ROLE OF COMPUTED TOMOGRAPHY IN DIAGNOSIS OF GASTRIC NEOPLASMS

THESIS
Submitted by

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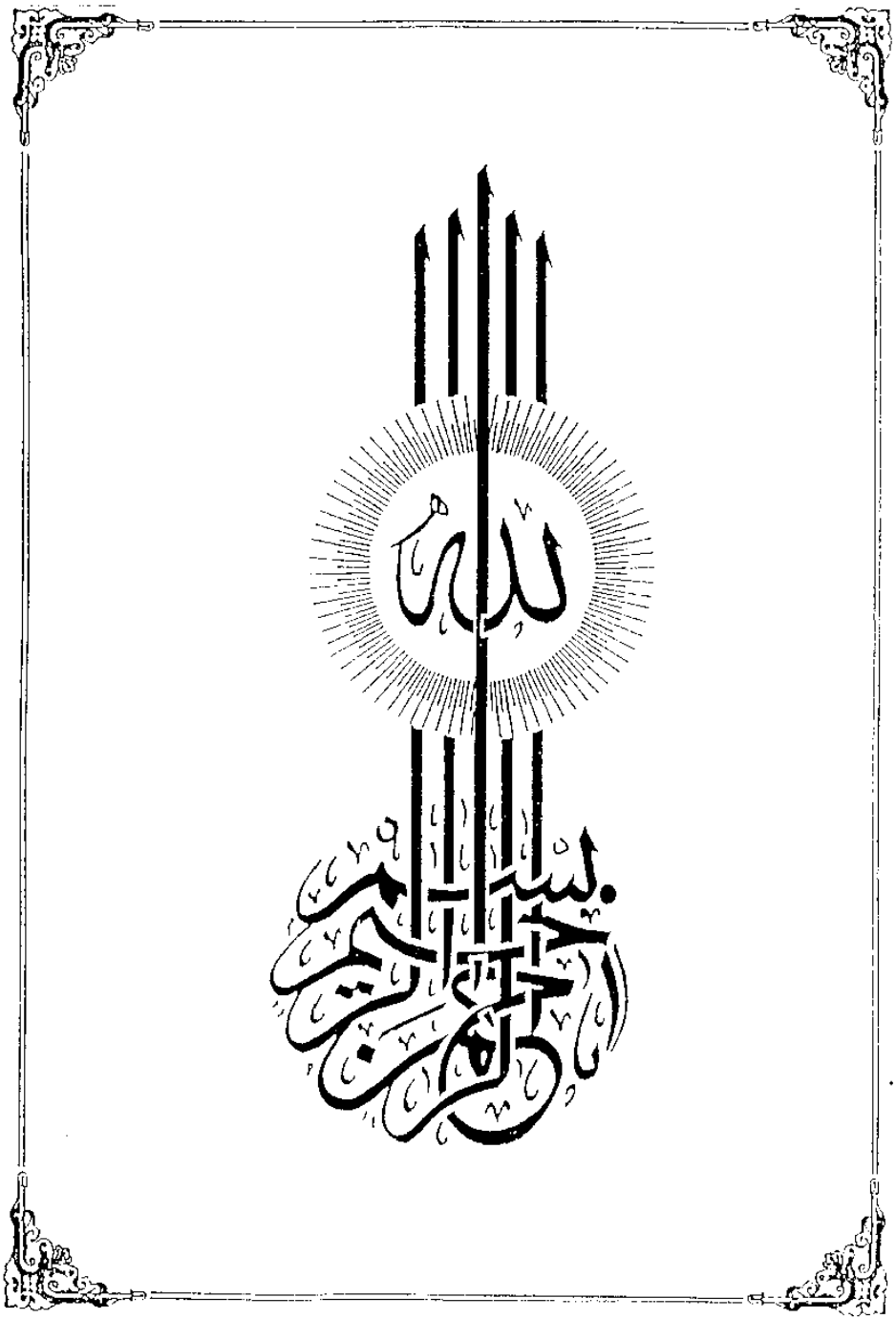

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INTRODUCTION AND AIM OF THE WORK

Introduction and Aim of Work

The importance of gastric neoplasms comes from being the third between gastrointestinal cancers after colorectal and pancreatic cancer. Adenocarcinoma which is the most common gastric tumour is the sixth leading cause of cancer deaths ***(Megibow and Balthzar, 1986)***.

Preoperative evaluation of gastric adenocarcinoma has been dependent upon upper gastrointestinal radiography and endoscopy despite the fact that radiographic and endoscopic examinations do not assess the extramucosal extent of disease ***(Moss et al., 1981)***.

While computed tomography is routinely performed to assess conditions involving the solid abdominal viscera, less attention has been given to problems of alimentary tract ***(Balfe et al., 1981)***.

CT not only can demonstrate the gastric wall and perigastric tissue but also can demonstrate the direct extension of tumour into contiguous organs and the presence of distant metastasis ***(Sussman et al., 1988)***.

There is no doubt that CT has a unique ablity to demonstrate the anatomical configuration of the various

structures present on a cross sectional image through clinically aparent palpable mass ***(Williams et al., 1984)***.

The wide spread availability of high resolution fast scanners, combined with increasing experience in both performing and interpreting studies, has led to the maturing of CT into a vital diagnostic tool for evaluation of gastrointestinal tract abnormalities ***(Raptopoulos, 1989)***.

CT is able to present three dimentional information concerning the internal structure of the body by presenting it in the form of a series of slices. It is very senstive and can show soft tissue clearly and it can measure the value of X-ray absorption of those tissues very accurately, thus enabling the nature of the tissues to be studied. ***(Kreel, 1979)***.

The aim of this work is to emphasize the role of CT in the diangosis of gastric neoplasms and staging of malignant tumours.

CT ANATOMY OF THE STOMACH

Computed tomographic anatomy of the stomach

The important anatomical features for the radiologist attempting to evaluate the stomach on CT are: the appearance and thickness of the normal gastric wall, cross sectional representation of the gastric curvatures, the relation of the gastric surfaces to the greater and lesser peritoneal cavities, the sites of attachment of supporting ligaments that contain the gastric blood supply and lymph nodes, the location of major lymph node groups, and the perigastric vessels ***(Megibow and Balthazar, 1986)***.

The gastric wall:

The appearance of the stomach varies with the degree of distension. The gastric wall have a uniform thickness without focal thickening or thinning ***(Haaga and Alfidi, 1983)***.

In 1981, ***Balfe et al.*** analyzed the clinical and CT findings in 100 normal subject and 31 patients with gastric disease to determine the significance of thickening of gastric wall. Ninety percent of normal individuals has a wall thickness less than 1 cm with adequate distension of the lumen ***(Balfe et al., 1981)***.

Fig.(1): Normal gastric wall-air contrast technique. The mucosal and serosal aspects of the wall are clearly identifiable.This allows an accurate measurement of a 2.2 mm thickness. The rugae are clearly seen and are symmetrically distributed around the circumference. The wall measures 6 mm when the rugal fold is included.

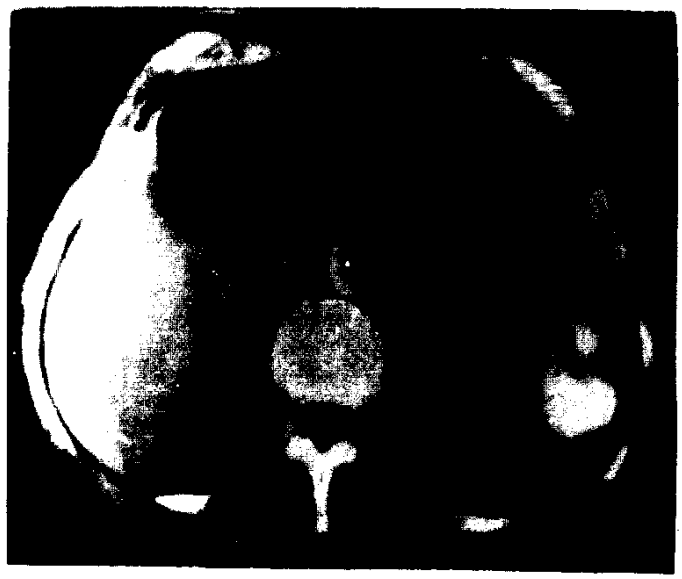

Fig. (2): Pyloric canal-air contrast CT. The narrow pyloric canal is seen between the thick pyloric musclature

(Quoted from Megibow and Balthazar, 1986)

In 1986, ***Megibow and Balthazar*** examined by air contrast technique the appearance of the gastric wall in 50 consecutive patients in whom there is no clinical evidence of gastric disease where the findings indicate the average thickness of the gastric wall to be 1.5 to 2.5 mm (Fig. 1) ***(Megibow and Balthazar, 1986)***.

In ***Komaki's series***, in 1982, the thickness ranges from 1.2 to 13 mm (average 5 mm). These series were performed after distending the stomach with positive contrast material ***(Komaki, 1982)***.

Wall thickness of the gastric cardia will appear greater since the oxial slice orientation obliquely intersects the curved gastric wall here ***(Scatarige and DiSantis, 1989)***.

The pylorus and pyloric canal (Fig. 2) displays focal thickening. Occasionally the thin gastric lumen can be seen traversing the pyloric canal. The location and symmetrical positioning of the gastric lumen traversing the pyloric canal helps eliminate confusion in identifying this wall thickening from a pathologic condition. The thickening of the pylorus is a result of the presence of thick oblique muscle fibers in the region of the pyloric sphincter ***(Megibow and Balthazar, 1986)***.

Fig.(3): Gastric fundus posterior to splenic vessels. A portion of the gastric fundus can be seen posterior to splenic artery and vein. Poor filling of the stomach can lead to the false diagnosis of a left adrenal mass.

(Quoted from Megibow and Balthazar, 1986)