

COMPUTED TOMOGRAPHY
OF
GASTRO-INTESTINAL
NEOPLASMS

Thesis

Submitted in Partial Fulfilment
For Master Degree Of
Radio diagnosis

By

Nadia Motassem El Barghouty
MR, BC

616.0757
N.H

Supervised by

Prof. Dr. Abd El Moneim Abou Senna
Prof. of Radiodiagnosis
Ain Shams University

Faculty Of Medicine
Ain Shams University
1989

DEDICATION

To my parents



Acknowledgement

I would like to express my great appreciation and gratitude to **Prof. Dr. Abd El Moneim Abou Senna**, Prof. of Radiodiagnosis, Ain Shams University, for his fatherly guidance, sincere supervision and continuous support and advice he offered me during my work.

I am grateful to **Prof. Dr. Mohamed Samy El Beblawy**, Head of radiodiagnosis department, Ain Shams University, for his continuous help and support.

I wish to express my deep thanks and gratitude to **Prof. Dr. Zenab Abdallah**, Prof. of Radiodiagnosis, Ain Shams University, for her scientific guidance and valuable advise.

My deep appreciation and gratitdue also go to **Dr. Hoda Ahmad El Deeb**, Prof. of Radiodiagnosis, Ain Shams University, for her warm encouragement and continuous help.

Dr. Khaled Talaat Khairy, Lecturer of Radiodiagnosis, Ain Shams University, has paid a lot of efforts and contribution to this work, that can never be forgotten. He sacrificed a good deal of his valuable time in helping me with beneficial ideas and suggestions throughout the progression of this work.

My sincere gratitude is devoted to **Dr. Heba Khalil El Deeb**, Assistant professor of Radiodiagnosis, **Dr. Ahmad Abd El Tawab**, Lecturer of Radiodiagnosis and all other senior staff in Radiodiagnosis department, Ain Shams University, for their kind support and help.

Special words of thanks go to my colleagues and the technicians in the CT unit of Ain Shams University Specialized Hospital, for their beneficial help offered during the preparation of this work.

Last but not least my personal sincere gratitude is devoted to my husband **Dr. Ahmad Kamal El Dorry**, Lecturer of Radiodiagnosis, Ain Shams University, for his continuous support and understanding.

Contents

	Page
Introduction And Aim of The Work	1
Normal CT Appearances	3
Pathology of the Different Gastro-intestinal Neoplasms	13
CT Appearances	39
Methods of Examinations	
a- Barium Studies	58
b- Technique of CT	63
Illustrating Cases	73
Discussion	87
Summary and Conclusions	99
References	100
Arabic Summary	

*Introduction
And Aim
Of The Work*

Introduction And Aim Of The Work

Diseases of the alimentary tract often form a diagnostic problem to the examining clinician. The presenting symptoms are, at times, non-specific and may point to a diversity of lesions. At other times, the lesion may be silent and the only presentation may be anaemia or low grade fever.

Such presentations would need, beside the clinical examination, other investigations to reach the proper diagnosis. A meticulous technique and search is essential for further evaluation, to exclude malignant disease particularly in its early stages.

Barium studies still remain the primary and essential screening method for evaluation of gastro-intestinal tract lesions and in particular, neoplastic affection. However, these studies have their own limitations and need careful and close scrutiny in order not to miss early and subtle changes. Extraluminal extension of the disease, as well as, distant changes are often missed by barium studies. Endoscopy is often resorted to for evaluation as it provides direct visualisation and direct access for biopsy.

CT studies have proved useful in the evaluation of gastro-intestinal neoplasms and has largely contributed in their diagnosis and staging. Its major contribution lies chiefly in the direct visualisation of the bowel wall and

adjacent tissues and organs. It is distinctly better than barium studies in evaluating extraluminal abnormalities.

It is particularly useful in staging gastro-intestinal malignancies, assessing response to treatment, clarifying changes seen on barium studies and shows associated distant changes.

The aim of this study is to emphasize the role of computed tomography in the assessment and staging of gastro-intestinal neoplasms and to describe the different CT manifestations.

*Normal CT
Appearances*



Fig.(1): Normal esophagus-cervical region. Cervical esophagus (E) at level of thyroid gland (arrows) is positioned in the midline, just posterior to the trachea (T). The normal esophageal wall (arrowheads) is a thin, sharp structure outlined by air and mediastinal fat measuring less than 3mm in diameter. Longus colli muscles are indicated by curved arrows.

(Quoted from Moss and Thoeni, 1983)

Normal CT Appearances

THE ESOPHAGUS:

The esophagus connects the pharynx with the stomach and consists of cervical, mediastinal and abdominal segments.

Throughout its length, the esophagus is intimately related to a variety of vital vascular, pulmonary, cardiac, lymphatic and neural structures, the esophagus is surrounded throughout most of its length by periesophageal fat that permits ready differentiation of esophagus from adjacent structures.

The thickness of the normal esophageal wall as measured by CT in a well-distended esophagus is usually less than 3mm and any measurement above 5mm should be considered abnormal (Halber et al., 1979).

The cervical esophagus is a midline structure, intimately related to the posterior tracheal wall, which it indents in approximately 40% of cases. Lateral and dorsal to the esophagus on either side are the longus colli muscles.

The thyroid gland is seen as a high-density structure lying anterior and lateral to the trachea and esophagus (Fig.1).

Air is present within the cervical segment more frequently than in any other part of the esophagus (Halber et al., 1979).



Fig.(2): Normal esophagus-level of sternal notch. The trachea (T) is slightly to the left of the esophagus (E). The retrotracheal extension of lung (arrow) is a normal finding. The left subclavian artery (s), common carotid artery (C), brachiocephalic artery (b), right (r) and left (L) brachiocephalic veins and thin wall (arrowheads) of the normal esophagus are clearly identified.

(Quoted from Moss and Thoeni, 1983)

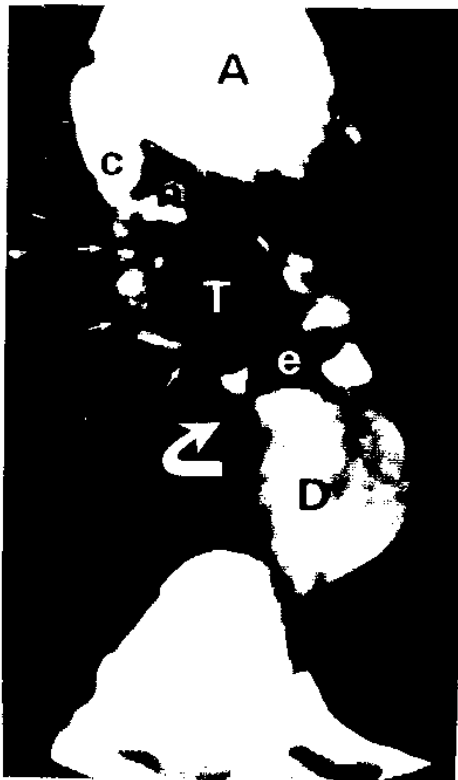


Fig.(3): Normal esophagus level of aortopulmonary window. The esophagus (e) is slightly to the right of the trachea (T) and the ascending (A) and descending (D) aorta, arch of the azygos vein (arrows) entering the superior vena cava (c) and azygosophageal recess (curved arrow) are identified at the level. n = Normal sized pretracheal lymph node.

(Quoted from Moss and Thoeni, 1983)

At the level of the sternal notch, the trachea is slightly to the left of the esophagus (Fig.2).

At the level just below the sternal notch, the trachea deviates slightly to the right of the esophagus, with the esophagus remaining midline or shifting slightly to the left.

The esophagus is closely applied to the thoracic spine, and no normal structure is found posterior to the esophagus at this level. A retrotracheal space of up to 4mm can be present between the trachea and esophagus, and a portion of lung may extend retrotracheally. The subclavian artery, common carotid artery, brachiocephalic artery, and brachiocephalic veins are also clearly identified at this level (Fig.2) (Halber et al., 1979).

At the level of the aortopulmonary window, the esophagus is closely related to the left posterolateral portion of the trachea. The azygos vein is located to the right, posterior and lateral to the esophagus, and the arch of the azygos can be identified at this level. The lung is in direct contact with the right side of the esophagus, forming the azygoesophageal recess, which is identified on 77% of mediastinal CT scans (Fig.3).

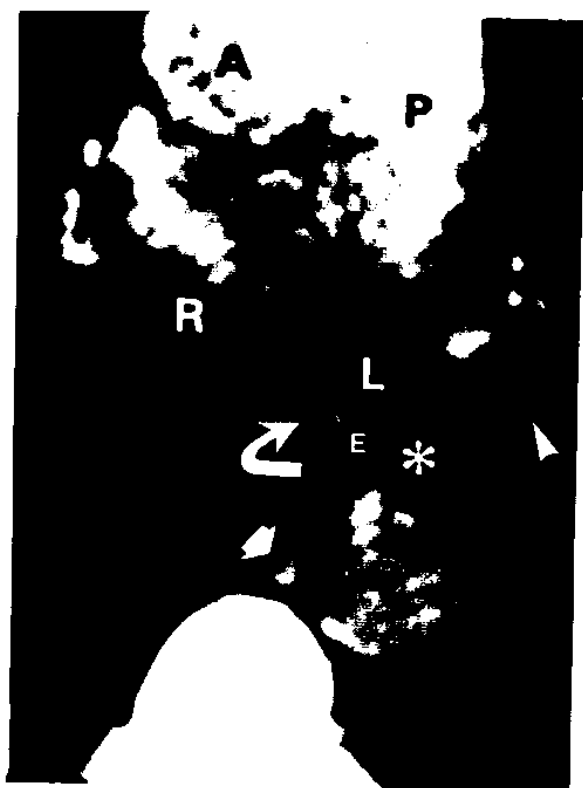


Fig.(4): Normal esophagus-level just below carina. The right (R) and left (L) main stem bronchi, esophagus (E), descending aorta (D), azygos vein (arrow), pulmonary artery (P), ascending aorta (A), and azygoesophageal recess (curved arrow) are identified. The left lung recess is shown abutting on the left main stem bronchus, esophagus and left pulmonary artery (arrow-head). V = Left pulmonary vein.
(Quoted from Moss and Thoeni, 19

Fig.(5): Normal esophagus-level of left atrium. The esophagus (E) is in contact with pericardium surrounding the left atrium (LA). Pulmonary veins (small arrows), right ventricle (V), right atrium (RA), ascending aorta (A), descending aorta (D), and azygos vein (Large arrow) are also seen. At this level the esophagus is separated from lung by only the thickness of the esophageal wall and pleura.
(Quoted from Moss and Thoeni, 1983)





Fig.(6): Normal esophagus level of left ventricle. The esophagus (E) is just to the left of midline, closely related to the left ventricle (LV) and separated from the descending aorta (D) by the posterior junction line (arrow).

V = Inferior vena cava;

RV = right ventricle.

(Quoted from Moss and Thoeni, 1983)

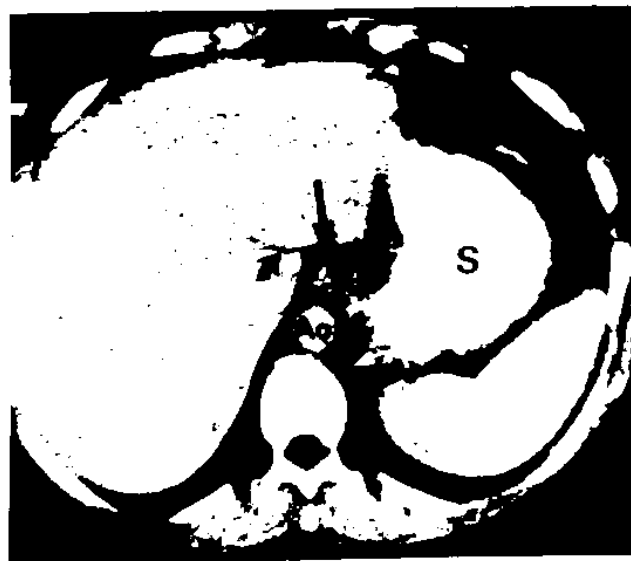


Fig.(7): Normal esophagus-level of gastroesophageal junction. The normal esophagus (large arrows) courses in a horizontal plane to enter the fundus of the stomach (S). The cleft above the caudate lobe (curved arrow) points to gastroesophageal junction. Left diaphragmatic crus (small arrow) is closely applied to the abdominal aorta (AO).

(Quoted from Moss and Thoeni, 1983)