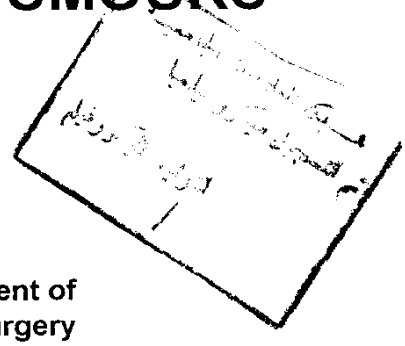
RECENT TRENDS IN MANAGEMENT OF OESOPHAGEAL TUMOURS



ESSAY

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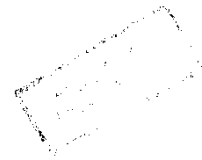

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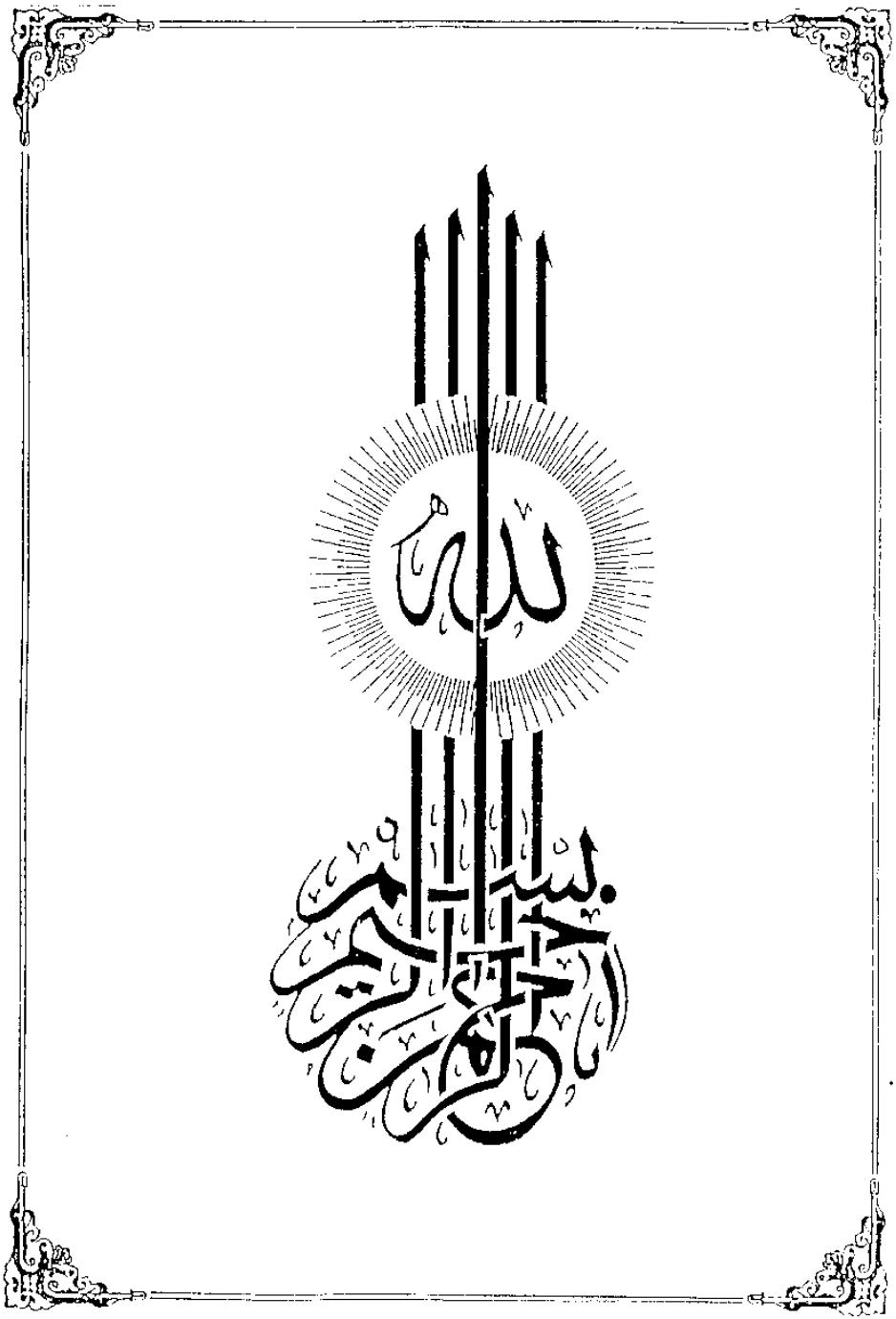

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INTRODUCTION

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Oesophageal tumours are not a common visceral malignancy, but one of the most challenging from the stand point of therapy. Because the disease is uncommon, the number of physicians who have had the opportunity to make personal observations regarding its management is limited. The stimulus of this work come from the recognition of this fact, and our perceived need to update,current issues in the aetiology, diagnosis and treatment of the disease. Issues pertinent to the management of oesophageal tumours are also discussed. Among them are :

* The frequent failure to make the clinical diagnosis when the disease is still anatomically localised to the oesophagus.
* The difficulty in clinically staging the extent of the disease.
* Establishing criteria for either curative or palliative surgical therapy.
* The high morbidity and mortality of surgical resection.
* Confirmation of the value of nutritional support, radio-therapy, and chemotherapy.
* The indication for non surgical methods of palliations.

EMBRYOLOGY

ANATOMY

EMBRYOLOGY

Both the oesophagus and trachea are first recognised as a ventral diverticulum of the foregut about 22 or 23 days after fertilization. As the diverticulum elongates, a proliferation of endothelial cells appears on its lateral walls. These cell masses become ridges of tissue that ultimately divide the foreguet into tracheal and oesophageal channels. At this point intrruption of normal events leads to imperfect formation of the trachea or oesphagus.

The division into separate tubes is completed between 34 and 36 days after fertilization, at which time the submucosal and muscular layers of the oesophagus and trachea are apparent.

The circular muscular coat appears early in the sixth week, and the vagus nerves appear shortly thereafter. Blood vessels from the aorta are seen in the seventh week of gestation,and the longitudinal musculature is recognizable by the ninth week **(Hopkins, 1972).**

During the seventh and eighth weeks, the epithelium lining the oesophagus proliferates until the lumen is nearly filled.Unlike the situation in the developing small intestine, there is never a stage of complete occlusion of the fetal oesophagus. The epithelium of the oesophagus is ciliated in early development,but after 20 weeks is gradually replaced by stratified squamous epithelium.

All presently recognized embryologic studies seem to indicate that intrruption in the fourth fetal week of events that bear on the elongation and partitioning of the oesophageal and tracheal tubes allows persistence of fistulas and clefts between the two channels and permits incomplete development of the oesophagus **(Greenwood and Rosenthal, 1976).**

Some additional elucidation of embryogenesis may be gained by reviewing the anomalies so frequently associated with oesophageal atresia, such as cardiac malformations seen in approximately 30% of babies with oesophageal atresia, and anal anomalies, which occur in about 12% of cases **(Andrassy and Mahour, 1979).**

ANATOMY

The primary functions of the oesophagus are propelling food and fluid into the stomach while preventing reflux of gastric juice. The oesophagus also allows for blecching, regurgitation, and vomiting.

The adult oesophagus is a musculomucosal canal 23-25 cm in length extending from the pharynx to the stomach. It begins as a continuation of the pharynx at the lower border of the cricoid carliage, which is marked by the lower border of the cricopharyngeus muscle that lies at the level of the Sixth cervical vetebra, passing through the diaphragm and entering the abdomen to end at the lower oesophageal sphincter opposite the eleventh thoracic vertebra.

The lumen of the oesophagus is marked by three constant radiographic and endoscopic constrictions.

* The first is due to the cricopharyngeus muscle.
* The second is due to the left lateral indentation of the aortic arch, and the anterior indentation of the left main bronchus.
* The third constriction occurs at the distal end where the oesophageal lumen is compressed by the lower oesophageal sphincter **(Tom and Bernard, 1985).**

The oesophagus is a midline structure, deviating to the left in two areas. The lower portion of the neck and

upper part of the thorax. The lower segment the oesophagus again inclines to the left to reach the diaphragmatic hiatus **(Postlethwait, 1979).**

The oesophagus may be divided conveniently into the cervical, thoracic and abdominal portions. The cervical portion is related anteriorly to the trachea.In the groove between the oesophagus and the trachea lies the recurrent laryngeal nerve, which is in closer apposition on the left side. Posteriorly the oesophagus rests on the vertebral column and the longus colli muscle. On the left side of the oesophagus lies the carotid sheath,lobe of the thyroid gland, and inferiorly the thoracic duct.On the right side, the carotid sheath and the thyroid gland are found.

From the thoracic inlet to the tracheal bifurcation at the level of the fifth thoracic vetebra, the oesophagus remains in intimate relationship with the trachea anteriorly and the prevertebral fascia posteriorly. On the left side and anterolaterally the left subclavian artery, and posterior to the latter is the pleura. In the same area, the thoracic duct approaches the structures on the left side of the oesophagus, as the duct passes from its posterior position. The arch of the aorta crosses the left side of the oesophagus, and just below the bifurcation of the trachea, the left main bronchus crosses. On the right side of the oesophagus the right pleura is in close contact, and just above the root of the right lung, the azygos vein runs transversely.

As the oesophagus completes its retrotracheal path and continues inferiorly, it gradually curves anteriorly and to the left. It becomes more marked inferiorly.Anteriorly lies the pericardium, and posteriorly a number of structures intervene between the oesophagus and vertebrae. The azygos vein lies posteriorly and to the right. Communicating branches from the haemiazygos vein and right posterior intercostal arteries are also present posteriorly. On the left side, there is at first the descending aorta, but as the oesophagus approaches the hiatus, the aorta gradually becomes more posterior in position. Just above the diaphragm, the oesophagus is in contact with the pleura.

On the right side, the pleura covers the oesophagus over a variable extent. The inferior vena cava is near the right anterolateral portion of the oesophagus inferiorly.

The thoracic duct lies posterior to the oesophagus above the diaphragm,being separated from it by a very thin layer of connective tissue. At about the fifth thoracic vertebra, the duct crosses to the left, then behind the aortic arch and the thoracic part of the left subclavian artery, between the left side of the oesophagus and the left pleura, in the neck it gradually diverges from the oesophagus in its curve to the left subclavian vein.

After the passage of the oesophagus through the diaphragm, a variable but usually quite short segment of

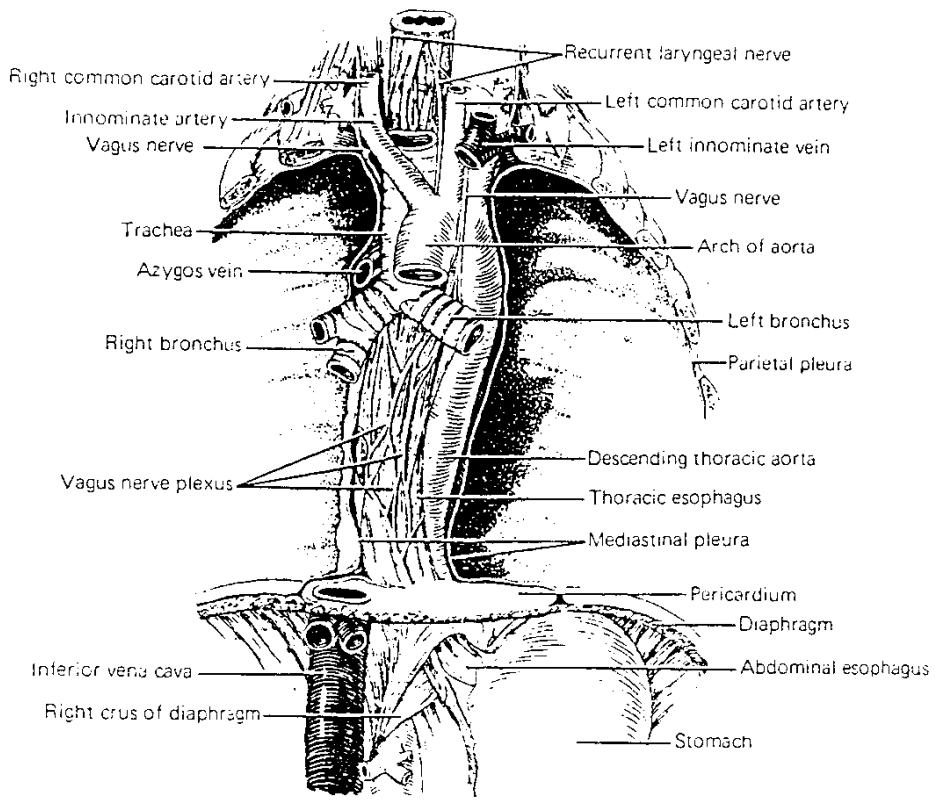

Fig. (1): Anatomy of the oesophagus.
(Lawrence and Carlos, 1991).

if lies in relationship anteriorly and to some extent to the right with the posterior surface of the left lobe of the liver. Posterior to the oesophagus the crura of the diaphragm. The medial border of the spleen may be in close apposition to the left side of the abdominal oesophagus **(Postlethwait, 1979). Fig. 1.**

BLOOD SUPPLY OF THE OESOPHAGUS

The oesophagus receives a variable but segmental blood supply but with extensive collaterlization **(Thor, 1987).**

A continues anastomotic chain of small arteries forms a network in the submucosa and over the external surface of the oesophagus.

The blood supply of the cervical portion arises mainly form the inferior thyroid artery, other branches may arise from subclavian, common carotid, superior thyroid, costocervical, superficial cervical and vertebral artries **(Postlethwait, 1979).**

The part of the oesophagus between the aortic arch and the bifurcation of the trachea is vasculised from the bronchial arteries with occasional major branches from the aorta.

Below the bifurcation, the artries arise from the thoracic aorta. Although generally described as three to

seven in number, actually there are usually only two branches arising between the seventh and ninth intercostal spaces.

The abdominal oesophagus receives its blood supply principally from branches of the left gastric and left inferior phernic arteries. These latter vessels arise from the aorta, supplying the crura of the diaphragm and then entering the abdominal portion of the oesophagus, anastomosing with the left hepatic or splenic arteries and occasionally directly from the celiac axis **(Postlethwait, 1979).**

The segmental nature of the arterial blood supply to the oesophagus suggests that extensive surgical mobilisation of the oesophagus without regard to its blood supply may result in ischemic complications **(Hermann, 1966).**

The venous drainge is more complex. Subepithelial and submucous channels course longitudinaly to empty above into the hypopharyngeal plexus and below into the gastric veins. These channels also penetrate the oesophageal muscle, from which they receive tributries and leave the oesophagus to form a periosophageal plexus, the longest trunks of which accompany the vagus nerves.

Drainge from the cervical portion of the oesophagus empties ultimately into the inferior thyroid and vertebral veins.Drainge from the thoracic portion is into the azygos