Recent Modalities In Treatment Of Esophageal Injury

Essay

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In General Surgery

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بسم الله الرحمن الرحيم

﴿قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا
إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ ﴾

صدق الله العظيم سورة البقرة (آية 32)

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Introduction

An esophageal injury is defined as a breach of esophageal wall, whether due to a mucosal tear, perforation or rupture ***(Cheynel N, et al., 2003).***

An esophageal injury allows upper GI contents to egress from the esophageal lumen into the soft tissues of the neck, mediastinum, pleural space and the peritoneal cavity, depending on the site of the injury. The distribution by site of injury is cervical (27%), intrathoracic (54%), and intra-abdominal (19%) ***(Infatolino A, 1999).***

Time from injury to definitive management and the degree of soilage to surrounding tissues are the most important factors for morbidity. The most important difference between traumatic injury and other forms of esophageal perforation is the high incidence of concomitant injury. Often, the underlying cause of morbidity or mortality in trauma patients is not the esophageal injury itself, but rather the constellation of other injuries sustained. For these reasons, the trauma surgeon must be aware of how esophageal injuries can present and expedite their evaluation ***(Andrade-Alegre R, 2005).***

An esophageal injury occurs because the esophagus, unlike the rest of the alimentary tract, lacks a serosal layer, which usually contains collagen and elastic fibers. The esophageal wall is thus comparatively weaker and may rupture at a lower intraluminal pressure ***(DeMeester, 2005).***

Among the causes of esophageal injury, the iatrogenic esophageal injury is the most common

accounting for 61% of perforations, it includes intraluminal injuries (during therapeutic and diagnostic endoscopy or during intubation) and intraoperative injuries (as during surgeries for thyroid, cervical spine or anti-reflux surgeries). Spontaneous rupture (Boerhaave's syndrome) can be post-emetic (due to alcohol or pregnancy), barogenic (during parturition, defecation or weight lifting), neurological (as during seizures), and in presence of pre-existing disease (as malignancy, ulceration or TB). Another cause is traumatic injury to the esophagus, either due to blunt trauma (as in blast injury or motor vehicle accidents) or penetrating trauma (as in stabbing or gunshot wounds). Ingestion injuries can occur due to ingestion of foreign bodies or corrosive agents ***(Vogel, S., et al., 2005).***

Penetrating cervical esophageal injury is present in <1% of all penetrating trauma, but is found in 5% to 12% of all penetrating trauma to the neck. Conversely, penetrating thoracic esophageal trauma has a reported incidence of <1% of all penetrating wounds to the chest, while blunt esophageal injury is much less common and most commonly affects the abdominal esophagus, such injury results from the sudden application of a blunt force to the abdomen usually with a full stomach ***(Chilimindris CP, 2002).***

Thinning of esophageal membrane secondary to variceal sclerotherapy (1-3%), and foreign body or toxic ingestions (5-15%) make up the bulk of the remaining causes ***(Guth AA, et al., 2001).***

A high index of suspicion coupled with accurate, on time, and high-resolution imaging are necessary because

injury to the esophagus commonly presents with nonspecific signs and symptoms or can be totally asymptomatic ***(Smakman N, et al., 2004).***

Signs and symptoms that are associated with esophageal injury can include pain, fever, dysphagia, odynophagia, hematemesis, hoarse voice, subcutaneous emphysema/crepitus, mediastinal crunch (Hamman sign), oropharyngeal blood, hemoptysis, and dyspnea ***(Euathrongchit J, et al., 2006).***

The critical determinants of therapy for esophageal perforation are the cause, the location, and the severity of the perforation, as well as the interval between perforation and treatment ***(Brinster CJ, et al., 2004).***

Controversy exists regarding indications for surgery for esophageal rupture; however, General recommendations for surgery include: recent postemetic perforation, intra-abdominal perforation, clinical instability with sepsis, leak outside the mediastinum (i.e. extravasation of contrast into adjacent body cavities), malignancy, obstruction, or stricture in the region of the perforation, with lack of medical contraindications to surgery (e.g. severe pulmonary emphysema or severe coronary artery disease) ***(Brinster CJ, et al., 2004).***

There are many options for operative management of esophageal rupture including primary repair, primary repair with reinforcement (with pleural flaps, diaphragmatic pedicle flaps, omental patches, rhomboid and latissimus dorsi flaps and strap muscle flaps), esophageal resection,

either drainage alone or T-tube drainage, exclusion and diversion. ***(Shenfine J, et al., 2006).***

Complication of surgical intervention is not uncommon, for example: anastomotic breakdown is unfortunately not a rare occurrence after repair of an esophageal injury. Depending on location, these leaks can subsequently cause wound infection, mediastinitis, abscess, empyema, pneumonia, and sepsis. Of all these complications, sepsis carries the highest mortality. The goal of therapy should be prevention of sepsis by maintenance or establishment of wide drainage ***(Thompson EC, et al., 2002).***

Esophageal perforation is still a high morbid condition with high mortality rates if not diagnosed early and treated promptly.

Morbidity and Mortality are determined by:

- Anatomical location: with thoracic esophageal perforations having the highest mortality rates (27%) and cervical perforations the lowest (6%)
- Delay in diagnosis: as mortality rises significantly with delays in definitive diagnosis and treatment. If properly diagnosed and treated within 24 hours the mortality is less than 14%, rates rise to 31% if delay is more than 24 hours. Mortality rates also are higher in spontaneous perforations (up to 71%) and underlying esophageal disease ***(Brinster, CJ, et al., 2004, Shenfine, J, et al., 2006).***

Aim of the study

The study aims to discuss and evaluate different modalities in early and accurate diagnosis of esophageal injuries, and different trends of its management with comparison between conservative and surgical treatment discussing the indications of surgical intervention and the choice between different options for operative management of esophageal injury

Anatomy Of The Esophagus

The esophagus is a flattened muscular tube of 18 to 26 cm length 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 antro-posterior dimension and up to 3 cm laterally to accommodate a swallowed bolus ***(Feldman, et al., 2002).***

The esophagus commences at the lower edge of the cricoid cartilage (at the level of sixth cervical vertebra) and ends at the esophago-gastric junction (at the level of eleventh thoracic vertebra) which is situated posterior to the 7^{th} left costal cartilage about 2.5 cm from the midline ***(Pelligrini CA, et al., 1991).***

Generally vertical in its course, it has two shallow curves. At its beginning it is median but inclines to the left as far as the root of the neck, gradually returns to the median plane near the fifth thoracic vertebra, and at the seventh deviates left again,(Fig. 1) ***(Bannister, 2003).***

Constrictions of the esophagus:

There are major constrictions and minor constrictions, (Fig. 2).

A) Major constrictions:

1. The cricopharyngeal or pharyngo-esophageal constriction is produced by the cricoid cartilage and the cricopharyngeal muscle 6 inches (15 cm) from the incisors.

2. The broncho-aortic constriction is produced by the arch of aorta and the left primary bronchus 9 inches (22.5 cm) from the incisors.

3. The diaphragmatic constriction is produced by the diaphragmatic crura forming the hiatus at the level of T9 or T10 16 inches (40 cm) from the incisors ***(Townsend CM, et al., 2001).***

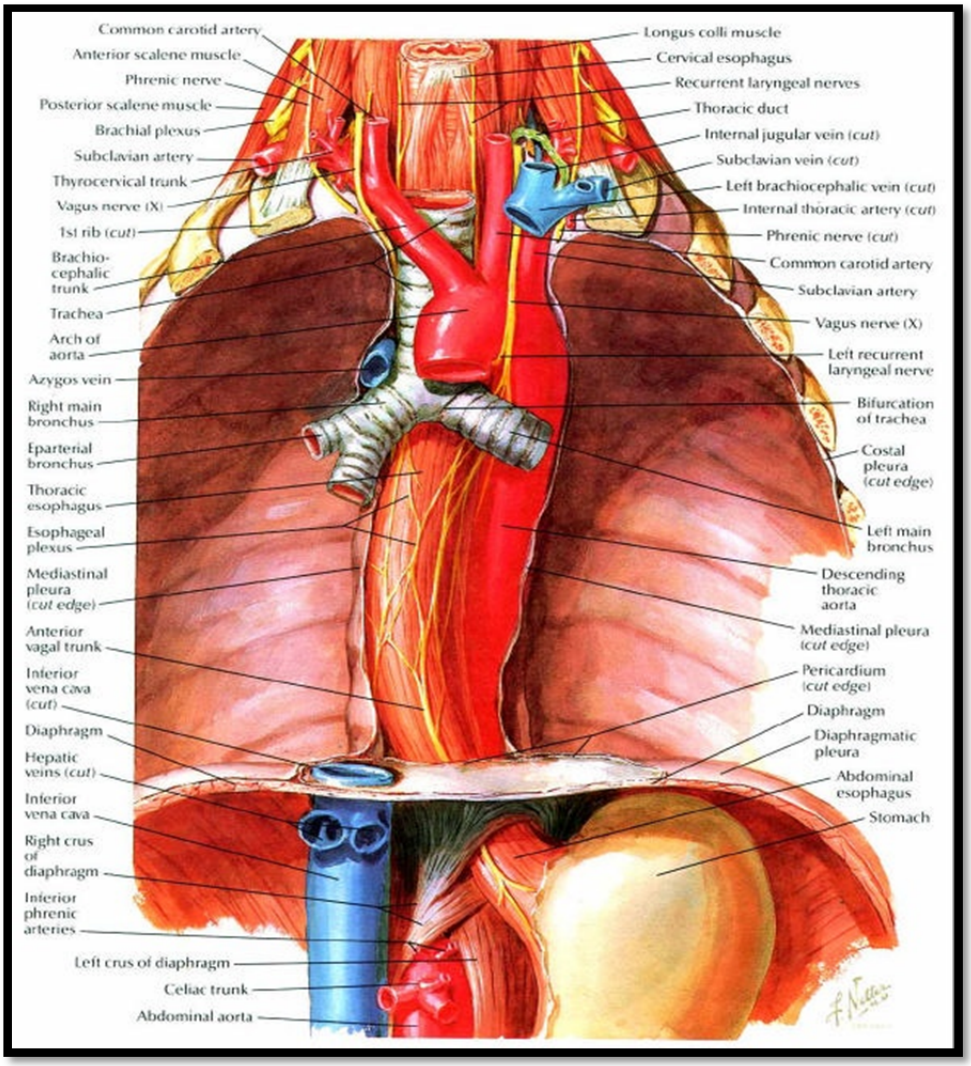

Fig.1 Relations of the esophagus (Elsevier.inc-Netterimages.com).

A) Minor constrictions:

There are minor constrictions seen occasionally as retrosternal constriction which may lie between the pharyngoesophageal and aortic constriction, a cardiac constriction and supradiaphragmatic constriction ***(Lafontaine, 1988).***

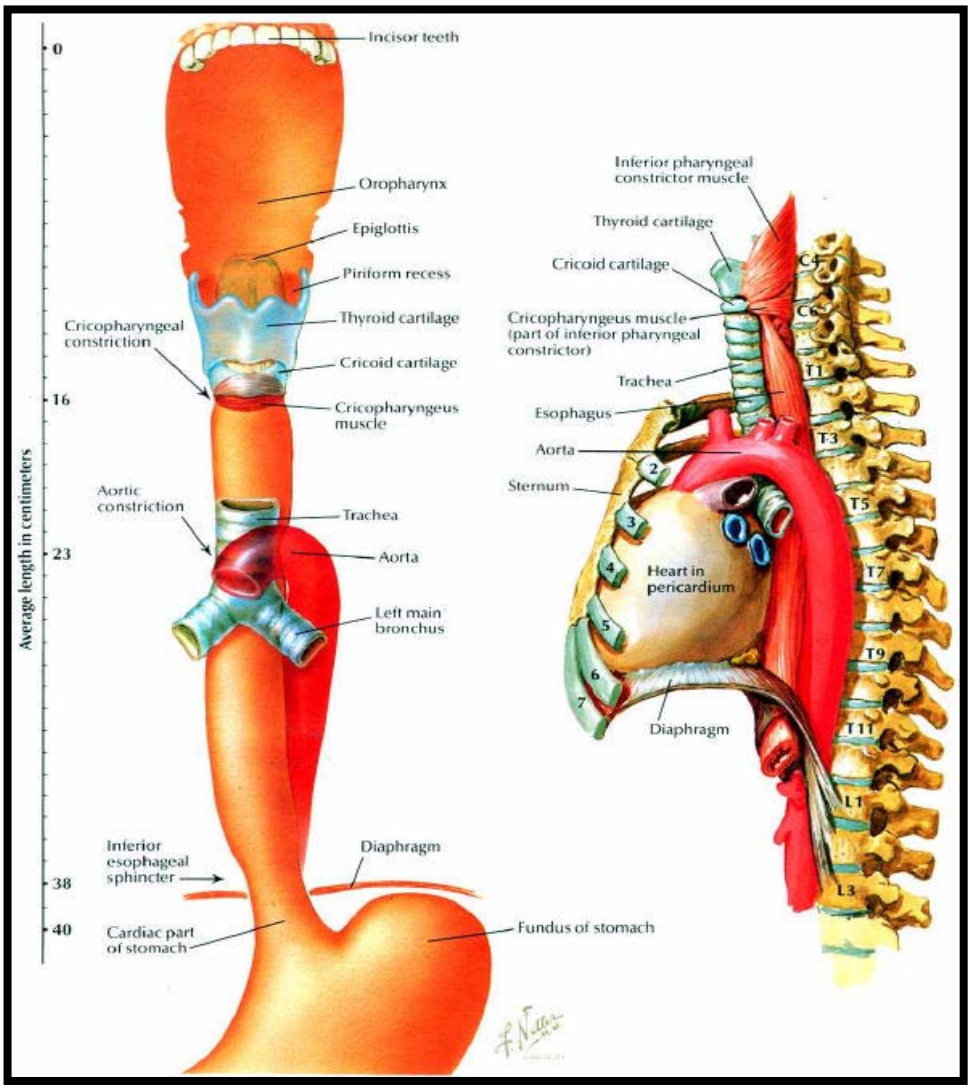

Fig.2 Constrictions of the esophagus (Elsevier.inc-Netterimages.com).