

TRANSHIATAL ESOPHAGECTOMY IN CANCER ESOPHAGUS

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INTRODUCTION

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Tumours of the esophagus are among the most challenging problems confronting the oncologic surgeon. Esophageal tumors are highly likely to result in early mortality owing to the likelihood of advanced disease at the time of diagnosis and the challenging nature of their treatment (Ferguson and Skinner, 1991).

There is disagreement about what constitutes optimal therapy for patients with carcinoma of the esophagus. However, surgical resection is the mainstay of curative therapy for carcinoma of the esophagus (Ferguson and Skinner, 1991).

The last 50 years have seen dramatic improvement in the preoperative evaluation, nutritional support, anesthetic and operative techniques, and post operative care. Transhiatal esophagectomy without thoracotomy has emerged in recent years as an alternative operative approach that may be associated with substantially less risk and mortality (Orringer, 1991).

This work aims at the study of the merits of transhiatal esophagectomy approach for esophageal cancer and to compare it with the transthoracic approach and to put a light on the proper patient selection for different approaches.

EMBRYOLOGY OF THE ESOPHAGUS

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The esophagus starts to develop on the twentieth day after fertilization as a short tube extending from the tracheal groove to the dilatation of the foregut destined to become the stomach. This tube elongates with ascent of the larynx and descent of the heart, during which process the esophageal lumen becomes temporarily obliterated by a proliferation of the endodermal columnar lining cells. Failure to recanalize is the cause of esophageal atresia. After recanalization, the epithelial lining of the esophagus changes to stratified squamous type. The muscular and connective coats of the esophagus are derived from visceral mesoderm between the sixth and twelfth weeks of life (Cuschieri, 1988).

Initially, the vagal trunk run along the sides of the esophagus, but as the stomach rotates to the right, the right vagus assumes a position posterior to the cardioesophageal Junction and the left trunk comes to lie anterior to the gullet (Cuschieri, 1988).

The respiratory system arises as a laryngo-tracheal diverticulum from the primitive pharynx. It grows ventro-caudally and becomes separated from the esophagus by tracheo-bronchial folds which fuse to form a partition to divide the laryngo-tracheal tube ventrally from the esophagus dorsally. Failure of complete fusion is the cause of tracheo-esophageal fistula (Davies, 1986).

ANATOMY OF THE ESOPHAGUS

ANATOMY OF THE ESOPHAGUS

Adult Anatomy :

The esophagus is a muscular tube, that is 25 cm (10 in) long in the average adult, connecting the pharynx to the stomach. It begins in the neck at the caudal border of cricoid cartilage, opposite the sixth cervical vertebra, where it is continuous with the pharynx. It descends largely anterior to the vertebral column, through the superior and posterior part of the mediastinum, pierces the diaphragm level with the tenth thoracic vertebra. The general direction of the esophagus is vertical but it presents two slight curves. At its commencement it is median, but it inclines slightly to the left side as far as the root of the neck, then gradually passes again to the median plane at the level of fifth thoracic vertebra, and again at the level of the seventh thoracic vertebra deviates to the left and then turn anteriorly to the esophageal opening in the diaphragm. It also presents antero-posterior flexures corresponding to the curvature of the cervical and thoracic part of vertebral column (Warwick and Williams, 1973).

The surgical importance of these deviations is that the cervical esophagus is best approached from the left side while the thoracic portion through a right thoracotomy, except the lower end which is more accessible through a left thoracotomy or left thoraco-abdominal approach (Cuchieri, 1988).

The esophagus has been subdivided arbitrarily into more divisions than just the cervical and thoracic portions. The American Joint Committee for cancer staging and End Result Reporting divided the esophagus into three principal regions.

The first is the cervical esophagus, which extends from the pharyngoesophageal junction to the level of the thoracic inlet. They consider the latter to be 18 cm from the upper incisor teeth. The second region includes the upper and midthoracic esophagus, extending from the thoracic inlet to a point 10 cm above the esophagogastric junction. The latter is usually located at T8, 31 cm from the upper incisor teeth. The third region is the lower thoracic esophagus, the distal 10 cm of esophagus. The Japanese Society of Esophageal diseases had a similar system for dividing the esophagus into regions but further subdivides the upper and midthoracic esophagus and the lower esophagus into two subdivisions (Fig. 2-1) (Rosenberg et al., 1985).

Alternatively, the thoracic esophagus can be divided into upper, middle, and lower portions. The upper thoracic esophagus is about 5 cm long, the middle thoracic esophagus is about 10 cm long, and the lower thoracic esophagus comprises the distal portion of the organ. One can subdivide esophagus into thirds. The upper third consists of the cervical esophagus and upper thoracic esophagus, the middle thoracic esophagus is the middle third, and the lower thoracic esophagus is the lower third. This classification may be the most practical because it is the simplest.

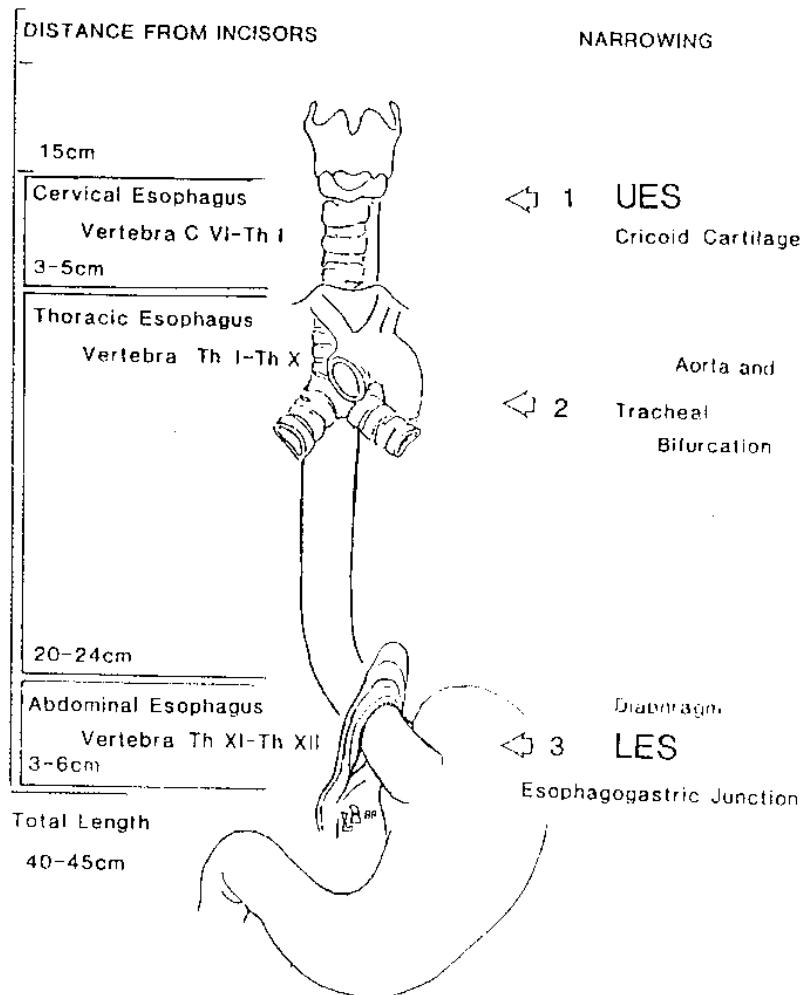


Figure 1 :

Classic division of the esophagus and its relationships to the vertebrae (Duranceau and Liebermann, 1991).

All subdivisions of the esophagus are arbitrary, and malignant lesions often extend beyond the limits of a designated portion of the esophagus (Rosenberg et al., 1985).

Compression by adjacent organs, vessels, or muscles causes narrowings, which can be visualized by means of fluroscopy and endoscopy. The cricopharyngeal narrowing is identified at a site 15 cm from the incisors. The aortic compression, which is left-sided and anterolateral, is caused by the crossing of the aortic arch and the left main bronchus at a location 22 cm from the incisors. The third narrowing is not constant and is located at or about 44 cm from the incisors. It may be caused by the functional effect of the lower esophageal sphincter rather than by the mechanical imprint of the diaphragm.

There are two functional constrictions, the upper and the lower esophageal sphincters. They can be defined manometrically at the esophageal opening, between 14 to 16 cm from the incisors, and at the entrance into the stomach, between 40 and 45 cm from the incisors (Duranceau and Liebermann, 1991).

The esophagus, both proximally and distally, is stabilized by bony, cartilagenous, or membranous structures. At the cranial end, the esophageal musculature is firmly inserted on the posterior margin of the cricoid cartilage with the help of the circoesophageal or cricopharangeal tendon. The lower attachments consist of serous reflection and the phreno esophageal membrane. The supra diaphragmatic pleura reflection is continuous with the mediastinal pleura and is