Updates in Management of Esophageal Motility Disorders

ESSAY

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List of Abbreviations

ATP	: Adenosine Triphosphate.
CDP	: Contractile Deceleration Point.
CFV	: Contractile Front Velocity.
CP	: Crico Pharyngeaus.
DCI	: Distal Contractile Integral.
DES	: Diffuse Esophageal Spasm.
DL	: Distal Latency.
EGD	: Esophago-Gastro Duodenoscopy.
EGJ	: Esophago-Gastric-Junction.
EPT	: Esophageal Pressure Topography.
GERD	: Gastro Esophageal Reflux Disease.
HP	: Hypertensive Peristalsis.
HRM	: High-Resolution Manometry.
IRP	: Integrated Relaxation Pressure.
LEs	: Lower Esophageal Sphincter.
LHM	: Laparoscopic Heller Myotomy.
NEMD	: Nonspecific Esophageal Motility Disorder.
NO	: Nitric Oxide.
NOTES	: Natural Orifice Transluminal Endoscopic Surgery.
PD	: Pneumatic Dilatation.
PEMDs	: Primary Esophageal Motility Disorders.
POEM	: Peroral esophageal myotomy.
PSS	: Progressiv e Systemic Sclerosis.
SE:	Standard Error.
SLE	: Systemic Lupus Erythematosus.
TBE	: Timed Barium Esophagram
TLESR	: Transient Lower Esophageal Sphincter Relaxation.
UES	: Upper Esophageal Sphincter.
VATS	: Video-Assisted Thoracic Surgery.
VIP	: Vasoactive Intestinal Peptide.

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Introduction

The esophagus functions solely to deliver food from the mouth to the stomach where the process of digestion can begin. Efficient transport by the esophagus requires a coordinated, sequential motility pattern that propels food from above and clears acid and bile reflux from below known as peristalsis (**Sonnenberg et al., 2009).**

Disruption of this highly integrated muscular motion limits delivery of food and fluid, as well as causes a bothersome sense of dysphagia regurgitation, reflux, and chest pain **(Eckardt et al., 2011)**.

Esophageal motility Disorders are referred to be spectrum of these disorders ranges from primary (well defined) to very non specific disorders. Also may occur as manifestation of systemic diseases such as diabetes, alcohol consumption or scleroderma,referred to as secondary motility disorders, where treatment will usually aimed at the disease cause the motility disorder but some time specific treatment including surgery may be required to help with swallowing difficult **(Pandolfino et al., 2011).**

Primary Motility disorders have been classified in many different ways, and there is no single classification that is fully satisfactory for all users. They may be classified based on major symptom, clinical syndrome, esophageal motility findings, pathophysiology, or the anatomic site of major involvement **(Frtunée et al., 2006).**

A detailed history from patients with dysphagia is imperative; many patients suffer unnecessarily because physicians are unfamiliar with this topic **(Holloway et al., 2012).**

Due to the similarity of symptoms, esophageal motility disorders can be mistaken for more common diseases such as gastro esophageal reflux (GERD), hiatus hernia, and even psychosomatic disorders. Several tests are available to help establish the diagnosis of an esophageal motor disorder. **(Goyal et al., 2006)**.

Esophageal manometry is the gold standard for diagnosis of motility disease of esophagus. For many years manometer was done using water-perfused systems that were difficult to set up. With further miniaturization and developments in computer software, thin catheters containing multiple pressure recording transducers (high-resolution manometry) have become widely available, resulting in new criteria (Chicago classifications) **(Bredenoord et al., 2012).**

Although not a common disease, the last several years have had exciting breakthroughs in better defining the pathophysiology of these disorders with diagnosis and recent therapeutic options **(Moreto et al., 2013).**

Aim of the Work

The aim of this essay is to highlight the problem of motility disorders of the esophagus with its morbid effect on health, and to give a practical systematic updated approach that can be used in the management of the different types of this condition.

Esophageal Anatomy

Gross Anatomy:

The esophagus is a flattened muscular tube of 18 to 26 cm from the upper sphincter to the lower sphincter. Between swallows, the esophagus is collapsed but the lumen can distend to approximately 2 cm in the anterior-posterior dimension and up to 3 cm laterally to accommodate a swallowed bolus ***(Malinger et al., 2004).***

The esophagus connects the pharynx to the stomach. Beginning in the neck, at the pharyngoesophageal junction (C5-6 vertebral interspace at the inferior border of the cricoid cartilage), the esophagus descend anteriorly to the vertebral column through the superior and posterior-mediastinum. After traversing the diaphragm at the diaphragmatic hiatus (T10 vertebral level) the esophagus extends through the gastroesophageal junction to end at the orifice of the cardia of the stomach (T11 vertebral level) (***Levine et al., 2004***).

Topographically, there are three distinct regions: cervical, thoracic, and abdominal. The cervical esophagus extends from the pharyngoesophagel junction to the supra sternal notch and is about 4 to 5 cm long. At this level, the esophagus is bordered anteriorly by the trachea, posteriorly by the vertebral column, and laterally by the carotid sheaths and the thyroid gland ***(Malinger et al., 2004).***

The thoracic esophagus extends from the suprasternal notch to the diaphragmatic hiatus, passing posterior to the trachea, the tracheal bifurcation, and the left main stem bronchus. The esophagus lies posterior and to the right of the aortic arch at the T4 vertebral level. From the level of T8 until the diaphragmatic hiatus the esophagus lies anteriorly to the aorta (***Tonz et al., 2004).***

The abdominal esophagus extends from the diaphragmatic hiatus to the orifice of the cardia of the stomach. Forming a truncated cone, about 1 cm long, the base of the esophagus transitions smoothly into the cardiac orifice of the stomach. The abdominal esophagus lies in the esophageal groove on the posterior surface of the left lobe of the liver ***(Fass et al., 2006)***.

Two high-pressure zones prevent the backflow of food: the upper and lower esophageal sphincter. These functional zones are located at the upper and lower ends of the esophagus but there is not a clear anatomic demarcation of the limits of the sphincters (**Malinger *et al., 2004)***.

Blood Supply:

Arterial blood Supply of the esophegus:

The rich arterial supply of the esophagus is segmental **(Fig. 1).**The branches of the inferior thyroid artery provide arterial blood supply to the upper esophageal sphincter and cervical esophagus. The paired aortic esophageal arteries or terminal branches of bronchial arteries supply the thoracic esophagus. The left gastric artery and a branch of the left phrenic artery supply the LES and the most distal segment of the esophagus. The arteries supplying the esophagus end in an extensive, dense network in the submucosa. The copious blood supply and network of potentially anastomotic vessels may explain the rarity of the esophageal infarction ***(Jeffrey et al., 2005).***

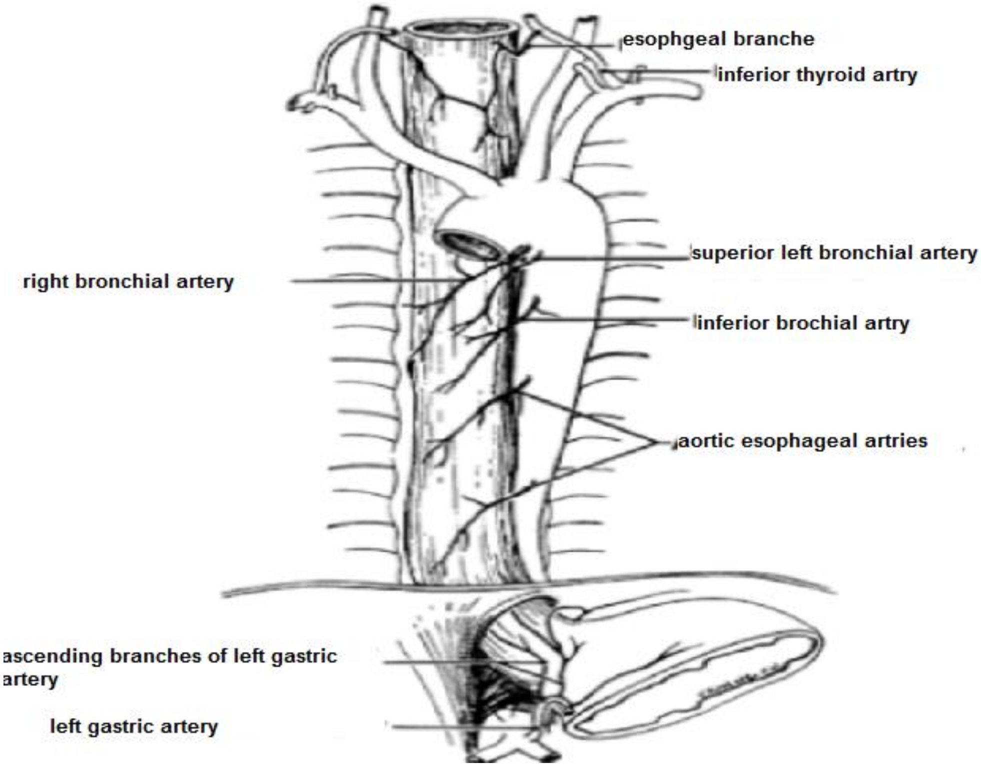

Fig (1): Arterial supply of esophagus **(Jeffrey et al., 2005).**

Venous Drainage of the esophagus:

The venous supply is also segmental **(Fig.2).** From the dense submucosal plexus the venous blood drains into the superior vena cava. The veins of the proximal and distal esophagus drain into the azygous system. Collaterals of the left gastric vein, a branch of the portal vein, receive venous drainage from the mid-esophagus. The submucosal connections between the portal and systemic venous systems in the distal esophagus form esophageal varices in portal hypertension. These submucosal varices are sources of major GI hemorrhage in conditions such as cirrhosis ***(Thomas et al., 2010).***

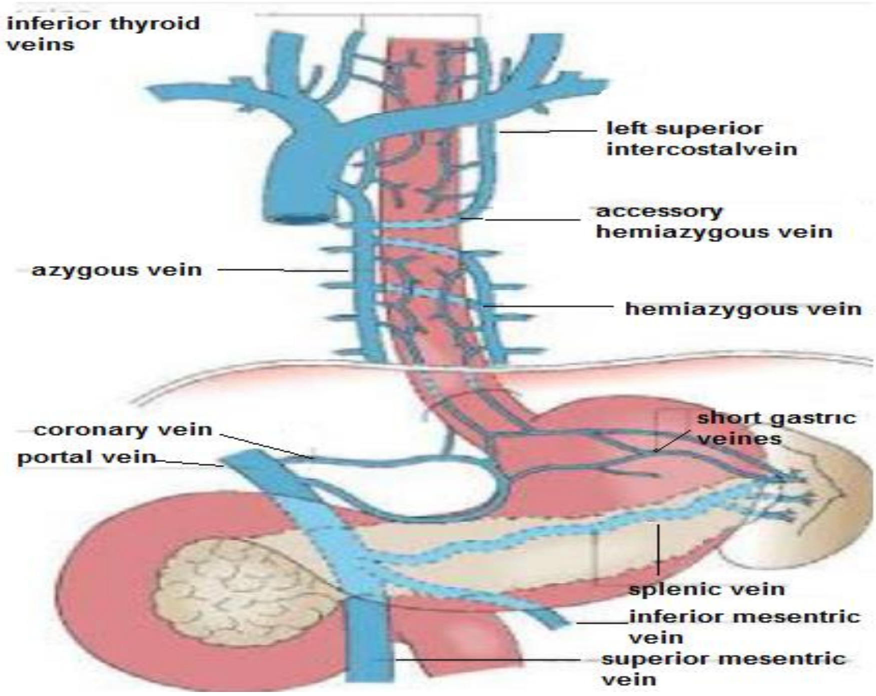

Fig (2): Venous Drainage of the esophegus **(Thomas et al., 2010).**

Esophageal Innervations:

The esophagus, like the rest of the viscera, receives dual sensory innervation (**Fig. 3).** Traditionally referred to as parasympathetic and sympathetic, but more properly based on the actual nerves, vagal, and spinal (***Ghosh et al., 2008***).

Vagal afferents merging from the esophageal smooth muscle layer are sensitive to mechanical distention, whereas polymodal (responding to multiple modalities of stimuli) vagal afferents with receptive fields in the mucosa are sensitive to various osmo-, chemo-, thermo-, and mechanical intraluminal stimuli. In general, vagal afferents do not play a direct role in visceral pain transmission, but through mechanoceptors vagal afferents transduce pressure into painful sensations ***(*Kuo *et al., 2006)***.