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Radiological Study of Staphylococcal Pneumonia.

THESIS

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Radiodiagnosis

By

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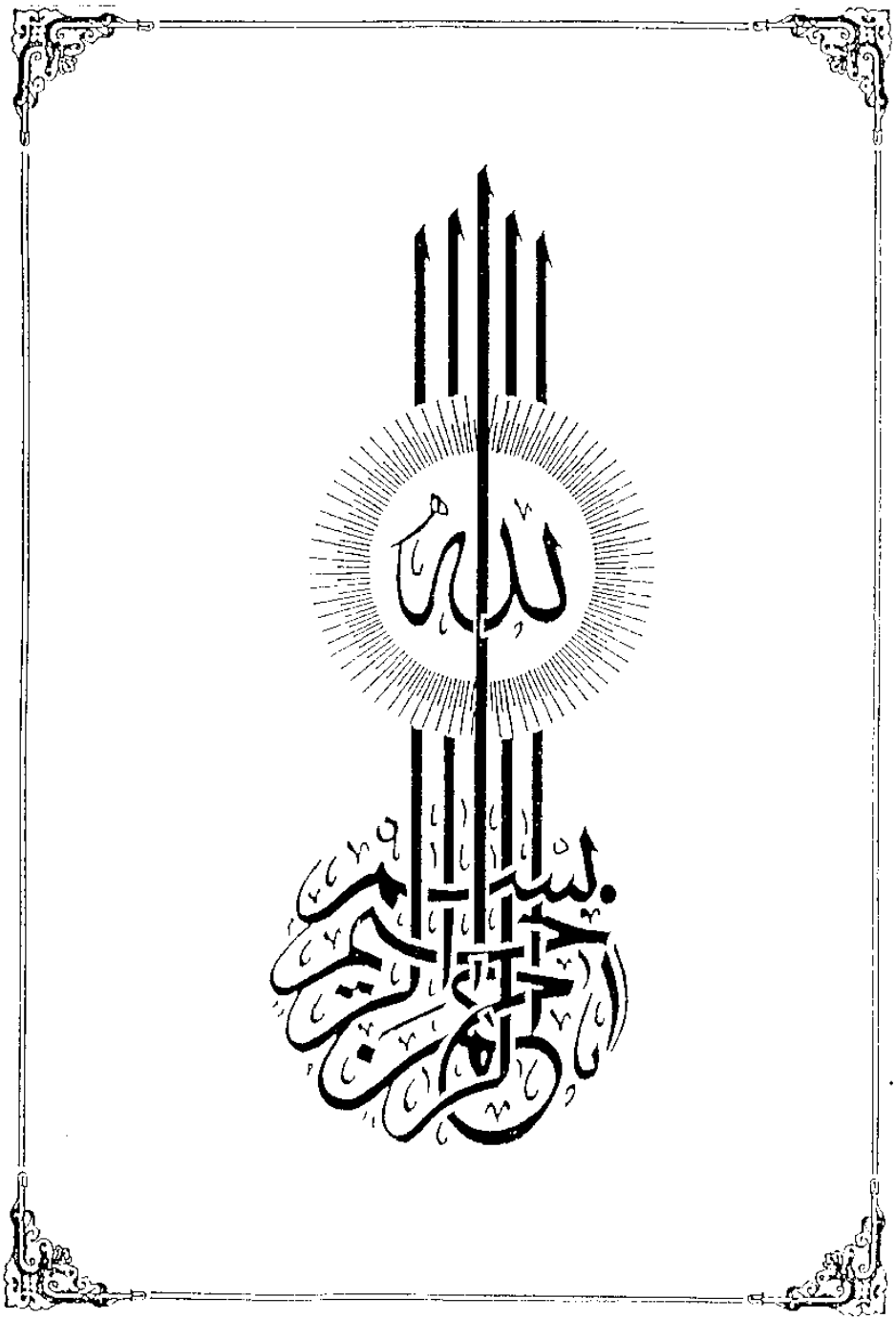

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RADIOLOGICAL STUDY OF STAPHYLOCOCCAL PNEUMONIA

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Introduction

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INTRODUCTION AND AIM OF THE WORK

Staphylococcal pneumonia is a common disease of childhood, caused by the staphylococcal aureus organisms. While it is not possible to know the cause of the pneumonia radiologically. The staphylococcal pneumonia is one type of pneumonia which can be diagnosed radiologically as multiple rounded areas of consolidations which often cavitate, pneumatocele, pleural effusion and rib periostitis .

Hence the proper radiological diagnosis of the cause of pneumonia helps the physician in the accurate treatment of the case.

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RADIOLOGICAL ANATOMY OF THE CHEST

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RADIOLOGICAL ANATOMY OF THE CHEST

The radiological appearances of the chest shows two lateral translucent fields, known as lung fields, which corresponding to the aerated lungs and an irregular shadow, between them, the mediastinal shadow. The translucent lung fields are bounded superiorly and laterally by the ribs and from below by the arching domes of the diaphragm. (Nagy, 1964).

I Soft tissues structures of the thoracic wall .

1- Skin and subcutaneous tissues :

Normally, these layers are seen only over the clavicle and as outlining shadows of the thoracic cage. (Meschan, 1975).

2- Breasts :

In the female usually it extends from the level of the second or third rib to the level of the sixth rib. The female breast forms a notable haziness that may obscure the lung substance proper. At the level of fourth or fifth rib, the nipple may cast an even denser shadow

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than that of the breast. (Meschan, 1975).

3- Muscular tissues :

The pectoralis major and minor,the serratus anterior, the sternocleidomastoid and the intercostal muscles may produce a shadow upon the radiograph. (Meschan, 1975).

II The bony cage :

1- The ribs :

The typical rib consists of a head, neck tubercle, body or shaft and costal cartilage. The heads of the upper nine ribs articulate with two thoracic vertebrae, the one above and the one which each rib is in numerical correspondence. The tenth, eleventh and twelfth ribs articulate with only one vertebral body. (Meschan,1975). The ribs run roughly parallel, the posterior halves horizontal or slightly downwards, the anterior ends curving downwards. (Sutton, 1980).

2- The sternum :

The sternum consists of the manubrium, body and xiphoid process. The manubrium has a suprasternal notch, a clavicular articular surface on either side and a rough

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portion just below the clavicular articulation where the cartilage of the first rib is implanted. The cartilage of the second rib joins the sternum at the sternal angle. There are small protuberances on either side of the sternum at which the rib cartilage for third, fourth and the fifth ribs join the sternum. The seventh rib cartilage joins the sternum at the junction of the body and xiphoid process, and the six rib cartilage joins the sternum slightly above this level. (Meschan, 1975).

3- The clavicles :

These show as long shadows from the median line in an oblique upward and outward direction. (Nagy, 1964).

4- The scapulae :

These cast lateral, moderately marked triangular shadows. (Nagy, 1964).

III The hilar shadows :

The hilum of the lung is a wedge shaped depressed area on the mediastinal surface of the lung above and behind the pericardial impression on the lung. The left hilum is larger and about half an inch higher than the right.Both hila are equal in density. (Shanks & Kerley, 1973).

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The hilum is surrounded by the reflection of the pleura from the surface of the lung on to the pulmonary root. The large structures forming the pulmonary root are : (1) The two pulmonary veins, (2) The pulmonary artery, (3) The bronchus, (4) Bronchial arteries and veins, (5) Pulmonary nerves and (6) Lymph vessels and some lymph nodes (bronchial). (Mecshan, 1975). The normal glands are not visible because they are superimposed on the arteries. The normal main bronchi lie inside the mediastinal shadow, the right lower lobe bronchus can be seen as tubular translucency running downwards between the lower lobe artery and the heart shadow. (Shanks & Kerley, 1973).

1- The pulmonary arteries :

The main pulmonary artery divides into right and left pulmonary arteries. The right proximal part of the left pulmonary artery cannot be seen in the plain radiograph because of the shadows of the overlying mediastinal structures. (Simon, 1978).

The right pulmonary artery passes under the aortic arch below the tracheal bifurcation and crosses in front of the right bronchus between its upper lobe and lower division branches. It divides into three branches,two going

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to the upper lobe, and one supplying the middle and lower lobes. (Meschan, 1975). The right upper lobe artery runs horizontally and after a short course it divides into an apical branch passing upwards and an axillary branch running horizontally. (Simon, 1978).

The left pulmonary artery is seen just below the aortic knob as it arches posteriorly into the left lung. It enters the hilum as three branches and then subdivides into nine branches five of which go to the upper lobe and four to the lower lobe following corresponding bronchial branches. (Meschan, 1975). (Fig. 1).

2- The pulmonary veins :

The upper lobe vein: the upper part of the hilum shadow on either side is formed by the proximal end of the most lateral vessel passing downwards from the region of the lung apex. This vessel has a shallow lateral convex curve and represents the vein draining the upper zone. Sometimes a second vein is seen roughly parallel and about 1cm medial to it. These two veins meet and joins by one or two veins running horizontally from the axilla in the second or third interspace to form the final branch of upper lobe vein. This vein then curves medially and its

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Fig. 1

Fig. showing the relationship of distended pulmonary viens with the ramifications of the pulmonary artery. The viens and arteries come closer together at about the fourth bronchial bifurcation. As the veins approach the hilum, they again become dissociated from the pulmonary arteries and diverge from them to enter the left atrium.

(Quoted from Meschan, 1975).

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