KARNATAKA RADIOLOGY EDUCATION PROGRAM

Silhouette sign

The loss of the normal silhouette of a structure is called the silhouette sign.

This is an important sign, because it enables us to find subtle pathology and to locate it within the chest.

Silhouette sign is somewhat of a misnomer and in the true sense actually denotes the loss of a silhouette, thus, it is sometimes also known as loss of silhouette sign or loss of outline sign .

The differential attenuation of x-ray photons by two adjacent structures defines the silhouette, e.g. heart borders against the adjacent lung segments, and it is the pathological loss of this differentiation, which the silhouette sign refers to. In short, it denotes that a mediastinal border can only be obscured by pathology which is in direct anatomical contact.

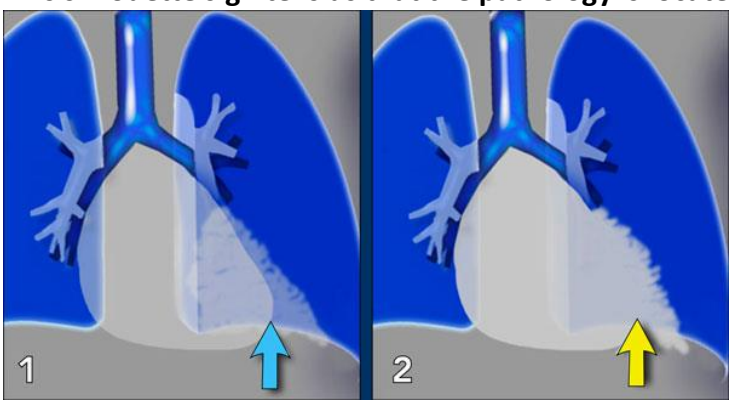
Here an illustration to explain the silhouette sign:

No silhouette sign

The heart is located anteriorly in the chest and it is bordered by the lingula of the left lung. The difference in density between the heart and the air in the lingula enables us to see the silhouette of the left ventricle.
When there is a pneumonia in the left lower lobe, which is located more posteriorly in the chest compared to the heart, the left ventricle will still be bordered by air in the lingula and we will still see the silhouette of the heart (blue arrow).

Silhouette sign

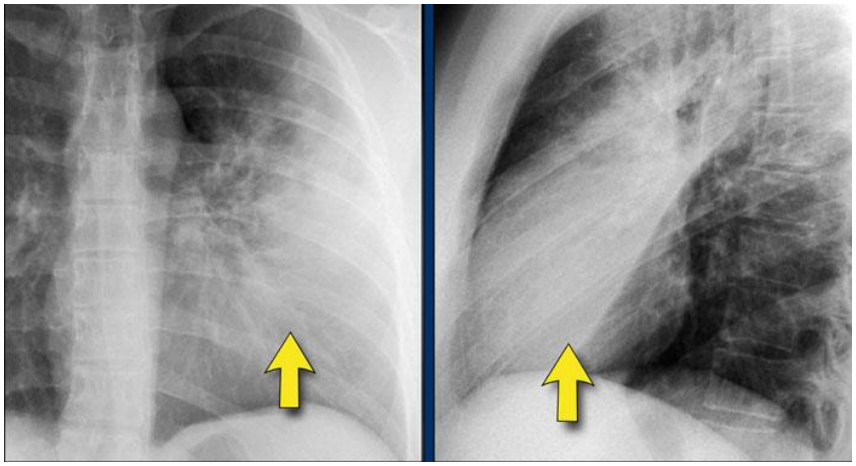
When there is a consolidation in the lingula with the same 'water density' as the heart, the normal silhouette of the left ventricle will be lost (yellow arrow).
This silhouette sign tells us that the pathology is located anteriorly in the chest.



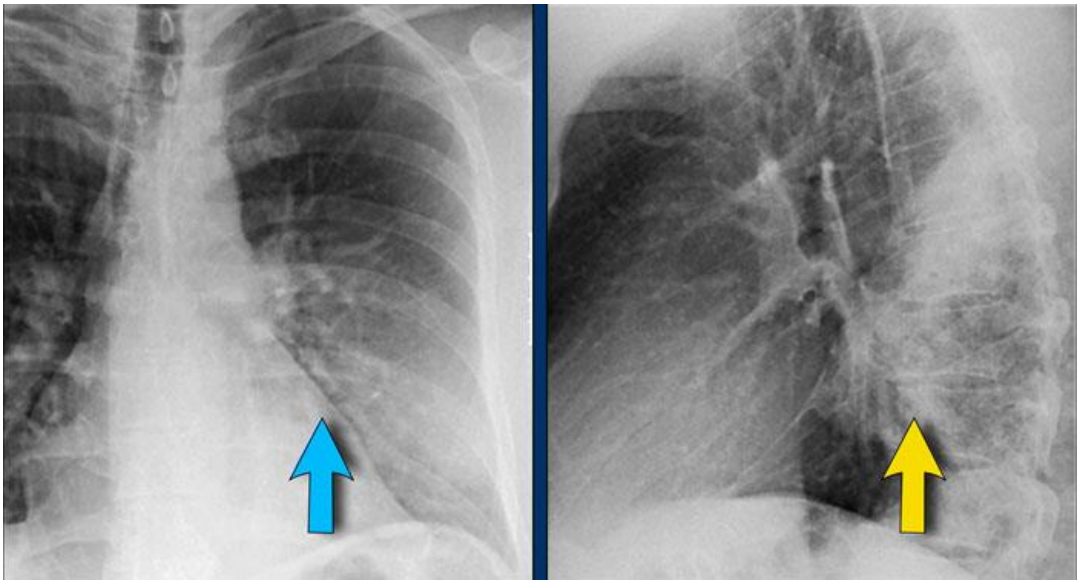
1. No silhouette sign in a consolidation located in the left lower lobe (blue arrow).
2. Silhouette sign in a consolidation in the lingula lobe (yellow arrow).

Silhouette sign (2)

The PA-film shows a silhouette sign of the left heart border.
Even without looking at the lateral film, we know, that the pathology must be located anteriorly in the left lung.
This was a consolidation due to a pneumonia caused by Streptococcus pneumonia.



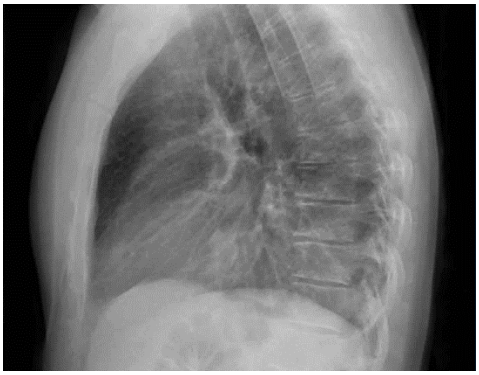
Silhouette sign (3)
Here a consolidation which is located in the left lower lobe (yellow arrow).
Notice that there is a normal silhouette of the left heart border (blue arrow).
The absence of a silhouette sign tells us that the pathology is located in the left lower lobe and not in the lingula.

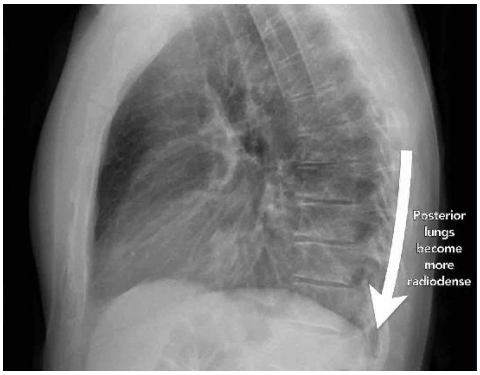


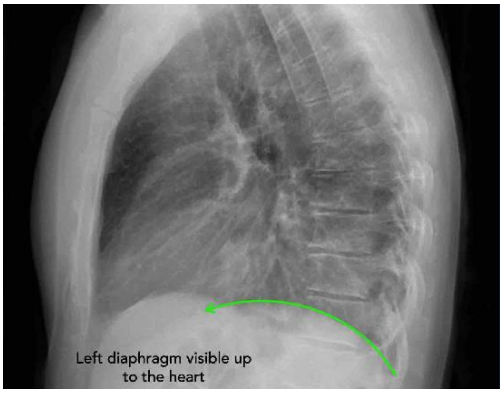
Silhouette sign (4)

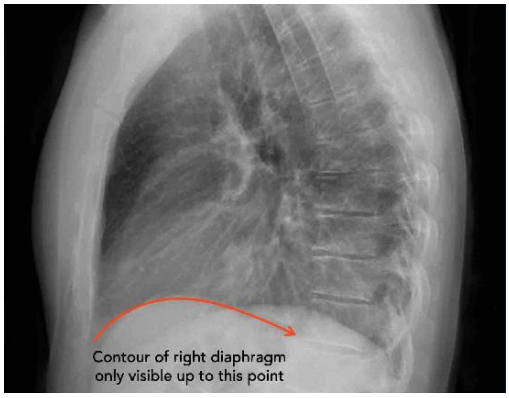
On this lateral film there is too much density over the lower part of the spine.
First study the lateral film and decide on which side the pathology is located.

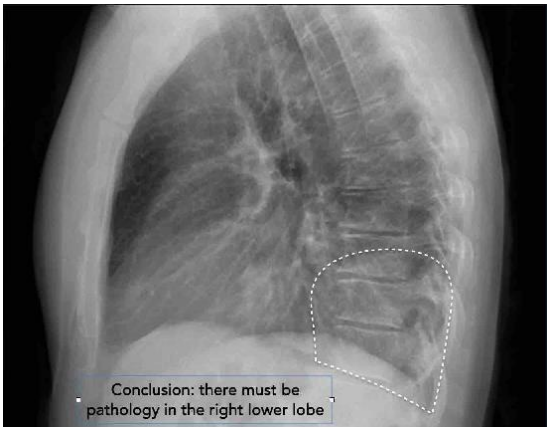
By only looking at the interfaces of the left and right diaphragm on the lateral film, it is possible to tell on which side the pathology is located.
In this case we cannot follow the contour of the right diaphragm all the way to posterior, which indicates that there is something of water-density in the right lower lobe.
Continue with the PA-film of the same patient...

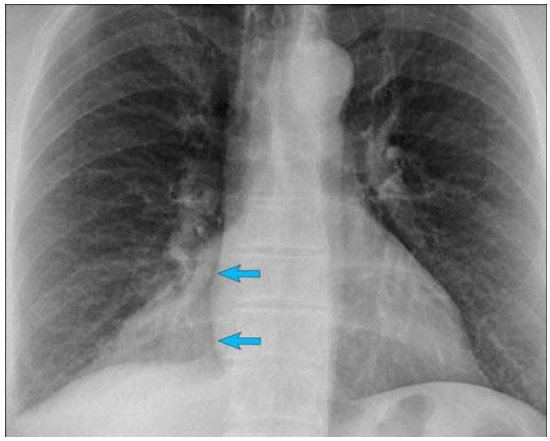












On the PA-film there is a normal silhouette of the right heart border, so the pathology is not in the anterior part of the chest, which we already had decided by studying the lateral view.
Question:
Why do we still see the silhouette of the right diaphragm on the PA-film?
Answer:
What we see is actually the highest point of the right diaphragm, which is anterior to the pneumonia in the right lower lobe.
The pneumonia does not border the highest point of the right diaphragm and there will be no silhouette sign.

Plain radiograph

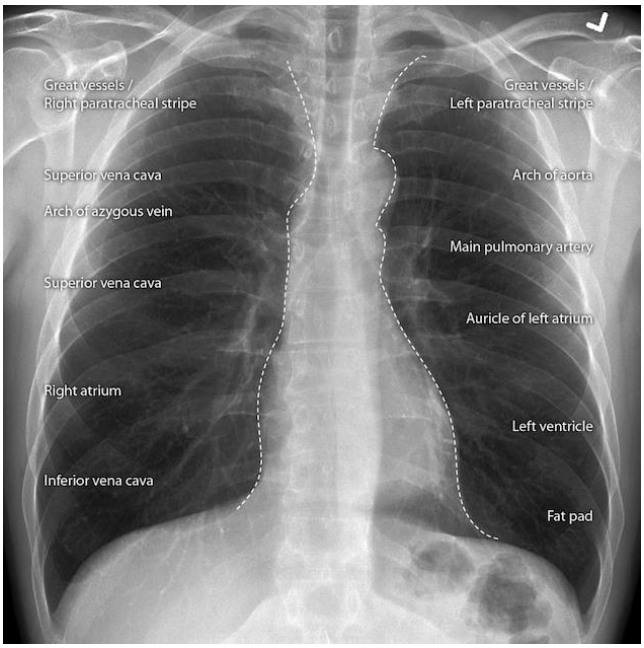
Recognition of this sign is useful in localizing areas of airspace opacities, atelectasis or mass within the lung, with the loss of these normal silhouettes on frontal chest radiographs being generally indicative of the site of pathology :

- **right paratracheal stripe: right upper lobe**
- **right heart border: right middle lobe or medial right lower lobe**
- **right hemidiaphragm: right lower lobe**
- **aortic knuckle: left upper lobe**
- **left heart border: lingular segments of the left upper lobe**
- **left hemidiaphragm or descending aorta: left lower lobe**

Sites of silhouette sign on the lateral chest radiograph include :

- **posterior border of the heart +/- posterior left hemidiaphragm: left lower lobe**
- **anterior right hemidiaphragm: right middle lobe**
- **posterior right hemidiaphragm: right lower lobe**

The silhouette sign forms the basis of the hilum overlay sign, cervico-thoracic sign and thoraco-abdominal sign .



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