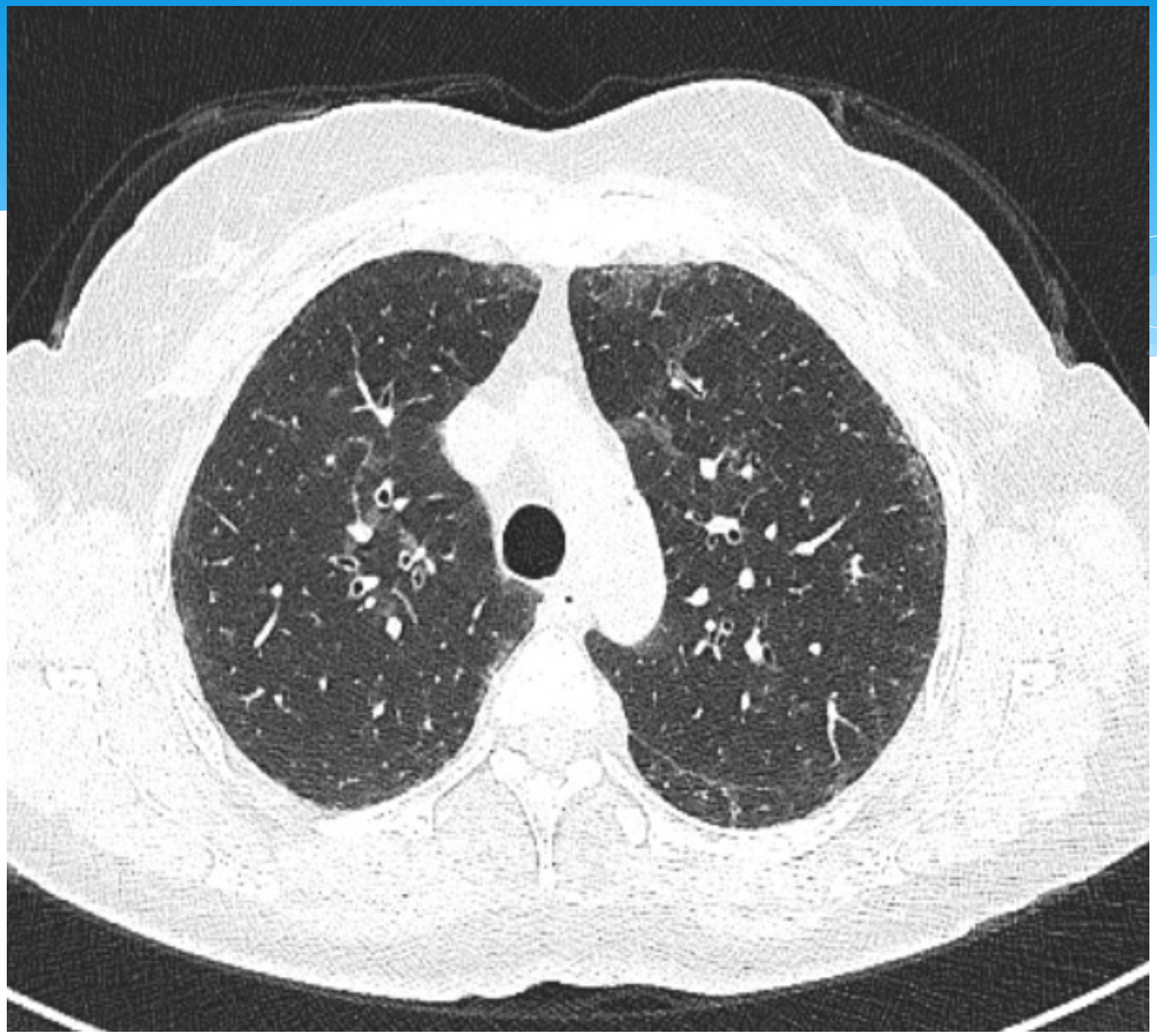


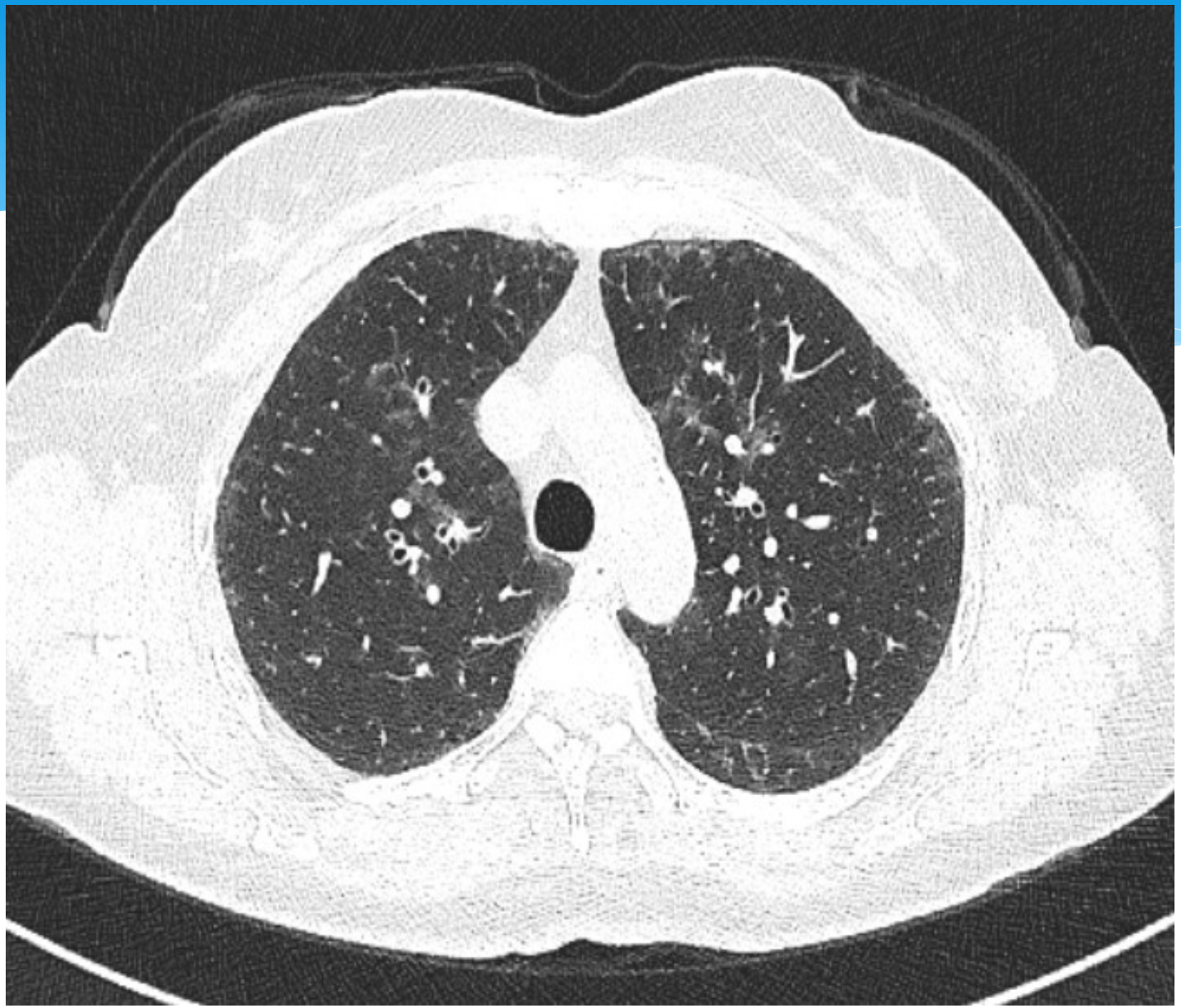


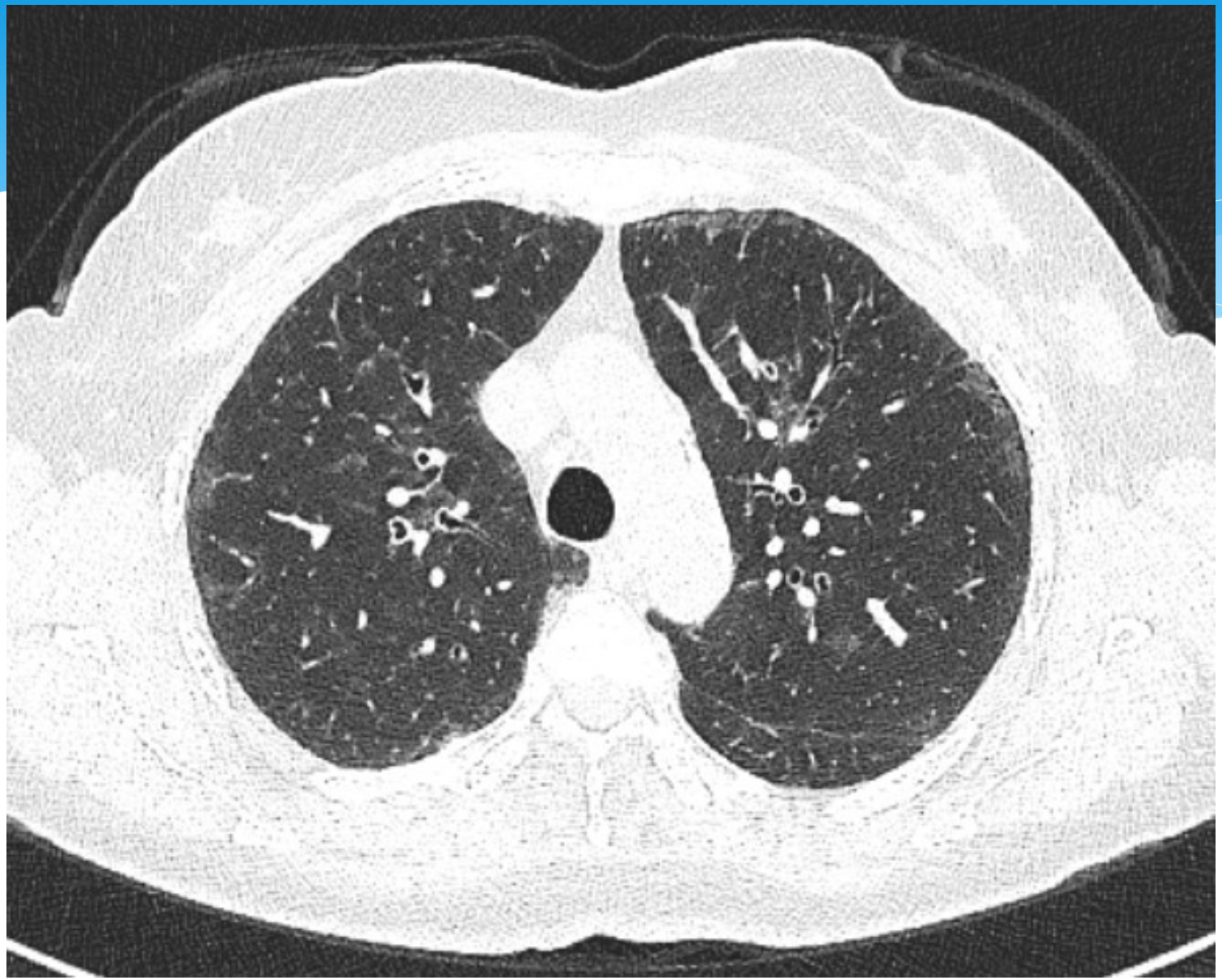


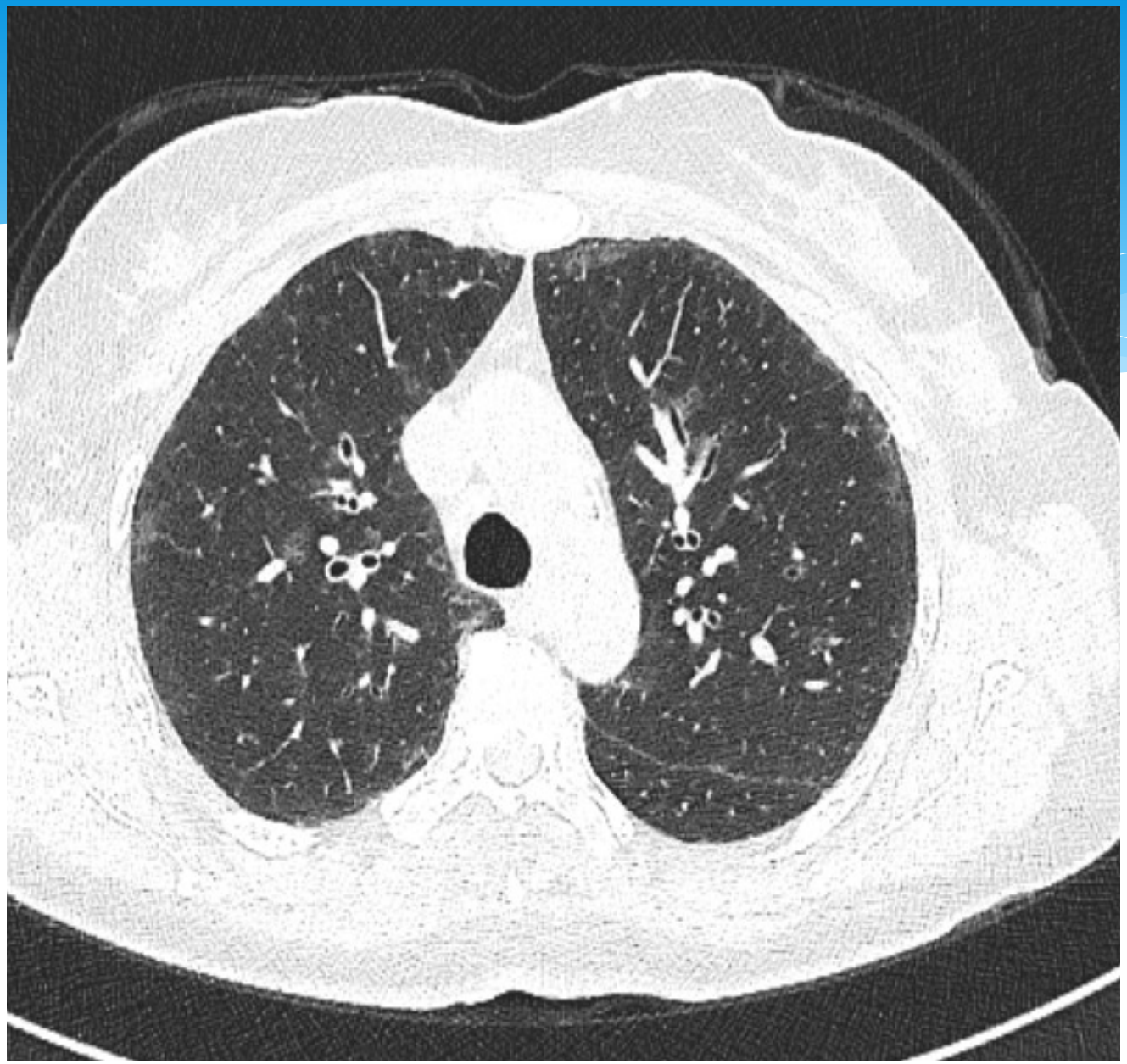


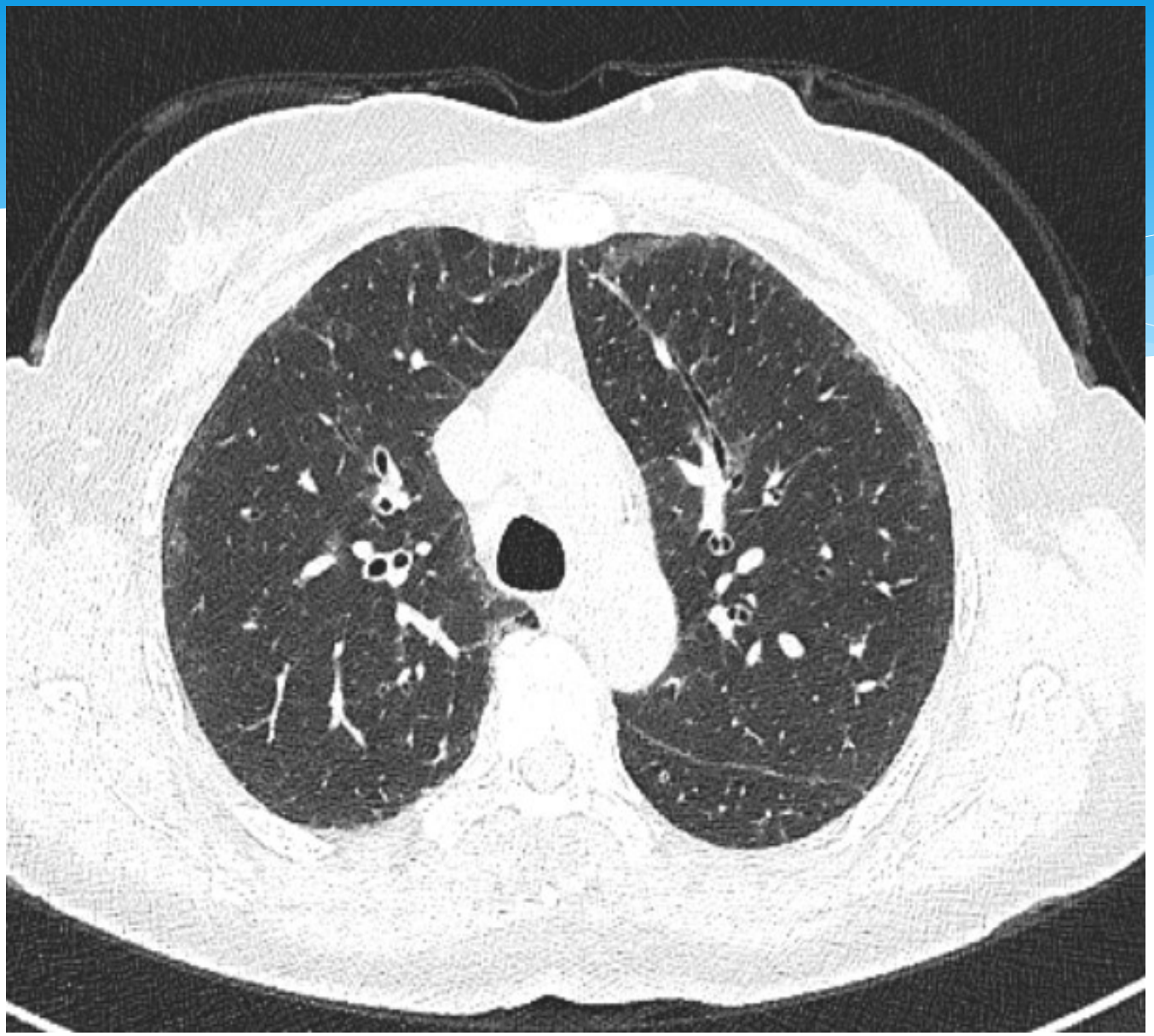


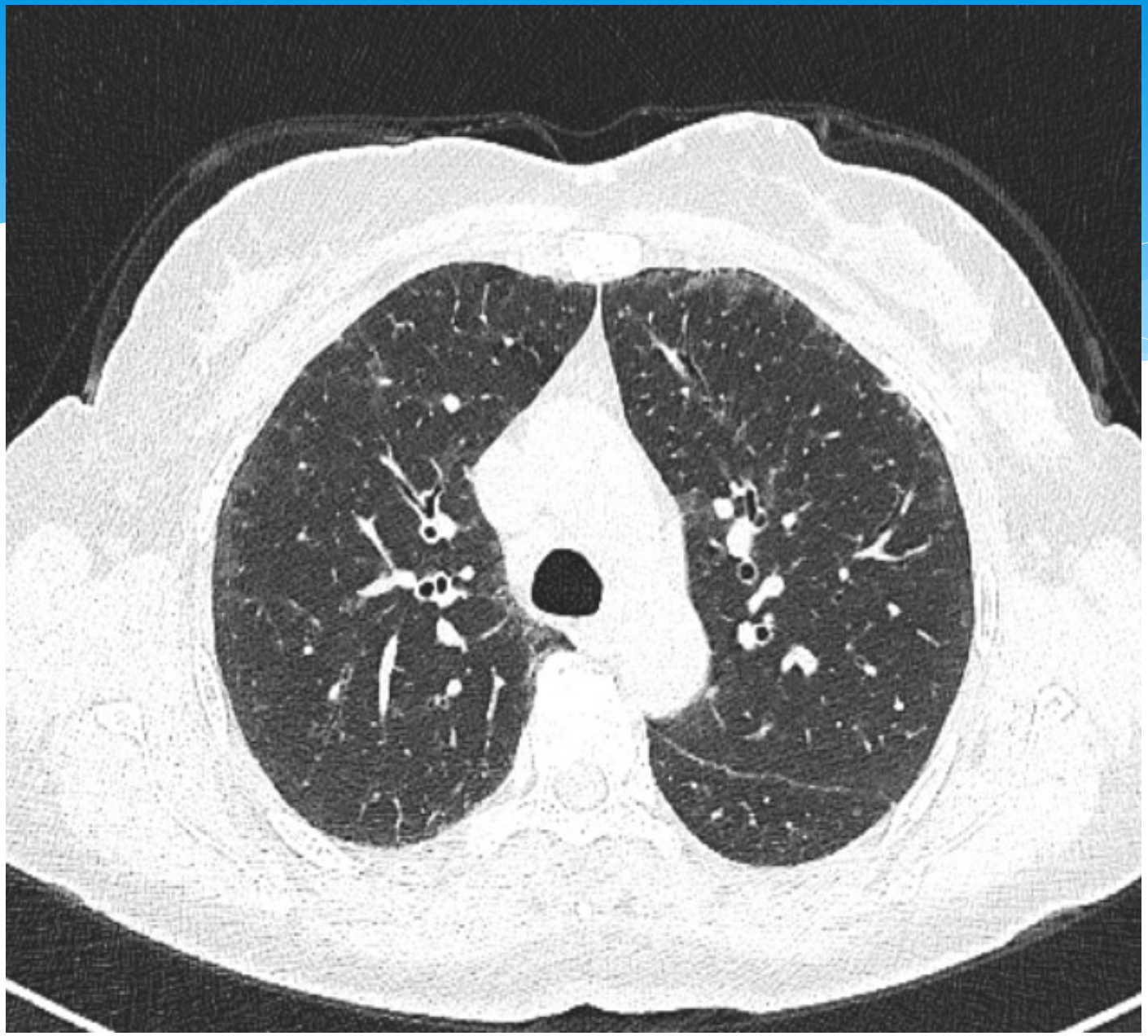


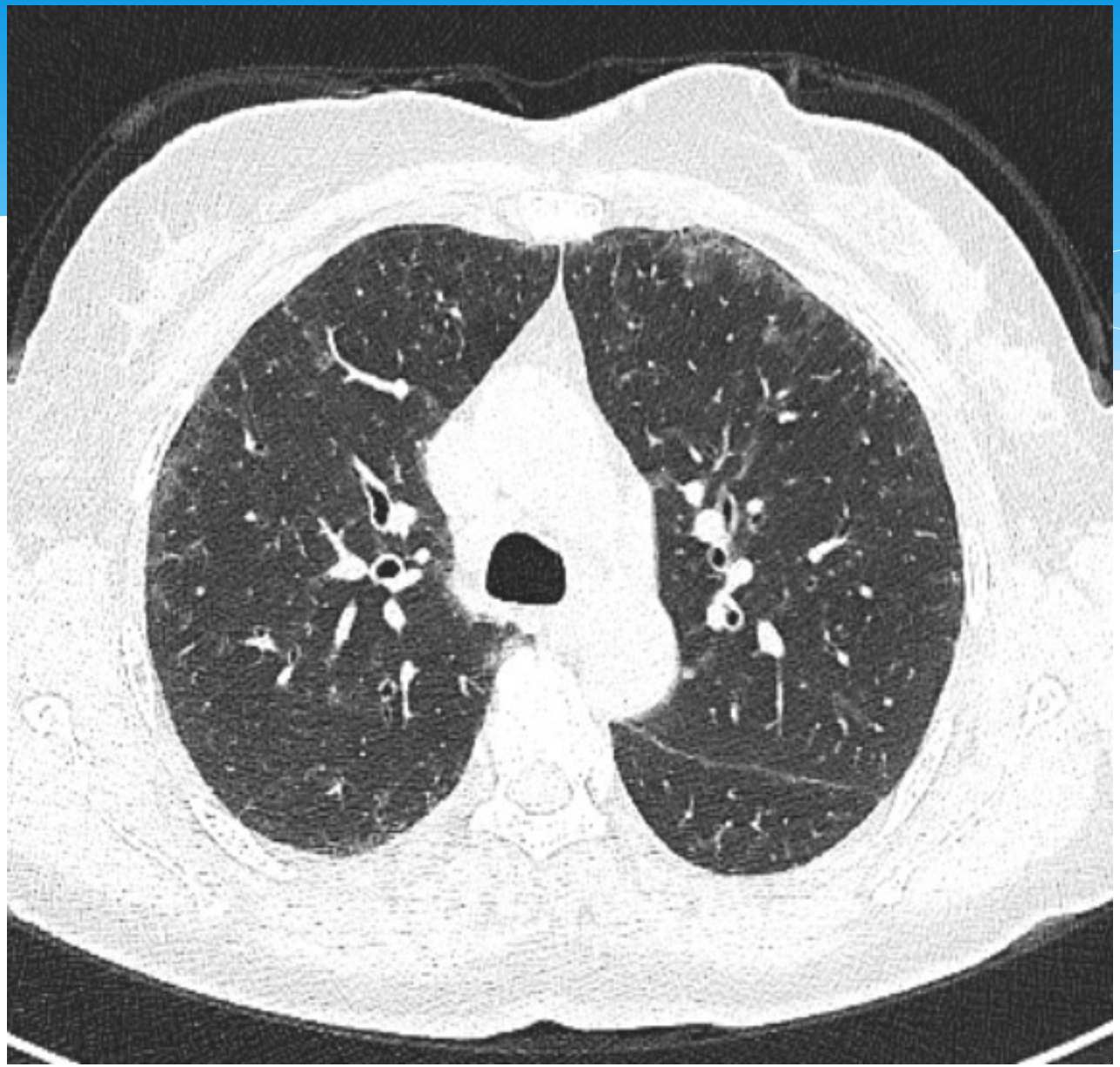


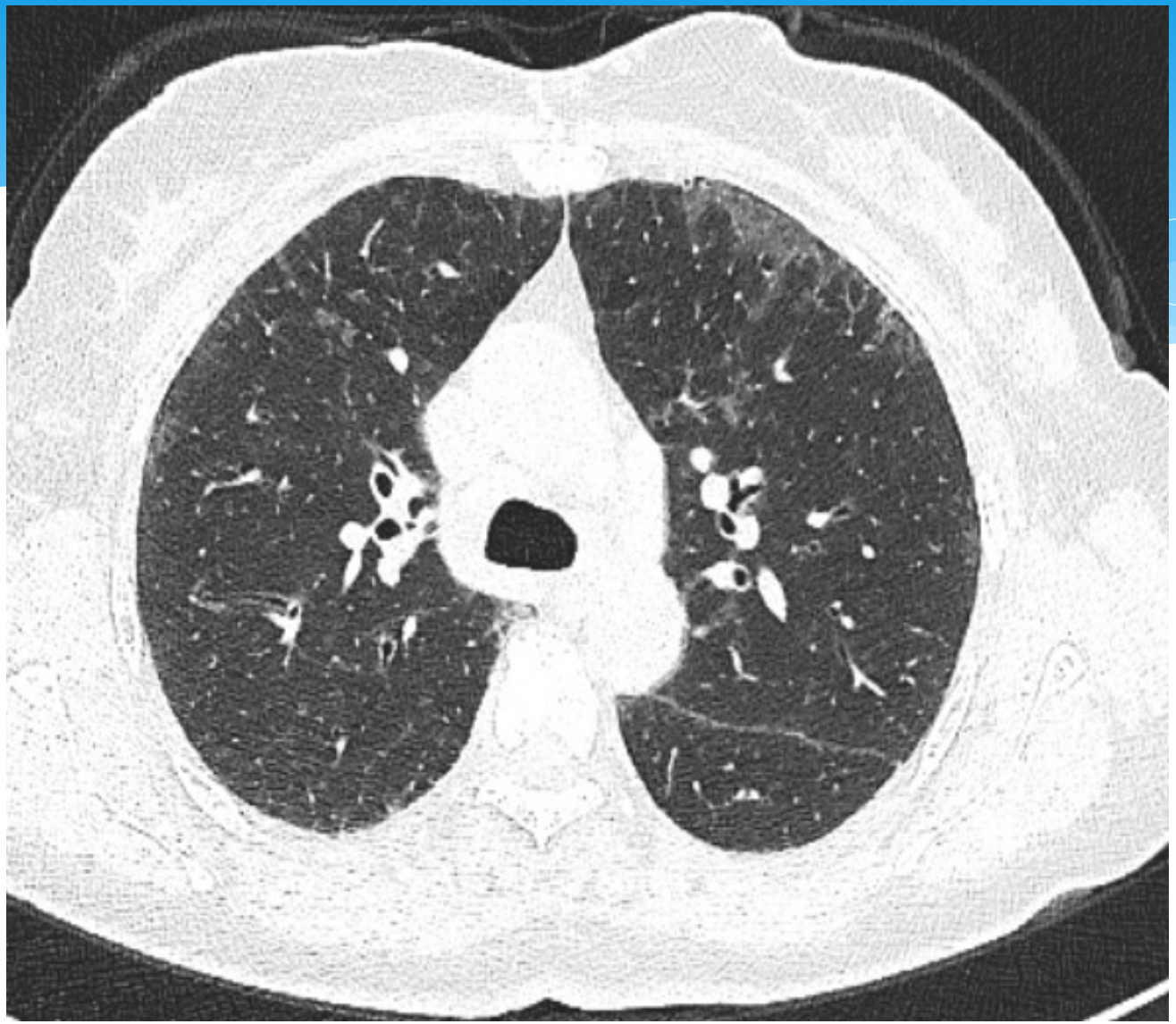


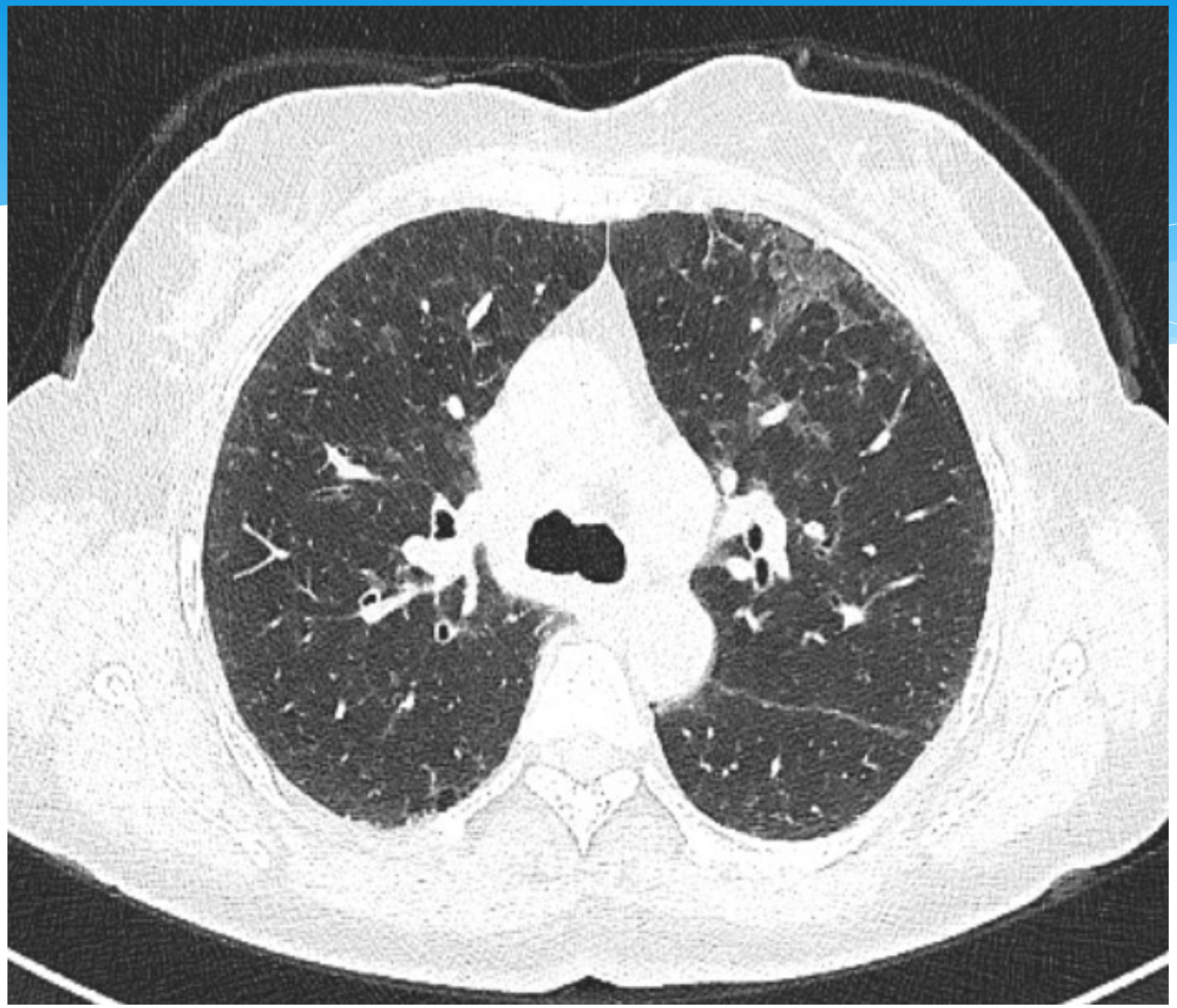


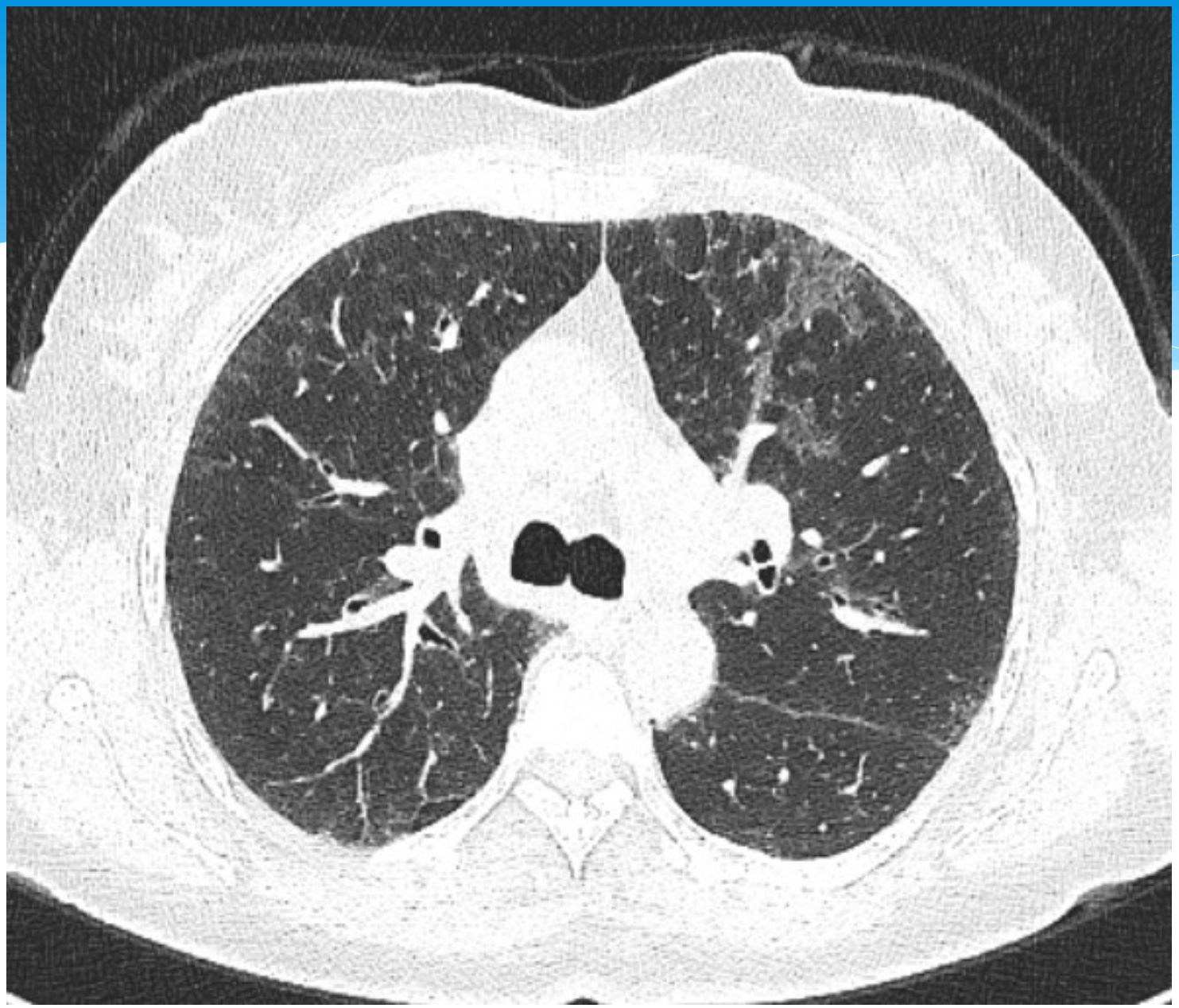


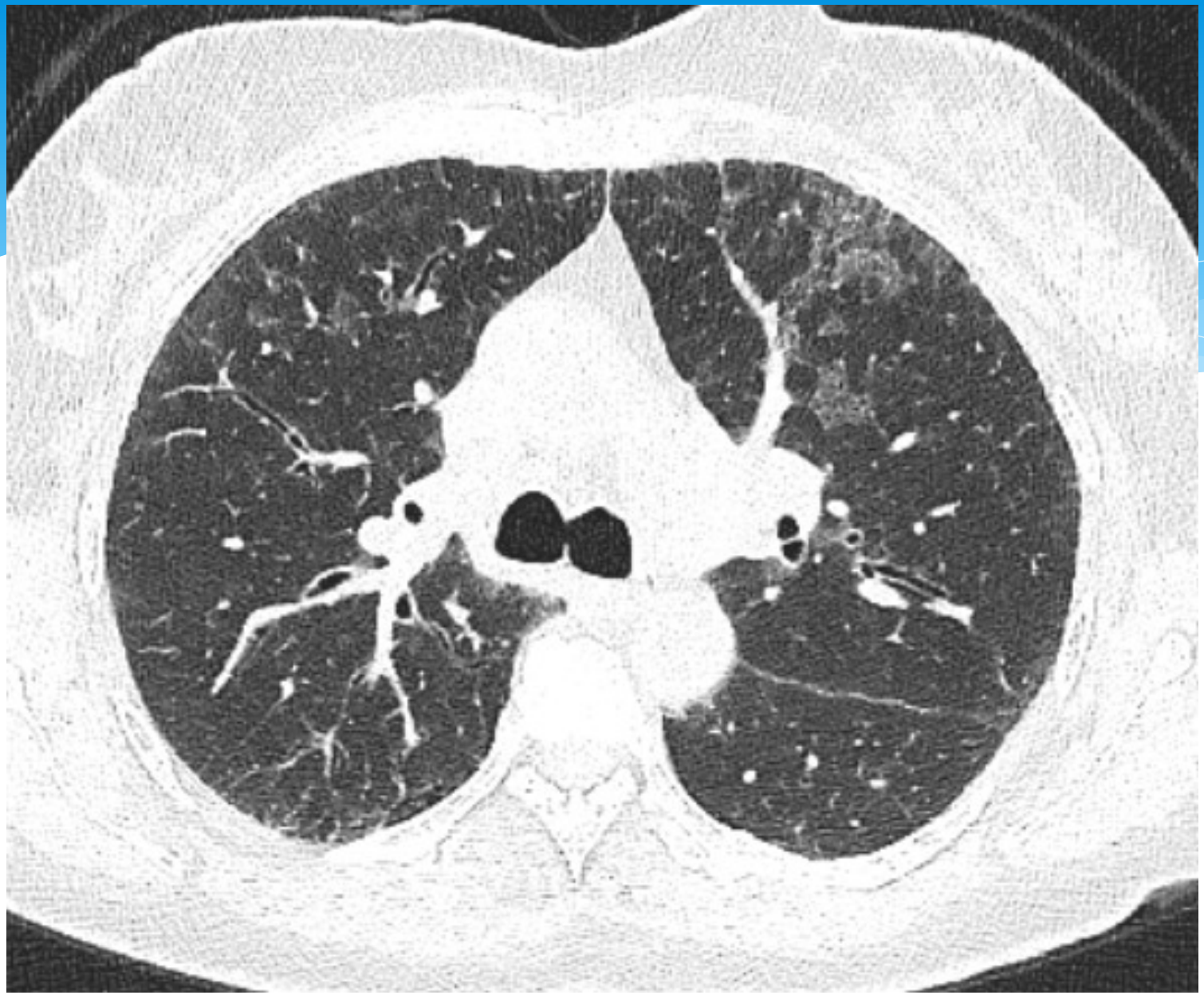


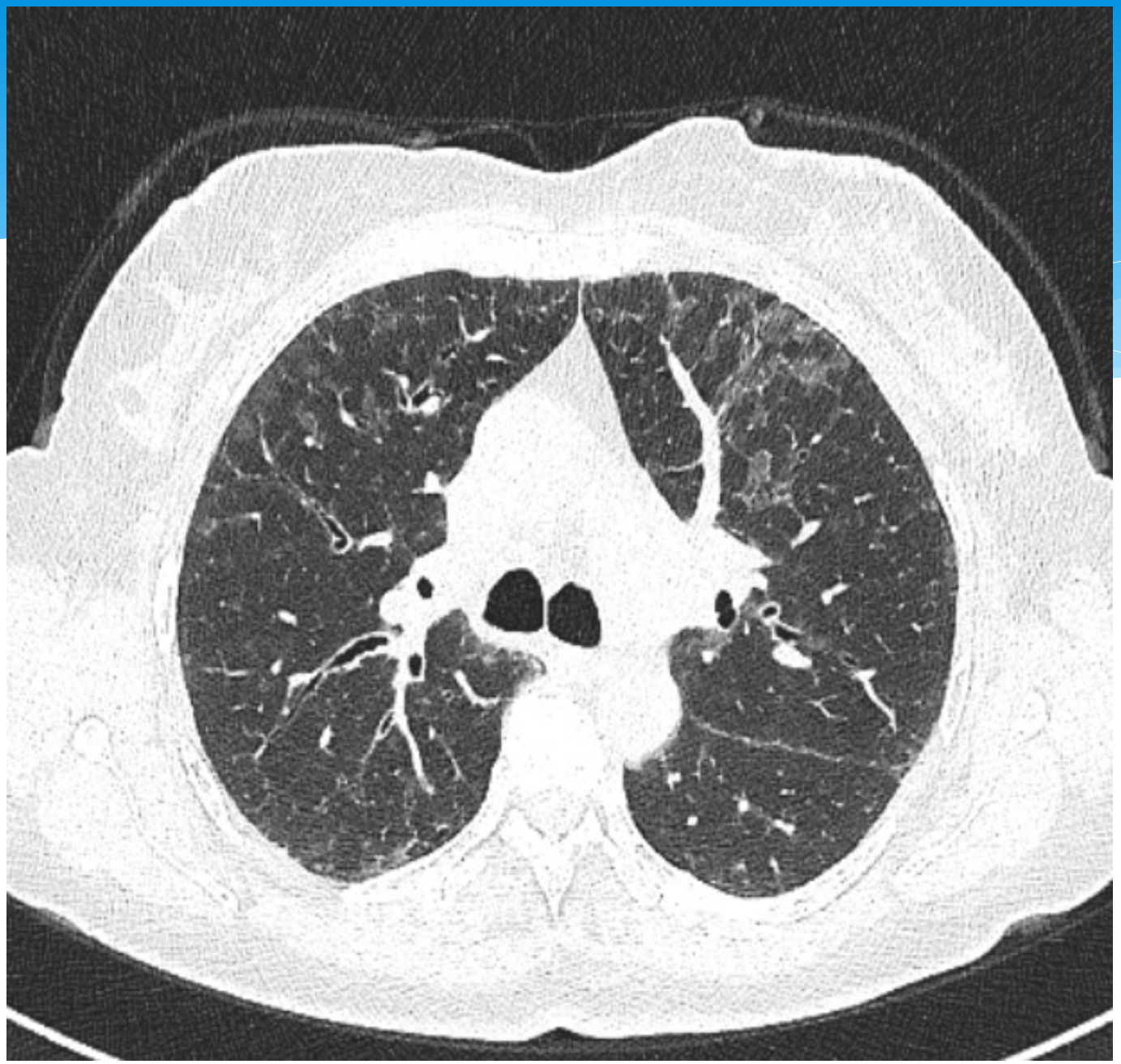


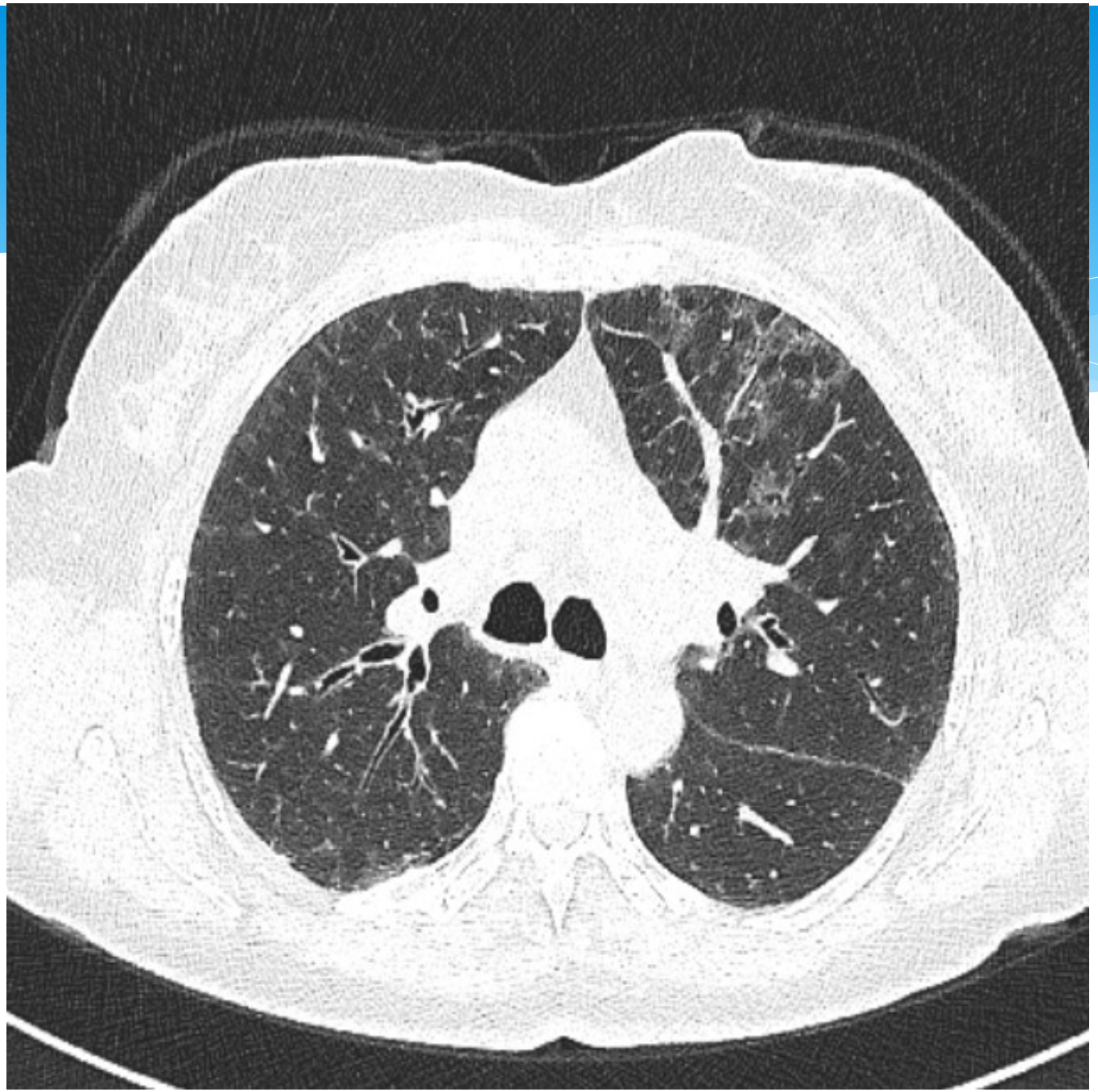


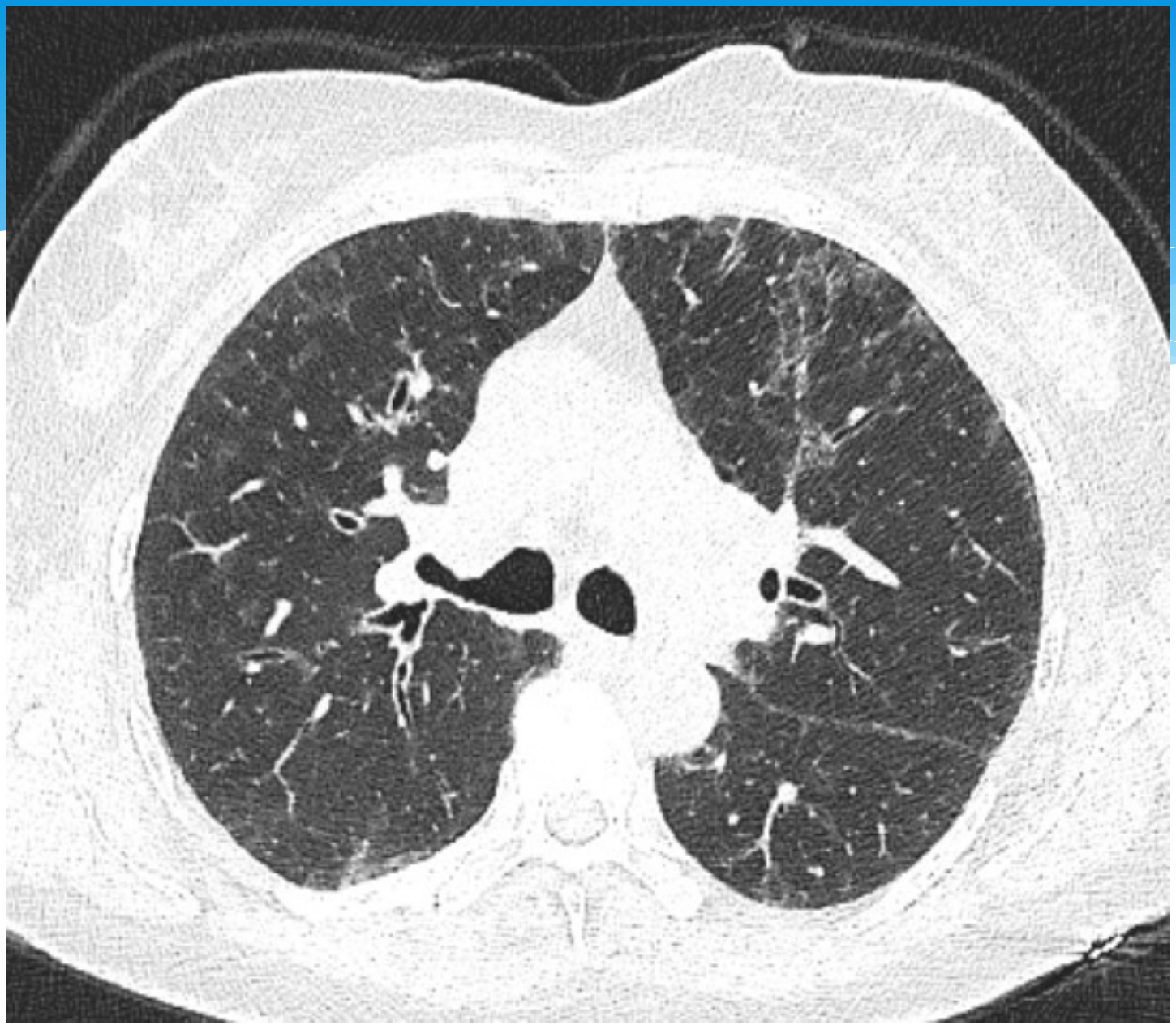


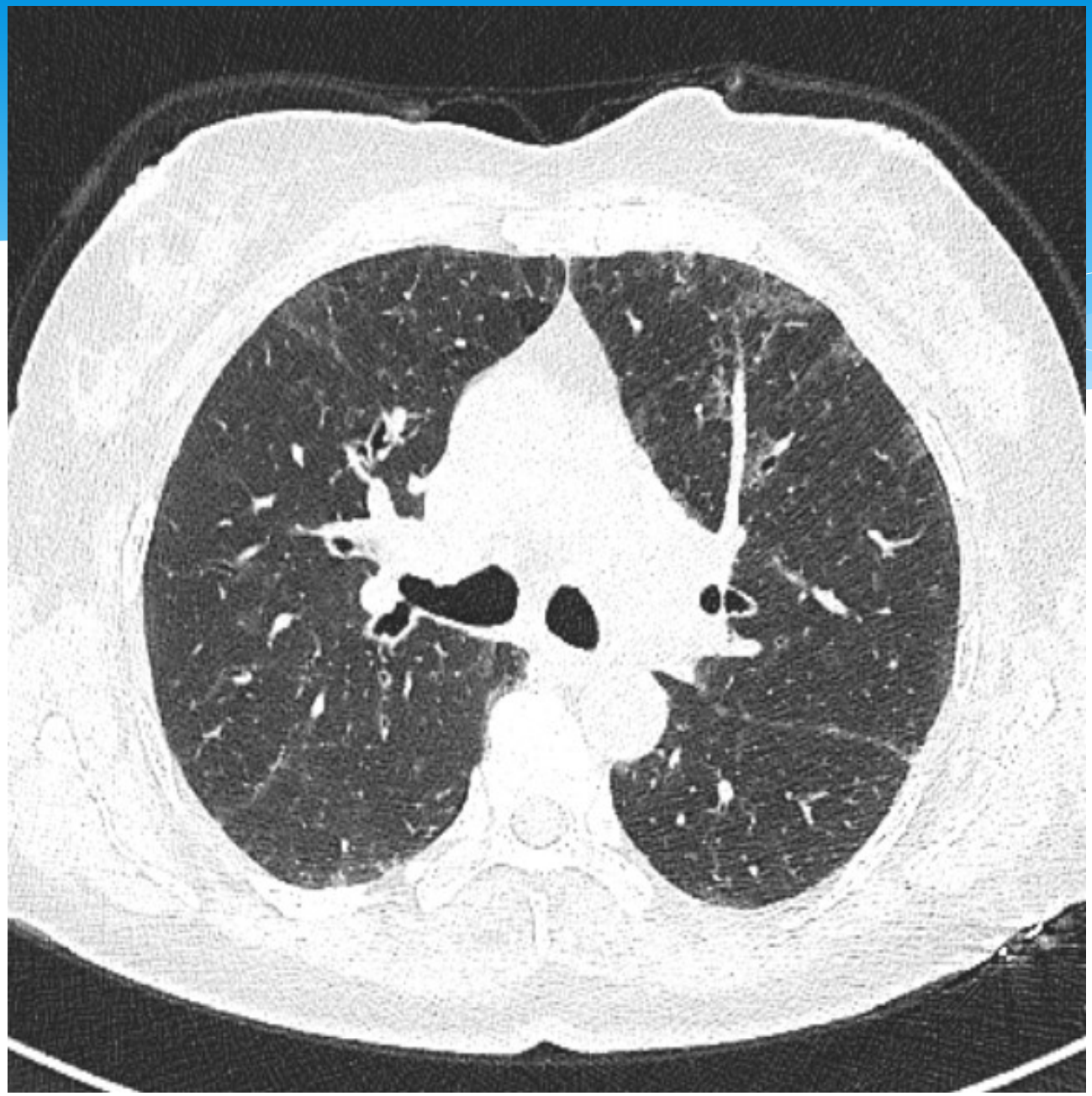


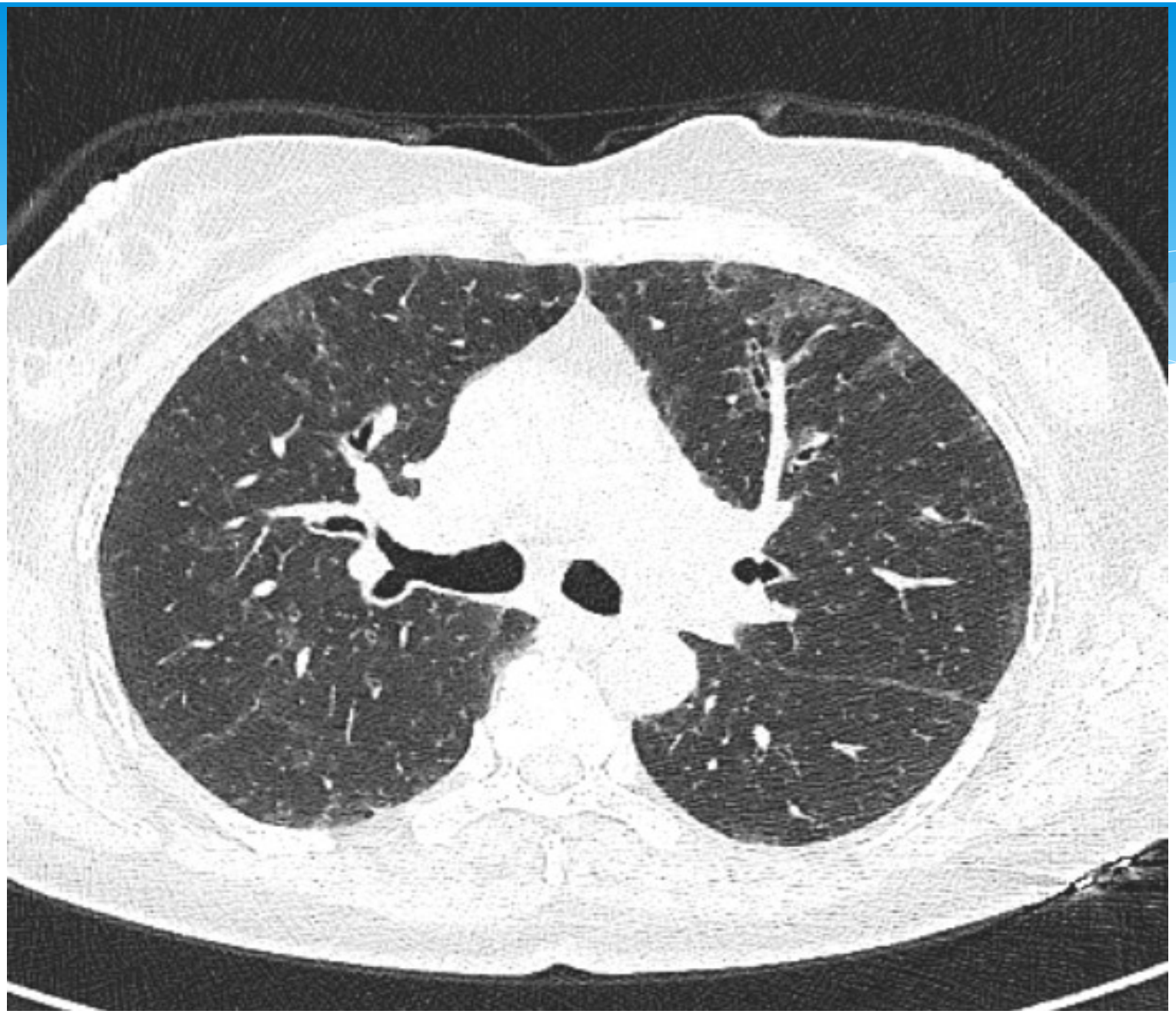


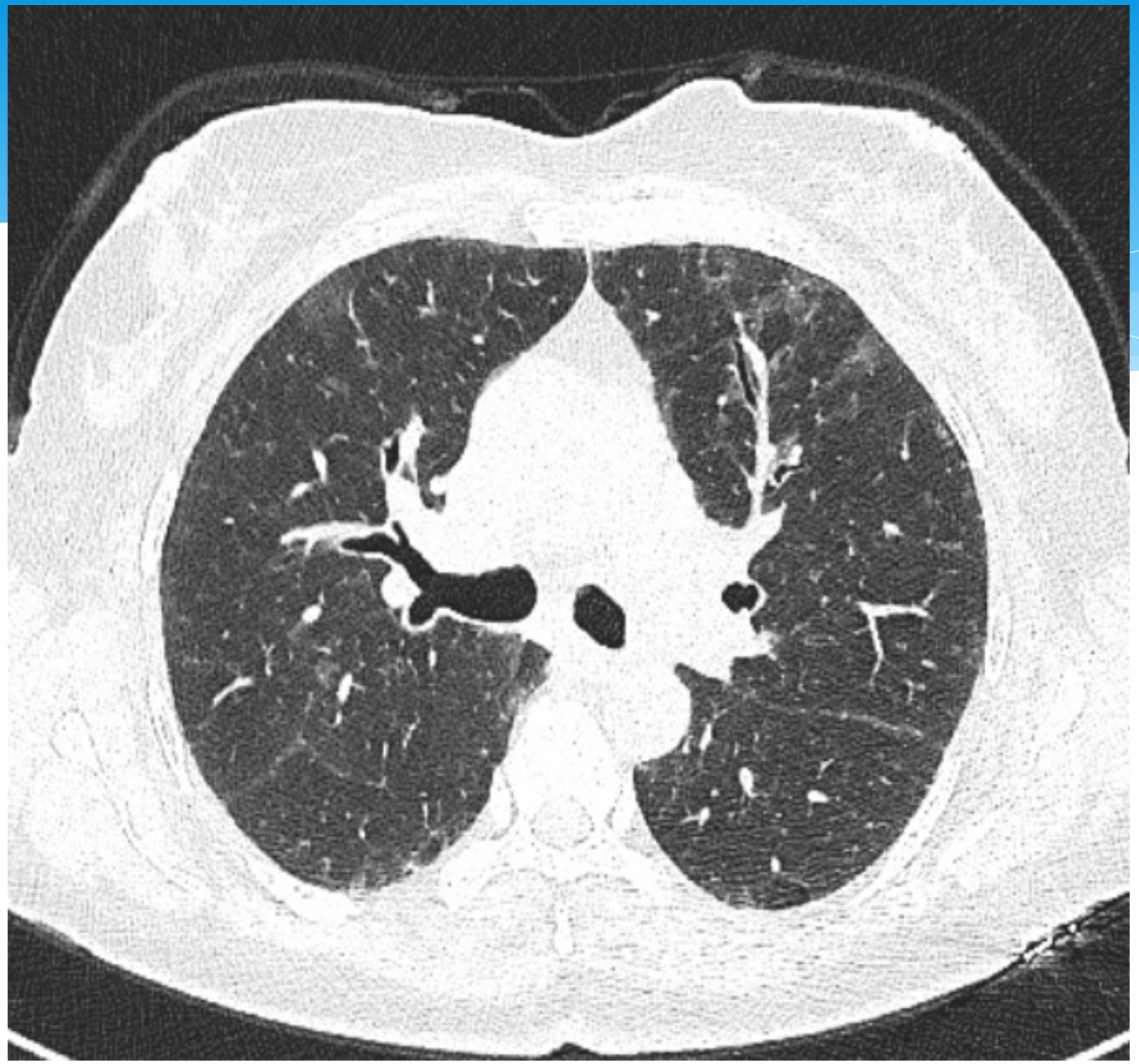


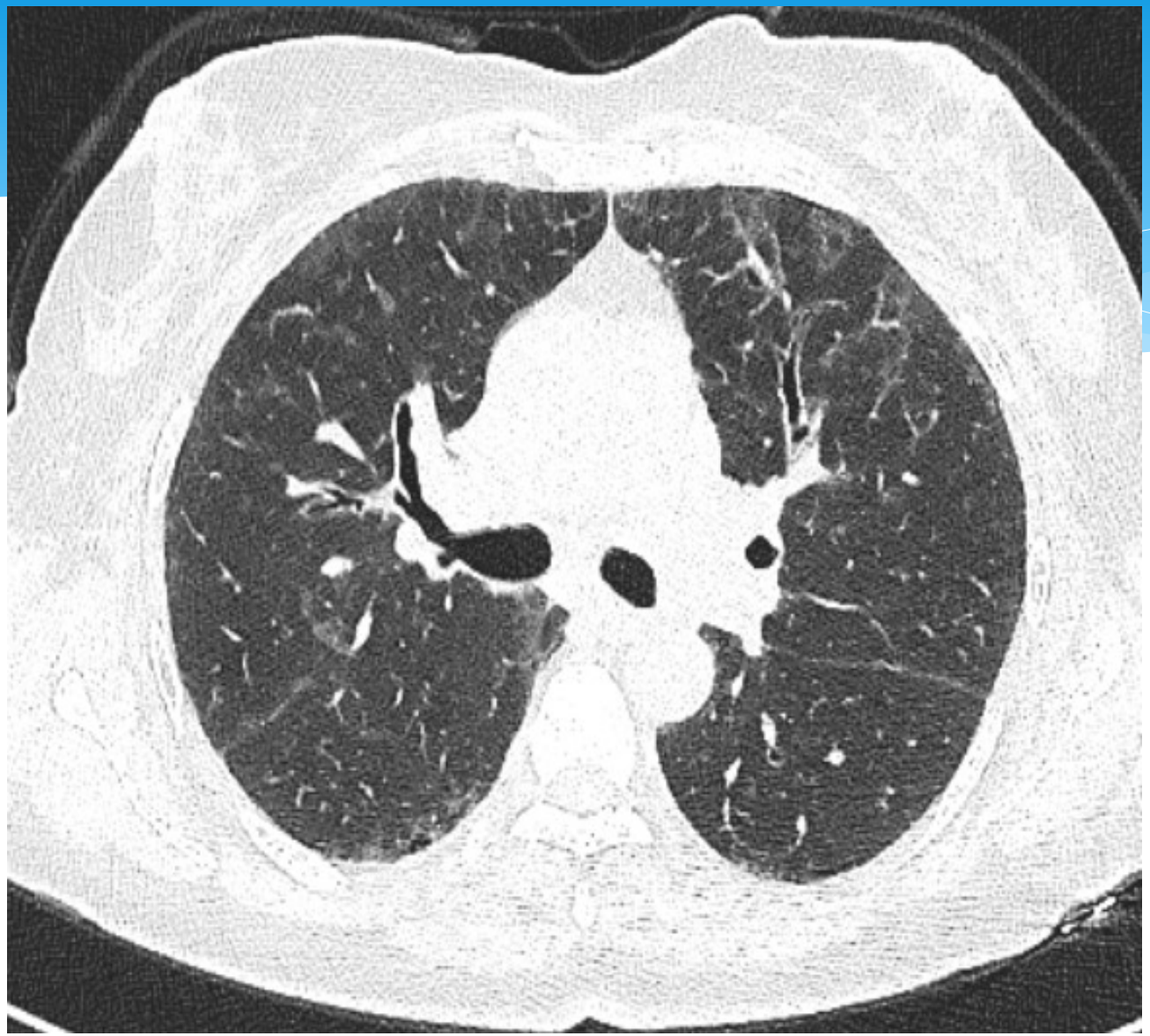


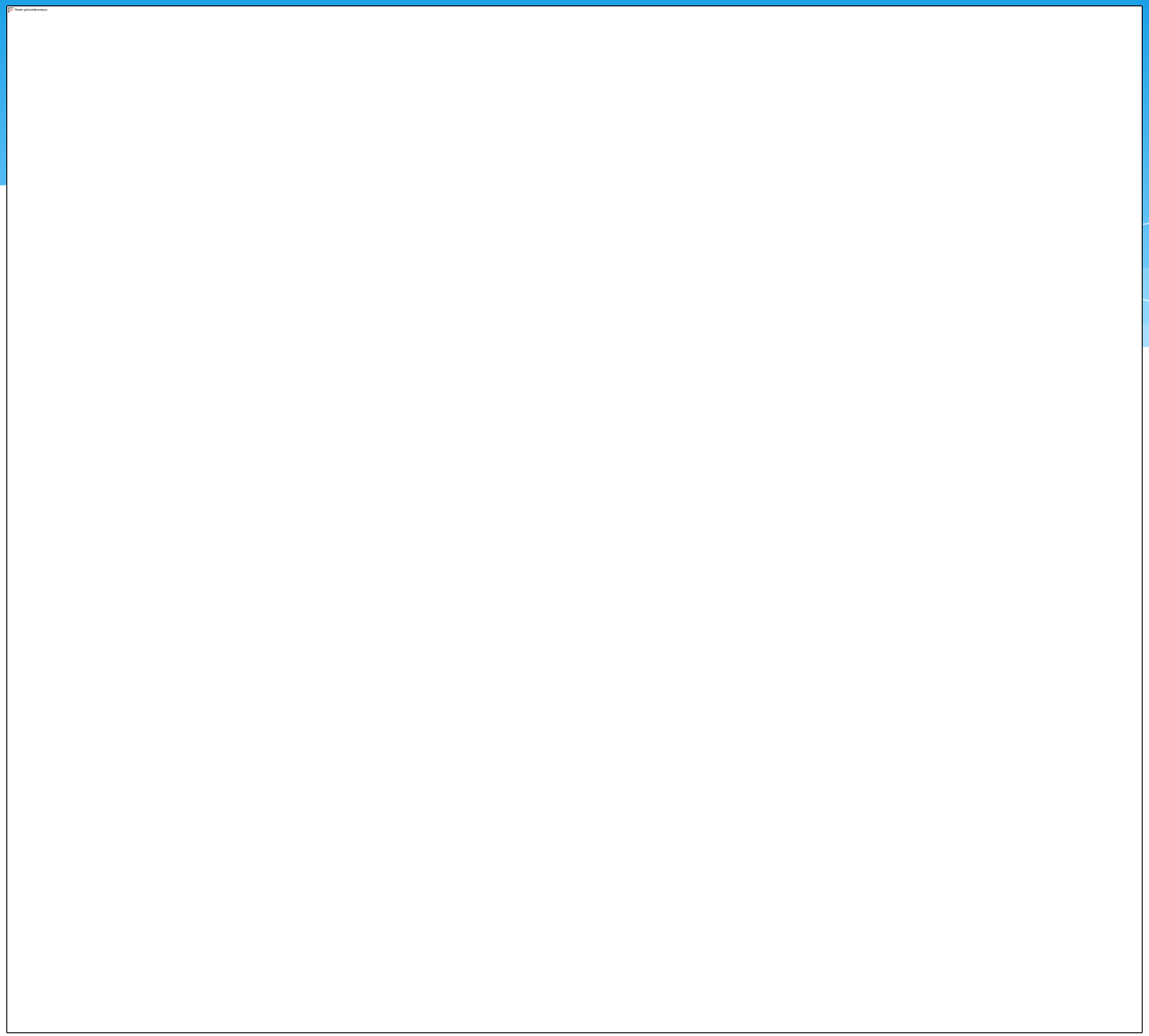


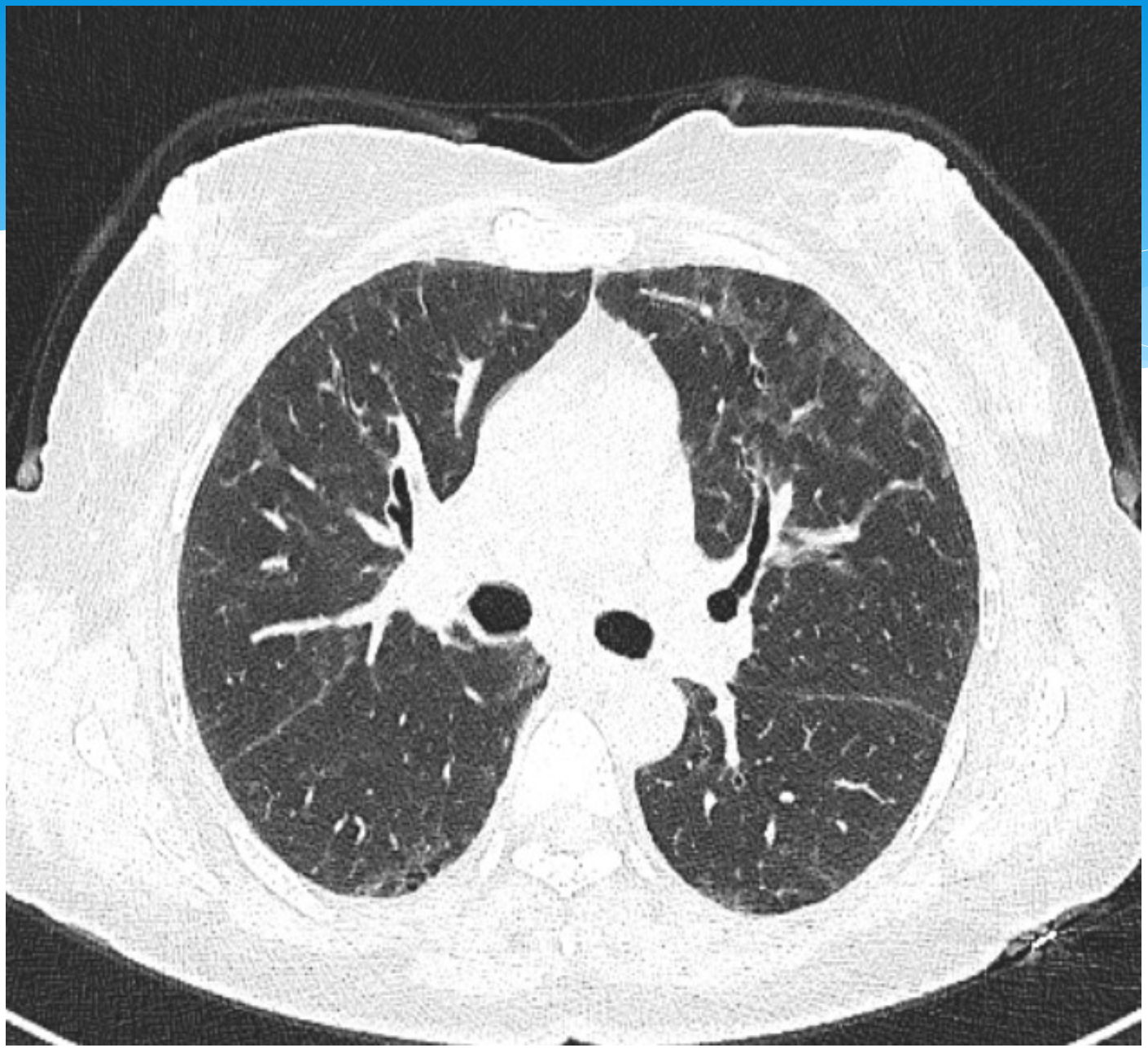


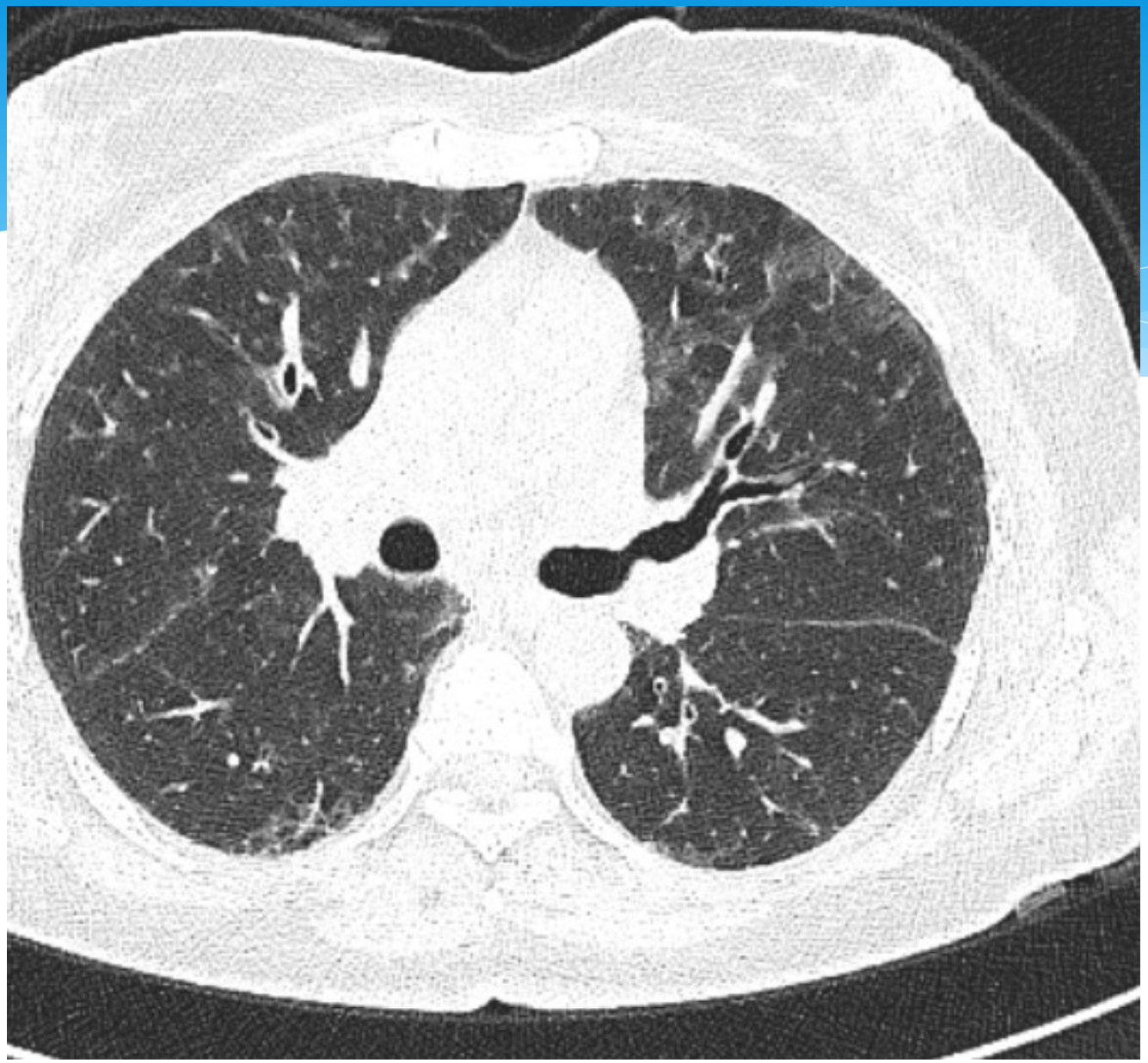


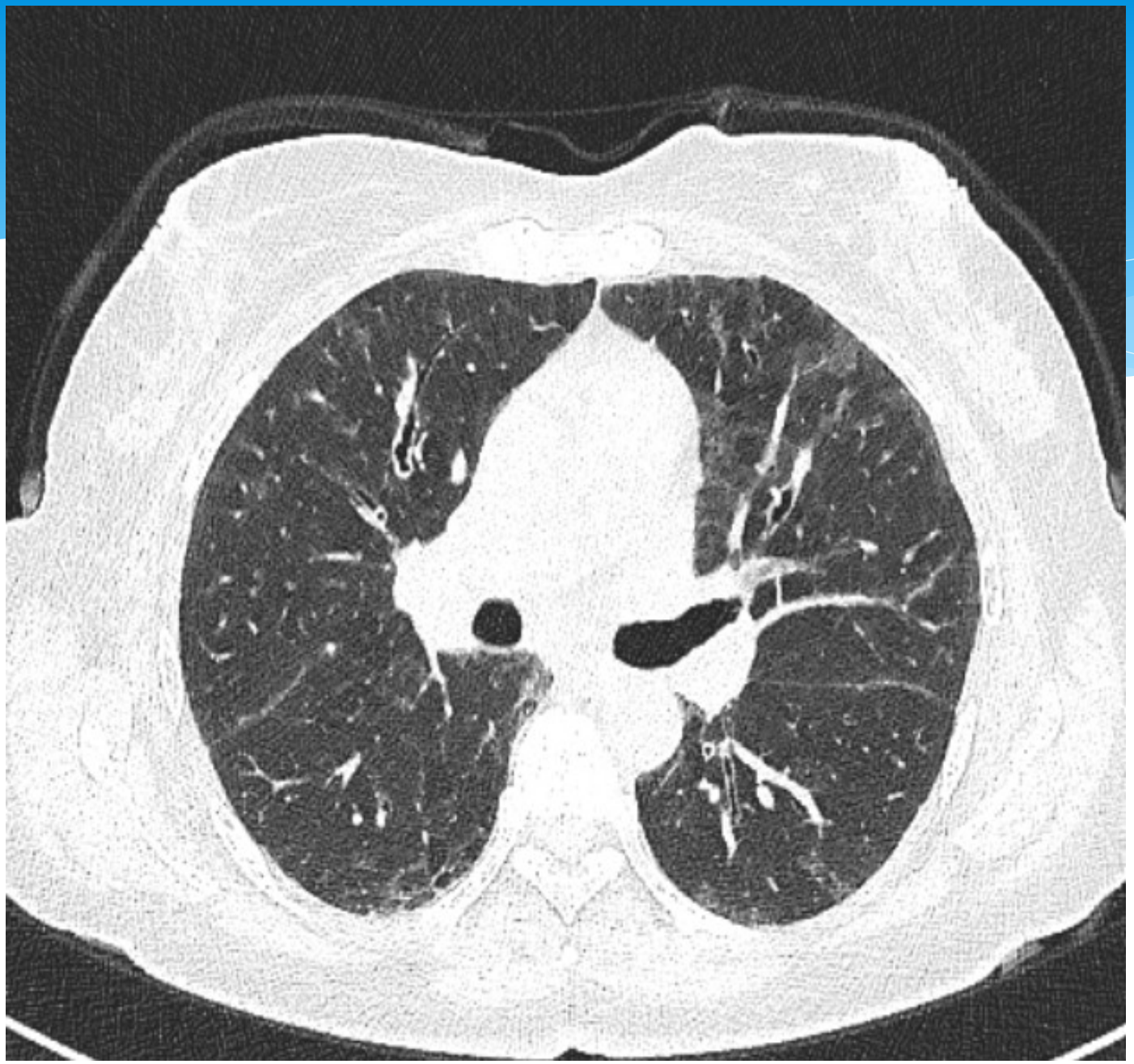


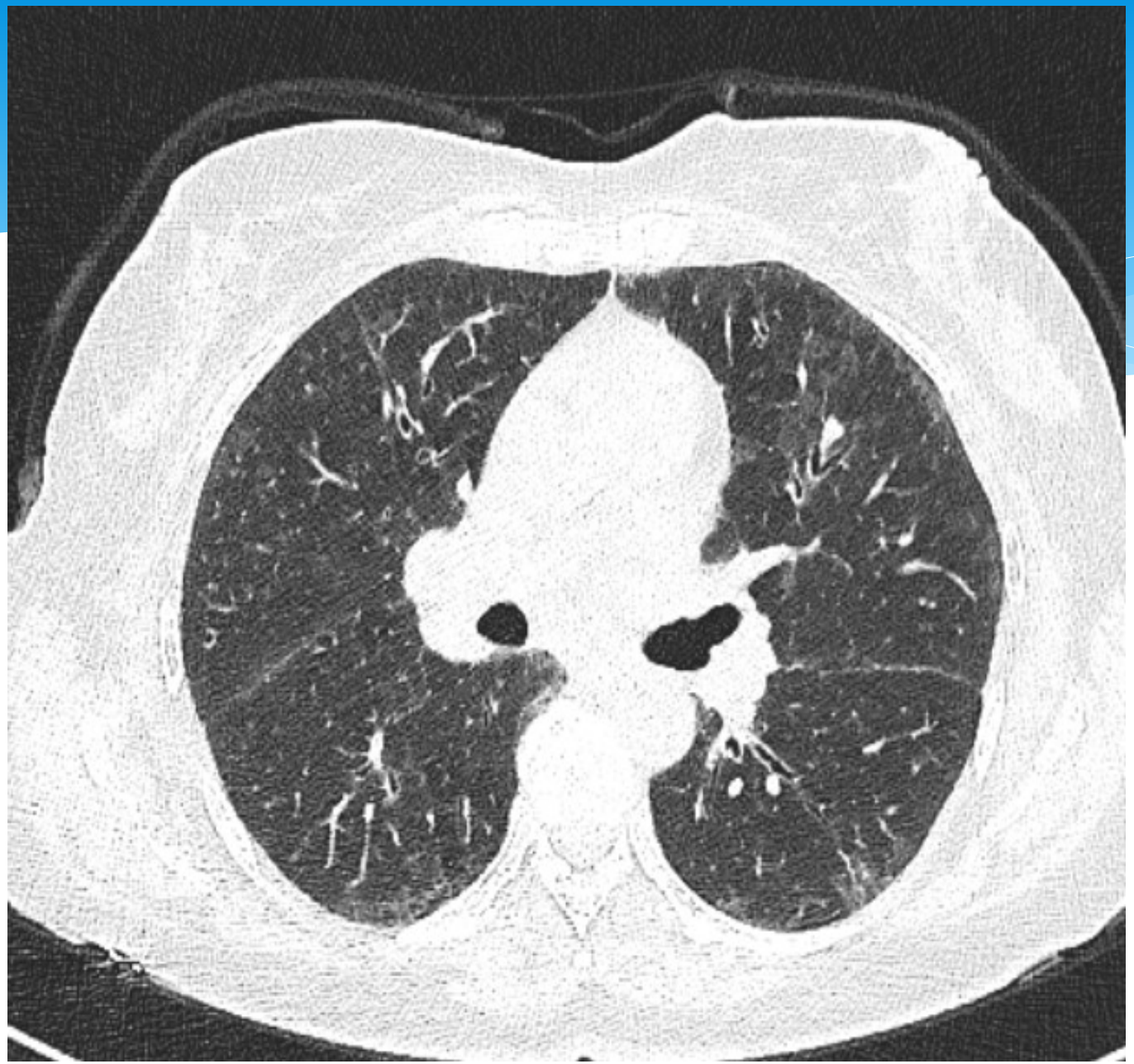


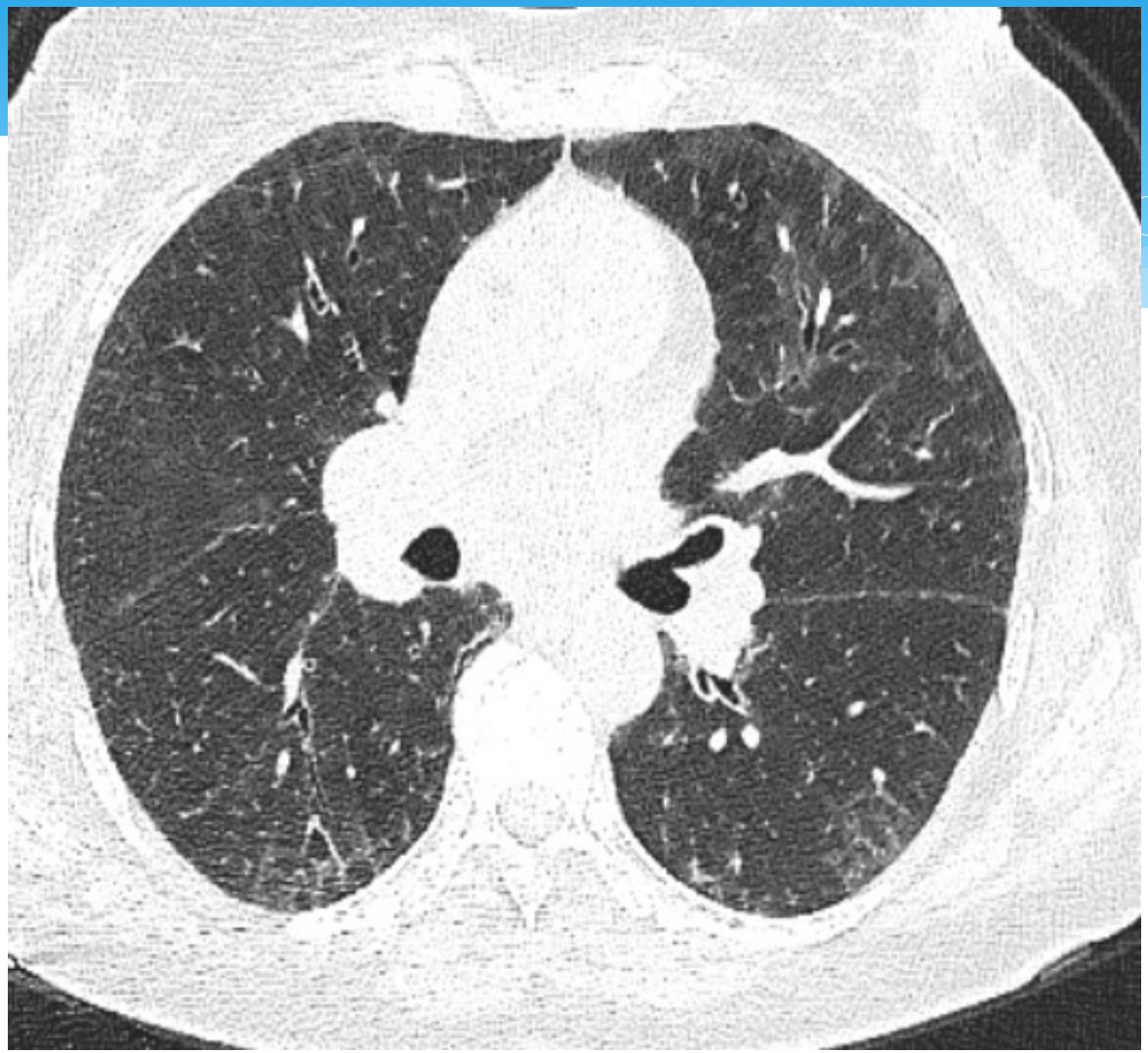


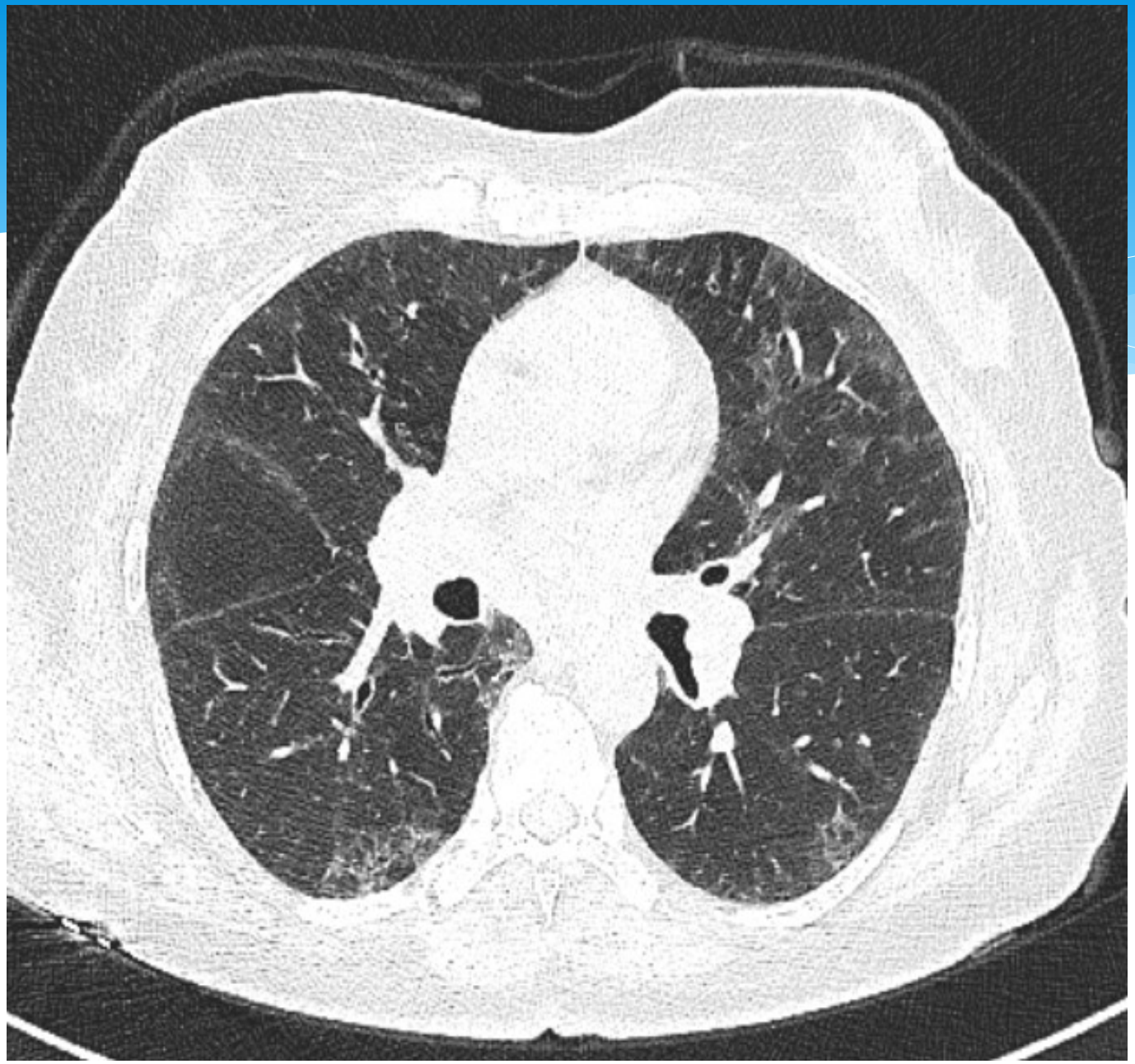


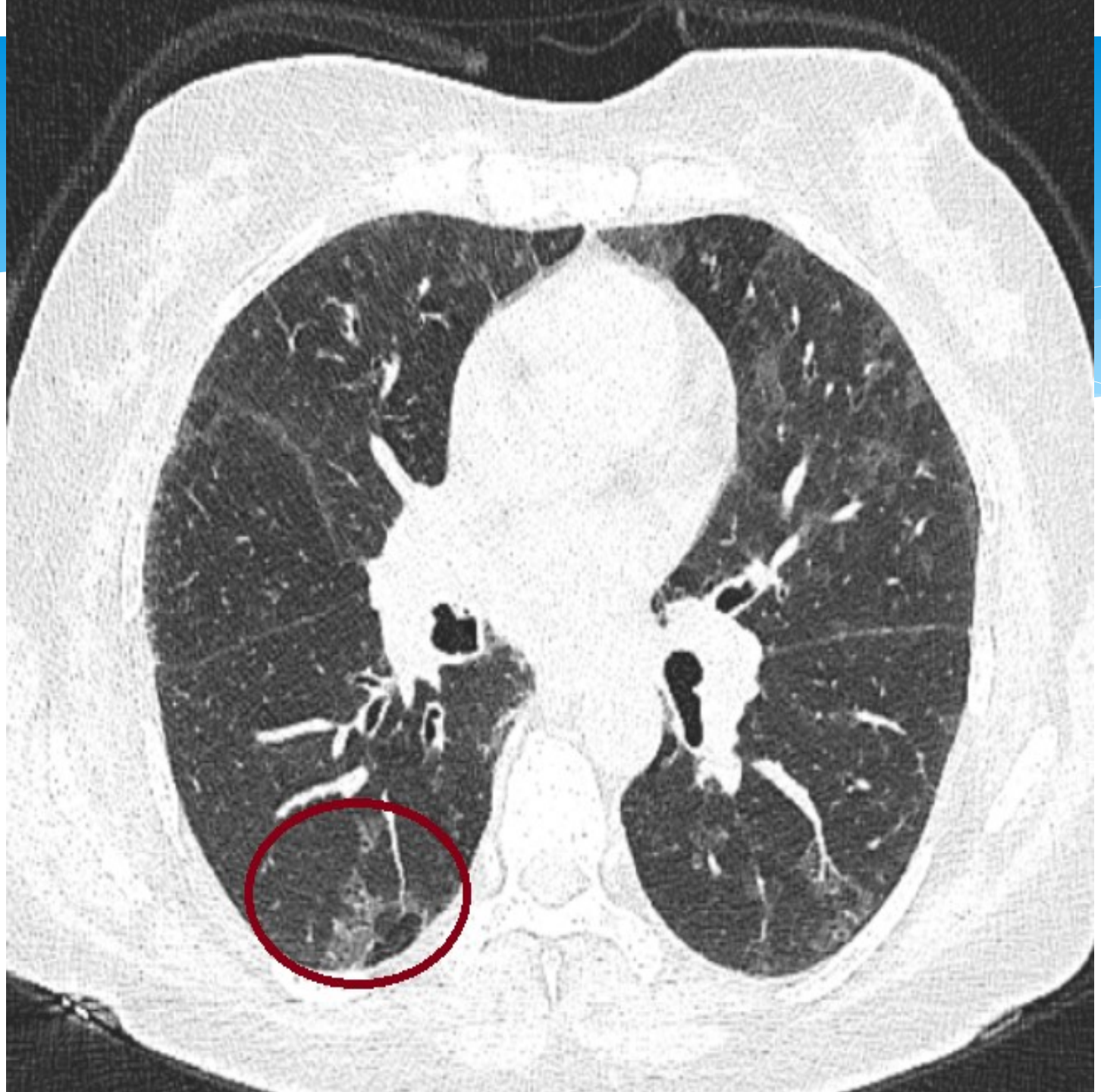


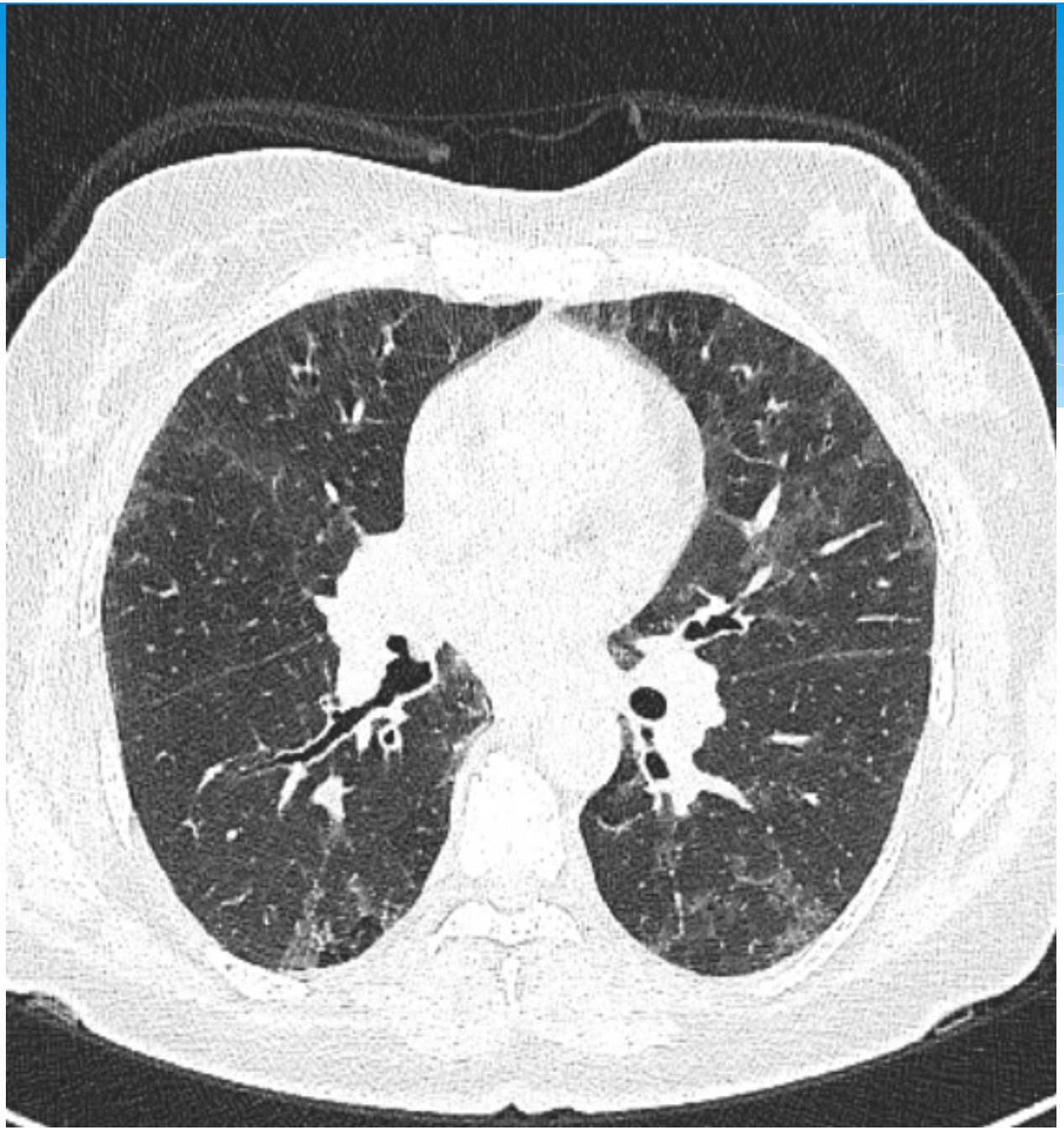


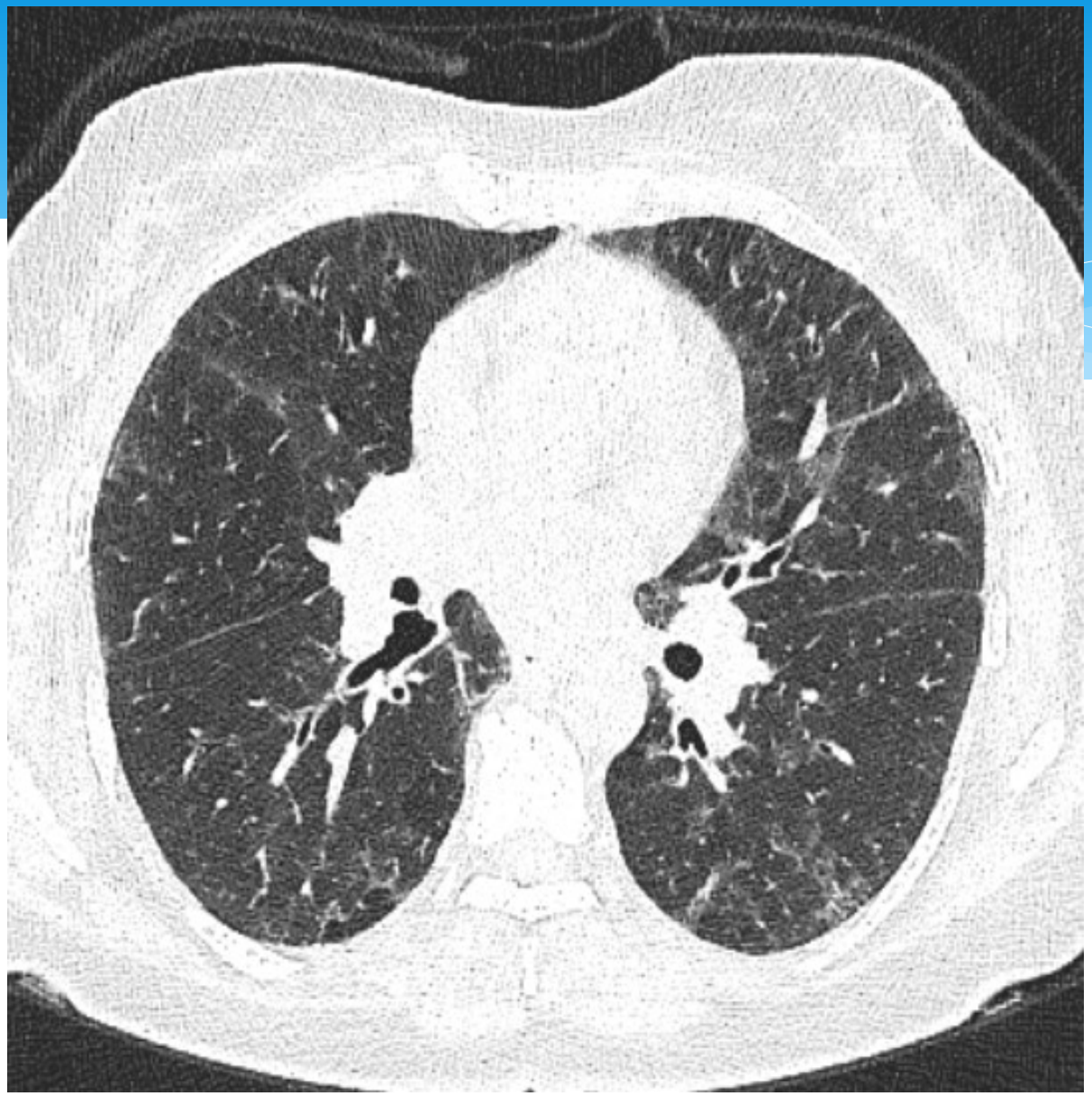


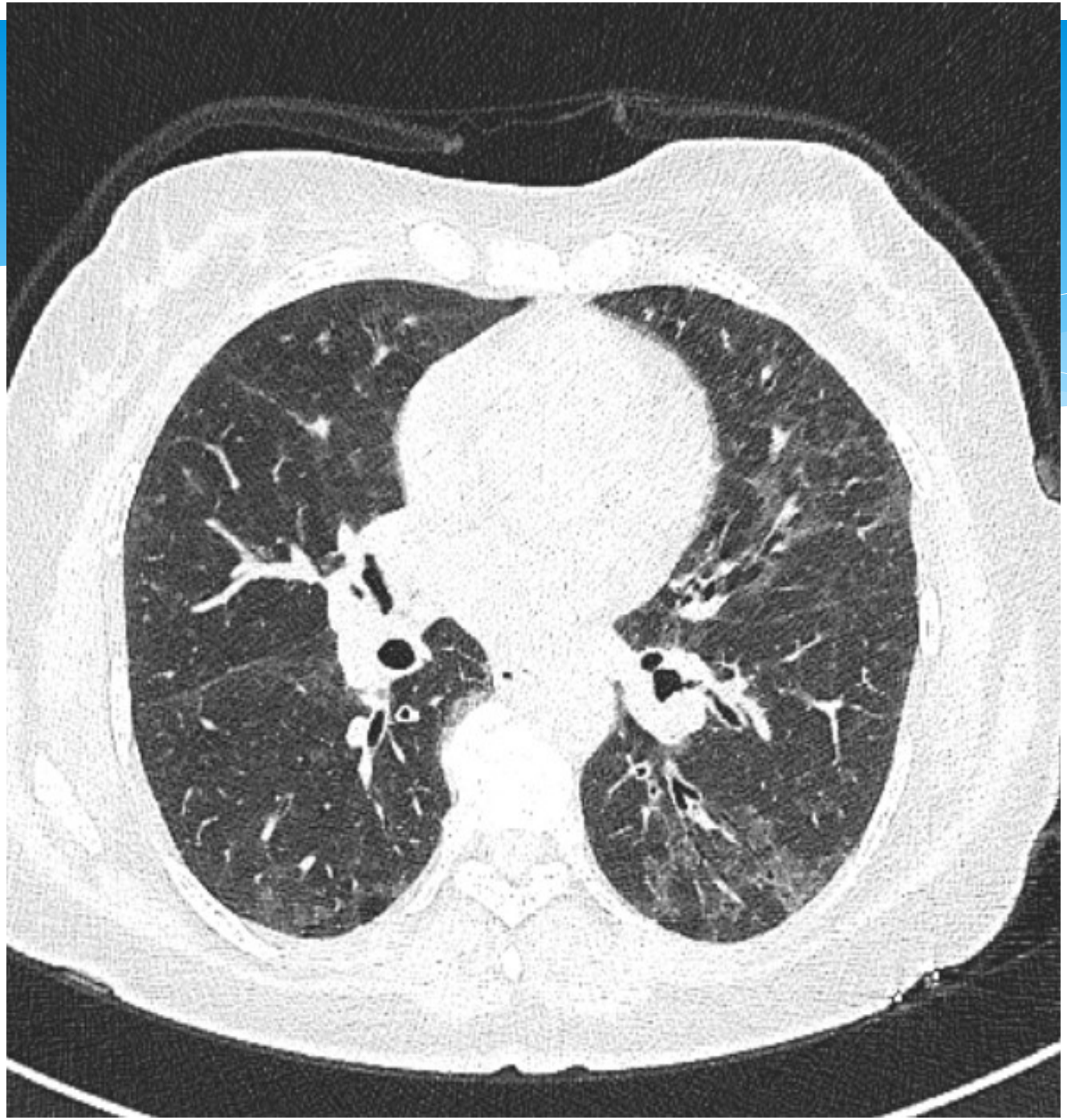


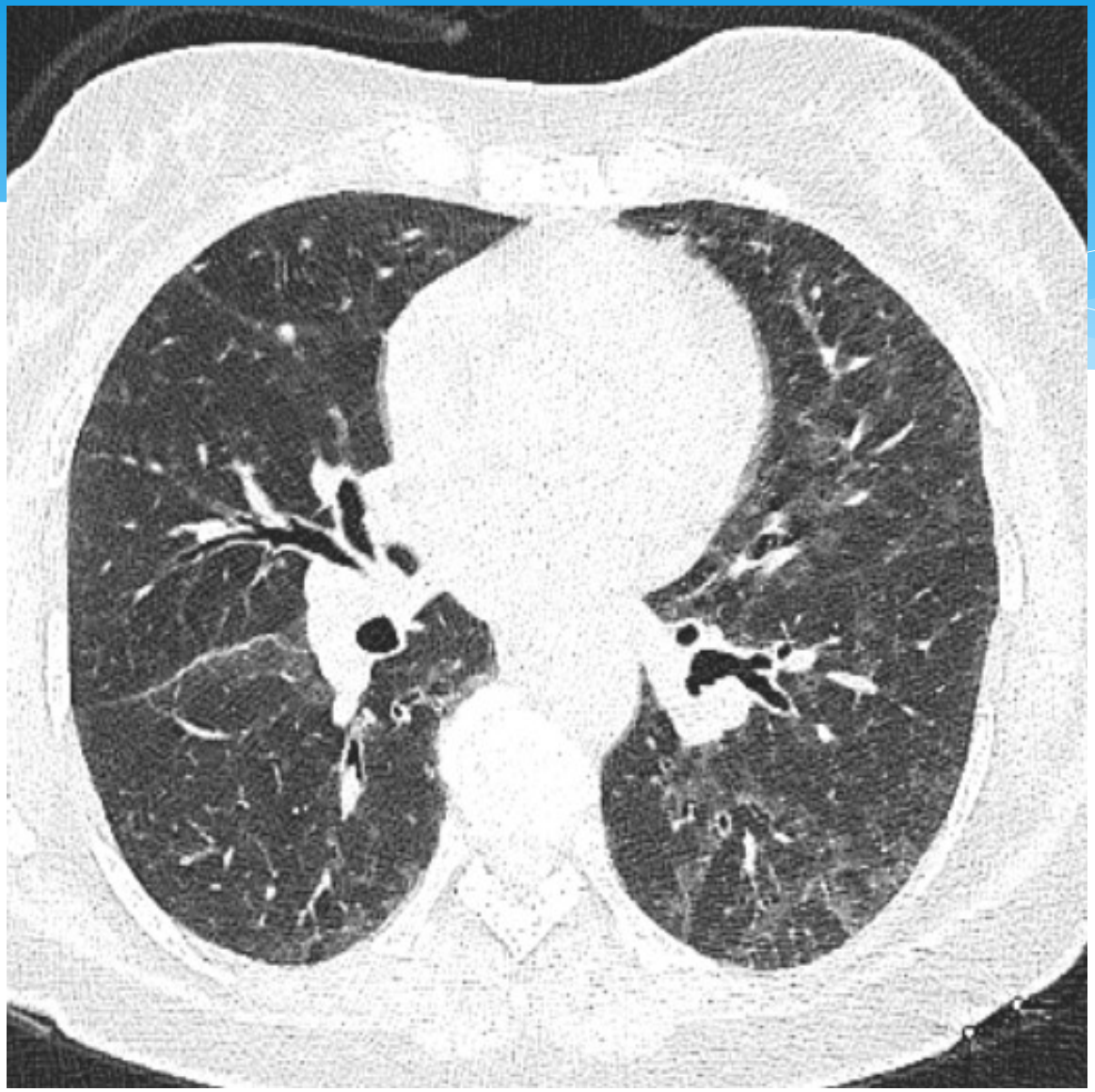


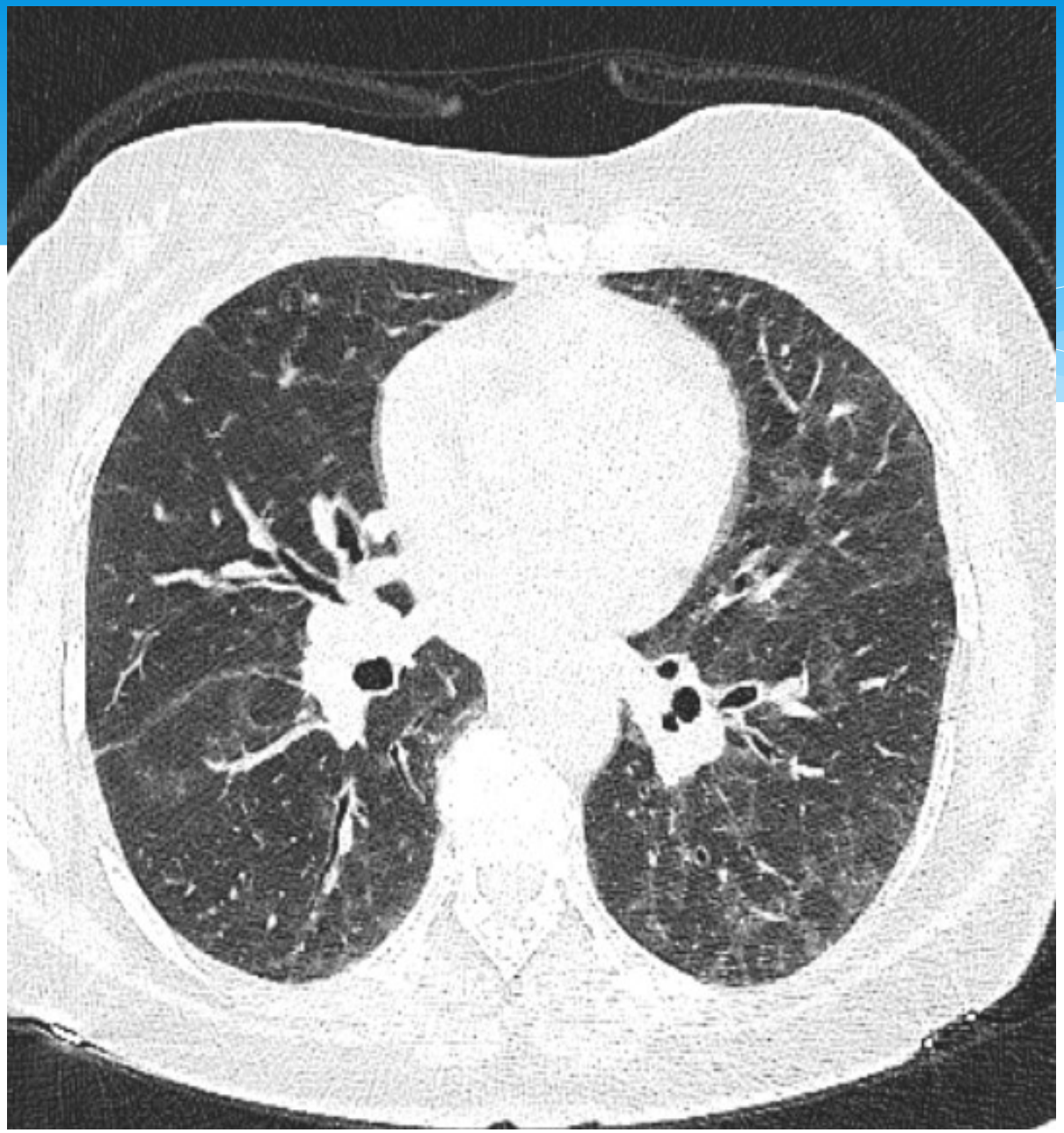


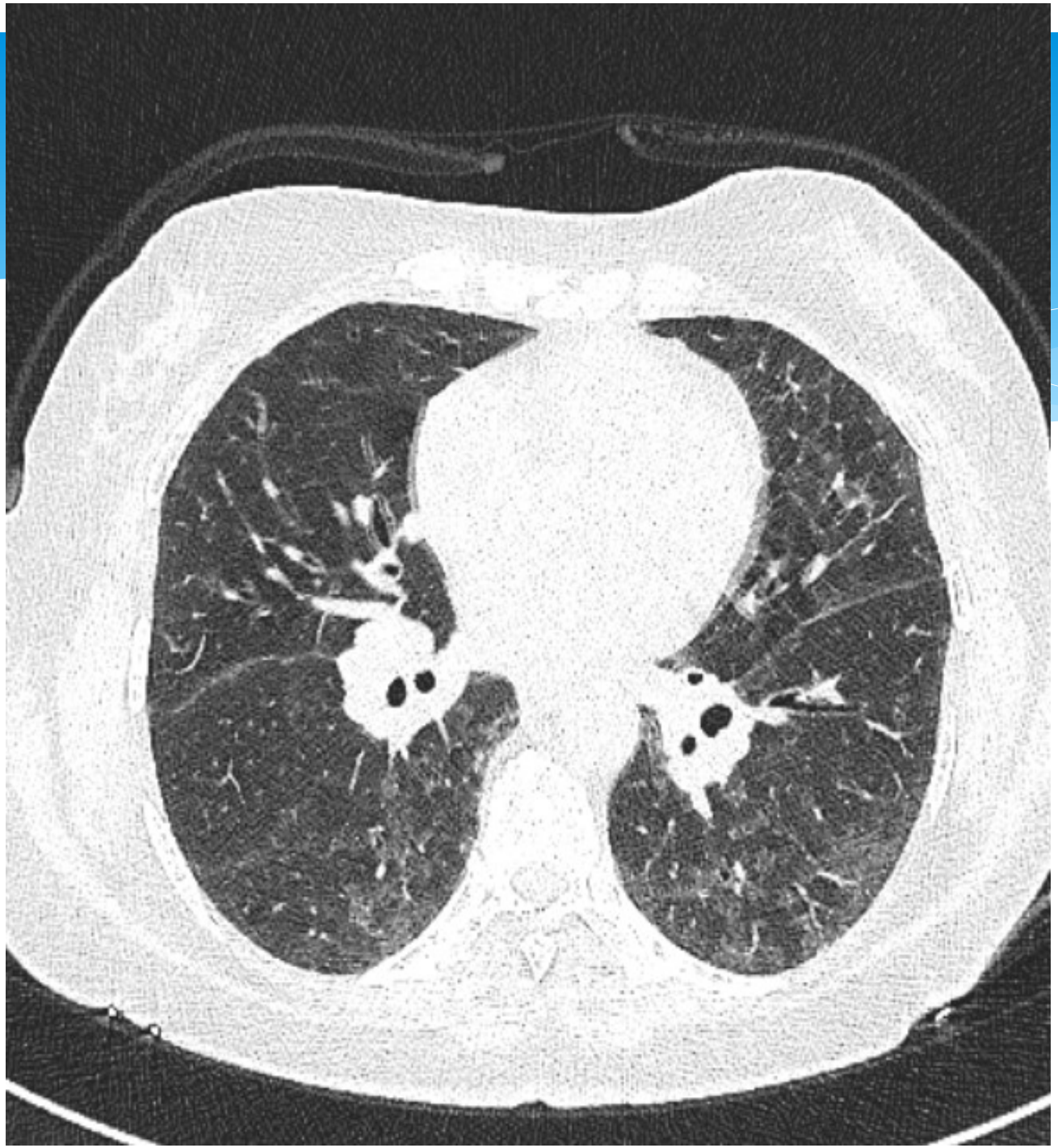


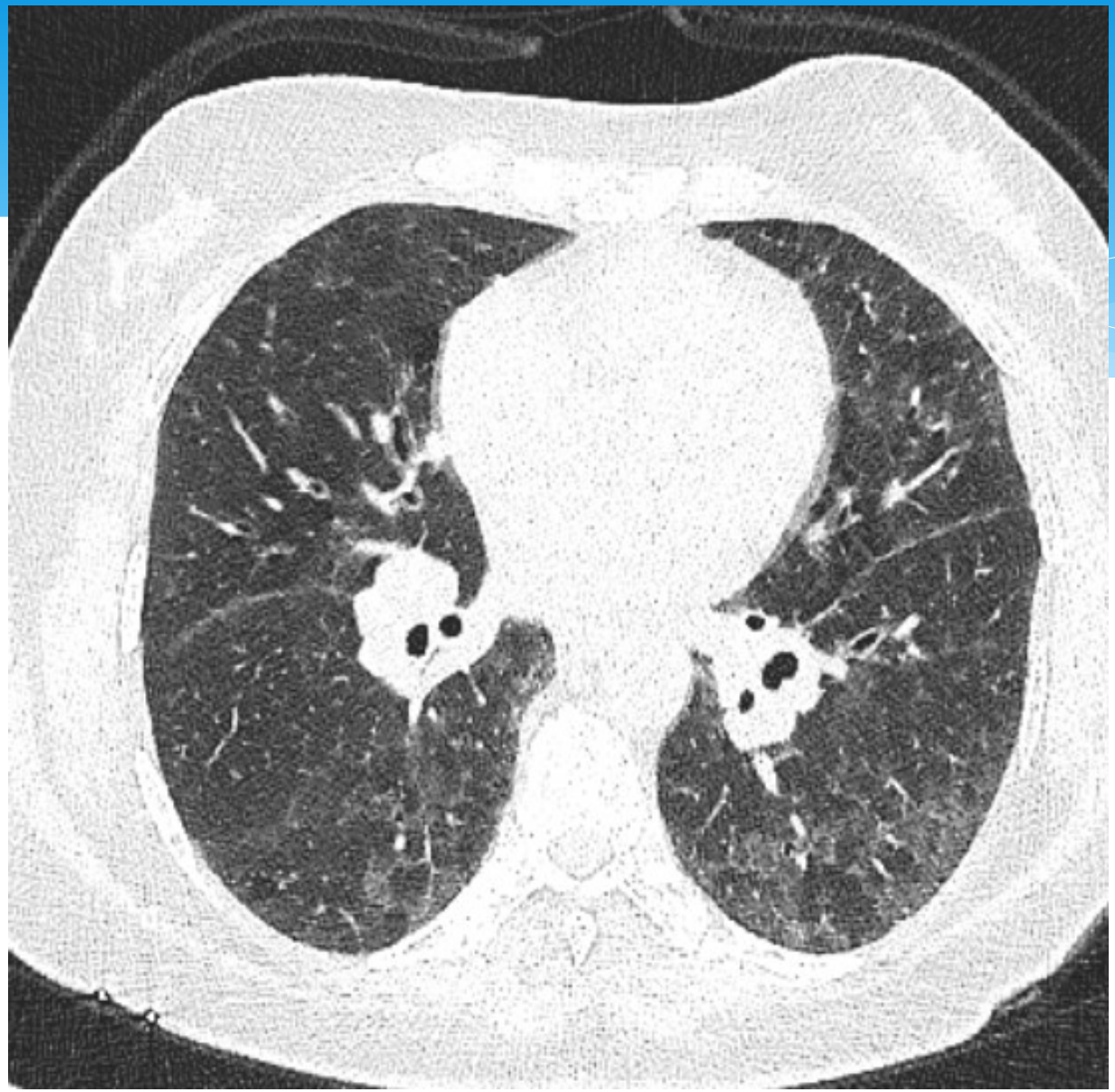


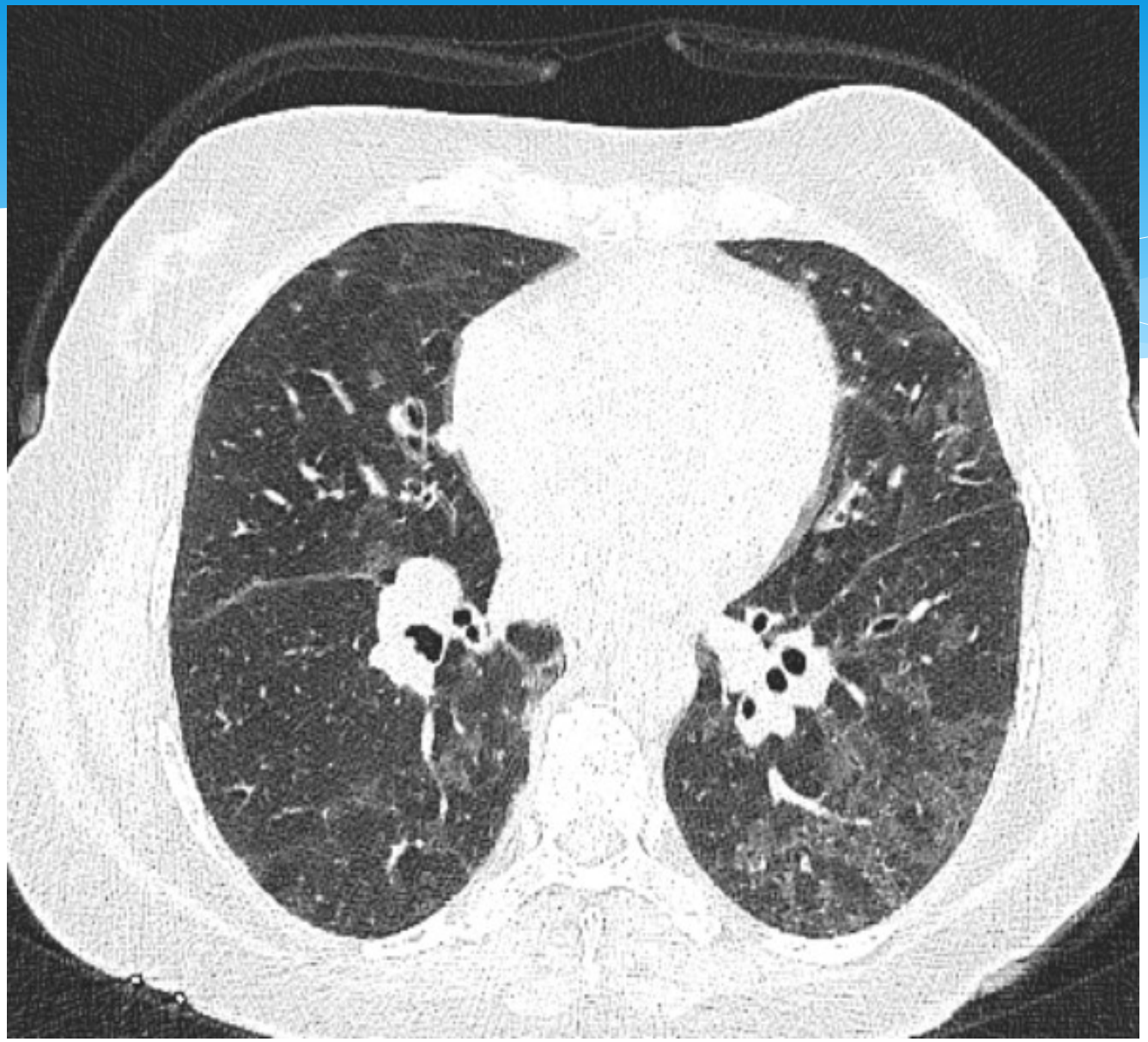


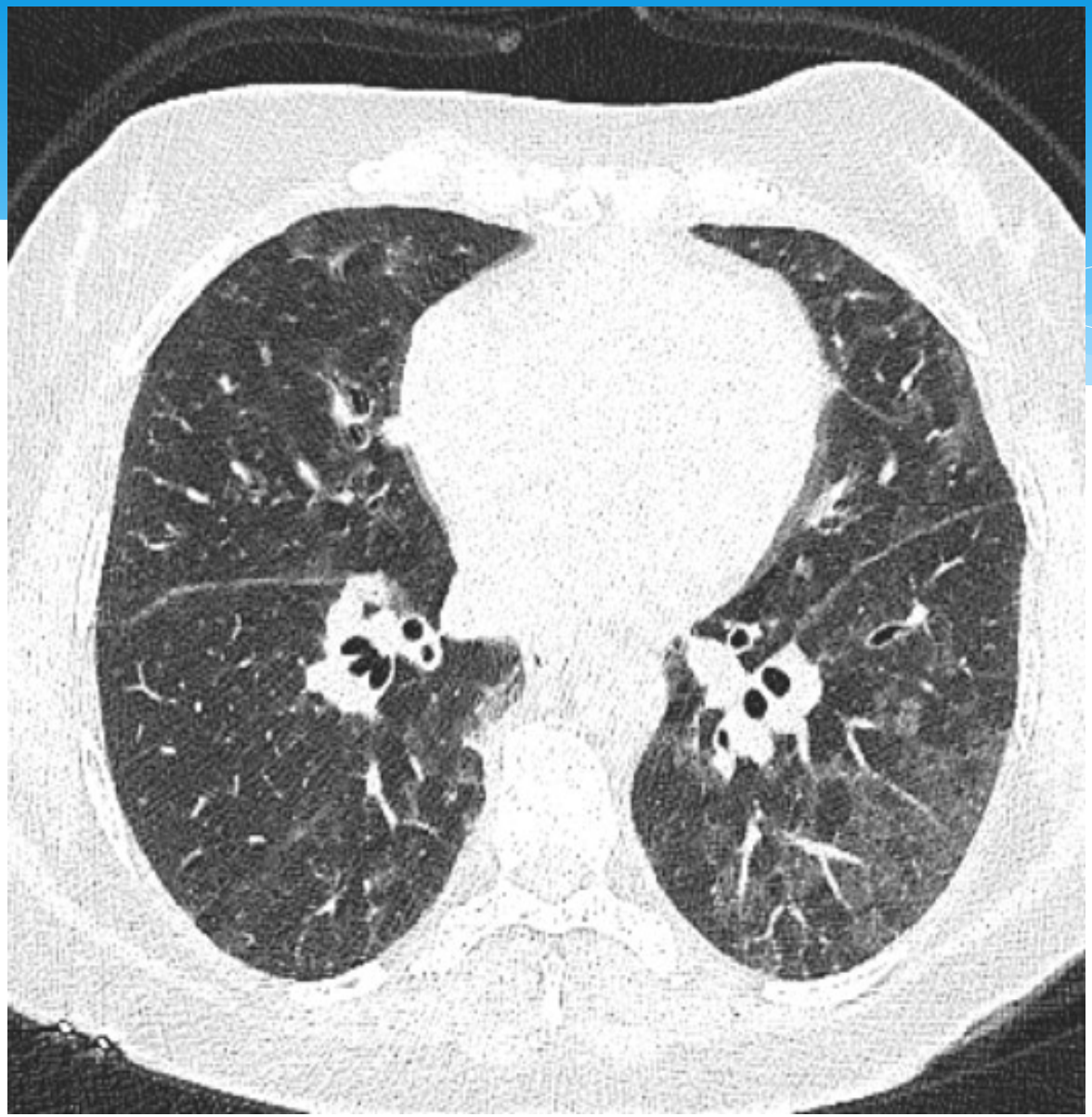


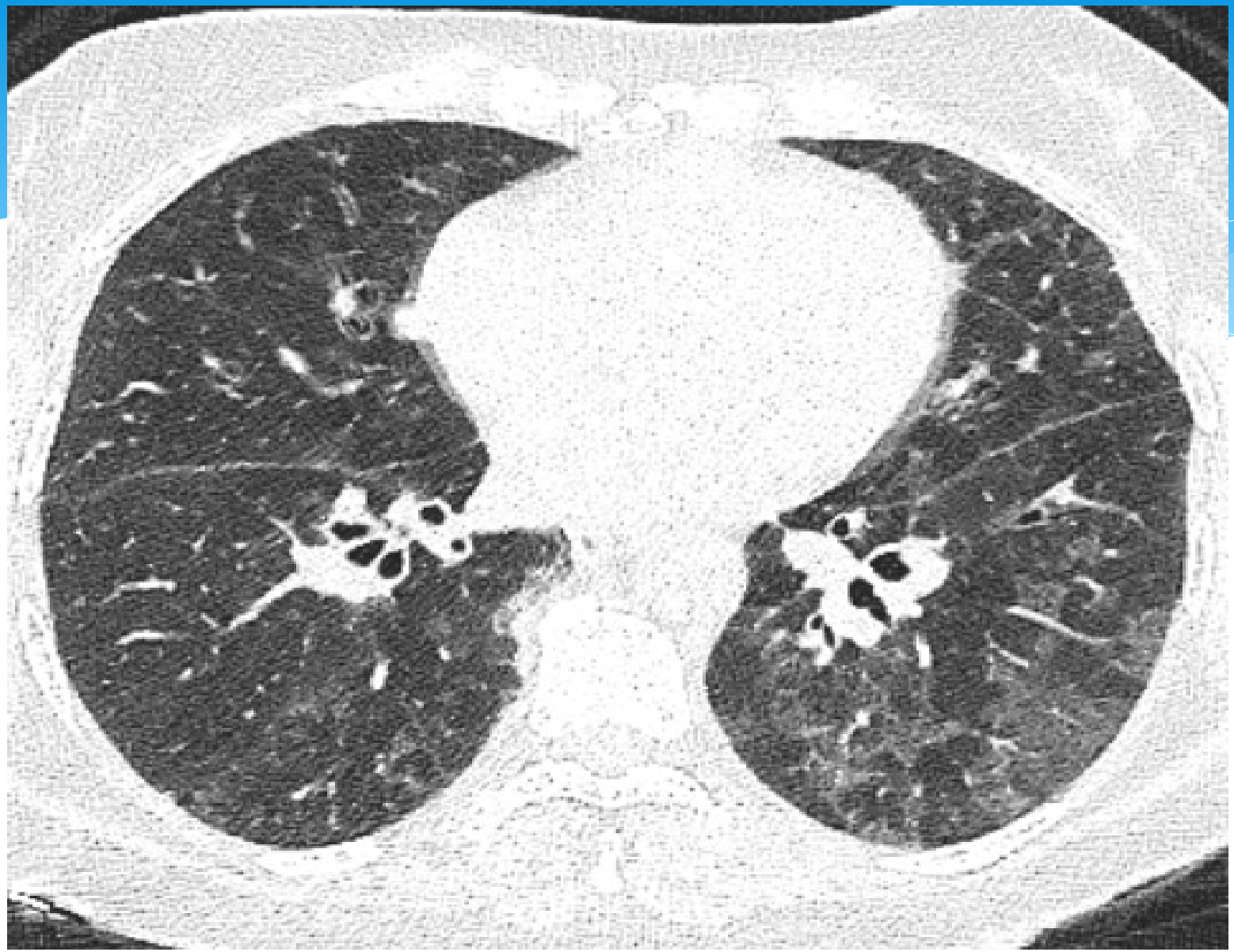


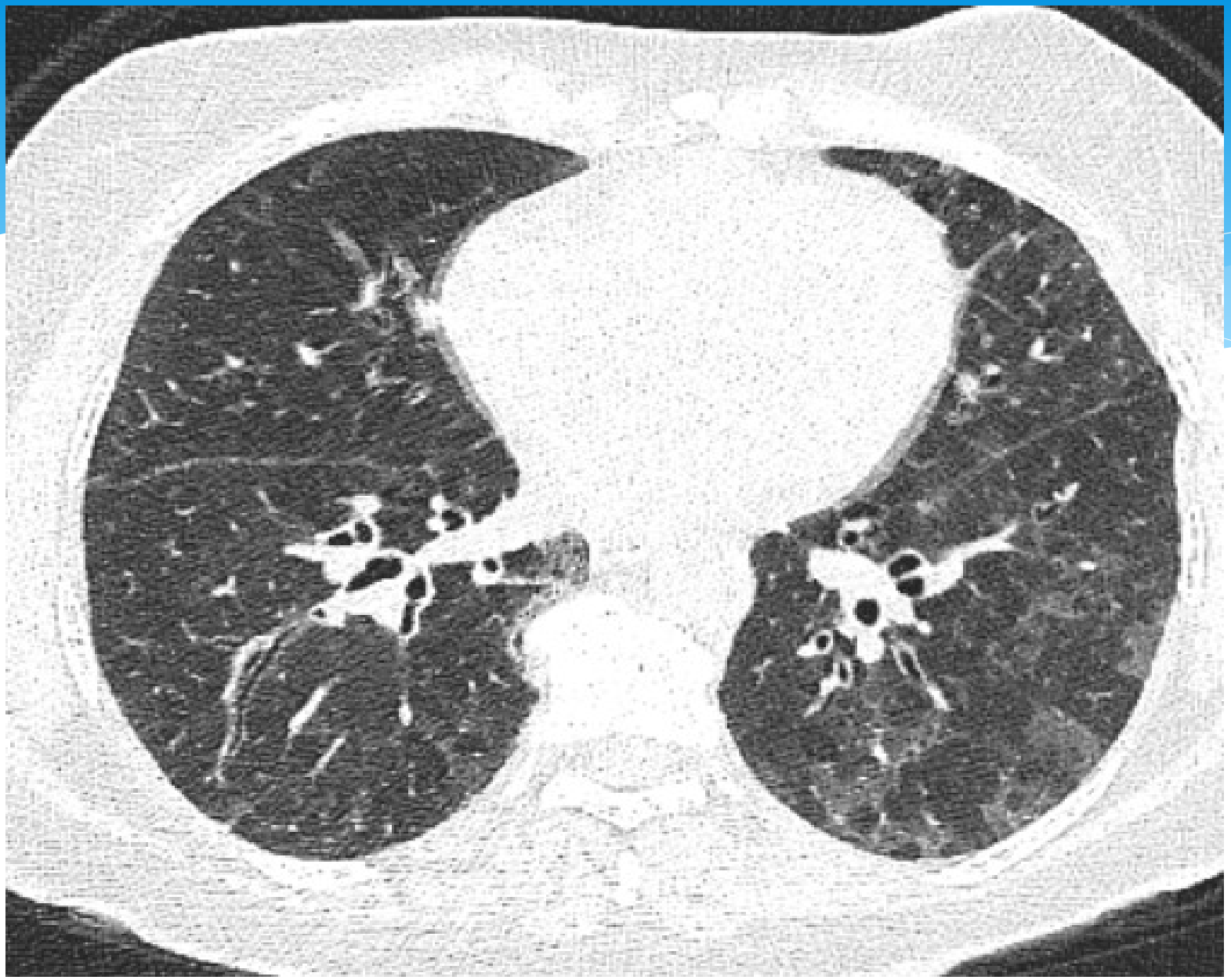


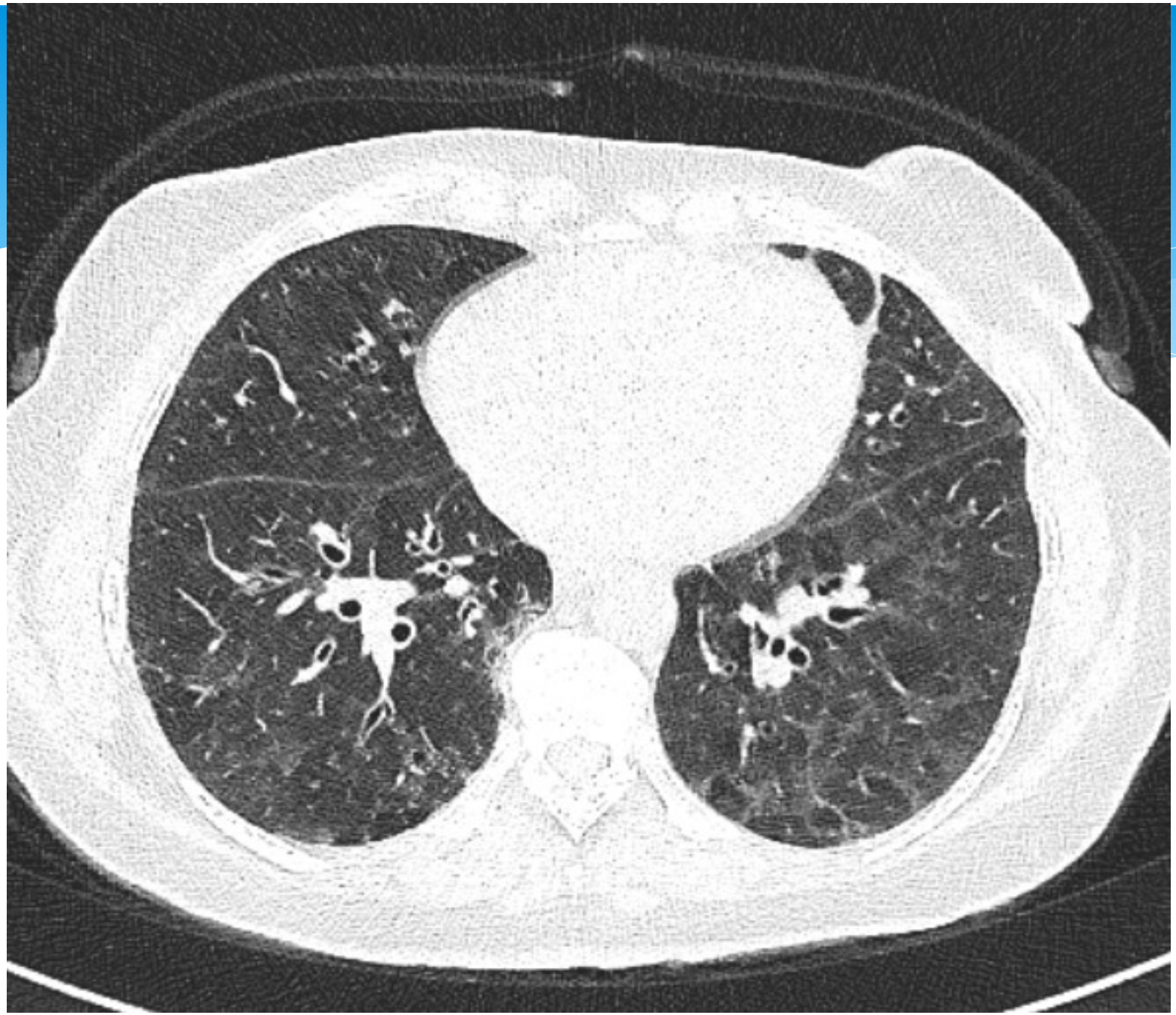


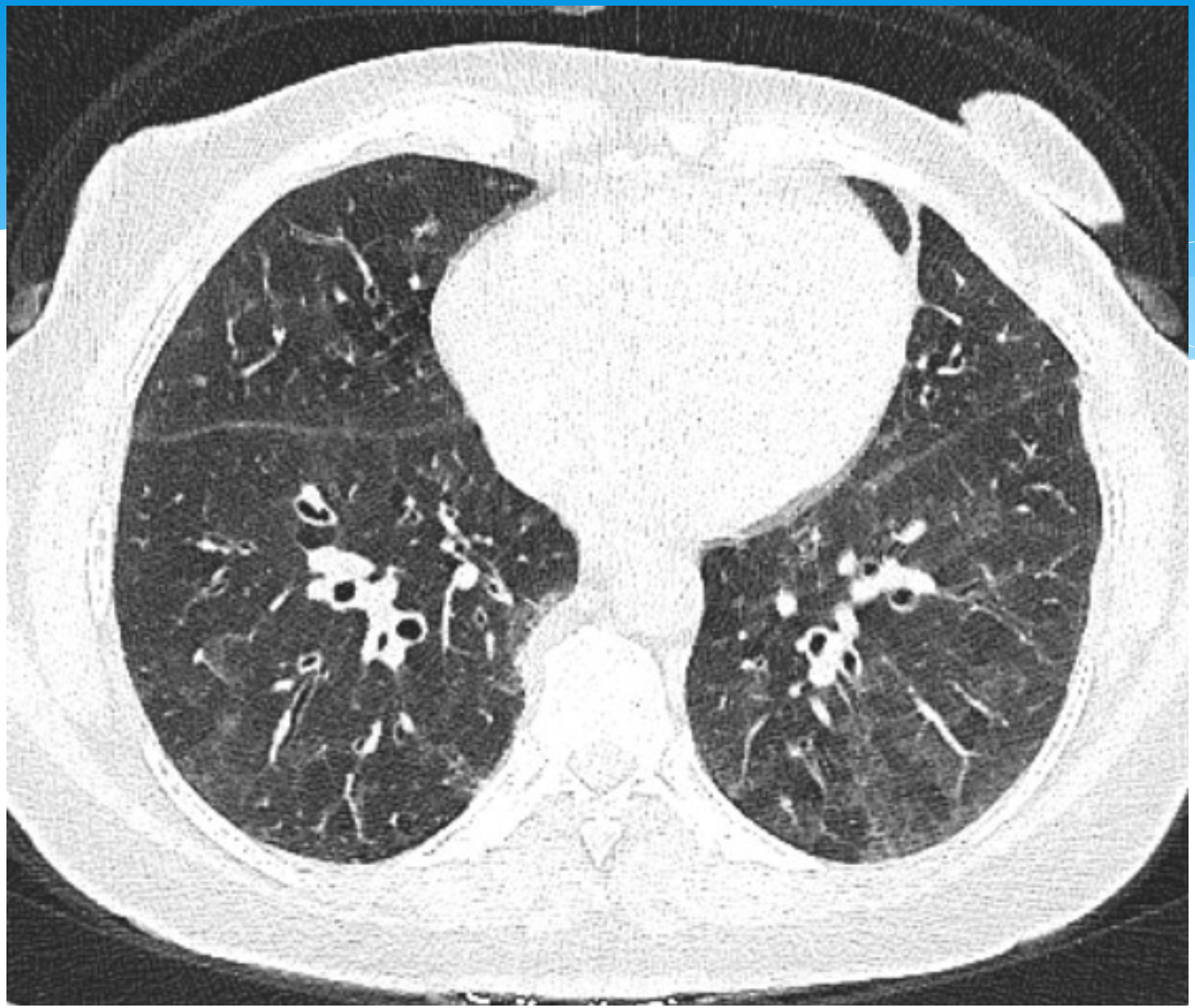


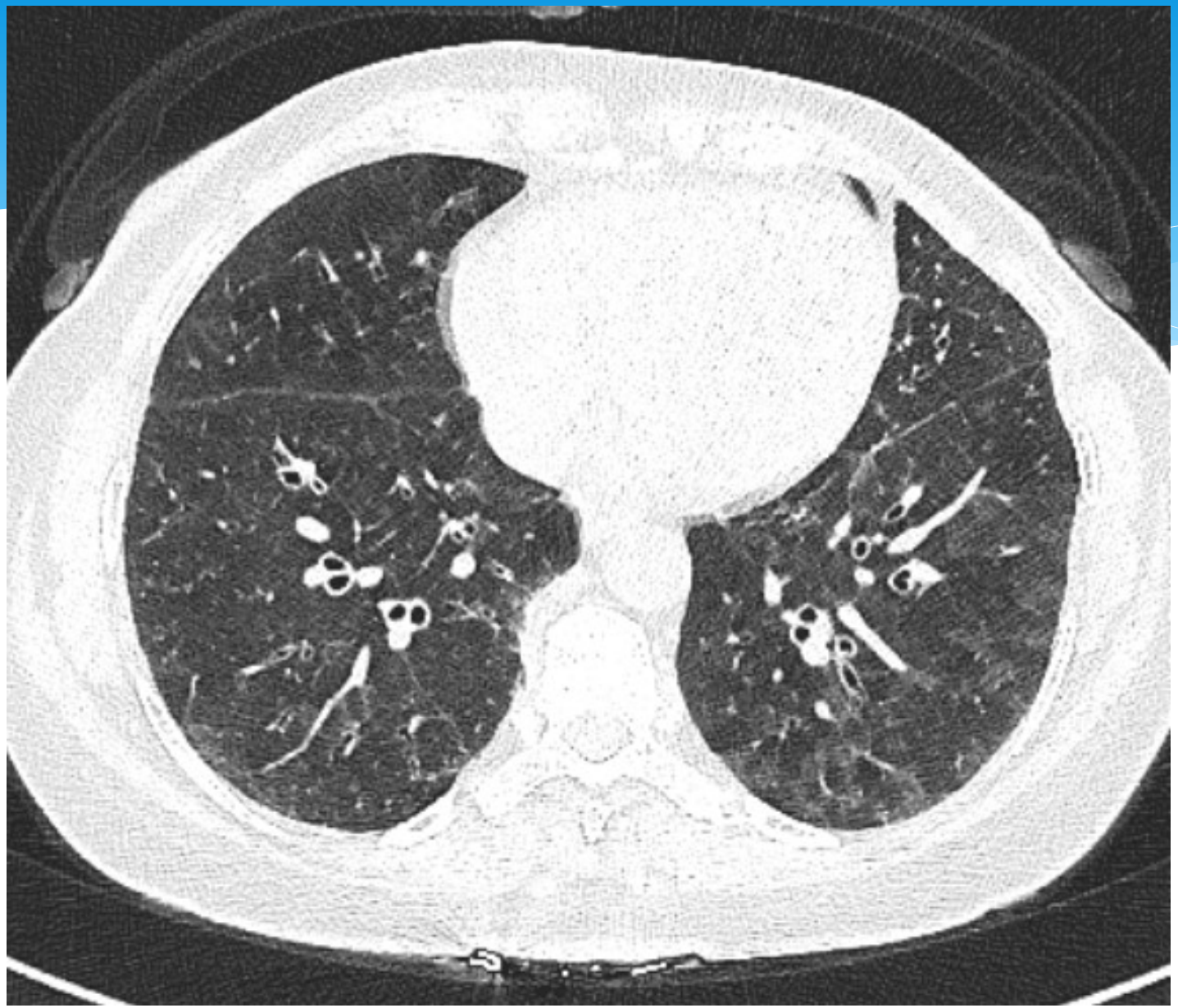


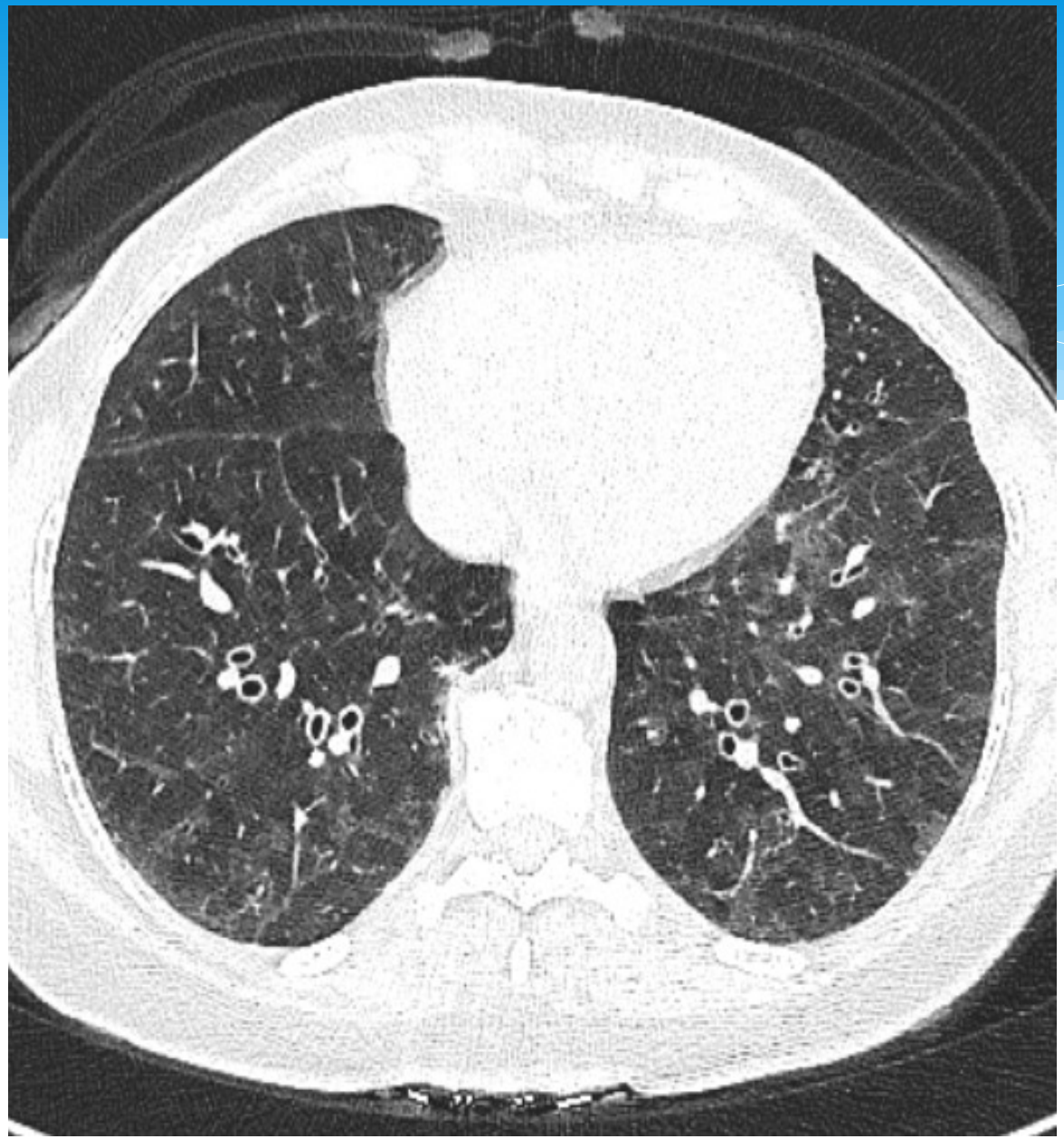


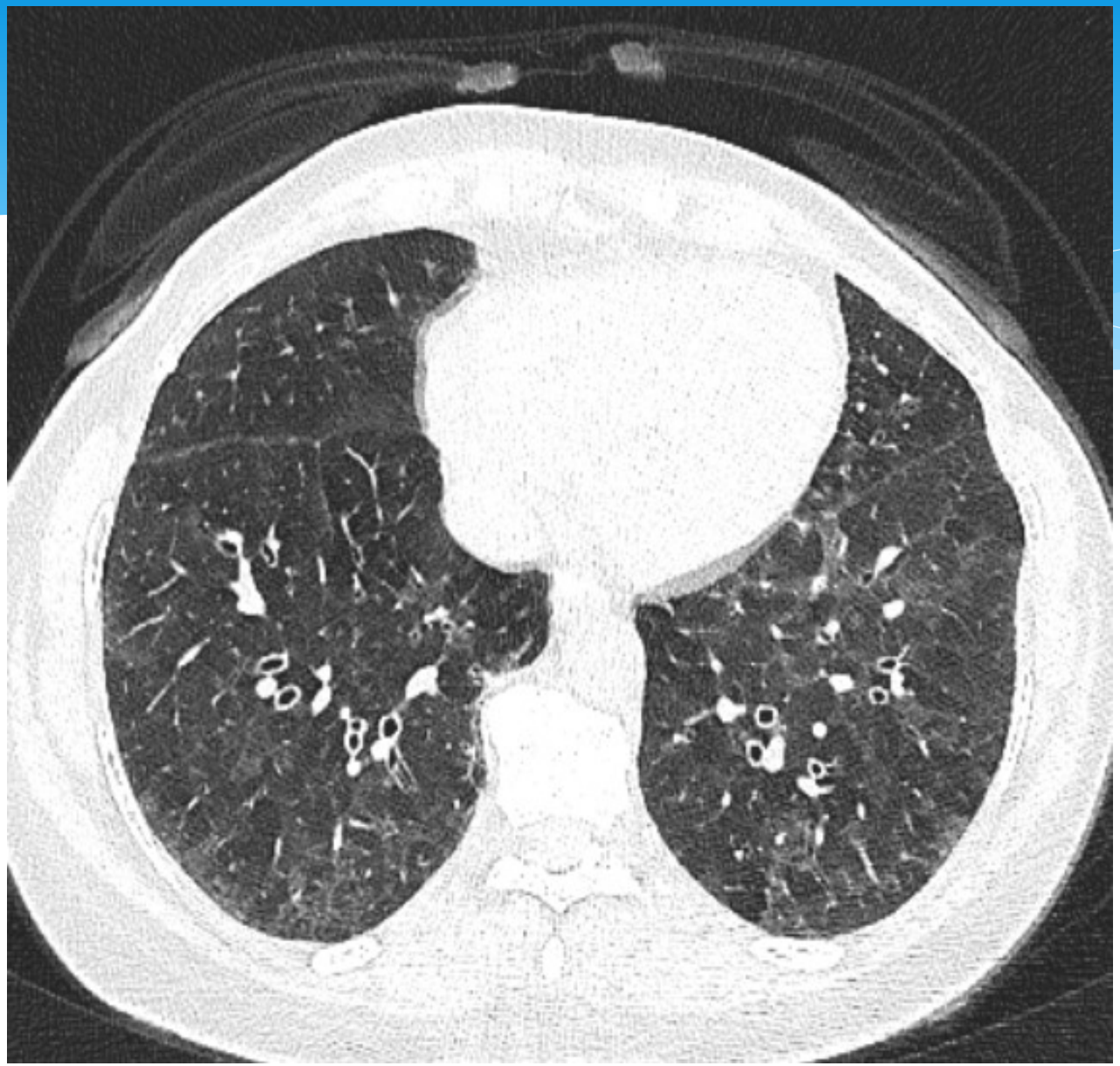


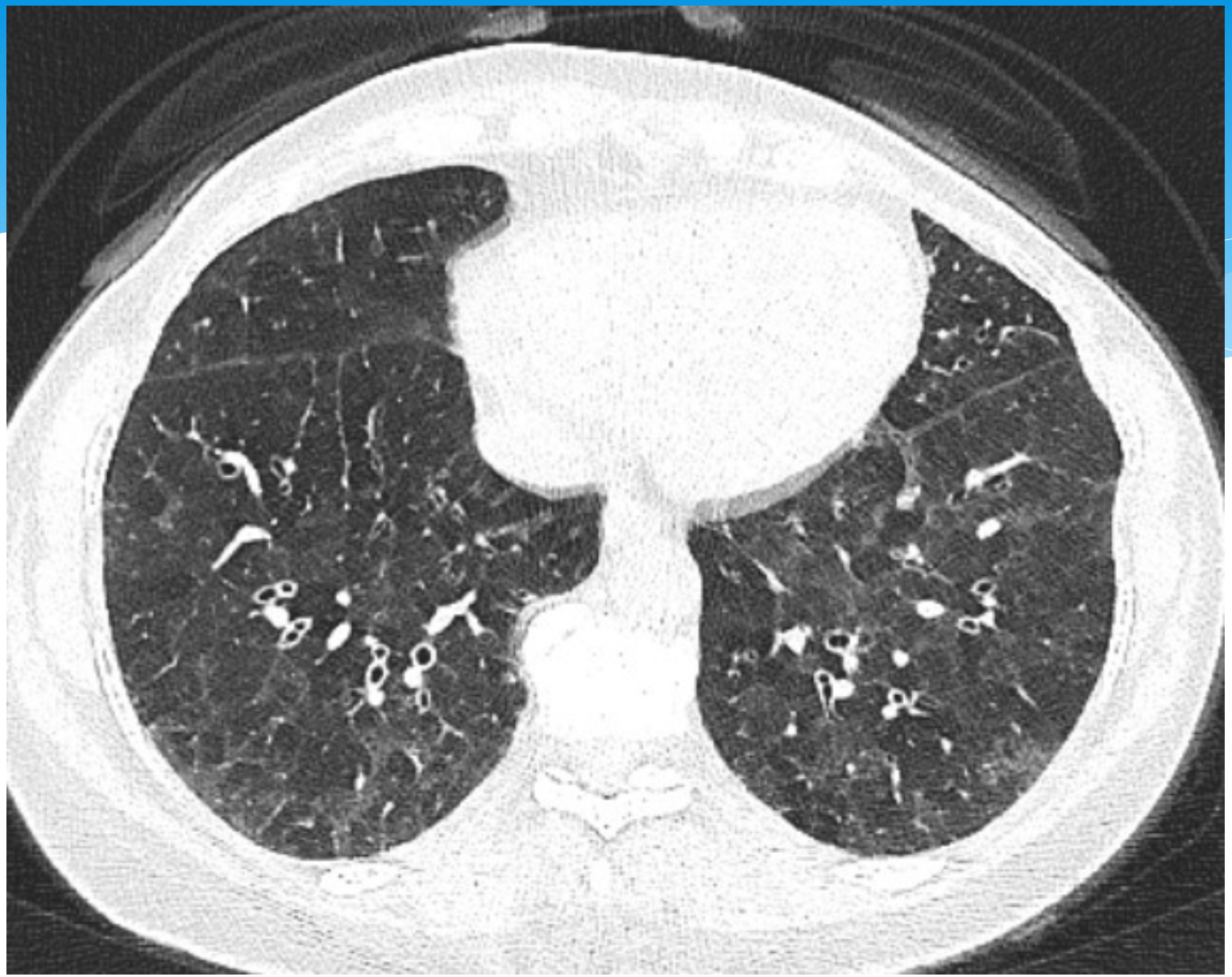


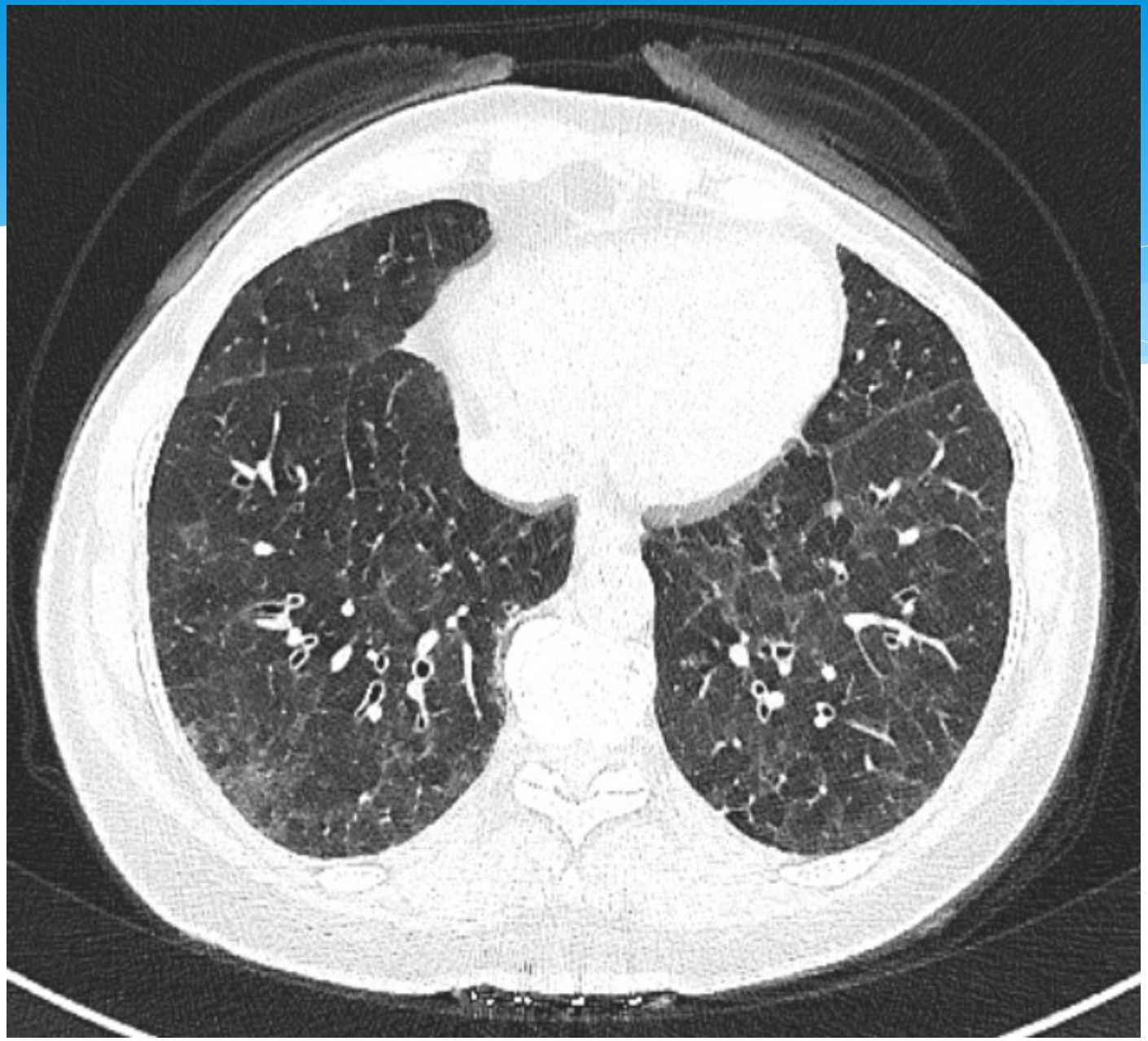


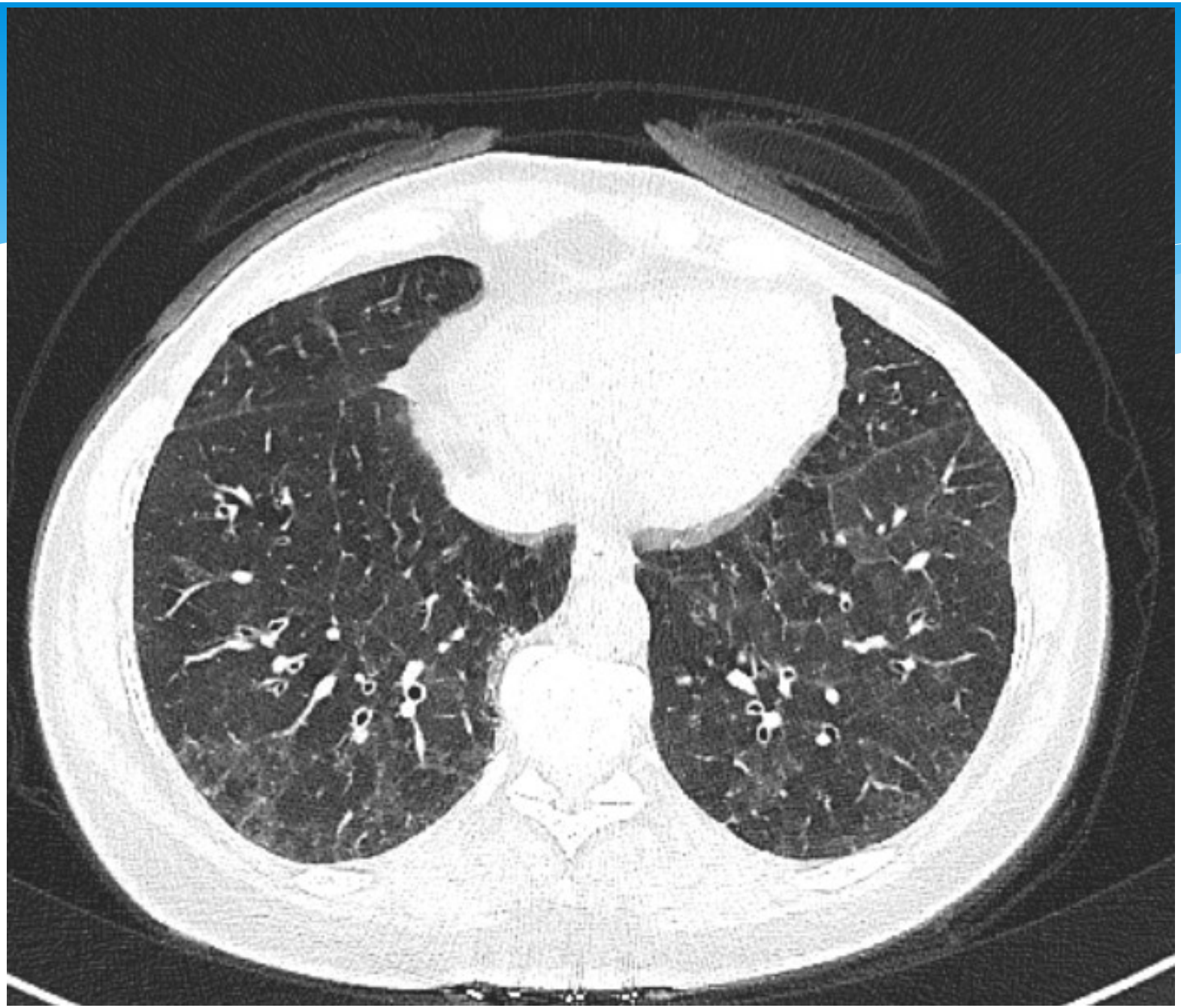


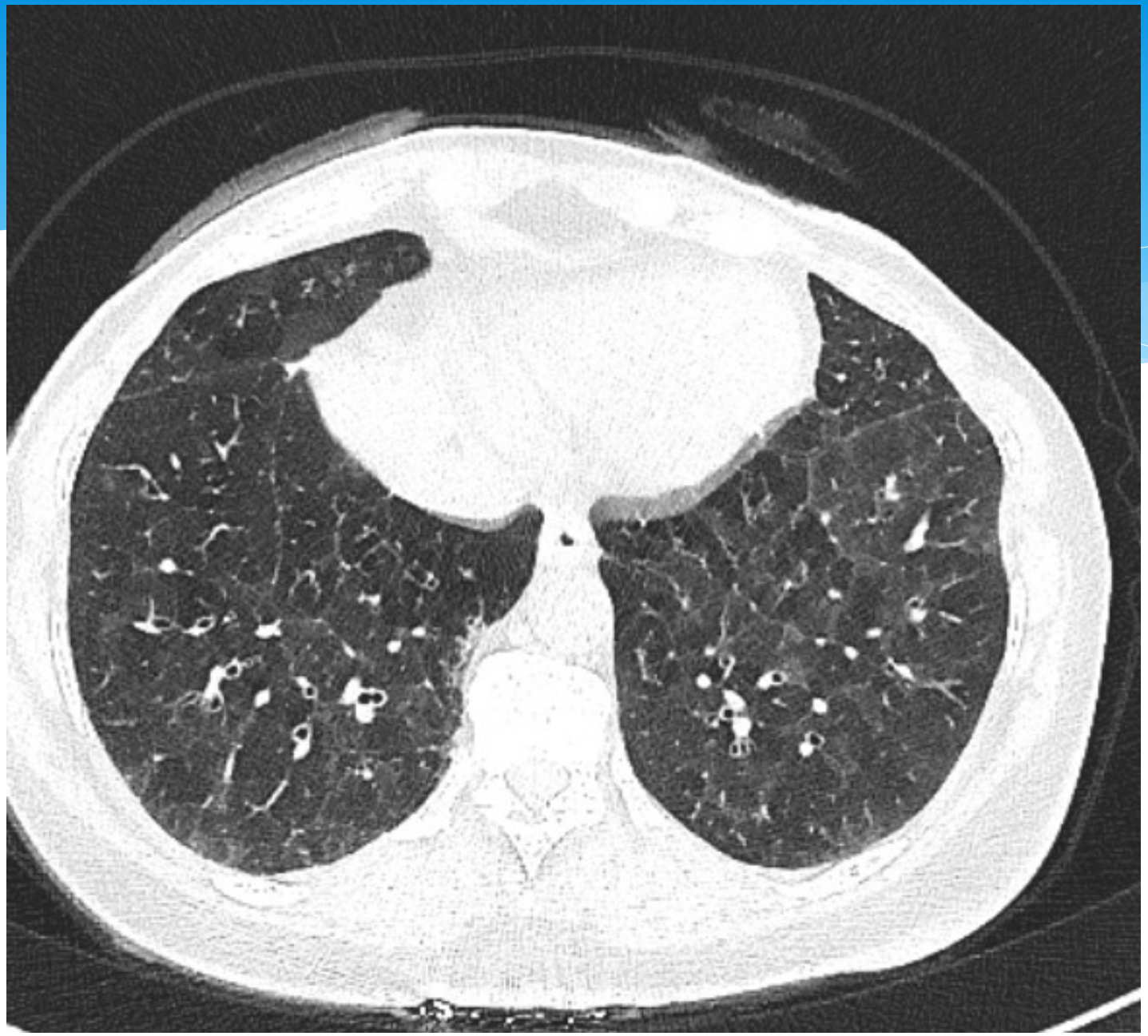


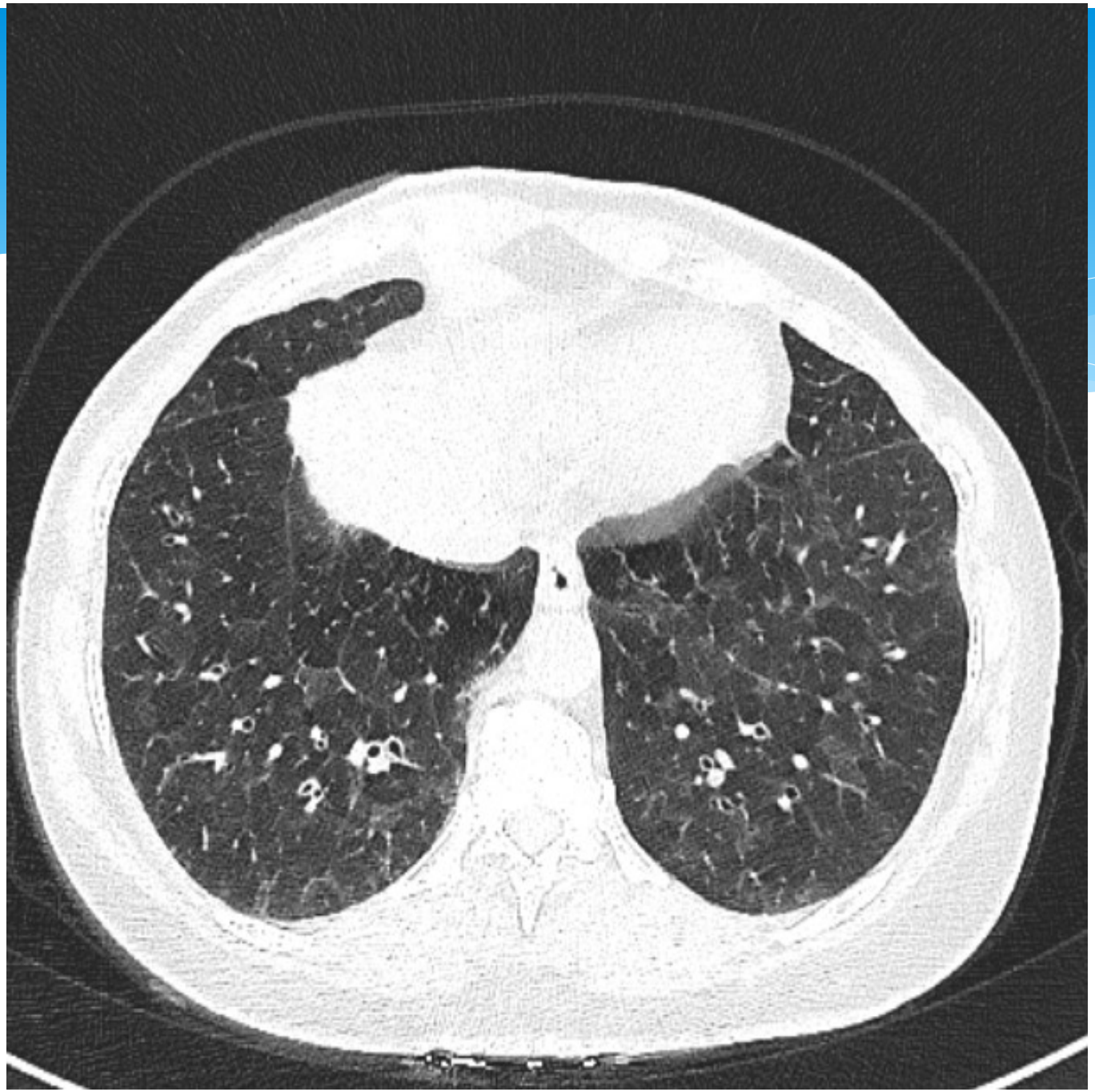


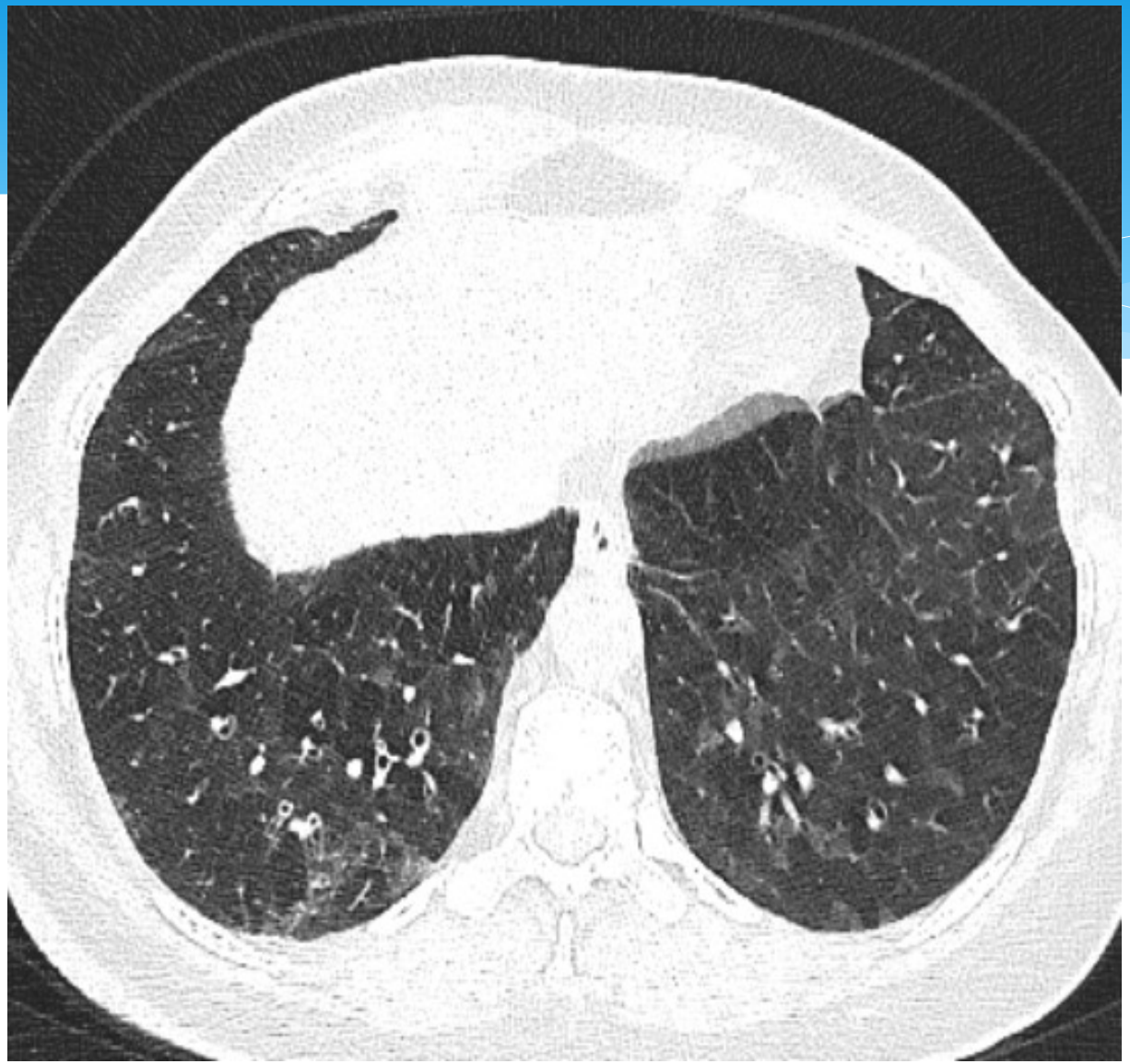


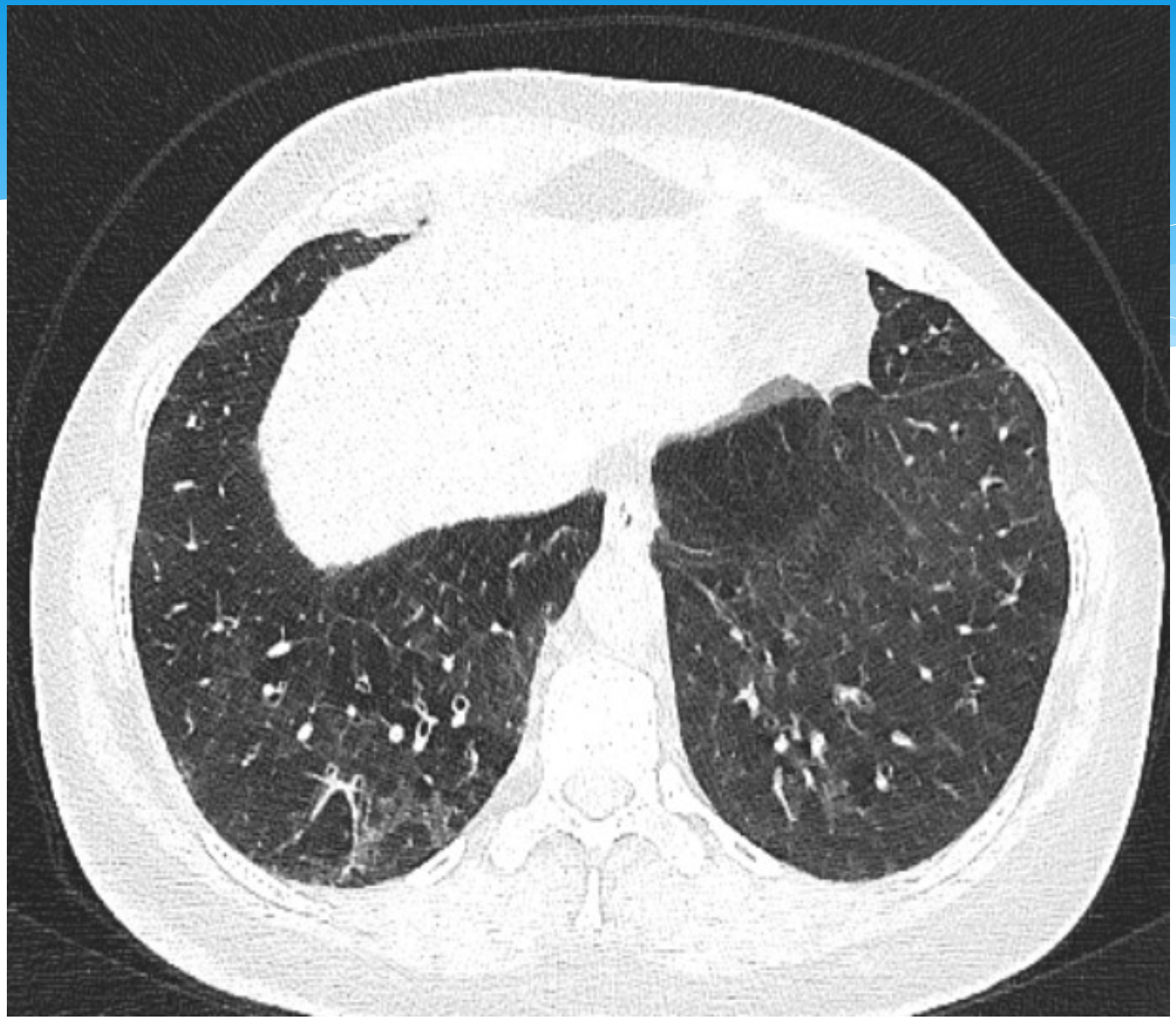


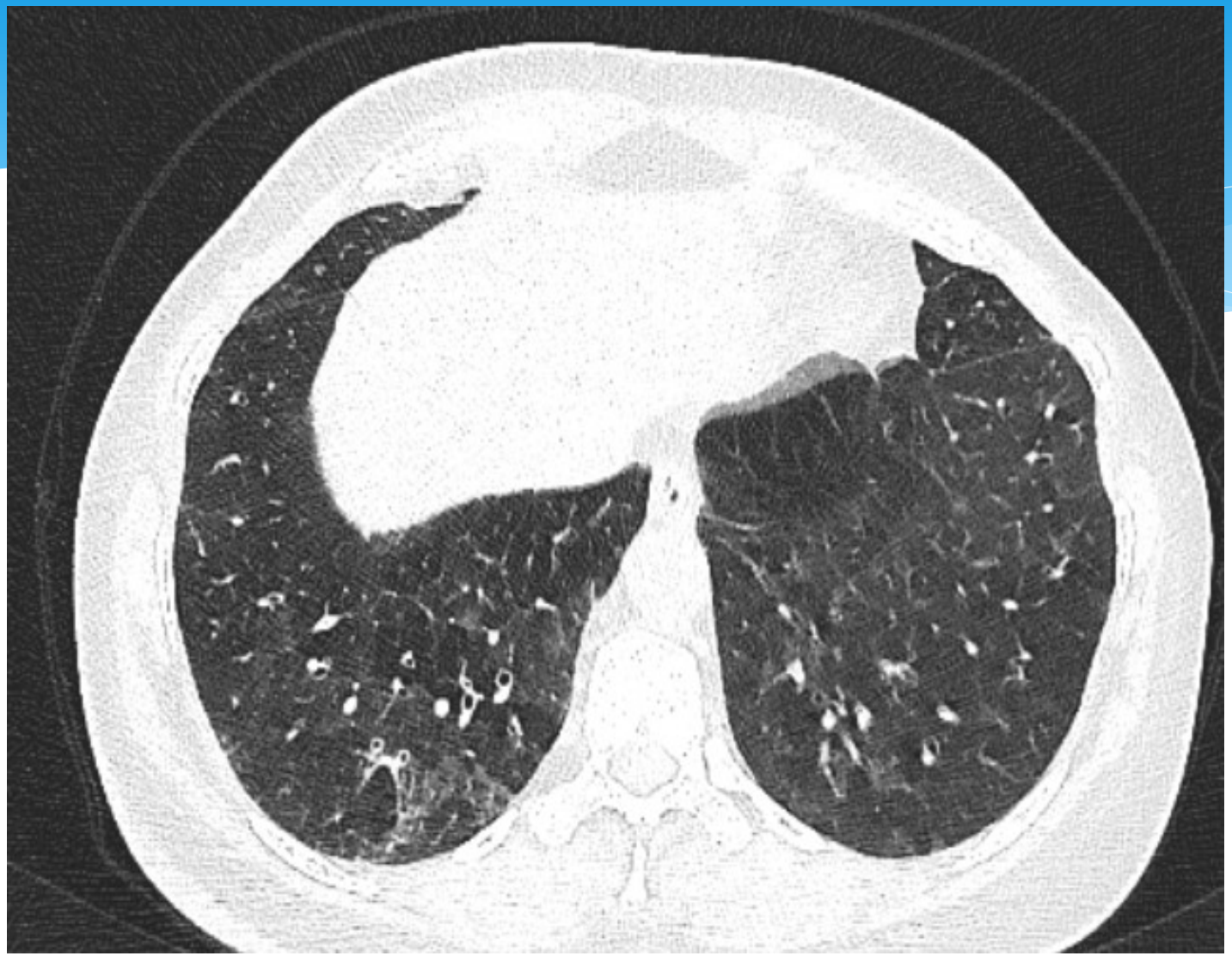


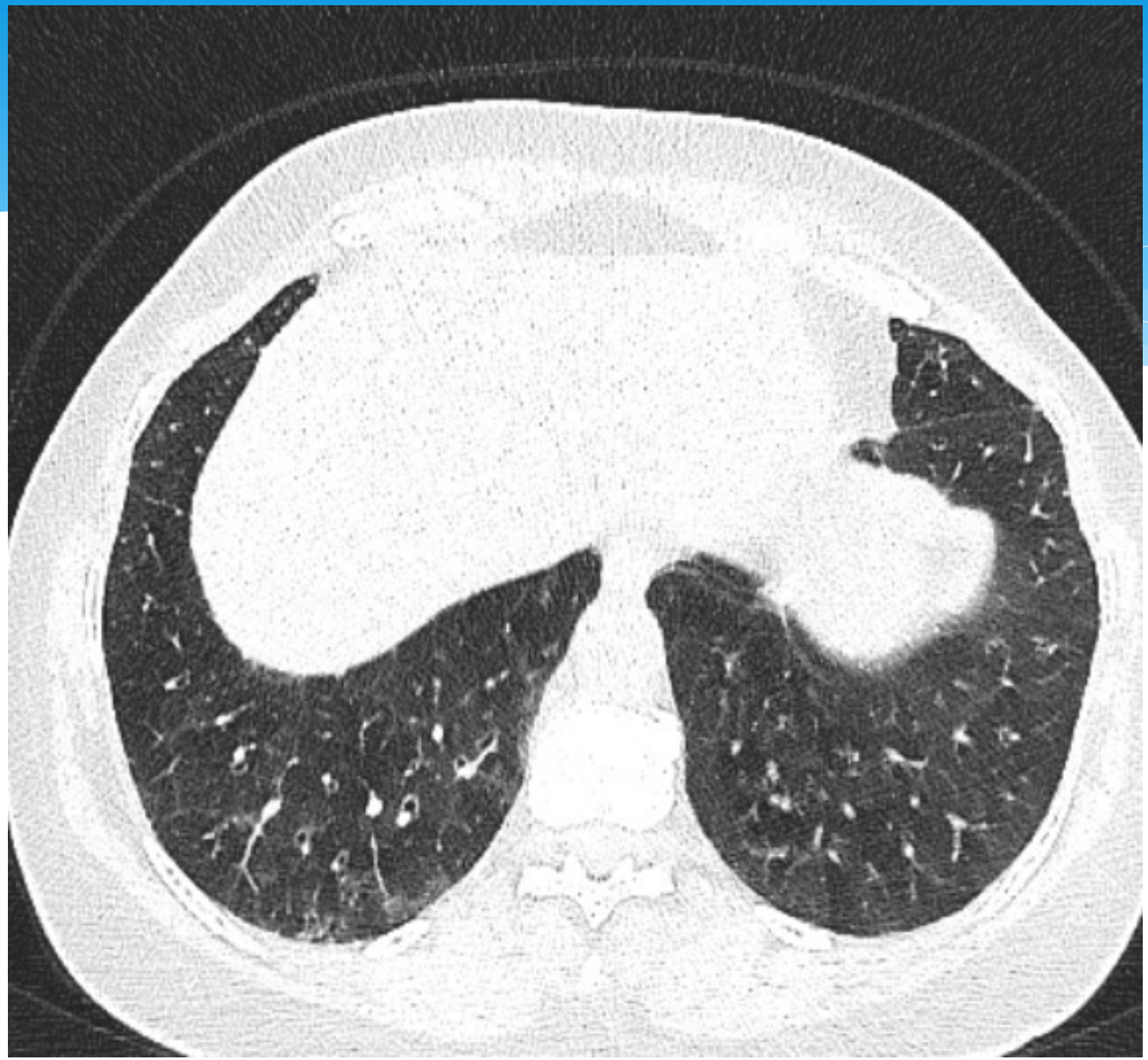


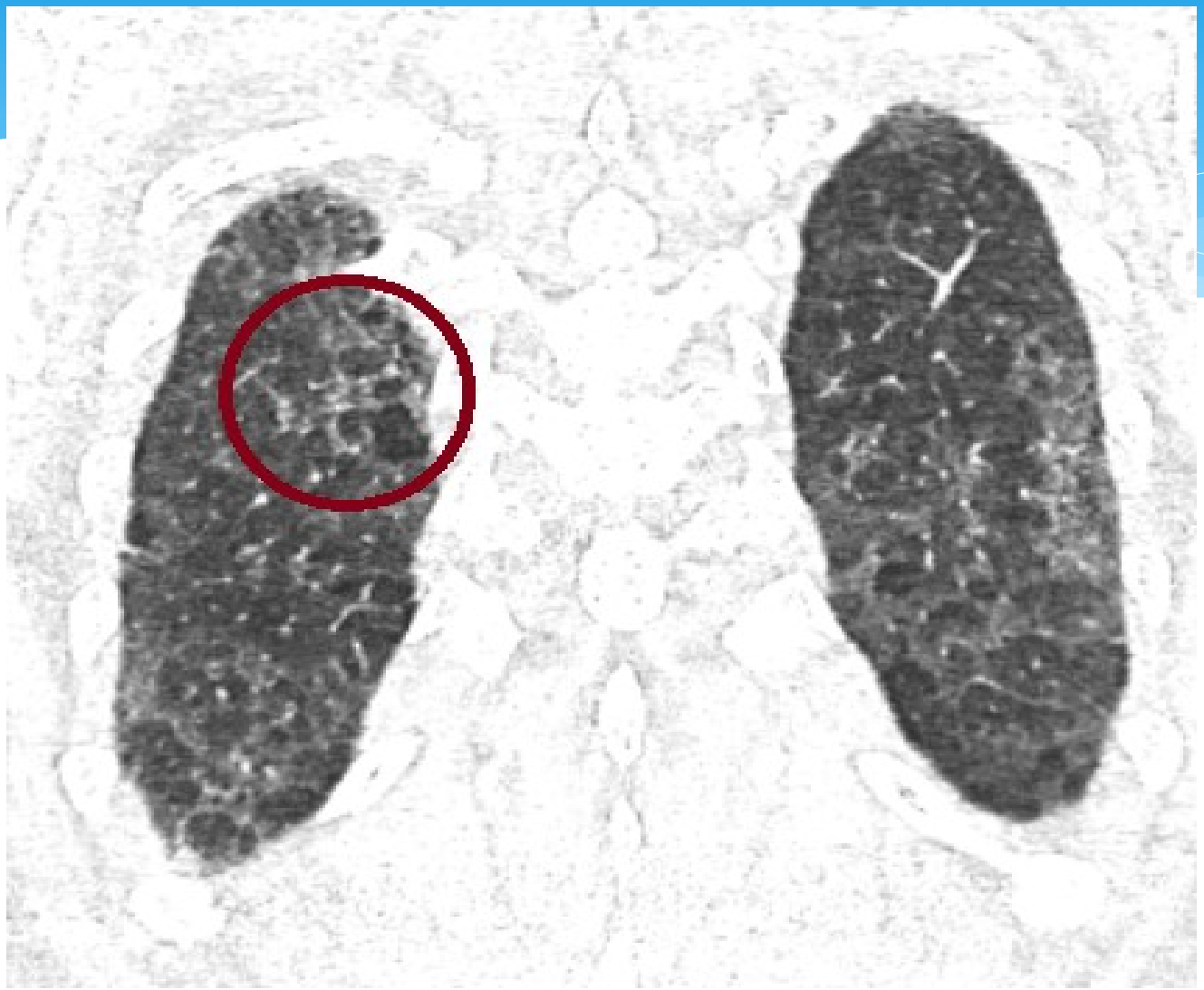












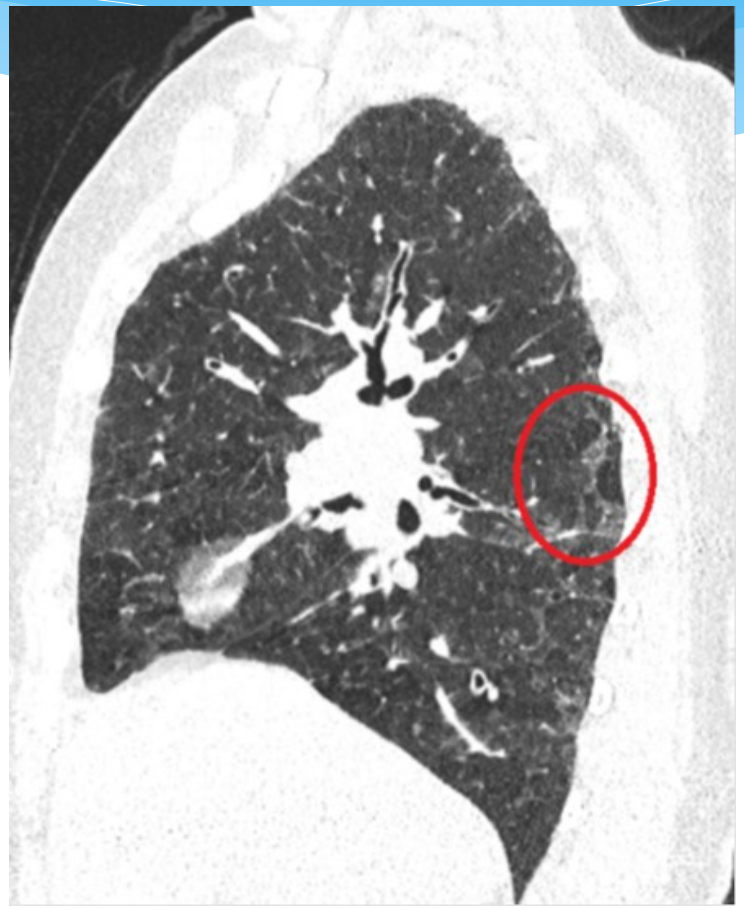


TABLE 3] Diagnostic CT Categories of Nonfibrotic and Fibrotic HP Based on CT Patterns

HRCT Scan	Features
Typical nonfibrotic HP	Any of the following: • Profuse poorly defined centrilobular nodules of ground-glass opacity affecting all lung zones • Inspiratory mosaic attenuation with three-density sign • Inspiratory mosaic attenuation and air-trapping associated with centrilobular nodules ***And*** • Lack of features suggesting an alternative diagnosis
Compatible with nonfibrotic HP	Any of the following: • Centrilobular nodules of ground-glass attenuation that are not profuse or diffuse, and not associated with mosaic attenuation or lobular air-trapping • Patchy or diffuse ground-glass opacity • Mosaic attenuation and lobular air-trapping without centrilobular nodules or ground-glass abnormality ***And*** • Lack of features suggesting an alternative diagnosis
Typical fibrotic HP	CT signs of fibrosis with either of the following: • Profuse poorly defined centrilobular nodules of ground-glass opacity affecting all lung zones • Inspiratory mosaic attenuation with three-density sign ***And*** • Lack of features suggesting an alternative diagnosis
Compatible with fibrotic HP	CT signs of fibrosis with any of the following: • Patchy or diffuse ground-glass opacity • Patchy, nonprofuse centrilobular nodules of ground-glass attenuation • Mosaic attenuation and lobular air-trapping that do not meet criteria for typical fibrotic HP ***And*** • Lack of features suggesting an alternative diagnosis
Indeterminate for fibrotic HP	CT signs of fibrosis without other features suggestive of HP

In a nonsmoker, the presence of diffuse, profuse, poorly defined ground-glass centrilobular nodules is highly suggestive of the diagnosis of HP; similar findings may occasionally occur for example in infections, pulmonary hemorrhage, metastatic pulmonary calcification, or severe group 1 pulmonary hypertension, but the clinical context will usually identify these rare causes. The distribution alone is not pathognomonic of HP. CT signs of fibrosis include any of the following: reticular or ground-glass abnormality with traction bronchiectasis, lobar volume loss, and honeycombing. The distribution of fibrotic HP is quite variable and often not diagnostically helpful. However, a midlung predominant distribution of fibrosis is suggestive of fibrotic HP, and an upper lobe predominance is much more common in fibrotic HP than in idiopathic pulmonary fibrosis. HP = hypersensitivity pneumonitis.

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Table 5. Chest HRCT Scan Features of the Nonfibrotic HP Pattern

HRCT Pattern	Typical HP	Compatible with HP	Indeterminate for HP
Description	The "typical HP" pattern is suggestive of a diagnosis of HP. It requires *a*) at least one HRCT abnormality indicative of parenchymal infiltration and *b*) at least one HRCT abnormality indicative of small airway disease, both in a diffuse distribution	"Compatible-with-HP" patterns are nonspecific patterns that have been described in HP	N/A
Relevant radiological findings	HRCT abnormalities indicative of parenchymal infiltration: • GGOs • Mosaic attenuation* HRCT abnormalities indicative of small airway disease: • Ill-defined, centrilobular nodules • Air trapping Distribution of parenchymal abnormalities: • Craniocaudal: diffuse (with or without some basal sparing) • Axial: diffuse	Parenchymal abnormalities: • Uniform and subtle GGOs • Airspace consolidation • Lung cysts Distribution of parenchymal abnormalities: • Craniocaudal: diffuse (variant: lower lobe predominance) • Axial: diffuse (variant: peribronchovascular)	N/A

Definition of abbreviations: GGO = ground-glass opacity; HP = hypersensitivity pneumonitis; HRCT = high-resolution computed tomography; N/A = not applicable.
*Mosaic attenuation corresponding to parenchymal infiltration is created by GGOs adjacent to normal-appearing lung.

Table 6. Chest HRCT Scan Features of the Fibrotic HP Pattern

HRCT Pattern	Typical HP	Compatible with HP	Indeterminate for HP
Description	The "typical HP" pattern is suggestive of a diagnosis of HP. It requires *a*) an HRCT pattern of lung fibrosis (as listed below) in one of the distributions and *b*) at least one abnormality that is indicative of small airway disease	"Compatible-with-HP" patterns exist when the HRCT pattern and/or distribution of lung fibrosis varies from that of the typical HP pattern; the variant fibrosis should be accompanied by signs of small airway disease	The "indeterminate-for-HP" pattern exists when the HRCT is neither suggestive nor compatible with a typical and probable HP pattern
Relevant radiological findings	HRCT abnormalities indicative of lung fibrosis are most commonly composed of irregular linear opacities/coarse reticulation with lung distortion; traction bronchiectasis and honeycombing may be present but do not predominate The distribution of fibrosis may be: • Random both axially and craniocaudally or • Mid lung zone–predominant or • Relatively spared in the lower lung zones HRCT abnormalities indicative of small airway disease: • Ill-defined, centrilobular nodules and/or GGOs • Mosaic attenuation, three-density pattern,* and/or air trapping (*often in a lobular distribution*)	Variant patterns of lung fibrosis: • UIP pattern: basal and subpleural distribution of honeycombing with/without traction bronchiectasis (*per 2018 diagnosis of IPF guidelines* [20]) • Extensive GGOs with superimposed subtle features of lung fibrosis Variant (predominant) distributions of lung fibrosis: • Axial: peribronchovascular, subpleural areas • Craniocaudal: upper lung zones HRCT abnormalities indicative of small airway disease: • Ill-defined centrilobular nodules, or • Three-density pattern* and/or air trapping	Lone patterns (i.e., not accompanied by other findings suggestive of HP) of: • UIP pattern (*as per 2018 IPF diagnosis guidelines* [20]) • Probable UIP pattern (*as per 2018 IPF diagnosis guidelines* [20]) • Indeterminate pattern for UIP (*as per 2018 IPF diagnosis guidelines* [20]) • Fibrotic NSIP pattern • Organizing pneumonia–like pattern • Truly indeterminate HRCT pattern

Definition of abbreviations: GGO = ground-glass opacity; HP = hypersensitivity pneumonitis; HRCT = high-resolution computed tomography; IPF = idiopathic pulmonary fibrosis; NSIP = nonspecific interstitial pneumonia; UIP = usual interstitial pneumonia.
Rarely, fibrotic HP may be seen *1*) as a component of combined pulmonary fibrosis and emphysema or pleuroparenchymal fibroelastosis with emphysema, *2*) as a pure emphysematous form of HP, or *3*) in acute exacerbation.
*The three-density pattern was formerly called the "headcheese sign." It is described in detail in Table 4.

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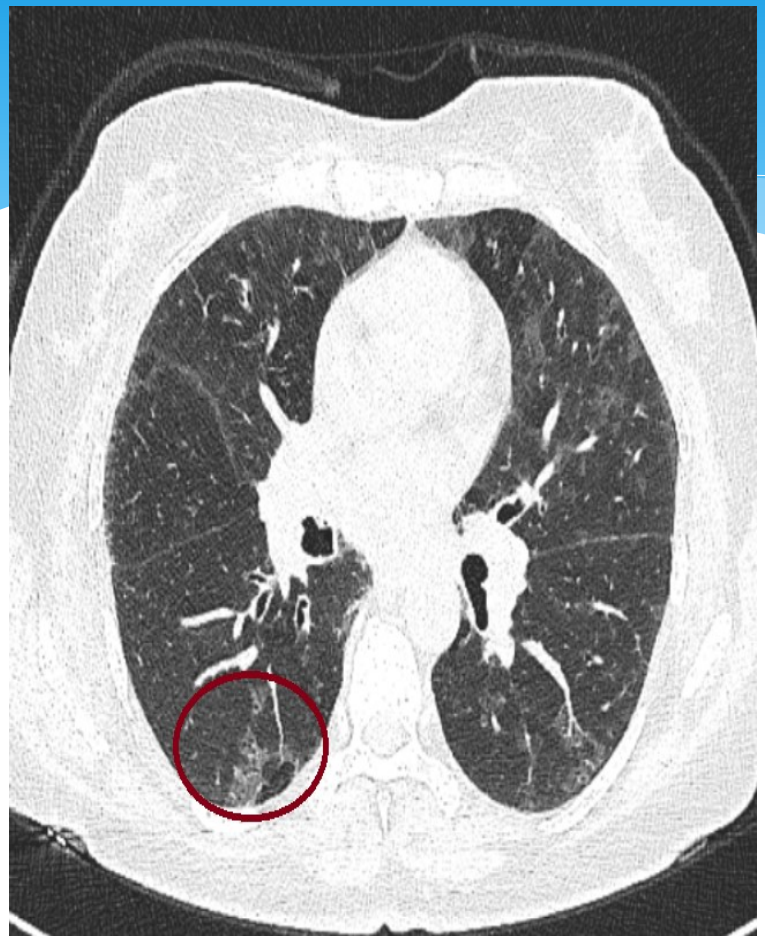

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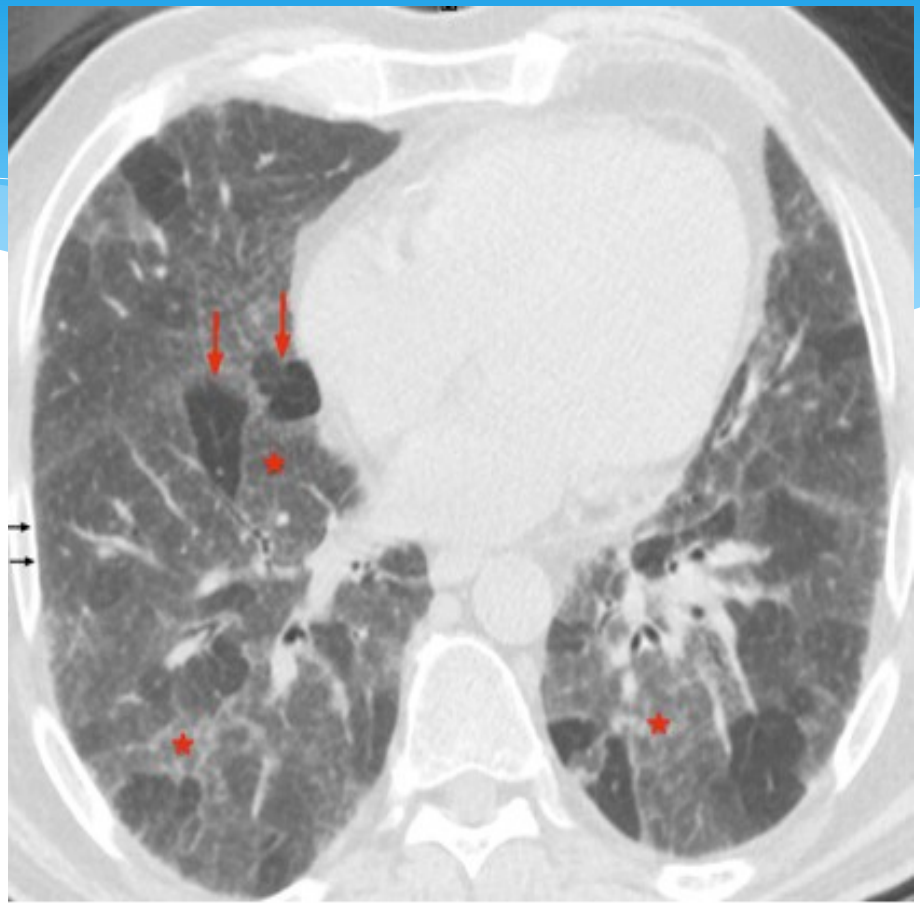

Three-density pattern; high attenuation (ground-glass opacity) (red stars), lucent lung (regions of decreased attenuation and decreased vascular sections) (red arrows), and normal lung (black arrows), which are sharply demarcated from each other.

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* ppd:10 mm
* 24 saatlik idrar ca:Normal
* Serum ACE:52
* Göz ve dermatolojik muayene norma
* EKO normal

FOB

* Endobronşiyal lezyon yok
* Sol üst lobdan(lingula) BAL
* Sol alt lobdan TBB

BAL

* BAL sıvısında ARB (-), Tbc PCR(-)

Flow sitometri-BAL hücre analizi

WBC	18.78	Y	10^3/uL
RBC	0.02	D	10^6/uL
HGB	0.30	K	g/dL
HCT	0.20	K	%
MCH	150.00	Y	pg
MCHC	150.00	Y	g/dL
PCT	0.05	D	%
MPV	10.80		fL
LY%	5.90	D	%
MO%	4.40	D	%
NE%	86.90	Y	%
EO%	2.80		%
BA%	0.0	D	%
BA#	0.00		10^3/uL
EO#	0.53	Y	10^3/uL
LY#	1.100	D	10^3/uL
MCV	100.00	Y	fL
MO#	0.83		10^3/uL
NE#	16.32	Y	10^3/uL
PDW	11.50		fL
PLT	50.00	D	10^3/uL
NRBC%	1.20		%
P-LCR	31.60		%
CD 4	76,9		
CD 8	23,1		

BAL(patoloji): Makrofaj %90,
Multinükleer dev hücre %2-3,
Lenfosit %3-5 , Nötröfil %3-5

TBB patoloji

KLİNİK BİLGİ: Hipersensivite pnömonisi? Sarkoidoz ? IPF ?

MAKROSKOPİK BULGULAR:
En büyüğü 0.3 cm, en küçüğü 0.1 cm çapında kirlibeyaz renkte 3 adet doku parçası. T3P1K

MİKROSKOPİK BULGULAR:
Kesitlerde izlenen biyopsi örneklerinden 1 tanesi ödemli bronş mukozası özelliğindedir. Diğer 2 biyopsi örneği akciğer parankimini temsil etmekte olup alveolar septumların bir kısmında hafif kalınlaşma, minimal fibrozis ve az sayıda lenfositin eşlik ettiği multinükleer dev hücrelerden oluşan mikrogranülomlar izlenmiştir.

HİSTOKİMYA:
EZN: Negatif
Masson Trikrom: Hafif bağ doku artışı

HİSTOPATOLOJİK TANI:
Akciğer, transbronşiyal biopsi:
Lütfen Mikroskopik Bulguları ve Yorumu Okuyunuz

YORUM: Morfolojik bulgular ile ayırıcı tanıya klinik öyküden hareketle Hipersensitivite pnömonisi ve Sarkoidoz alınmıştır. Granülomlar iyi gelişmemiş ve nonnekrotizan özellikte olsa da öncelikle Tüberküloz gibi enfeksiyöz etkenlerin klinik ve mikrobiyolojik olarak ekarte edilmesi önerilir.

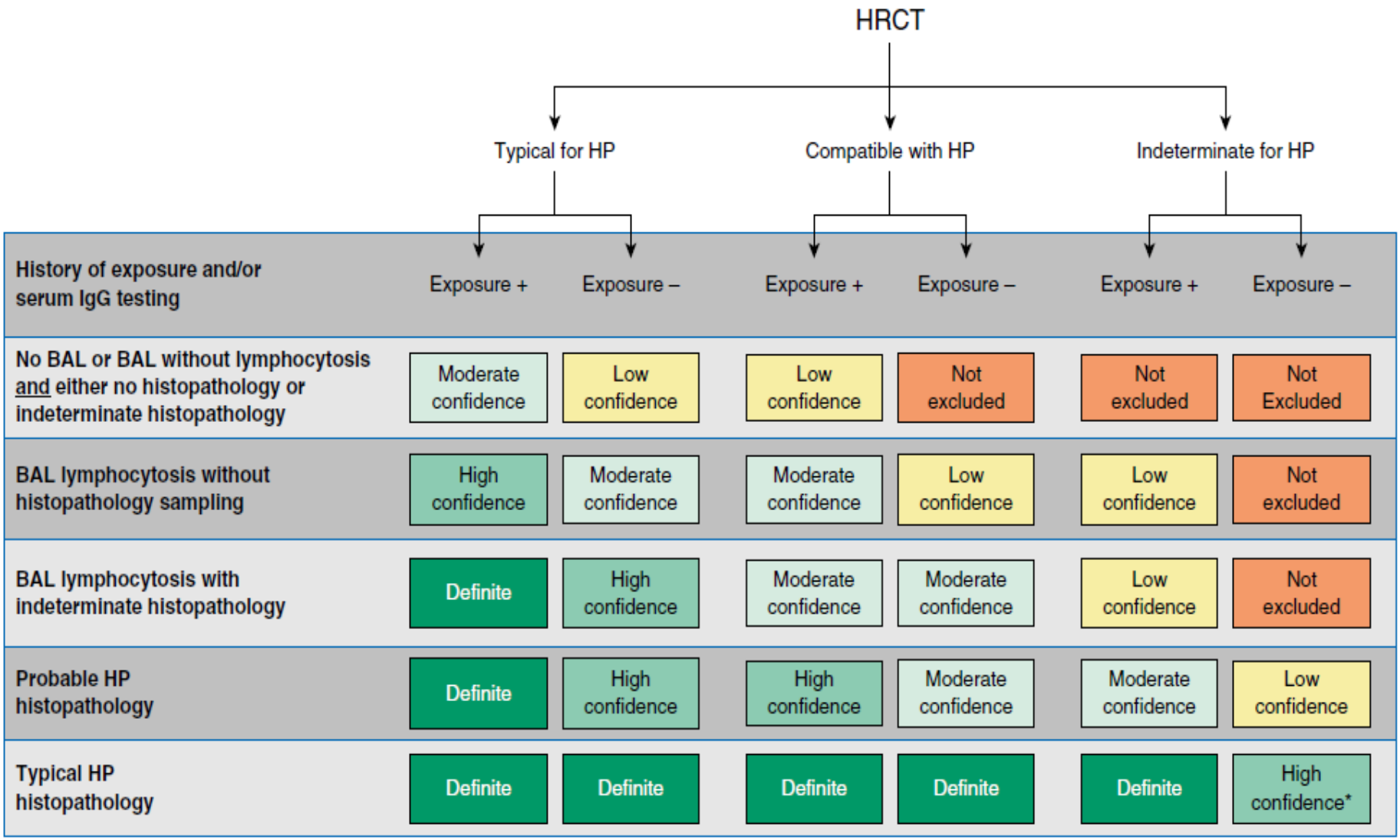

Figure 6. Hypersensitivity pneumonitis diagnosis based on incorporation of imaging, exposure assessment, BAL lymphocytosis, and histopathological findings. All confidence levels are subject to multidisciplinary discussion. *Confidence may increase to "definite" if the pathologist's conclusion persists after reevaluation in the context of additional clinical information or an expert second opinion on histopathology. HP = hypersensitivity pneumonitis; HRCT = high-resolution computed tomography.

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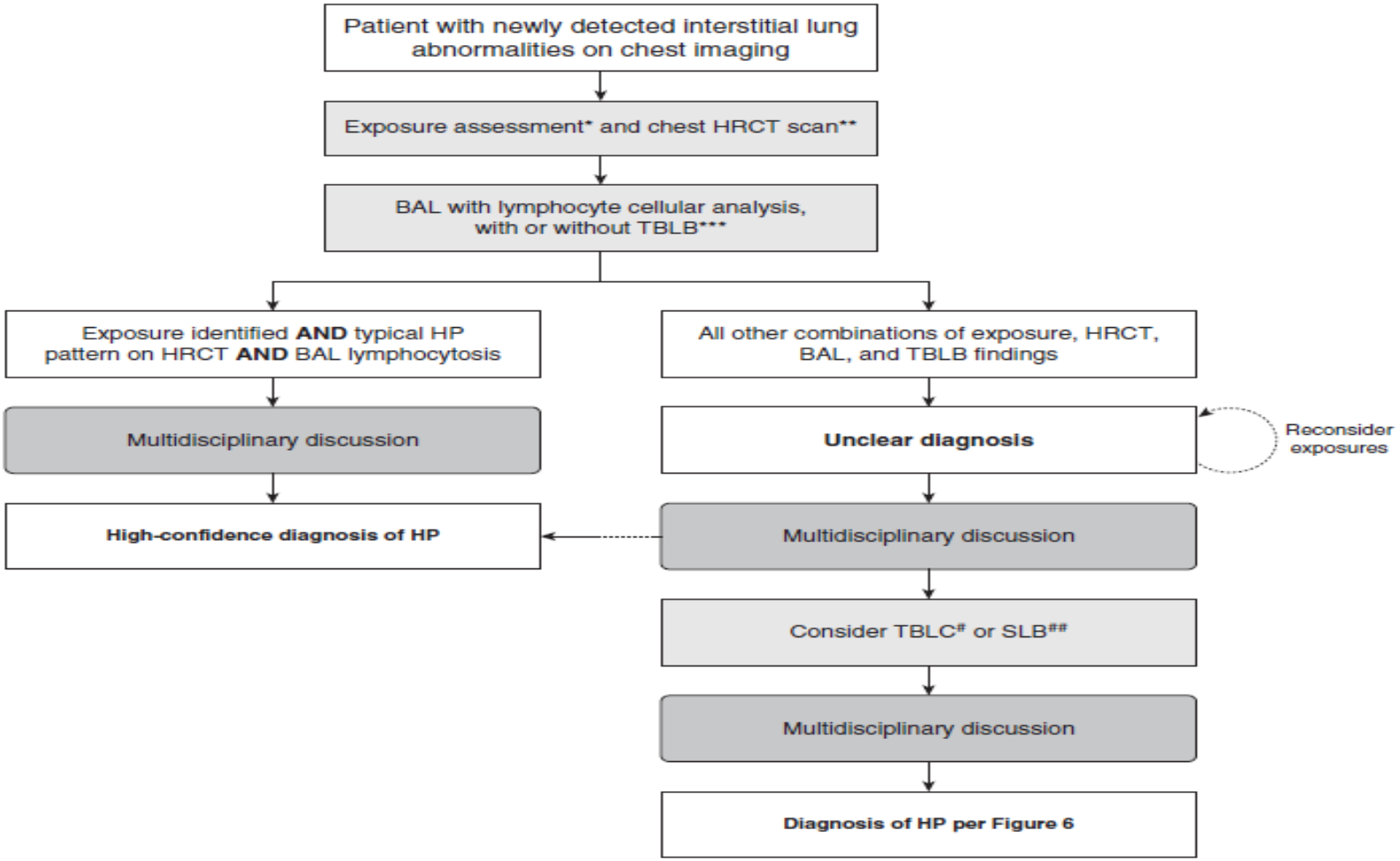

Figure 7. Algorithm for the diagnostic evaluation of possible hypersensitivity pneumonitis (HP). Specific features are described for all steps of the algorithm in the corresponding sections of the manuscript. A provisional diagnosis may be adequate in patients for whom the differential diagnosis has been sufficiently narrowed such that further investigations are unlikely to alter management, when invasive testing has unacceptable risks, or when such tests are declined by the patient. *Exposure assessment includes a thorough clinical history and/or serum IgG testing against potential antigens associated with HP and/or, in centers with the appropriate expertise and experience, specific inhalational challenge testing as described in References 9, 323, 324, and 325. **High-resolution computed tomography should be performed using the technique described in Table 3 and then reviewed with a thoracic radiologist. ***Transbronchial lung biopsy is suggested for patients with potential nonfibrotic HP (see question 4, recommendation 1). #TBLC is suggested for patients with potential nonfibrotic HP, depending on local expertise (see question 5, recommendation 2). ##SLB is infrequently considered in patients with nonfibrotic HP. HRCT = high-resolution computed tomography; SLB = surgical lung biopsy; TBLB = transbronchial lung biopsy; TBLC = transbronchial lung cryobiopsy.

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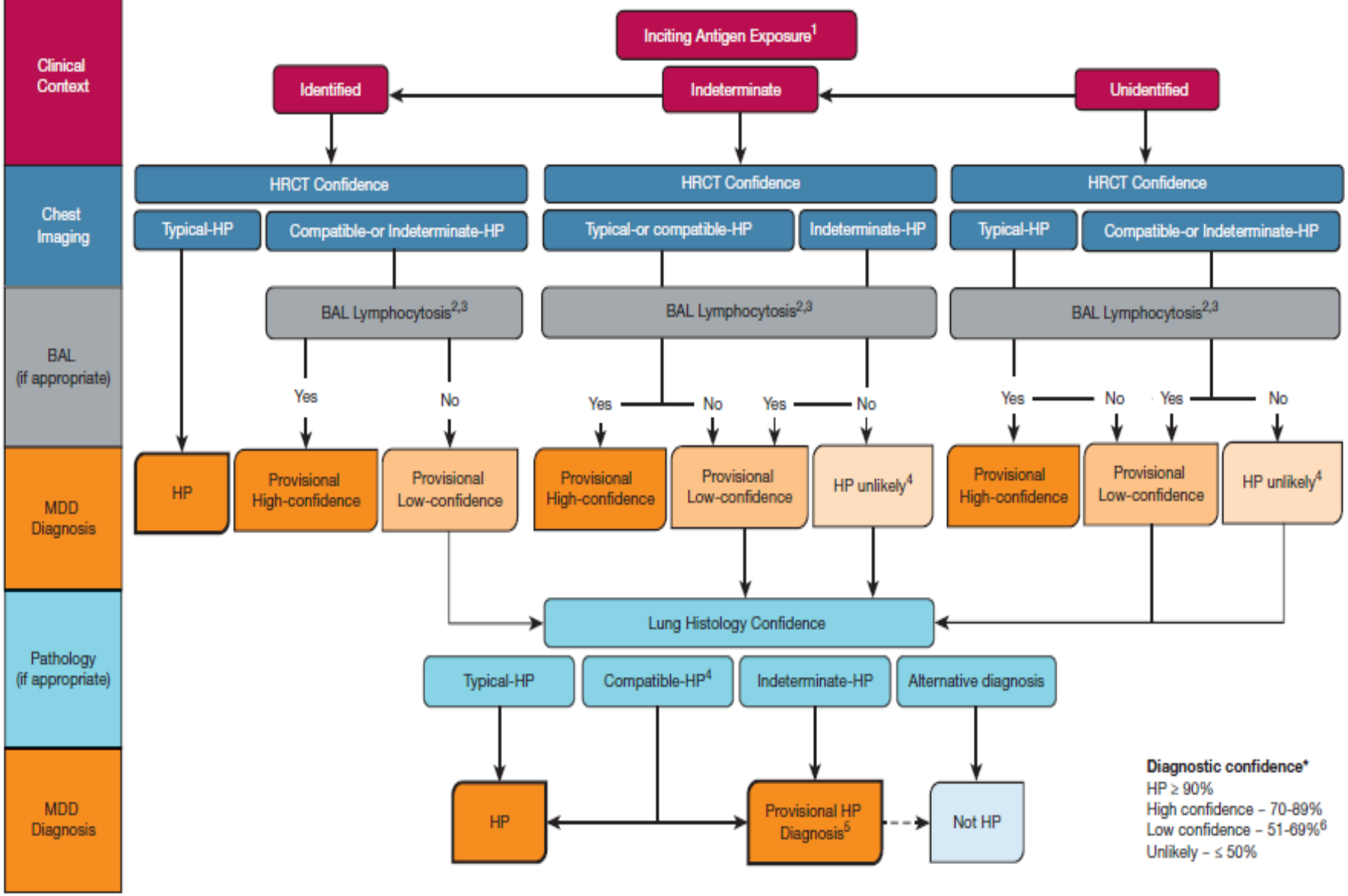

Figure 1 – *Algorithm for the diagnosis of fibrotic and nonfibrotic HP. See full online version for more details.*[4]

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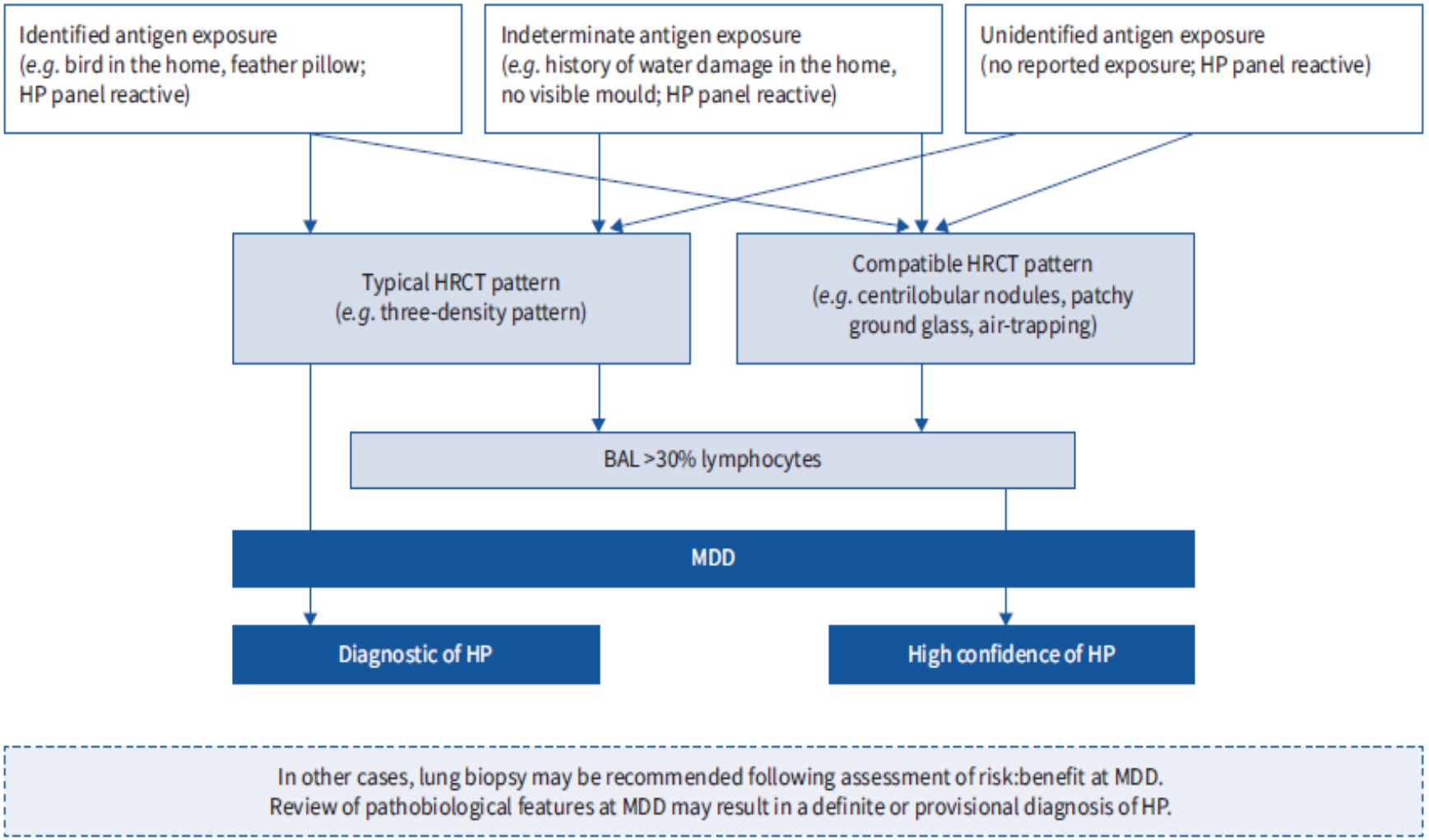
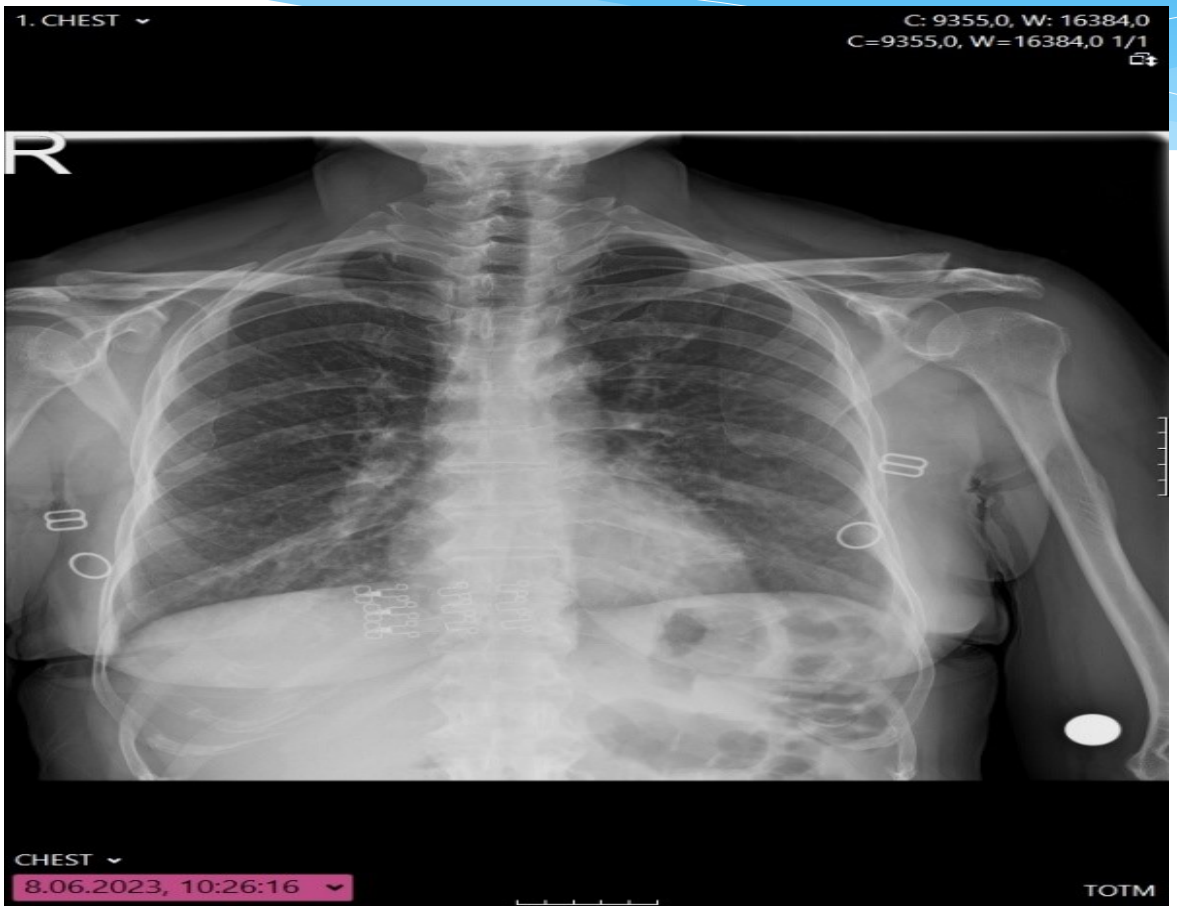


FIGURE 4 Diagnostic algorithm for hypersensitivity pneumonitis (HP) in patients with no indication for lung biopsy based on the CHEST guidelines. Reproduced and modified from [2] with permission. BAL: bronchoalveolar lavage; HRCT: high-resolution computed tomography; MDD: multidisciplinary discussion.

Hamblin M, Prosch H, Vašáková M. Diagnosis, course and management of hypersensitivity pneumonitis. Eur Respir Rev 2022; 31: 210169.DOI: 10.1183/16000617.0169-2021.

Tanı ve Tedavi

* Klinik,radyolojik ve patolojik bulgular ışığında
* HİPERSENSİTİVİTE PNÖMONİSİ
* Etkenin uzaklaştırılması
* Prednizolon 32mg/gün başlandı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Hipersensitivite Pnömonisi

* Akciğer parankimini ve küçük hava yollarını etkileyen inflamatuvar ve/veya fibrotik bir hastalıktır.

* Duyarlı bireylerde bilinen veya bilinmeyen bir antijen/lerin solunması ile tetiklenen immun aracılı bir reaksiyondan kaynaklanır.

HP Etkenler

* Bernardino Ramazzini(1633-1714);" tahıl eleyenlerin ve ölçenlerin hastalığı"
* 300' den fazla etyolojik ajan
* Bakteri,mantar,hayvansal ve bitkisel proteinler,düşük mölekül ağırlıklı kimyasallar ve metaller
* En yaygın formları kuş besleyici hastalığı ve çiftci akciğeri
* Sanayilşemiş ülkelerde çalışma koşullarının değişmesine bağlı olarak metal işleme sıvılarına bağlı gelişen HP de artış
* Ayrıntılı bir öyküye rağmen antijen ve maruziyet %20-60 olguda saptanamıyor.

HP Etkenler

Table 2. Sources of Antigens Known to Cause HP

Matter	Typical Sources	HP "Disease"
Organic particulate matter		
I. Microbes		
Fungi/molds		
Aspergillus spp.	Contaminated plant material	Farmer's lung
Alternaria alternata, *Aureobasidium* spp.	Contaminated water	Humidifier lung
	Contaminated houses (flooded)	Malt worker's lung
Botrytis cinerea	Upholstered furniture	Woodworker's lung
Cephalosporium spp.	Contaminated stucco	Indoor-air alveolitis (domestic HP)
Cladosporium spp.	Contaminated raw materials in food-processing industry	Compost lung
Cryptococcus spp.		Mushroom grower's lung
Fusarium spp.	Organic wastes	Malt worker's lung
Graphium spp.	Contaminated sawdust	Stucco worker's lung
Mucor spp.	Moldy wood	Suberosis
Penicillium spp.	*Aspergillus* enzyme in baking agents	Baker's lung
Rhizopus spp.	Contaminated domestic ventilation and cooling systems	Waste sorter's lung
Trichoderma spp.		Sauna taker's lung
Phytase (enzyme from *Aspergillus* or *Trichoderma*)	Potted flowers, greenhouses	Wine grower's lung
	Mold on grapes	Wind-instrument alveolitis
	Contaminated wind instruments	Sequoiosis
	Contaminated soil	Peat worker's lung
	Peat	Cheese washer's lung
		Salami producer's lung
		Phytase alveolitis
Yeasts		
Candida spp.	Contaminated misting fountains and humidifiers	Humidifier lung
Geotrichum candidum		Farmer's lung
Saccharomyces cerevisiae	Moldy hay, compost, mushrooms	Footcare alveolitis
Saccharomonospora viridis	Contaminated swimming pools	*Candida* alveolitis
Saccharopolyspora rectivirgula	Contaminated wind instruments	Indoor-air alveolitis
Torulopsis glabrata	Human intestine, fingernails, and skin	Yeast-powder alveolitis
Trichosporon cutaneum	Milk mold	Thatched-roof lung
	Baker's yeast, brewer's yeast, wine yeasts	Mushroom worker's lung
	Contaminated houses	Summer-type HP
	Dried grasses, leaves	Wind-instrument lung
	Compost	
	Mushrooms	
Edible mushrooms		
Mushrooms (shiitake, bunashimeji, *Pleurotus*, *Pholiota*, *Lyophyllum*, *Agaricus*)	Mushrooms growing in indoor environments	Mushroom grower's lung
Bacteria		
Acinetobacter spp.	Contaminated water, whirlpools	Machine operator's lung
Bacillus spp.	Contaminated machine fluid	Humidifier lung
Klebsiella spp.	Sewage treatment plants	Woodworker's lung
Nontuberculous mycobacteria	Sawdust	Detergent worker's alveolitis
Phoma spp.	Moist wood	Summer-type HP
Pseudomonas spp.	Detergents	Farmer's lung
Stenotrophomonas spp.	Biological cleaning agents	Hot-tub lung
Staphylococcus spp.	Washing powders	Whirlpool alveolitis
Streptomyces spp.	Contaminated houses	Wind-instrument alveolitis
Thermoactinomyces spp.	Moldy plants	Indoor-air alveolitis
Endotoxin from pool-water sprays and fountains	Contaminated wind instruments	Steam-iron alveolitis
	Moldy shower curtains	Mushroom grower's lung
Bacillus subtilis enzymes (subtilisin)	Compost	Thatched-roof disease
	Edible mushroom manure	Bagassosis
	Contaminated soil	Compost lung
	Moldy thatched roofs	
Protozoa		
Amoebae	Contaminated humidifiers and air-conditioning systems	Humidifier lung

HP Etkenler

Table 2. (*Continued*)

Matter	Typical Sources	HP "Disease"
Nematodes		
Nematodes	Contaminated humidifiers and air-conditioning systems	Humidifier lung
Mite		
Acarus siro	Contaminated cheese	—
II. Proteins/enzymes		
Animal proteins		
Animal fur dust	Animal pelts	Furrier's lung
Avian droppings, serum, and feathers	Parakeets, canaries, budgerigars, pigeons, parrots, chicken, turkeys, geese, ducks, wild birds, pheasants	Bird fancier's disease, bird breeder's disease, pigeon breeder's lung, chicken breeder's lung
Avian feathers	Feather beds, pillows, duvets	Feather-duvet lung
Bats	Contact with bats	—
Carmine (from *Coccus cacti*)	Food and cosmetics	Carmine alveolitis, dyer's lung
Cow milk	Cow milk	Heiner syndrome
Fish feed	*Daphnia*, meat, mosquito larvae	Fish-feed alveolitis
Fish meal	Animal feed	Fish-meal alveolitis
Shell protein (oyster, sea snail, mussels)	Oyster-shell powder	Shellfish alveolitis, oyster-shell HP, mollusk-shell HP
Pig pancreas	Animal extracts	—
Pituitary proteins	Pituitary powder	Pituitary snuff-taker's lung
Rat and desert mouse (gerbil) urine, serum, pelts	Rats, gerbils	Alveolitis due to rat and mouse proteins
Silkworm proteins	Dust from silkworm larvae and cocoon	Silkworm rearer's lung
Weevils (corn, wheat) (*Sitophilus* spp.)	Contaminated grain or flour	Corn (wheat)–weevil lung
Plant proteins		
Alginate	Seaweed	—
Argan cake	Cosmetics, unsaturated fatty acids, phytosterol	—
Catechin	Green-tea powder	—
Esparto dust	Esparto grass	Esparto lung, plasterer's lung
Grain flour (wheat, rye, oats, maize)	Flour dust	Flour-dust alveolitis
Malt	Food-processing industry	—
Legumes (soy)	Legumes (soya) flour dust	Soya-dust alveolitis
Paprika	Paprika dust	Paprika splitter's lung
Pyrethrum	Plant-based insecticide	—
Spinach	Spinach powder	—
Tiger nut	Horchata (drink)	Tiger-nut alveolitis
Wood (cabreuva, cedar, mahogany, pine, ramin, umbrella pine)	Wood particles	Wood fiber alveolitis
Inorganic particulate matter		
I. Chemicals		
Acid anhydrides (pyromellitic and trimellitic anhydrides)	Polyurethane foams, spray paints, elastomers, glues, adhesives, mattresses, car parts, shoes, imitation leather, rubber products, chipboards, elastic synthetic fibers, electrical insulations	Acid anhydride alveolitis
Acrylate compounds (methyl methacrylate)	Dental materials, lacquer, resin, glues	Methacrylate alveolitis
Copper sulfate	Copper-sulfate Bordeaux mixture	Vineyard sprayer's lung
Chloroethylene (trichlorethylene)	Degreasing agents, cleaning agents, extraction agents	Chemical alveolitis
Dimethyl phthalate and styrene	Industrial solvents, plasticizers	—
HFC-134a	Coolant fluid in laser hair-removal devices	Hair-remover lung
Isocyanates (toluene diisocyanate, methylene diphenyl diisocyanate, hexamethylene diisocyanate, MIC, NDI, polyisocyanate)	As in acid anhydrides	Isocyanate alveolitis
Tetrachlorophthalic and hexahydrophthalic acid	Hardener for epoxy resin	Acid anhydride alveolitis
Sodium diazobenzene sulfate	Laboratory reagent, chromatography	Chemical alveolitis
Triglycidyl isocyanurate	Polyester powder (powder paints)	Painter's lung
Matter	**Typical Sources**	**HP "Disease"**
II. Pharmaceutical agents		
Penicillins, cephalosporins	Antibiotics	Drug-induced HP
Methotrexate	Immunosuppressive agents	
α-IFN	Immunomodulatory agents	
Lenalidomide	Hypolipidemics	
Pravastatin	Antidepressants	
Venlafaxine	Alkylating agents	
Temozolomide		
III. Metals		
Cobalt	Hard metals, alloys	Giant cell pneumonitis
Zinc (tungsten and alloys)	Zinc fumes	Zinc-fumes alveolitis
Zirconium	Zircon	Zirconium alveolitis
Beryllium	Batteries, computers, neons	Beryllium HP
TMI	Organometallic compound for semiconductors used in industry	—

Epidemiyoloji

* Yıllık prevelans:1.6-2.7/100.000
* 11.5/100.000(65 yaş üstü)
* 30/100.000(New Mexico)
* 1.3-12.9 %(çiftcilerde)
* 3.7-10.4%(kuş yetişcilerde)
* 3.5-29%(mantar çalışanlarında)
* IAH içinde 3.sırada(IPF ve KDH bağlı IAH'dan sonra)
* Ülkemizde IAH içinde 3.sırada (Sarkoidoz ve IPF'den sonra)
* Genel prevelans ve insidansın düşük olduğu düşünülmekte
* Hafif ve subklinik HP tanınmaktan kaçabilir, viral bir hastalık veya astım olarak yanlış tanımlanabilir

Aycicek O,at al. Research Burden of Interstitial Lung Diseases in Turkey – RBILD.Sarcoidosis,Vasculitis and Diffuse Lung Disease

Patofizyoloji

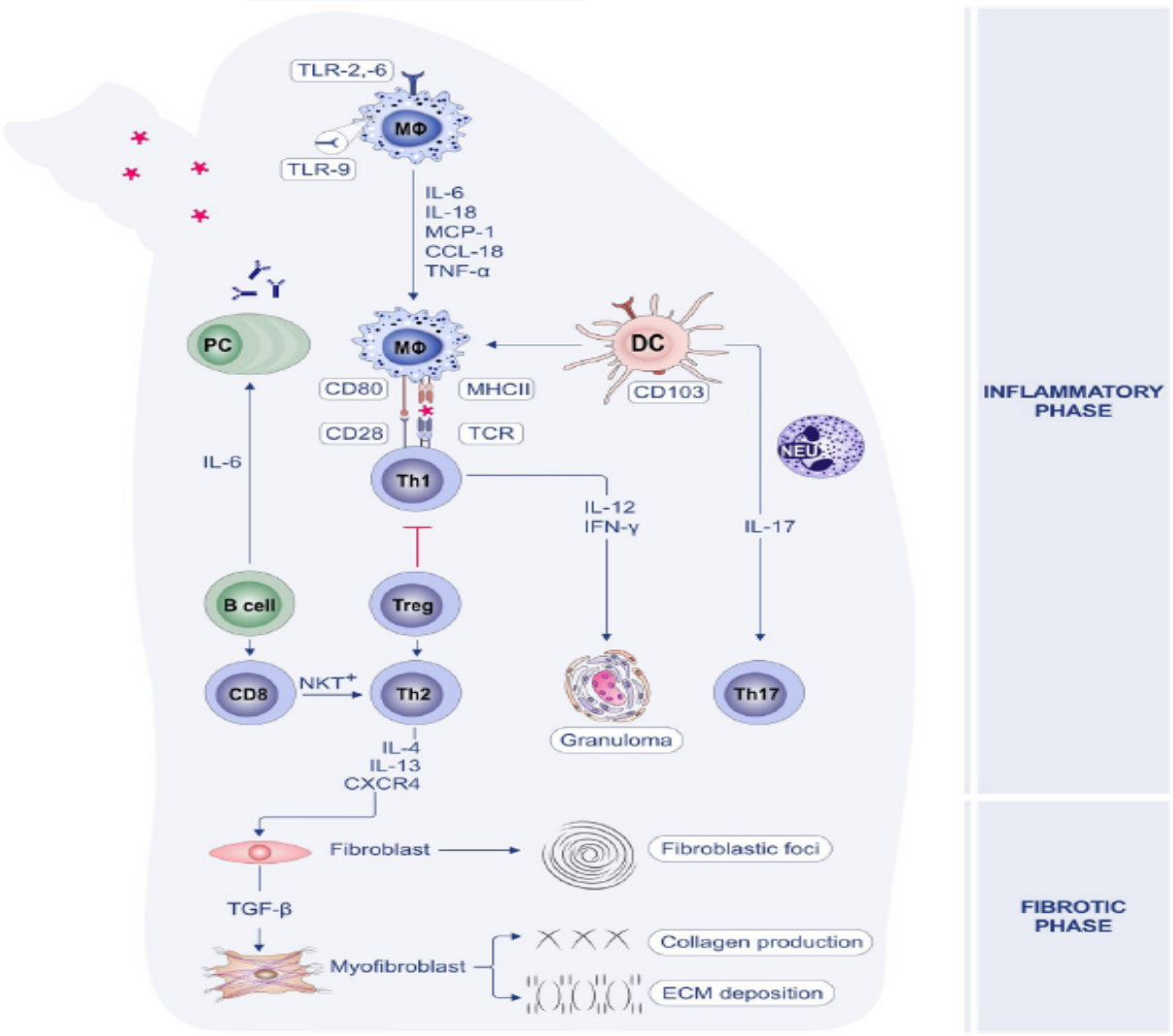


FIGURE 1 Immunopathogenesis of HP in the lung. Inhaled antigens interact with antigen-presenting cells (macrophages, dendritic cells), via pattern recognition receptors including toll-like receptor 2, 6, 9. APCs stimulate a Th1 response, enhanced by cytokine and chemokine production. Neutrophils are present in early disease. In parallel, stimulated B cells (plasma cells) produce IgG antibodies which initiates the complement cascade and further stimulates macrophages. Macrophages fuse to multinucleated giant cells and epithelioid cells to form granulomas, mediated by Th1 cytokine production. Chemotactic factors produced by granulomas, a greater Th2 to Th1 response, a decrease in regulatory T-cell response, $CD8^+$ T-cell production, and Th17 differentiation (partly induced by $CD103^+$ on dendritic cells) promotes fibroblast proliferation. Fibroblasts differentiate into myofibroblasts, produce collagen and extracellular matrix

Barnes H, Troy L, Lee CT, Sperling A, Strek M, Glaspole I. Hypersensitivity pneumonitis: Current concepts in pathogenesis, diagnosis, and treatment. Allergy. 2021;00:1–12. https://doi.org/10.1111/all.15017

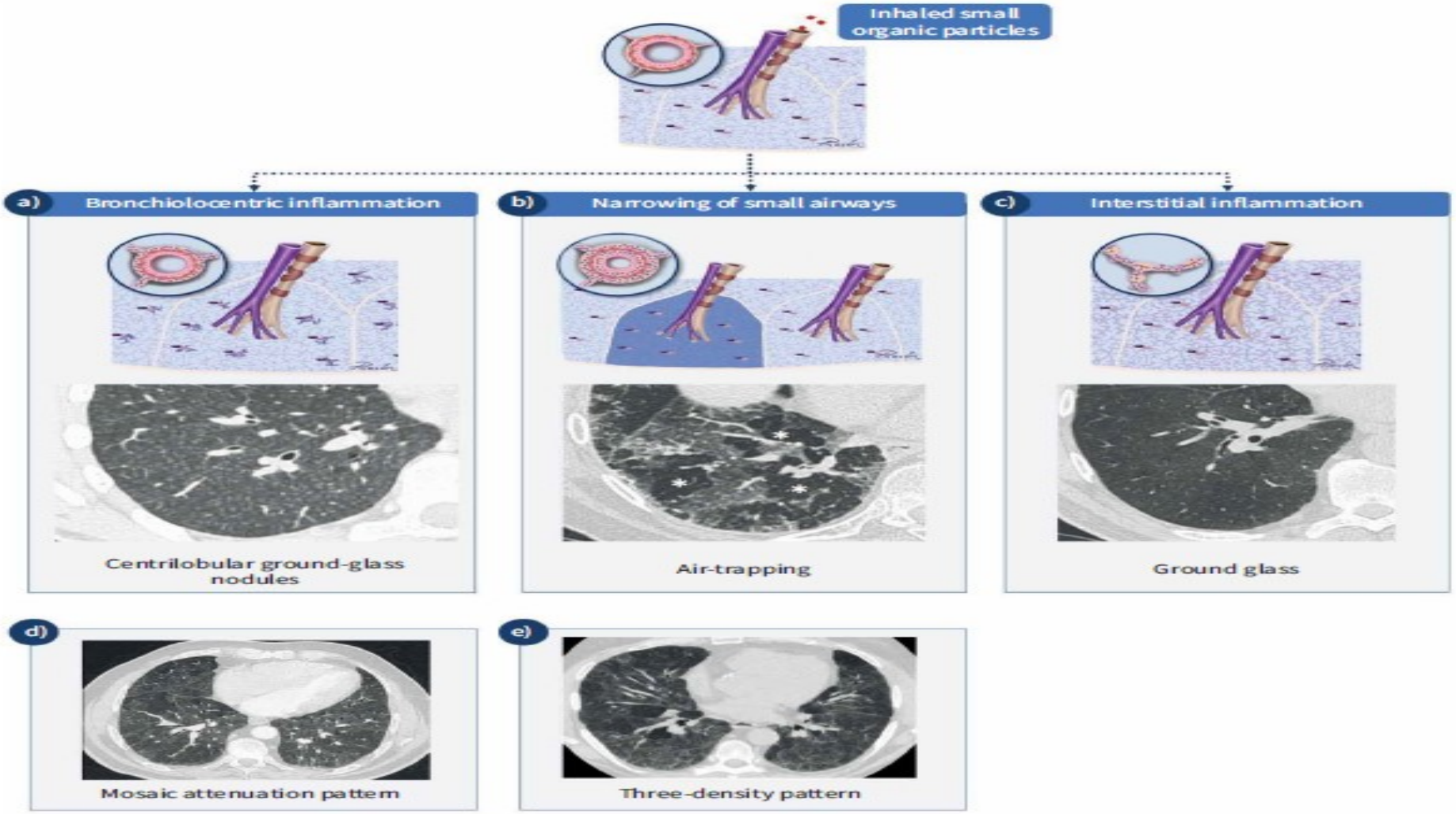


FIGURE High-resolution computed tomography (HRCT) findings in hypersensitivity pneumonitis (HP). a) The reaction to inhaled antigens leads to bronchiolocentric inflammation, which on computed tomography can be seen as ill-defined centrilobular ground-glass nodules. b) Narrowing of the involved small airways by the inflammatory process may lead to retained air in the involved lobules on expiratory scans (air-trapping). The involved lobules appear darker on the expiratory scan (*). c) Diffuse interstitial inflammation leads to an increase in lung density with visibility of vessels and bronchial walls and is called ground glass. d) In HP,lobular areas with ground glass are frequently intermixed with lobules of normal appearance, leading to a patchwork of lobules with differing density, which is called mosaic attenuation. e) A patchwork of lung lobules with normal density, with lobules with ground-glass attenuation and lobules with decreased density and decreased vessel size due to air-trapping is called the "three-density pattern" and is the most specific sign for HP on HRCT. This pattern is more accentuated on expiratory scans.

Hamblin M, Prosch H, Vašáková M. Diagnosis, course and management of hypersensitivity pneumonitis. Eur Respir Rev 2022; 31: 210169.DOI: 10.1183/16000617.0169-2021.

HP-Sigara

* %80-95 sigara içmeyenlerde görülmekte.
* Sigara içenlerde daha az görülmesinin nedeni net bilinmemekte.
* Nikotinin antiinflamatuar etkisi????
* Sigara içenlerde prognoz daha kötü.

Sınıflama

* **Önceki Tanımlama**
  - Akut
  - Subakut
  - Kronik

* **Güncel Sınıflama**
  - Non-fibrotik
  - Fibrotik

1-Diagnosis of Hypersensitivity Pneumonitis in Adults An Official ATS/JRS/ALAT Clinical Practice Guideline. Am J Respir Crit Care Med Vol 202, Iss 3, pp e36–e69, Aug 1, 2020

2-Executive Summary. Diagnosis and Evaluation of Hypersensitivity Pneumonitis: CHEST Guideline and Expert Panel Report; CHEST 2021; 160(2):595-615

Klinik Belirti ve Bulgular

* Öksürük, nefes darlığı
* Kilo kaybı
* Grip benzeri semptomlar(titreme,hafif ateş,halsizlik)
* Göğüs sıkışma ve hırıltı
* squeak
* Siyanoz

* **Non-Fibrotik HP**
  - maruziyet tespit edilebildiği,
  - akut başlangıçlı semptomların varlığı,
  - Radyolojik setrlobuler nodüller
  - BAL'da lenfositozun görüldüğü form

* **Fibrotik HP**
  - tanımlanmış bir maruziyeti saptama olasılığının daha düşük ,
  - daha sinsi ve kronik seyirli,
  - BT'de spesifik ve/veya nonspesifik fibrotik değişiklikler,
  - BAL'da nonspesifik bulguların olduğu formdur.

TABLE 1 Features of nonfibrotic and fibrotic HP.

Clinical features	Nonfibrotic HP	Fibrotic HP
Exposure duration	Short, high intensity exposure; or chronic exposure	Chronic, low-level exposure; no identifiable exposure; or past exposure
Clinical symptoms	Sudden onset dyspnoea, cough, fever, malaise, acute respiratory failure	Insidious onset dyspnoea, cough, subacute or chronic respiratory failure
HRCT features	Typical: Bilateral, diffuse mosaic attenuation (including the three-density sign), ground glass opacities, features of small airways disease (small centrilobular ill-defined nodules; gas trapping on expiration)	Typical: Bilateral, peribronchovascular interstitial thickening, traction bronchiectasis, honeycombing with ground glass opacities, mosaic attenuation (three-density sign), diffuse or mid-to-upper zone distribution
	Other: isolated gas trapping, airspace consolidation, cysts	Other: basal distribution, UIP, fibrotic NSIP, fibrotic OP patterns

BAL fluid features	Lymphocytosis	Less frequently lymphocytosis
Histopathological features	Chronic bronchiolitis, peribronchiolar interstitial lymphocyte-predominant inflammation and poorly formed granulomas/giant cells	Chronic fibrosing interstitial pneumonia, poorly formed granulomas (or giant cells), ± features of nonfibrotic HP. Absence of features to suggest an alternate diagnosis
Disease behaviour	Potentially reversible with antigen removal or immunosuppression	Chronic, irreversible, a subgroup demonstrates the PPF subtype

Abbreviations: BAL, bronchoalveolar lavage; HP, hypersensitivity pneumonitis; HRCT, high resolution computed tomography scan; NSIP, non-specific interstitial pneumonia; OP, organising pneumonia; PPF, progressive pulmonary fibrosis; UIP, usual interstitial pneumonia.

Diagnosis and management of hypersensitivity pneumonitis in adults: A position statement from the Thoracic Society of Australia and New Zealand. Respirology. 2024;1–24.

BAL

* HP şüphesi varlığımda alveoliti saptamada en hassas yöntem
* Özellikle non-fibrotik HP tanısını desteklemede önemli
* Ancak bilinen bir antijen maruziyeti ve uyumlu HRCT bulguların varlığında tanıya katkısı çok az.
* Özellikle öyküde allerjen maruziyeti ve HRCT bulguların uyumsuzluğunda bakılmalı.
* BAL lenfositozun Fibrotik HP tanısını desteklemede veya dışlamada sensitivite ve spesifitesi düşük.
* Fibrotik IAH varlığında; BAL lenfositozu (%30 üzeri) HP tanısını koymada oldukça spesifik ancak normal olması HP'i dışlamaz.

1-Hamblin M, Prosch H, Vašáková M. Diagnosis, course and management of hypersensitivity pneumonitis. Eur Respir Rev 2022; 31: 210169.DOI: 10.1183/16000617.0169-2021.
2-Executive Summary. Diagnosis and Evaluation of Hypersensitivity Pneumonitis: CHEST Guideline and Expert Panel Report; CHEST 2021; 160(2):595-615

Transbronşiyal biyopsi(TBB)/ Kriyobiyopsi(TBC)/Cerrahi biyopsi

Non-Fibrotik HP

- TBB öneriliyor
- TBC için lehine veya aleyhine bir öneri yok
- Cerrahi akc biyopsi sadece diğer hiçbir tanısal yöntem ile tanı konulmadığında

Fibrotik HP

- TBB için lehine veya aleyhine bir öneri yok
- TBC öneriliyor
- Cerrahi akciğer biyopsi öneriliyor(Diğer yöntemlerle tanı konulamıyorsa)

NOT: ATS/JRS/ALAT veya CHEST rehberlerinde cerrahi biyopsisi yerine TBC kullanımı için herhangi bir öneri yapılmamış; ancak, 447 hastadan elde edilen verilerin sistematik bir incelemesinin ve meta-analizinin bulguları, TBC'nin daha düşük morbidite ve mortalite riski oluşturabileceğini düşündürmektedir.

Ravaglia C, Bonifazi M, Wells AU, et al. Safety and diagnostic yield of transbronchial lung cryobiopsy in diffuse parenchymal lung diseases: a comparative study versus video-assisted thoracoscopic lung biopsy and a systematic review of the literature. Respiration 2016; 91: 215–227.

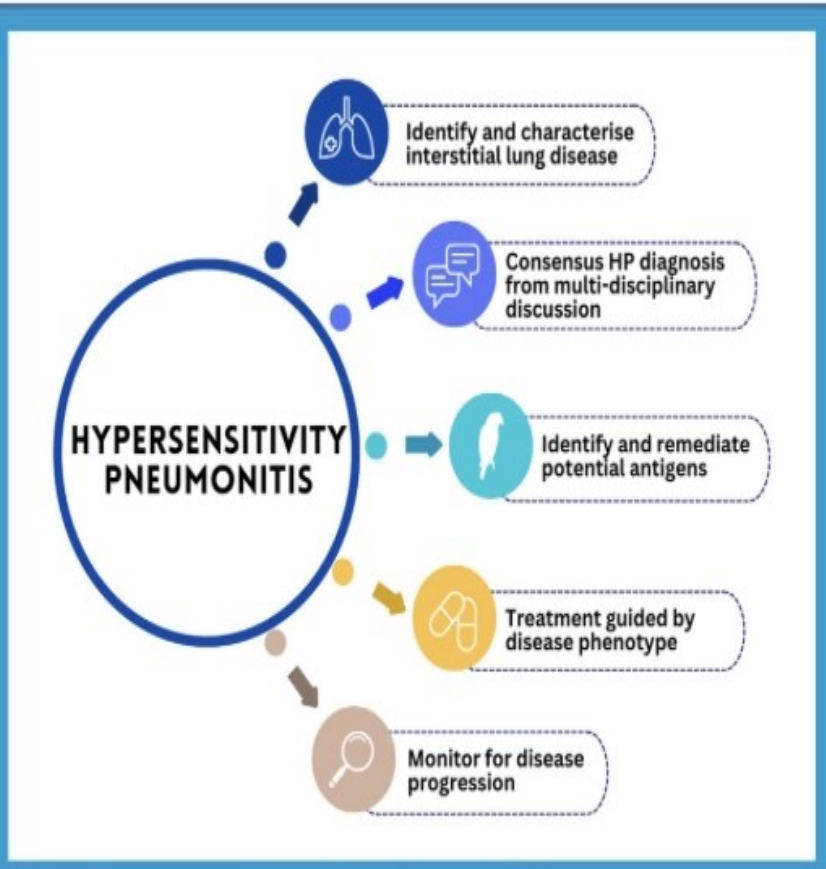
Tedavi

* Maruziyetin ortadan kaldırılması

* Antiinflamuar tedaviler
(Kortikosteroid,azotiyoprin,Mikofenolat mofetil vb.)

* Antifibrotikler

TSANZ Position Statement: Diagnosis and management of hypersensitivity pneumonitis in adults



NONFIBROTIC HP
More inflammation

Phenotype

FIBROTIC HP
Less inflammation

Corticosteroids and immunosuppression
More beneficial in inflammatory disease

Pharmacologic approach

Anti-fibrotic agents
Beneficial in progressive fibrotic disease

General management

Pulmonary rehabilitation; management of comorbidities; supportive care; consider clinical trials and transplant referral

Respirology

Diagnosis and management of hypersensitivity pneumonitis in adults: A position statement from the Thoracic Society of Australia and New Zealand
Barnes et a. 2024: DOI: 10.1111/resp.14847

Prognostik Faktörler

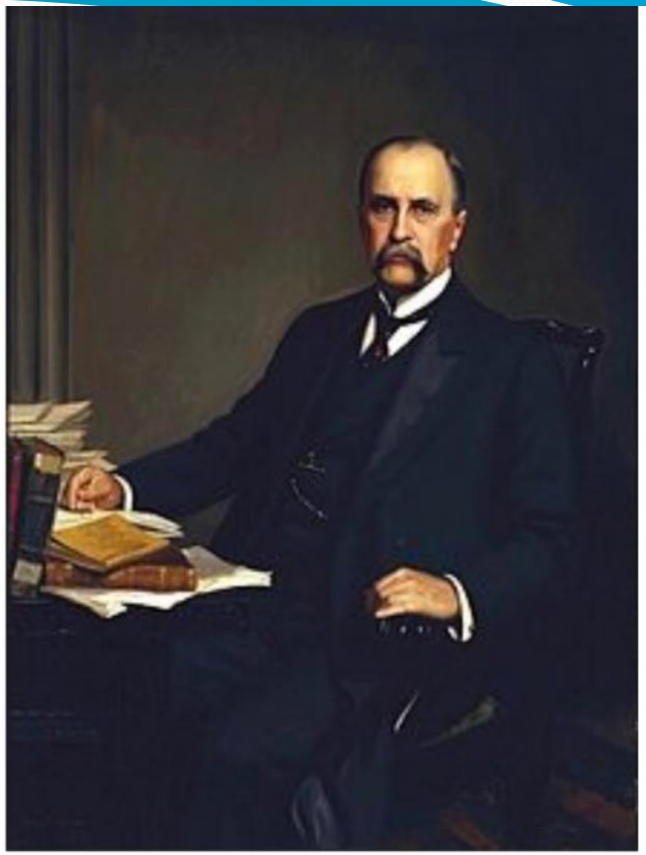
Factors associated with mortality in patients with HP	
Intrinsic factors	Older age
	Male sex
	Genetic predisposition
Exposures	Unidentifiable inciting antigen
	Duration of exposure to inciting antigen
	History of smoking
Physiology	Low FVC
	Low D_{LCO}
	Decline in FVC
	Lower BAL lymphocytosis
Radiology	Presence of fibrosis on HRCT
	Extent of fibrosis on HRCT
	UIP pattern on HRCT
Histology	UIP pattern
	Fibrotic NSIP pattern

BAL: bronchoalveolar lavage; D_{LCO}: diffusing capacity of the lungs for carbon monoxide; FVC: forced vital capacity; HRCT: high-resolution computed tomography; NSIP: non-specific interstitial pneumonia; UIP: usual interstitial pneumonia.

Hamblin M, Prosch H, Vašáková M. Diagnosis, course and management of hypersensitivity pneumonitis. Eur Respir Rev 2022; 31: 210169.DOI: 10.1183/16000617.0169-2021.

ÖZET

* HP, IAH arasında 3.sıklıkla görülüyor
* Allerjen maruziyetinin tespitinde öykü ve/veya IgG tipi(Ag spesifik) Ab'ların çalışılması önemli
* Bilinen bir allerjen maruziyeti ve tipik radyolojik bulguların varlığında MD konseylerde tartışmak şartı ile HP tanısı konulabilir
* BAL'da lenfositoz varlığı klinik ve radyolojik bulguların uyumsuzluğunda tanısal değeri yüksek
* Mevcut klinik, radyolojik ve BAL bulguları ile tanı konulamıyorsa akciğer doku örneklemesi düşünülmeli.



William Osler

12 Temmuz1849- 29 Aralık 1919

'' medicine is a science of uncertainty and an art of probabilty''

* TEŞEKKÜRLER