

KARNATAKA RADIOLOGY EDUCATION PROGRAM

X Ray Chest Basic approach



PA view

On the PA chest-film it is important to examine all the areas where the lung borders the diaphragm, the heart and other mediastinal structures.

At these borders lung-soft tissue interfaces are seen resulting in a:

- Line or stripe for instance the right para tracheal stripe.
- Silhouette for instance the normal silhouette of the aortic knob or left ventricle

These lines and silhouettes are useful localizers of disease, because they can be displaced or obscured with loss of the normal silhouette. This is called the silhouette sign, which we will discuss later.

The paraspinal line may be displaced by a paravertebral abscess, hemorrhage due to a fracture or extravertebral extension of a neoplasm.

Widening of the paratracheal line (> 2-3mm) may be due to lymphadenopathy, pleural thickening, hemorrhage or fluid overload and heart failure.

Displacement of the para-aortic line can be due to elongation of the aorta, aneurysm, dissection and rupture.

The anterior and posterior junction lines are formed where the upper lobes join anteriorly and posteriorly. These are usely not well seen and we will not discuss them.

An important mediastinal-lung interface to look for is the azygoesophageal line or recess (arrow).



Lateral view

On a normal lateral view the contours of the heart are visible and the IVC is seen entering the right atrium.

The retrosternal space contains air and should be radiolucent down to the level where the right ventricle borders the sternum (small black arrow).

Any radiopacity in this upper retrosternal area is suspective of a process in the anterior mediastinum or upper lobes of the lungs.

As you go from superior to inferior over the vertebral bodies they should get darker, because usually there will be less soft tissue and more radiolucent lung tissue (white arrow). If this area becomes more dense, look carefully for pathology in the lower lobes.



Diaphragm

The contours of the left and right diaphragm should be visible.

The right diaphragm should be visible all the way to the anterior chest wall (red arrow). Actually we see the interface between the air in the lungs and the soft tissue structures in the abdomen.

The left diaphragm can only be seen to a point where it borders the heart (blue arrow). At that point the interface is lost, since the heart has the same density as the structures below the diaphragm.



Pulmonary vessels

The left main pulmonary artery (in purple) passes over the left main bronchus and is higher than the right pulmonary artery (in blue) which passes in front of the right main bronchus.



Whenever you review a chest x-ray, always use a systematic approach.

We use an inside-out approach from central to peripheral.

First the heart figure is evaluated, followed by mediastinum and hili.

Subsequently the lungs, lungborders and finally the chest wall and abdomen are examined.

You have to know the normal anatomy and variants.

Find subtle abnormalities by using the sihouette sign and mediastinal lines.

Once you see an abnormality use a pattern approach to come up with the most likely diagnosis and differential diagnosis.

Old films

It is extremely important to always compare with old films, as we will demonstrate in this case.

Actually someone said that the most important radiograph is the old film, since it gives you so much information.

For instance a lung mass, which hasn't changed in many years is not a lung cancer.

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References : <u>https://radiologyassistant.nl/</u>