ATUDER
Acil Tıp Uzmanları Derneği

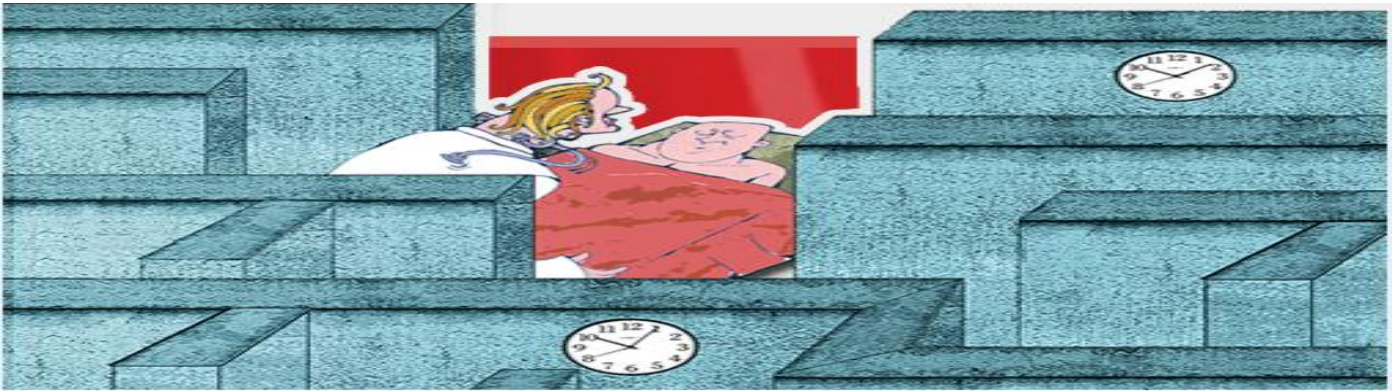
10. ULUSAL
ACİL TIP KONGRESİ

15 - 18 Mayıs 2014
Gloria Golf Resort Hotel,
Belek-Antalya

# Posterioanterior (PA) Akciğer Grafisi

Yard.Doç.Dr.Uğur Lök

ADYÜ Acil Tıp AD



## Sunum akımı

- PA AC grafisi çekim tekniği
- Teknik değerlendirme
- Radyolojik değerlendirme
- Radyografi örnekleri



## Röntgen

**Elektromanyetik**

**Kısa dalga boyunda**

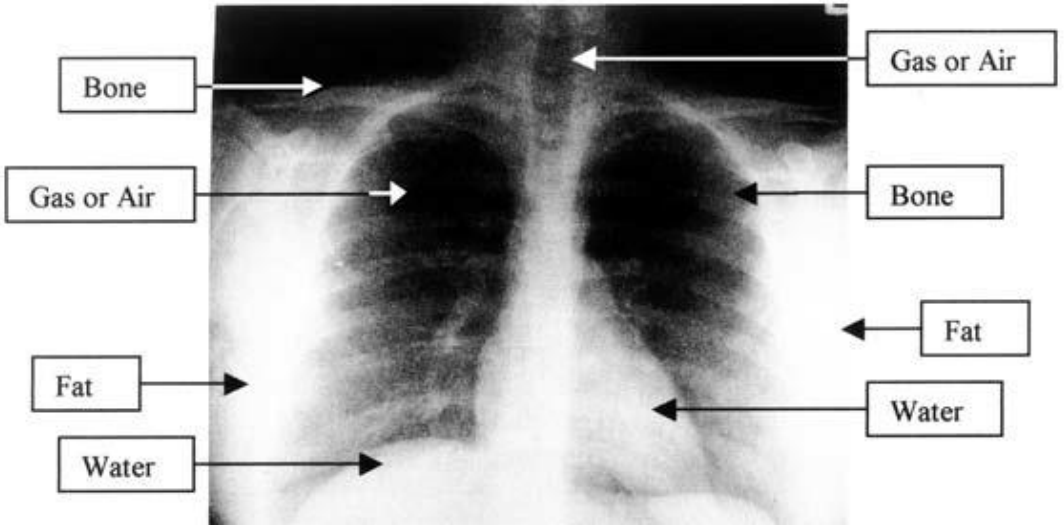
**0.2mSv radyasyon**

**Fotoğraf filmi**

Wilhelm Conrad Röntgen
(1845-1923)



X-ışını



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Schweiz Med Wochenschr. 1987 Jun 13;117(24):928-32.

# [Frequent errors in the interpretation of chest x-ray films].

[Article in German]

Vock P.

## Abstract

Chest radiography is responsible for 17.6% of all radiographic exposures; its results are false negative in 20-30% and false positive in 2-5%. False negative interpretations arise mainly in the retrocardiac area, the borderline between the chest wall and mediastinum, and in the mediastinum itself. Misinterpretation of recognized findings is due not only to technical factors, varying cooperation and individual variation, but also to false localization and inaccurate differential diagnosis. These errors can be reduced by awareness of history and clinical symptoms, systematic analysis of all anatomic compartments, comparison with previous studies, use of the lateral projection to obtain precise localization, and in case of nonspecificity, use of chest radiography to select the most appropriate and specific radiological or clinical investigation.

PMID: 3616585 [PubMed - indexed for MEDLINE]

*Emerg Med J*

**errors occurring in a busy district general hospital accident and emergency (A&E) department over four years.**
***Method*—All diagnostic errors discovered by or notified to one A&E consultant were noted on a computerised database.**
***Results*—953 diagnostic errors were noted in 934 patients. Altogether 79.7% were missed fractures. The most common reasons for error were misreading radiographs (77.8%) and failure to perform radiography (13.4%). The majority of errors were made by SHOs. Twenty two diagnostic errors resulted in complaints and legal actions and three patients who had a diagnostic error made, later died.**
***Conclusions*—Good clinical skills are essential. Most abnormalities missed on radiograph were not difficult to diagnose. Junior doctors in A&E should receive specific training and be tested on their ability to interpret radiographs correctly before being allowed to work unsupervised.**
(*Emerg Med J* 2001;**18**:263–269)

Keywords: radiography; diagnostic errors

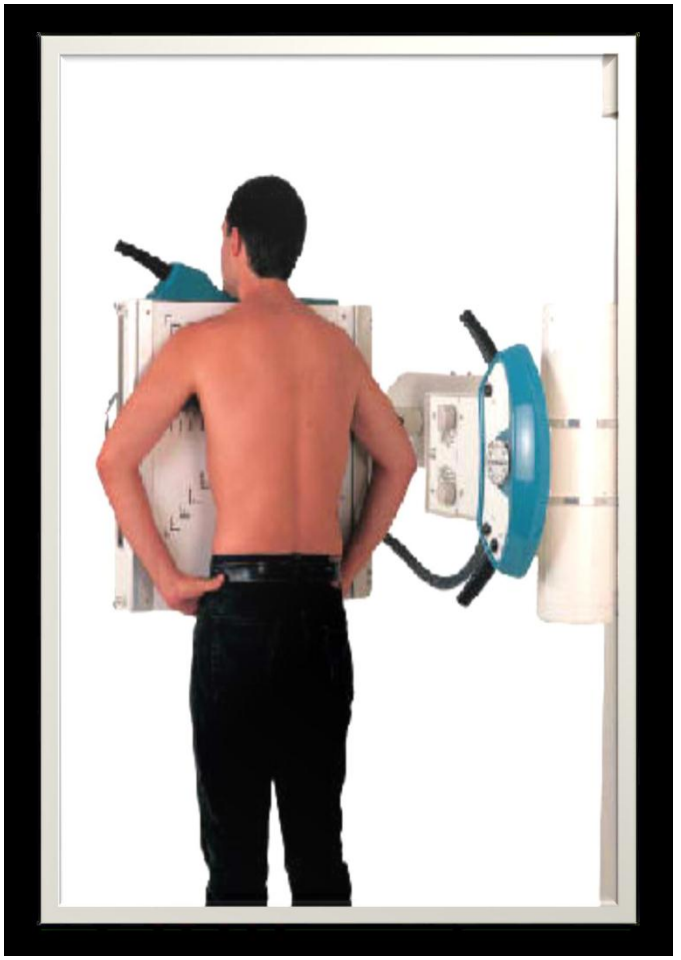
Diagnostic errors are important in all branches of medicine as they are an indication of poor patient care. Medically, the significance of a accidents" (of which diagnostic errors are one type) has been neglected and the problem should be studied.[1] "Studies on the epidemiology of malpractice are just as important as studies of the epidemiology of disease . . .(as) they allow insights into the causative factors and ways of reducing the harm".[3]

A&E departments are often staffed by very junior doctors. Errors are not uncommon and A&E is accepted as a "high risk" specialty. Most of what is written about diagnostic errors in A&E is in the form of case reports or diagnostic difficulties with specific injuries (for example, dislocated lunate,[4] carpometacarpal dislocations,[5] tendon injuries[6]). Diagnostic errors in patients with major injuries are described in papers describing management errors and deaths in such patients.[7] Papers describing errors over a period of time usually describe the misinterpretation of radiographs (which is closely related but not necessarily the same as diagnostic errors). The only previous report of all errors in an A&E department was a description of 135 diagnostic errors that occurred over six months.[8] No study of missed radiographs has been longer than a year.

The aim of this study is to describe, in detail, the diagnostic errors occurring in an A&E department over a four year period.

# Posterioanterior Akciğer Grafisi

1. **Ayakta**
2. **PA**
3. **Tüm AC alanları kasete dahil, skapulalar dışarıda**
4. **Simetrik**
5. **Işın santralize , T4 vertebra**
6. **Uygun doz**
7. **İnspiryum sonu çekim**



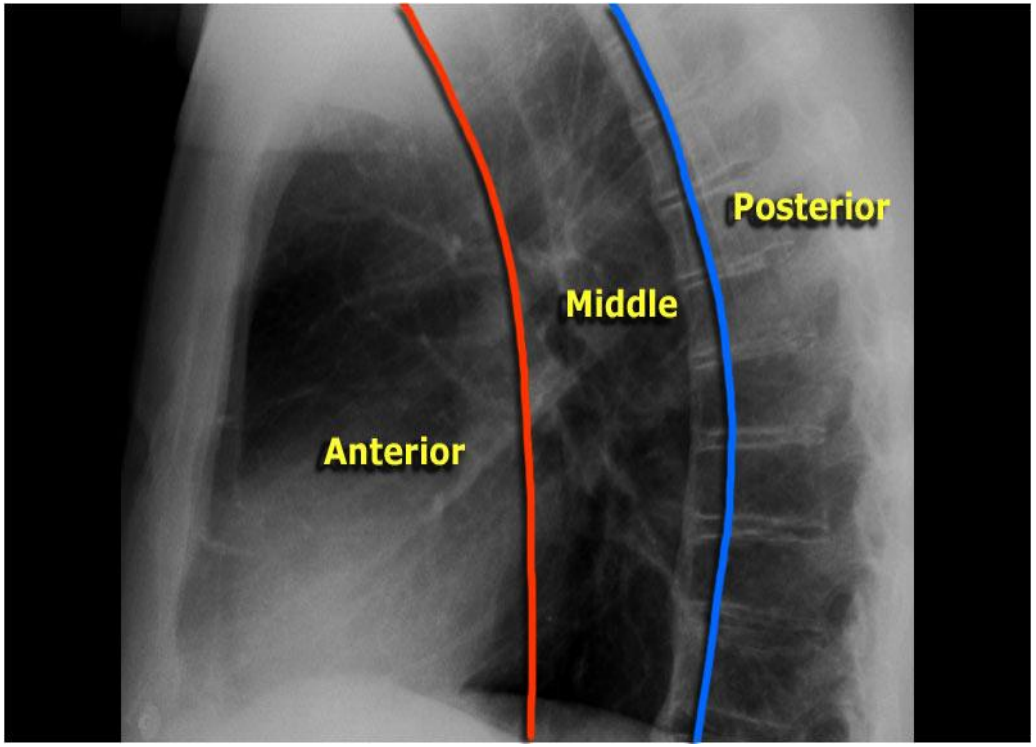
Tüp-film mesafesi 180-182 cm

## Anterioposterior grafi (AP)

- Kardiyomegali
- Geniş mediyasten
- Diafram yüksekliği
- Yetersiz inspirasyon
- Rotasyon artifactları
- Küçük pnömotorakslar atlanabilir
- Pleural efüzyonda posterior alan diffüz bulanıklık
- Cilt katlantıları

- **Potansiyel dezavantaj**

# Lateral grafi



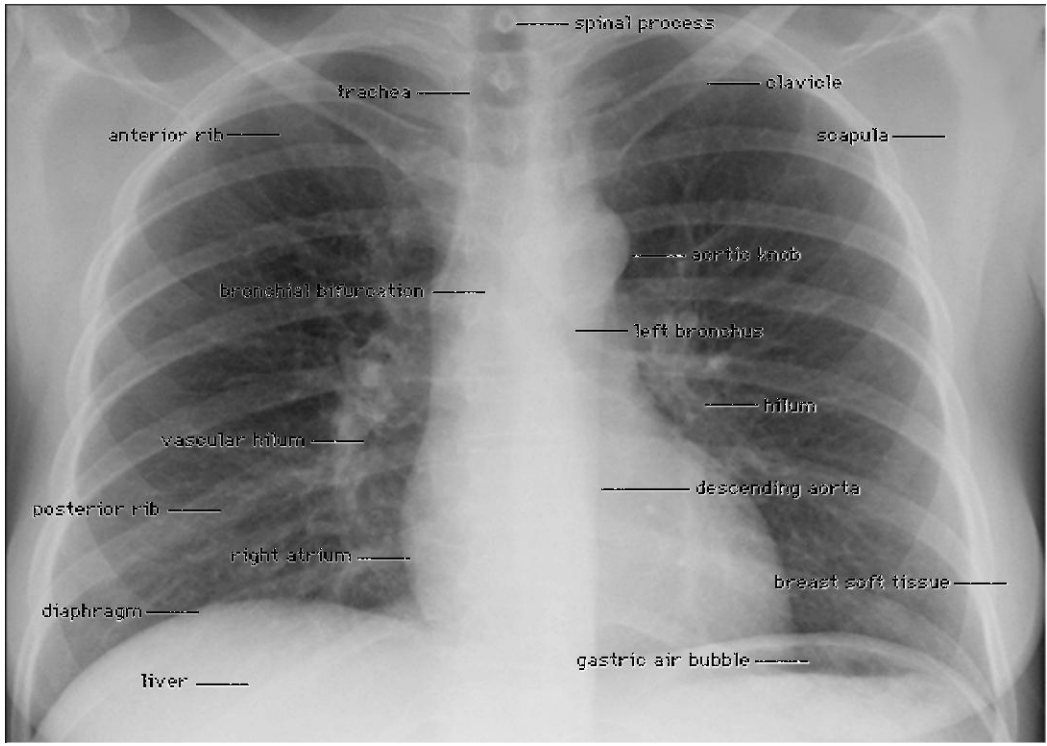
## KLASİK TORAKS GRAFİLERİ

- ...
- Lateral Dekubitus Grafi
- Apikolordotik Grafi
- İnspiriyum-ekspiriyum Grafileri
- Floroskopik İnceleme
- Oblik Grafiler

# TEKNİK İNCELEME

- Doğru hasta?
- Doğru tarih ve saat?
- Doğru tetkik?

- Tüm akciğer alanlarını kapsıyormu
- Skapulalar dışardamı
- Angulasyon
- Sağ veya sol işareti
- Ayakta veya oturarak,
- Penetrasyon
- Rotasyon
- İnspirasyon



# ENSIK!...



## TEKNİK HATALAR

- Doz
- Pozisyon
- Yetersiz inspiriyum
- İsim
- İşaret

# Penetrasyon

Penetrasyonu yetersiz grafiler diffüz dansite artışı izlenimi yaratır



Penetrasyonu fazla grafiler patolojik dansiteleri maskeleyebilir



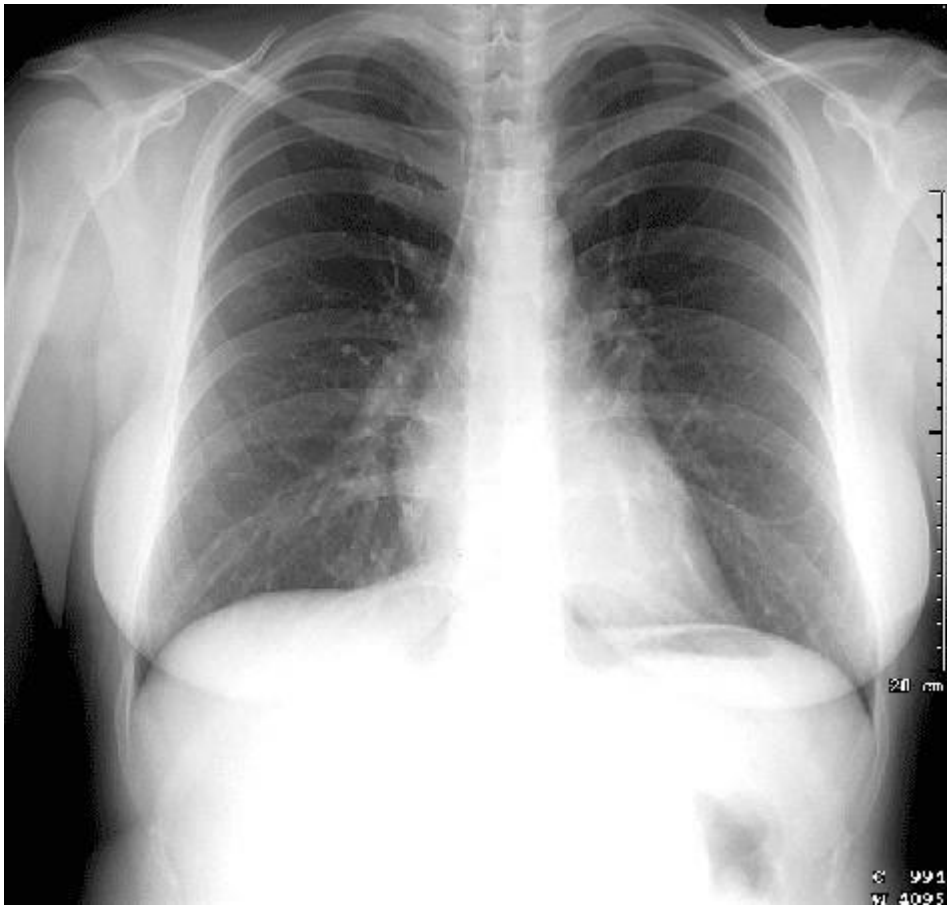
## Optimum penetrasyon

•İntervertebral disk mesafelerinin hafif seçilecek

•Vertebra detayı seçilmeyecek

•Kalbin arkasındaki damarlar görülebilecek

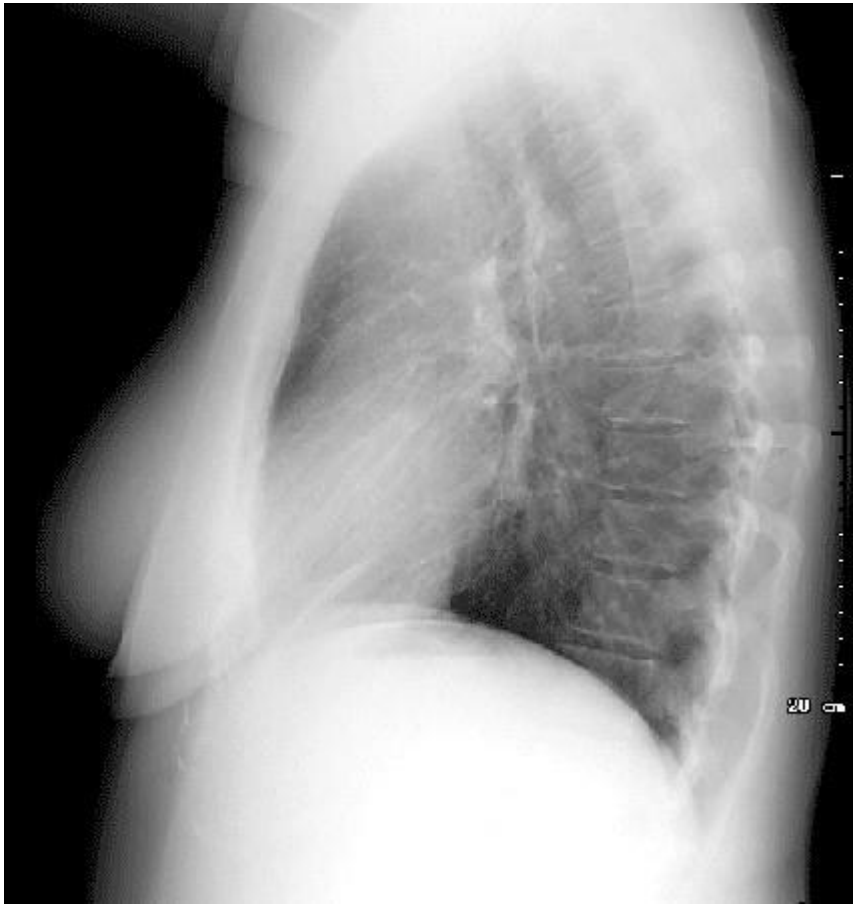
•AC periferinde damar görülecek



Vertebra alta doğru koyulaşacak

Arkada 2 sıra kosta seçilecek

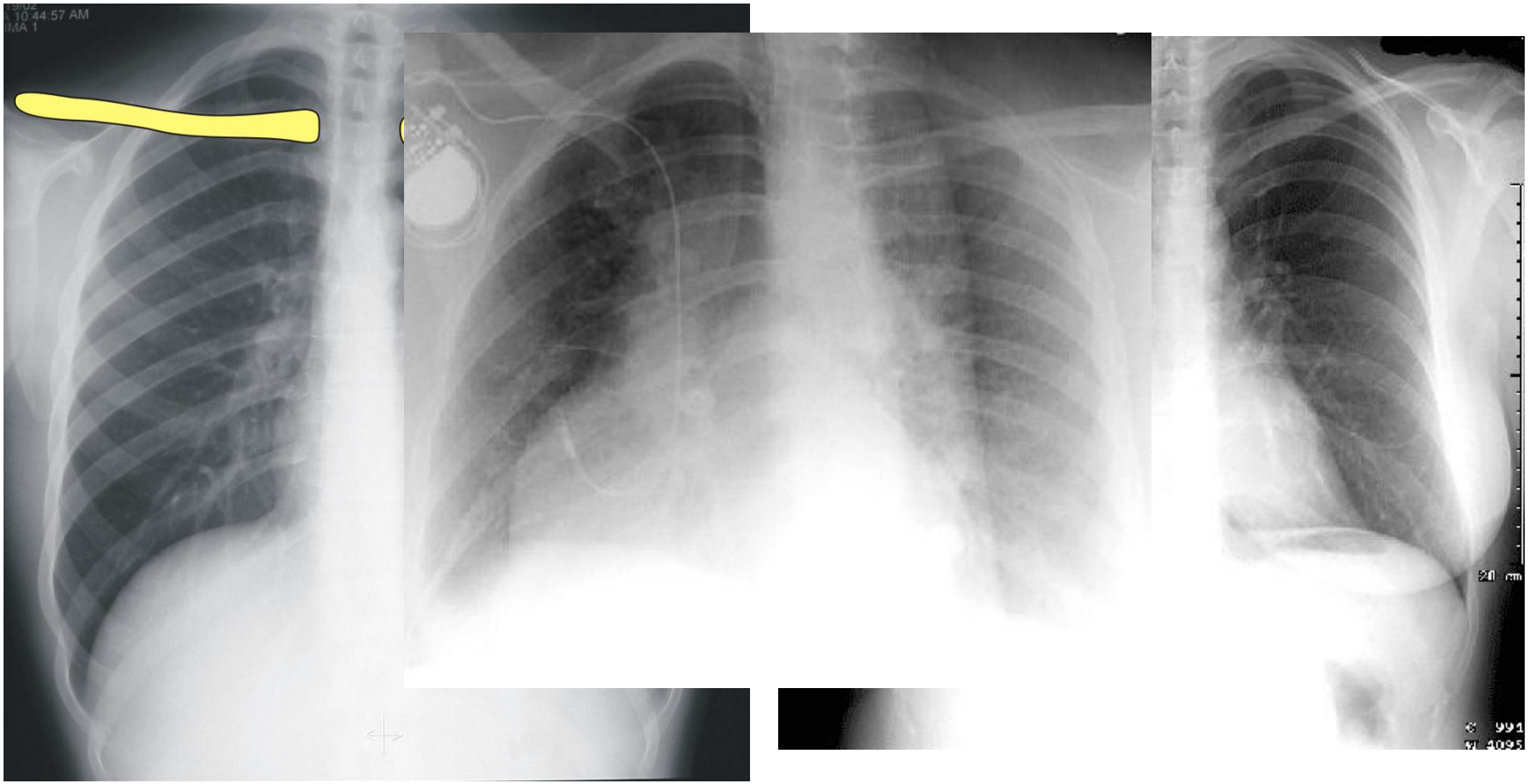
Sternum seçilecek



# Rotasyon

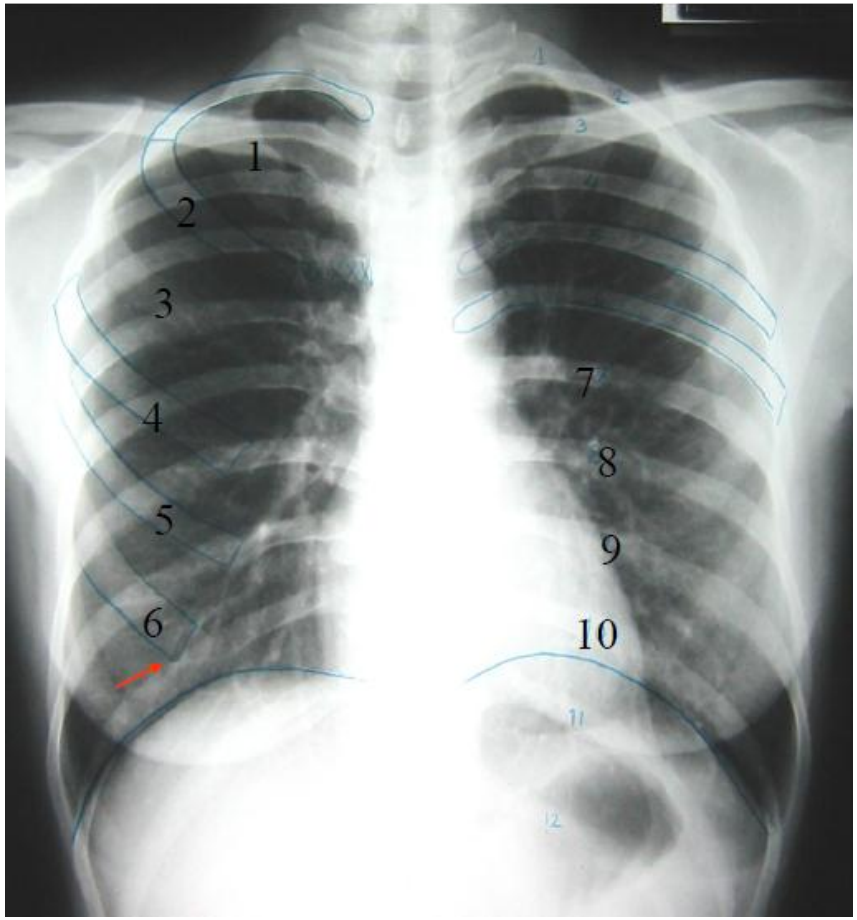
- Kalp büyüklüğü, şekli etkilenir
- Mediastinal genişleme izlenimi verebilir.
- Yalancı havalanma artışı izlenir veya pnömotoraks

# Rotasyon



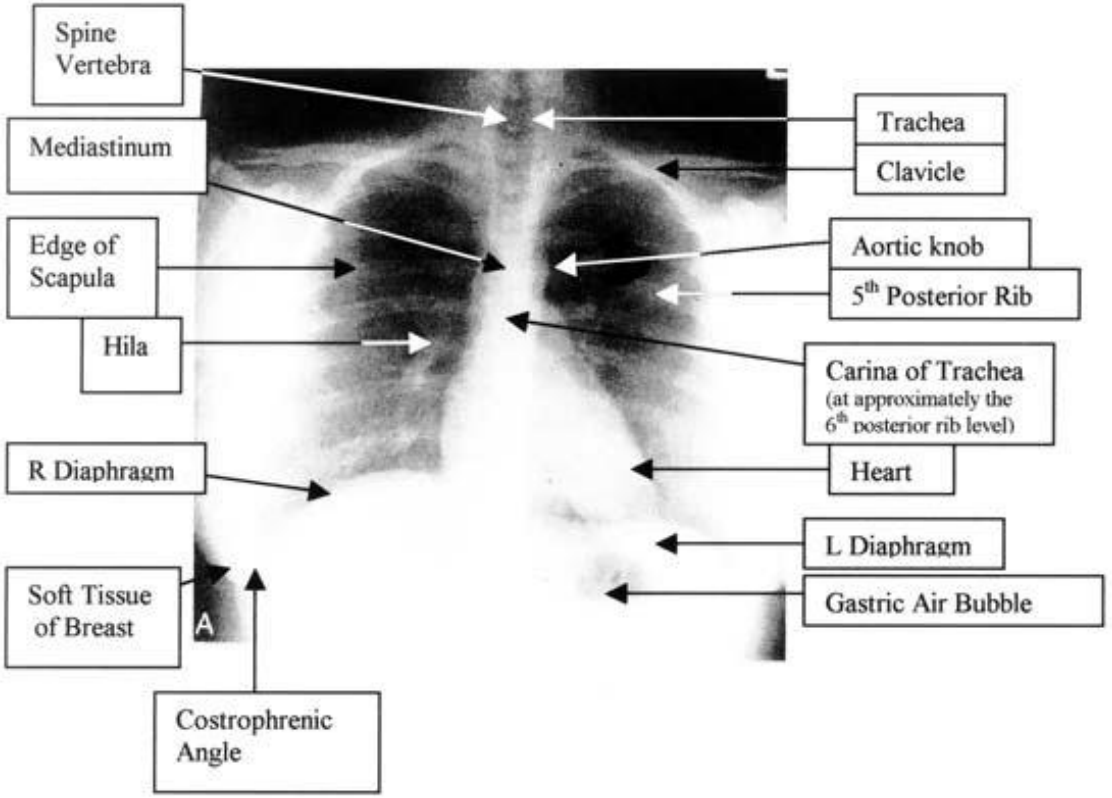
## İnspirasyon

  - Arkada 8-10, önde 5-6. kot
- Yetersiz insp.;
  - Diffüz pulmoner hastalığı taklit eden dansite artışı
  - Diyafragmalar, kalp ve mediasteni komprese olur kalp ve mediasteni genişletir



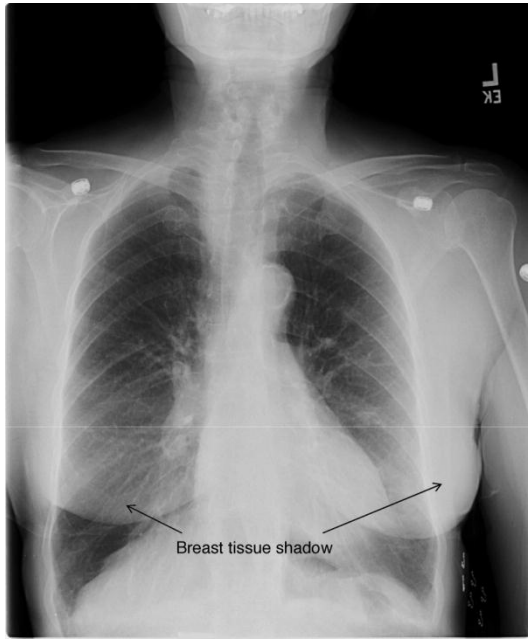
## Radyolojik değerlendirme

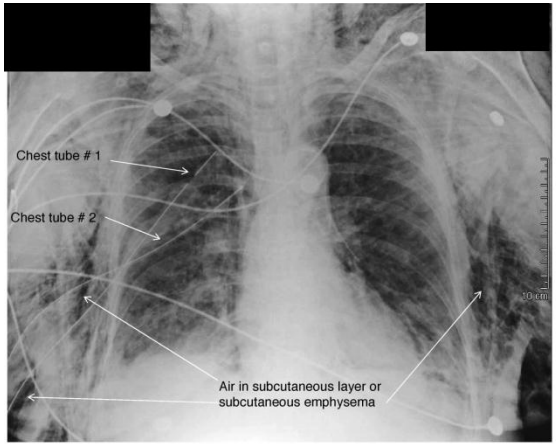
- Dikkatli gözlem
- Radyolojik göğüs anotomisini iyi anlama
- Sistemik yapılmalı;
  - tepeden tırnağa ve
  - taraf taraf
  - yapı-yapı



## Yumuşak dokuyu

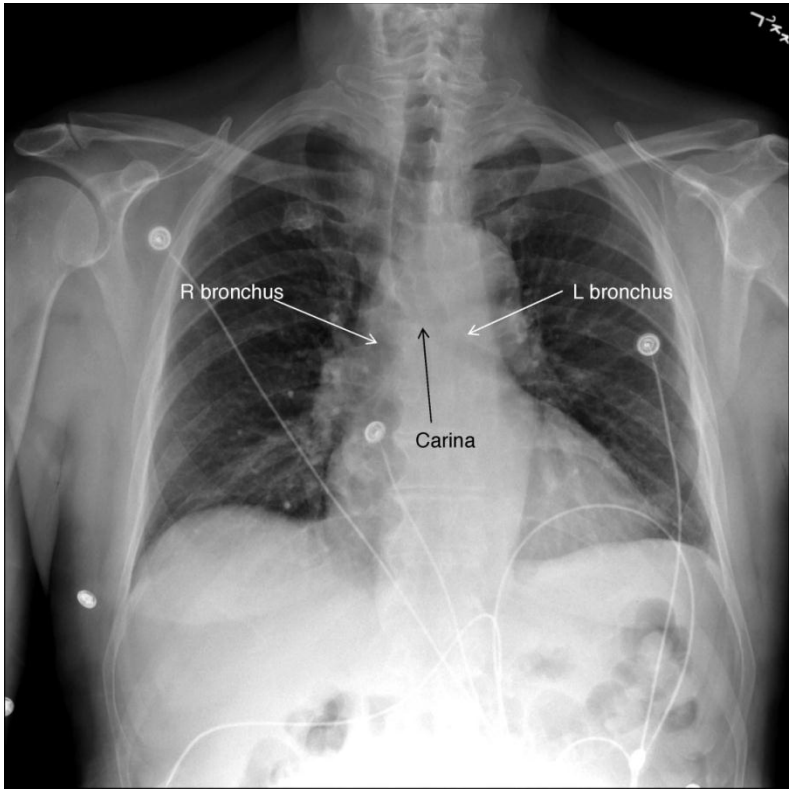
- Asimetri
- Kitle
- Subkütan hava
- Doku şişliği: eski hematoma, eski abse formasyonu, ve yumuşak doku kalsifikasyonları da
- Meme dokusu bazen alt lobları gizleyebilir



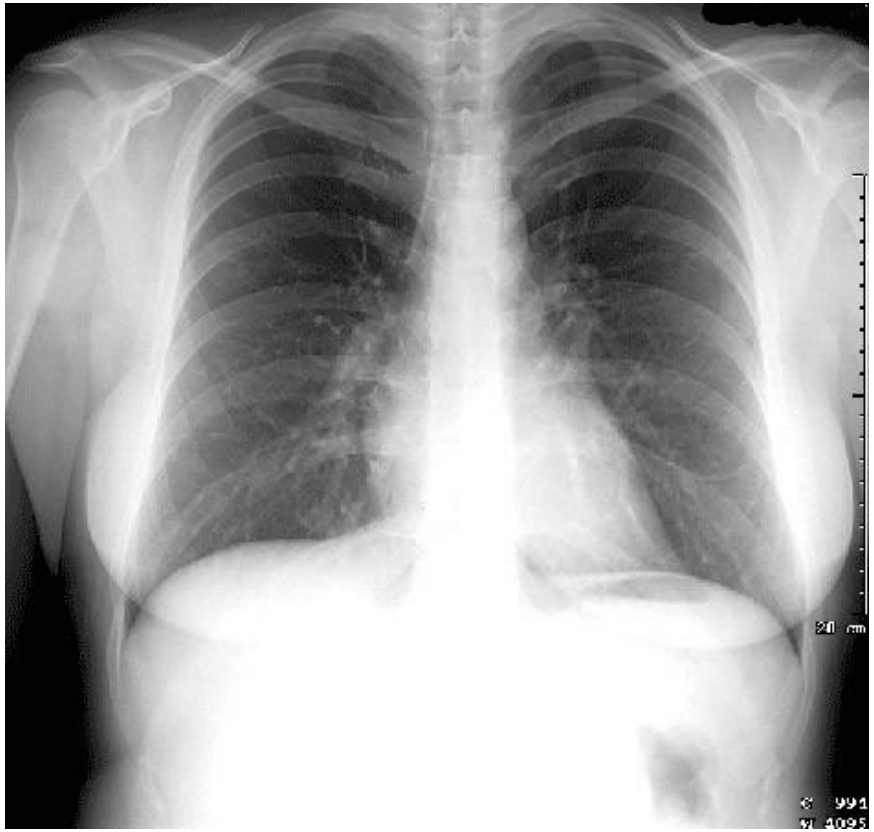
## Trakea

- Orta hattan Sağa yada sola deviasyon varmı
- En yayagın sebebi göğüs rotasyonudur
- Gerçek deviasyon tümör, mediastinal şift, pneumotoraks veya major atelaktazi
- Carina yaklaşık olarak 6.posterior kosta hizasında veya T4 te bulunur
- Doğru yerleştirilmiş ETT ucu karinadan 3-5cm yukarda olmalıdır



## Kemik yapı

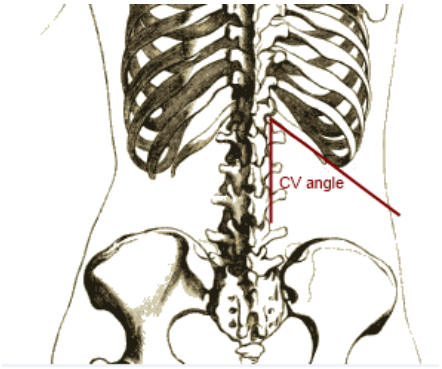
- Yeri,dansitesi, simetris, fraktürleri ve lezyonları
- Kosta yayı boyunca  ve bilateral
- Travmalı hastalar kosta fraktürü

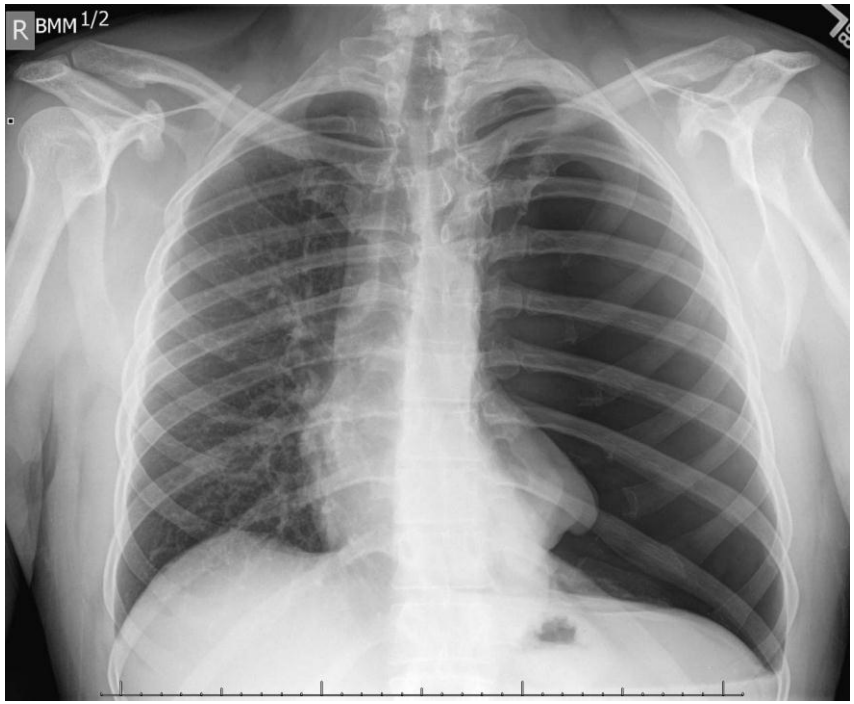


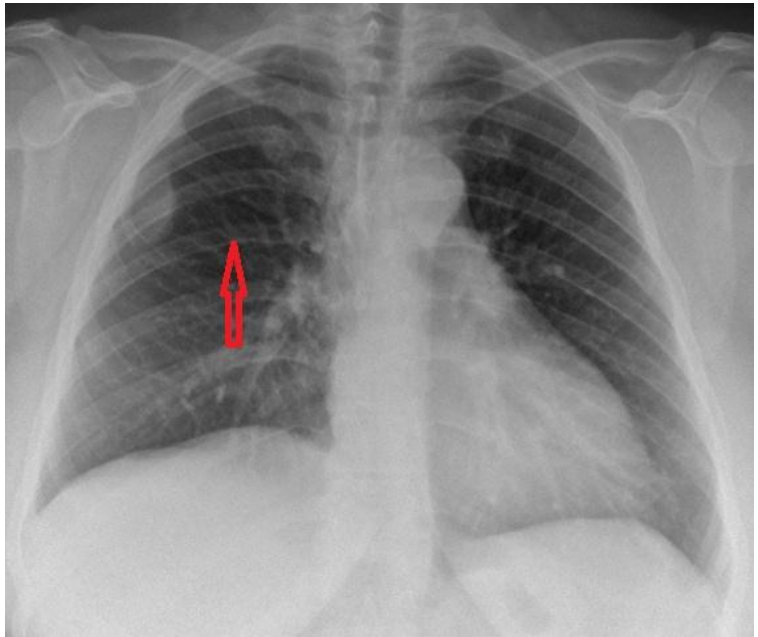
## İnterkostal aralık

- Genişlemesi volümünü arttıran durumlarda görülür: KOAH, pnömotoraks, ve pleuvral efüzyon

- İCA daralma akciğer volümünü azaltan durumlarla ilişkilidir. Atalektazi ve intertisyel fibrozis



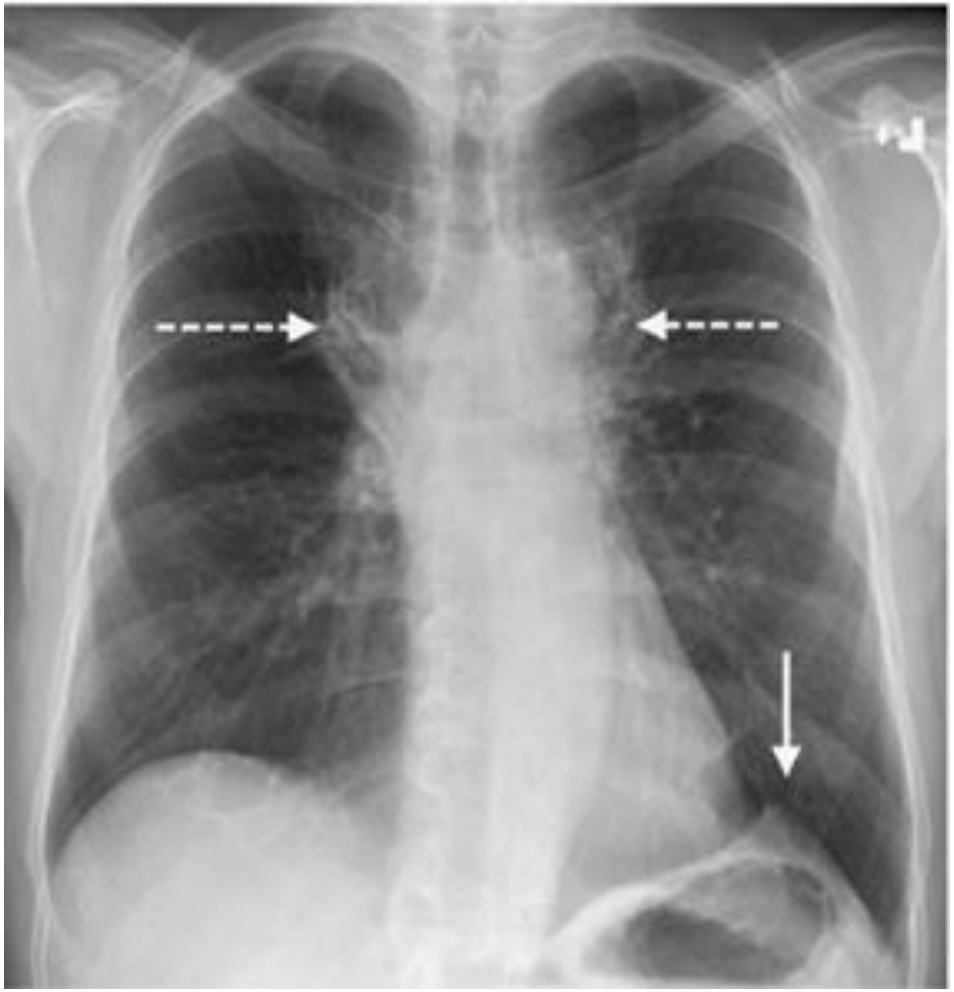
## Diafragma

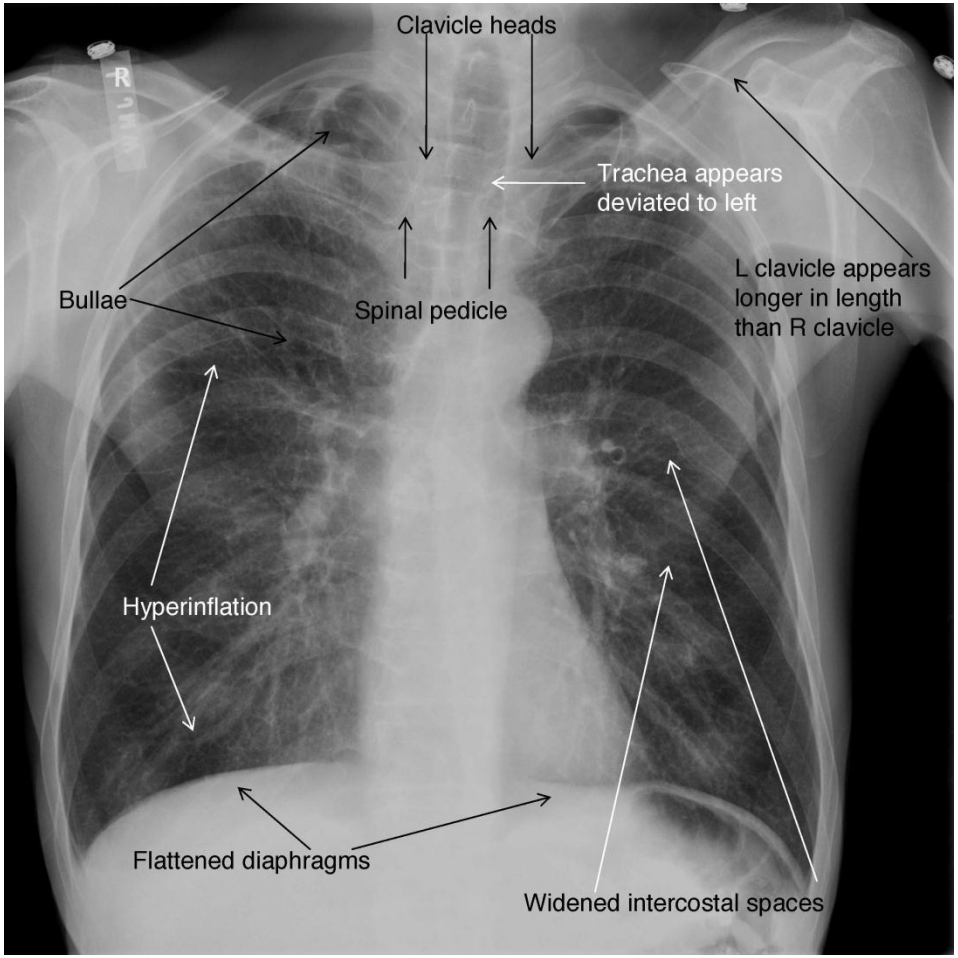
- Diafragma  kontürü ve şekli
- Sağ hemidiafragma daha yüksektedir yaklaşık 3cm
- Sinüsler: keskin ve açık

- Elavasyonunun;
  - abdominal distansiyon,
  - firenik sinir kompresyonu
  - atelektazi/ akciğer kollapsı

- Depreyonu veya düzleşmesi;
  - KOAH ve pnömotoraks vs.

## Jukstafrenik tepe işareti




Clavicle heads
Trachea appears deviated to left
L clavicle appears longer in length than R clavicle
Bullae
Spinal pedicle
Hyperinflation
Flattened diaphragms
Widened intercostal spaces

# Yaka bulgusu: diyafragma rüptürü

67y erkek t.kazası

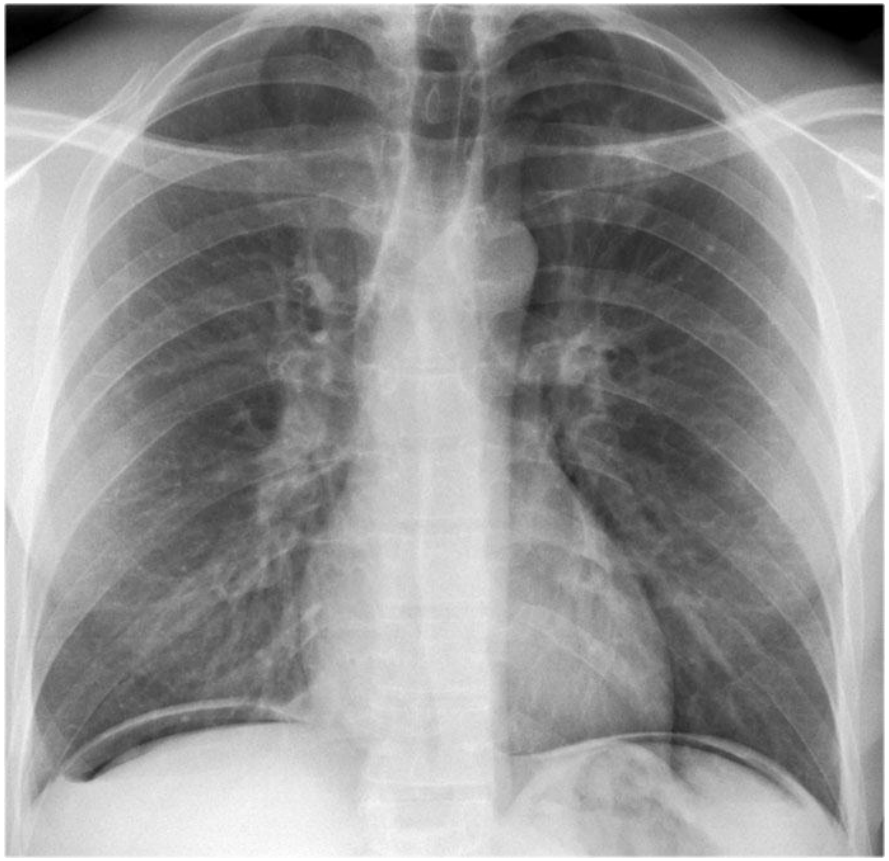




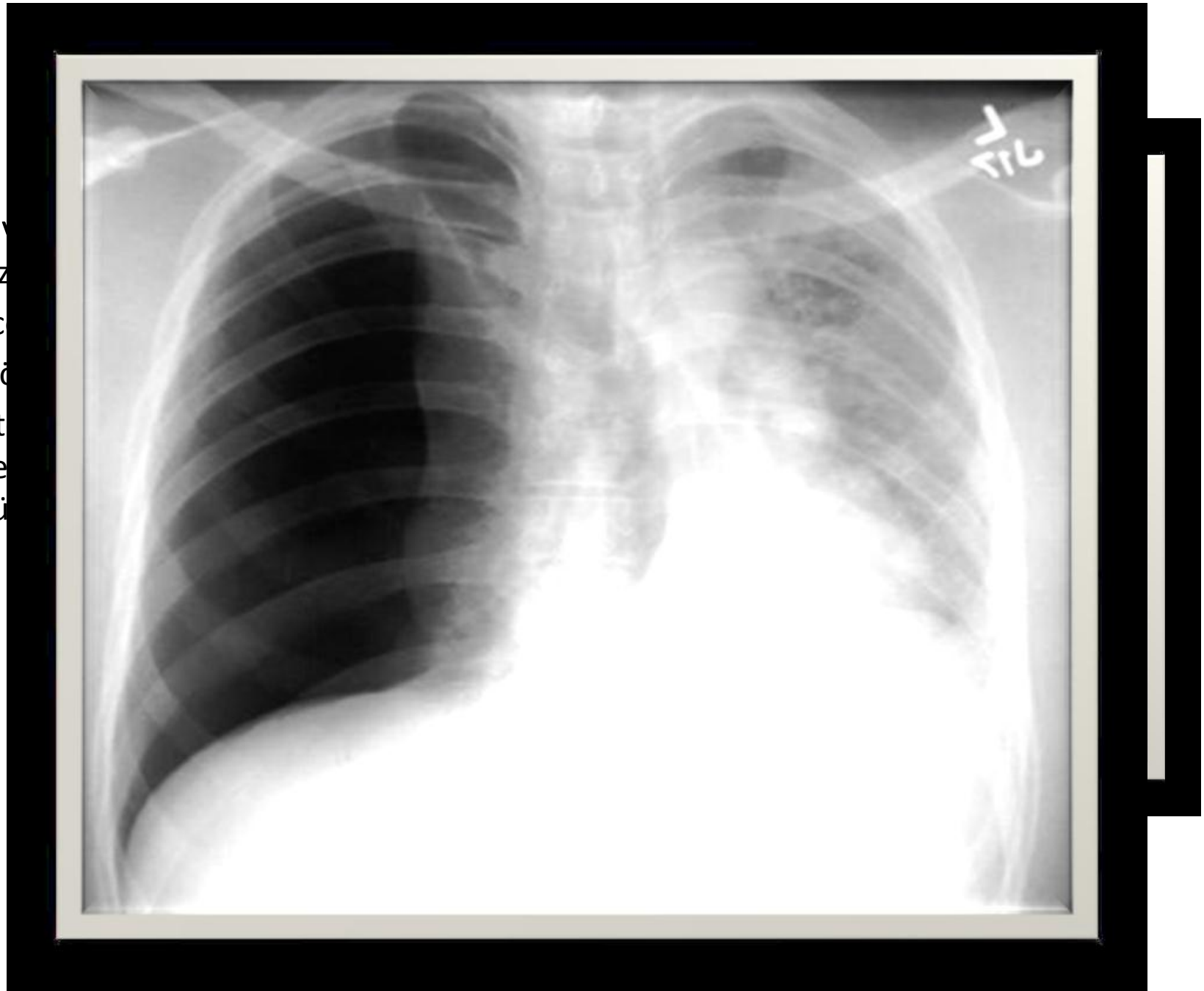
## Diafragma altı yapılar

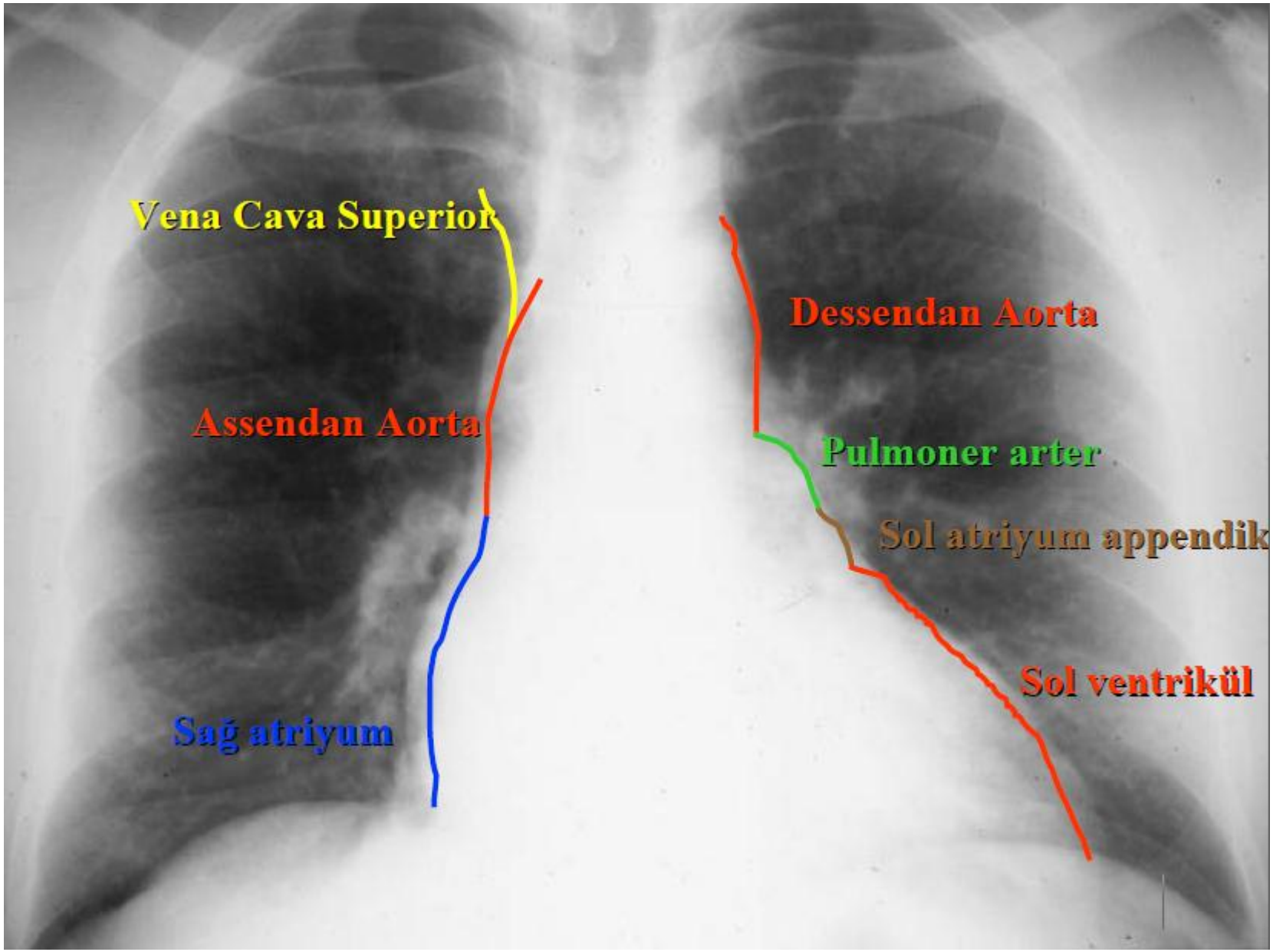
- Mide hava gölgesi/ kolon gazı

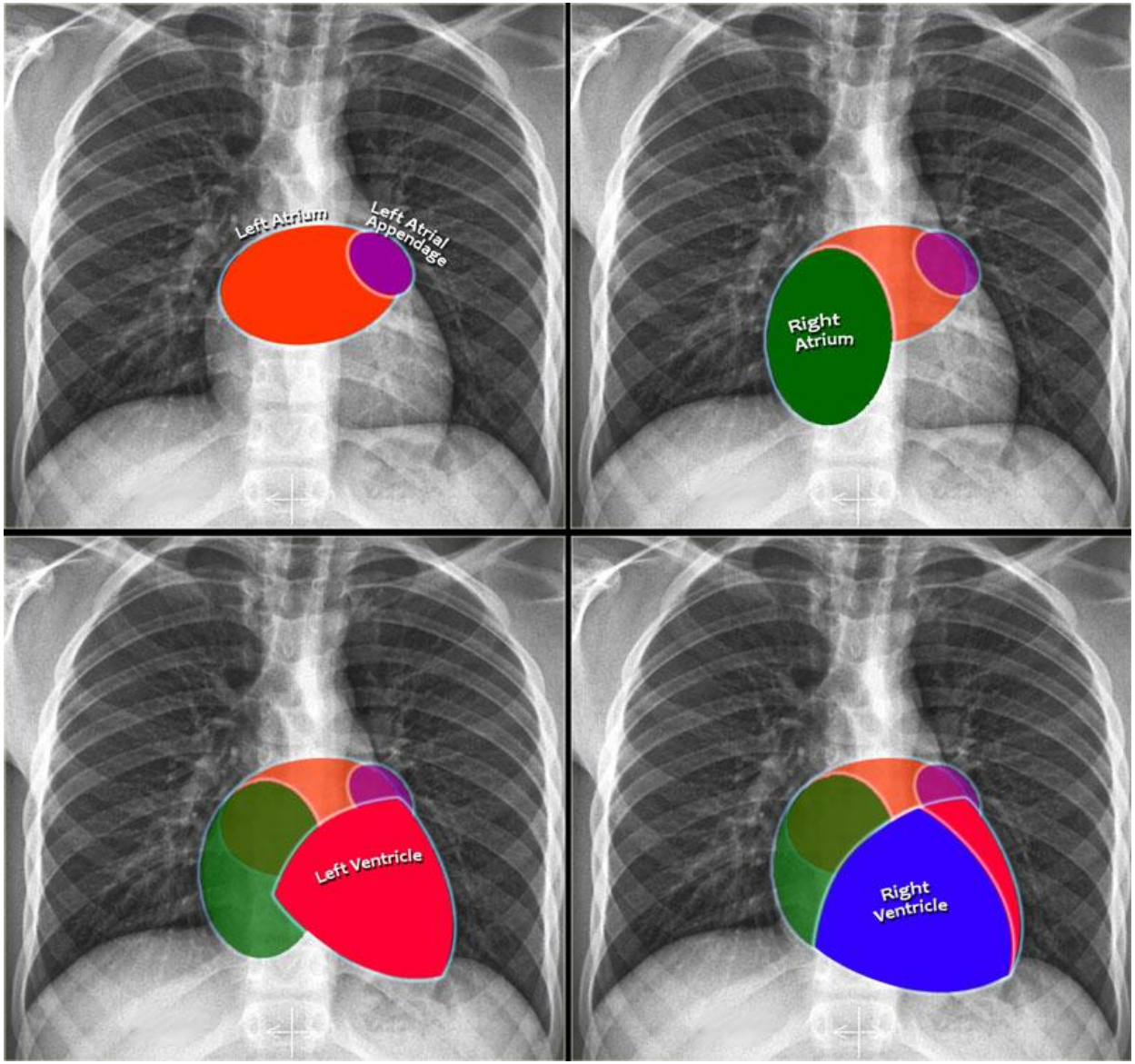
- Serbest hava/pnömoperiton
- elavasyon
  - Subdiyafragmatik sıvı,
  - Kitle,
  - Abse ya da
  - Organomegaliyi

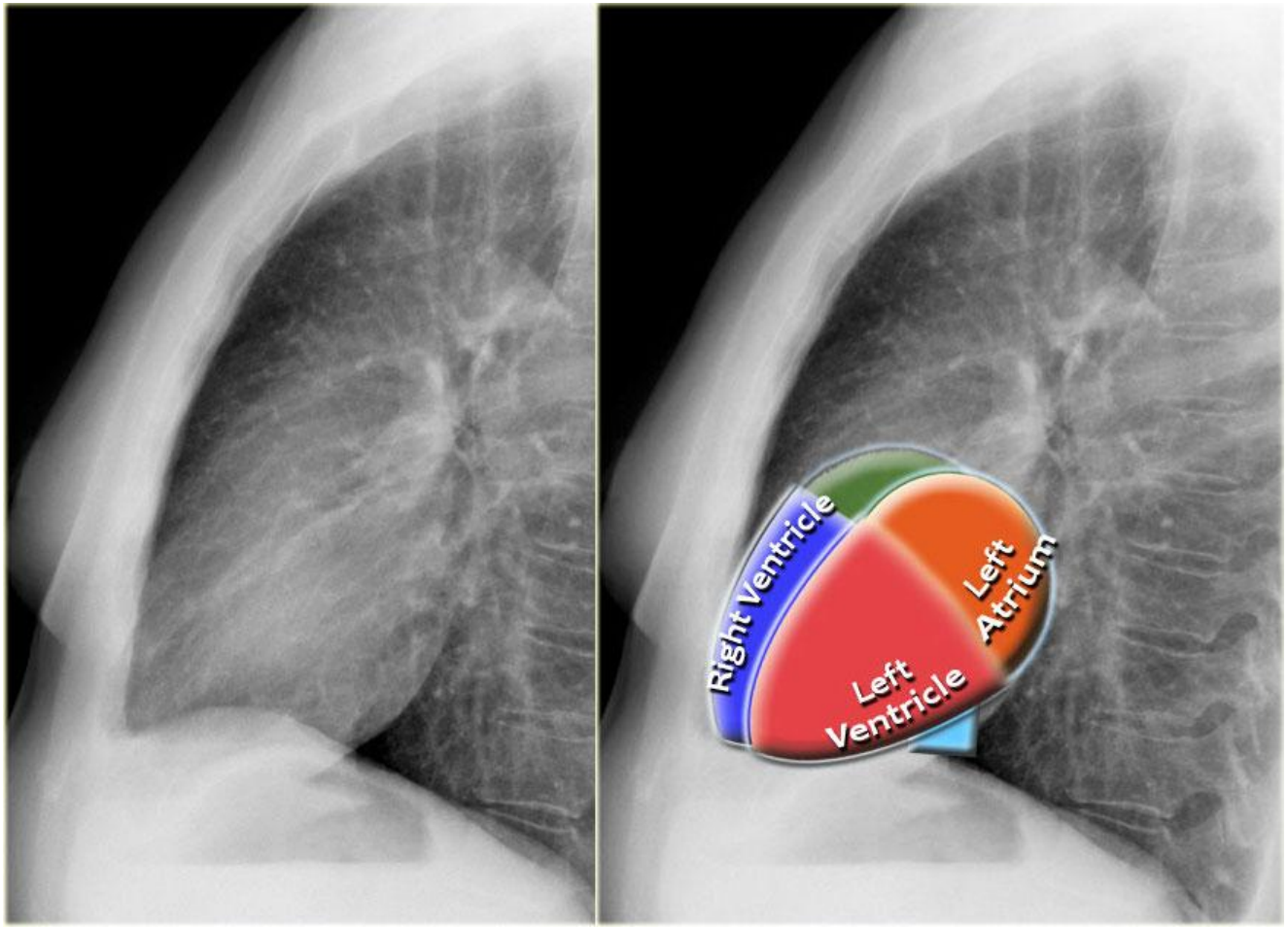


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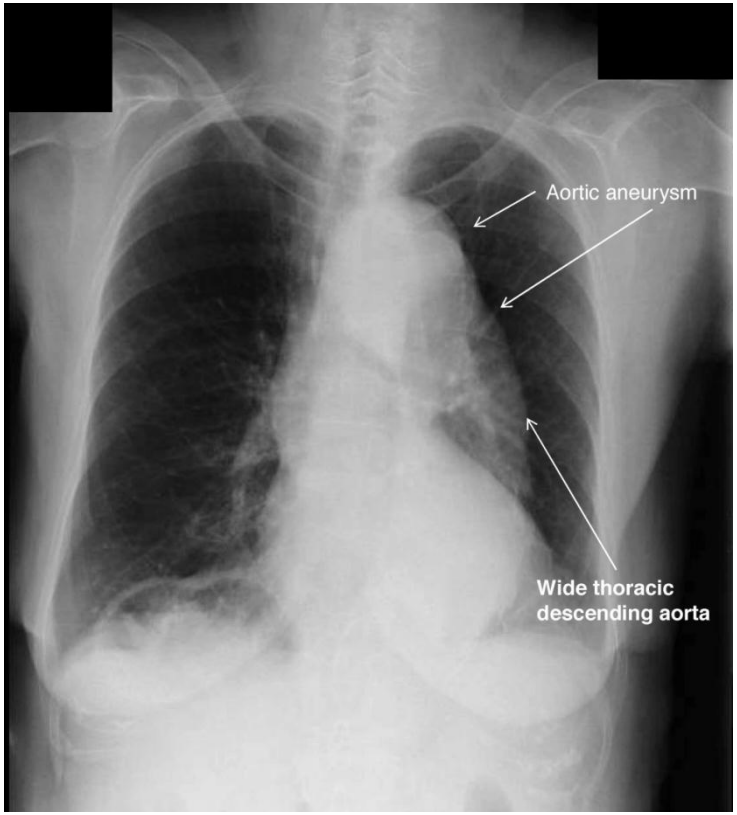

Vena Cava Superior
Assendan Aorta
Sağ atriyum
Dessendan Aorta
Pulmoner arter
Sol atriyum appendik
Sol ventrikül


Left Atrium
Left Atrial Appendage
Right Atrium
Left Ventricle
Right Ventricle

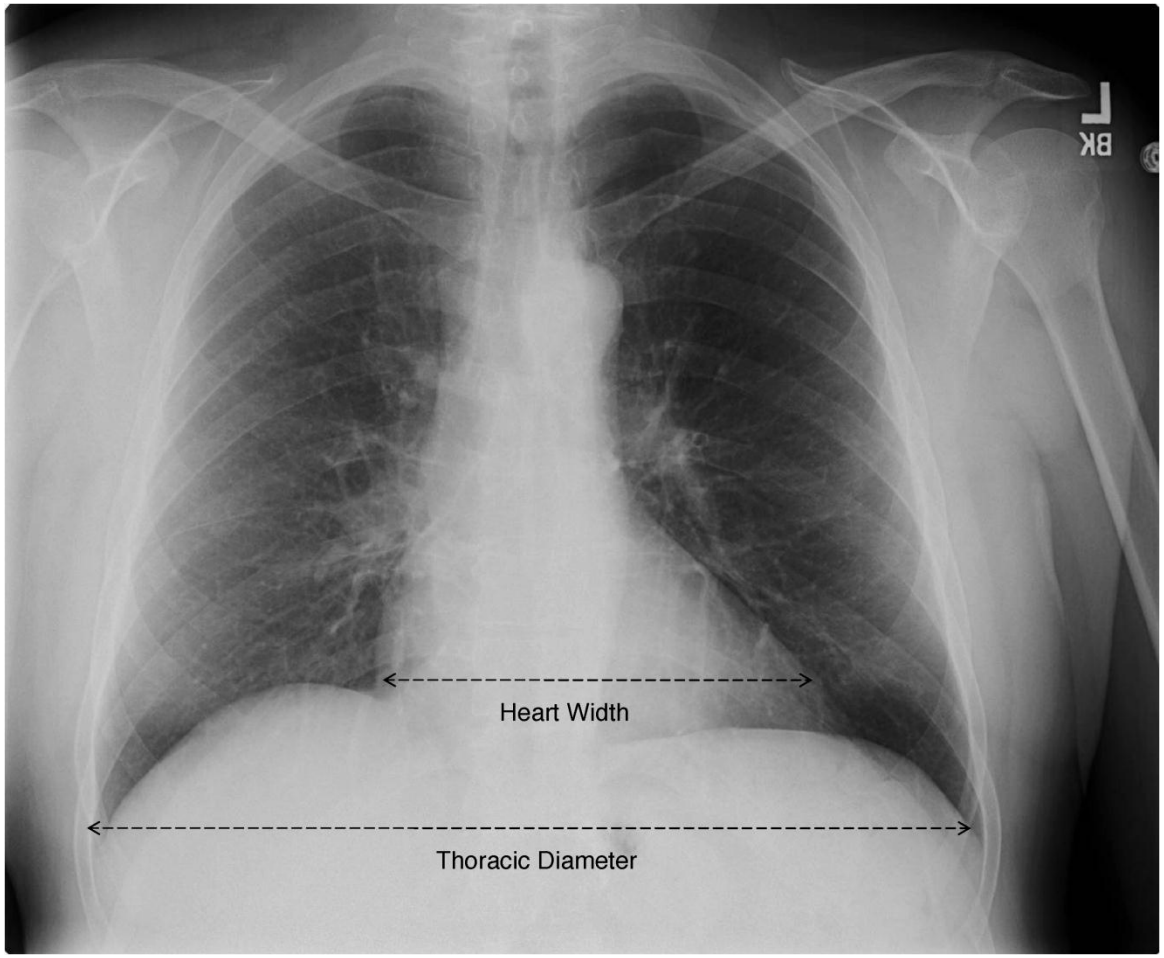

Right Ventricle
Left Atrium
Left Ventricle

# Mediastinal genişleme

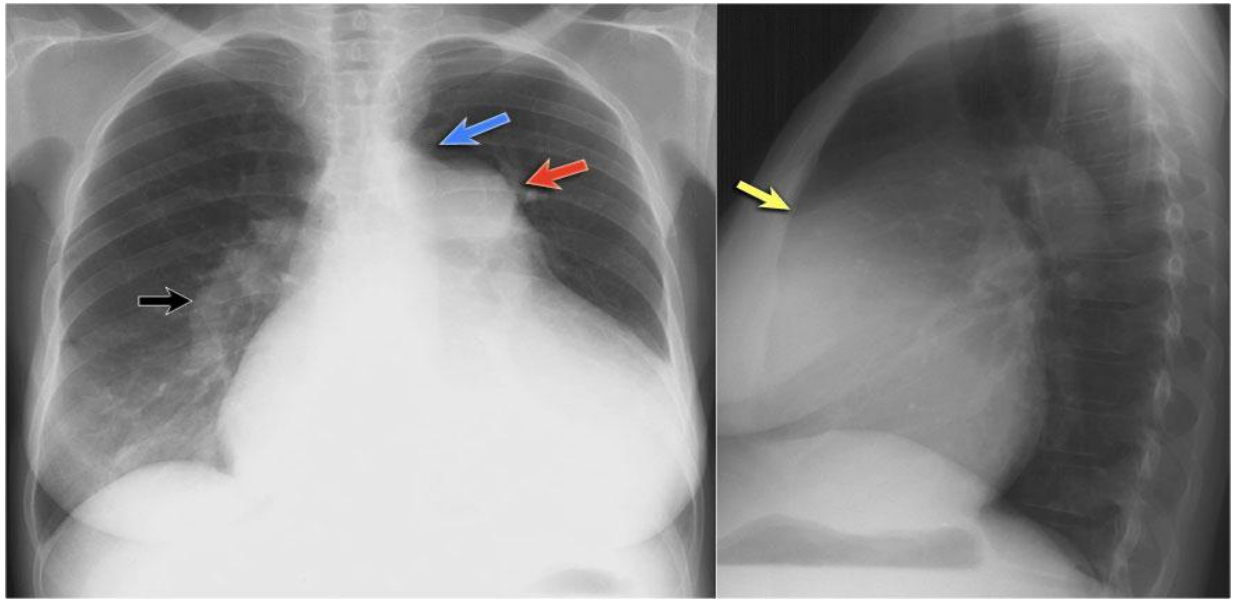
- Karinada 8 cm veya torasik çapın %25 den büyük olması
- Fokal kitleler genellikle keskin ve konvex mediastinal genişlemeye neden olur.
- İnfiltratlar hemoraji veya bakteriyel enfeksiyonda yaygın ve diffüz olur.



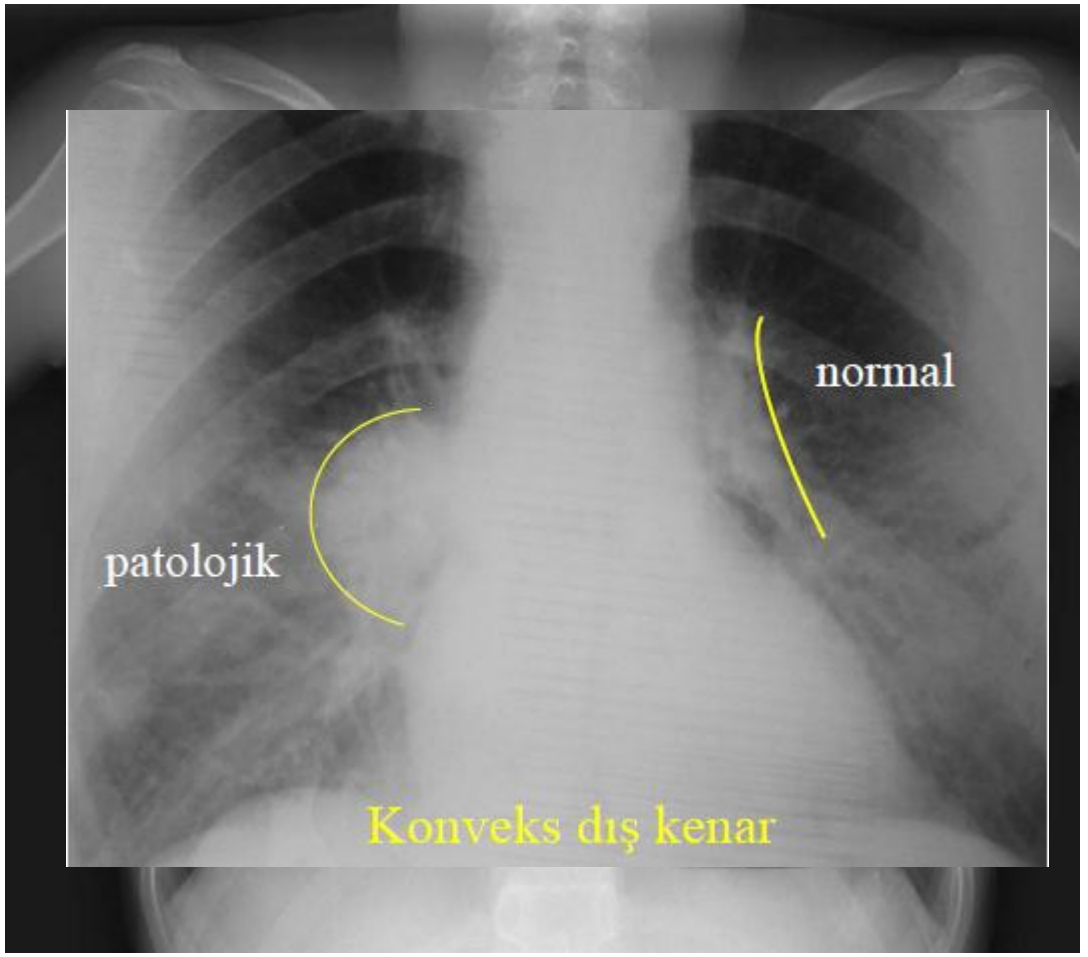
**KTİ**



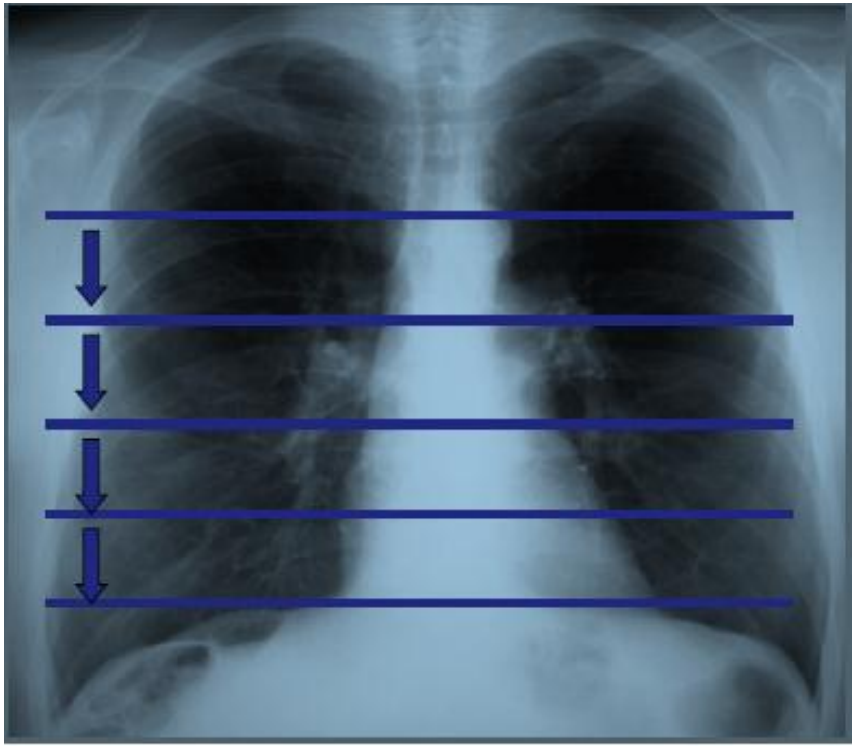
**Sağ ventrikül hipertrofisi önplanda**



# Hilus



# Akciğer parankimi

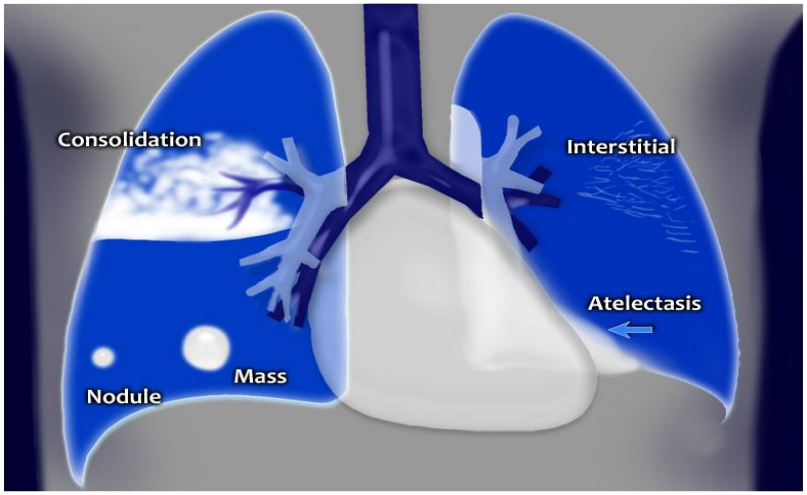




## Akciğer parankimi

- **Vasküler yapı**
  - ~2cm plevral yüzeyden (~3cm apeksler), damar yapısı bazis> apeks
- **Akciğer alanı**
  - Anormal opasite/lusensi,
  - Homojen
- Konsolidasyon, nodül-kitle, atelektazi,eksüdasyon,yabancı cisim,plevral sıvı, silüet belirtisi

  - Nonhomojen
    - Lineer
    - Retiküler
    - Nodüler



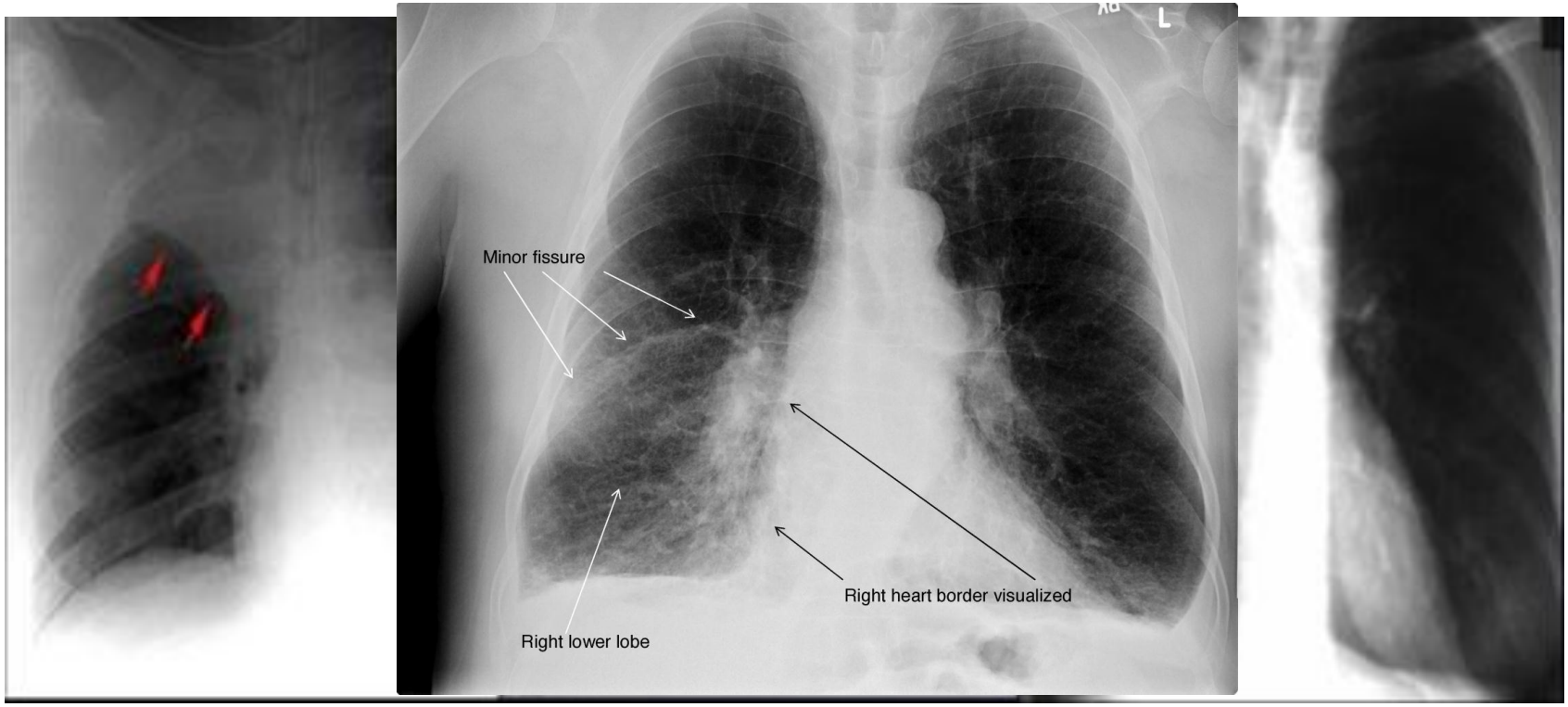

- )

# Parankimal patolojiler

- Parlaklıkartışı (radyolüsensi)
  - Damarlanma azalması (Oligemi)
  - Havalanma artışı (Hiperinfleasyon

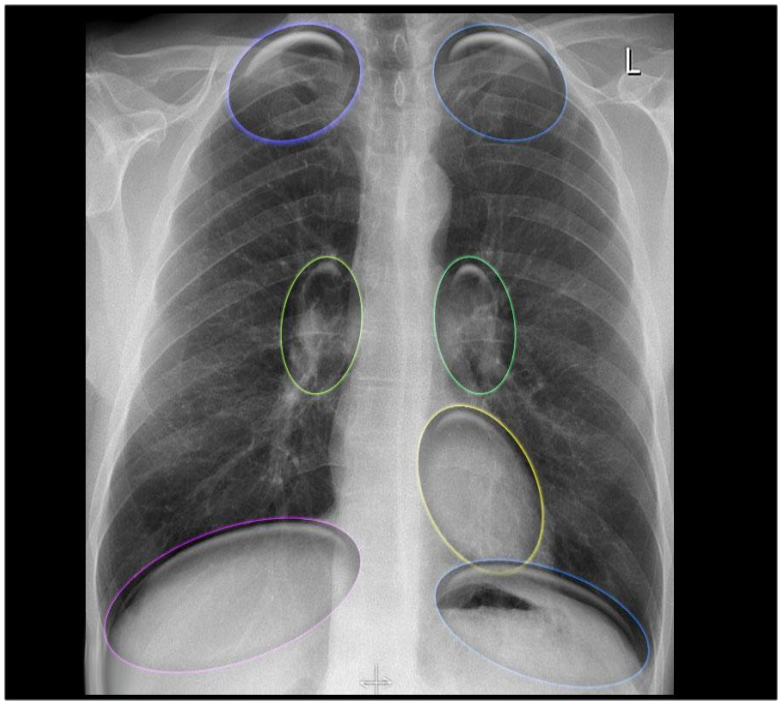
  - Fissür hatları:
    - Sağ akciğerde horizontal fissure
    - Major / oblik fissür

**Atelektazi** **Pnömoni** **Tümör**



# Dikkat !..

- Apikal alanlar
- Hilar alanlar
- Retrokardiyak alanlar
- Diafragma kubbesi altındaki alanlar




**Lezyonların kolayca gözden kaçabilir**

# Destek kataterleri, tubler, kablo ve lines

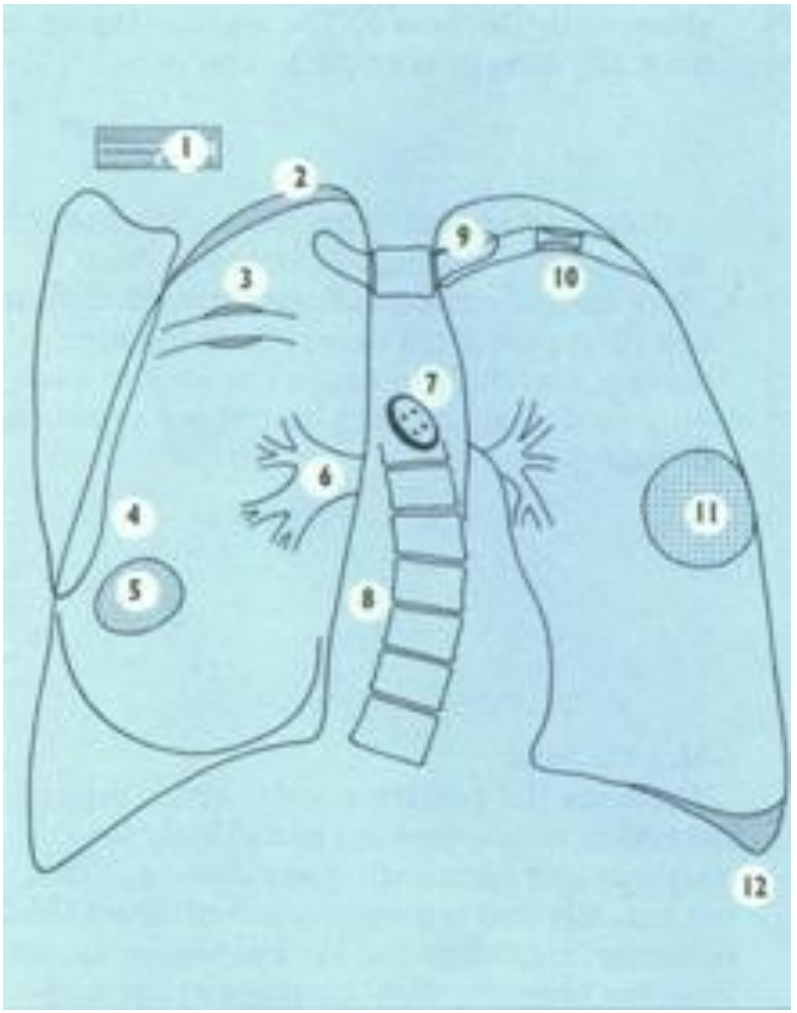
Uçlarının hangi noktada olduğu ve

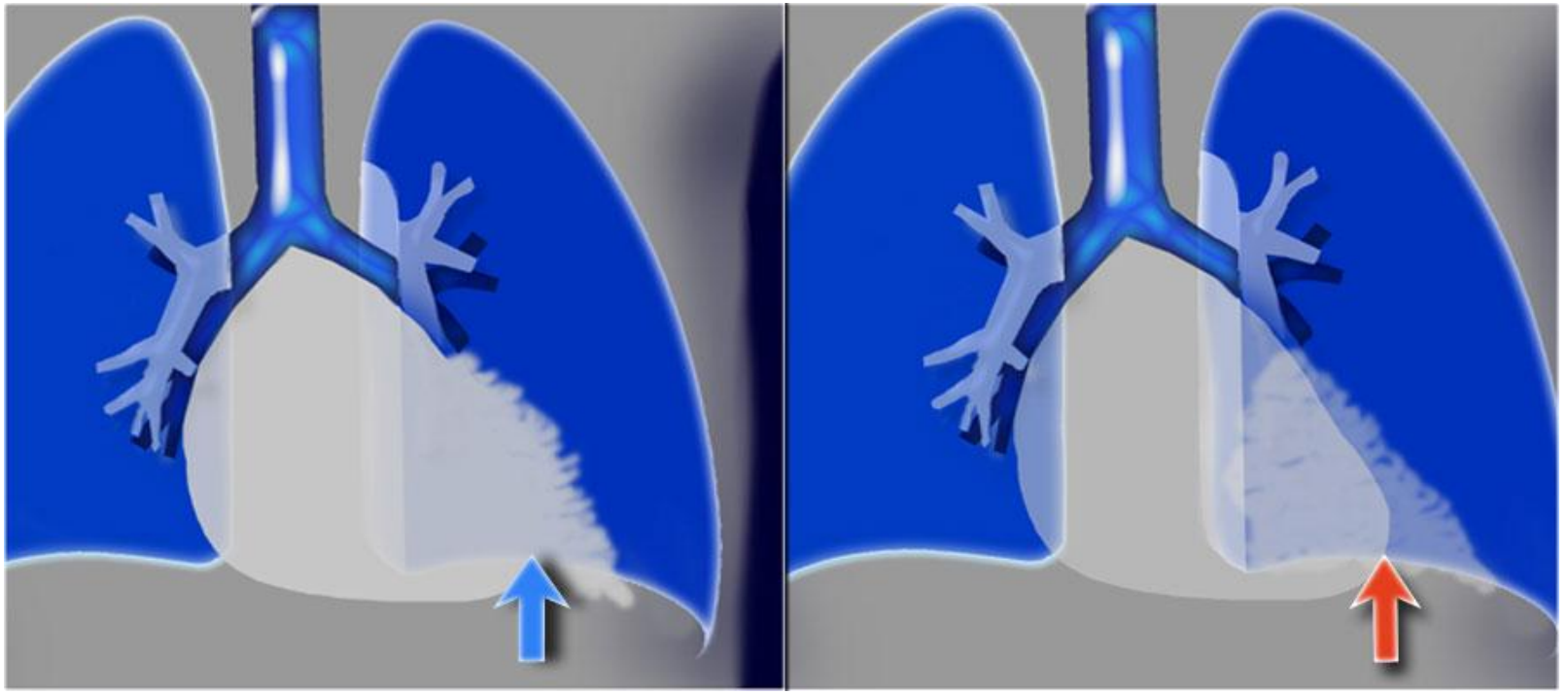
uygun şekilde yerleştirilip

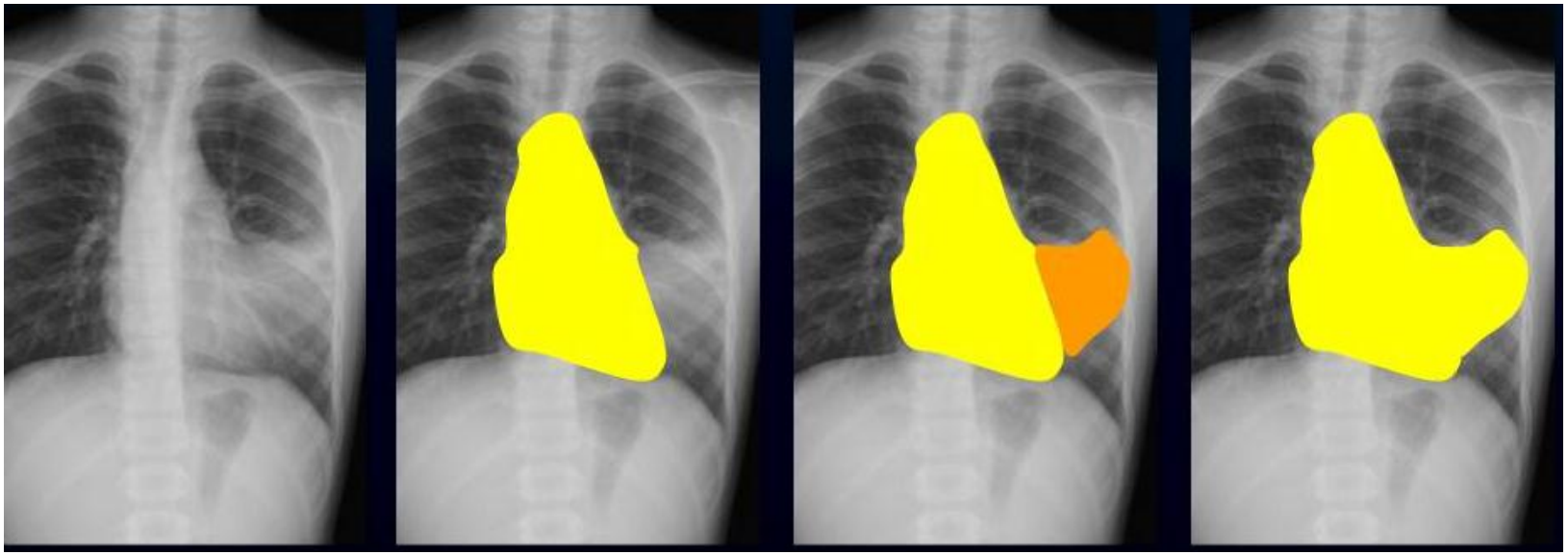
yerleştirilmediği mutlaka belirtilmelidir

# Sık yapılan hatalar

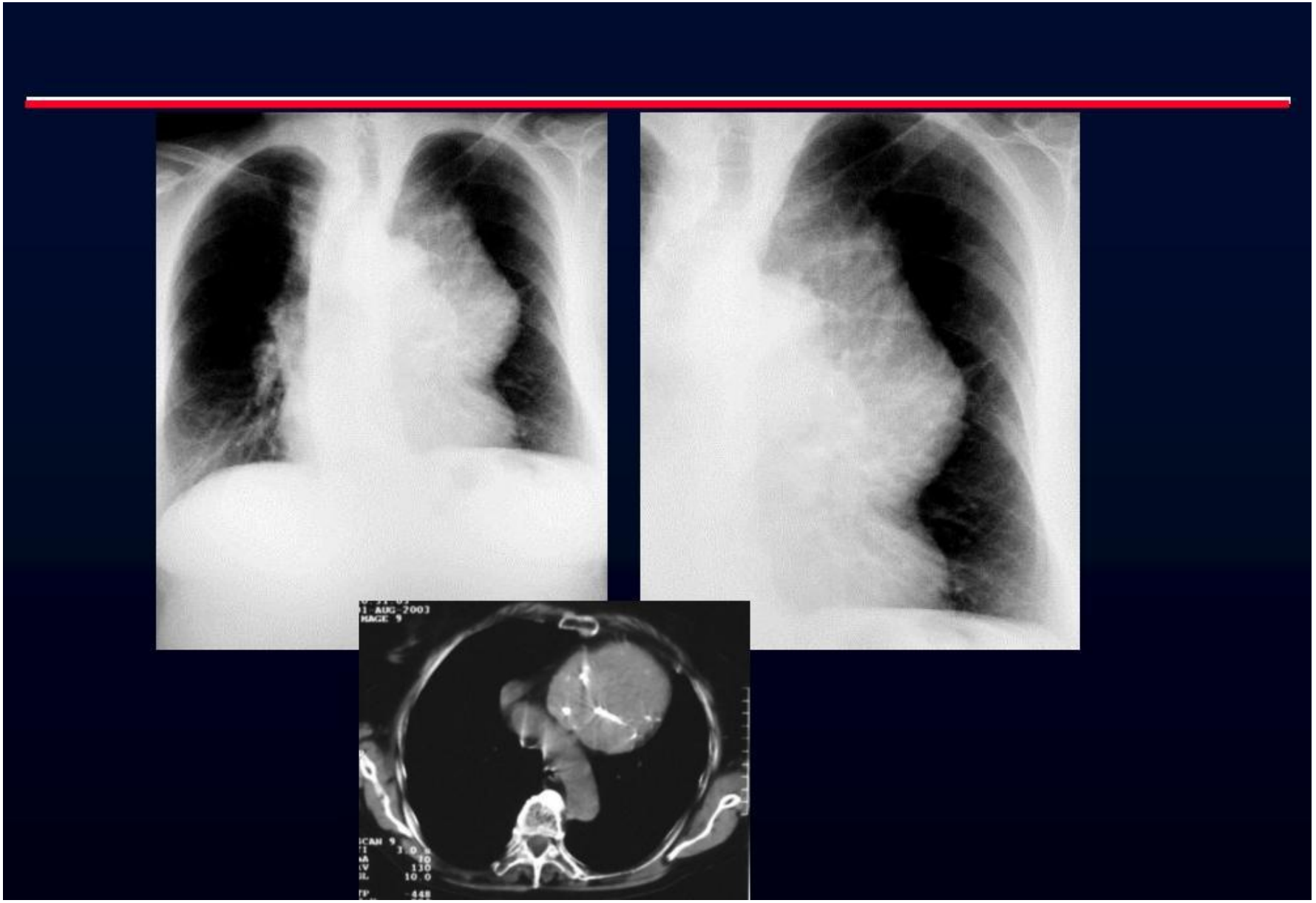
1) Yanlış hasta ya da yanlış tarih
2) Gözden kaçmış küçük apikal pnömotoraks
3) Pulmonel veya plevral kitle veya kosta tümörü olarak yanlış tanıya neden olan eski kot fraktürü etrafında kallus
4) Pnomaotoraks veya pleural kitle gibi algılanan skupula medial kenarı
5) Cilt lezyonları(sebaseöz kist veya lipom) intratorasik lezyon olarak algılanabilir.
6) Amfizamatöz hastalarda pulmoner hipertansiyondan dolayı pulmonel arterler tümör veya kitle olarak algılanabilir
7) Düğme ve ciltteki cisimler yanlışlıkla intratorasik lezyonlar olarak algılanabilir
8) Skolyoz ve kifoskolyoz gözden kaçabilir
9) Kostatransvers eklemler yanlışlıkla fraktür olarak algılanabilir
10) Kostalardaki litik ve sklerotik lezyonlar sıklıkla gözden kaçırılır
11) Büyük periferik büller yanlışlıkla pnömo toraks olarak algılanır
12) Ameliyat nedeniyle kostafirenik sinüste oluşan skarlar efüzyon olarak algılanabilir, lateral dekübit grafisi alınmalıdır.







# Hilum overlay sign



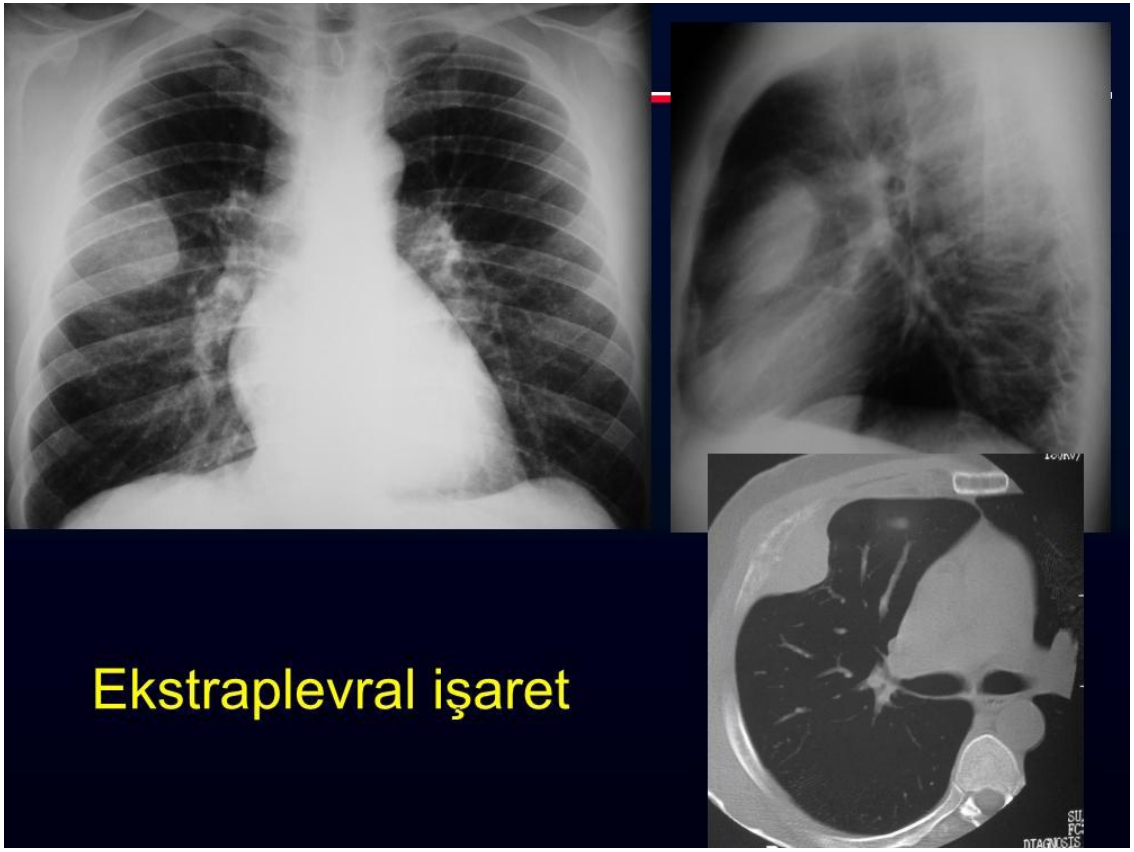
## İnkomplet sınır bulgusu

Ekstra plevral lezyonların hava

ile çevrili olmayan sınırlarının

seçilememesi

Süliet işaretiyle anolog



## Servikotorasik isaret

Klavikula

medyasti

•Keskin s

arkada ye

Üst kontü

düzeyind

medyaste

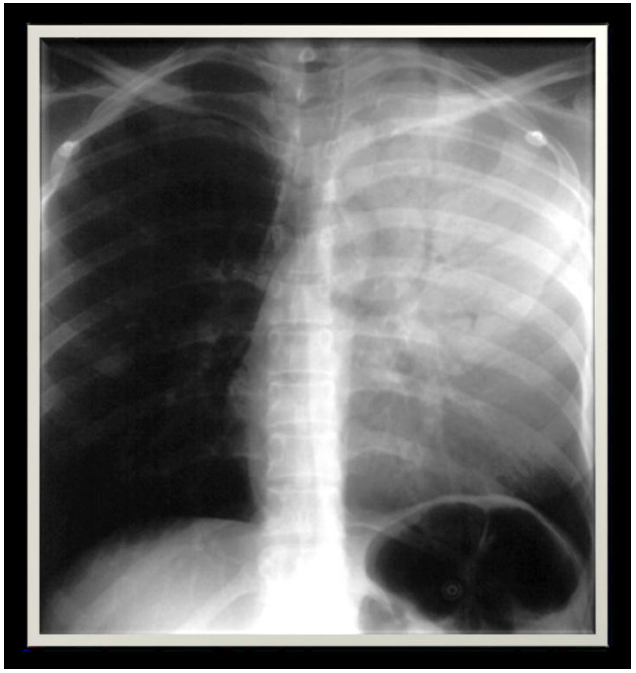
uzanım

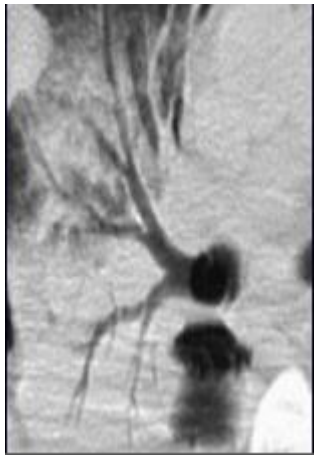


# Hava-bronkogramı

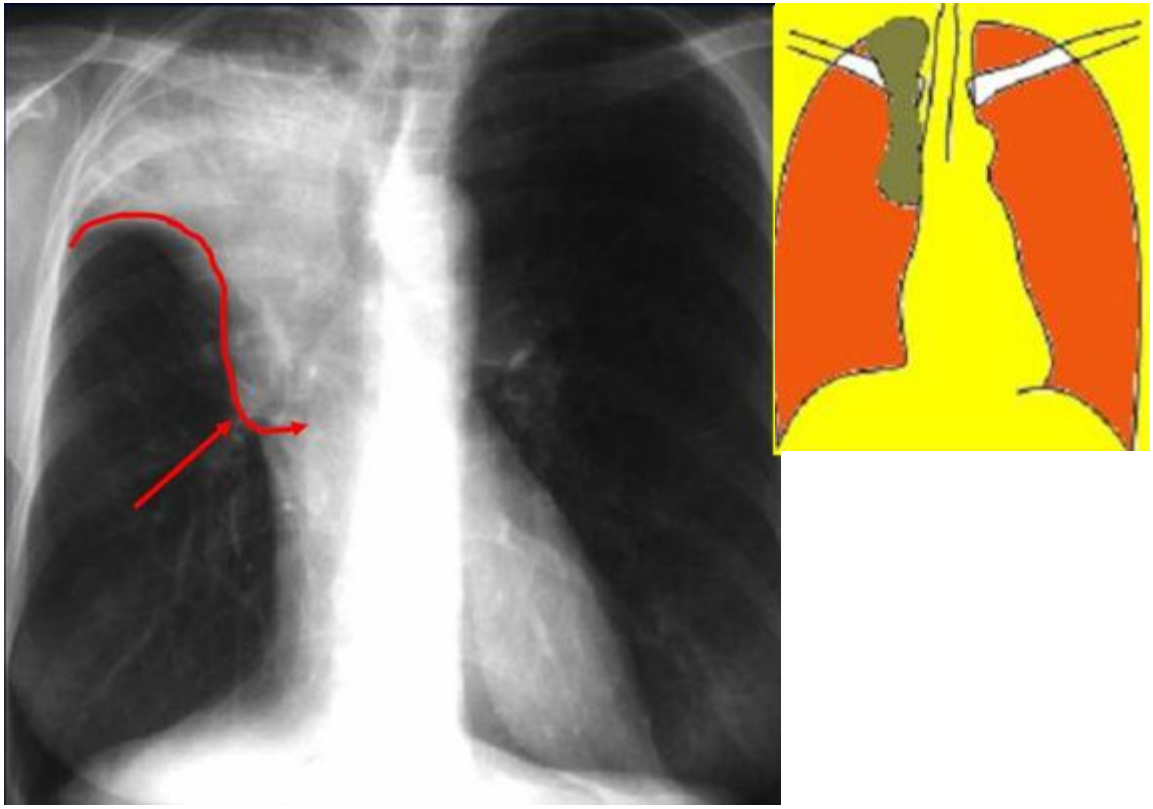
Hastalığın Akciğer parankiminde ve bronşların açık olduğunu gösterir

- **Pulmonel ödem,**
- **konsolidasyon,**
- **hemoraji,**
- **atelaktazi,**
- **interstisyel Akciğer hastalığı,**





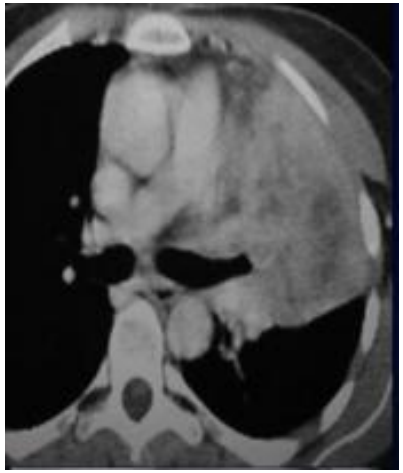
# **Golden sign:** fissürde depresyon, santral konveksite



# Luftsichel sign
## (Hava orağı)





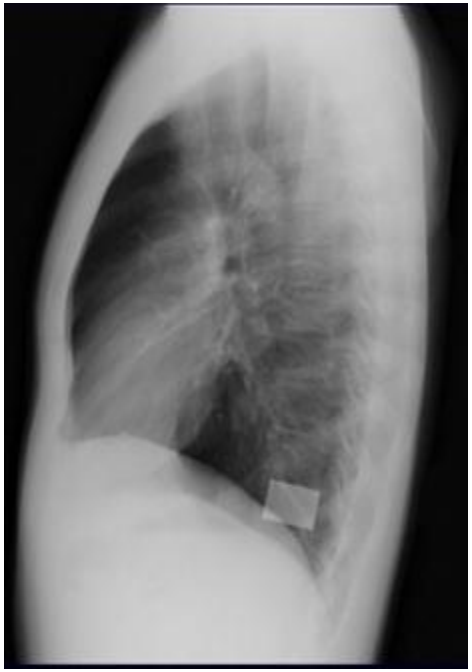


## Omurga işareti
## Spin sign

Normalde aşağıya doğru artması gereken vertebral lüsensinin kesintiye uğraması



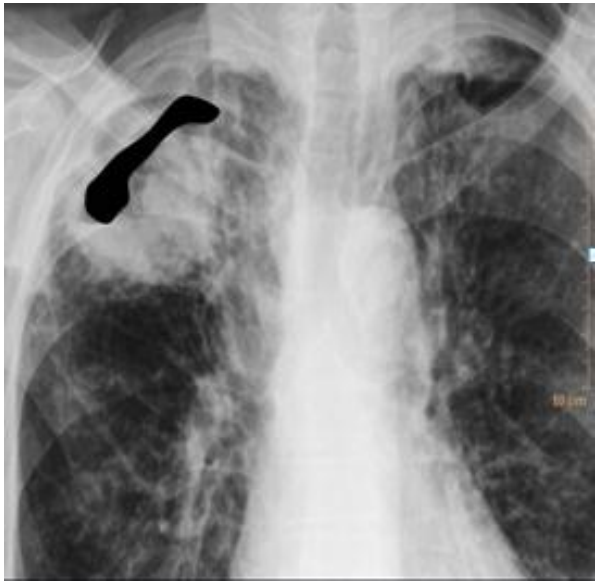




## Hava-hilal (menüsküs) işareti

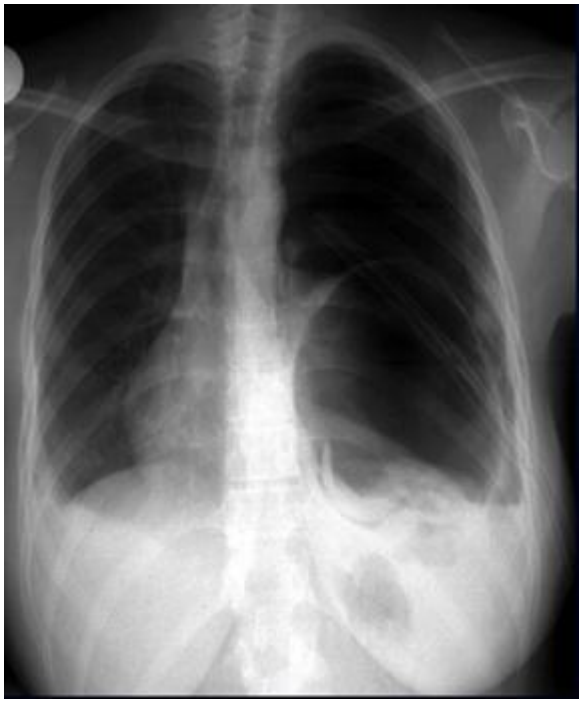
- Mantar topu( aspergilloma-miçetoma)
- **İnvaziv aspergilloma**







## Nilüfer işareti

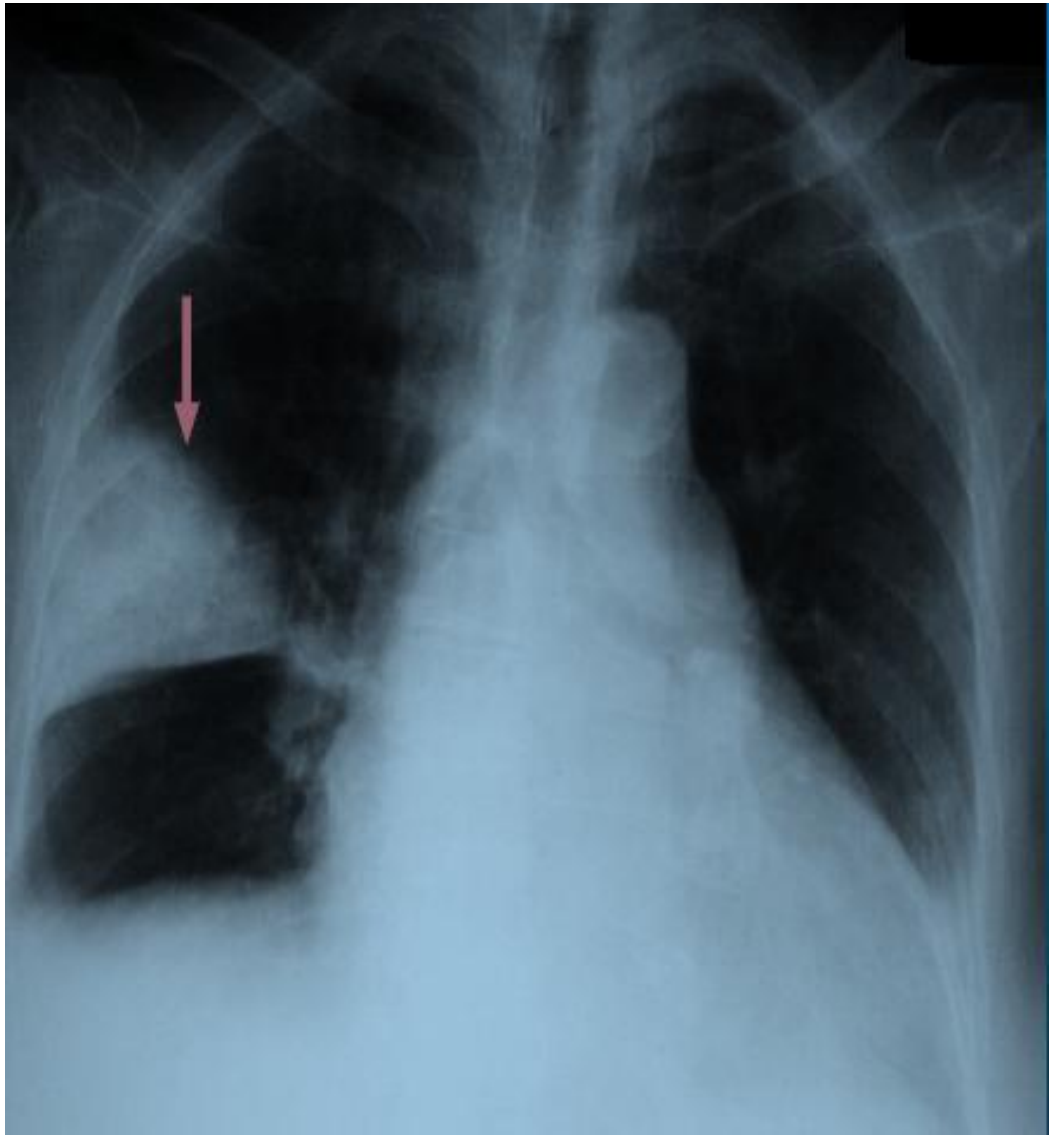






## Hampton Hörgücü

•Plevra tabanlı tepesi kesilmiş üçgen tabanlı opasite



# Pulmonel embolideki bulgular



Westermark işareti:
Fokal oligemi



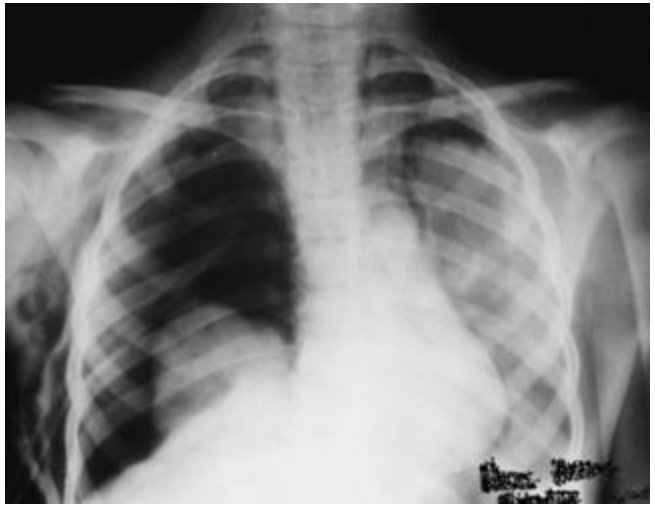
Fleishner işareti:
Diskoid atelektazi



Genişlemiş pulmoner arter

## Düşmüş akciğer bulgusu:
## Bronş rüptürü

•%80 karinaya 2.5 cm mesafede

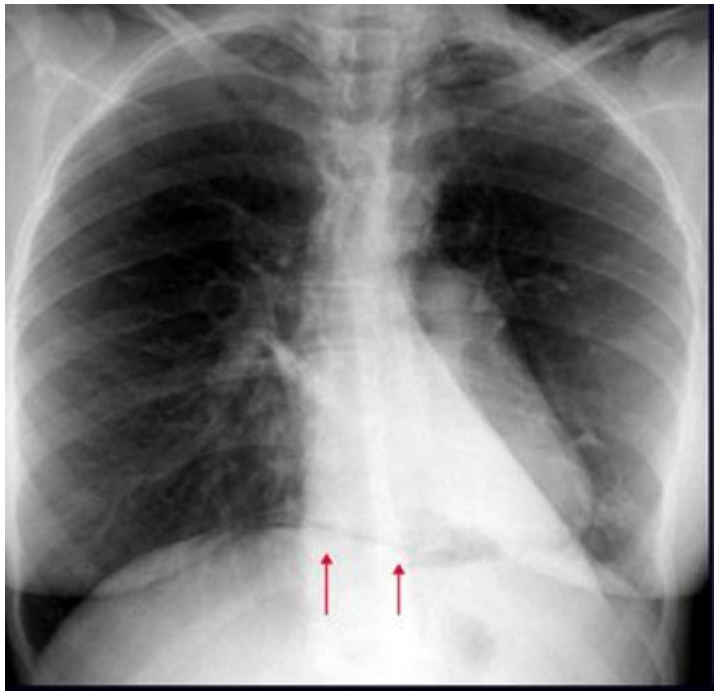


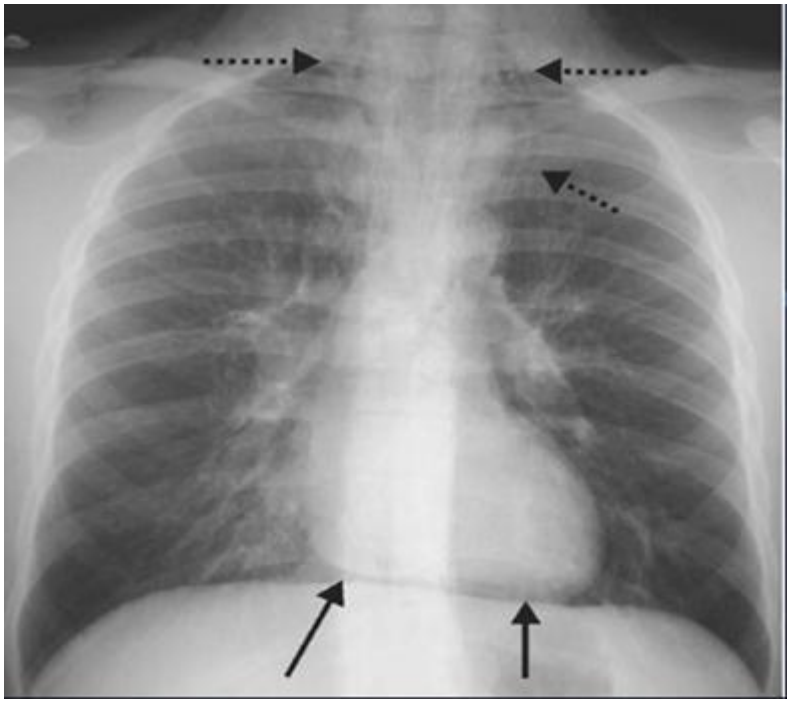


**Arter çevresinde hava bulgusu:**
**Pnömomedyasten**

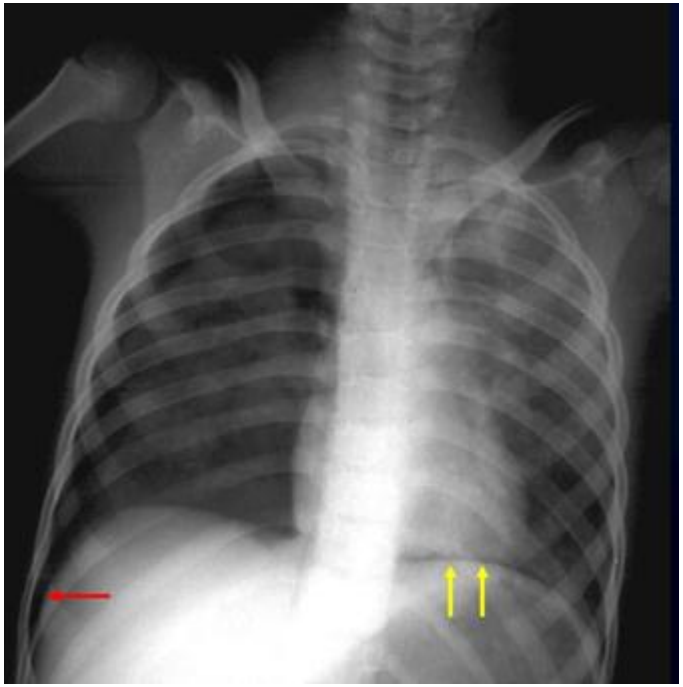


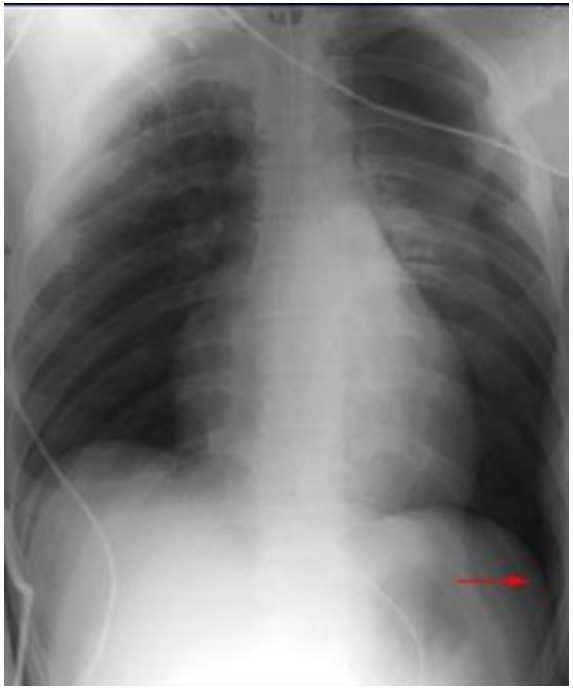
**Devamlı diyafram bulgusu:**
**Pnömomedyasten**





**Derin sulkus bulgusu:**
subpulmonik pnömotoraks



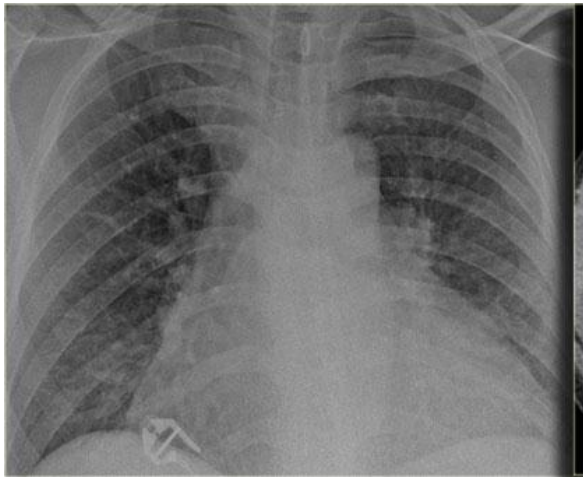


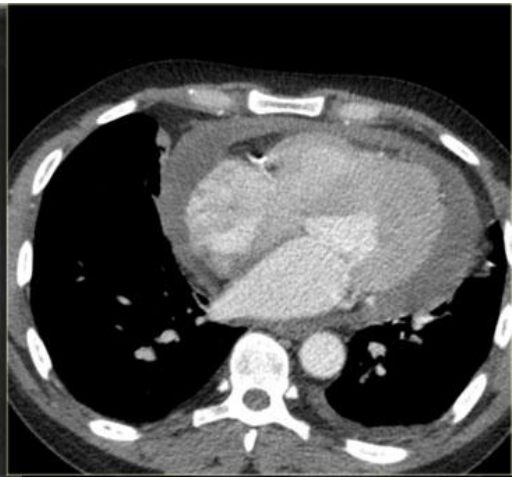
## Çadır manzarası (Su torbası

•KTİ artmış, yükseklik artmamış (üst mediyasten düzleşmiş)





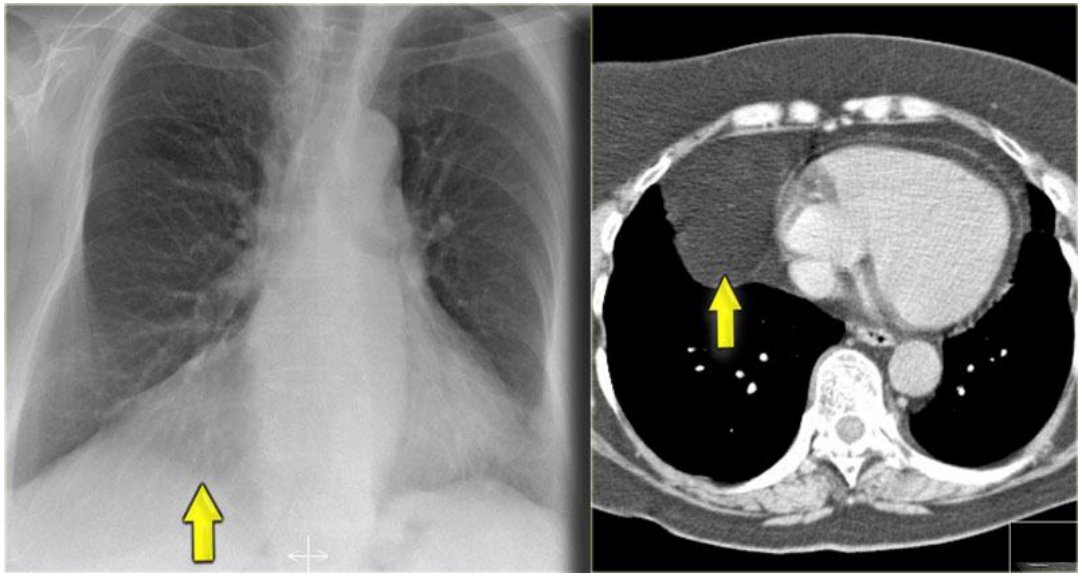




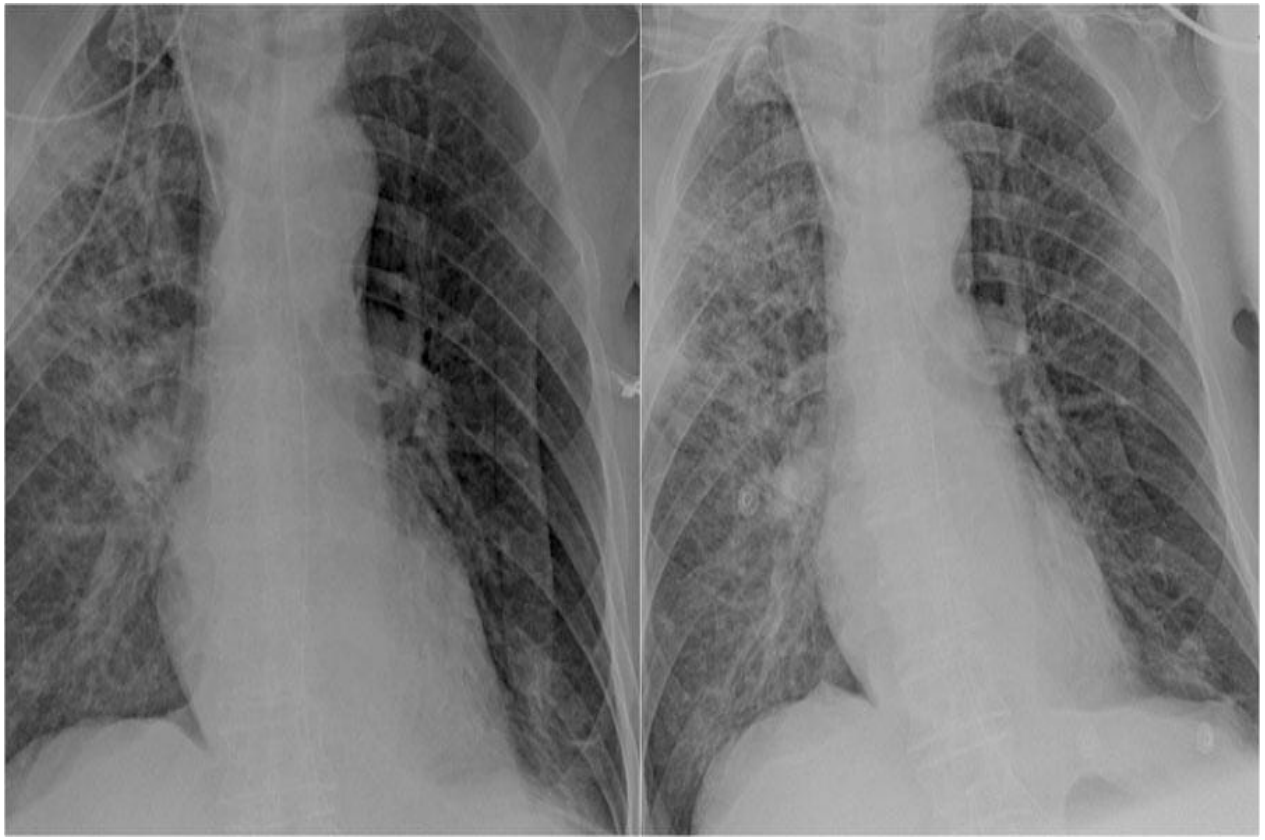
# Yağ yastığı işareti

Benign process

Ağrı yapabilir



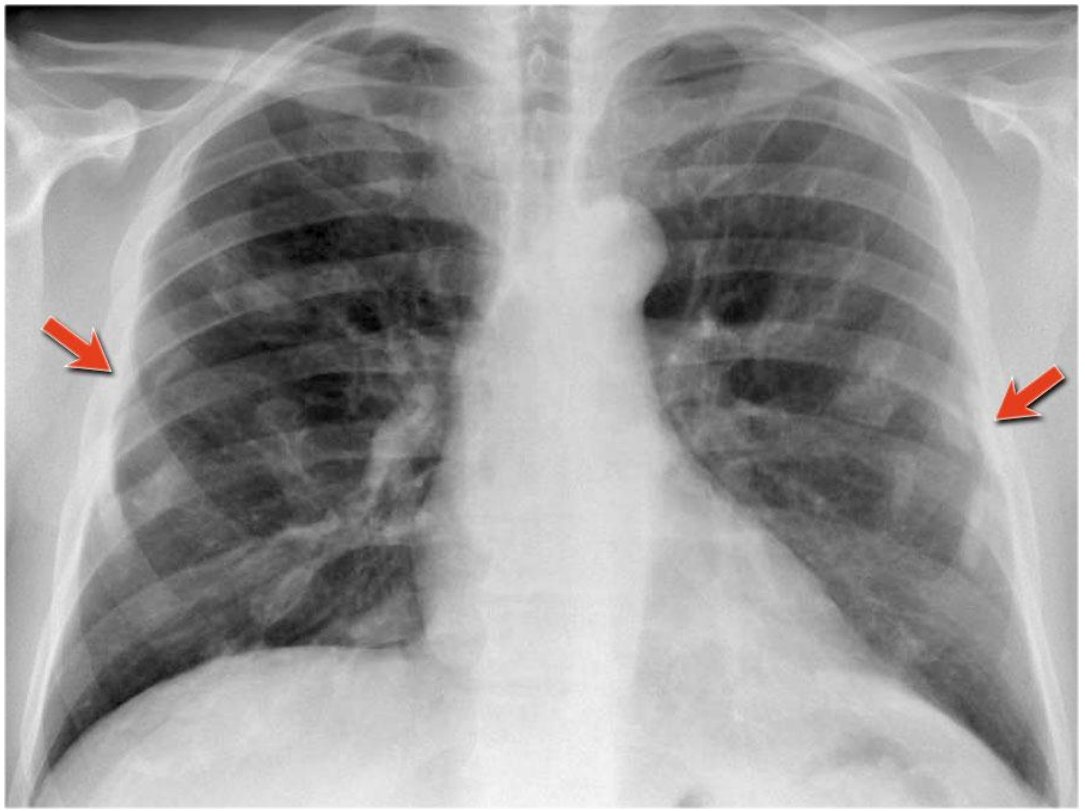
## Cilt katlantısı



## Plevral plak ve

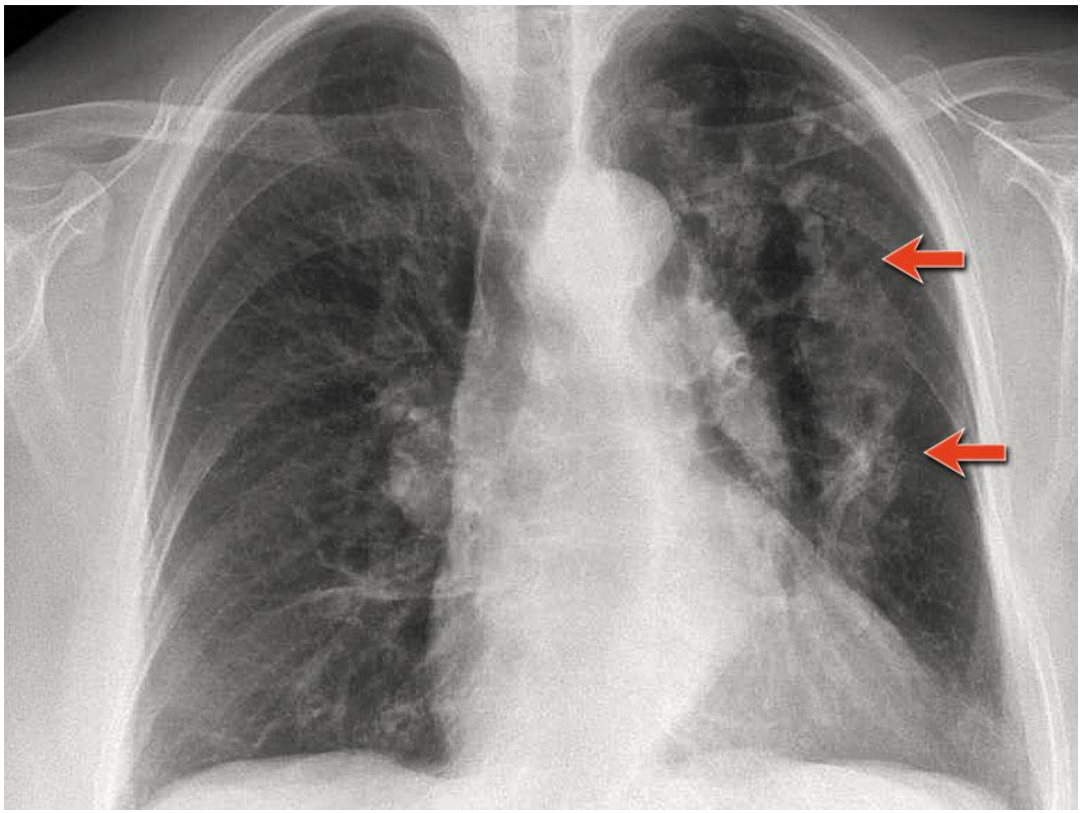
Düzensiz şekilli

Aspestoz..

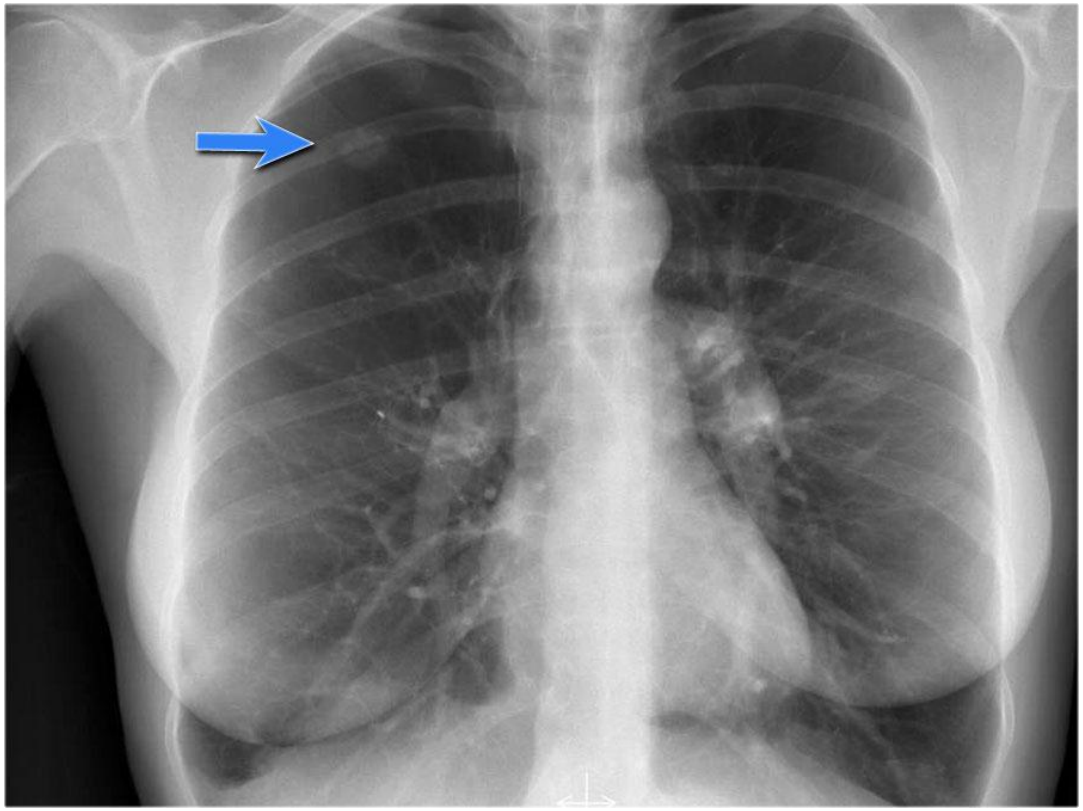


## Plevral kalsifikasyonlar

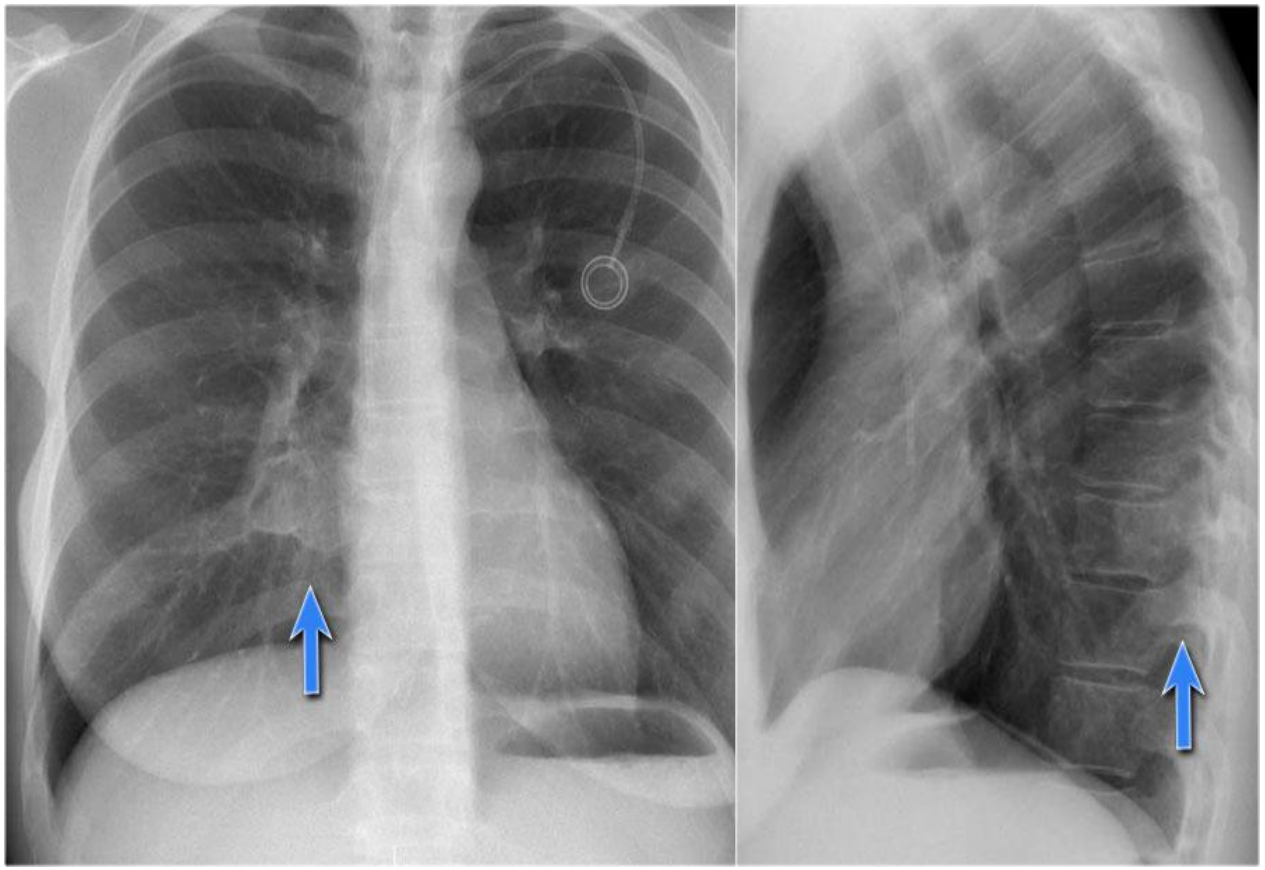
- Tbc
- Ampiyem
- Hemorajik



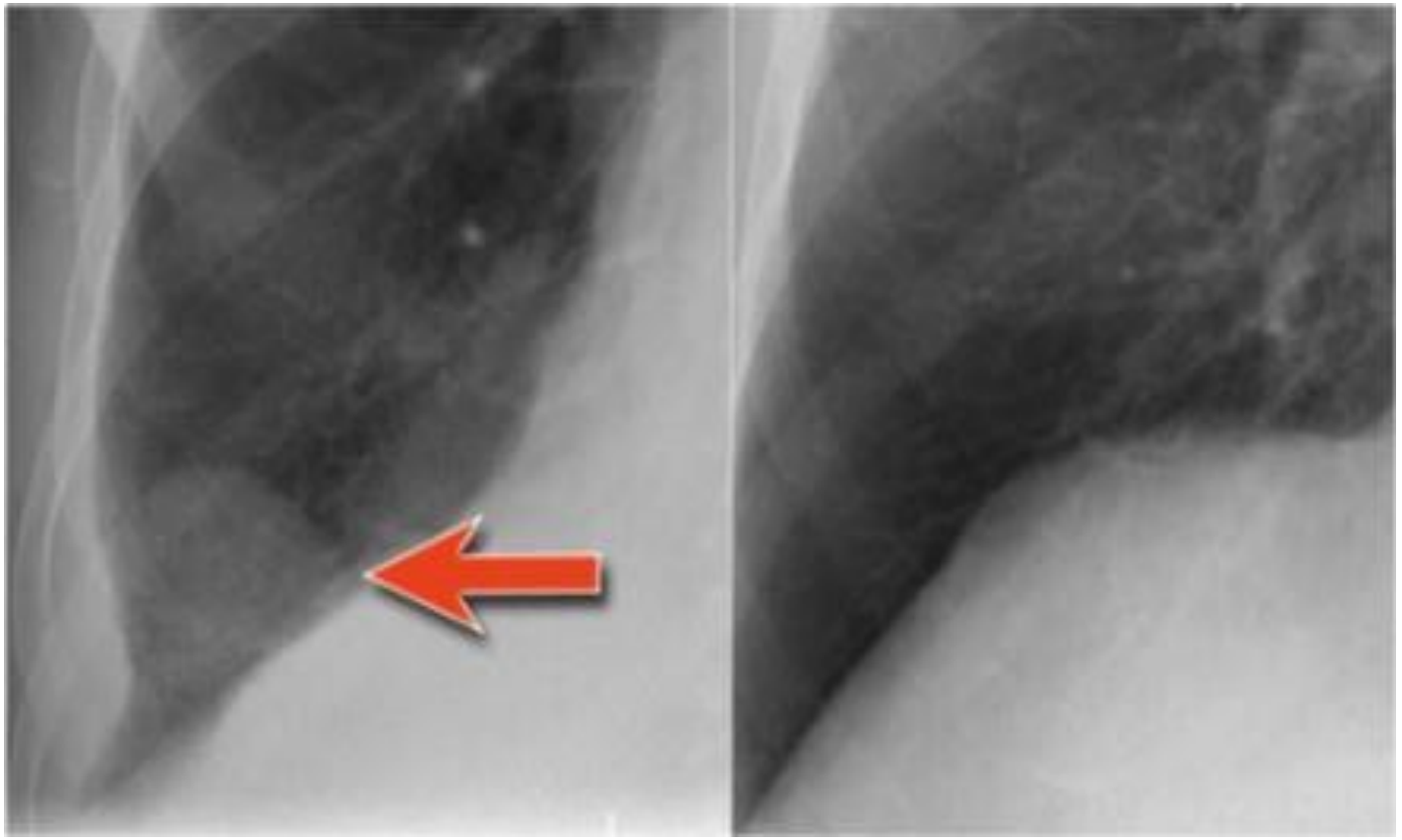
# Kostada kallus



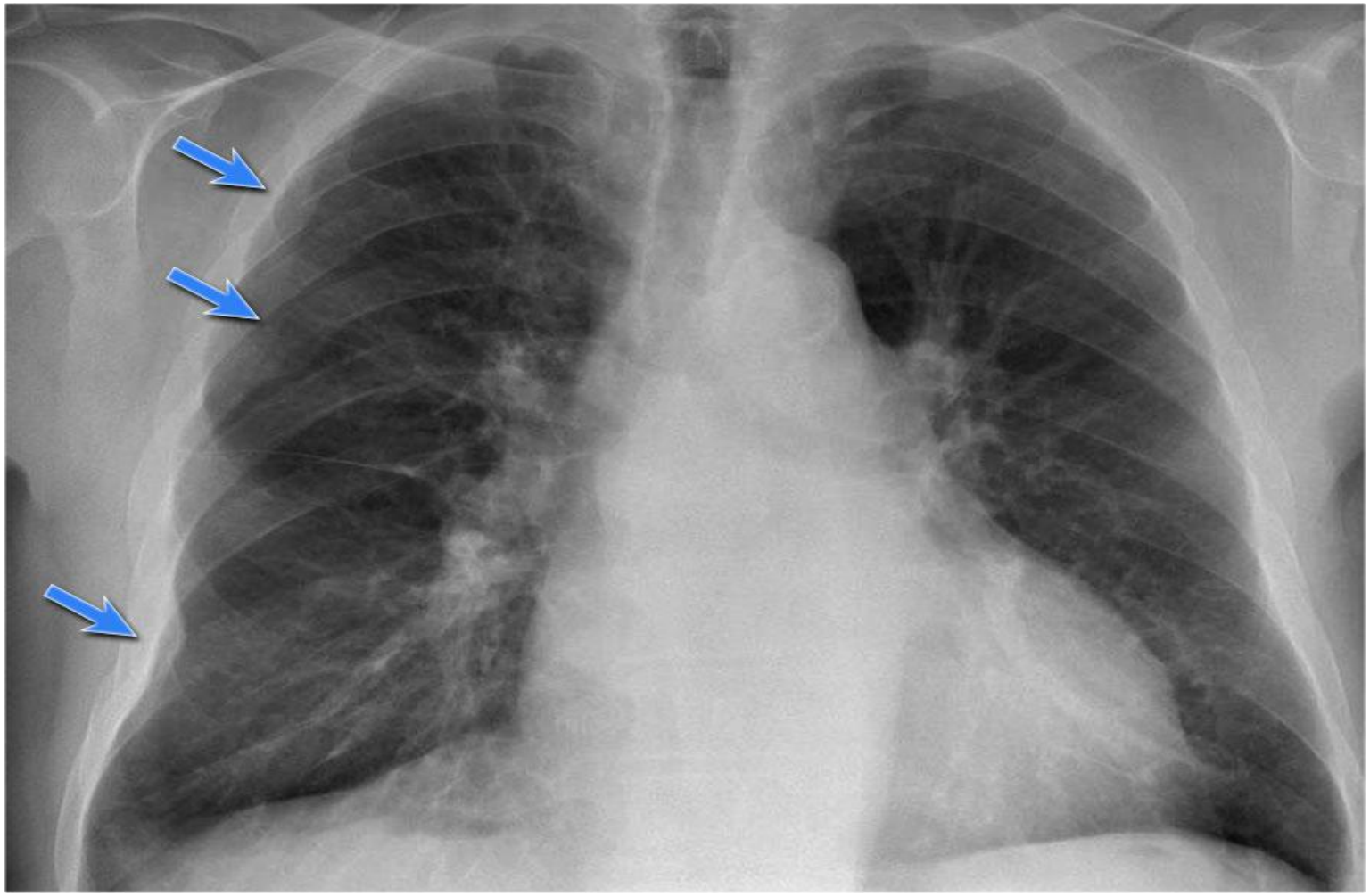
## Kosta metastazı



## Travmatik plevral hematom



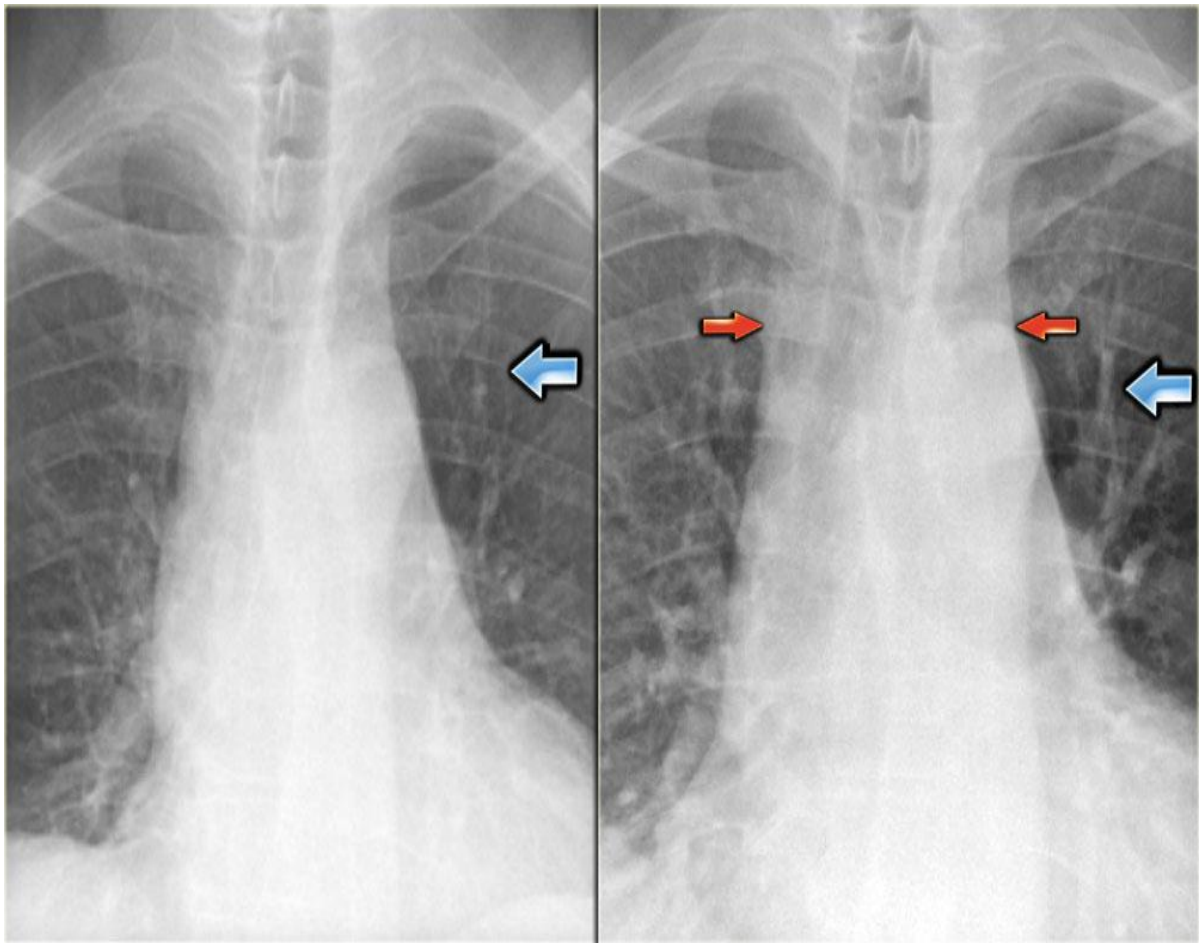
**Kot fraktürü**



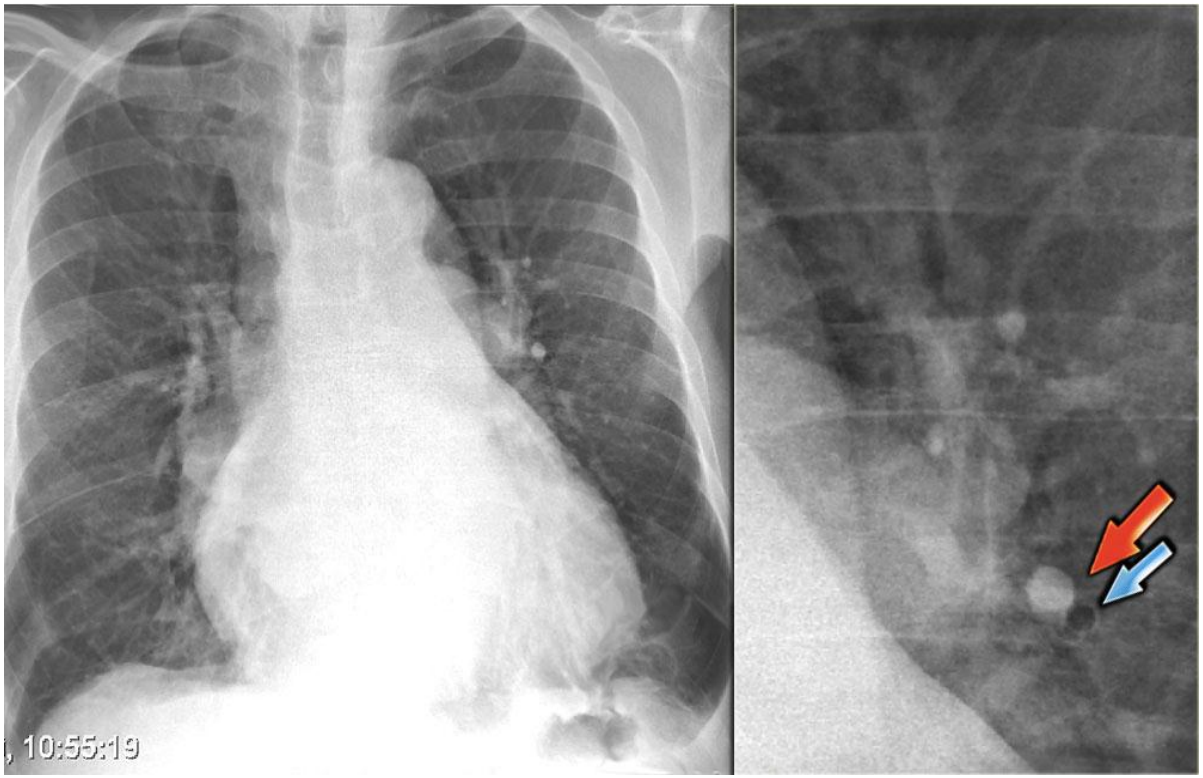
# Kalp yetmezliği

## evre I

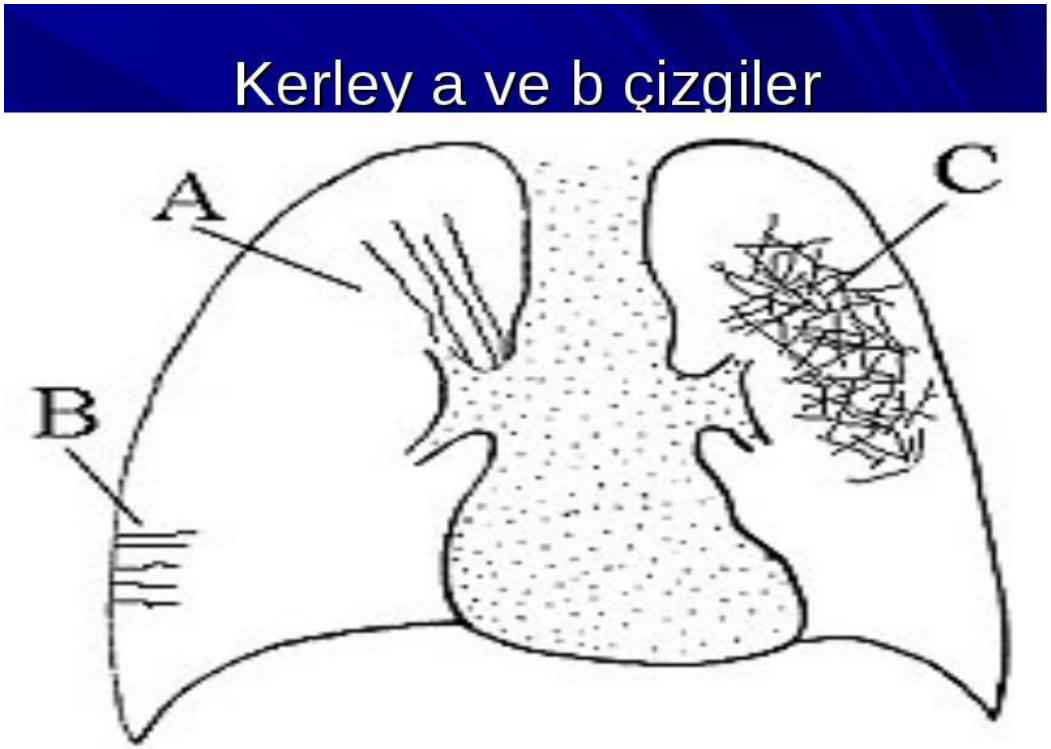
Sefalizasyon



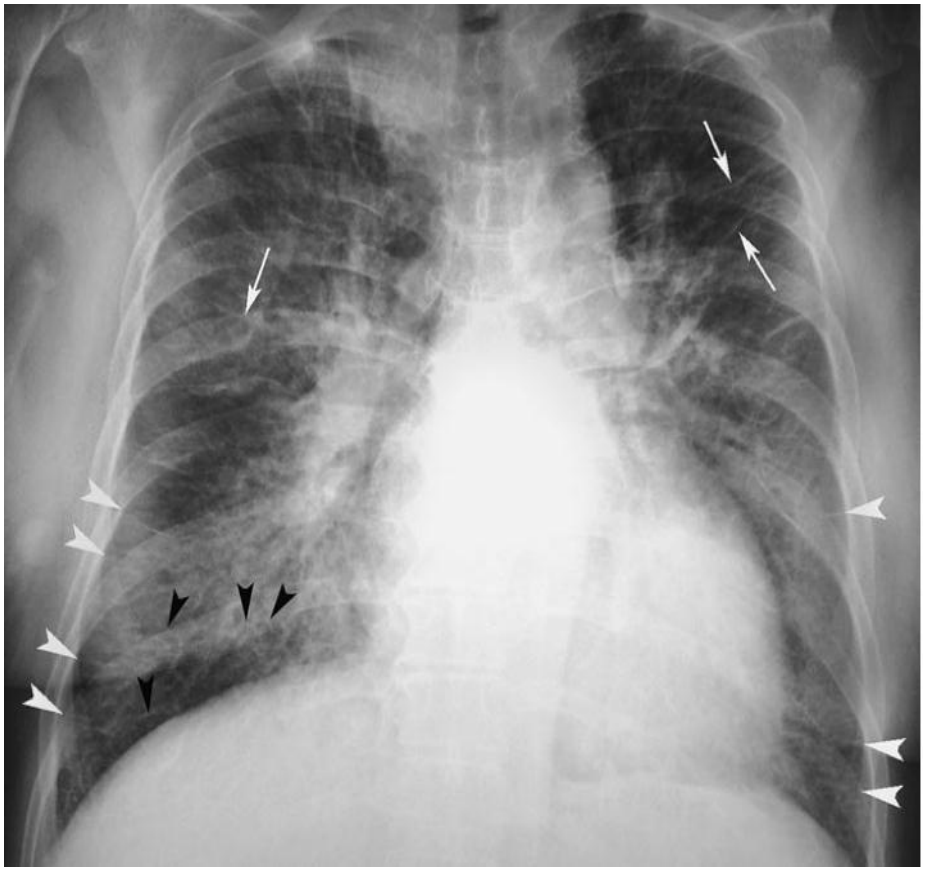
Arter bronş oranı



**Evre II**



**Evre II**



## evre III

Alveolar ödem

