COMPUTED TOMOGRAPHY OF THE PULMONARY HILUM

THESIS
Submitted for partial fulfillment of
M.D. Degree in **Radiodiagnosis**

By
Mervat Tawfik Mohamad
M.B.,B.Ch., M.Sc.

Supervised By
Prof. Dr. Salwa Taha Ahmad Ismaiel
Prof. of Radiodiagnosis
Ain Shams University

Dr.Omar Hussein Omar
Assis. Prof.of Radiodiagnosis
Ain Shams University

Dr. Mervat Mohamad Ibrahem
Lecturer of Radiodiagnosis
Ain Shams University

Faculty of Medicine
Ain Shams University
1994

ACKNOWLEDGEMENT

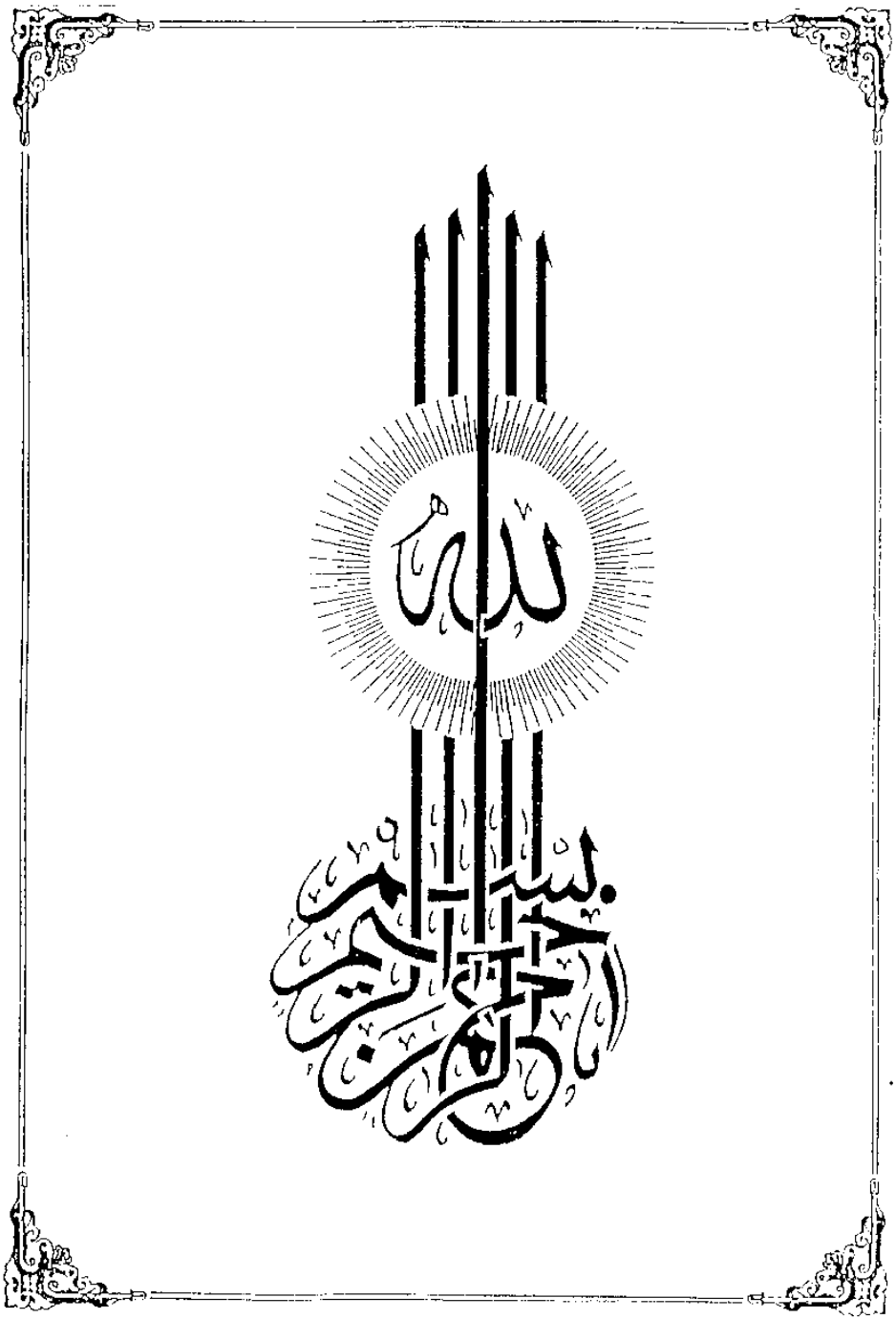
I wish to express my sincere gratitude to Prof. Dr. Salwa Taha Ahmad Ismaiel, Professor of Radiodiagnosis, Ain Shams University, for her moral support, meticulous supervision and valuable advice aiming at the perfection of this work.

My sincer thanks to Dr. Omar Hussein Omar, Assisstant Professor of Radiodiagnosis, Ain Shams University for his helpful remarks in the perfection and completion of this work.

My sincer thanks to Dr. Mervat Mohamad Ibrahem, Lecturer of Radiodiagnosis, Ain Shams University for her generous help and kind supervision that were essential for this work to be achieved.

Special words of thanks and recognition of deep gratitude are given to my family who supported me a lot.

Last, but not least, I would like to offer my warm thanks to all staff of Radiodiagnosis Department, Ain Shams University specially Dr. Khaled Talaat Khairy for their collaboration and advices.



CONTENT

ABSTRACT

This study was conducted on 65 patients (53 males and 12 female) with the aim of emphazing the role of computed tomography of the chest in evaluating pulmonary hilum.

The result revealed that C.T is more sensitive than plain radiography and conventional tomography in evaluating the hilar region and in detecting the nature of the diseases affecting the hilum whether benign or malignant. Also comparison between C.T. and fiberoptic bronchoscopy was done and the result revealed that; there is a good overall correlation between C.T and F.O.B. C.T. should be considered complementary to F.O.B. in patients with hilar abnormalities.

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION AND AIM OF THE WORK

INTRODUCTION AND AIM OF THE WORK

Evaluation of the pulmonary hila has both challenged and fascinated radiologists for years. Anatomic complexity and variability account for mush of the difficulty in hilar analysis (Glazen et al., 1984). Posteroanterior and lateral chest radiography serve as the screening test for hilar disease (Herrnheiser, 1962, Vix and Klatte, 1970). Specialized techniques for hilar evaluation include conventional tomography and computed tomography are essential (Chasen and Yrizary, 1983).

Unfortunately there is no precise radiological definition of pulmonary hilum. Anatomically the hilum is bronchovascular pedicle enclosed in a connective tissue envelop that connect the lung to the mediastinum. It includes the main bronchi, pulmonary arteries, pulmonary veins, pulmonary plexus of nerves, lymph vessels, bronchopulmonary lymph nodes and areolar tissue. The bronchi and normal sized hilar lymph nodes contribute minimally to hilar density using conventional radiography(Glazer et al., 1984, Sone et al., 1990).

Early reports indicated that CT had limited value in hilar evaluation. It is important to note that the early studies used second generation CT scanners that were suboptimal for displaying hilar anatomy because examinations could not always be performed during suspended respiration. Also normal cross sectional hilar anatomy was not appreciated at that time, thus in the early investigations only gross hilar abnormalities were detected (Glazer et al., 1984).

Now after improvements in scanning technology, using contrast-enhanced dynamic scanning or scanning with repeated bolus injection coupled with detailed anatomic analysis of the hilum, we have found that CT is very useful in hilar evaluation (Glazer et al., 1984).

The aim of this work is to emphasize the role of computed tomography in diagnosis of different lesions affecting pulmonary hilum.

ANATOMY

HILAR ANATOMY

Pulmonary hilum can not be defined anatomically with precision, but it is generally considered to be the depression on the mediastinal surface of the lung where the bronchus, blood vessels and nerve enter (Gamsu, 1983).

Anatomically the hilum is the bronchovascular pedicle enclosed in a connective tissue envelope that connect the lung to the mediastinum (Glazer et al., 1984).

Anatomic components of the hilum include the main bronchi, pulmonary arteries, superior and inferior pulmonary veins, pulmonary plexus of nerves, lymph vessels, bronchopulmonary lymph nodes and areolar tissue (Williams and Warwick, 1984).

As detailed by Herrnheiser, the anatomic hilum definitely does not correspond to the radiologic hilum. It is generally agreed that the radiologic hilum is primarily composed of the pulmonary arteries, the superior pulmonary veins contribute to the upper hilar contour, however, the inferior pulmonary veins are considered too caudal to contribute to hilar opacity. The peripheral boundary of the radiologic hilum is a zone where the

Fig. (1a): P.A. a veiw of normal chest.

Fig. (1b): Lateral view of normal chest.

Fig. (1): Quoted from Armstrong, 1992.