THE ROLE OF RADIOTHERAPY AND CHEMOTHERAPY IN MANAGEMENT OF SMALL AND NON-SMALL BRONCHOGENIC CARCINOMA

Thesis

Submitted in Partial Fulfillment of

Master Degree of Radiation Oncology and Nuclear Medicine

By

SHERIF FIKRY YACOUB

(M.B., B.CH.)

Supervised by

Prof. Dr. LAILA FARIS
Professor and Head of
Radiotherapy and Nuclear
Medicine Department
Faculty of Medicine
Ain Shams University

Prof. Dr. HASSAN HOSNEY
Professor and Head of
Chest Department
Faculty of Medicine
Ain Shams University

Dr. SOHIR ISMAIL
Lecturer of Radiotherapy and
Nuclear Medicine Department
Faculty of Medicine
Ain Shams University

Faculty of Medicine
Ain Shams University

1988

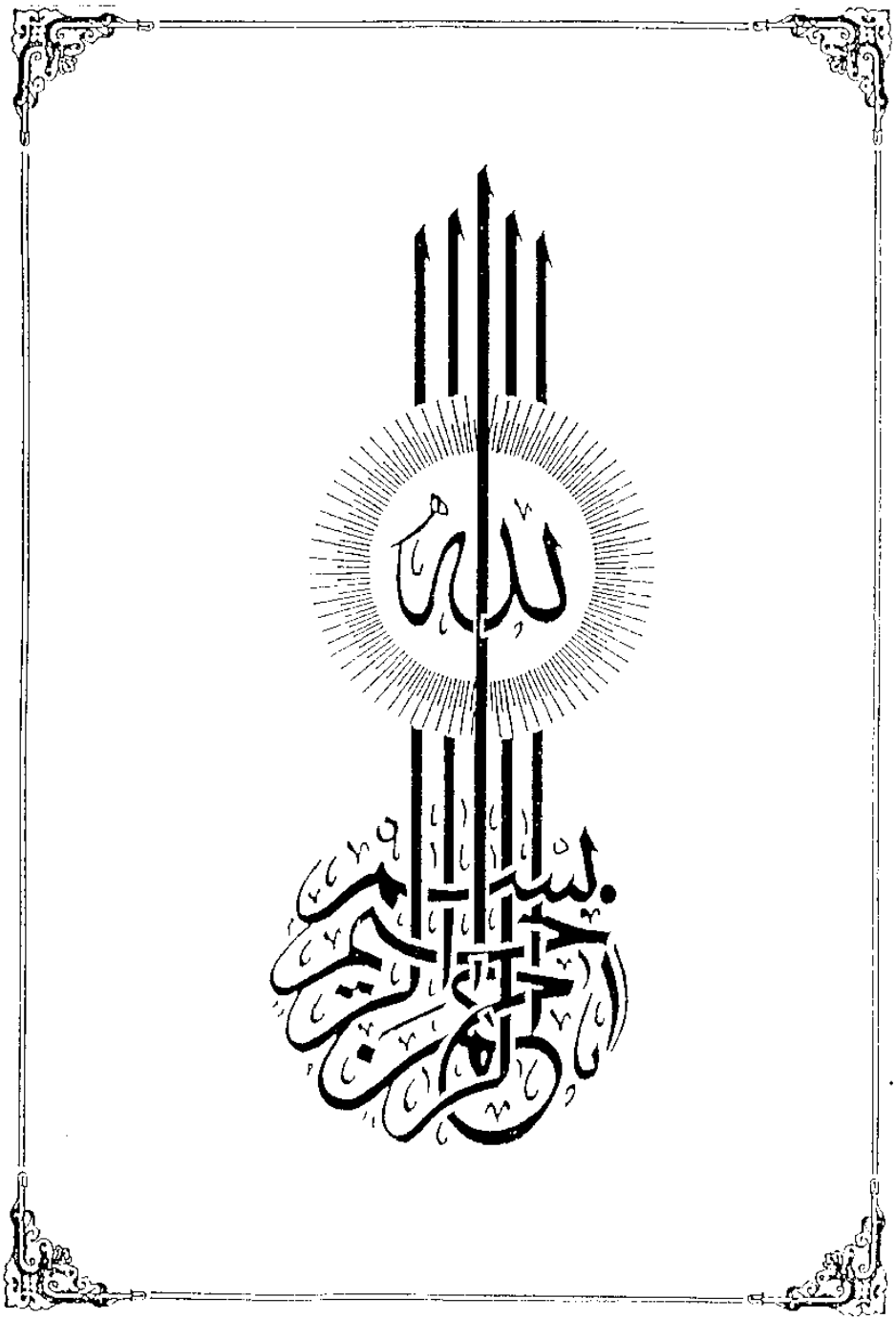
ACKNOWLEDGEMENT

Words fail to express my deepest gratitude to Professor Dr. Laila Faris, Head of Radiotherapy and Nuclear Medicine Department, Ain Shams University, for her valuable supervision, continuous encouragement and moral support throughout this work.

I am grateful to Professor Dr. Hassen Hosni, Head of Chest Department, Ain Shams University, for supervising and adding the fine touches to this work.

I am indebted to Dr. Sohir Ismail, Lecturer of Radiotherapy and Nuclear Medicine Department, Ain Shams University, for her valuable help, advice, and indispensable direction.

I would like also to express my thanks to my Senior Staff, and my colleagues in the Radiotherapy Department, Ain Shams University, for their help and cooperation.



DEDICATION

To my Wife and Son
for Their Love and Forbearance

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INTRODUCTION AND AIM OF THE WORK

INTRODUCTION

Lung cancer is now the leading cause of cancer death in men. Bronchogenic carcinoma occurs most frequently between the ages of 45 and 75 years old and there is a male to female preponderance of about 3:1. The incidence of various histologic types of bronchogenic carcinoma varies in several reported series. Recent report suggest that the incidence of adenocarcinoma is increasing.

Surgery remains the most effective therapy for stages I and II bronchogenic carcinoma. One exception is in the patients with small cell anaplastic carcinoma.

Radiation therapy is recommended for stages I and II only when surgical treatment is contraindicated. This form of therapy is indicated for stage III neoplasm when the disease is limited to the involved hemithorax and can eliminate evidence of cancer in 30% of such patients. Patients with advanced lung cancer frequently may receive palliation with radiotherapy.

Many clinical trials utilizing polychemotherapy are now under way for this neoplasm.

Overall, the prognosis for all patients with lung cancer is poor. The size and extent of primary lesion are important determinants of survival.

AIM OF THE WORK

This study aim to evaluate the role of radiotherapy and chemotherapy in the treatment of different pathological types of bronchogenic carcinoma.

REVIEW OF LITERATURE

ANATOMY OF THE LUNG

The lungs (pulmones) are a pair of sponge-like, elastic organs; they are situated one on each side within the thorax, and separated from each other by the heart and the other contents of the mediastinum. Each lung is conical and has an apex, a base, three borders and two surfaces.

The right lung is composed of three lobes, the upper, middle, and lower - and comprises approximately 55% of the ventilatory capacity. The left lung consists of only two lobes - the lingular portion of the upper lobe corresponding to the middle lobe on the right. The lobes are separated by fissures, on the right side, two fissures are present - the oblique or major fissure that separates the lower lobe from the upper and middle lobes, and the horizontal or minor fissure that separates the upper and middle lobes. On the left side, the single fissure (oblique fissure) separates the upper and lower lobes, running obliquely from above downward and from outside inward [Minna et al., 1985].

Each lung contains the successive subdivision of the bronchi to their termination in the pulmonary lobules. The bronchi are protected from collapse by incomplete rings of cartilage that become progressively spaced as the bronchi become smaller until they are merely wide plaques without annular shape [Ackerman and Del Regato., 1985].

The Bronchopulmonary segments:

The lungs are divided 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. To designate the subdivisions of the bronchi we suggest the use of international nomenclature accepted by the Thoracic Society (Table, 1).

Table (1): Designation of subdivisions of bronchi*

RIGHT LUNG		LEFT LUNG	
Lobe	Segments	Lobe	Segments
Upper Lobe	Apical bronchus Post.bronchus Ant.bronchus	Upper Lobe	Apical bronchus Post. bronchus Ant. bronchus
Middle Lobe	Lat. bronchus Med. bronchus	Lingula	Sup. bronchus Inf. bronchus
Lower Lobe	Apical bronchus Med.basal bronchus Ant.basal bronchus Lat.basal bronchus Post.basal bronchus	Lower Lobe	Apical bronchus Ant. Med. basal br. Lat. basal bronchus. Post. basal bronchus

* From thoracic Society: Thorax 5: 222-228, (1950)

Blood Supply

The bronchial tree receives its own arterial supply through the bronchial arteries which are direct branches of the aorta. The bronchial veins drain into the Azygos vein on the right and the accessory hemiazygos vein on the left.

The alveoli contain within their walls a rich capillary plexus which is fed with deoxygenated blood by the pulmonary artery.

The pulmonary veins are formed from tributaries which tend to run in the intersegmental septa, two veins leave each hilum; one from above and the other from below the oblique fissure, to end in the left atrium (Last, 1978).

Nerve Supply:

The innervation of the lungs is by both Vagal and Sympathetic fibers via the anterior and posterior Pulmonary Plexuses (Pansky, 1984)

Lymphatics:

The lymphatics of the lungs are a rich intercommunicating network. The superficial lymphatics of the visceral pleura and the deep lymphatics accompanying the bronchi and pulmonary veins are the most important. There are no lymphatics in the alveoli beyond the ductuli alveolaris. The rich plexus of lymphatics accompanying the pulmonary veins becomes more abundant as it flows toward the hilum; it

communicates with those of the bronchi and of the pleura (Ackerman and Del Regato, 1985).

Nohl-Oser (1972), divides the draining lymph nodes of the lung into: intrapulmonary and bronchopulmonary. The "intrapulmonary nodes" are related to the divisions of the segmental or smaller bronchi and lie in the bifurcation of the smaller branches of the pulmonary artery.

The "bronchopulmonary nodes" are situated either in the angles formed by the bronchial bifurcation into lobar bronchi (interlobar nodes) in the depths of the interlobar fissures or alongside the lower portions of the main bronchi (hilar nodes).

The lymphatics of the right upper lobe are predominantly drained by the nodes below the anterior segmental bronchus and to those near the intermediate stem bronchus. The lymphatics from the right lower lobe are drained by the same nodes and by those on the medial aspects of the intermediate stem bronchus. The lymphatics of the upper and lower lobes of the left lung have a similar left sided drainage.

The lymphatics of the lungs are drained by mediastinal lymph nodes: the "paratracheal nodes" are the highest in the mediastinum and are more abundant on the right than on the left; and the "tracheo-bronchial nodes" which are divided into three groups about the bifurcation of the trachea. The

upper group is located in the obtuse angle formed by the trachea and the corresponding main bronchus. The lower group, called "subcarinal nodes:, lies in the angle of tracheal bifurcation, contiguous to the hilar nodes on either side. In addition, an "anterior tracheal" group lying infront of the distal end of the trachea and the right main bronchus.

The collecting trunks of the lymphatics of the "diaphragmatic pleura" empty into the anterior mediastinal nodes on the left and the posterior mediastinal nodes on the right. Those of the posterior region communicate with the network of infradiaphragmatic lymphatics that terminate in the paraaortic nodes and inter-communicate with those of the liver, the suprarenal gland, and the kidney.

The lymphatics of the "thoracic pleura" are divided into three regions [Rouvieere, 1932]:

1. Those of the pleural dome, which are drained by the supraclavicular, subclavian, or axillary nodes.
2. Those between the second and fourth rib, which are drained by the internal mammary and posterior intercostal and axillary nodes.
3. Those of the fourth to sixth rib, which also may be drained by the axillary nodes.

Surface markings of the lung and pleura

The apex of the lung and the upper limit of the pleura reach about one inch above the middle of the clavicle, but

inferior the lung does not reach the lower limit of the pleura owing to the presence of the costo-diaphragmatic recess.

The lower limit of the pleura is represented approximately by a line with a slight upward inclination drawn round each side of the body at the level of the twelfth thoracic spinous process. This line should pass through the eighth rib in the nipple line, the tenth in the mid-axillary line, the eleventh in the mid-scapular line, and the twelfth at the lateral margin of the sacrospinalis muscle.

The lower border of the lung is approximately two intercostal spaces above that of the pleura [Warrick, 1976].

The oblique fissure begins at the posterior border at the level of the third thoracic spine and extends round the chest downwards and forwards to end at the inferior margin at the lateral end of the sixth costal cartilage.

The horizontal fissure of the right lung begins at the anterior border at the level of the fourth costal cartilage and extends horizontally backwards till it joins the oblique fissure [Mahran et al., 1974].