

TORAKS BT DEĞERLENDİRME

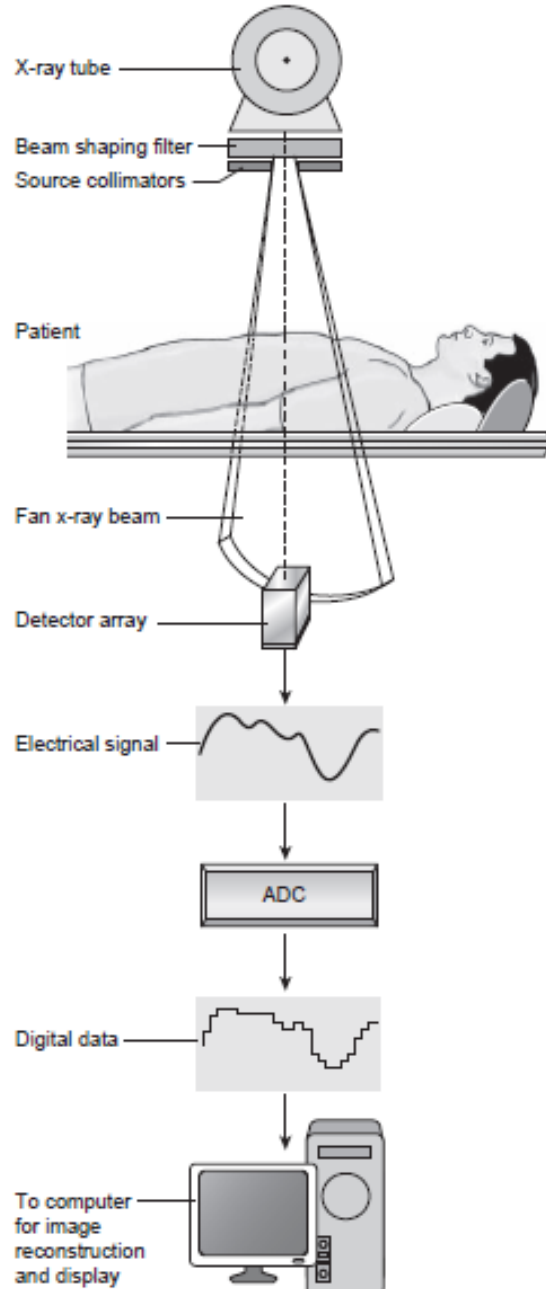
Dr. Recep SAVAŞ

Ege Üniversitesi Tıp Fakültesi Radyoloji AD, İzmir

ÖZET:

- Toraks BT'de görüntü oluşumu, renkler, dansite
- Normal anatomi, varyasyonlar
- Dansite artıran ve dansite azaltan lezyonlar
- Niçin toraks BT isteriz?
- Kaç değişik yöntemle toraks BT çekilebilir ?
- Toraks BT değerlendirmeyi nasıl bir sıra içinde yapalım ?
- BT' de işaretler
- Okunması gereken makaleler, takibinde fayda olan siteler

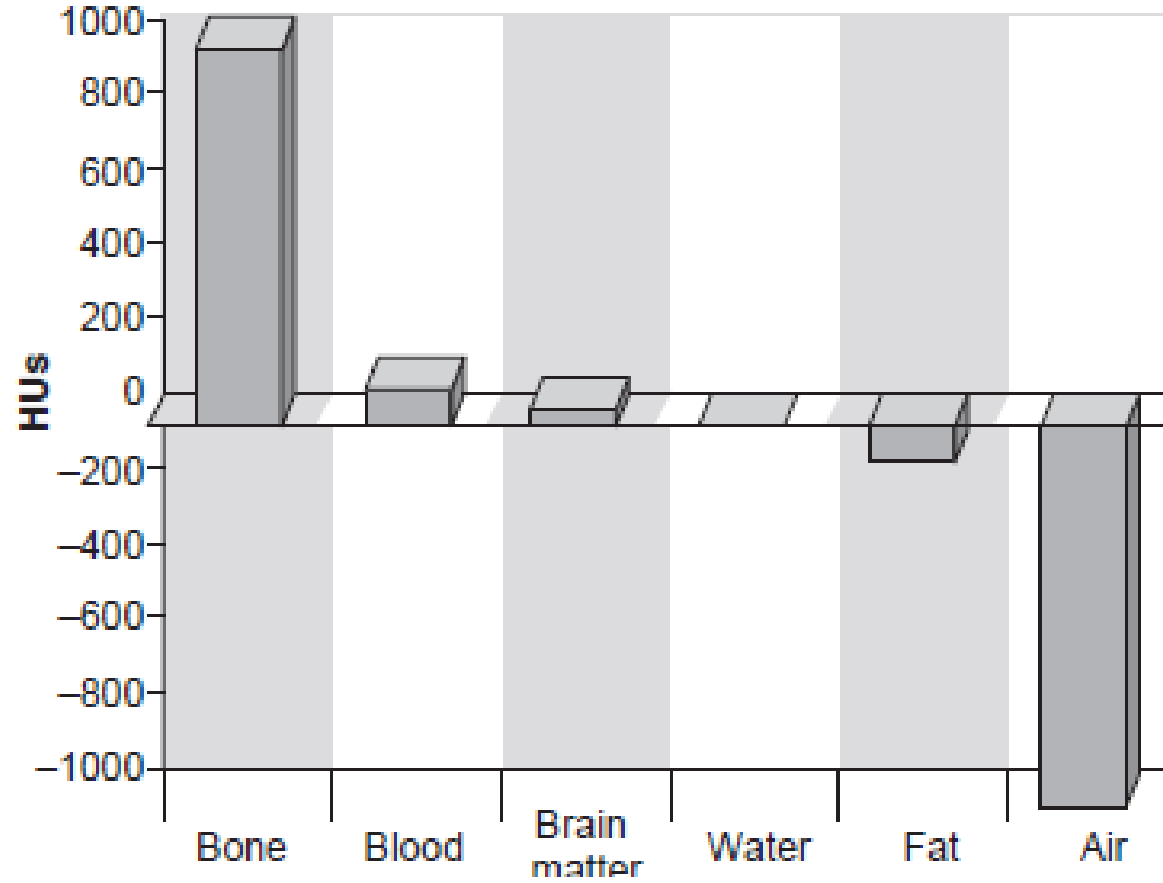
BT'de GÖRÜNTÜ oluşumu



- X ışınları hastaya ait dokular tarafından attenüe olur.
- Dedektörler tarafından attenüe olan fotonlar saptanır.
- Saptanan veriler elektrik sinyaline dönüştürülür.
 - Elektrik sinyali dijital verilere çevrilir (ADC)
- Dijital veriler bilgisayara rekonstrüksiyon için gönderilir.

BT GÖRÜNTÜ oluşumu:

- Organizmayı geçen X-ışınlarının attenuasyon değerleri sayısal olarak saptanır.
- Her pikselin bir sayısal karşılığı vardır.
- Bu sayılar suyun attenuasyon değerini sıfır kabul eden bir skalaya göre düzenlenmiştir.



+ 1000'den – 1000 'e kadar uzanan bu skalaya *Hounsfield skalası*, bu skaladaki sayılara da *Hounsfield üniti (HÜ)* adı verilir.

BT'de renkler neyi ifade eder?

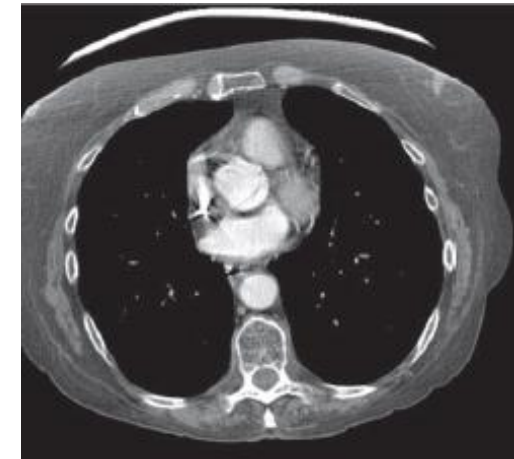
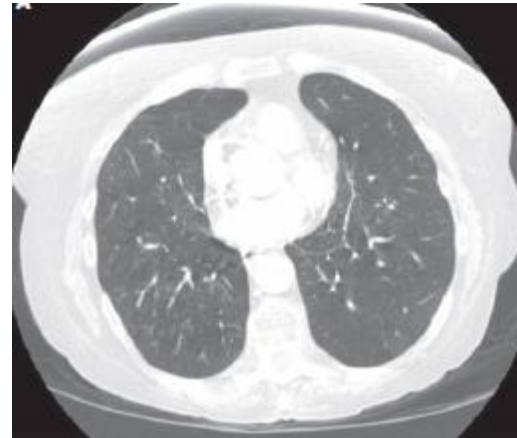
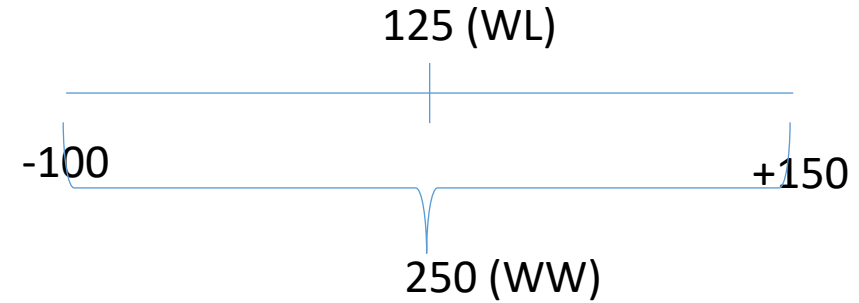
- Siyah, beyaz ve bunların arasında kalan yaklaşık 30 gri renk (gözümüzün gördüğü)
- Siyah: Hava ve yağ
- Beyaz: Kemik, kalsifikasyon
- Ara renkler: Yumuşak dokular (nodülden kitleye, buzlu camdan konsolidasyona)
- Dansite: HU ile ifade edilir
- Su 0 HU olarak kabul edilmiş

Ör:-100 ile +150 HU arasındaki oluşumları daha iyi görmek için seçilmesi gereken pencere seviyesi ve pencere aralığı nedir?

WW: 250

WL: 125

Examination	Width	Level
Head		
Posterior fossa	150	40
Brain	100	30
Temporal bone	2,800	600
Neck		
	250	30
Chest		
Mediastinum	350	50
Lung	1,500	-600
Abdomen		
Soft tissue	350	50
Liver (high contrast)	150	30
Pelvis		
Soft tissue	400	50
Bone	1,800	400
Spine		
Soft tissue	250	50
Bone	1,800	400



BT'DE NORMAL ANATOMİK YAPILAR


Chest CT, radiology, anatomy



[All](#) [Images](#) [Videos](#) [News](#) [Shopping](#) [More](#) [Settings](#) [Tools](#)

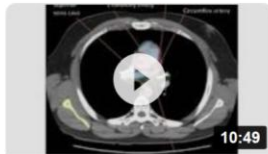
About 8,000,000 results (0.63 seconds)

Videos



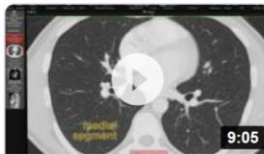
Chest CT Anatomy Discussion by Radiologist

rdavidm1
YouTube - Jan 7, 2014



Anatomy of a Transverse CT of the Thorax

Eva Sweeney
YouTube - Oct 22, 2016

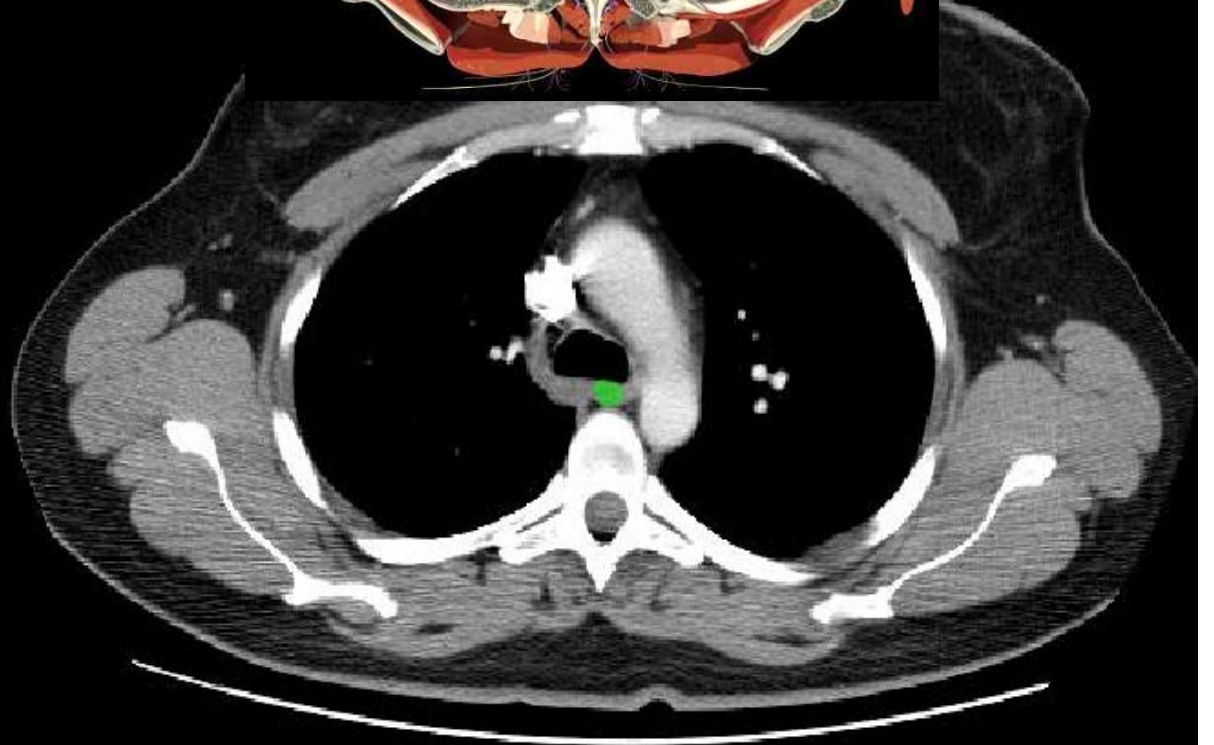
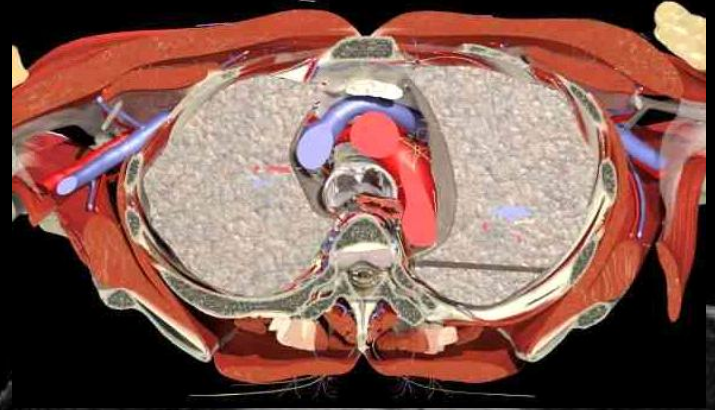
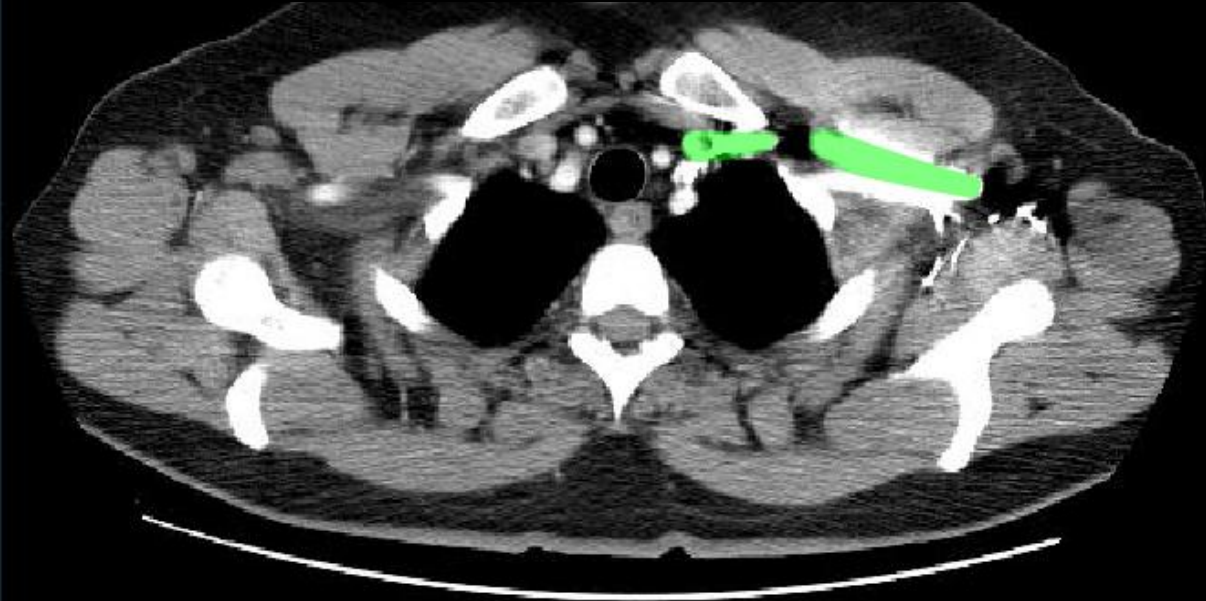


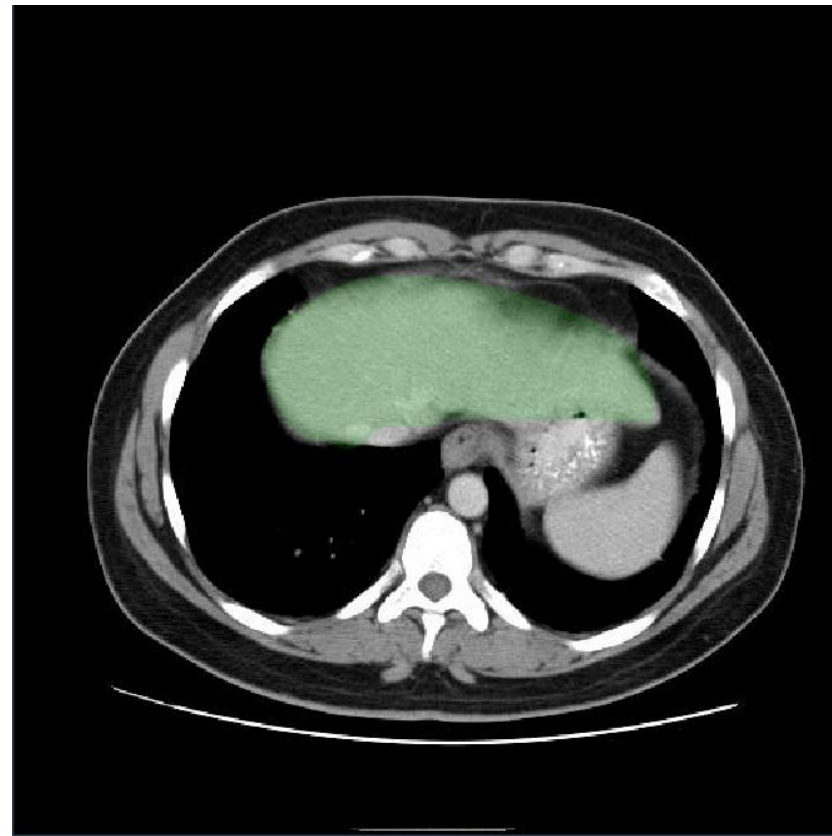
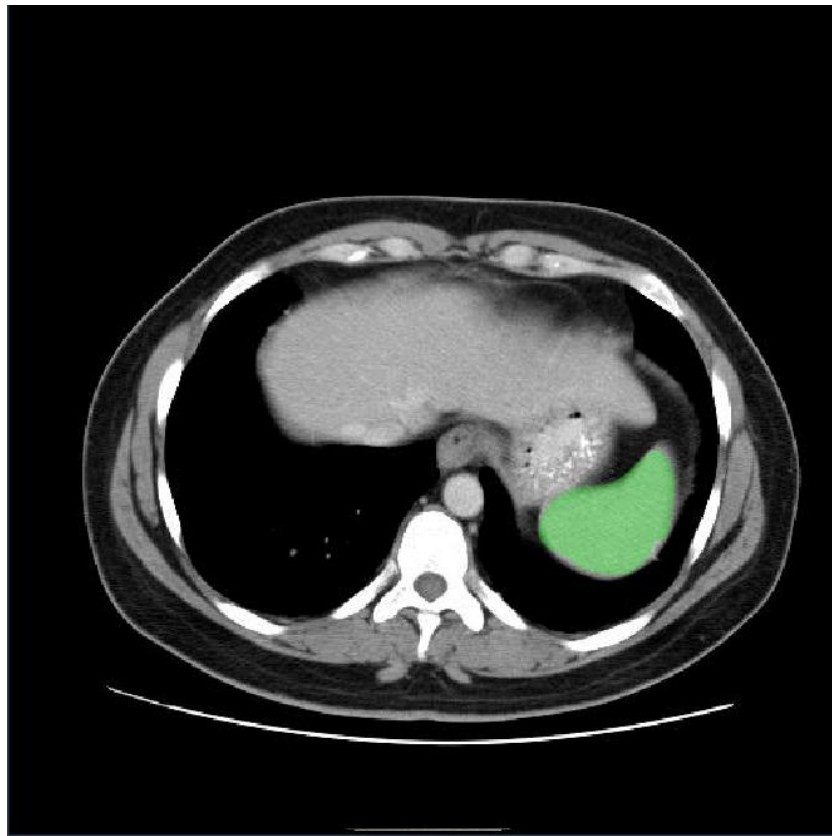
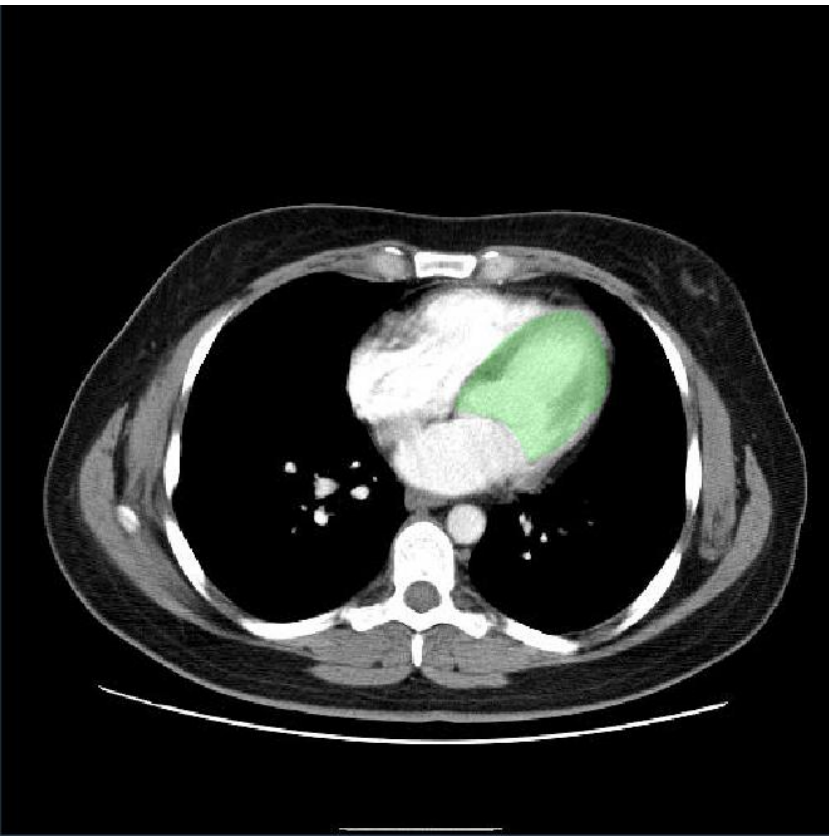
Lobar and Segmental Lung Anatomy on CT

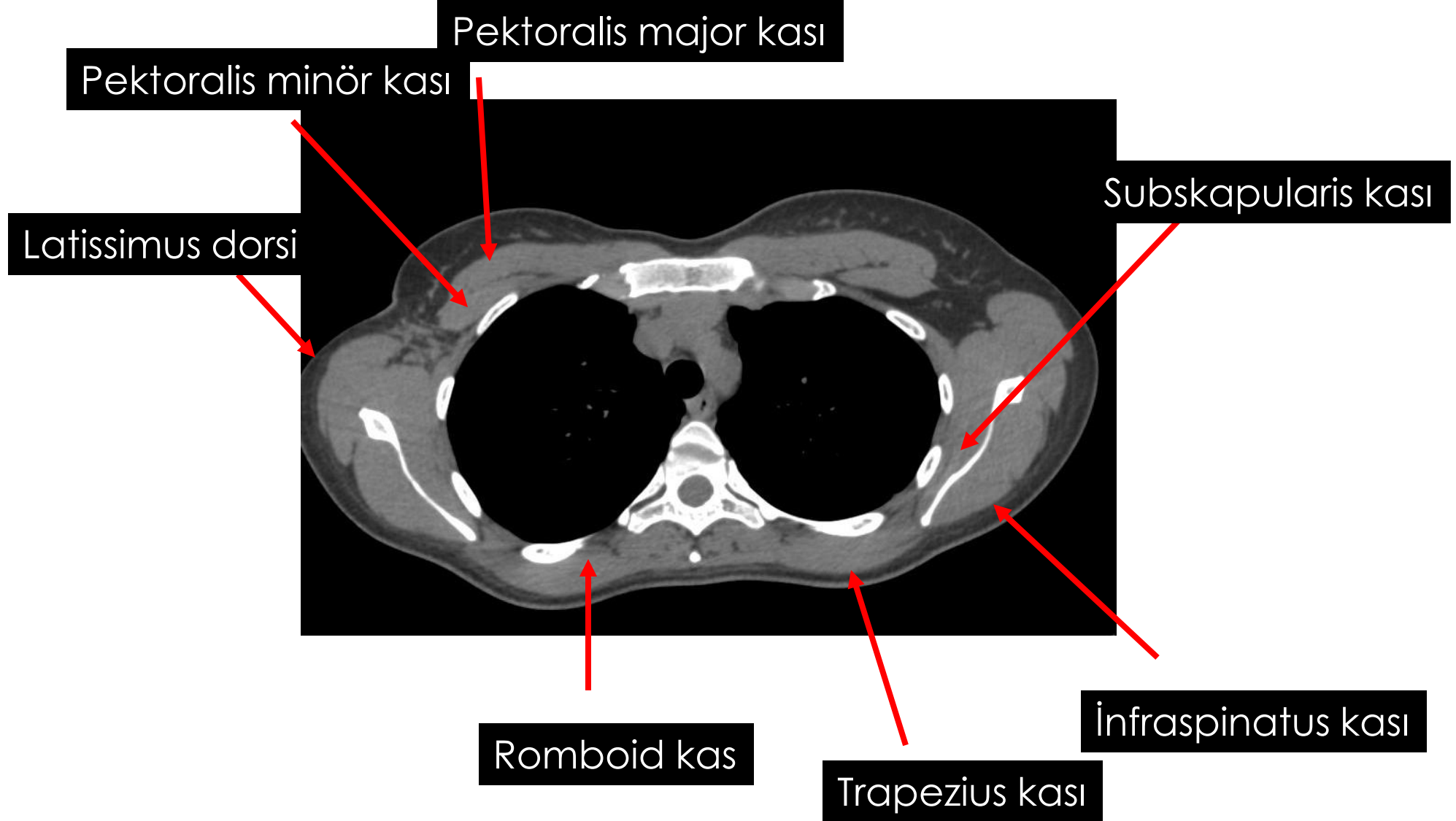
Thoracic Radiology
YouTube - Aug 14, 2016

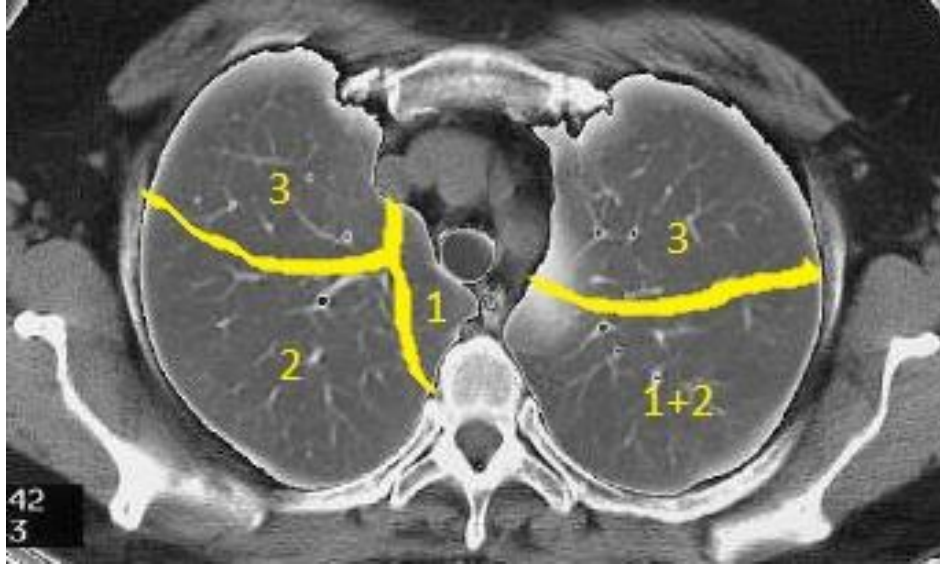
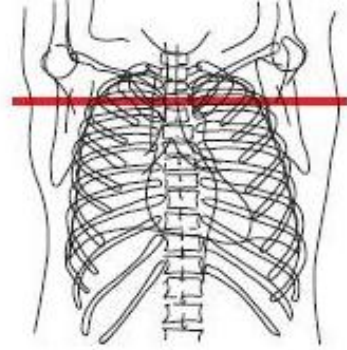
[Bronchopulmonary segments: annotated CT | Radiology Case ...](https://radiopaedia.org/cases/bronchopulmonary-segments-annotated-ct-1)

<https://radiopaedia.org/cases/bronchopulmonary-segments-annotated-ct-1>



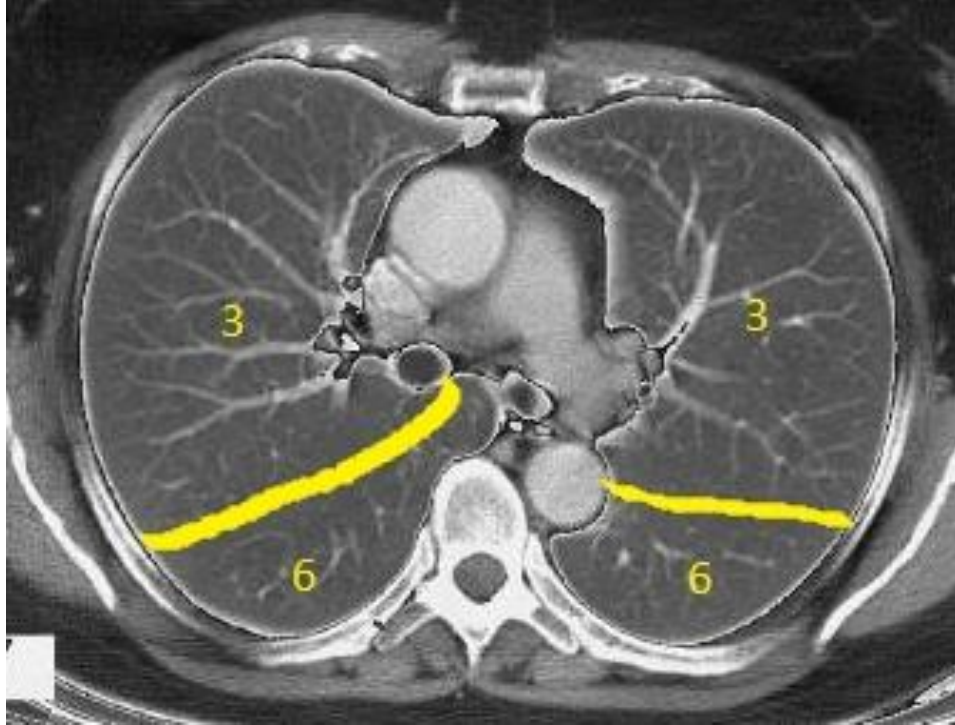
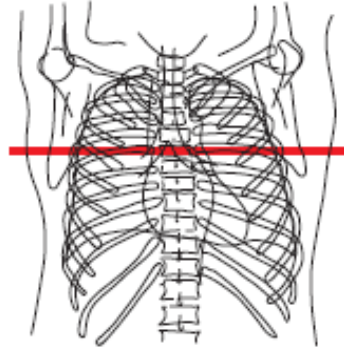






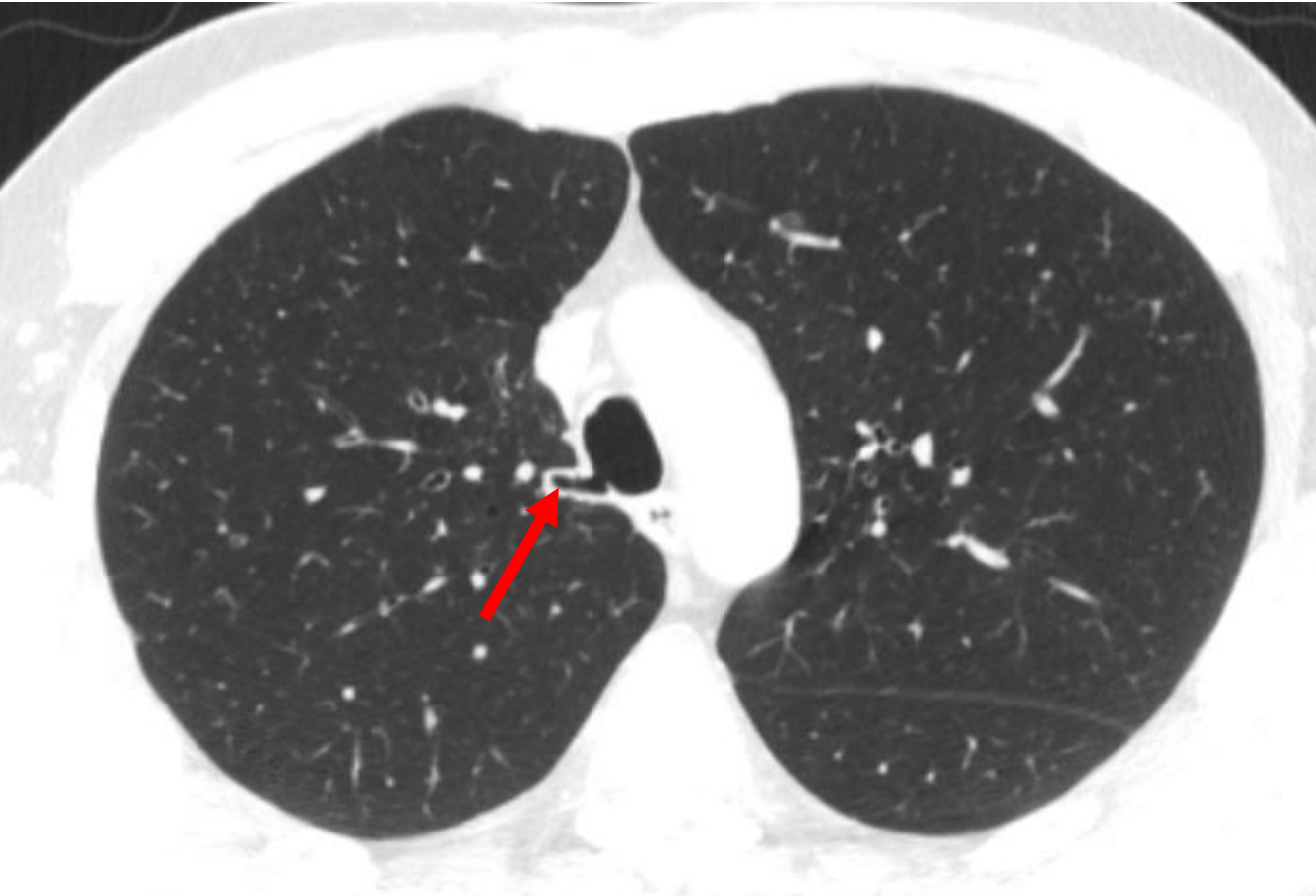
SAĞ
SOL

1. Üst lob apikal
2. Üst lob posterior
- 1+2 Üst lob apikoposteior
3. Üst lob anterior
4. Orta lob lateral
4. Süperior linguler
5. Orta lob medial
5. İnferior lingüler
6. Alt lob süperior
7. Alt lob medial bazal
8. Alt lob anterior bazal
9. Alt lob lateral bazal
10. alt lob posteior bazal



SAĞ
SOL

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8. Alt lob anterior bazal
9. Alt lob lateral bazal
10. alt lob posteior bazal



Trakeal bronkus

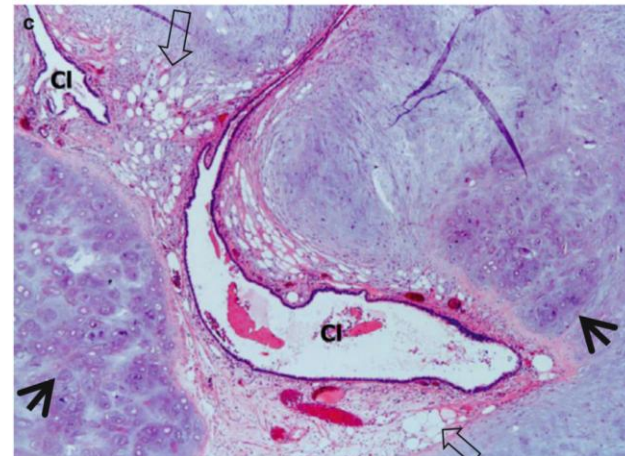
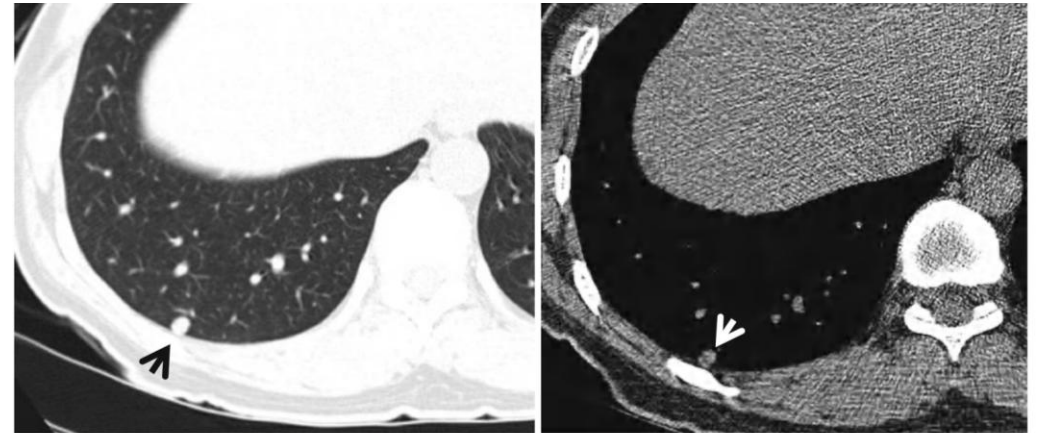


DANSİTE VE AKCİĞER

- Akciğerin dansitesi havadan daha yüksektir (içinde kan ve doku içermesi nedeniyle)
- Akciğerin normal dansitesi kişiden kişiye değişmekle birlikte **-500 ila -900 HU** arasında değişir
- Lezyonlar da DANSİTE ARTIŞI yapan, DANSİTE AZALTAN ve her ikisini de barındıran (MİKST) olmak üzere üç grupta toplanabilir.

Kyung Soo Lee
Joungho Han
Man Pyo Chung
Yeon Joo Jeong

Radiology Illustrated Chest Radiology

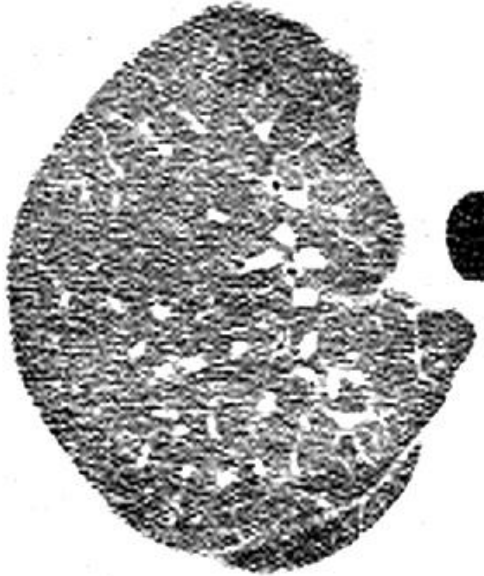


DANSİTE ARTIŞI (parankimal)

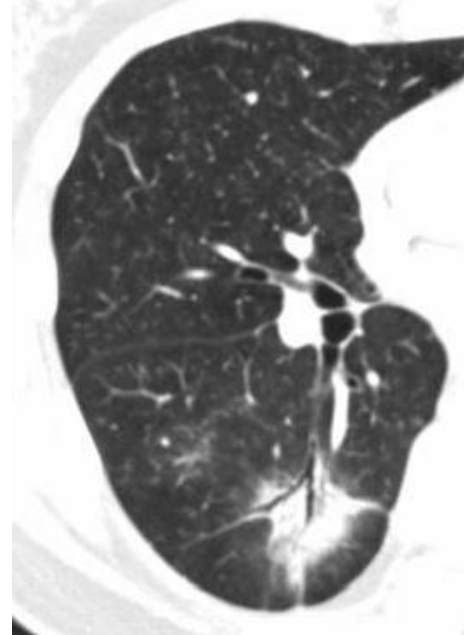
- Buzlu cam ve konsolidasyon
- Nodül ve kitleler
- Atelektazi
- Vasküler lezyonlar
- Retiküler ve retikülonodüler görünüm yapan lezyonlar
- Yüksek dansiteli lezyonlar (kalsifikasyon, iyod birikimi vb)
- Hiler, mediastinal veya göğüs duvarı lezyonlarının akciğere uzanımı.....

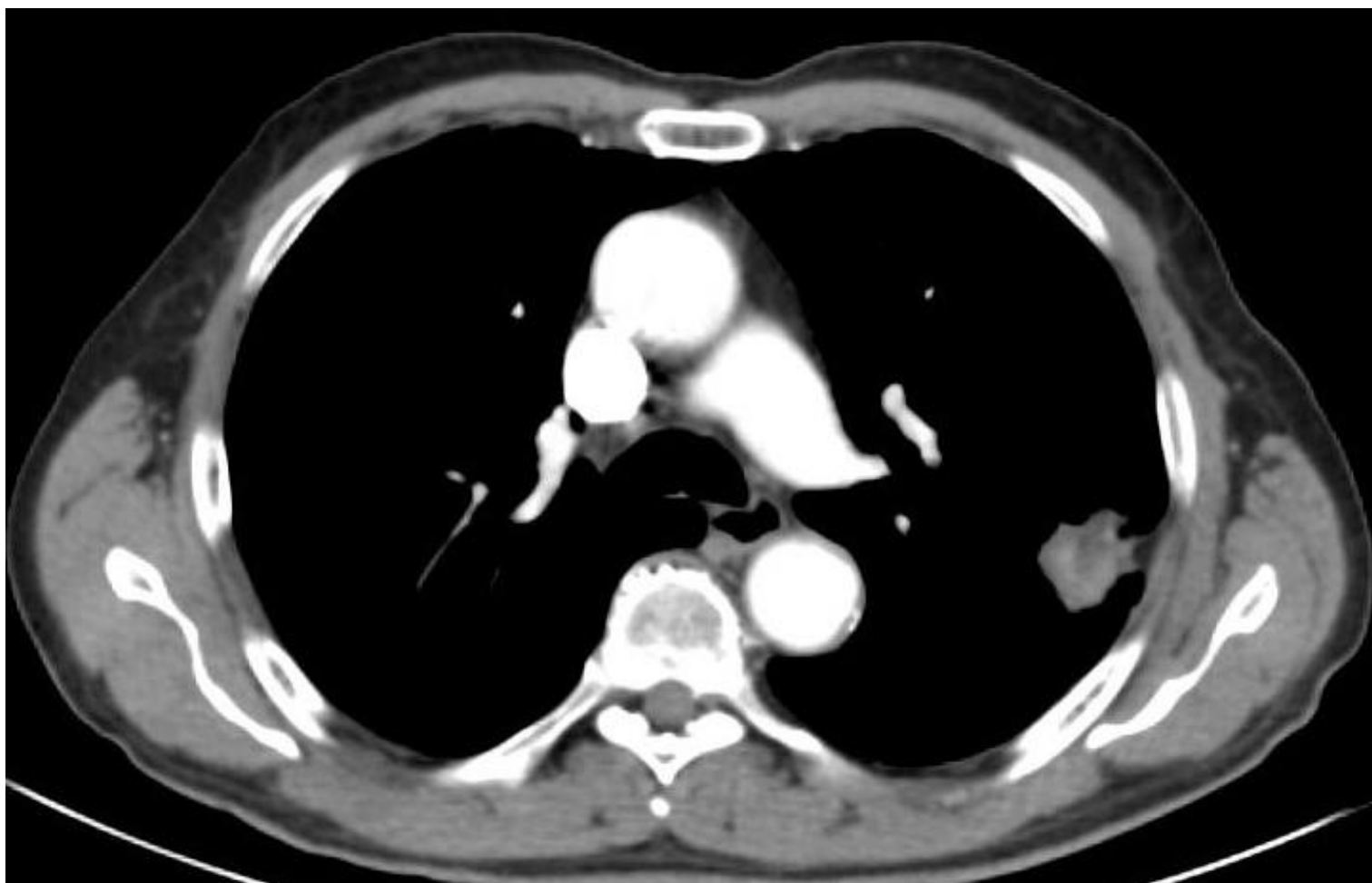
BUZLU CAM / KONSOLİDASYON

- Altta geçen damar yapılarını bozmayan dansite artışı BUZLU CAM



- Damar yapılarını silen dansite artışı KONSOLİDASYON





DANSİTE AZALMASI

- Normal akciğer dansitesi; hava dansitesinden daha yüksek değerlerdedir (-750 ye -1000)
- **Parankimal dansiteyi oluşturan** : Hava ve yumuşak dokular (bronş duvarı, interstisyum, damar ve lenfatikler ile içindeki kan ve lenf)

DANSİTE AZALMASI

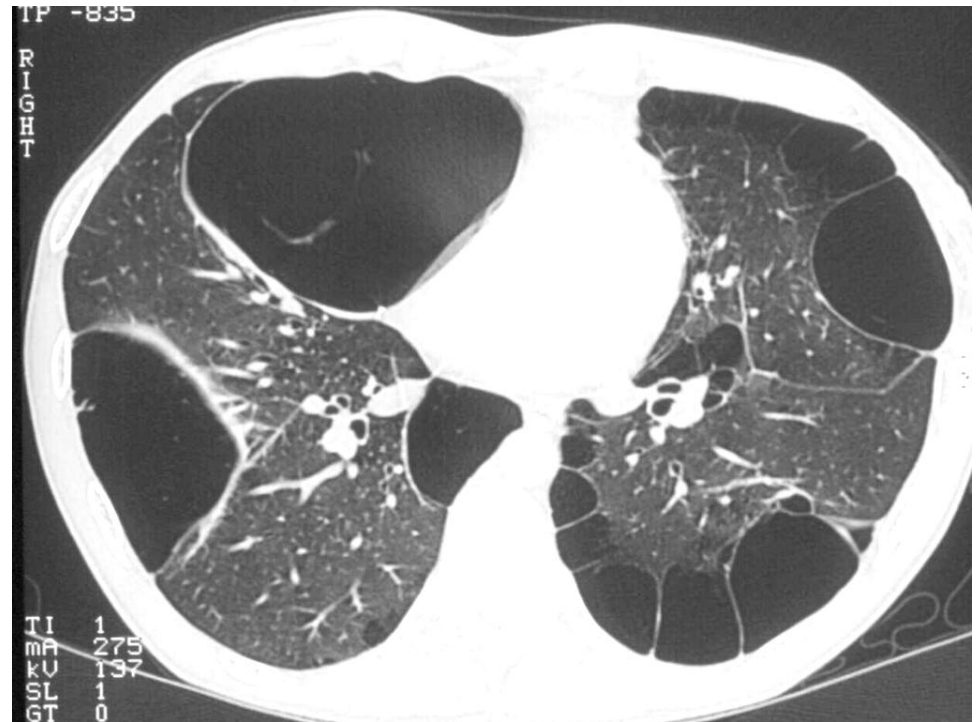
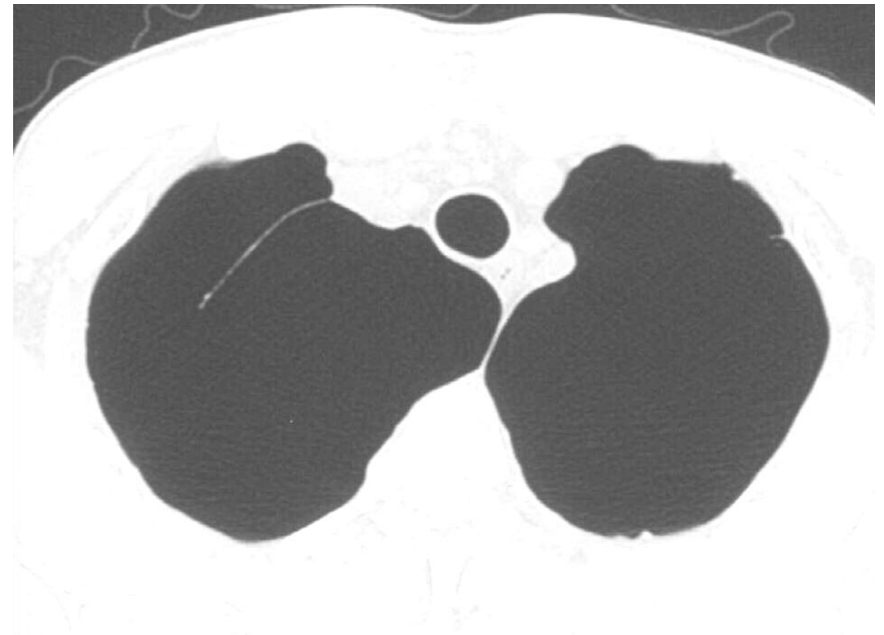
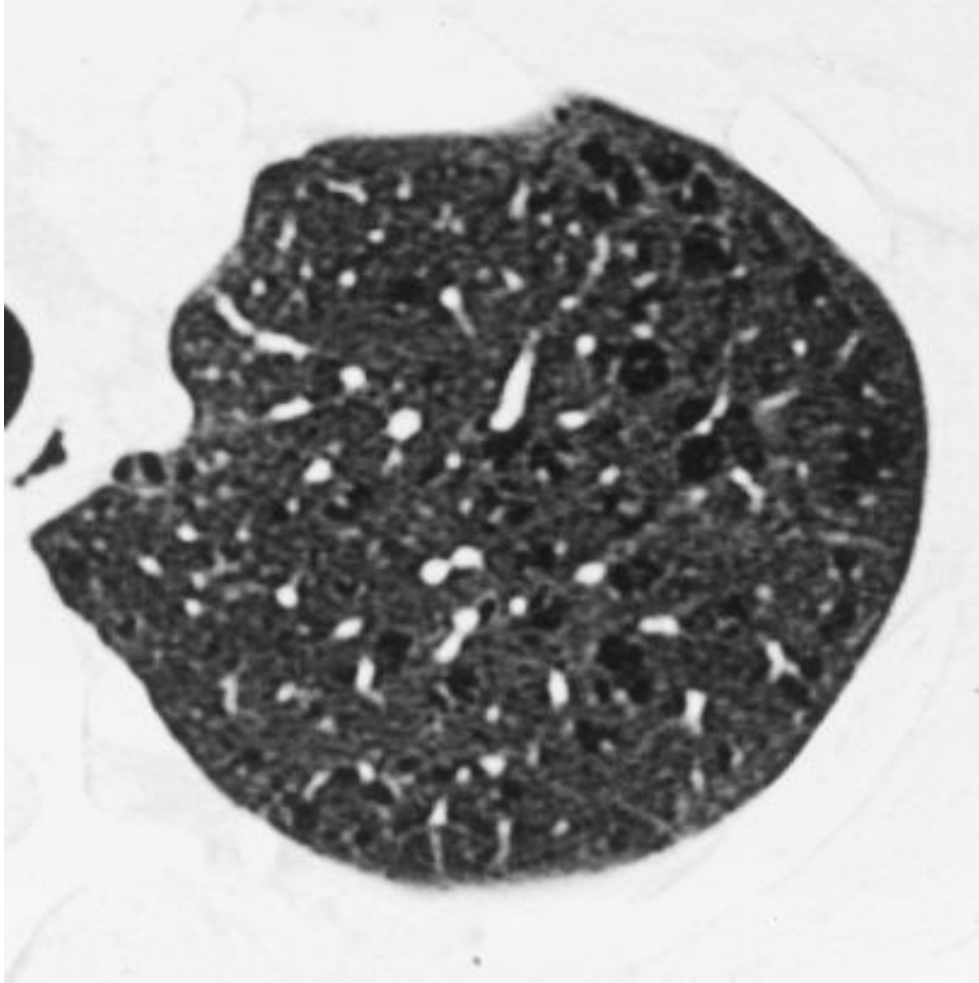
- Dansite azalması olması için:

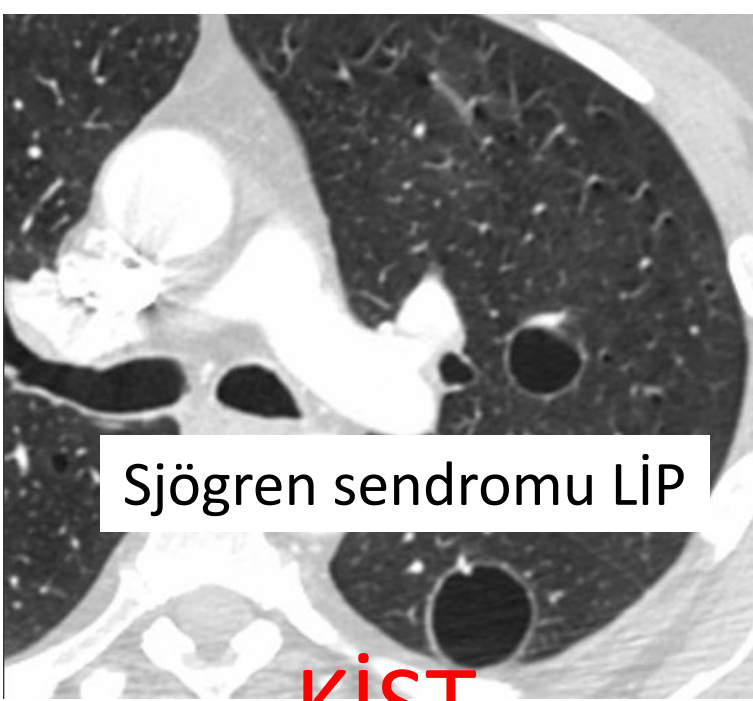
- *Havanın aşırı artışı

- veya

- *Yumuşak dokuların azalması (damar çapı, kan akımı, doku kaybı vb) gereklidir.

PARANKİM- Amfizem

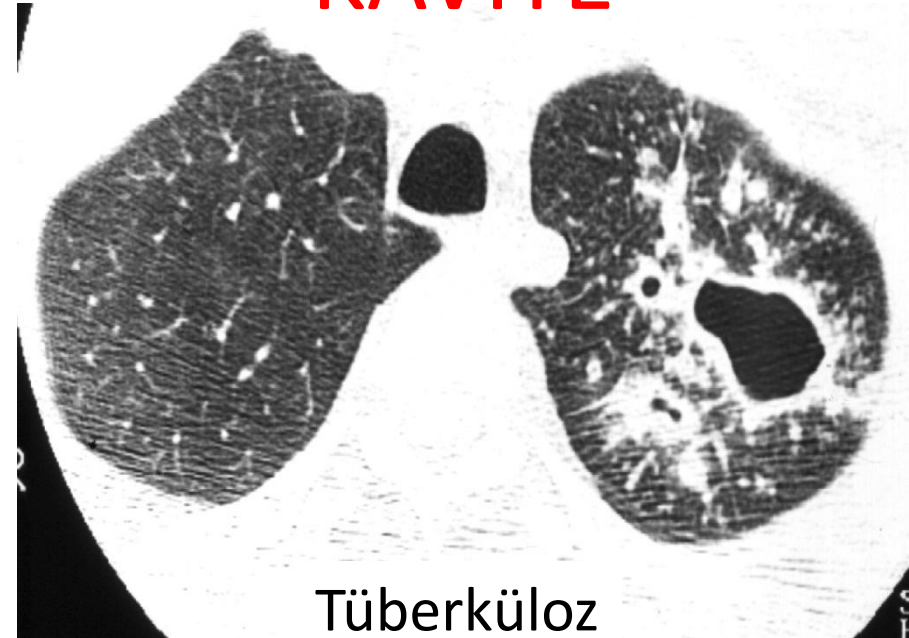




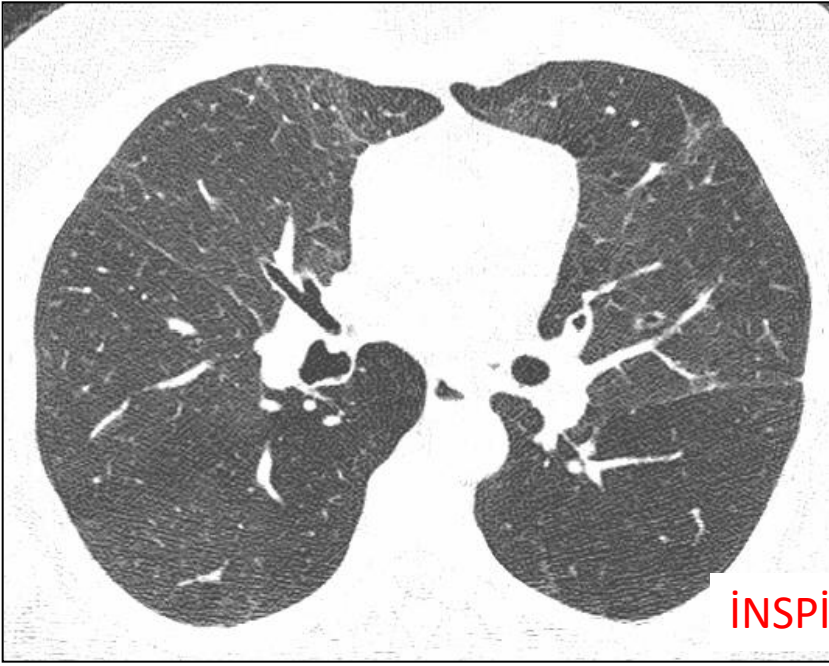
KİST



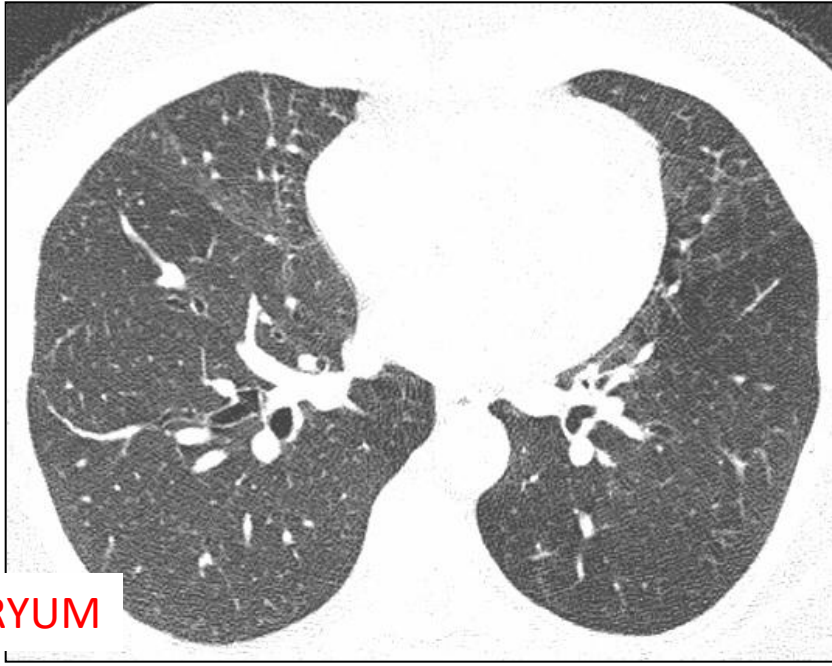
KAVİTE



LAM



İNSPİRİYUM



EKSPİRİYUM



MOZAIK PERFÜZYON

HAVA YOLU HASTALIKLARI

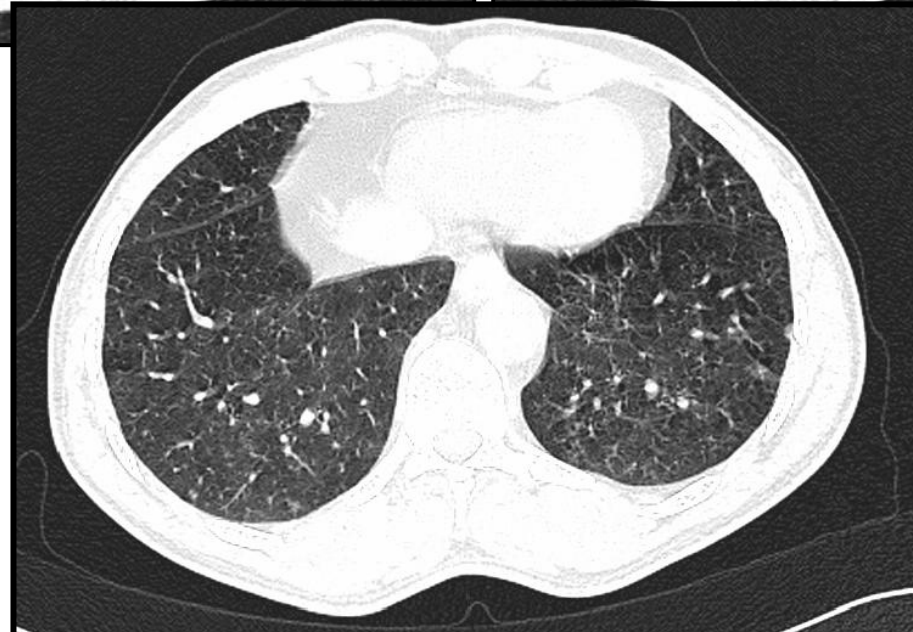
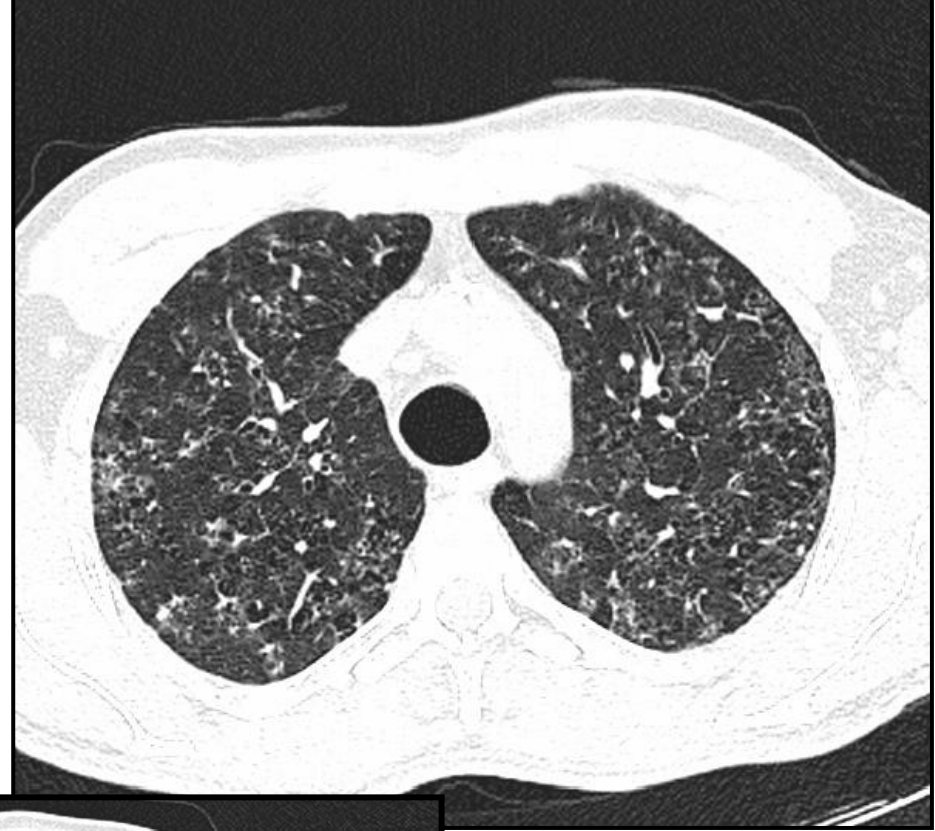
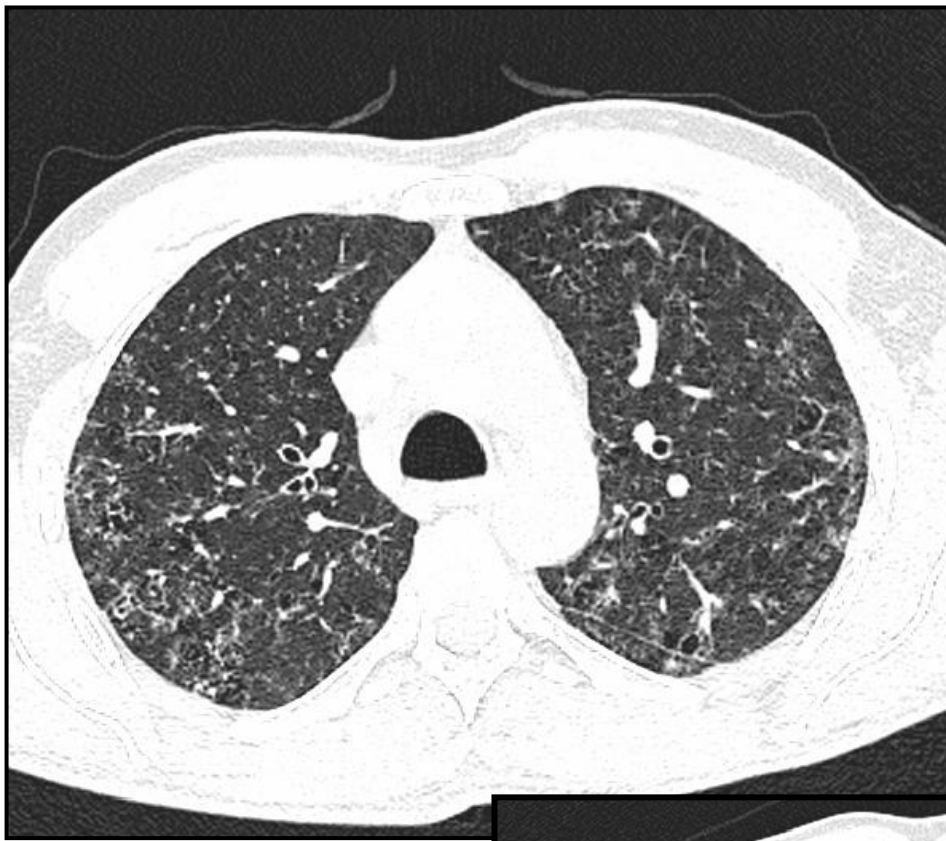
- Bronşiolitis obliterans
- Sarkoidozis
- Hipersensitiv. Pnomönisi
- AIDS
- LHH ve LAM
- Bronşioler spazm

VASKÜLER HASTALIKLAR

- Kronik pulmoner emboli
- Pulmoner hipertansiyon
(idiopatik veya kardiyojenik/
pulmoner nedenle)



LAM



LHH

KİSTİK AKCİĞER HASTALIKLARI

AKCİĞER KİSTLERİ

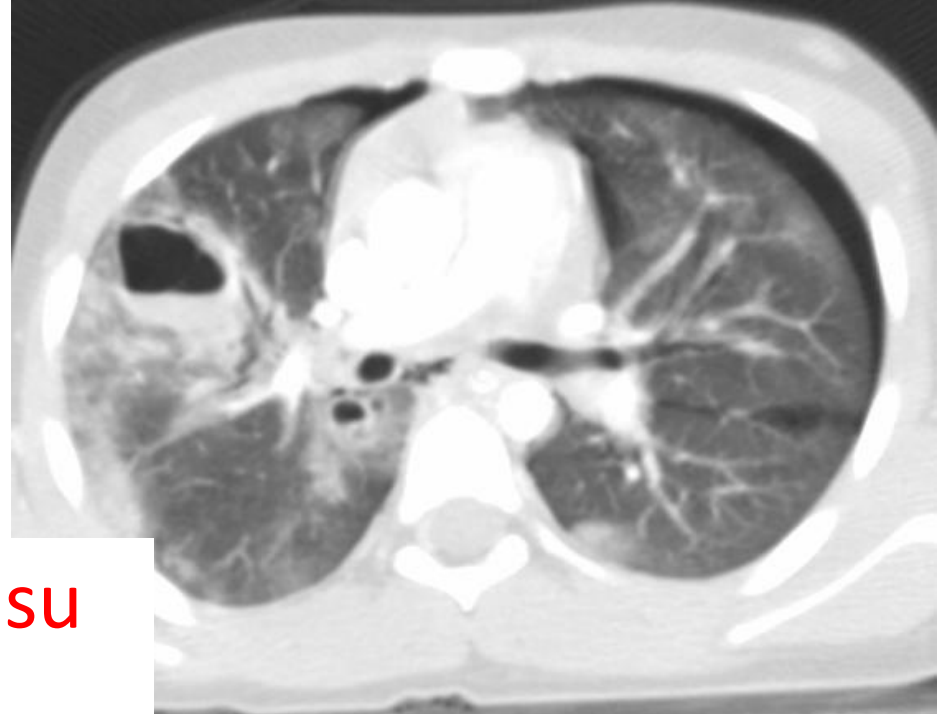
- Balpeteği akciğer
- LAM
- LHH
- LIP
- Tüberoskleroz
- Nörofibromatozis

KİST BENZERİ/KAVİTER

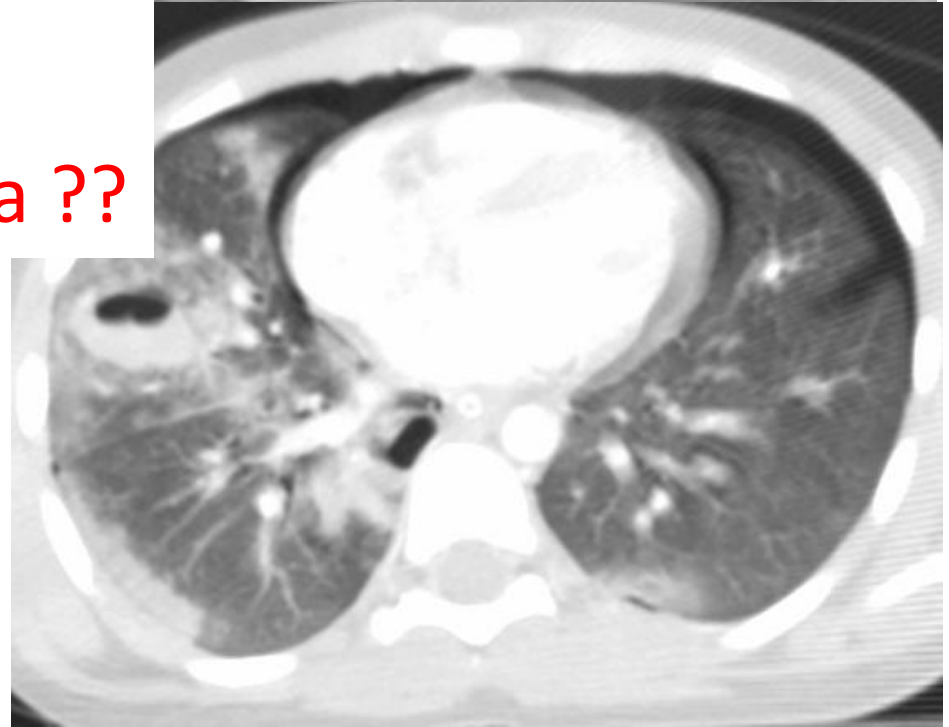
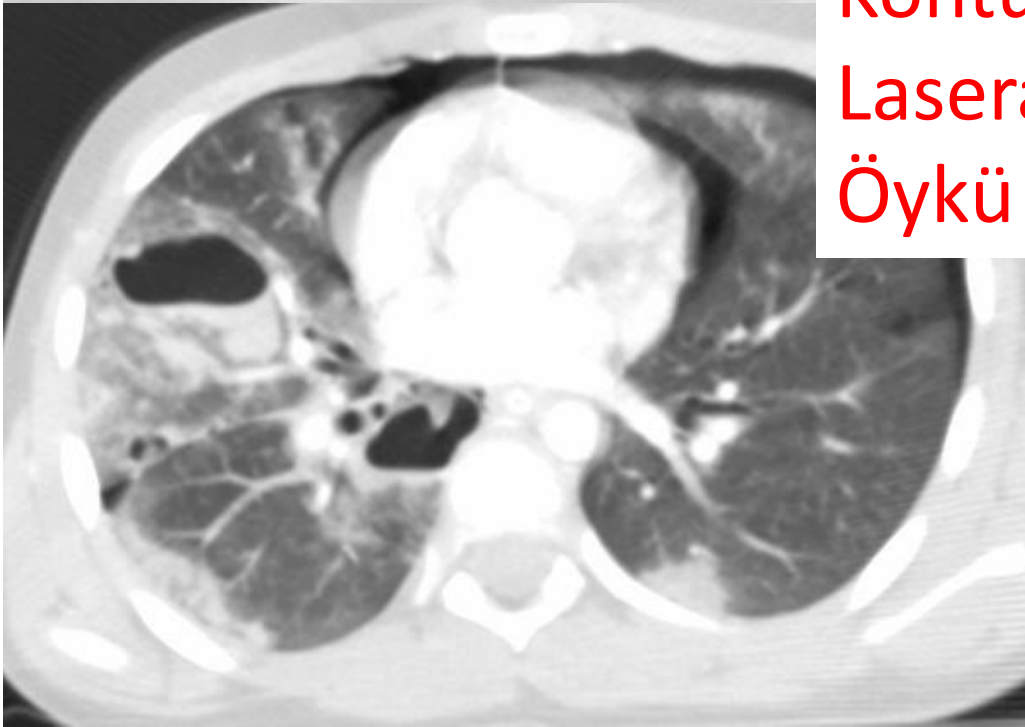
- LHH
- Metastazlar
- Septik emboli
- Wegener gr.
- Tüberküloz
- RA (nekrobiyotik nodül)
- Sarkoidoz

Niçin Toraks BT isteriz?

- Akciğer grafisinde gördüğümüz lezyon veya kuşku,
- Akciğer grafisi ile göremeyeceğimiz lezyonları görmek için,
- Bilinen lezyonların takibi (tedavisiz veya tedavi sonrası)
- Tarama amaçlı
- Lezyonların natürünü belirleme (benign- malign ayrımı vb),
- Bilinen sistemik bir hastalığın akciğer tutulumunu görmek,
- Semptomların natürünü açıklayabilmek için (öksürük, hemoptizi vb)
- Diğer....



Travma olgusu
Kontüzyon
Laserasyon
Öykü olmasa ??



- Klinik isteklerin deęerlendirildięi bir alıřmada: BT ekilmiř hastalardan 167'si rastgele deęerlendirilmeye alınmıř:
BT İSTEKLERİ'nin %22'sinin klinik bilgi iermedięi,
%56.5'inde kılavuzlarda belirtilen uygunluk kriterlerine gre BT endikasyonu olmadığı ortaya konmuř.

Filippo M, Corsi A, Evaristi L, Bertoldi C, Sverzellati N, Aversa R, et al. Critical issues in radiology requests and reports. Radiol Med 2011;116:152-62.



Bi sürü test...

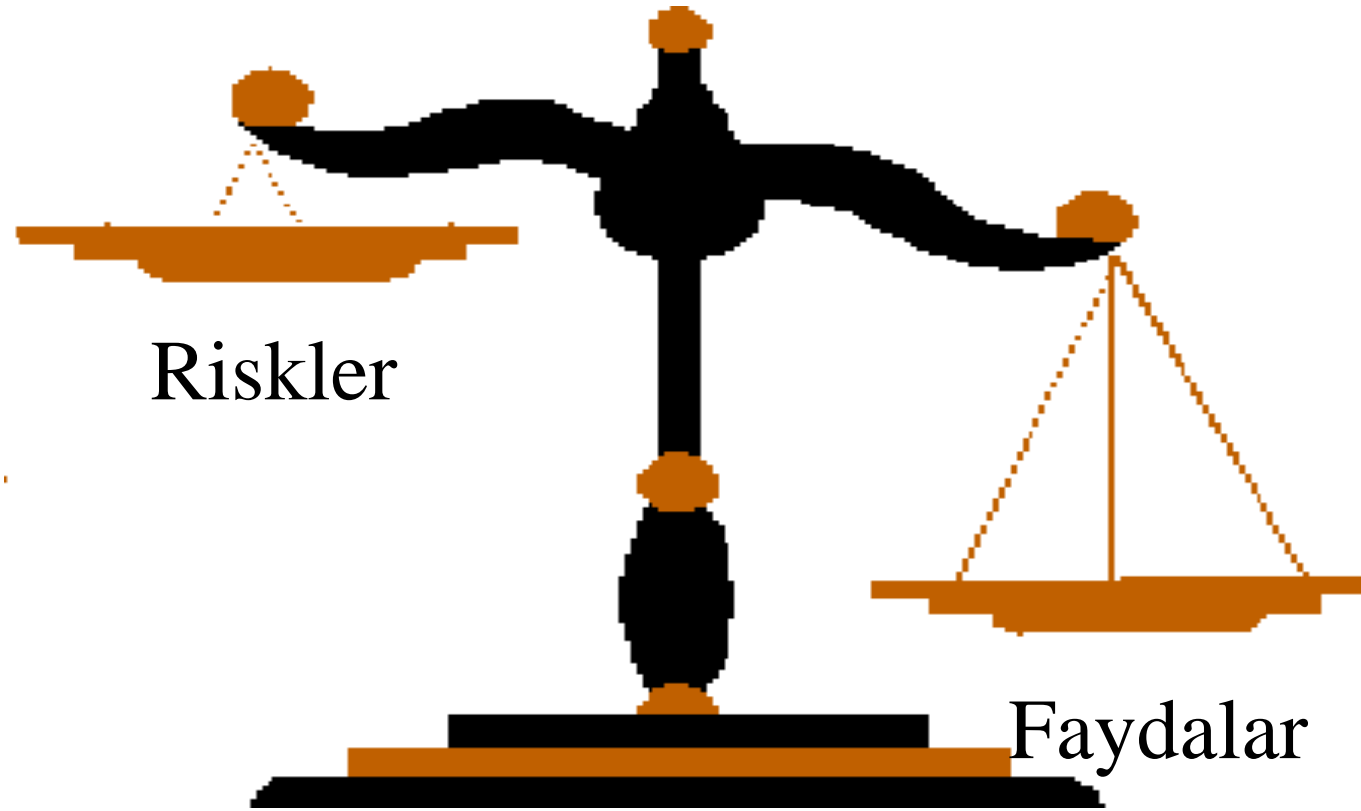
EN ÖNEMLİ SORUNLAR:

- Gereksiz yere tetkik istemek
- Yapılmış tetkiki beğenmeyip yeniden istemek
- Tetkik türü konusunda yanılmak
- Abartılı ve çok takip
- Tetkik kalitesinin çok kötü olması (kesit kalınlığı, verilen kontrastın miktarı, zamanlaması vb)
- Kötü yazılmış radyoloji raporu

GÖRÜNTÜLEDE AKILCI KULLANIM

- Klinisyen düşündüğü tanı için doğru tetkik ve yöntemi istemeli
- Ön tanı / tanıyı yazarak tetkikin türünü radyologdan istemeli
- Hasta hakkında kısa ama önemli bilgiler verilmeli,
- Klinisyen-radyolog işbirliği ile konuşarak doğru tetkiki isteme
 - Ortak konseylerin çok önemli faydaları olmakta

BT ÇEKİMİ İÇİN

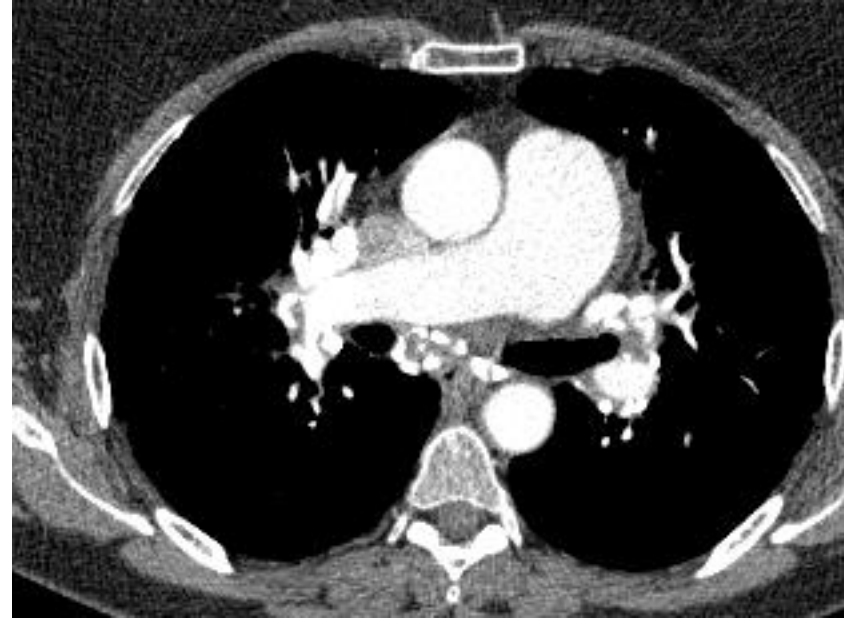


Kaç deęişik yöntemle Toraks BT çekeriz?

- Kontrastsız toraks BT
- Kontrastlı toraks BT (hangi damara yönelik? Aorta? Pulmoner arter? Genel ?)
- YRBT
- Düşük doz toraks BT
- Dinamik BT
- PET/BT'nin BT komponenti



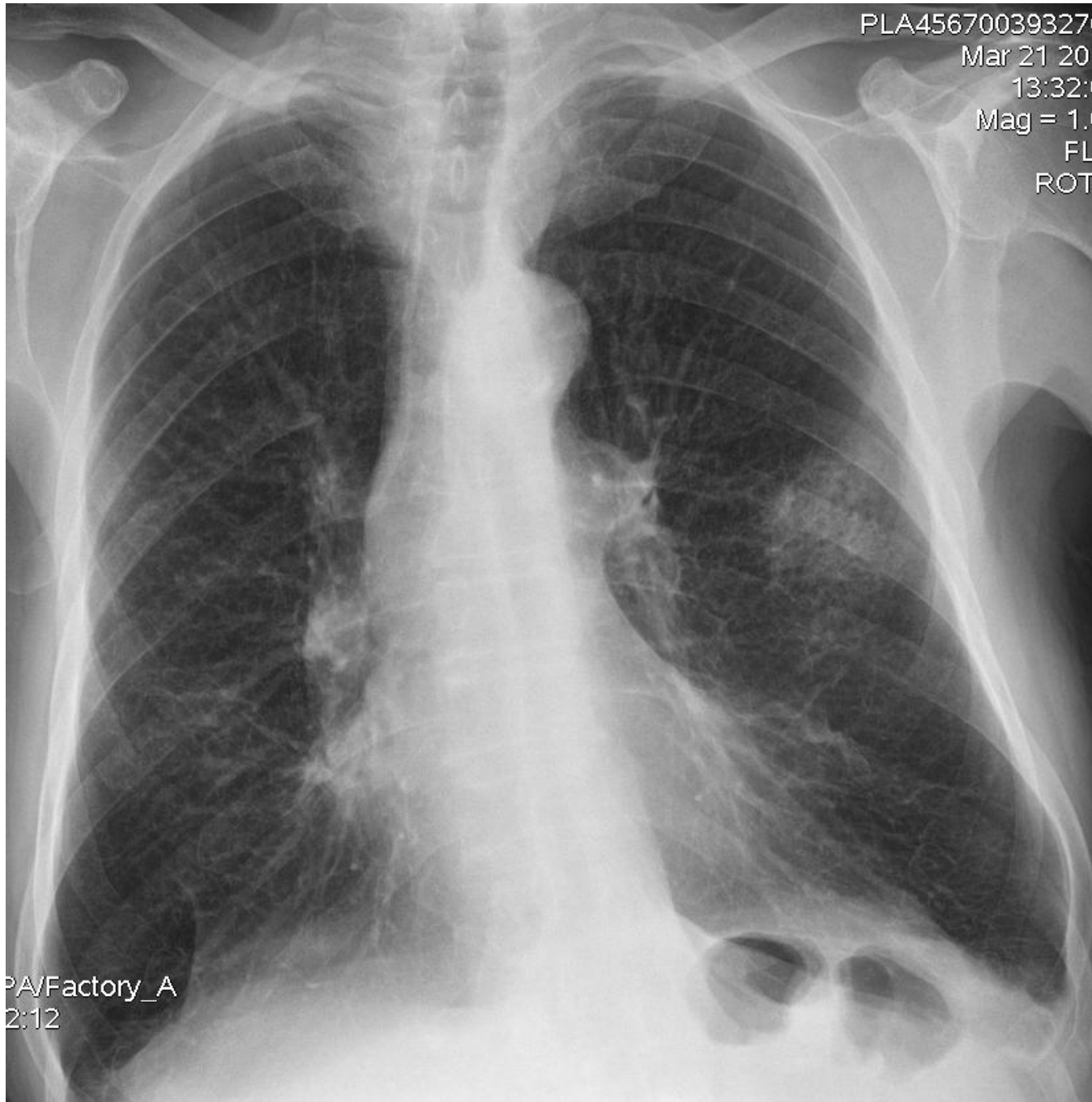
Pulmoner arter fazi



Ara faz



Aort fazi

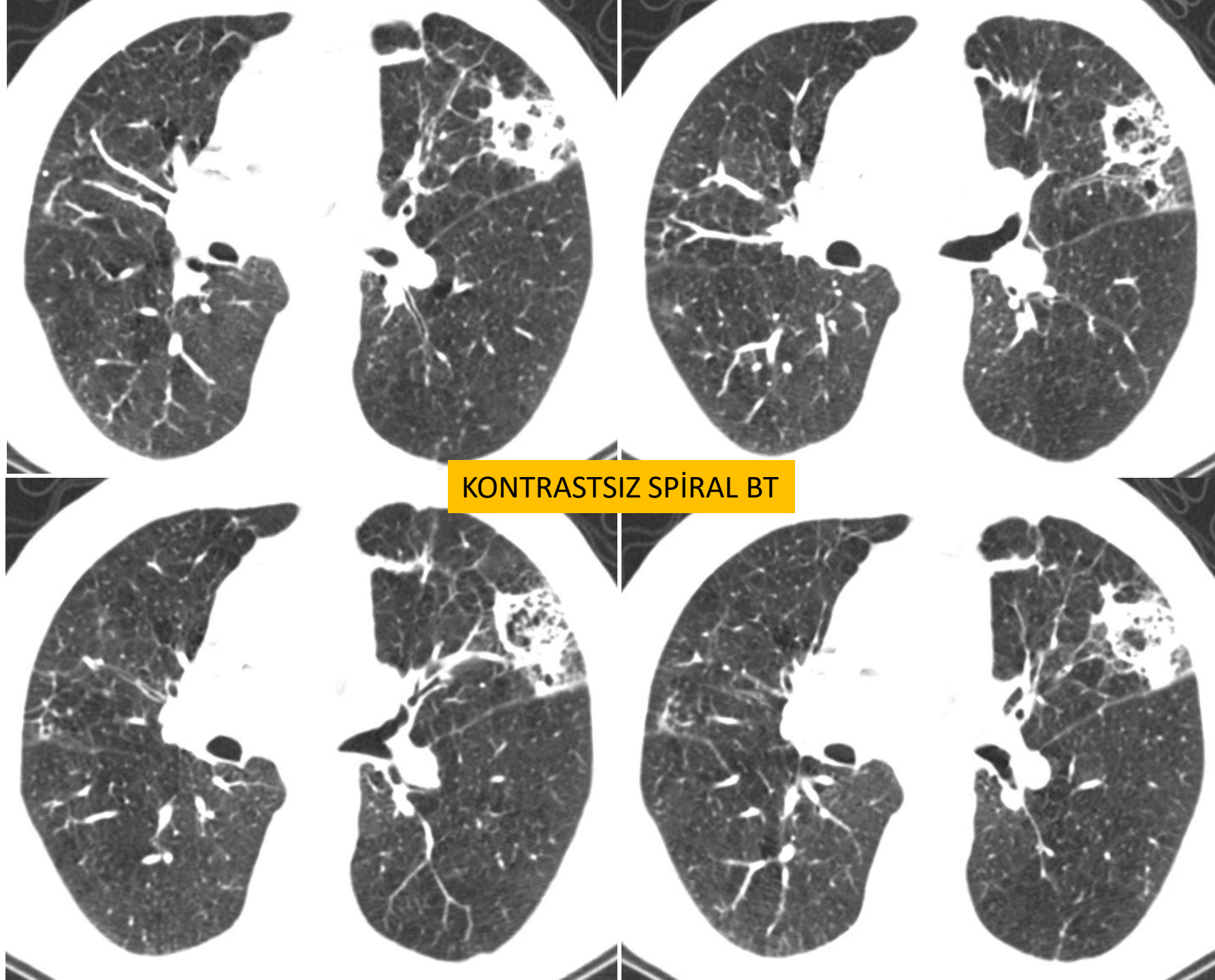


45 yaşında erkek hasta
Öksürük ve nefes darlığı

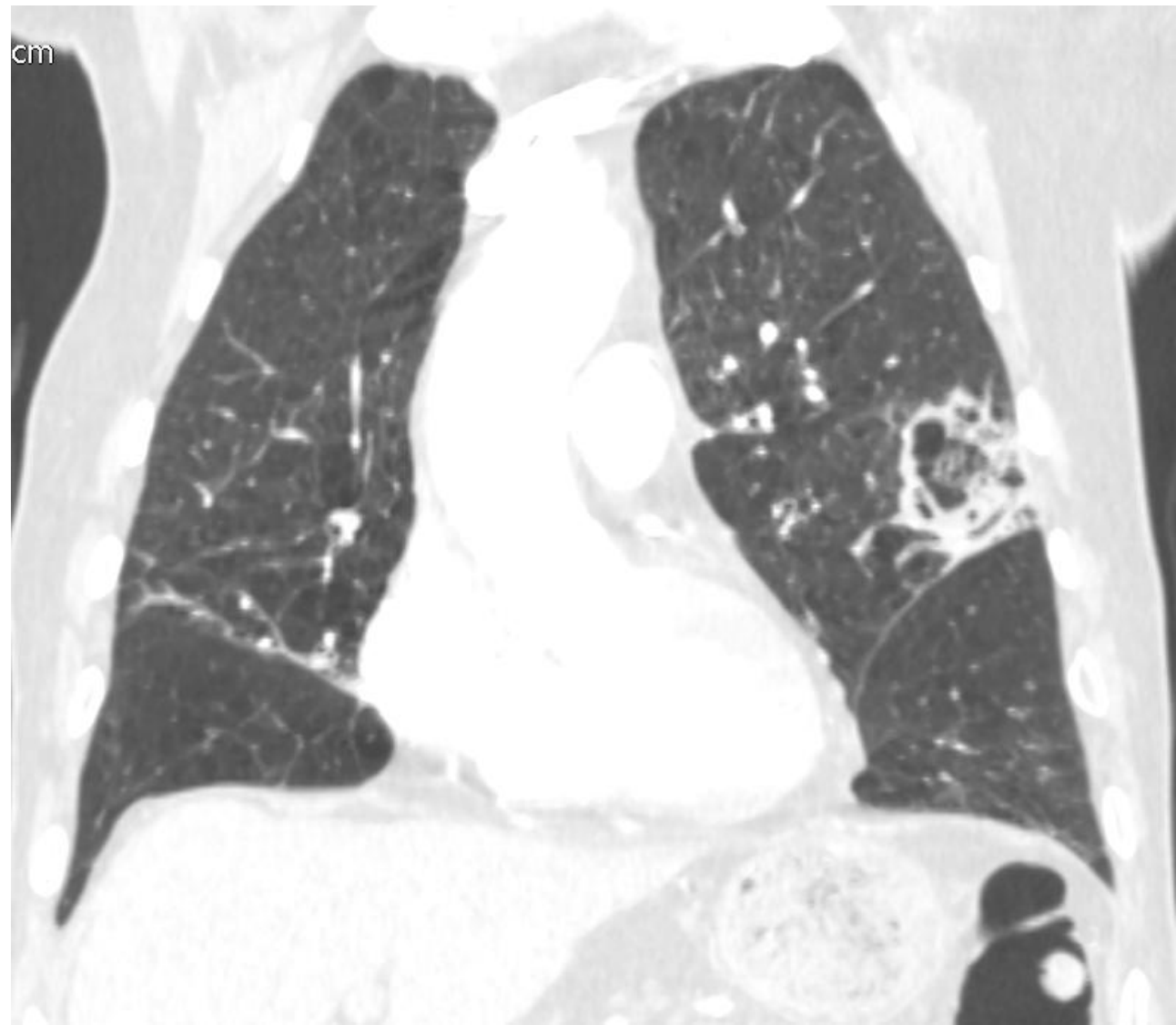
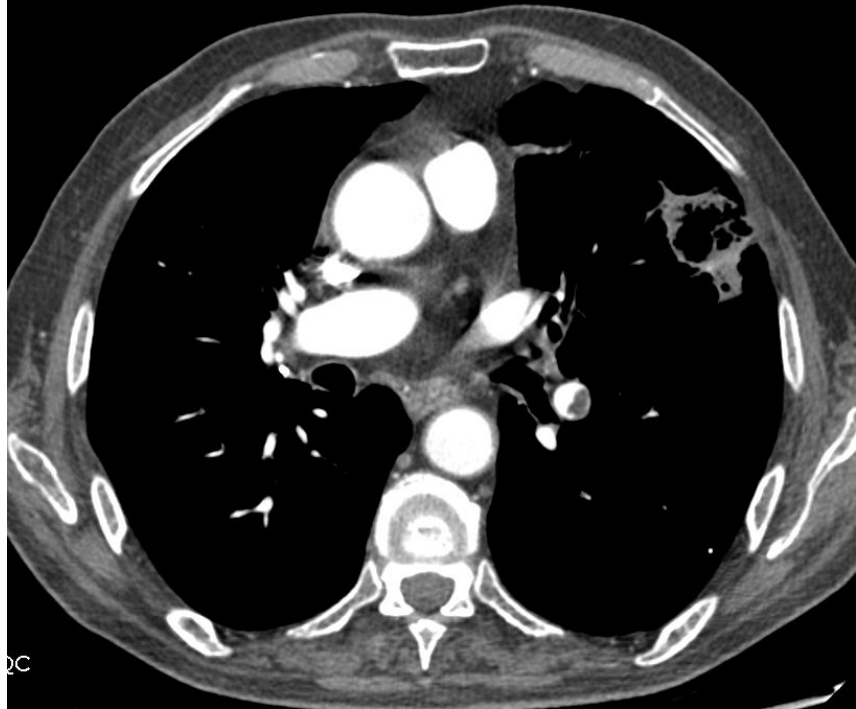
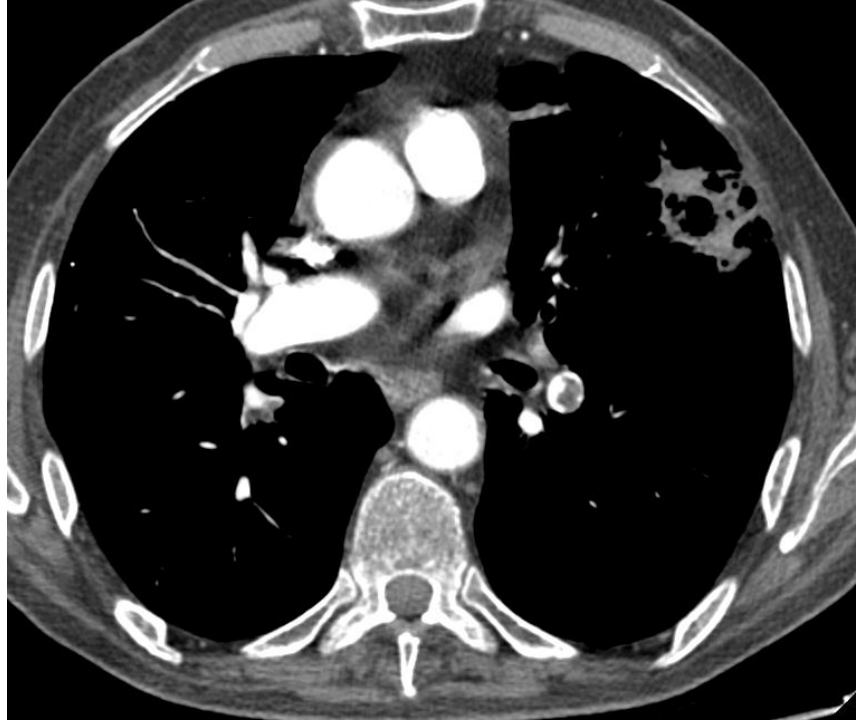
Şimdi ne isteyelim ?

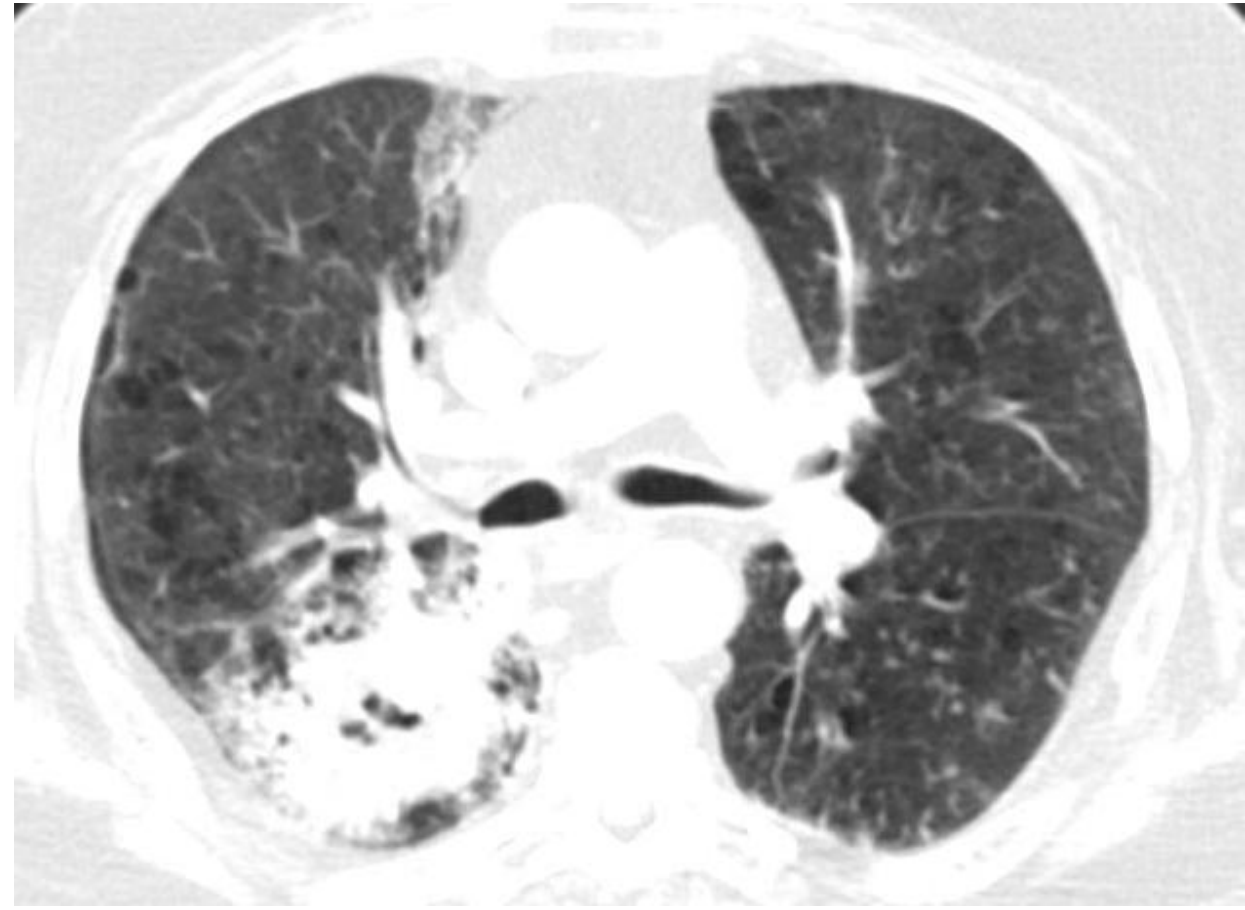
BT

- YRBT ?
- Kontrastsız spiral BT ?
- Anjio BT ?
- Dinamik BT ?
- Düşük doz BT ?

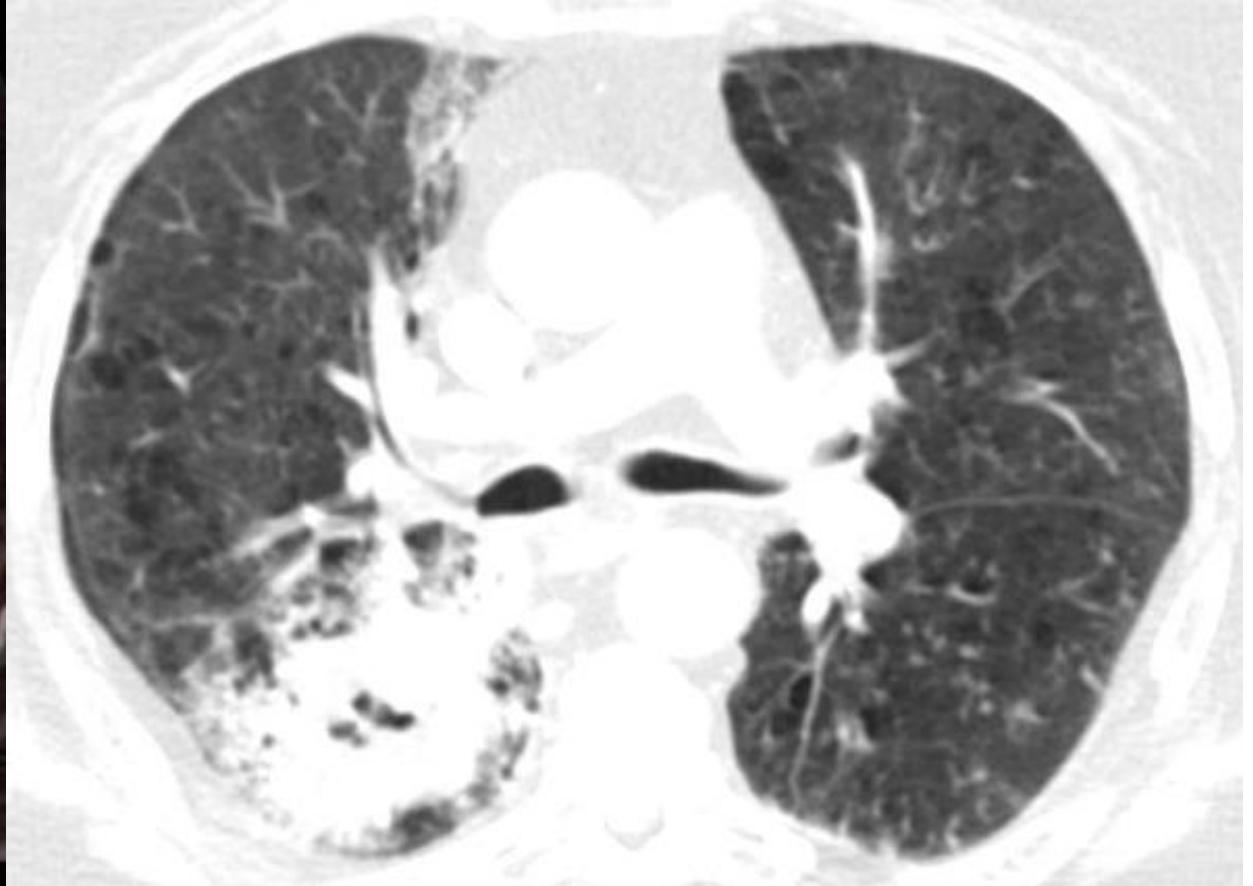
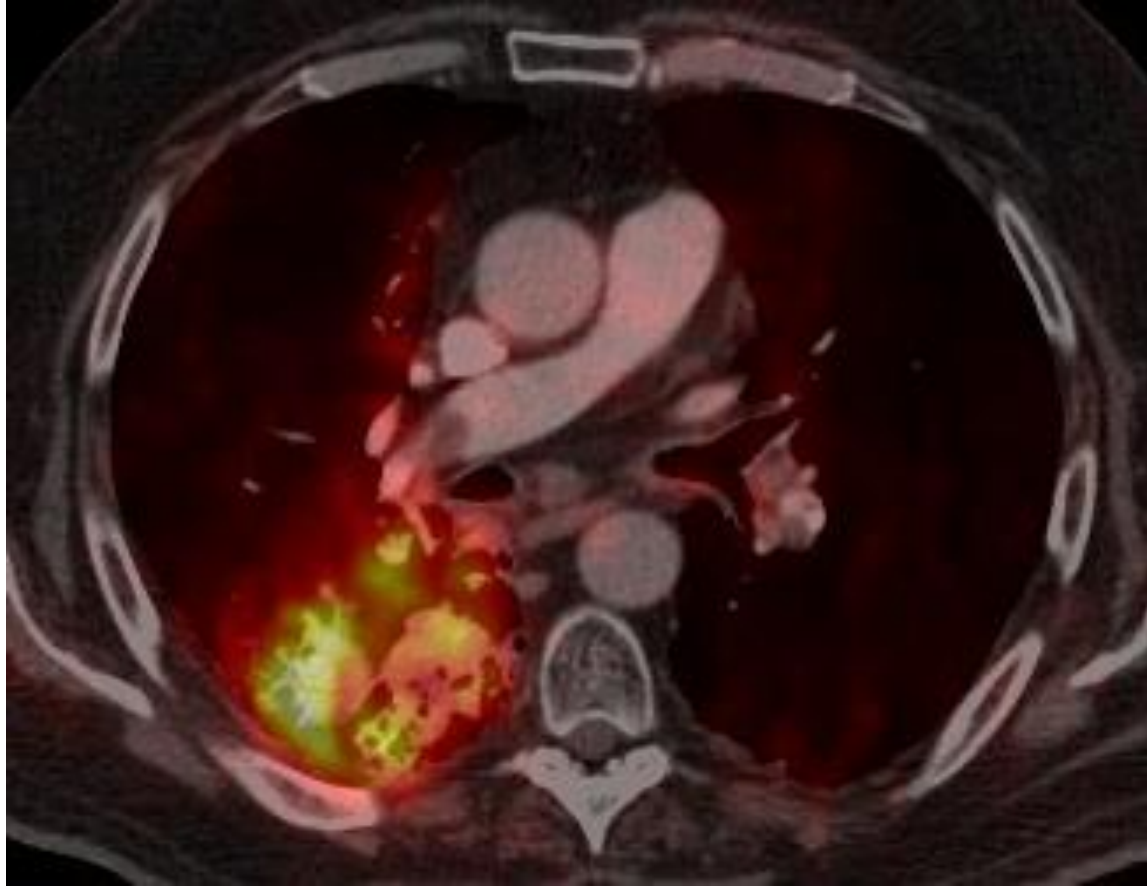


KONTRASTSIZ SPİRAL BT

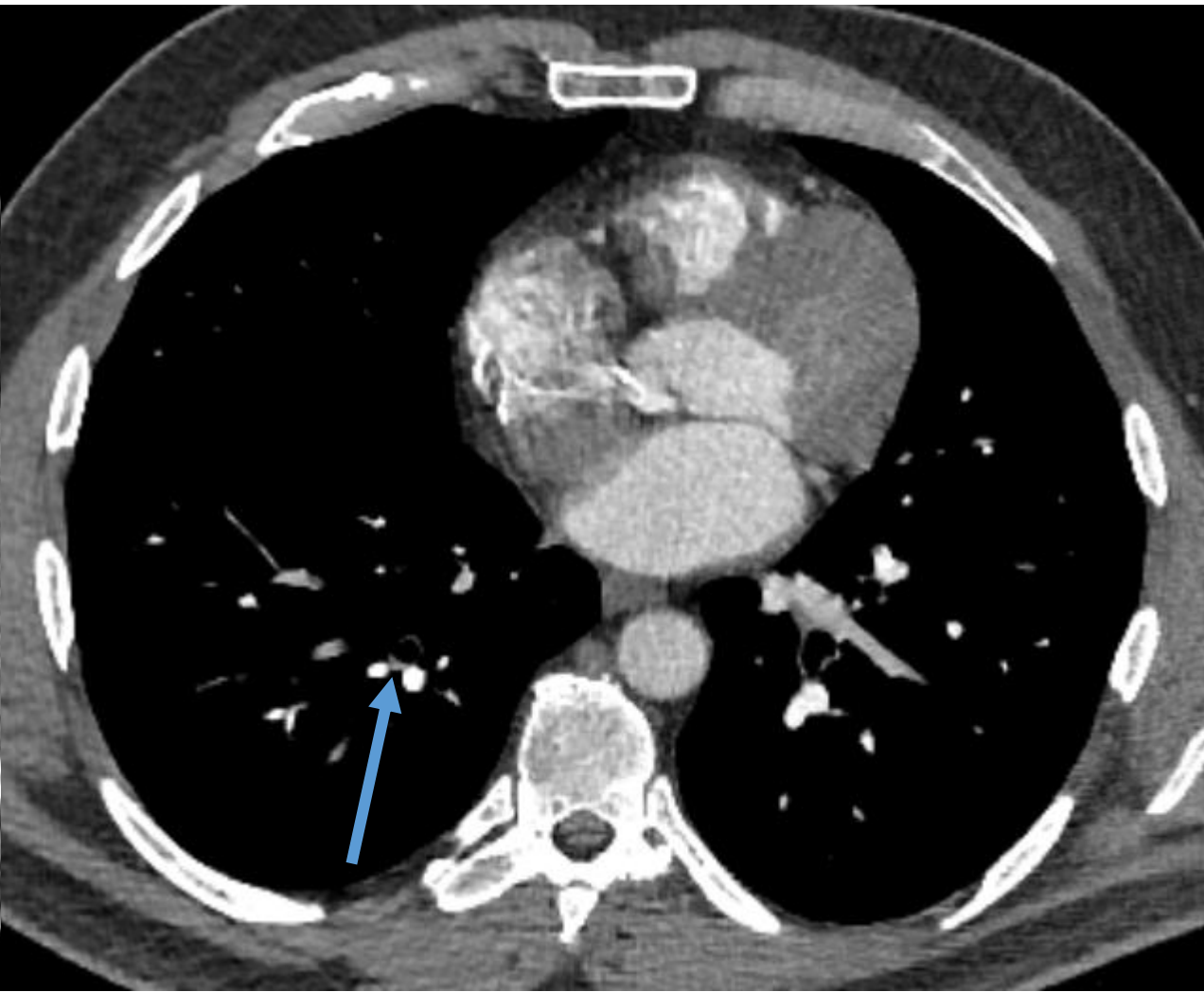
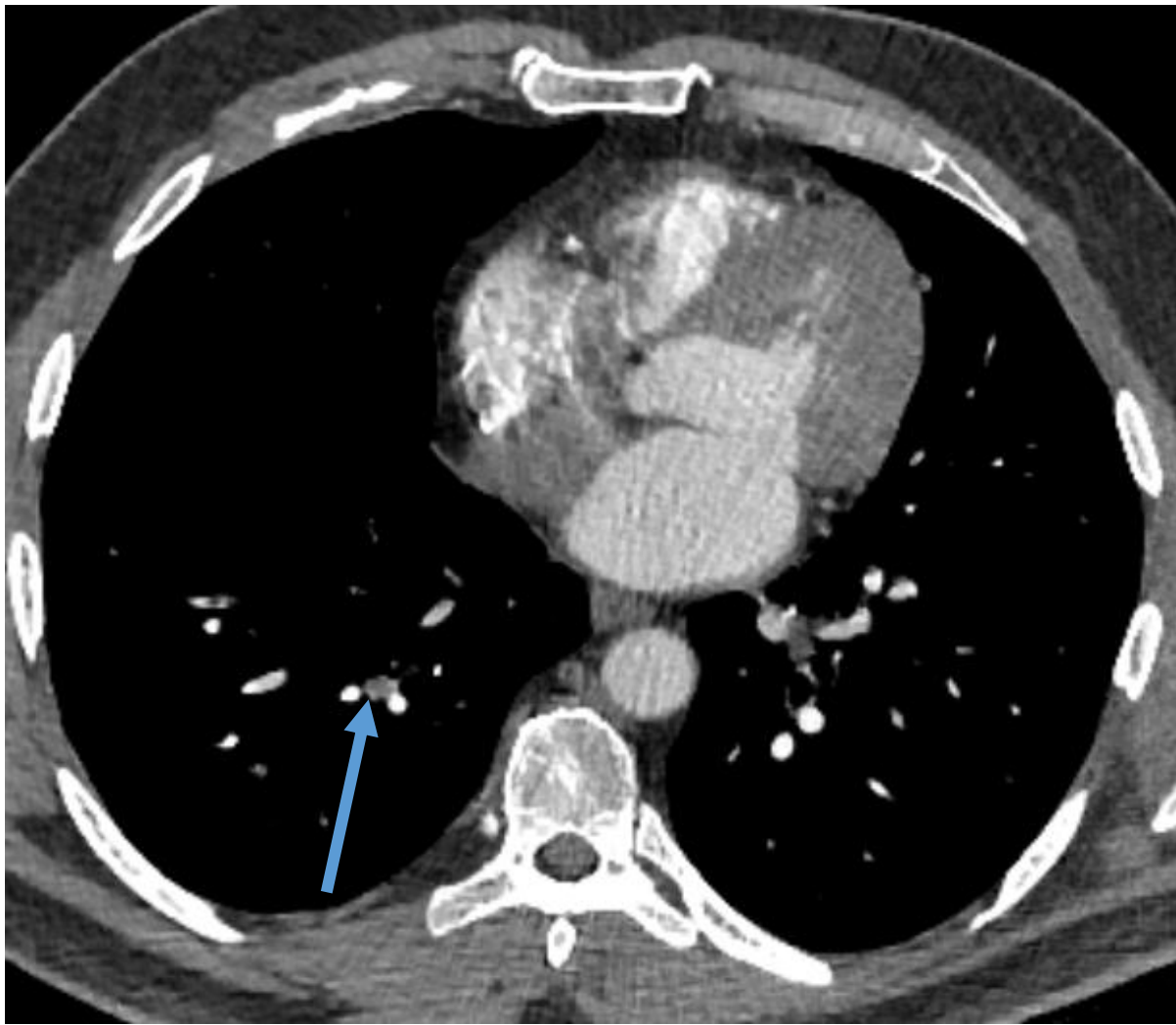


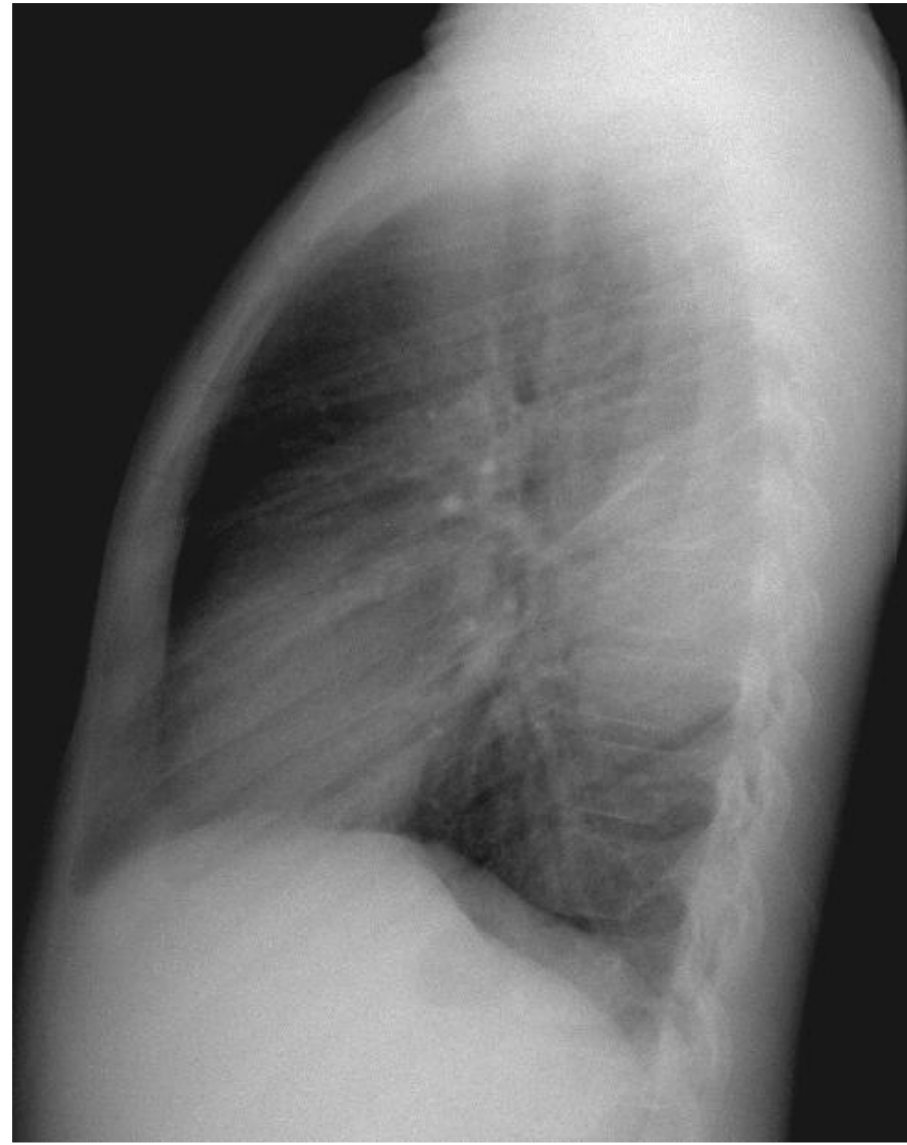
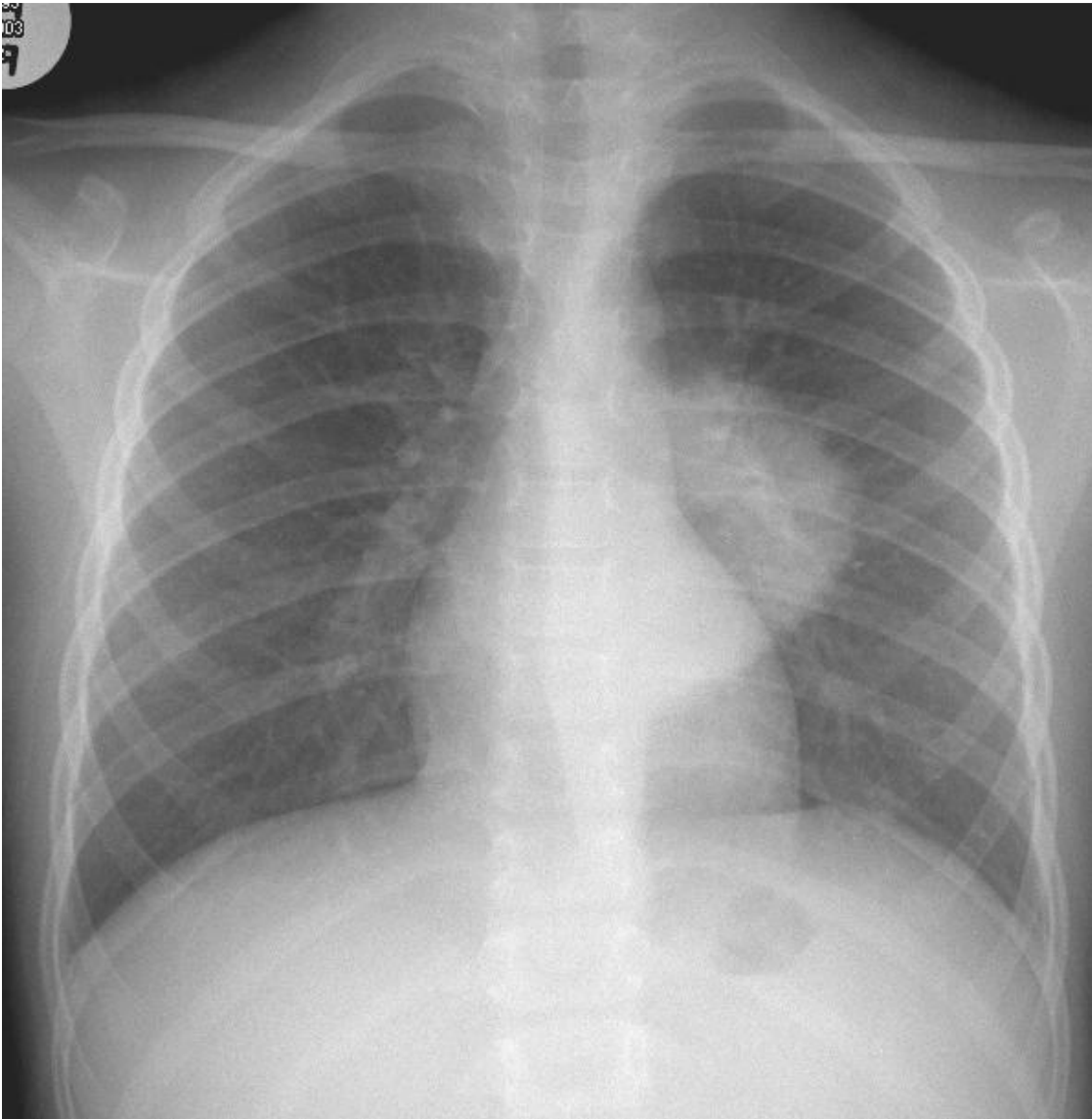


Geçmeyen konsolidasyon nedeniyle Akciğer malignitesi düşünülerek PET/BT istenmiş

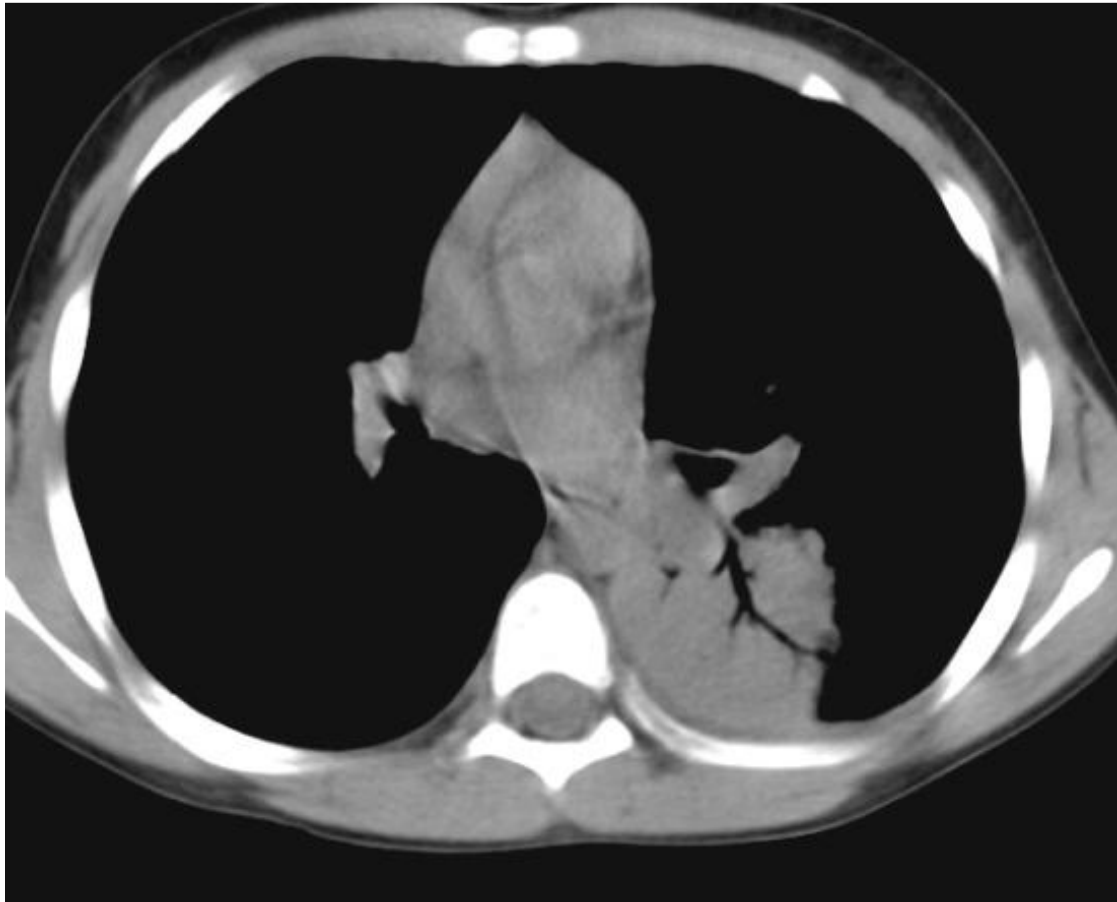


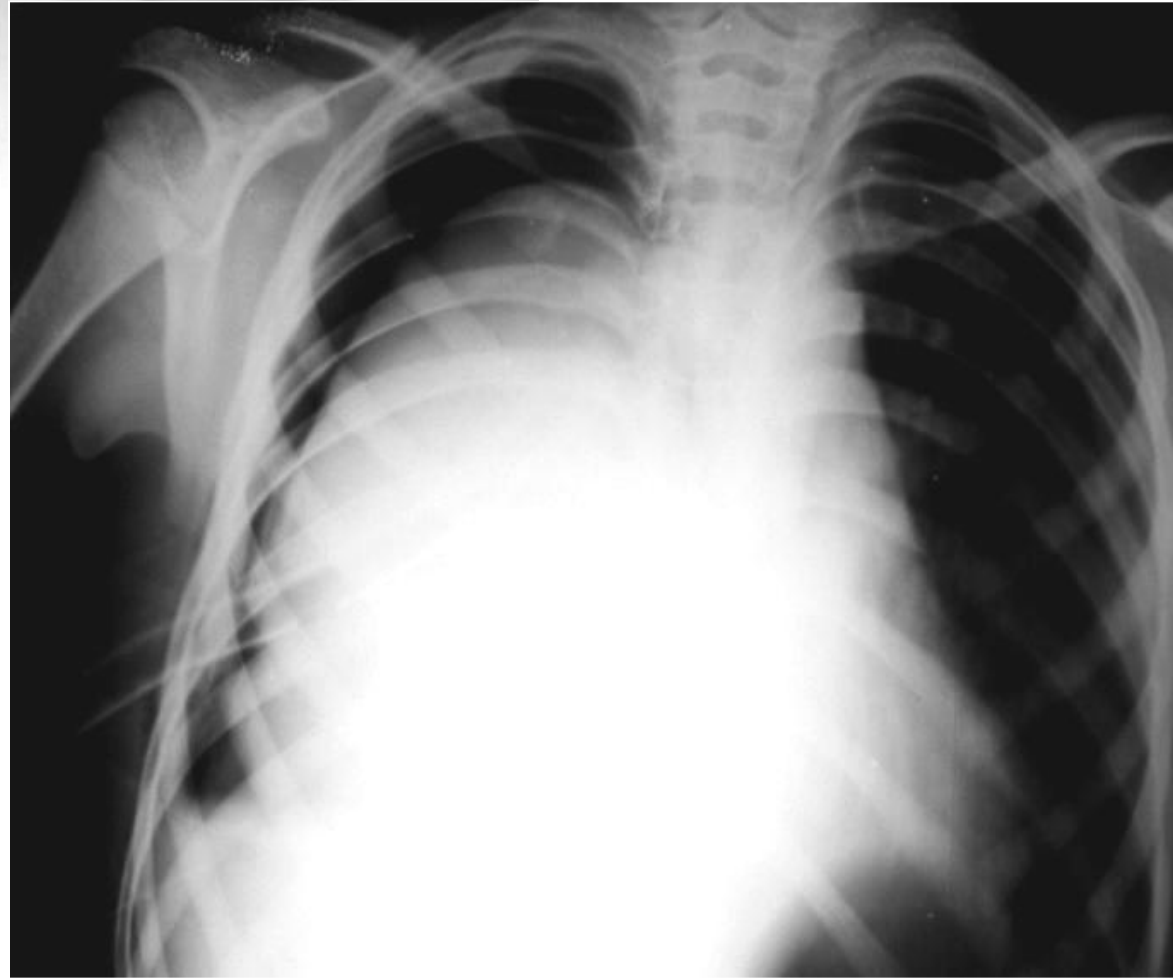
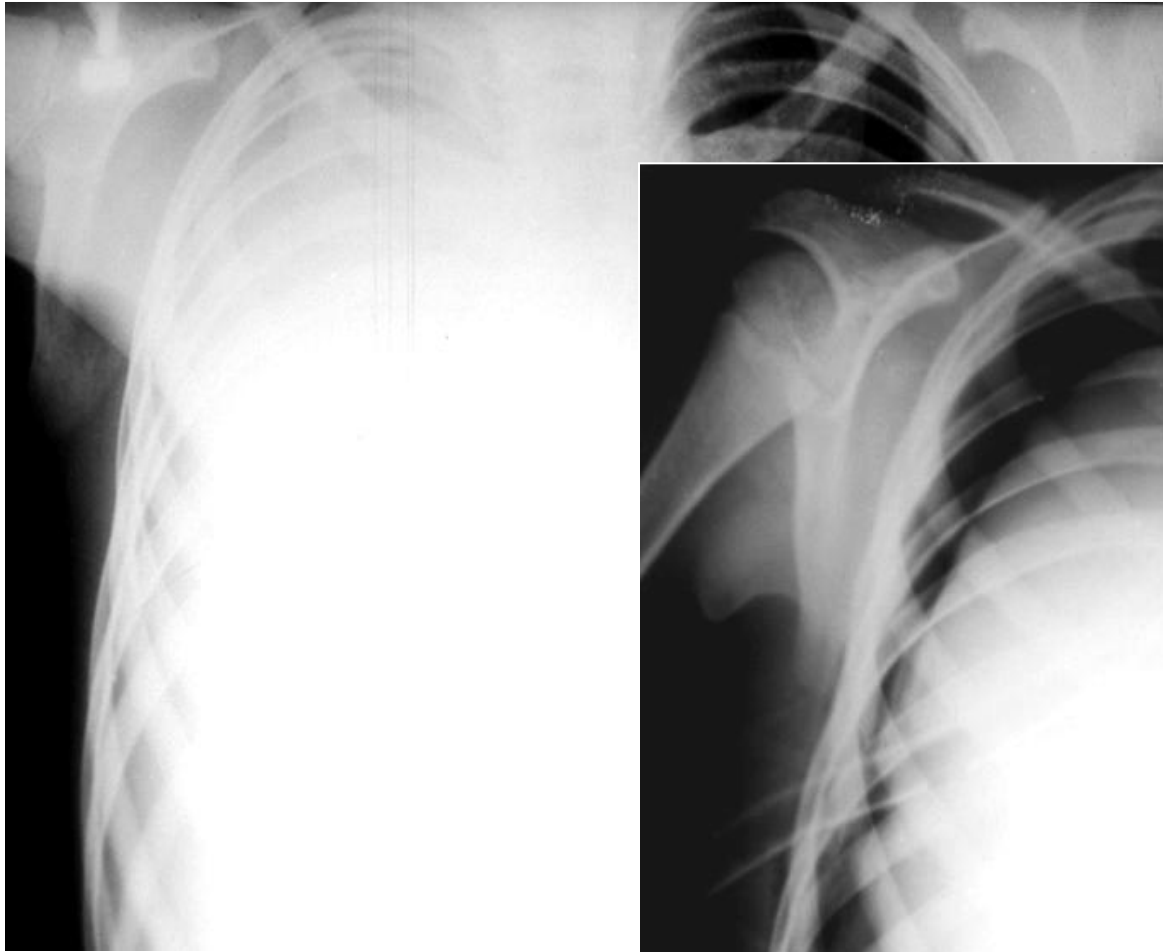


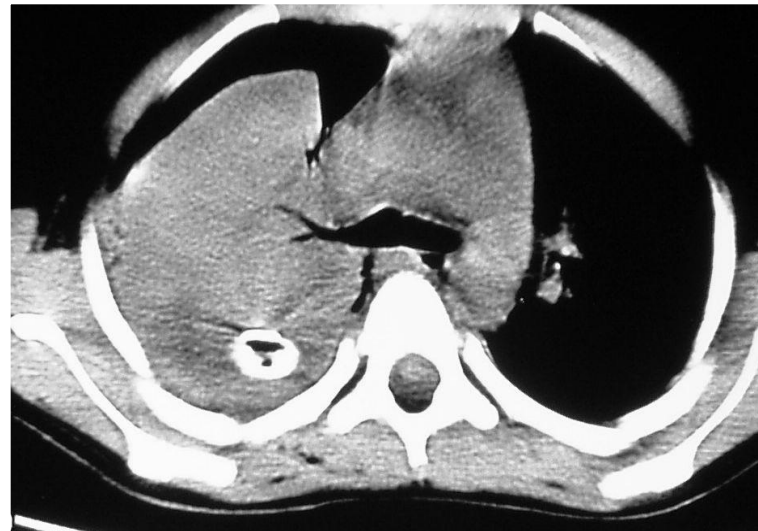


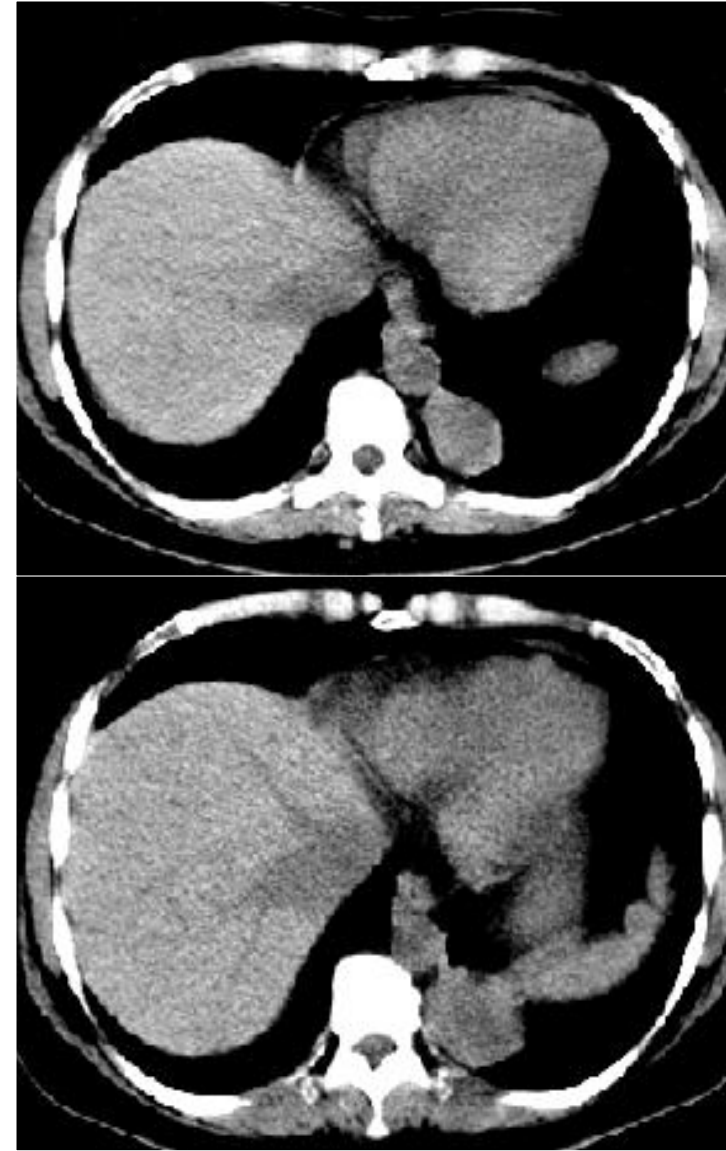
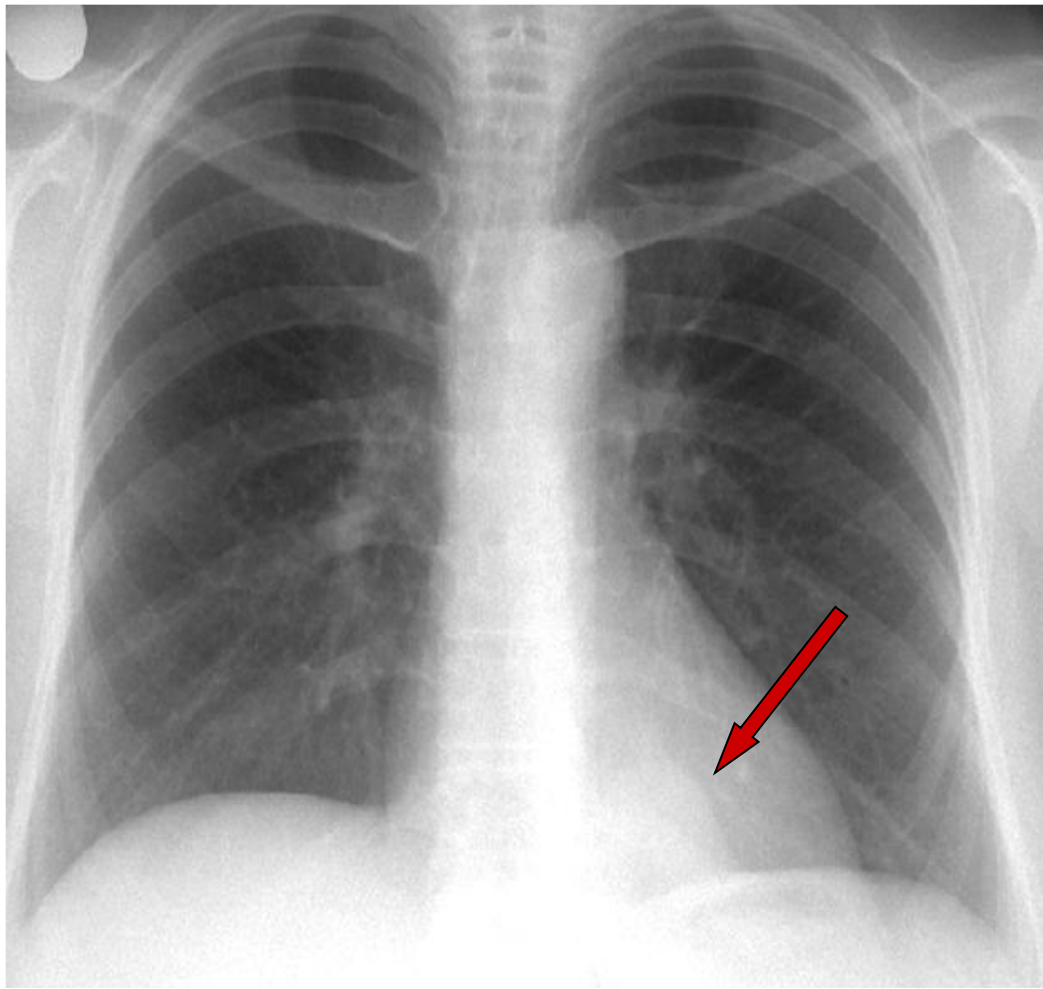


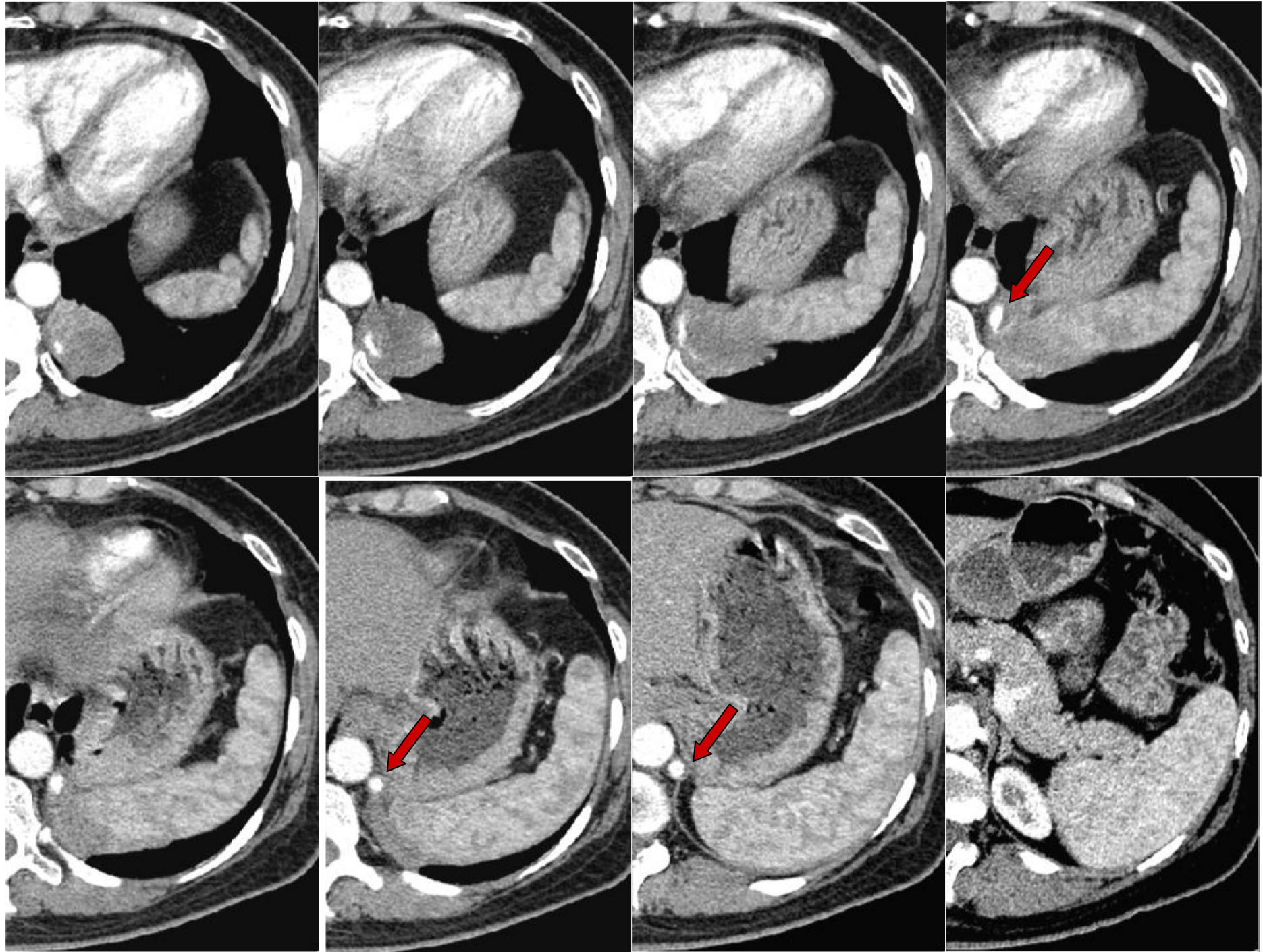
14 yaşında çocuk, ateş ve öksürük





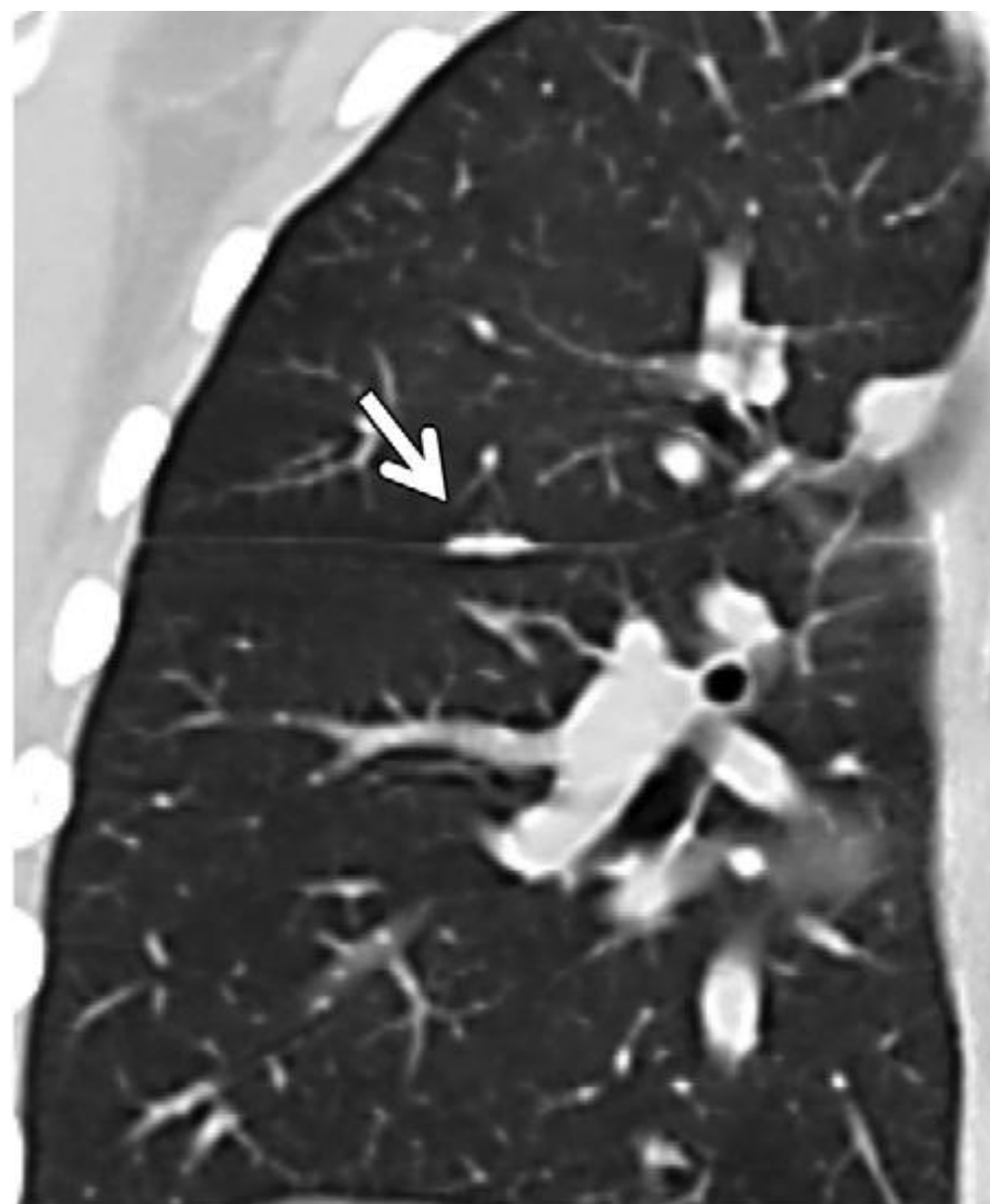








- TAKİP Mİ?
- OPERASYON MU ?

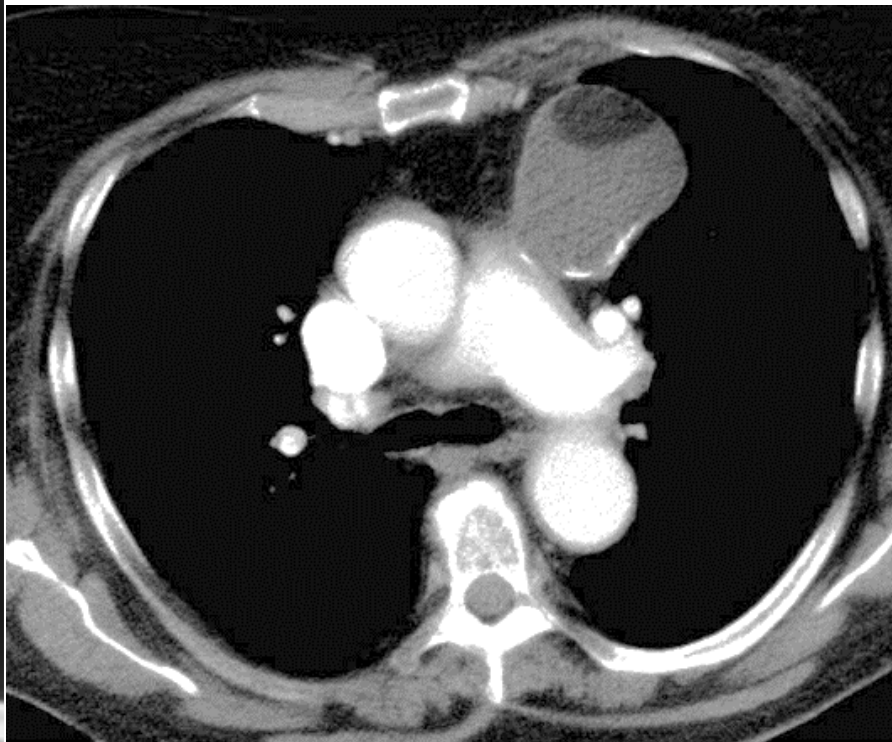
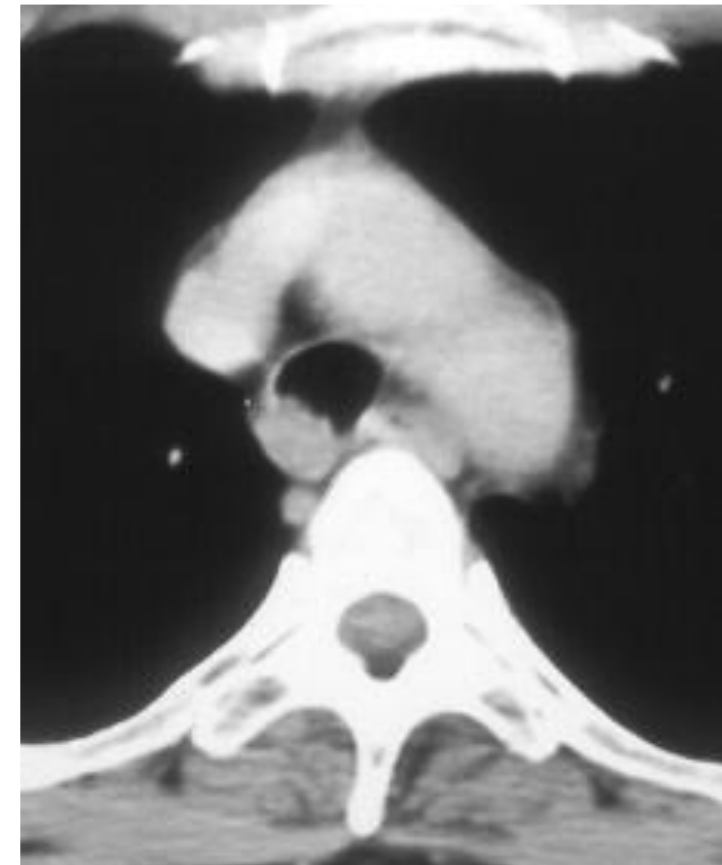


Toraks BT deęerlendirmeyi nasıl bir sıra içinde yapalım ?

- Hastanın adı soyadı doğru mu?
- Tetkik nasıl çekilmiş? Kontrastlı mı? Kesit kalınlığı nedir?
- Görüntülerin DICOM formatında saklanması gerekli
- Bu nedenle DICOM viewer ile görüntüler açılmalı (Radiant dicom viewer – ücretsiz)
- Görüntüler bu formatta açılmış ise :

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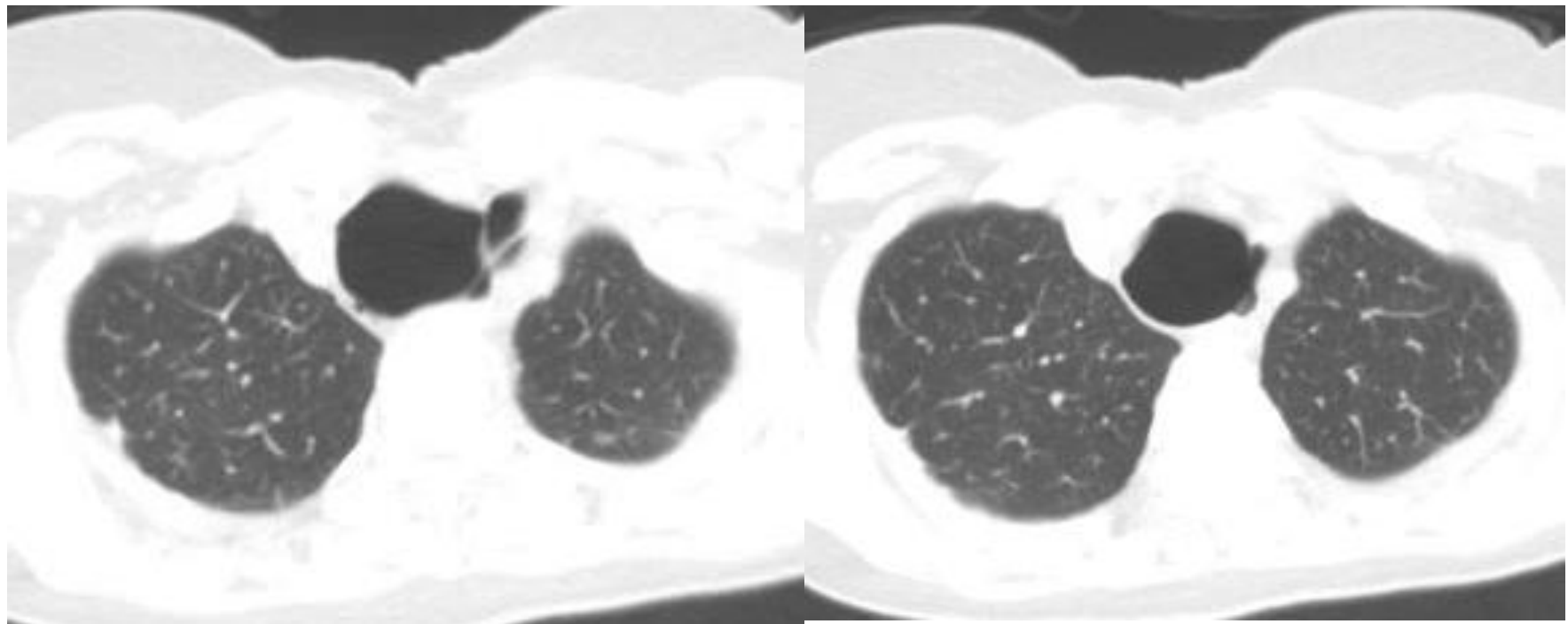
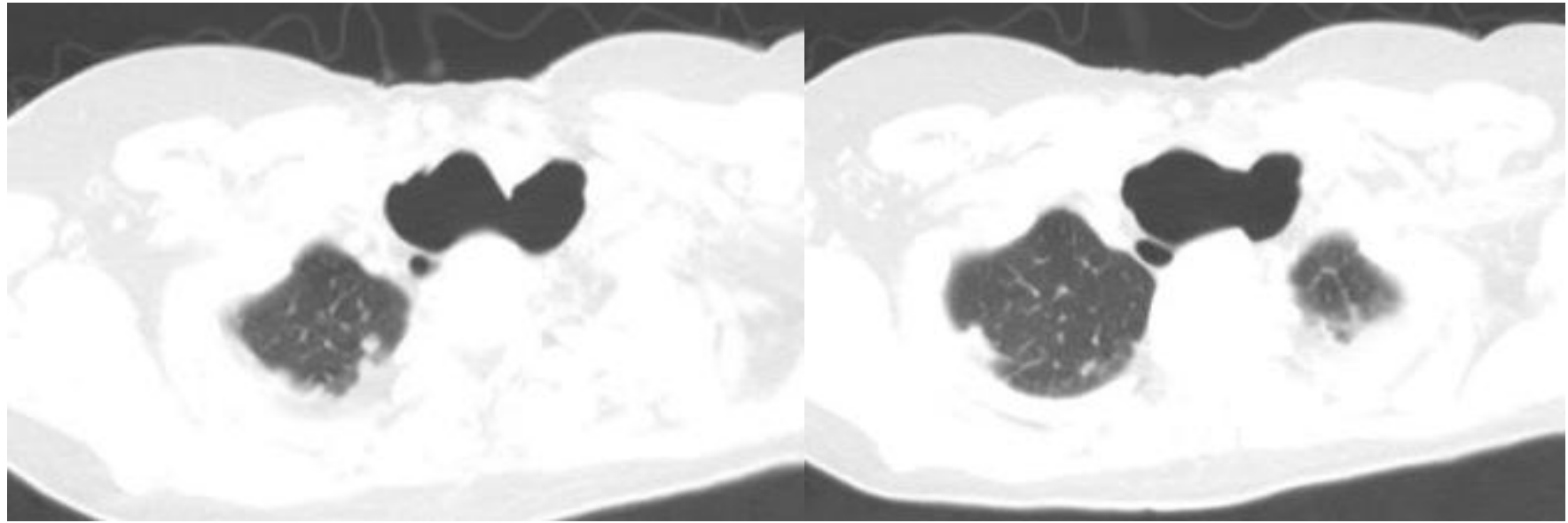
- **Mediasten penceresi:** Tiroid bezi, timüs loju, ana vasküler yapılar, kalp, özefagus, trakea, ana bronşlar, hiluslar, lenf bezleri tek tek incelenmelidir.
- Mediasten penceresinde parankim alanları damar yapıları hariç tamamen siyah olmalıdır. Parankimde görülen lezyon var mı ? (kalsifik, yumuşak doku dansitesi vb ?)
- Kemik yapılar ve komşuluęundaki yumuşak dokular (vertebra, kosta, aksilla, supraklavikuler bölge vb)
- Mevcut lezyon varlığında dansitesi, boyutu, lokalizasyonu, komşu yapılarla ilişkisi deęerlendirilir.

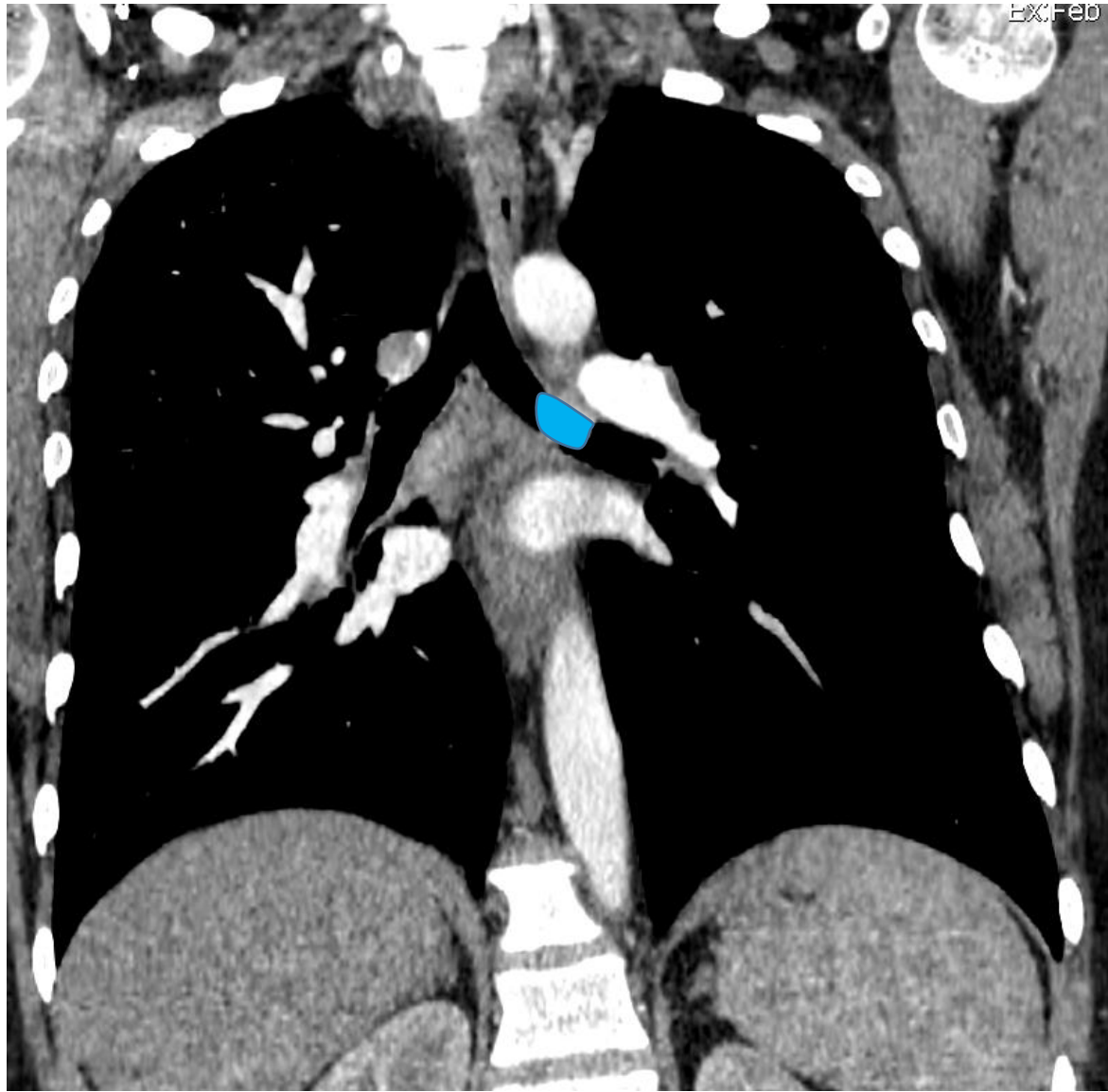




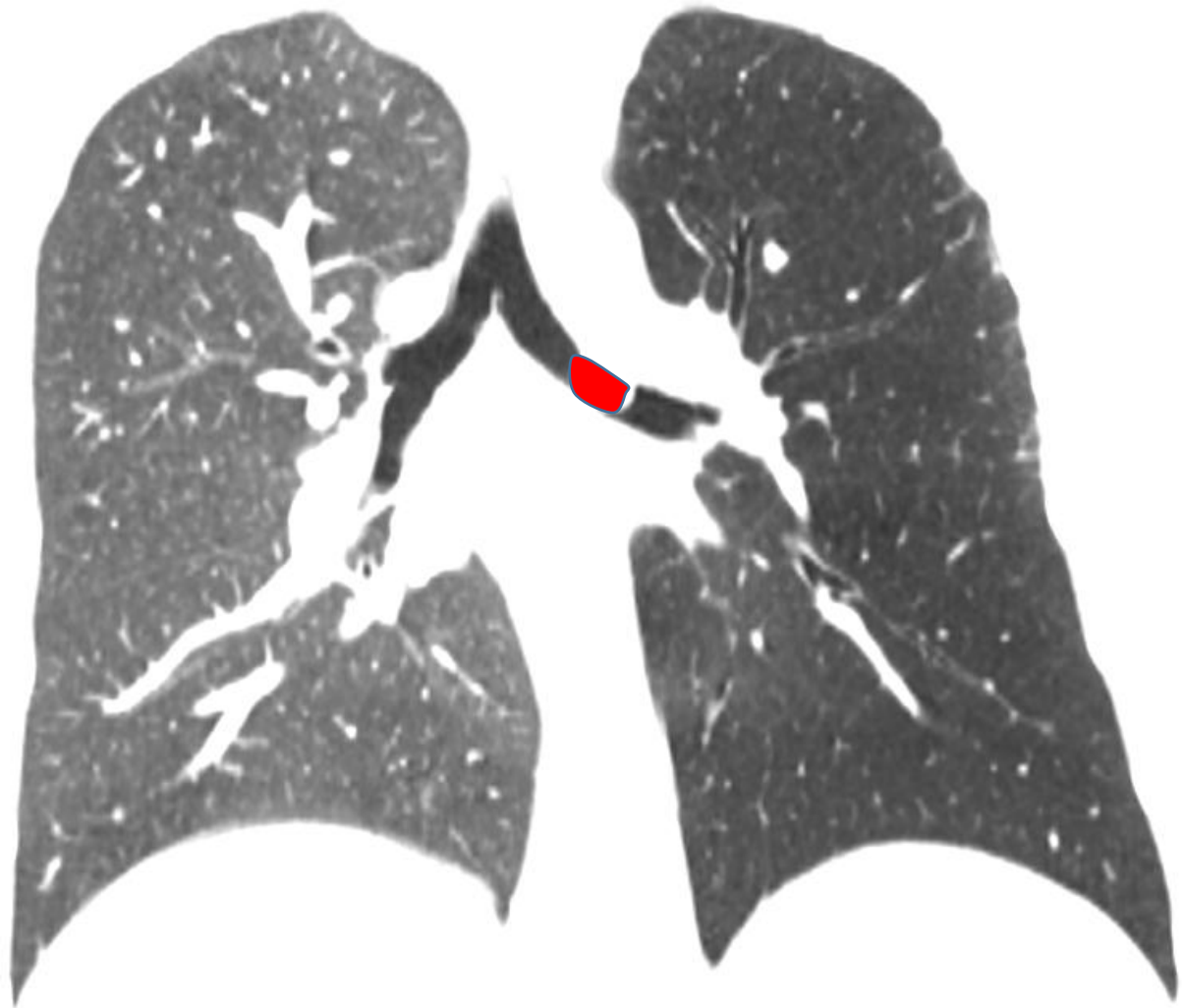
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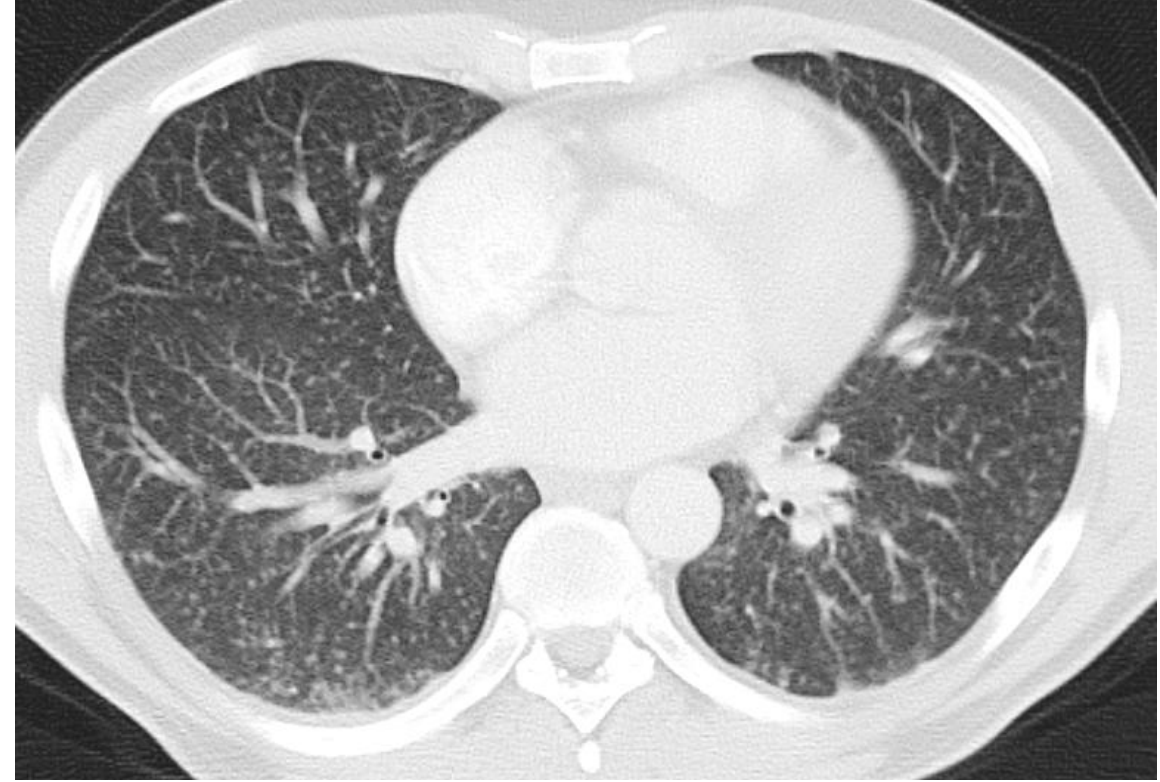
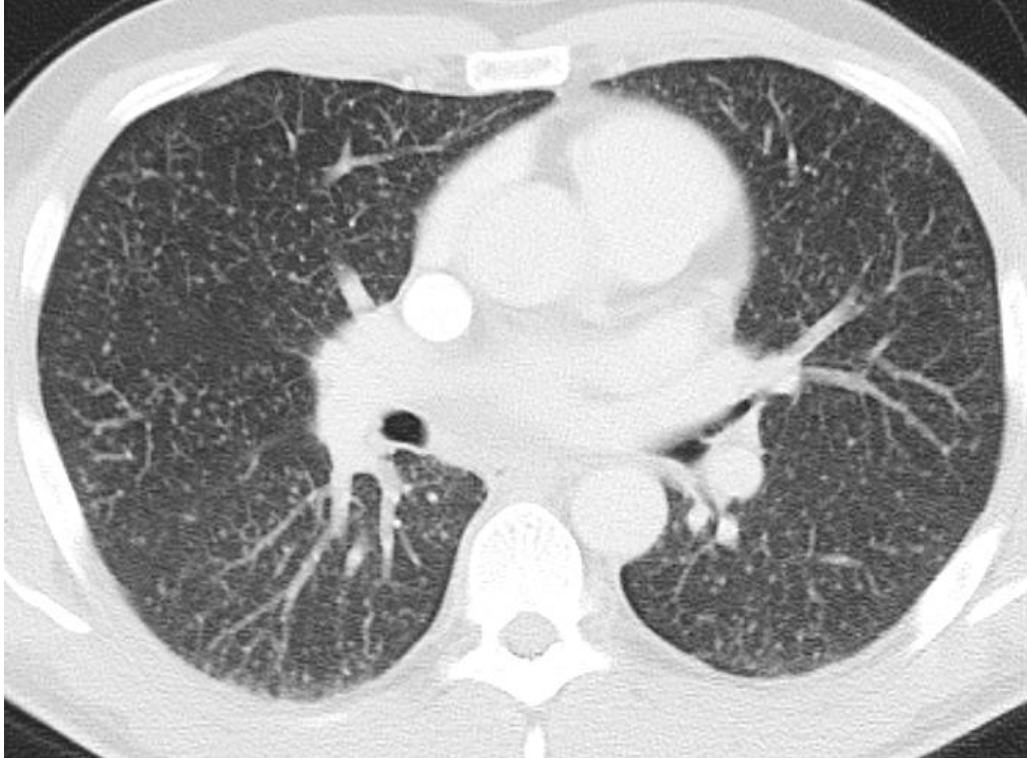
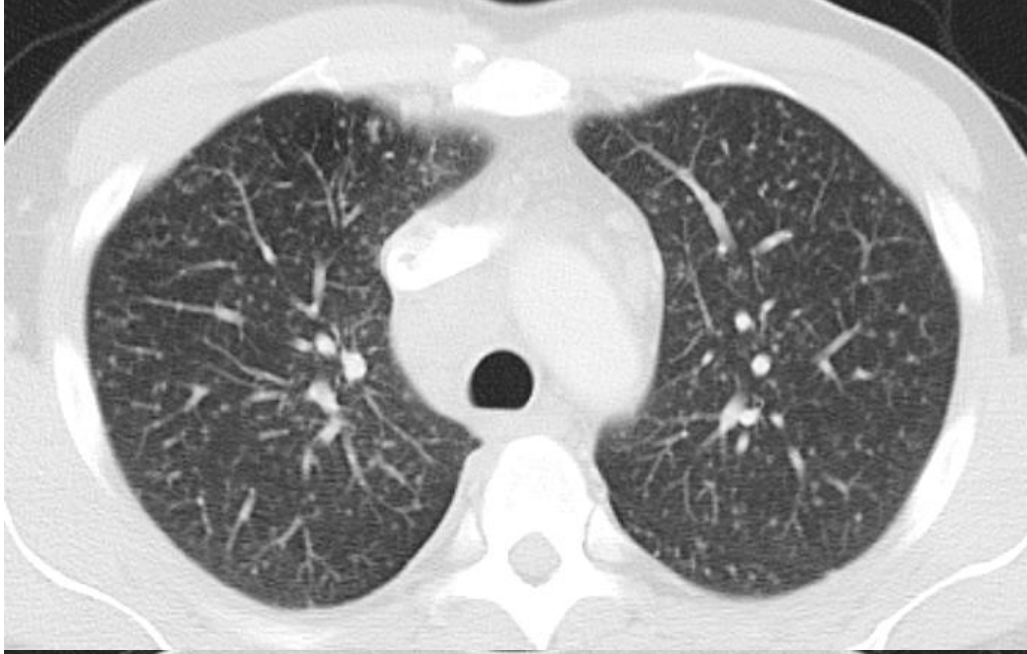
- **Parankim penceresi:** Trakea ve ana bronşlar ve segmental-subsegmental bronşlar tek tek incelenir.
- Her iki akcięerin havalanması- vaskülaritesi, fissurler
- Mevcut lezyon var ise mediasten penceresindeki görünümüne bakılmalıdır – nodül kalsifik mi değil mi?
- Parankim içi lezyon düşük dansiteli ise (hava ve yağ içerięi ya da buzlu cam şeklinde) mediasten penceresinde genelde görülmez.



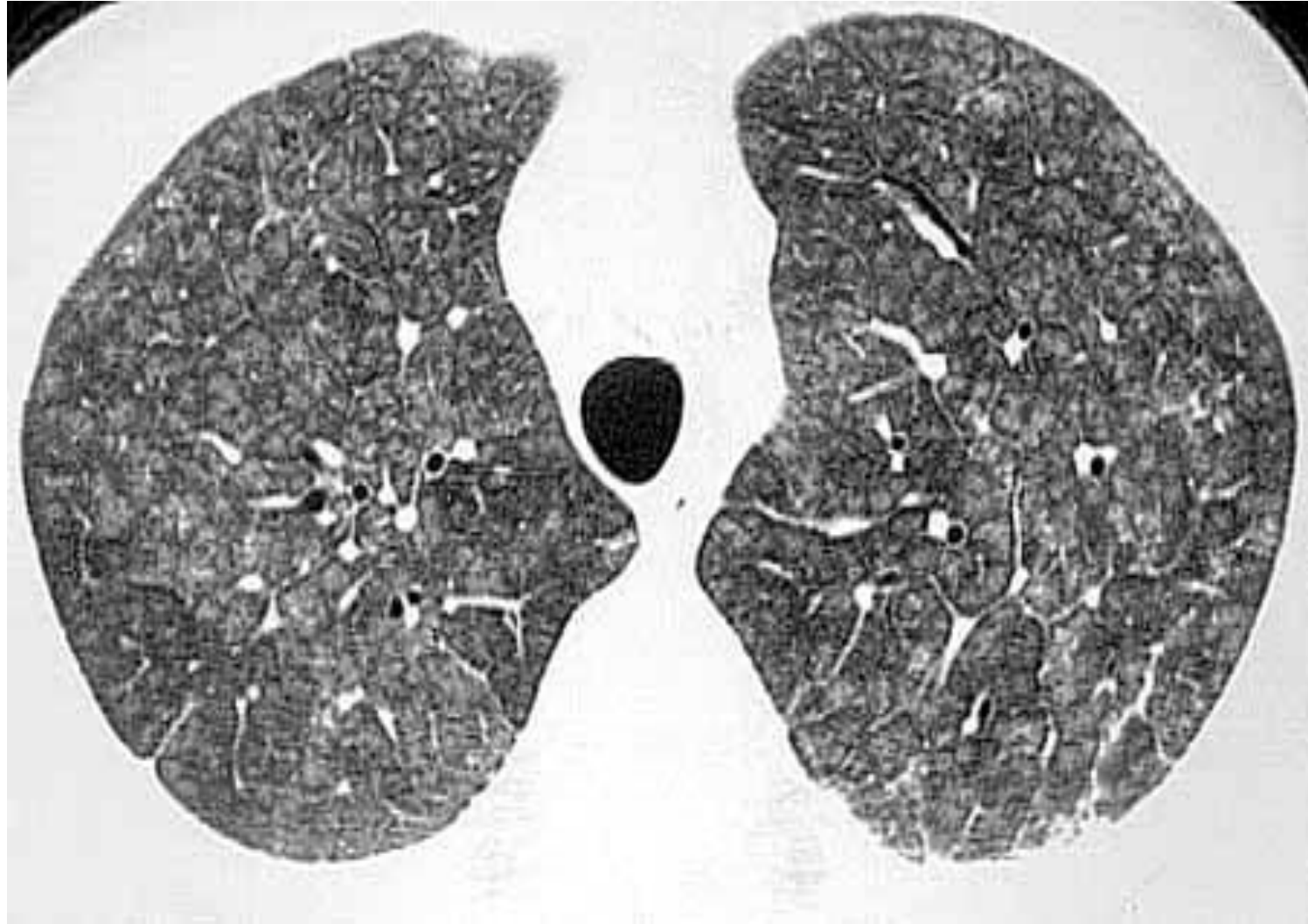


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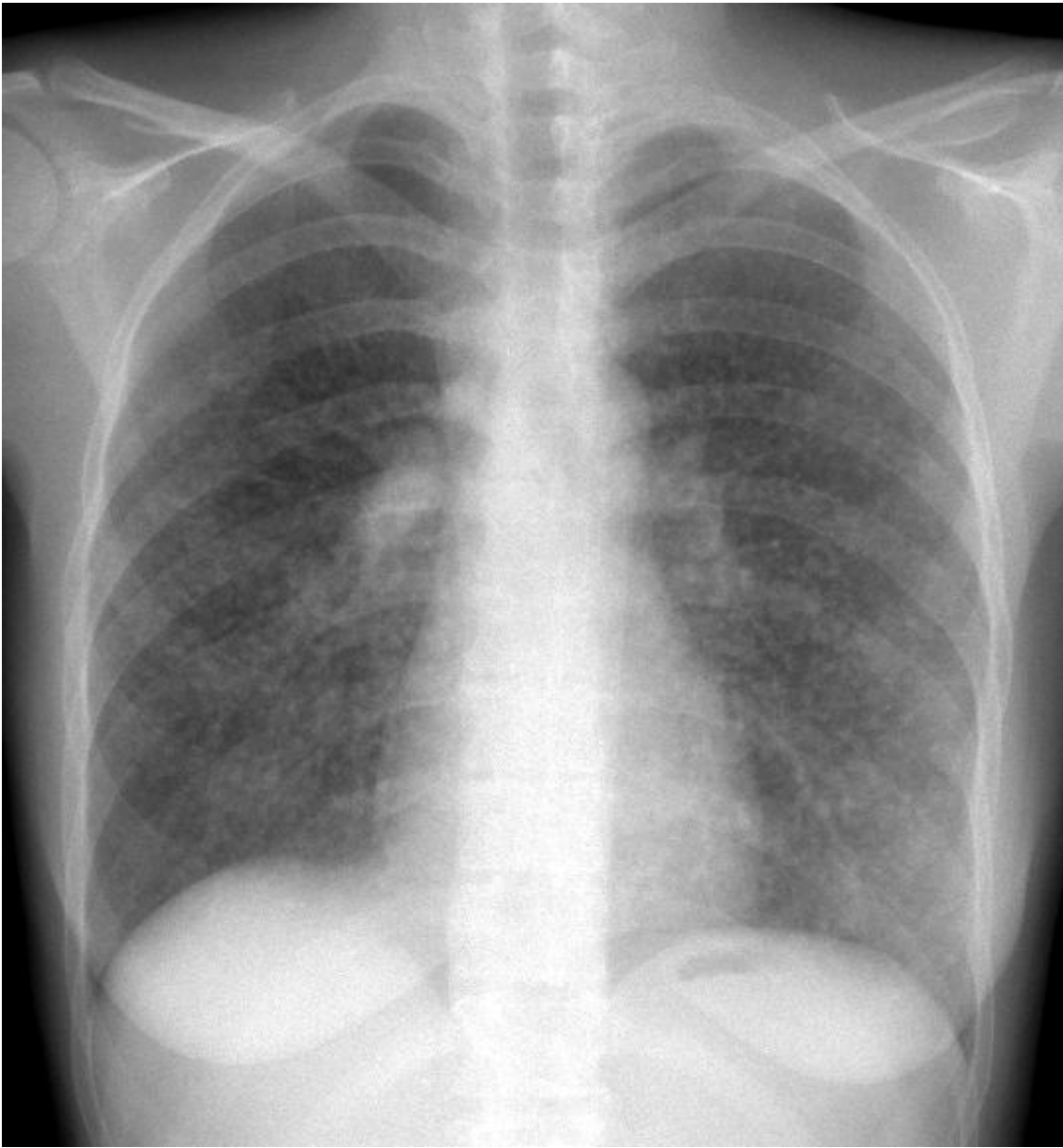




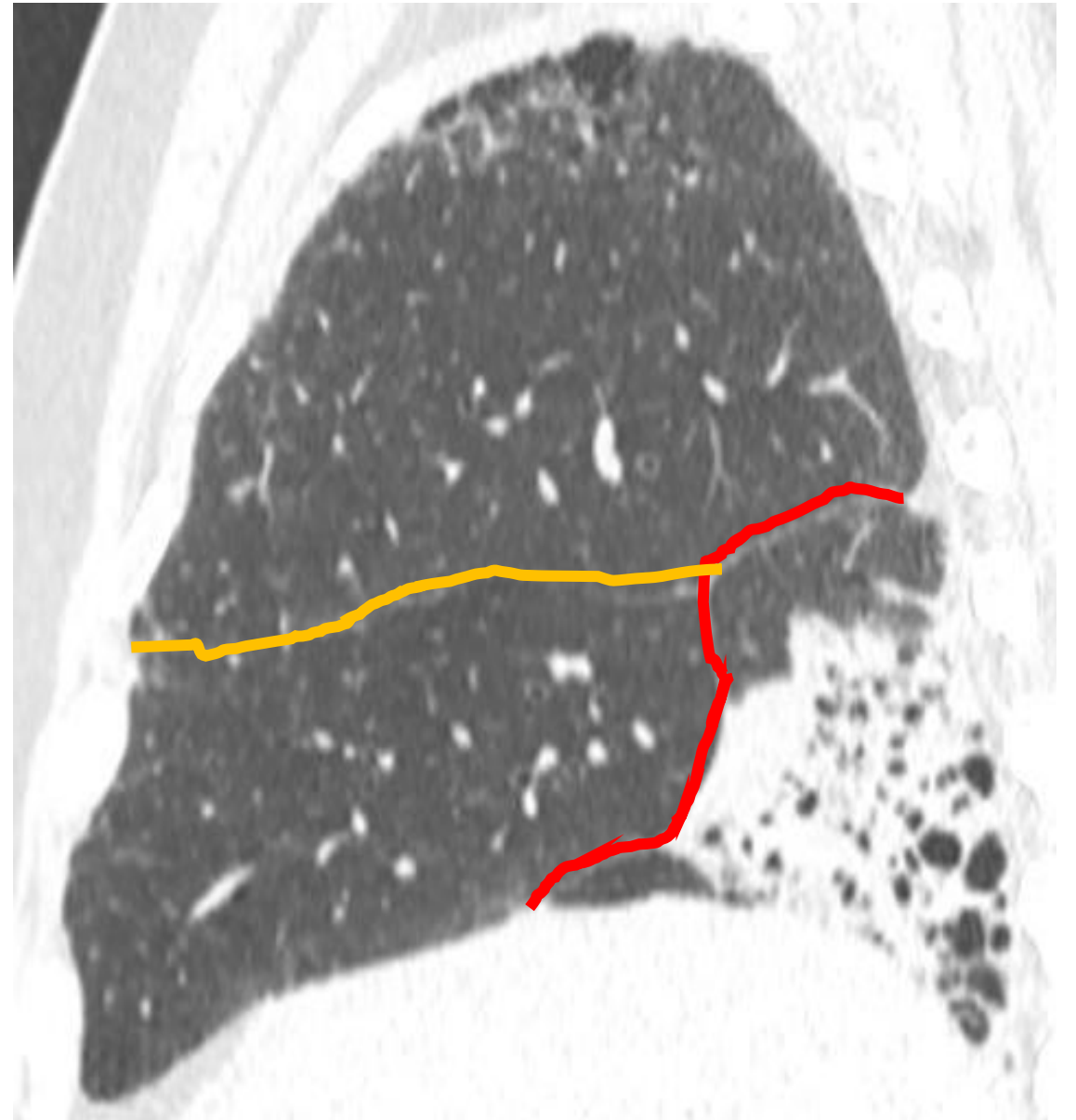
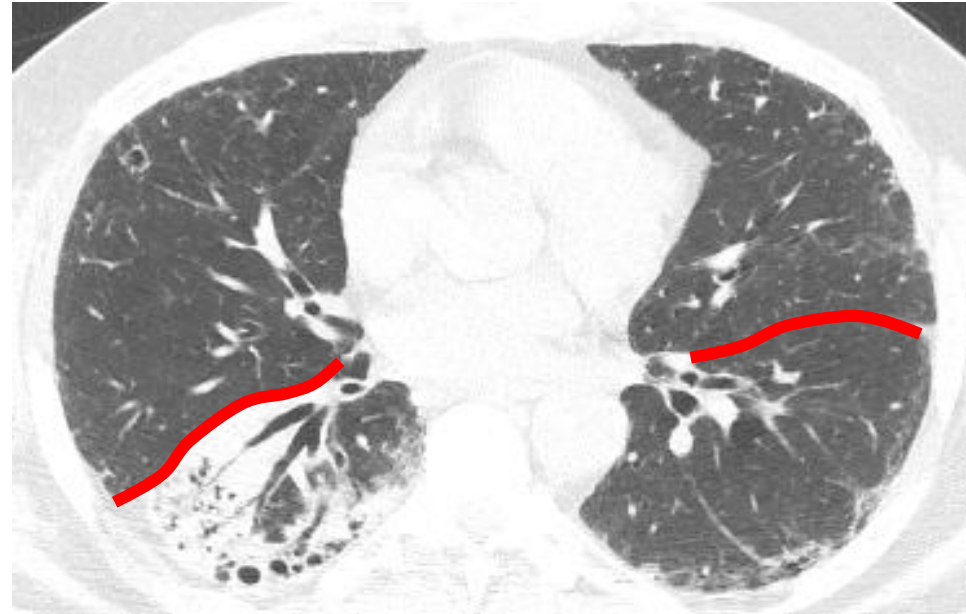
Miliyer tüberküloz



Hipersensitivite pnömonisi



Akciğer kanseri

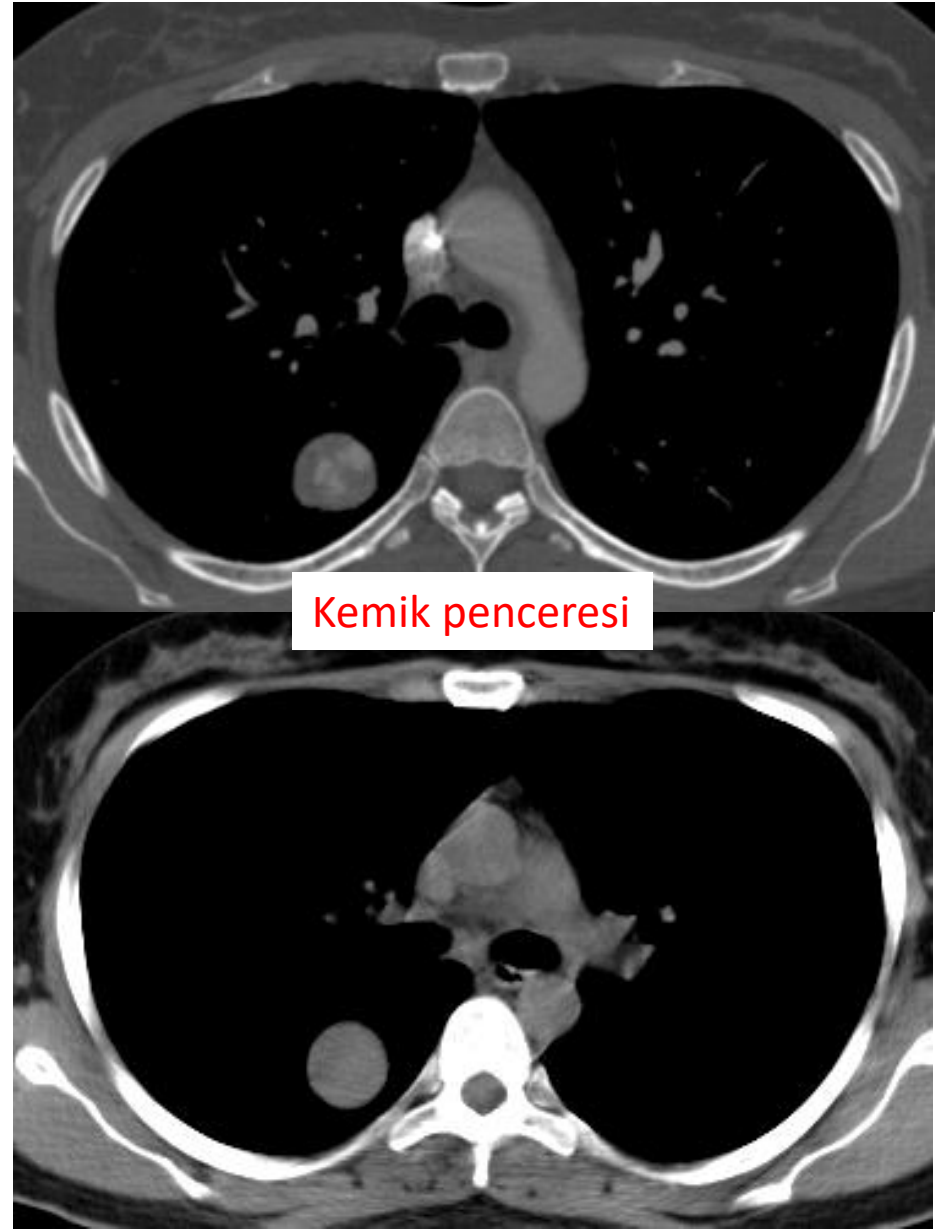


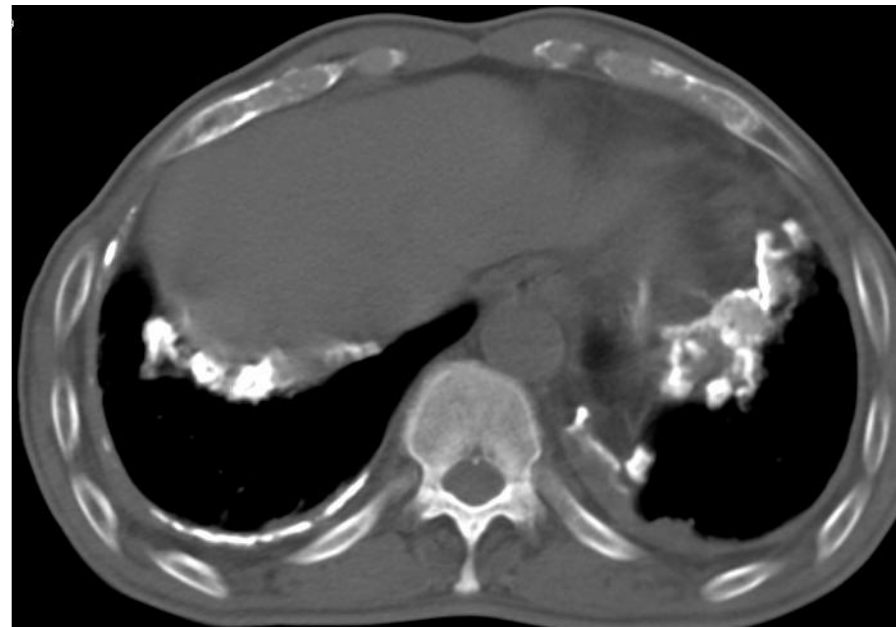
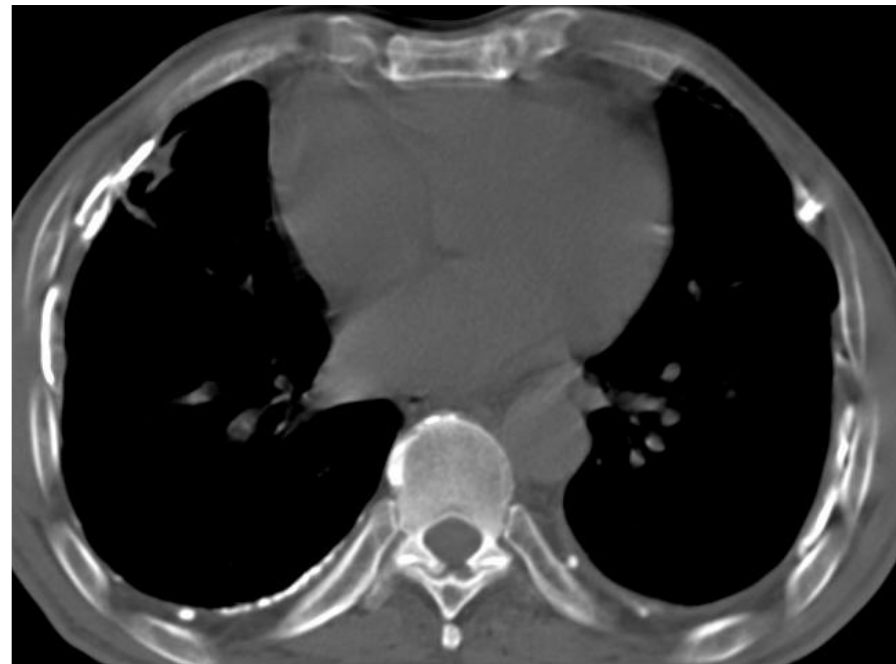
Toraks BT Deęerlendirme:

- **Kemik penceresi:** Bu pencere ile tüm kemik yapılar yeniden deęerlendirilir.
- Kalsifikasyonlar, kırık, metastaz, kitlenin kemięe uzanımı gibi faktörler deęerlendirilir.
- Bazen kontrast madde kalsifikasyon gibi bazen de tersi bizi yanıltabilir.Kemik penceresinde bakmak bu yanılgıları azaltır.



Kontrast mı ? Kalsifikasyon mu?







Chest CT Signs in Pulmonary Disease A Pictorial Review

Shine Raju, MD; Subha Ghosh, MD; and Atul C. Mehta, MD, FCCP

Chest CT is one of the most important imaging modalities available to a pulmonologist. The advent of high-resolution CT scanning of the chest has led to its increasing use. Although chest radiographs are still useful as an initial test, their utility is limited in the diagnosis of lung diseases that depend on higher resolution images such as interstitial lung diseases and pulmonary vascular diseases. Several metaphoric chest CT scan signs have been described linking abnormal imaging patterns to lung diseases. Some of these are specific to a disease, whereas others help narrow the differential diagnosis. Recognizing these imaging patterns and CT scan signs are thus vitally important. In the present article, we describe a comprehensive list of the commonly encountered metaphoric chest CT scan signs and their clinical relevance.

CHEST 2017; 151(6):1356-1374

KEY WORDS: CAT scan; chest imaging; CT scan; pulmonary; radiology; review; thoracic

CT imaging of the chest plays a vital role in the diagnosis of various lung diseases. Although pulmonary diseases can vary in clinical presentation, the associated imaging patterns can be grouped into a few distinct patterns. Various metaphoric signs have been described to identify and simplify these patterns. Some of these signs, which have been well described in the imaging literature, are pathognomonic for a disease, whereas others can help narrow the list of differential diagnoses. These signs also help to create a unique association between an imaging pattern and the underlying disease process.

Understanding these imaging findings, and their subsequent pattern recognition, is thus of vital importance to a pulmonologist. The

present review is a pictorial essay of the important chest CT scan signs and the associated pulmonary diseases. Some of these signs have been described in chest radiographs as well as in CT imaging. We have included these signs in this review, having recognized an increasing trend of CT imaging being used as the initial imaging modality.

General Considerations: The Secondary Pulmonary Lobule

It is important to review the basic structure of a secondary pulmonary lobule (SPL) and its radiologic appearance on a high-resolution CT (HRCT) scan image before we discuss the various CT scan signs. The SPL is a fundamental unit at the

ABBREVIATIONS: GGO = ground glass opacity; HRCT = high resolution CT; PJP = *Pneumocystis jirovecii* pneumonia; SPL = secondary pulmonary lobule

AFFILIATIONS: From the Respiratory Institute (Drs Raju and Mehta) and the Radiology Institute (Dr Ghosh), Cleveland Clinic, Cleveland, OH.

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Radiographic Signs and Patterns in Interstitial Lung Disease

Ayesha Nasrullah, MBBS,* Shaimaa Fadl, MBChB,* Jitesh Ahuja, MBBS,* Haodong Xu, MD, PhD,[†] and Gregory Kicska, MD, PhD*

Introduction

Thoracic computed tomography (CT), specifically high-resolution CTs (HRCTs), plays an essential role in diagnosing diffuse pulmonary lung disease. Although diffuse lung diseases often present with nonspecific radiographic findings, there are a small number of radiographic signs and patterns that are more specific and can be used to narrow the differential diagnosis.

Honeycombing

Honeycombing is a term

distinguished IPF from cellular nonspecific interstitial pneumonia (NSIP) and fibrotic NSIP were the extent of honeycombing (odds ratio, 5.16 and 2.10, respectively).⁵

Honeycombing can sometimes constitute more than 70% of the fibrotic portions of the lungs in ILDs and this can be referred to as "exuberant honeycomb sign" (Fig. 1b and c). It is associated more commonly with connective tissue diseases (CTD) UIP rather than IPF UIP.⁶ Honeycombing can be present in other conditions such as NSIP and chronic hypersensitivity pneumonitis (HP). However, ground glass opacities dominate in NSIP and honeycombing, if present, is usually minimal. Similarly, HP can also demonstrate honeycombing, but it is usually minimal. Similarly, HP can also demonstrate honeycombing, but it is usually minimal. Similarly, HP can also demonstrate honeycombing, but it is usually minimal.



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Radiologic Signs in Thoracic Imaging: Case-Based Review and Self-Assessment Module

Mark S. Parker¹, Marvin H. Chason², Narinder Paul³

ABSTRACT

Objective

Chest imaging remains one of the most important specialties of diagnostic radiology. The successful interpretation of thoracic imaging studies requires the recognition and understanding of the radiologic signs that are characteristic of many complex disease processes.

Conclusion

The educational objectives for this case-based self-assessment module are for the participant to exercise, self-assess, and improve his or her understanding of important thoracic radiologic signs that are useful in establishing the diagnosis of particular diseases of the chest.

INTRODUCTION

This self-assessment module on several radiologic signs used in thoracic imaging to assist radiologists in establishing a particular diagnosis of pathologic processes affecting the chest has a self-assessment component and an educational component. The self-assessment component consists of six previously unpublished case-based studies with accompanying clinical histories and radiologic images. These cases have been selected to illustrate specific radiologic imaging signs. A series of multiple-choice questions follows each case, with solutions and a discussion of that particular radiologic sign and its cause. The educational component consists of suggested readings or references that accompany each case that the participant should review. To claim CME and SAM credit, each participant must log on to the ARRS Website (www.rrs.org) and enter his or her responses to the questions online.

EDUCATIONAL OBJECTIVES

By completing this educational activity, the participant will:
A. Exercise, self assess, and improve his or her understanding of selected radiologic signs useful in establishing a particular diagnosis of pathologic processes affecting the chest.

B. Exercise, self assess, and improve his or her understanding of the underlying cause for these particular radiologic signs.

REQUIRED ACTION

Review interactive case scenarios presented in this article.

RECOMMENDED READING

1. Woodring JH, Reed JC. Radiographic manifestations of lobar atelectasis. *J Thorac Imaging* 1996; 11:109-144
2. Catalano O. The incomplete border sign. *Radiology* 2002; 225:129-130
3. Chung M, Edinburgh K, Webb E, McCovin M, Webb W. Mixed infiltrative and obstructive disease on high-resolution CT: differential diagnosis and functional correlates in a consecutive series. *J Thorac Imaging* 2001; 16:69-75
4. Whitten CR, Khan S, Munneke GJ, Grubnic S. A diagnostic approach to mediastinal abnormalities. *Radiographics* 2007; 27:657-671
5. Ferguson EC, Krishnamurthy R, Oldham SA. Classic imaging signs of congenital cardiovascular abnormalities. *Radiographics* 2007; 27:1323-1334
6. Marshall GB, Farnquist BA, MacGregor JH, Burrows PW. Signs in thoracic imaging. *J Thorac Imaging* 2006; 21:76-89

INSTRUCTIONS

1. Complete the educational and self-assessment components included in this issue.
2. Visit www.rrs.org.
3. Order the online SAM as directed. (The SAM must be ordered to be accessed even though the activity is free to ARRS members.)
4. The SAM can be accessed at www.rrs.org under the Lifelong Learning link.
5. Answer the questions online to obtain SAM credit.

BT'de işaretler

TABLE 3] Tabular Summary of Common CT Signs on Pulmonary Imaging

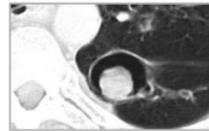
Air crescent sign

- Crescentic or circumferential rim of radiolucent airspace within a parenchymal consolidation or nodular opacity
- DDX: Invasive aspergillosis, bronchogenic Ca



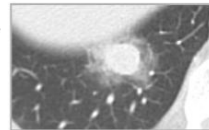
Monod sign

- Air surrounding a fungal ball in a preexisting pulmonary cavity.
- DDX: Aspergilloma



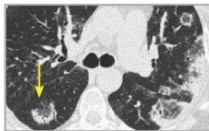
Halo sign

- SPN or mass surrounded by a circumferential GGO
- DDX: invasive pulm aspergillosis, pulm mucormycosis, GPA, amyloidosis, sarcoidosis, mets to the lung



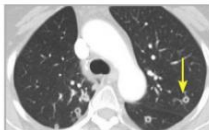
Atoll sign (reverse-halo sign)

- Central GGO surrounded by a crescentic or circumferential denser consolidation
- DDX: COP, IFI, PJP, LG, GPA, lipid pna, sarcoidosis, paracoccidioidomycosis



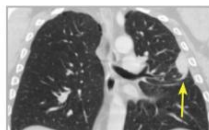
Cheerio sign (open bronchus sign)

- Pulmonary nodule with a central lucency
- DDX: Pulm adeno Ca, PLCH, primary and metastatic lung malignancy, rheumatoid nodules, GPA



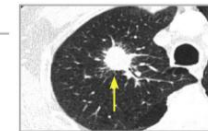
Comet tail sign

- Curvilinear pleural based opacity directed towards the ipsilateral hilum
- DDX: Rounded atelectasis



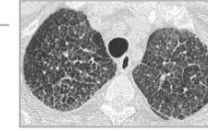
Corona radiata (sunburst sign)

- SPN or mass, with spiculated and irregular margins
- DDX: Bronchogenic Ca



Crazy paving sign

- Thickened interlobular septa in a background of diffuse GGO's.
- DDX: PAP, pulm edema, lymphangitic spread of malignancy, pulm mucinous adeno Ca, sarcoidosis, lipid pna, pulm hge, ARDS, PJP



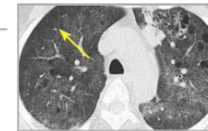
Galaxy sign

- Coalescent granuloma with a central dense mass and tiny peripheral satellite nodules
- DDX: Sarcoidosis, progressive massive fibrosis, active pulm TB.



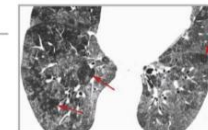
Mosaic attenuation

- Variable attenuation seen on a chest CT in a lobular or multilobular distribution.
- DDX: BO, CTEPH, PJP, CEP, HP, COP



Head cheese sign

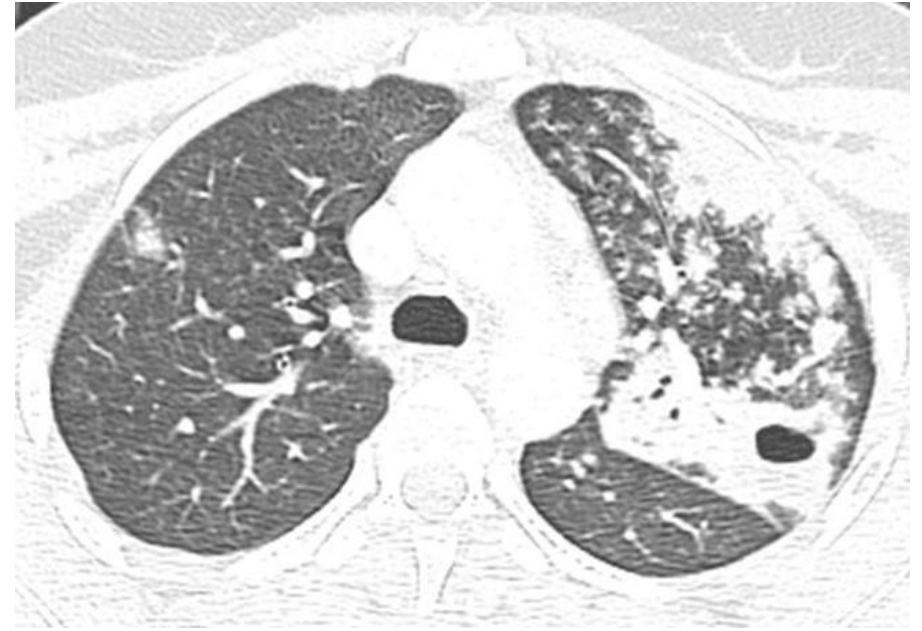
- Juxtaposition of distinct radiographic areas of low, normal and high attenuation
- DDX: sub-acute HP, sarcoidosis, RB, Mycoplasma pna



Sand storm sign

- Diffusely dense pulmonary micronodular calcifications. Note the black pleural line sign (arrow)
- DDX: PAM





Tomurcuklanan Ađaç
görünümü

TERS HALO İŞARETİ



Organize Pnömoni



Aktif Tüberküloz enfeksiyonu

David M. Hansell, MD, FRCP, FRCR
 Alexander A. Bankier, MD
 Heber MacMahon, MB, BCh, BAO
 Theresa C. McLoud, MD
 Nestor L. Müller, MD, PhD
 Jacques Remy, MD

Fleischner Society: Glossary of Terms for Thoracic Imaging¹

Members of the Fleischner Society compiled a glossary of terms for thoracic imaging that replaces previous glossaries published in 1984 and 1996 for thoracic radiography and computed tomography (CT), respectively. The need to update the previous versions came from the recognition that new words have emerged, others have become obsolete, and the meaning of some terms has changed. Brief descriptions of some diseases are included, and pictorial examples (chest radiographs and CT scans) are provided for the majority of terms.

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Radiology: Volume 246: Number 3—March 2008

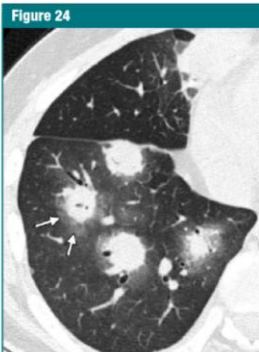


Figure 24: Transverse CT scan shows several nodules exhibiting the halo sign (arrows).

halo sign

CT scans.—The halo sign is a CT finding of ground-glass opacity surrounding a nodule or mass (Fig 24). It was first described as a sign of hemorrhage around foci of invasive aspergillosis (61). The halo sign is nonspecific and may also be caused by hemorrhage associated with other types of nodules (62) or by local pulmonary infiltration by neoplasm (eg, adenocarcinoma). (See also *reversed halo sign*.)

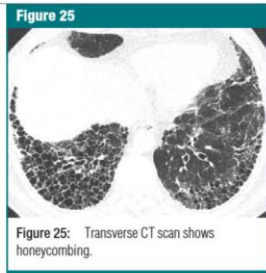


Figure 25: Transverse CT scan shows honeycombing.

honeycombing

Pathology.—Honeycombing represents destroyed and fibrotic lung tissue containing numerous cystic airspaces with thick fibrous walls, representing the late stage of various lung diseases, with complete loss of acinar architecture. The cysts range in size from a few millimeters to several centimeters in diameter, have variable wall thickness, and are lined by metaplastic bronchiolar epithelium (51).

Radiographs and CT scans.—On chest radiographs, honeycombing appears as closely approximated ring shadows, typically 3–10 mm in diameter with walls 1–3 mm in thickness, that resemble a honeycomb; the finding implies end-stage lung disease. On CT scans, the appearance is of clustered

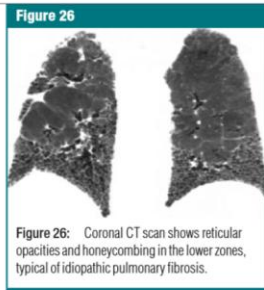


Figure 26: Coronal CT scan shows reticular opacities and honeycombing in the lower zones, typical of idiopathic pulmonary fibrosis.

idiopathic pulmonary fibrosis

Pathology.—Idiopathic pulmonary fibrosis is a specific form of chronic fibrosing interstitial pneumonia of unknown cause and is characterized by a histologic pattern of usual interstitial pneumonia (5,64).

Radiographs and CT scans.—The typical imaging findings are reticular opacities and honeycombing, with a predominantly peripheral and basal distribution (Fig 26). Ground-glass opacity, if present, is less extensive than reticular and honeycombing patterns. The typical radiologic findings (65,66) are also encountered in usual interstitial pneumonia secondary to specific causes, such as asbestos-induced pulmonary fibrosis (asbestosis), and the diagnosis is

bullae is of little clinical importance, the use of this term by radiologists is discouraged.

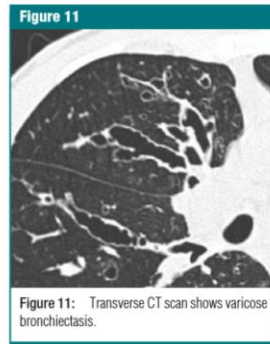


Figure 11: Transverse CT scan shows varicose bronchiectasis.

bronchiectasis

Pathology.—Bronchiectasis is irreversible localized or diffuse bronchial dilatation, usually resulting from chronic infection, proximal airway obstruction, or congenital bronchial abnormality (26). (See also *traction bronchiectasis*.)

Radiographs and CT scans.—Morphologic criteria on thin-section CT scans include bronchial dilatation with respect to the accompanying pulmonary artery (signet ring sign), lack of tapering of bronchi, and identification of bronchi

Radiographs and CT scans.—Bronchioles are not identifiable in healthy individuals, because the bronchiolar walls are too thin (4). In inflammatory small-airways disease, however, thickened or plugged bronchioles may be seen as a nodular pattern on a chest radiograph or as a tree-in-bud pattern on CT scans.

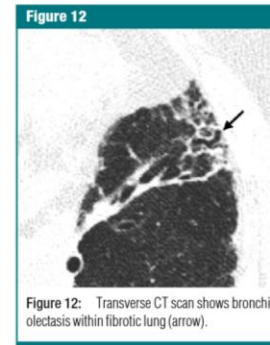


Figure 12: Transverse CT scan shows bronchiectasis within fibrotic lung (arrow).

bronchiolectasis

Pathology.—Bronchiolectasis is defined as dilatation of bronchioles. It is caused by inflammatory airways disease (potentially reversible) or, more frequently, fibrosis.

CT scans.—When dilated bronchioles are filled with exudate and are thick

ability of centrilobular structures due to thickening or infiltration of the adjacent interstitium, or (d) abnormal areas of low attenuation caused by centrilobular emphysema (4). (See also *lobular core structures*.)

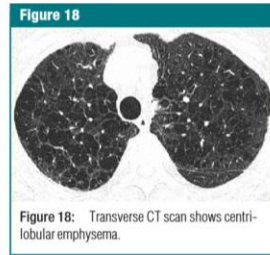


Figure 18: Transverse CT scan shows centrilobular emphysema.

centrilobular emphysema

Pathology.—Centrilobular emphysema is characterized by destroyed centrilobular alveolar walls and enlargement of respiratory bronchioles and associated alveoli (42,43). This is the commonest form of emphysema in cigarette smokers.

CT scans.—CT findings are centrilobular areas of decreased attenuation, usually without visible walls, of nonuniform distribution and predominantly located in upper lung zones (44) (Fig 18). The term *centriacinar emphysema* is synonymous. (See also *emphysema*.)

scans. (See also *small-airways disease, tree-in-bud pattern*.)

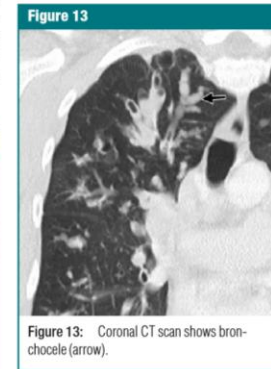


Figure 13: Coronal CT scan shows bronchocele (arrow).

bronchocele

Pathology.—A bronchocele is bronchial dilatation due to retained secretions (mucoid impaction) usually caused by proximal obstruction, either congenital (eg, bronchial atresia) or acquired (eg, obstructing cancer) (34).

Radiographs and CT scans.—A bronchocele is a tubular or branching Y- or V-shaped structure that may resemble a gloved finger (Fig 13). The CT attenuation of the mucus is generally that of soft tissue but may be modified

consolidation

Pathology.—Consolidation refers to an exudate or other product of disease that replaces alveolar air, rendering the lung solid (as in infective pneumonia).

Radiographs and CT scans.—Consolidation appears as a homogeneous increase in pulmonary parenchymal attenuation that obscures the margins of vessels and airway walls (45) (Fig 19). An air bronchogram may be present. The attenuation characteristics of consolidated lung are only rarely helpful in differential diagnosis (eg, decreased attenuation in lipid pneumonia [46] and increased in amiodarone toxicity [47]).

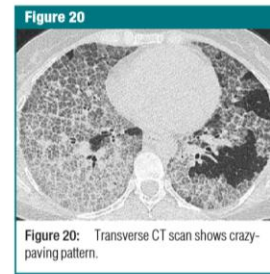


Figure 20: Transverse CT scan shows crazy-paving pattern.

crazy-paving pattern

CT scans.—This pattern appears as



Figure 21: Coronal CT scan shows a cyst.

cyst

Pathology.—A cyst is any round circumscribed space that is surrounded by an epithelial or fibrous wall of variable thickness (51).

Radiographs and CT scans.—A cyst appears as a round parenchymal lucency or low-attenuating area with a well-defined interface with normal lung. Cysts have variable wall thickness but are usually thin-walled (<2 mm) and occur without associated pulmonary emphysema (Fig 21). Cysts in the lung usually contain air but occasionally contain fluid or solid material. The term is often used to describe enlarged thin-

TANIM (Fleischner Society)

Kavite:

- Duvarı 4 mm den daha kalın hava içeren lezyon
(Nodül-kitle ya da konsolidasyon içinde)

Kist:

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- Çevreleyen kitle veya konsolidasyon mevcut değil

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Computed tomography of the chest



Dr Yuranga Weerakkody and Dr Aditya Shetty et al.

Computed tomography (CT) of the chest is a cross-sectional evaluation of the heart, airways, lungs, mediastinum, and associated bones and soft tissues.

Two key methods of image acquisition include:

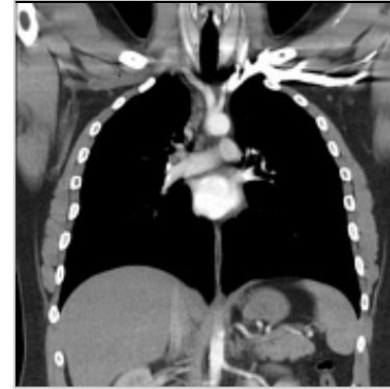
- standard CT with 5 mm slice thickness for mediastinum and gross evaluation of lungs
- [high-resolution CT \(HRCT\)](#) with thin sections (slice thickness of 0.625 to 1.25 mm) for evaluation of the secondary lobule of the lungs

General indications

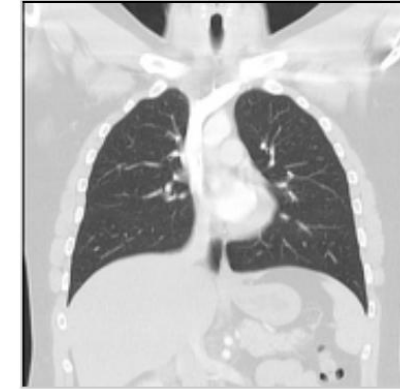
Emergencies

- chest trauma: evaluation of [contusions](#), [rib fractures](#) and [pneumothorax](#)
- aortic pathologies: [dissection](#), [transection](#)
- [pulmonary embolism](#)
- post-thoracic surgery complications: [mediastinal hematomas](#), [complex pleural collections](#)

Cases and figures



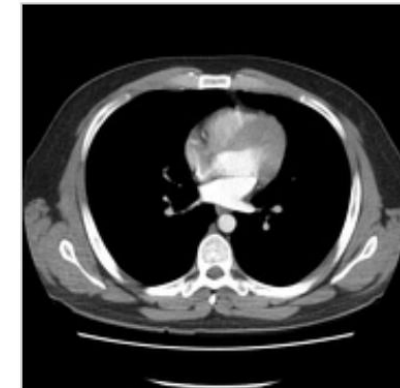
Case 1: normal CT chest



Case 1: normal CT chest



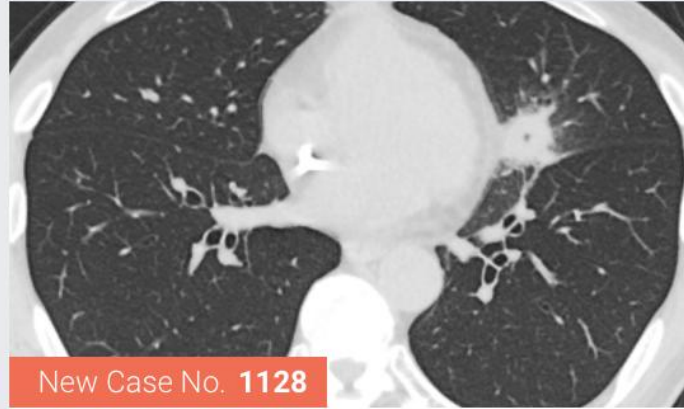
Case 1: normal CT chest



Case 1: normal CT chest



WEEKLY CHEST CASES



New Case No. 1128

Chief Complaint

Fever / Past history : Allogenic stem cell transplantation due to extranodal NK/T cell lympho...

Age Sex

53 M

June 23, 2019 (Sun)

New

Chie

Agg
Pas
6ye

June

DIAGNOSIS WITH BRIEF DISCUSSION



Case No. 1126



Case No. 1125



Case No. 1124



Ca

Bir göğüs hastalıkları hekimi olarak toraks BT değerlendirme öğrenmenin yolları

- 30 dk içinde toraks BT değerlendirme anlatmak ve anlamak güç
- Göğüs hastalıkları asistanı öncelikle ne tür tetkik istemesi gerektiğini bilmeli
- Yeterince klinik ve lab bulguları özetleyerek istekte bulunmalı
- Kendine gelen tetkikin raporu ve görüntülerini mutlaka görmeli
- BT'yi sistematik olarak değerlendirmeli ve uyumsuzluklar durumunda en yakın Radyoloji uzmanı ile bunu tartışmalı
- Mümkünse ortak toplantılar düzenlemeli, kongre ve sempozyumlara gitmeli,
- Radyoloji ile ilgili temel makale ve en gerekli siteleri takip etmeli.