CARDIAC ACHALASIA
ITS INVESTIGATIONS AND SURGICAL METHODS OF TREATMENT

THESIS

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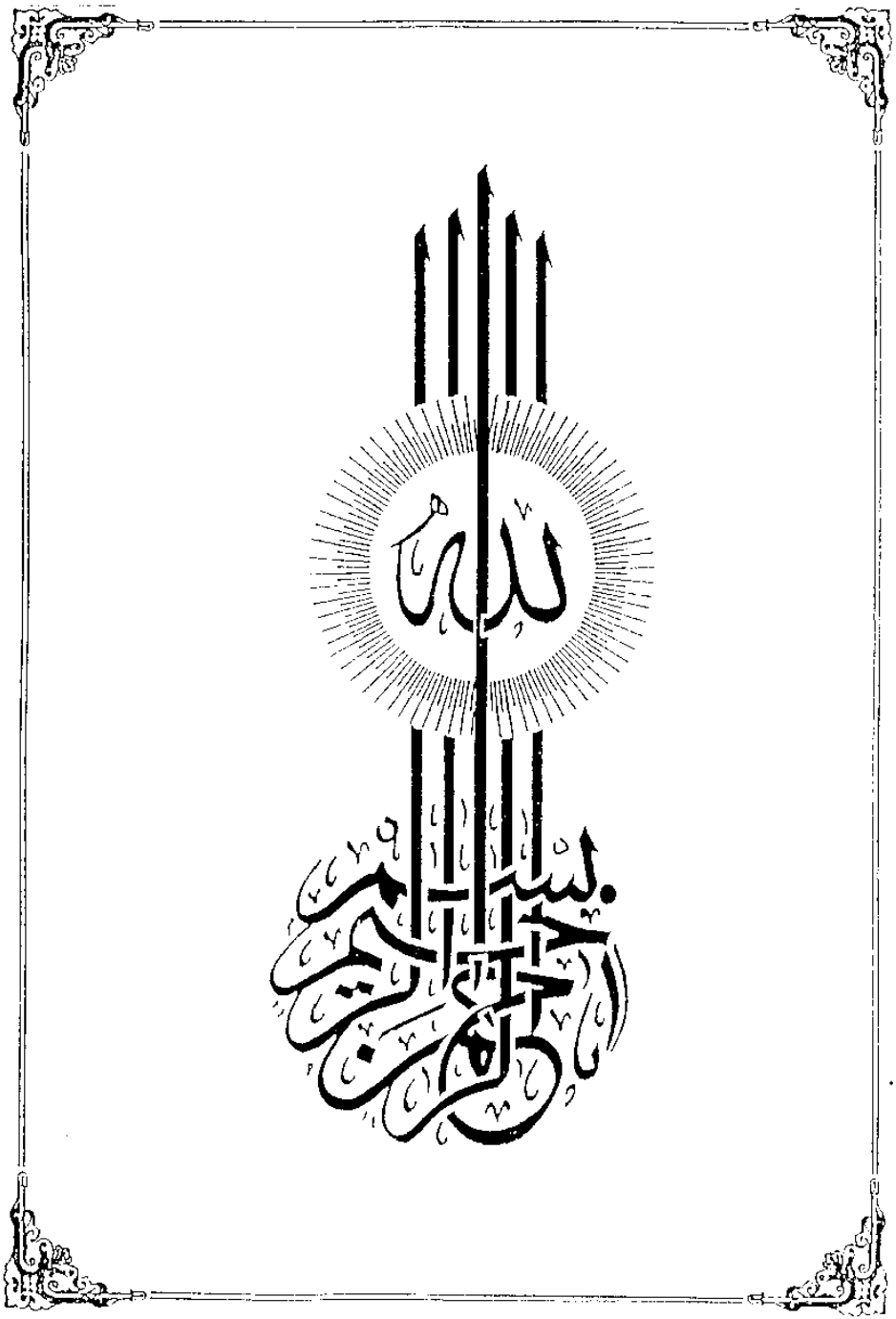
C O N T E N T S



INTRODUCTION

This thesis has been written for cardiac achalasia diagnosis and managment.

This thesis also includes simple note on complications of cardiac achalasia.

The work comprise one case, who is a female patient, 17 years old with picture of cardiac achalasia. This patient was subjected to trans-thoracic Heller's operation and passed without any complications except some chest troubles in form of delayed lung expansion.

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HISTORICAL ASPECTS

In the past decade, there has been a remarkable growth of knowledge about the oesophagus - its function, methods of examining it, and the diseases affecting it and their management. Before transthoracic operations were possible and before the marked advancement of anaesthetic procedures only cervical and intraabdominal parts of the oesophagus could be approached surgically and in so far as is known the earliest operation on this organ was cervical oesophagatomy for removal of a foreign body. Thomas Willis 1674 first described cardiac achalasia, he not only recognized the nature of the disorder but also deviced a treatment, which in principle has been used to the present time, he adviced forcible dilatation as a treatment of choice.

The term achalasia was first introduced by Sir Arthur Hurst 1915, translated from the Greek, it means "lack of relaxation". Old names described this condition are "Mega oesophagus", or "Idiopathic dilatation of the oesophagus" or "Cardiospasm". Term achalasia is not a completely satisfactory name for the disease. However it is more suitable than other terms.

Kranecker and Meltzer and Hurst did much to improve our basic physiological studies that shed much light on the nature of the condition, and Henry plumner was largerly responsible for

introducing the non surgical treatment of this condition. In 1913 the German surgeon Heller described transthoracic oesophagomyotomy which still so satisfactory in surgical treatment of this condition.

ANATOMY AND HISTOLOGY

Anatomy of the oesophagus

- Relations of cervical part
- Relations of thoracic part
- Rlations of abdominal part
- Blood supply and venous drainage
- Lymphatic drainage
- Nerve supply

Anatomy of the diaphragm

Embryology of the oesophagus and diaphragm

Histology of the oesophagus

ANATOMY OF THE OESOPHAGUS

The oesophagus is a distensible, hollow, muscular tube or conduit extending from the pharynx at the level of the 6th cervical vertebra, through the posterior mediastinum and diaphragm to the stomach, it pierces the diaphragm level with the 10th thoracic vertebra, and ends at the cardiac orifice of the stomach at the level of the 11th thoracic vertebra. The general direction of the oesophagus is vertical, but it presents two slight curves. At its commencement it is median; but it inclines slightly to the left as far as the root of the neck and therefore it is best approached surgically from that side. Gradually it passes again to the median plane, at the level of the 5th thoracic vertebra and again, at the 7th, deviates to the left and then turns anteriorly to the oesophageal opening in the diaphragm. There is usually a short segment of intraabdominal oesophagus before it joins the stomach at the cardia. Oesophagus descends largely anterior to the vertebral column. The oesophagus also presents anteroposterior flexures corresponding to the curvatures of the cervicothoracic part of the vertebral column.

In adult its length from upoer incisor to the cricopharyngeus 15-20 cm., and to arch of aorta 20-25 cm., and to inferior pulmonary vein 30-35 cm. and to cardiooesophageal junction nearly 40-45 cm.

The oesophagus has three distinct areas of narrowing - at its origin where the cricopharyngeus muscle narrows the introitus of the oesophagus, about 15 cm. from the incisor teeth, and at level of the arch of the aorta and left principle bronchus where these structures crossing it about 22.5 to 27.5 cm. from incisors, and at its lower end as it approaches the diaphragm to join the stomach at gastro-oesophageal sphincter, about 40 cm. from the incisors.

The cricopharyngeal narrowing is usually the narrowest point in the gastrointestinal tract, a fact of considerable teleologic importance and sites of these constrictions as a whole are important clinically in connection with impaction of foreign body in the oesophagus.

Relations of the cervical part of the oesophagus:

Anteriorly lies the trachea with the recurrent laryngeal nerves lodged on each side, in the groove between the trachea and the oesophagus. Posteriorly, it lies on vertebral column, the longus colli and the prevertebral layer of the deep cervical fascia.

Lateraly, on each side, lie the corresponding common carotid artery and the posterior part of the loop of the thyroid gland; in the lower part of the neck, where the oesophagus projects to the left side, it has a closer relation to the carotid sheath and the thyroid gland than on the right side. Thoracic duct ascends for a short distance along the left edge of the oesophagus.

The thoracic part of the oesophagus:

Is at first situated in the superior mediastinum between the trachea and the vertebral column, a little to the left of median plane.

It passes behind and to the right of the aortic arch and descends in the posterior mediastinum along the right side of the descending thoracic aorta. Below, as it inclines to the left, it crosses infront of the aorta, and enters the abdomen through the diaphragm at the level of the tenth thoracic vertebra. It is in relation anterior ly (from above downward), with the trachea, the right pulmonary artery, the left principal bronchus, the pericardium (separating it from the left atrium), and the diaphragm; posteriorly are the vertebral column, the longus colli muscles, the right posterior (aortic) intercostal arteries, the thoracic duct, the azygos vein and the terminal parts of the hemiazygos and acessory hemiazygos veins, and inferiorly, near the diaphragm, the front of the aorta. In the posterior mediastinum an elongated recess of the right pleural sac intervenes between the oesophagus and the vena azygos and vertebral column. On its left side, in the superior mediastinum the terminal part of the aortic arch, the left subclavian artery, the thoracic duct, and the left pleura are immediate relations, while the left recurrent laryngeal nerve runs upwards in, or just in front of, the

groove between it and the trachea; in the posterior mediastinum it is in relation with the descending thoracic aorta and the left pleura. On its right side it is related to the right pleura, the azygos vein intervening as it arches forwards above the right principal bronchus to join the superior vena cava. Below the roots of the lungs the vagus nerves descend in close contact with it, the right nerve chiefly behind, and the left chiefly in front of it, the two nerves unite to form a plexus around the tube. In the lower part of the posterior mediastinum the thoracic duct lies behind and to the right of the oesophagus; higher up, it is placed behind it, and crossing to the left about the level of the fifth thoracic vertebra, is continued upwards on its left side. On the right side of the oesophagus, just above the diaphragm, a small serous sac (the infracardiac bursa) is sometimes found; it represents the upper detached part of the right pneumato-enteric recess.

The abdominal part of the oesophagus: having emerged from the right crus of the diaphragm slightly to the left of the median plane at the level of the tenth thoracic vertebra, lies in the oesophageal groove on the posterior surface of the left lobe of the liver. It is about 1.25 cm. in length, conical in shape and curved sharply to the left, the base of the cone being continuous with the cardiac orifice of the stomach; its right border continues evenly

into the lesser curvature of the stomach while its left border is separated from the fundus of the stomach by the cardiac notch. It is covered with peritoneum in front and on its left side; it is contained in the upper left part of the lesser omentum, the peritoneum reflected from its posterior surface to the diaphragm being part of the gastrophrenic ligament.

The oesophageal branches of the left gastric vessels pass to the oesophagus in this peritoneal ligament. Behind the oesophagus are the left crus of the diaphragm and the left inferior phrenic artery.

The vagus nerves have variable relations to the oesophagus as it passes through the diaphragm. Sometimes one trunk (consisting mainly of left vagal fibres) lies on the front, and one (consisting mainly of right vagal fibres) on the back of the oesophagus, but each vagus may consist of two or three trunks at this level.

Blood supply of the oesophagus:

The oesophagus receives its blood supply from the inferior thyroid artery of the thyrocervical trunk, in its cervical portion, and from the oesophageal branches of the aorta (both direct and via oesophageal branches of intercostal and branchial arteries) in its thoracic portion.

Additional blood supply to the distal oesophagus derives from oesophageal branches of the inferior phrenic (from abdominal aorta) and left gastric arteries (from coeliac trunck) it is to be remembered that rough handling or wide mobilization of the oesophagus may imperile its blood supply, especially over its main extent where the aortic branches are destributed in a segmental manner. There are not more than two or three aortic oesophageal arteries. They are selender and tenuous vessels.

In part, venous drainages parallels arterial supply. However there are extensive intercommunications that affords excellent collateral venous circulation. A fine microscopic venous plexus is present throughout the entire submucosa, which freely communicates with the richer submucosal venous plexus of the stomach. In addition, this fine plexus of veins drains into larger submucosal venous channels that are placed around the circumference of the oesophagus and run longitudinally the entire length of the organ. These vertical veins enter communicates with the inferior thyroid veins superiorly while in thoracic oesophagus they communicate with perforating and external oesophageal veins which drain into hemiazygos and azygos and accessory hemiazygos veins, which, in turn, empty in the superior vena cava. Inferiorly, at the oesophagogastric junction these large vertical veins have direct connection

with the portal venous system via the cardinal (left gastric) veins. The abdominal part of the oesophagus is one of the sites where portosystemic anastomosis occur.

Lymphatic channels run longitudinally in the wall of the oesophagus before penetrating the muscular layers to reach original lymph nodes. The latter are distributed throughout the length of the oesophagus in preoesophageal connective tissue and enter communicate freely with one another and with neighbouring lymphatic systems. Upper cervical part drain into cervical lymph nodes near origin of the inferior thyroid artery, middle part into preaortic lymph nodes to posterior mediastinal to tracheobranchial glands and to mediastinal lymph trunk. The lower part drain into periaortic lymph nodes of the coeliac group. Thoracic duct also provides a major drainage system for the oesophagus while subcranial and diaphragmatic nodes provide minor system.

Nerve supply of the oesophagus:-

The oesophagus has both sympathetic and parasympathetic innervation parasympathetic connections are via the vagi; the recurrent laryngeal nerves supply the upper part of the oesophagus, and the vagi below the recurrent nerves supply the remainder of the oesophagus. The vagus nerves lie on either side of the oesophagus through most of its course,