POST-OPERATIVE CHEST COMPLICATIONS

THESIS

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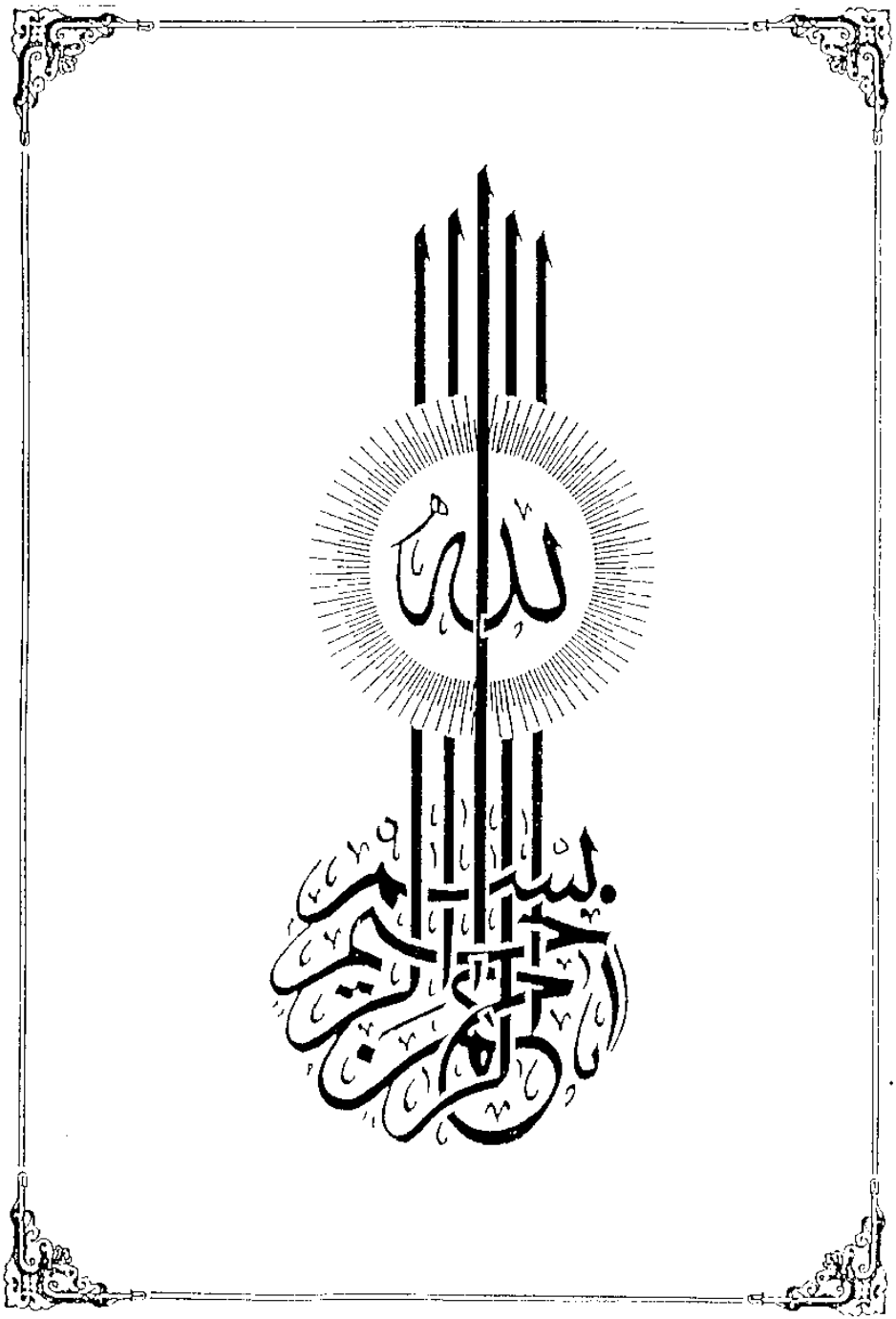

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INTRODUCTION

Despite the great improvement in anaesthetic technique and increase in under-standing the causes and mechanisms of post-operative pulmonary complications. Most studies have shown that there has been little decrease in their incidence over the past thirty years.

Wightman (1968) in an extensive survay of 785 patients - suggests that the reason why the advances in chemotherapy, antibiotics, and surgical anaesthetic techniques appear to have had so little effect on the over all incidence of pulmonary complications, is that patients are now operated on who would formerly have been rejected on grounds of age, chronic respiratory or other disease.

It is unfortunate that in spite of all that is known about the causes of post-operative chest complications, so little is done to minimise the likelihood of their occurence (Wylie, Churchil, Davidson, 1970)

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AIM OF WORK

The aim of this work is to provide back ground informations as regards the post-operative chest complications following various operations as regards the Predisposing Factors, the incidence, the age, sex, type of anaesthesia, type of operations its durations, type of premedication before operations, the prophylaxis, type of Chest Complication post-operatively, Diagnosis and treatment given to the patients after surgical intervention.

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ANATOMY OF RESPIRATORY SYSTEM

A) Anatomy of the chest wall & Pleura:

The chest wall is an air tight, expandable, Cone - shaped Cage

The ventral wall of the bong thorax is the shortest dimension. It extends from the supre sternal notch to the xiphoid-a distance of approximately 18 cm. It is formed by the vertically aligned manubrium, sternum, Xiphoid and the costal cartillage of the first 10 ribs.

The side of the chest wall consist of the upper 10 ribs, which slope downward and forward from their posterior attachment.

The posterior chest wall is formed by the 12 thoracic vertebral, their transverse processes, and the 12 ribs. The upper ventral portion of the thoracic Cage is covered by the clavicle and subclavian vessels laterally, it is covered by the shoulder and a xillary nerves and vess dorsally it is covered by the scapula.

The superior aperture of the thorax (also called the thoracic inlet or the thoracic outlet) is a 5 x 10 cm kidney-shaped opening bounded by the first costal cartillag and ribs laterally, the manubrium anteriorly, and the body

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of the first thoracic vertebrae posteriorly.

The inferior aperture of the thorax is bounded by the twelfth vertebrae and ribs posteriorly and the Cartillages of the seventh to twelfth ribs and the xiphisternal joint anteriorly. It is much wider than the superior operature and is occupied by the diaphragm. The blood supply and innervation of the chest wall are via the intercostal vessels and nerves, but the upper thorax also receives vessels and nerves fro; the cervical and axillary regions.

The parietal pleura is the inner most lining of the chest wall and is divided into 4 parts: the cervical pleura, costal pleura, mediastinal pleura, and diaphragmatic pleura.

The visceral pleura is the serous layer investing the lungs and joins the parietal pleura at the hilum of the lung. It covers the whole surface of the lungs except the hilum and the thin mediastinal area between the two leaflets of the pulmonary ligament. It is composed of a single layer of flattened epithelial cells resting on abasement membrane.

The pleura derives its blood supply from the bronchial vessels and this reaches it via the interlobular septa formed by extension from the subserous layer.

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B) Anatomy of the lung:

The unit of the lung tissue is the lobule, and several of these unit to form asegment. Each lung is formed of a fixed number of segments, each segment is comparable to a pyramid with its base towards the pleura which covers it. The apex of the pyramid, which is towards the hilum, contain the segmental bronchus and a branch from the pulmonary artery situated in an anterior plane. The bronchial artery supplies the segmental bronchi through branches in direct relation to the bronchus.

There is a segmental vein in a posterior position to the segmental bronchus. It receives the intersegmental veins which collect blood from the adjacent segments.

Fissures of the lungs:

The right lung is divided into three lobes by two main fissures; the oblique and the transverse. The left lung is divided into two lobes by the oblique fissure. Piersol describes most accurately the levels of the interlobal fissures. The right oblique fissure starts at the level of the posterior end of the fifth rib, or one intercostal space above or below, following the course of the fifth rib in the axillary line. It ends anteriorly usually at the fifth space or the sixth rib

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at its costochondral junction, five to ten centimeters from the middle line.

The horizontal fissure follows a line joining the fourth right costal cartilage and join the right oblique fissure at the axillary line. It is complete in only 29 per cent of individualls, absent in 20 per cent and is incomplete in 51 per cent (brock 1946).

The left oblique fissure begins posteriorly at a less definite point in the range between the upper border of the fifth rib and the lower border of the third rib, and follows the level of the fifth rib in the mid axillary line then anteriorly it follows the same course as on the right side. These are the main fissures but other accessory fissures may be present. The superior accessory fissure occurs in five per cent of cases and separates, the basal segments of the lower lobe from its superior segment. The inferior accessory fissure occurs in five per cent of cases and it separates the lower lobe from the medial basal segment. The Azygos Fissure present in 0.5 per cent of cases, starts from the apex of the lung reaching the mediastinum at about the level of the second costal cartilage describing a line which is convex outwards Anatomy of the bronchial tree:

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The trachea bifurcates, at a point corresponding to the level of the angle of lewis or the lower border of the fourth thoracic vertebra, into right and left main bronchi. The angle of bifurcation is seen on bronchoscopy as a narrow vertical ridge, namely the carina.

The right main bronchus is shorter, wider and more in line with the trachea than the left. About one centimeter from the carina, the right upper lobe bronchus takes origin. It divides in turn after one centimeter into a picall, anterior and posterior segmental bronchi which could be seen by a right-angled telescope.

The continuation of the right main bronchus is the intermediate bronchus which is about three centimeters in length and divides into the middle and lower lobe bronchi.

The origin of the middle lobe bronchus seen coming anteriorly, branches after 1.5 centimeters into lateral and medial segmental bronchi. These are best seen in the right lateral broncho graphic films opposite the origin of the middle lobe bronchus posteriorly, or a bit lower down arises the apical segmental bronchus of the lower lobe. Then the lower lobe gives its basal

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segmental bronchi which are four on the right side namely the medial, anterior, lateral and posterior the left main bronchus divides into the upper and lower lobe bronchi about five centimeters from the carina. After about one centimeter from the origin of the upper lobe bronchus the Lingular segmental bronchus originates which in turn divides into superior and inferior branches. These are best seen in left oblique bronchographic films. After the lingular bronchus, the apico-posterior bronchus divides after 1.5 centimeters into a pical and posterior subsegmental bronchi. The continuation of the left main bronchus, after the origin of the upper lobe, is the lower lobe bronchus which gives rise to abronchus to the apical segment coming from its posterior aspect.

The arrangement of the basal segmental bronchi is the same as that on the right side except that the medial basal segmental bronchus is absent. In fifty per cent of cases a subapical bronchus may take origin just distal to the apical segmental bronchus of the lower lobe of either lung, (Lee McGregor, 1963).

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SEGMENTAL ANATOMY

A) The segments of the right lung:

1) Upper lobe:

1) Apical.

2) Anterior.

3) Posterior.

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2) The Middle lobe:

1) Medial.

2) Lateral.

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3) Lower lobe:

1) Superior

2) Medial basal

3) Anterior basal

4) Lateral basal

5) Posterior basal

B) The segments of the left lung:

a) Upper lobe:

1) Apical

2) Anterior

3) Posterior

4) Superior lingular

5) Inferior lingular.

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C) Lower lobe:

1) Superior

2) Medial basal

3) Anterior basal

4) Lateral basal

5) Posterior basal.

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THE VASCULAR SUPPLY TO THE LUNGS

The pulmonary arteries:

The pulmonary trunk arises from the summit of the infundibulum of the right ventricle, it is 5 cm long. It lies in front of the ascending aorta, then passes backward to the left of the ascending aorta. It divided into right and left main pulmonary arteries within the concavity of the aortic arch. The main trunk is enclosed in a common tube of visceral pericardium which also includes the ascending aorta. In part it is covered by the pleura and the left lung on the right side there is always a strong bqnd of fibrous tissue extending laterally from the pericardium onto the posterior surface of the artery.

The right pulmonary artery appears to be much shorter than the left, becauee it is overlapped by the bulging superior venacava.

After the right pulmonary artery has emerged from behind the superior vena cava, it gives off three branches to the right upper lobe. The arterial stem then passes onto the lower lobe where it lies immediately antero-lateral to the bronchus. As it enter the hilum of lower lobe, it gives off abranch anteriorly to the middle lobe and one posteriorly to the apical

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