THE ROLE OF CT IN THE DIAGNOSIS OF CAVITARY LUNG SYNDROMES

ASSAY

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By

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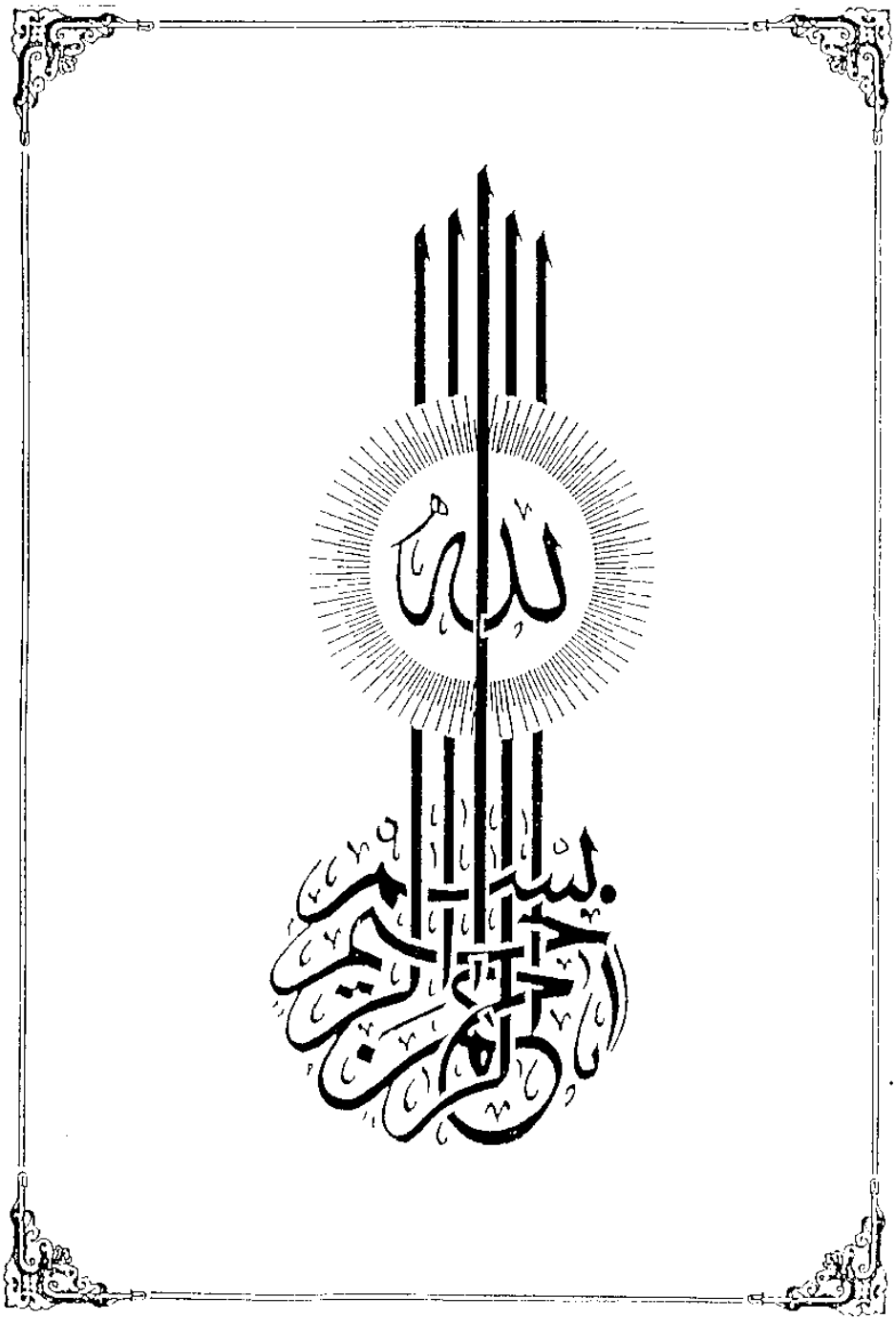

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Acknowlegement

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"Samir Taha A.Rashed"

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INTRODUCTION
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It was found that the intrapulmonary cavitary lesions have been caused by a wide variety of lung diseases.

One of the main diagnostic clues in the investigation of cavitary lung lesions is the radiological study, recently Ct has been introduced in our field of dignostic radiolgoy for more accurates & decissive diangosis.

The aim of this work is to show the value of Ct in the diagnosis of the common intrapulmonary cavitary lesions

In this study the following points are involved:

- The anatomy of the lungs.
- The causes of the cavitary lung lesions.
- The pathology of each cavitary lun lesion.
- The technique of C.T. examination of the lung.

REVIEW OF LITERATURE

Anatomy

Surface marking of the lungs & pleura :

Lungs :

The apex :

It extends into the neck above the medial third of the clavicle .

In quiet respiration its summit lies 2.5 cm above the clavicle . The entire apex lies behind the sternomastoid muscle , it lies medial & inferior to the greater supraclavicular fossa in the neck (Fig . 1) .

The posterior border :

This border is thick & rounded & lies approximately 2 cm from the middle line , extending between the levels of the 2nd and the 10th or 11th thoracic spinous processes .

The anterior border :

It is represented by a line which passes behind the sternoclavicular joint & gradually approaches the border of the other lung as it passes downwards behind the manubrium sterni

The two borders are close togather behind the upper part of the body of the sternum down to the level of the 4th castal cartiloge, and from this level the anterior border of the right lung is continued behind the sternum .

The junction of the anterior & inferior borders of the right lung lies behind the 6th right chondro sternal junction . The anterior border of the left lung exhibits a concavity , the cardiac notch , the

1.Oblique fissure.

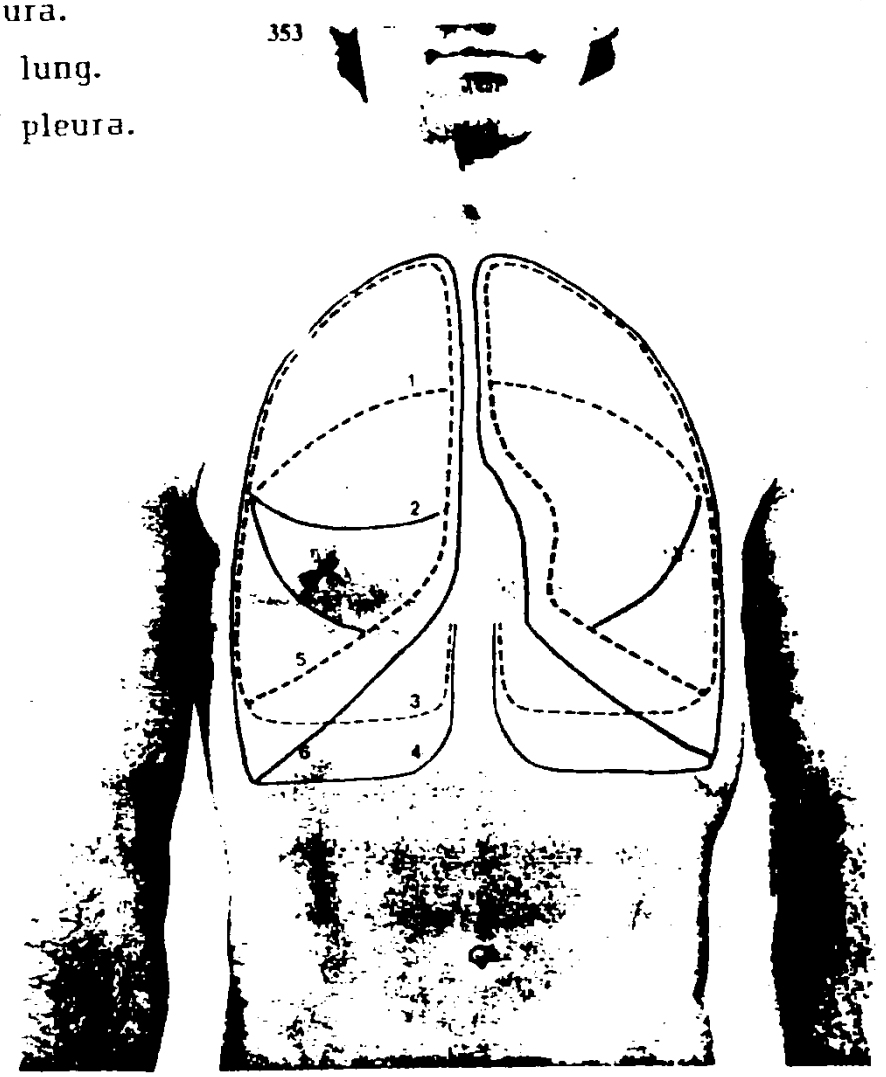
2.Transverse fissure.

3.Back border of lung.

4.Back border of pleura.

5.Anterior border of lung.

6.Anterior border of pleura.



(Fig.1) Surface anatomy of the lungs and pleura.

outline of which is represented by a concave line drown from the 4th chondrosternal junction to a point on the 6th costal cartilage , 2.5 cm from , the sternum where the anterior border jeins the inferior border of the lung . The nost lateral point of the cardiac notch is commonly 4 cm to the left of the stenum .

The inferior border :

It moves up & down in respiration , a short distance in quiet respiration but through a distance of 5 to 8 cm in full respiratory movement . The inferior border passes behind the anterior part of the 6th costal cartilage as far as its lowest part , and hence , approximately horizontal , round the side of the chest towards the interval between the 10th & 11th thoracic spinous processes

In the midaxillary line , the border is situated at the level of the 8th rib and in scapular line at the level of the 10th rib.

In full inspiration the inferior border lies 5 cm above the subcostal margin in midaxillary line , but in neutral respiratory position it is about 10 cm above the subcostal margin .

The lung does not reach the lower limit of the pleura owing to the presence of costodiaphragmatic recess (warrick , 1976) .

The pleural cavities :

The outline of the pleura representing the limits of expansion of the lungs , are represented by lines which lie just medial to those stated for the anterior borders of the lungs , with exception of the cardiac notch in the left lung where the sternal line of reflexion (anterior margin) of the left pleura is represented by a line which extends downwards immediately to the left of the sternum .

The sternal line of reflexion of the pleura joins the diaphragmatic line of reflexion behind the 7th costal cartilage on the left side & below the 7th costochondral junction on the right .

The position of the diaphragmatic line of reflexion of the pleura may be shown by a line which extends with slight inferior convexity , from the junction of the sternal and diaphragmatic lines of the reflexions of the pleura to a point 5 cm above the lowest point of the 10th costal cartilage , then it passes backwards horizontally through the intersection of the lines of the 12th rib & the lateral margin of the sacrospinous muscle . Medially to this point of intersection , the pleura extends below the 12th rib , anterior to the quadratus lumborum muscle , towards the 10th lumbar spinous process .

Portions of the pleural cavities are unoccupied by lung in the neutral respiratory position .

The most extensive of these is the costodiaphragmatic recess on each side & a portion of the left pleura which lies anterior to the heart the costo mediastinal recess .

The lung structure and anatomy :

The lungs are composed of a serous coat , a subserous areolar tissue and the pulmonary substance .

The serous coat is the pulmonary pleura , it is thin transparent , inseparately connected , with the lung substance and invests the entire organ as far as the root .

The subserous areolar tissue contains many elastic fibres and it invests the entire surface of the lung & extends inwards between the lobules .

The pulmonary substance is composed of lobules , which although closely connected by inter lobular arcolar tissue are quite distinct from one another .

The lobules , vary in size , those on the surface are large and of pyramidal forms , with the bases turned towards the surface , while those in the interior are smaller and of various forms .

Each lobule is composed of a terminal bronchus and it's more distal branches and air cells and of the ramifications of the pulmonary and bronchial vessels , lymph nodes and nerves , all these are connected togather by arcolar tissues (Davis and compland 1976).

Fissures and lobes :

The left lung is divided into two lobes ; upper and lower , by an oblique fissure which extends from the 4th thoracic spine to the diaphragm 1.5 inch behind the sternum .

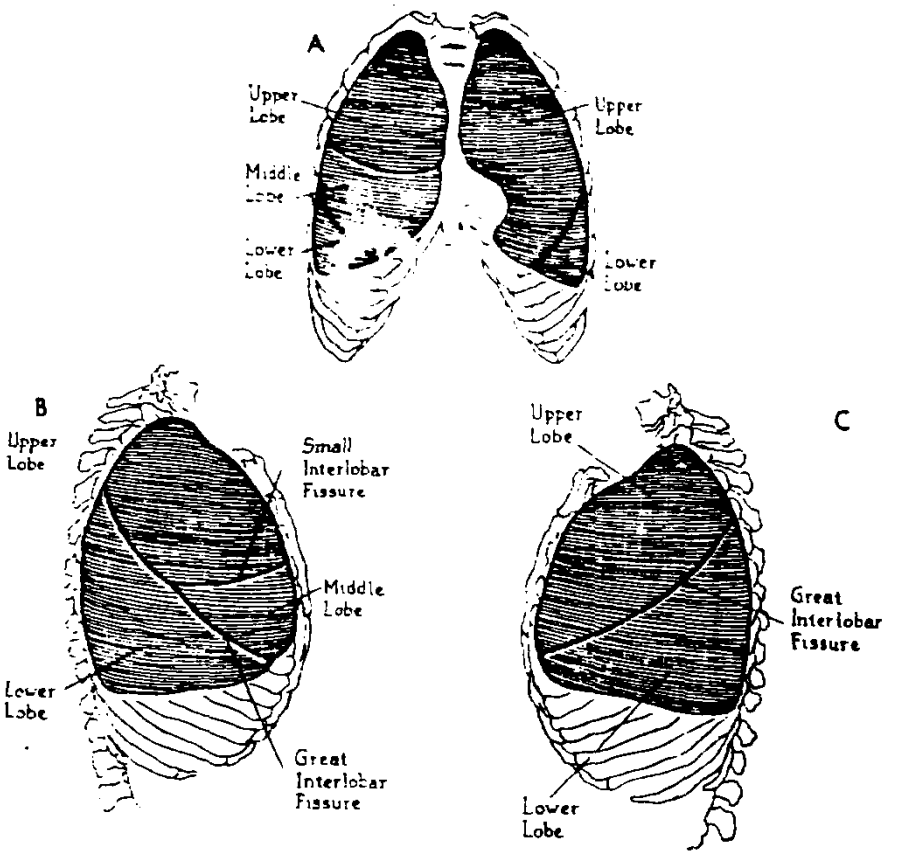
The right lung is divided into three lobes ' upper , middle and lower , by two fissures ' an oblique fissure , similar to that of the left lung , separates the lower from the middle & upper lobes , the other ' the horizontal fissure , separates the middle from the upper lobe . It passes from the hilum horizontally to the back of the sternum (Pansky 1984) . (Fig. 2) .

Supernumerary (accessory or azygos) lobes of the lung :

(1) The lobe of the azygos vein .

(2) Upper azygos lobe (above hilum

(3) Lower azygos lobe (below hilum



(Fig.2) Lobes and Fissures of normal lungs.

A.Frontal aspects of both lungs.

B.Lateral aspect of the right lung.

C.Lateral aspect of the left lung.

The last 2 are accessory lobules of lung tissues , not associated with abnormality of azygos vein and they are of no clinical importance [Azygos means a medion unpaired structure]

- *The lobe of the azygos vein :*

It is an accessory lobe which is due to abnormality of azygos vein it is of clinical importance due to unusual appearance in chest radiographs , may be a site of lung disease and it is significant to be discovered in operations .

* **Broncho-pulmonary segments** (Fig. 3 ,4)

The lungs are devided into segments each having its own segmental bronchus , artery and vein .

The segments are separated by connective tissue septa which are continuous with the visceral pleura .

The right lung is supplied by three secondary bronchi originating from the main bronchus .

I) Upper lobe bronchus :

Lies above the pulmonary artery and gives three branches :

1. Apical segmental bronchus .
2. Posterior segmental bronchus
3. Anterior segmental bronchus .

II) Middle lobe bronchus :

Lies below the pulmonary artery and gives two branches :

(1) Lateral segmental bronchus .
(2) Medial segmental bronchus .