

Department of Radiology – Case of the Month #6

Part 1 – Identifying Abnormalities

52-year-old male patient with upper back pain worse in recumbent position. A chest x-ray is ordered (Figures 1 and 2):

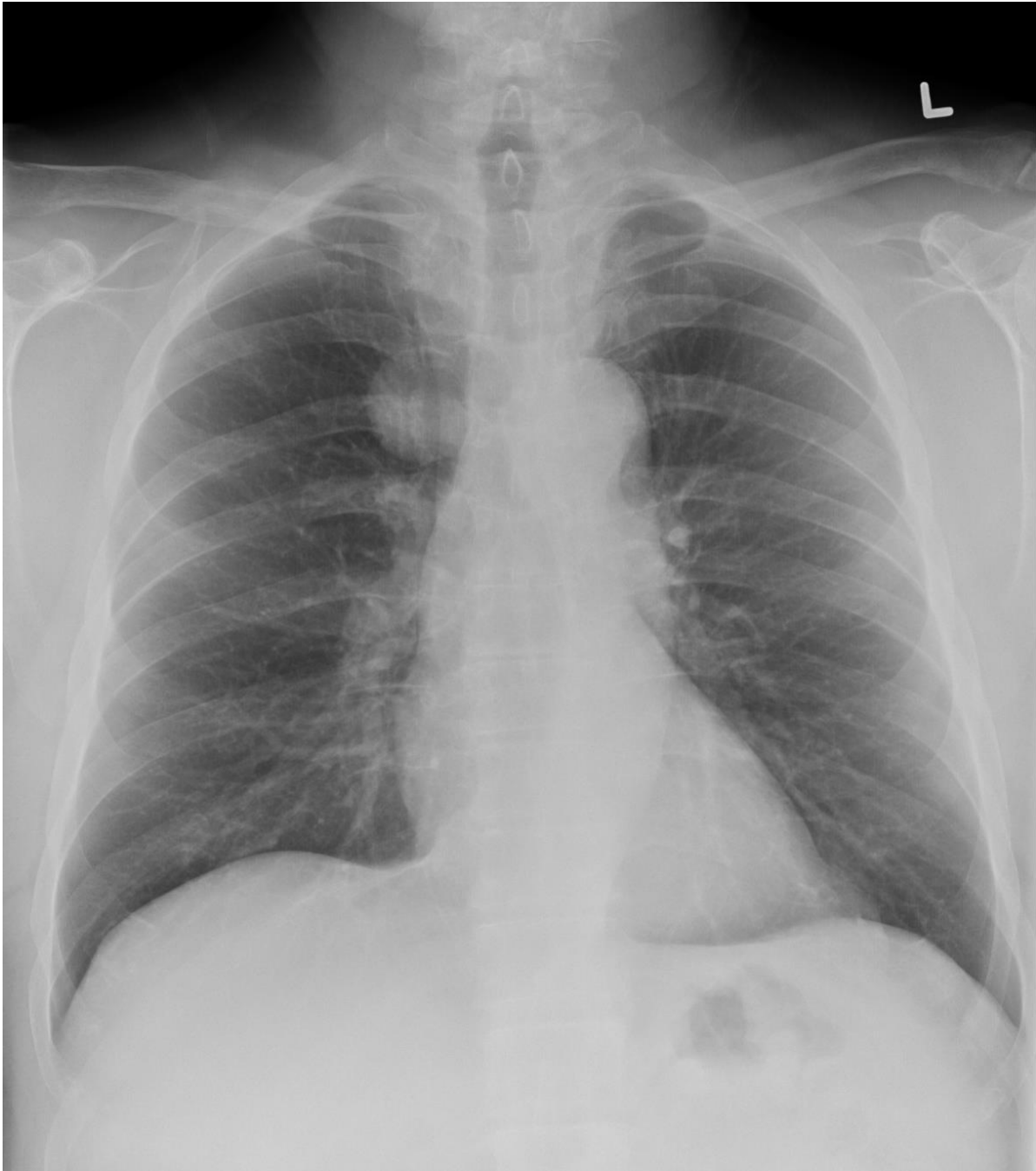


Figure 1: PA View

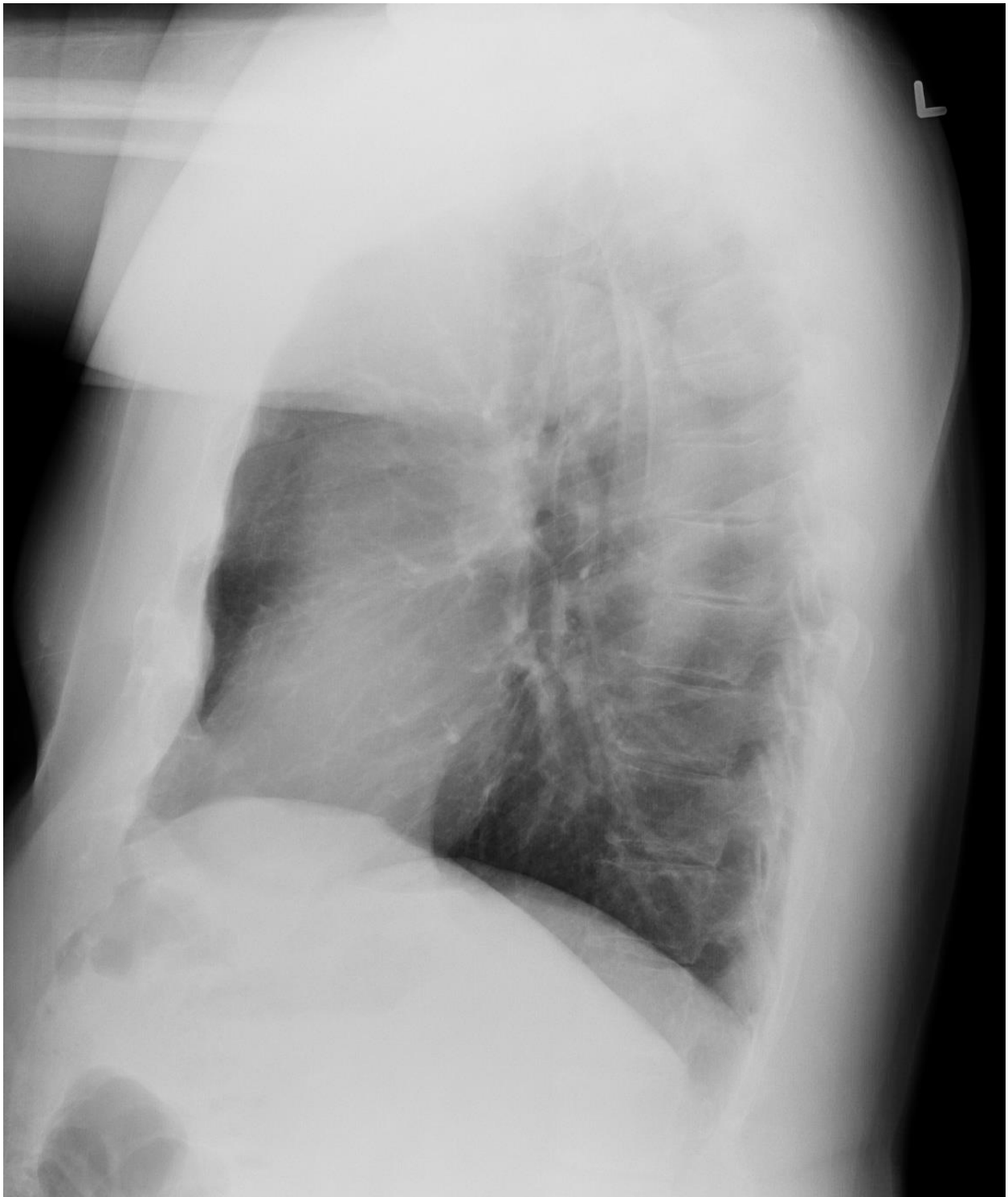


Figure 2: Lateral View

Prompting Questions:

- 1) Can you identify any abnormalities in the above scans?
- 2) How would you characterize the abnormality/abnormalities?
-too white or too black? Shape? Borders?
- 3) Can you localize the abnormality?

Part 2 – Localization and Commonly Missed Areas

Examination of the PA film reveals a right-sided, superior homogenous opacity:

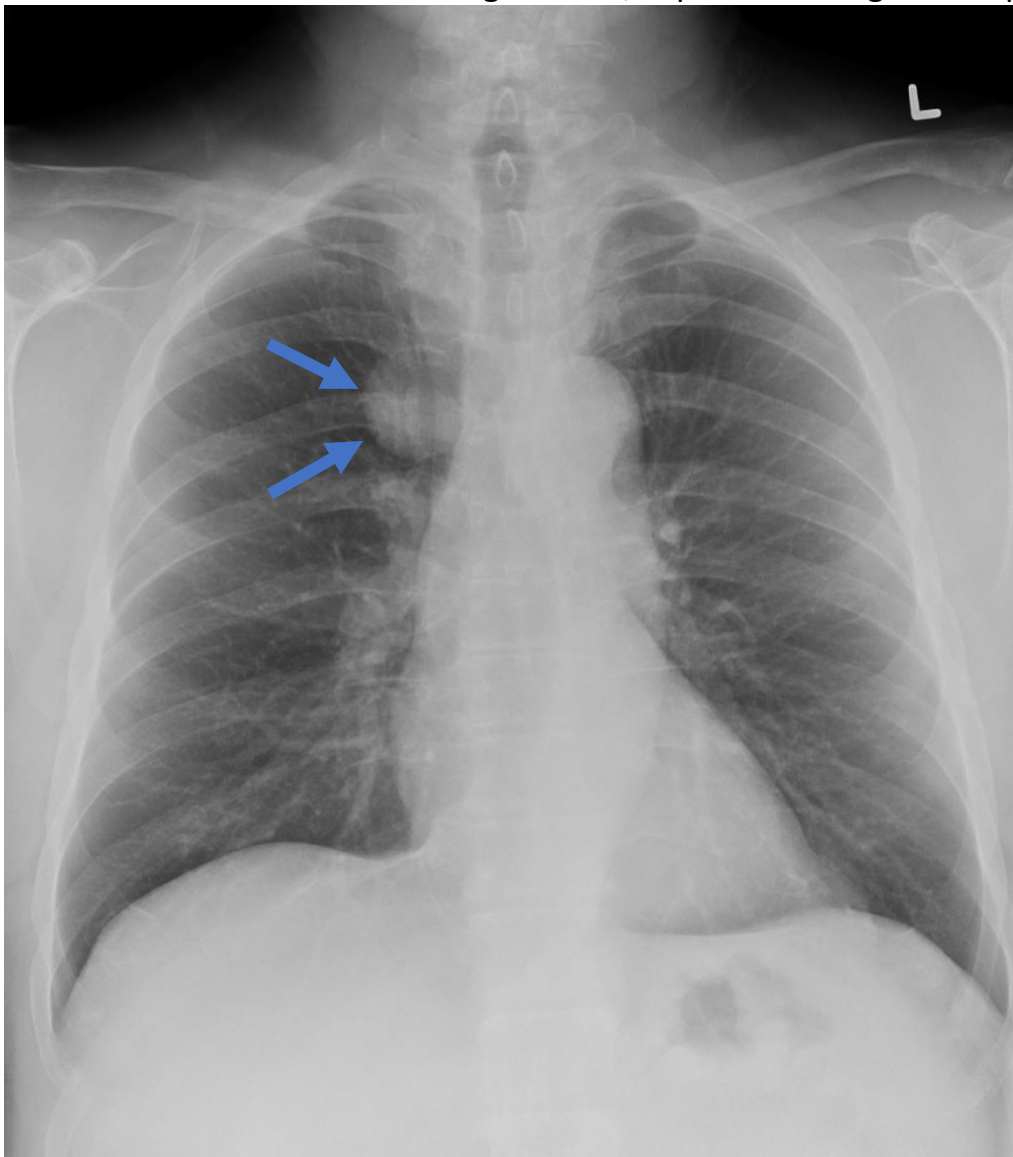


Figure 3: The PA view shows a right-sided, superior, homogenous opacity.

There are several areas on chest X-rays in which pathology is commonly missed. Figures 4a and 4b highlight these areas. These misses occur due to the presence of several overlapping structures which can make the recognition of abnormalities challenging. Special attention should always be paid to these areas.

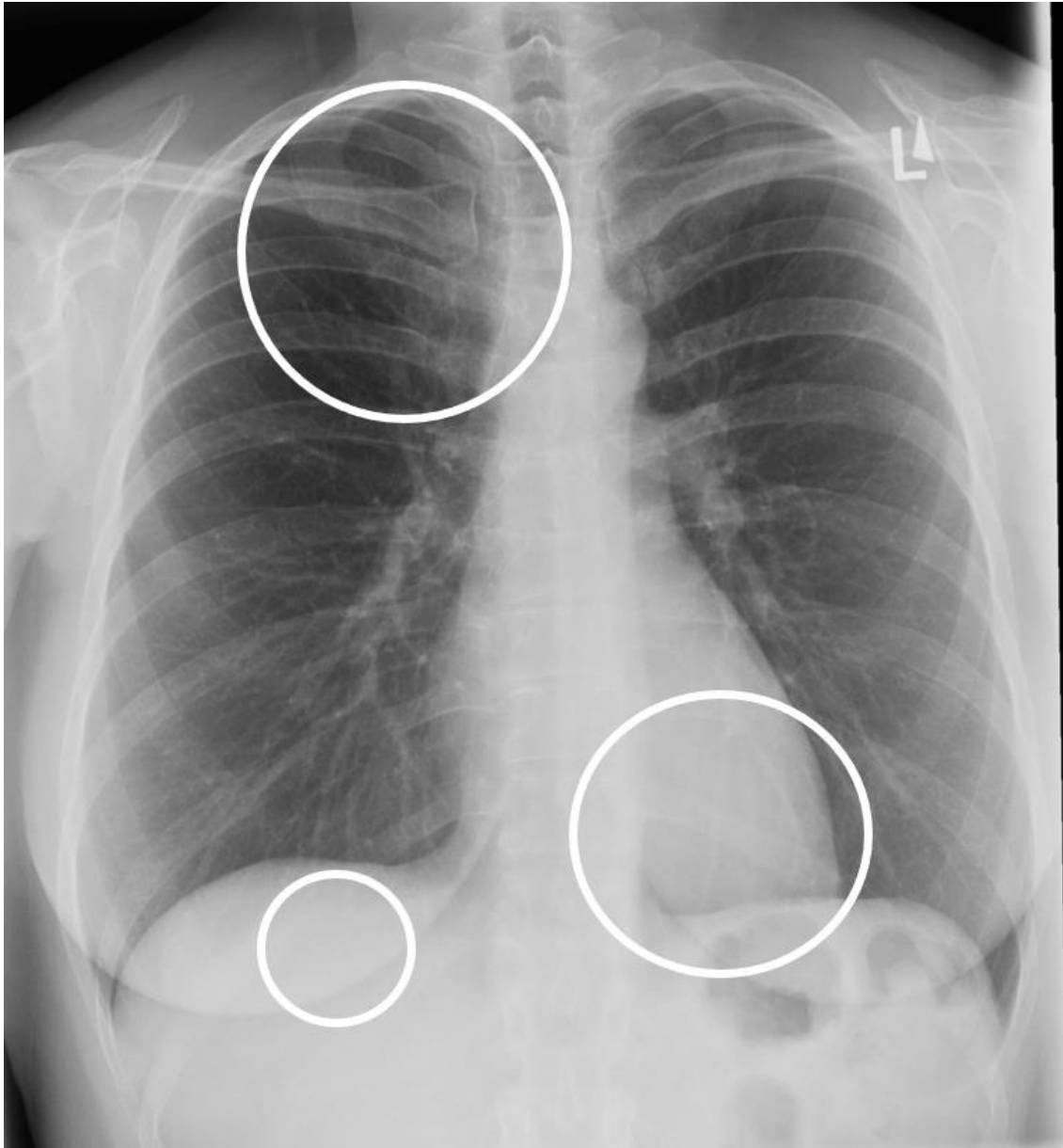


Figure 4a: Most commonly missed areas on PA film

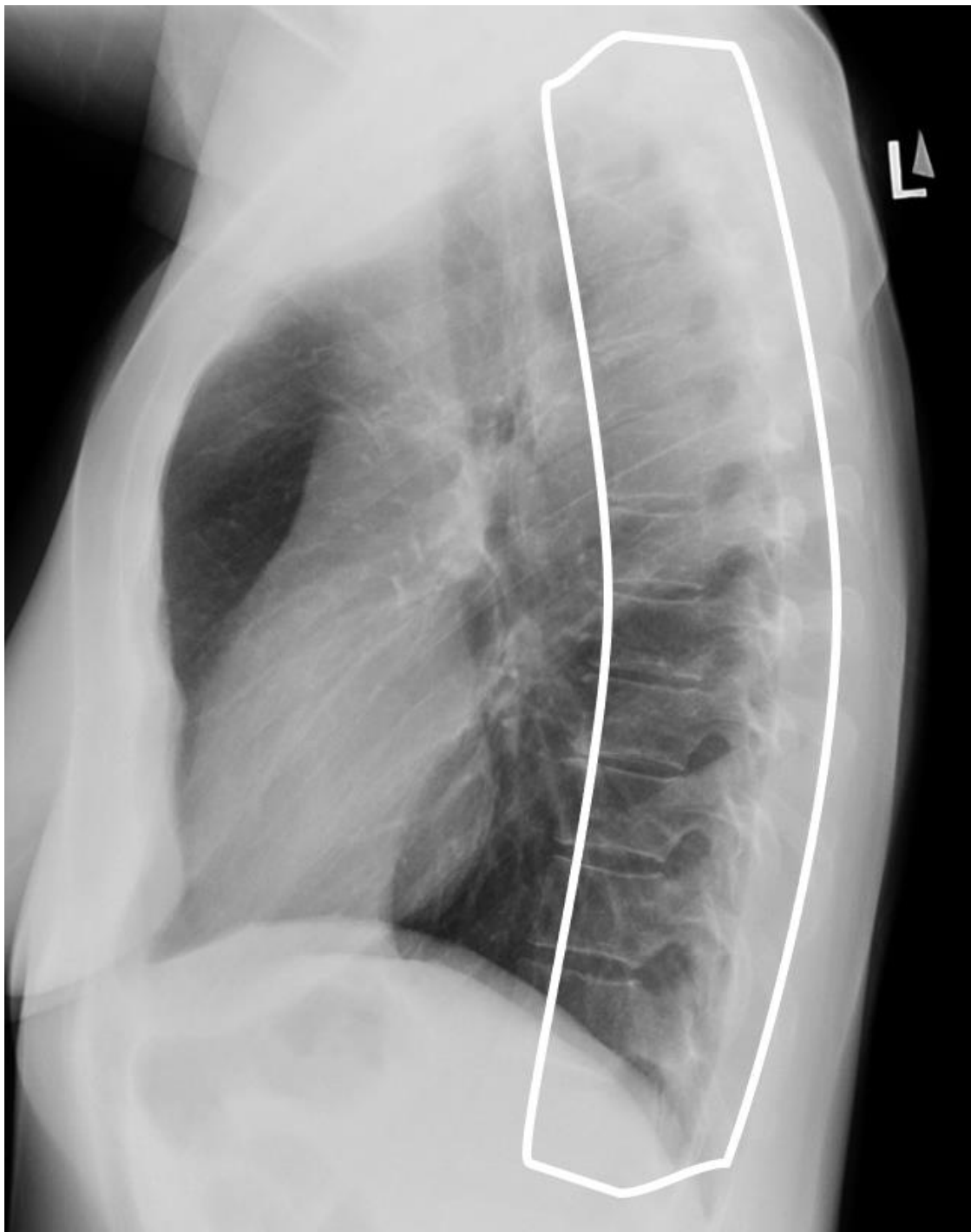


Figure 4b: Most commonly missed area on lateral film

Prompting Questions:

- 1) Can you visualize all aspects of the border of the opacity? If any aspects of the border cannot be visualized, what does this imply about the location of the opacity?
- 2) Can we definitively localize the abnormality or do we require a lateral view? What are the possible locations based on the PA film alone?

In order to localize, we require the lateral view:

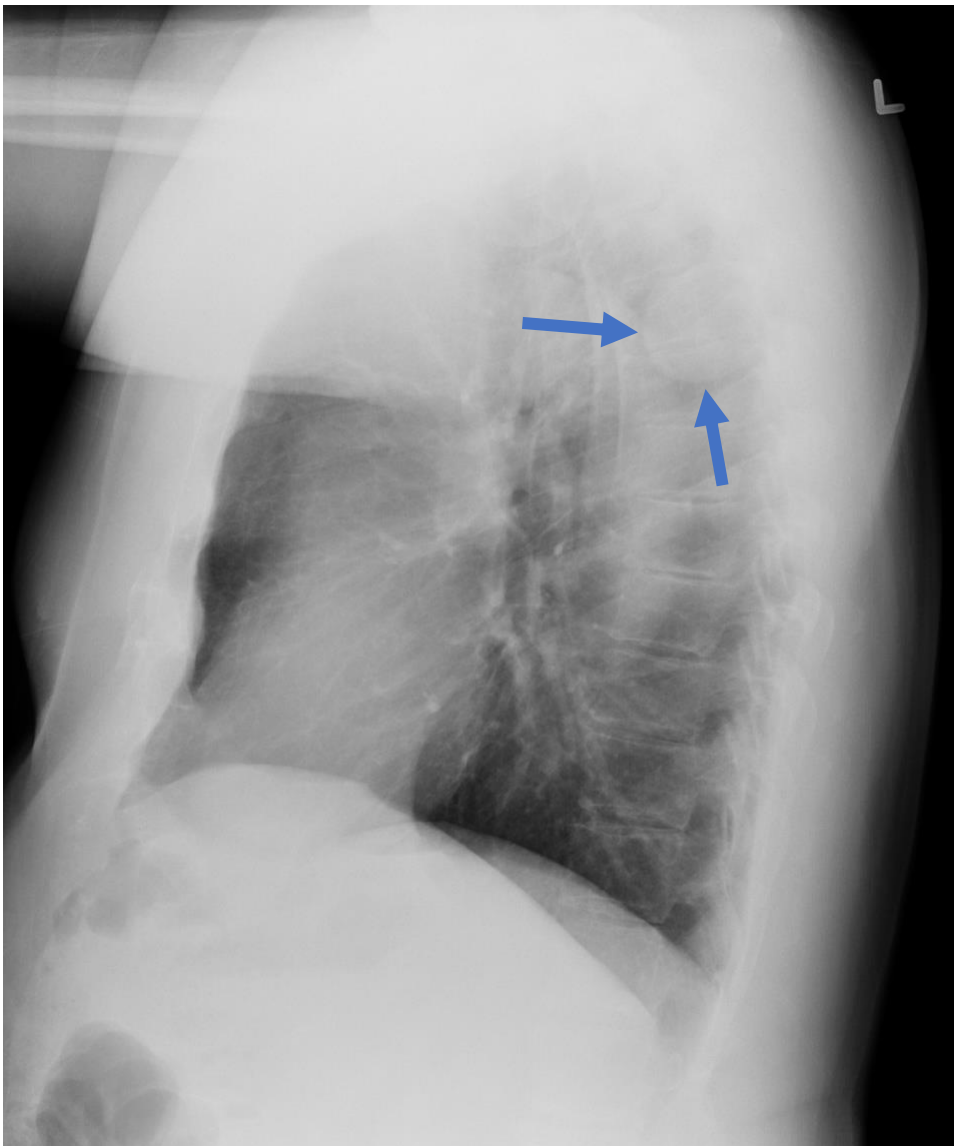


Figure 5: Round lesion highlighted on lateral film.

By comparing the PA and lateral films and utilizing a process of elimination, we are able to approximate the location of the abnormality. Based on the superior, right-sided location on the PA film, the possible locations include the anterior and posterior chest wall, the anterior and posterior pleura, the lung, and the mediastinum. It is important to note that without the lateral view, our list of possible locations remains quite long.

Upon assessment of the lateral film, we see the opacity is located superiorly and posteriorly. This allows us to eliminate the anterior and posterior chest walls, and the anterior and posterior pleura from our list of possible locations. This leaves us with the remaining possibilities of the lung and the mediastinum.

Important Note: On the PA view, the medial border of the opacity is obscured while on the lateral film, the posterior border is obscured. **When you see a lesion that looks like it lies in the lungs but one of the borders is missing, consider that the lesion originates outside of the lungs but forms an interface with the lung.**

Prompting Questions:

- 1) What are your next steps in terms of imaging / diagnostic tests? What information are you hoping these tests will tell you?
- 2) What is on your differential diagnosis at this point?
 - how does the clinical history inform our differential?
 - how does the shape / character / location of the abnormality help us refine our differential?

Part 3 – CT and MRI

To further characterize and localize the abnormality, a CT and MRI were performed (figures 6a-c):

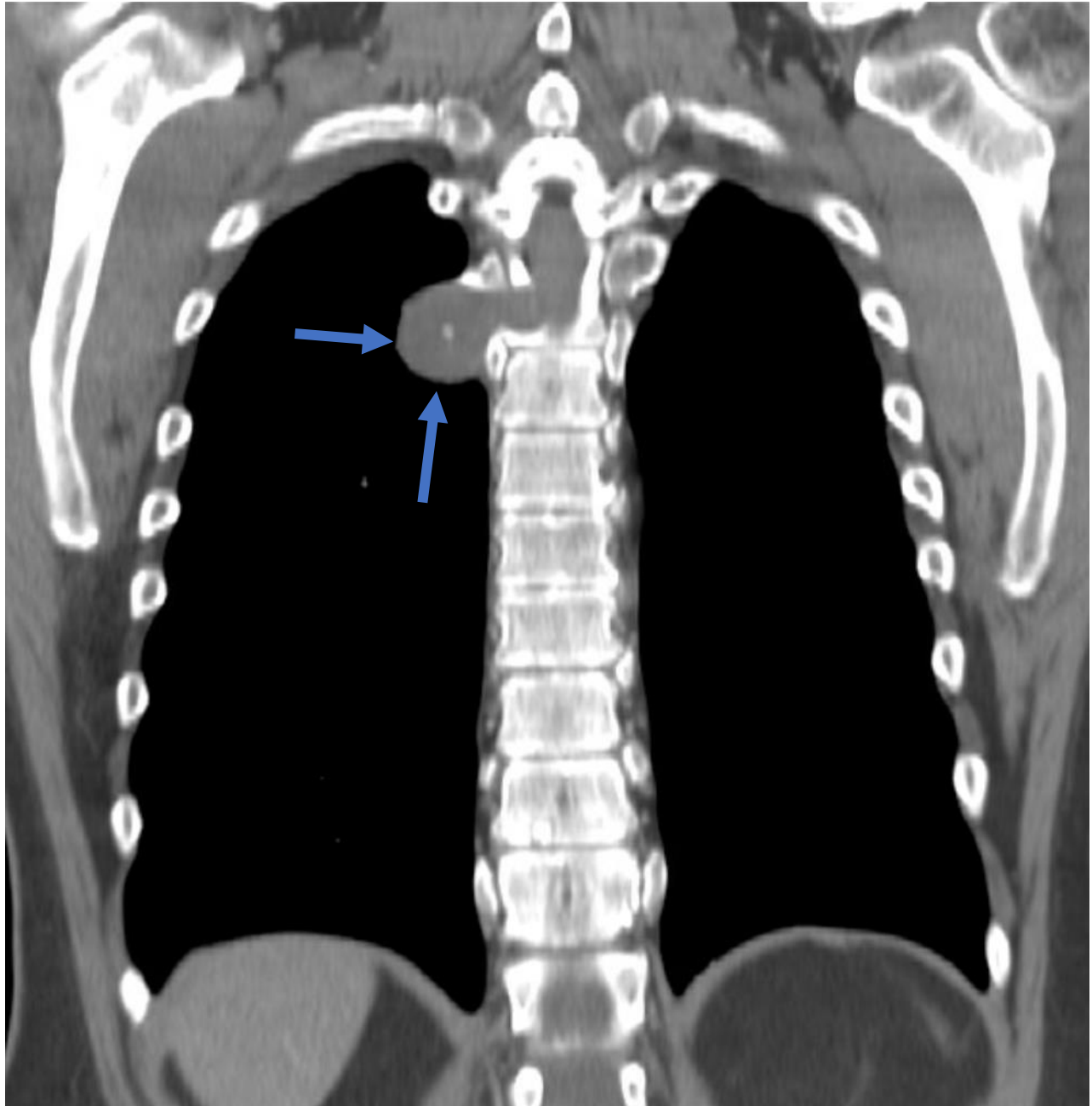


Figure 6a: Coronal CT scan. Soft tissue lesion (blue arrows) originating from the posterior spine region and forming a smooth interface with the lung. Note the presence of central calcification. This corresponds with the PA chest X-ray finding.

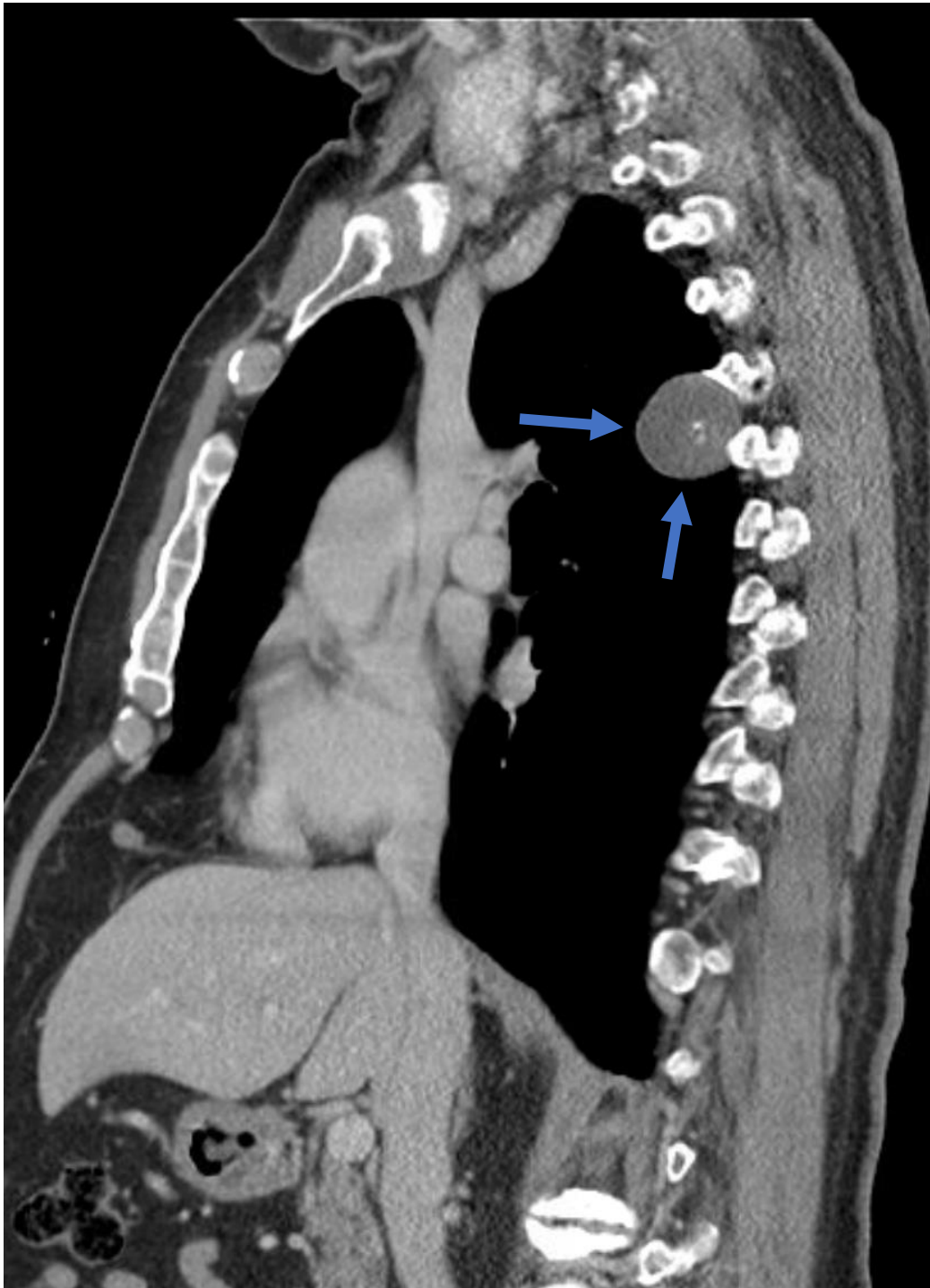


Figure 6b: Sagittal CT scan. Soft tissue lesion (blue arrows) originating from the posterior spine region and forming a smooth interface with the lung. Note the presence of central calcification. This corresponds with the lateral chest X-ray finding.

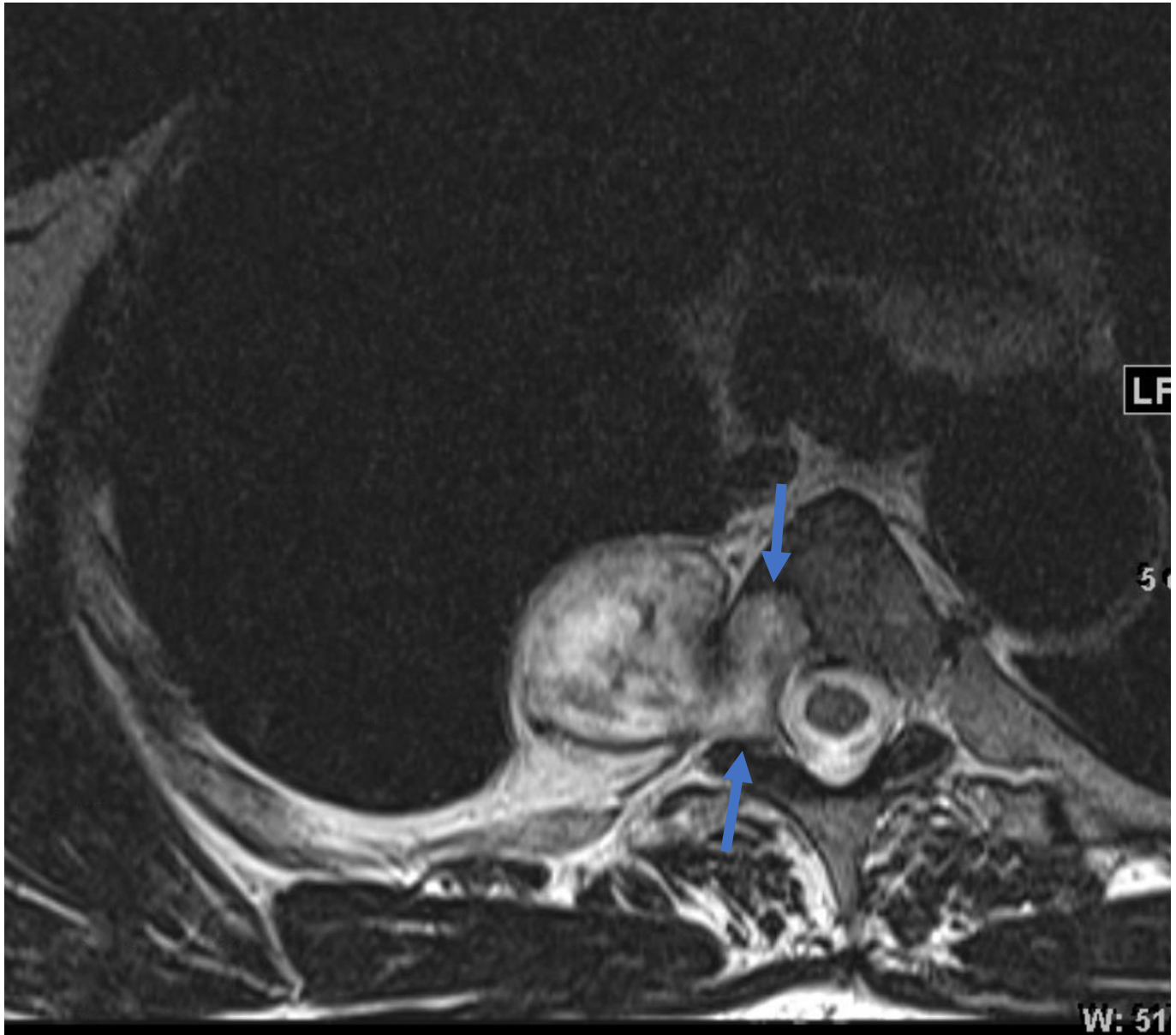


Figure 5c: Axial MRI: T2 weighted. Soft tissue lesion (blue arrows) originating from and expanding the neural foramen.

Summary:

The chest x-ray shows an opacity on the right of the PA view. The lateral x-ray shows the lesion posteriorly. Pathology in this region can be easily missed because of the overlap of the ribs and the clavicle. To put it simply, the area is very busy. This area is called Raider's triangle (Retrotracheal triangle). A CT scan is needed to further localize and characterize the lesion. In this case the CT scan shows that the opacity originated from the paravertebral soft tissues and the neural foramen. The full extent of spinal involvement was assessed with MRI.

Diagnosis:

Schwannoma