Modern Trends in laparoscopic Management of Gastroesophageal Reflux Disease

Essay

Submitted for partial fulfillment of master degree in

General surgery

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2014

*First and before all, thanks to **Allah** for his care and passion.*

*I would like to express my deep gratitude and appreciation to **Prof. Magdy Abd-Elghany Bassiuny** for his kind supervision, support and encouragement.*

*I am also grateful to **Dr. Ahmed Mohamed AL NABIL** for his great effort ,precious advice and assistance throughout this work*

*I am also grateful to **Dr. Haitham Mostafa ELMaleh** for his great effort ,precious advice and assistance throughout this workI am also indebted to everyone who assisted me in this work.*

*I am deeply grateful to **my mother and father** who directed and encouraged me during my life, and during the preparation of this work.*

*Lastly, Words fail to express my love, respect and appreciation to **My Wife** for her unlimited help, support and faith.*

Hossam Abd -El Aziz

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List of abbreviation

GERD	Gastroesophageal reflux disease
SCJ	Squamocolumnar junction
GOJ	Gastroesophageal junction
EGJ	Esophagogastric junction
LOS	Lower esophageal sphincter
LES	Lower esophageal sphincter
TLESRs	Transient lower esophageal sphincter relaxation
LESP	Lower esophageal sphincter pressure
BMI	Body mass index
ENT	Ear,nose and throat
BE	Barret's esophagus
UES	Upper esophageal sphincter
EGD	Esophagogastroduodenoscopy
PPI	Proton pump inhibitor
DGER	Duodenogastroesophageal reflux
HFIUS	High frequency intraluminal ultrasonography
H2RAs	Histamine 2 receptor antagonist
LNF	Laparoscopic Nissen fundoplication
LPF	Laparoscopic posterior fundoplication
LAF	Laparoscopic anterior fundoplication
RFA	Radiofrequency ablation

ESD	Endoscopic suture device
FDA	food and drug administration
SISS	ingle incision surgery
NOTES	Natural orifice transluminal endoscopic surgery
SILS	Single incision laparoscopic surgery
SSL	Single site laparoscopy
SPA	Single port access
OPUS	One port umbilical surgery
SIMPL	Single instrument port laparoscopic surgery
RAL	Robot assisted laparoscopy

Introduction

Gastro-esophageal reflux disease (GERD) is the commonest upper digestive disorder. It affects a large group of patients and has a negative impact on quality of life. In addition, this disorder is associated with considerable long term morbidity and mortality **(Pisegna et al., 2004).**

GERD was defined according to the Montreal consensus as a condition which when the reflux of stomach contents develops causes troublesome symptoms and/or complications. Symptoms were considered troublesome. If they adversely affected an individual's well being**(Kahrilas et al., 2008)**.

From a surgical perspective, GERD is the failure of the antireflux barrier, allowing abnormal reflux of gastric contents into the esophagus. It is a mechanical disorder, which is caused by a defective lower esophageal sphincter (LES), a gastric emptying disorder, or failed esophageal peristalsis. These abnormalities result in a spectrum of disease ranging from symptoms only, such as "heartburn", to esophageal tissue damage with or without subsequent complications including malignancy or airway disease. While the exact nature of the antireflux barrier is incompletely understood, the current view is

that the LES, the diaphragmatic crura, and the phrenoesophageal ligament are key components**(Tam et al., 2004**)**.**

Despite advances in antacid pharmacological treatments, many patients remain refractory to maximal medical therapy. In addition, many others are either unable to tolerate the side effects of the drugs or simply are unwilling to receive life-long daily medications. Laparoscopic Nissen fundoplication has evolved as the surgical procedure of choice for patients with GERD. Although the durability of surgical management has been questioned, experienced surgeons achieve long-term reflux cure rates of about 85% to 95%. Barrett's esophagus has recently been considered an additional indication **(Novitsky, 2006).**

Before considering surgery, objective documentation of gastro esophageal reflux is mandatory. This can often be achieved by flexible esophagoscopy. Endoscopic visualization of any mucosal break, defined as an area of slough or erythema clearly demarcated from adjacent normal appearing mucosa is considered objective proof of GERD in the appropriate clinical setting. This mucosal break is the minimum endoscopic lesion that is a reliable indicator of reflux esophagitis **(Schoeman et al., 2004).**

In an appropriate setting, a peptic stricture is also acceptable evidence of GERD as long as malignancy has been ruled out by multiple biopsies. Histological proof of Barrett's GERD even though other very rare causes of Barrett's esophagus may also exist **(Francalani et al., 2008)**

In the absence of endoscopic evidence of reflux the current gold-standard objective test to diagnose gastro esophageal reflux is the 24-hour ambulatory esophageal pH-metry. The variables with the highest sensitivity and specificity which are obtained from this test are: the total time with pH < 4 as recorded by a probe placed 5 cm above the LES, and a composite score (comprised of the following six variables: 1. total esophageal acid exposure time, 2. upright acid exposure time, 3. supine acid exposure time, 4. number of episodes of reflux,5. number of reflux episodes lasting more than 5 minutes and 6. the duration of the longest reflux episode **(Gunnarsdottir et al., 2007)**

Aim of Work

The aim of this essay is to review modern trends in laparoscopic management of gastro-esophageal reflux diseases.

Surgical Anatomy of the Oesophagus

The esophagus is a hollow muscular tube, which is about 25 cm long, and connects the pharynx to the stomach. It commences in the neck at the level of the lower border of the cricoids cartilage (C6), and descends in the superior and posterior mediastinum, ending in the abdomen at the cardiac orifice of the stomach (T10 and left 7th costal cartilage)**(Shimi, 2002).**

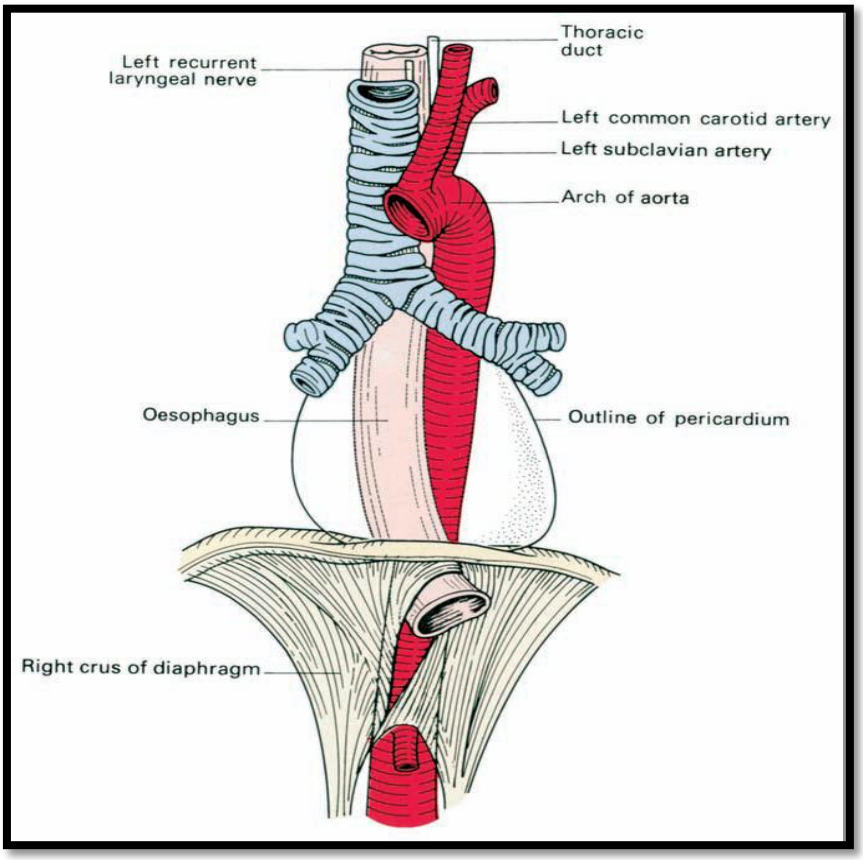

Fig.1. Anatomy of the esophagus.
(Ferner et al., 1974).

Development of the esophagus:

The esophagus develops from the distal part of the primitive foregut. From the floor of the fore-gut also differentiate the larynx and trachea, first as a groove (the laryngotracheal groove) which then converts into a tube, a bud on each side of which develops and ramifies into the lung **(Skandalakis et al., 2000)**

ANATOMY

The esophagus is the narrowest segment of the gastro intestinal tract, other than the appendix. It is a delicate organ that is able to expand and to permit solid food to enter the stomach. From an embryologic and anatomic standpoint, the esophagus may be divided into two surgical units: (1) the proximal part, from the pharyngeo-esophageal junction to the carina, and (2) the distal part, from the carina to the gastric cardia, but the distal surgical unit should include the proximal two thirds of the stomach **(Skandalakis et al., 2000)**.

The most useful reference point during upper gastro-intestinal tract endoscopy is the upper incisors, which are approximately in adult 14 cm above the pharyngo-oesophageal

junction, 25 cm above the tracheal bifurcation, and 38 to 44 cm above the gastric opening **(Peters et al.,1997)**.

DISTAL OESOPHAGUS

Immediately below the tracheal bifurcation the esophagus follows the curvature of the spine and remains in close contact with the vertebral bodies. From the eighth thoracic vertebra downward, it moves vertically away from the spine to pass through the hiatus of the diaphragm at the level of the tenth thoracic vertebra to become the abdominal esophagus, which includes a portion of the lower esophageal sphincter and ends at the gastro-esophageal junction, leveled with the eleventh thoracic vertebra **(Sinnatamby, 1998)**.

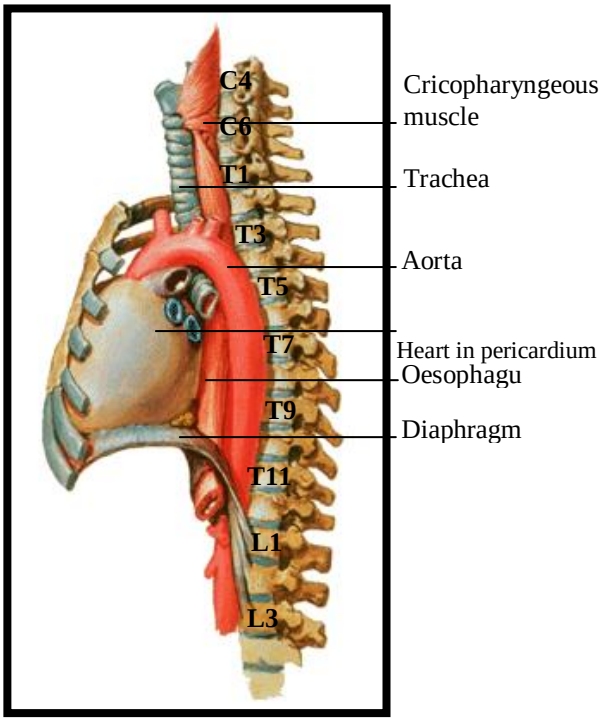

Fig.2. Vertebral landmarks of esophagus
(Ferner et al., 1974).

In the thorax, the pericardium, together with the underlying left atrium and the left vagal trunk, form the close anterolateral limit of the esophageal wall. Dorsally and toward the right, the azygos vein, the thoracic duct, and the right vagus nerve lie parallel to the esophagus. The thoracic duct crosses from the right to the left just above the arch of the azygos, at the level between the fourth and the fifth thoracic vertebrae. The descending aorta and hemiazygos veins are dorsal and to the left **(Liebermann et al., 1994)**.