

The Esophagus

is a long muscular tube approximately 40 cm from the incisor teeth (25 cm from cricopharyngeus), that extends from the pharynx at the level of 6th Cervical vertebra to the stomach, which it joins opposite the body of 11th thoracic vertebra. It is arbitrarily divided into Cervical, Thoracic and Abdominal parts.

The esophagus has three distinct areas of naturally occurring anatomic narrowing :-

- 1-The crico pharyngeal constriction
- 2-Broncho aortic constriction .
- 3-The diaphragmatic constriction .

Blood supply :-

Cervical esophagus **Inf.thyroid Ar.**

Thoracic esophagus **esophageal branches (Aorta) and segmental vessels (intercostal & phrenic) .**

Venous drainage:-

Cervical esophagus **inferior thyroid & vertebral V.**

Thoracic esophagus **azygous & hemi azygous**

Abdominal esophagus **gastric veins**

Lymphatic :- regional lymph nodes ,The flow of the upper 2/3 is upward while the flow of the lower 1/3 is downward.

Nerve supply :- the nerve supply to the normal esophagus is cholinergic and causes contraction everywhere except for the circular muscle of the cardia where it is adrenergic and causes relaxation .

Esophageal Hiatus :- It is a sling of muscle fiber that arises from the right crus in approximately 45% of the patients , however both right and left crus contribute to the hiatus

Physiology :- It is a muscular tube that begins proximally with upper esophageal sphincter (UES) and ends distally with lower esophageal sphincter (LES) .Its function is to transport the swallowed material from the pharynx down to the stomach

Clinical manifestation of esophageal diseases

it include :- **Dysphagia** (difficulty in swallowing) , **Odynophagia** (pain on swallowing) , **Regurgitation & vomiting** , **Drooling of saliva** , **Heart burn** (substernal burning sensation) , **Weight loss & cachexia** .

Investigations

1-Plain X-Ray chest :- it show :- *a dilated esophagus* (especially in lateral view) , *in the lung (fluid level)* from the spill over of the esophageal content , *radio opaque foreign body*

2-Barium swallow It is very essential and may be diagnostic in some esophageal diseases such as achalasia of the cardia .

3-Esophagoscopy :It is the direct visualization of the interior of the esophagus by either *rigid esophagoscope* , carried under GA or by the *flexible esophagoscope* ,carried under local anesthesia

Indications:-

A-diagnostic:- To evaluate symptoms of dysphagia & odynophagia ..etc , To asses established esophageal pathology , To define or confirm radiological abnormalities ..etc ,It is of great value in assessment of post operative problems as anastomotic stricture ,tumor recurrence ,bleeding and recurrent GER

B-Therapeutic :- Removal of foreign bodies , Dilatation of stricture ,Placement of endoluminal prosthesis (stent) ,Sclerotherapy , Laser photo coagulation for bleeding or tumor de bulking

1-Minor Complications:- Laceration of the lips or tongue , Fracture or dislodgment of teeth , Pharyngeal laceration

2 Major Complications **Perforation** which occurs in 1-2 % of patients after(F.B removal ,Dilatation of stricture or biopsy

Pain or fever after esophageal instrumentation represents an esophageal perforation until proven otherwise and is an indication for an immediate esophagogram

Management Conservative and Operative

4-Manometry :

It is the classical test to examine (LES) function. Hypertensive Lower Esophageal Sphincter is seen in achalasia of the cardia
Loss of the tone is seen in pregnancy & alcoholism

Disorders of esophageal motility

Functional disorders of the esophagus Are those conditions that interfere with the normal act of swallowing or produce dysphagia without any associated intra – luminal, mural organic obstruction or extrinsic compression.

Upper esophageal sphincter dysfunction :-Crico pharyngeal dysfunction (oro pharyngeal dysphagia) :- Symptoms complex that result when there is a difficulty in propelling liquid or solid food from the pharynx into the upper esophagus .

Causes :- **Neuro genic** CNS (MS) , vascular (CVA) ,tumors ,trauma , **Myogenic** myasthenia gravis , inflammatory (poly myositis) , **Structural** diverticulum , **Mechanical** intra or extra luminal , **Iatrogenic** surgical or irradiation , **Gastro esophageal reflux** .

Motor disorders of the body of the esophagus

- 1-Achlasia of the cardia .
- 2-Diffuse esophageal spasm & related hyper motility disorders

Achalasia of the cardia

Is a disease entity of unknown etiology Characterized by absence of peristalsis in the body of the esophagus, a high resting pressure at the (LES) and failure of this sphincter to relax in response to swallowing .

Etiology :- attributes to a neuromuscular dysfunction affecting both the narrowed and the dilated segments of the esophagus

Clinical features :- occurs at any age. The highest incidence is (25-60) Mostly equal sex incidence or > in female ,The duration of symptoms (Days to years) ,The onset ,sudden or insidious .sudden(emotional stress) ,The symptoms include :- dysphagia ,Regurgitation ,Pain ,Weight loss & Cachexia ,Emotional Disturbance ,Respiratory symptoms , Heart burn .

Diagnosis :- 1-CXR : -Absence of gastric air bubble. Visible Esophagus, Fluid level .

2-Barium Swallow : Dilated Esophagus ,food residue ,Little barium passed to the stomach ,Morphological forms : Cork-Screw,Cucumber ,Tortuous & Sigmoid, Bird s beak appearance

3-Esophagoscopy: To confirm the diagnosis ,exclude other path

4-Manometry: Absence of peristalsis(body), high LES pressure

Differential diagnosis: Diffuse esophageal spasm OR Systemic sclerosis OR Organic obstruction(stricture , tumors)

Treatment : 1-Medical treatment - adalat , isordil 2-Dilatation (bougienage) pneumatic or hydrostatic 3-Surgery -- --- Heller's cardio myotomy Recently -- Laparoscopic cardio myotomy

Complications of achalasia:- 1- Those related to retention & stasis (Retention esophagitis) 2-Air way obstruction & repeated chest infection 3-Pre malignant (squamous cell carcinoma)

Perforation of the esophagus

1-Esophageal perforation following instrumentation either by the rigid esophagoscope or by bougienage

2-Traumatic perforation , Foreign bodies ingestion or blunt and penetrating trauma

3-Spontaneous rupture (Boer-haave' s syndrome) due to the strain of emesis with or without predisposing disease .

The sites of the normal anatomical constriction are the most common sites of perforation .The upper 2/3 of the esophagus will perforate into the rt. Pleural cavity while the lower 1/3rd will perforate into the lt. Pleural cavity .

Clinical manifestations :Pain ,Fever ,Dysphagia ,Cervical pain or crepitation , Dyspnea , Pneumothorax and in severe cases dyspnea and cyanosis .

Chest X-ray :Mediastinal emphysema . Pleural effusion

Barium study can localize the site of perforation

Treatment ; Medical (NBM = NPO),IVF , Nasogasric feeding,
Surgical to close the perforation.

Stricture of the Esophagus

1-Caustic Strictures :It resulting from the ingestion of solid or liquid caustics most frequently seen in children who have accidentally swallowed the material or in adult who have ingested the material for suicidal purposes .

The chemicals included alkaline caustics, acids or acid- like & household bleaches .Strong alkalis (Na&KOH)

Symptoms :Ranges from(minimal to shock) . Dyspnea may occur .

Management :-Identification of the etiological agent , Administration of the neutralizing agent , Assessment of the extent of the injury , Early Esophagoscopy ! to determine whether there is esophageal injury or not , Cortico steroid decreases the degree of stricture , Antibiotics together with steroid for (3-6 week) , Barium –swallow two weeks later to see if there is stricture or not , Dilatation (Bougenage) may be needed after(3-4 weeks) and many patients need regular dilatation , May need Esophageal replacement .

Esophageal stricture is a premalignant.

2-Reflux Esophagitis and Stricture:-Esophageal stricture secondary to the reflux of acid or alkaline secretions into the esophagus caused by esophagogastric incompetence as a result of hypotensive (LES) . it is a continuous process of destruction and healing that may stop at any stage or may progress to fibrosis ,stricture with the resulting dysphagia.

Stricture secondary to reflux are of three types:- 1-Low stricture occur at the esophagogastric junction

2- High stricture occur at higher level ,associated with barrett esophagus; it is an acquired condition in which the squamous epithelium has been eroded by the damaging effects of GE reflux and has subsequently been replaced by columnar junctional epithelium, it is a rare ,but it is *PRE MALIGNANT* and the malignancy is adenocarcinoma .

3- long stricture rarest type ,occur in postpartum vomiting .

Treatment :1- Bougienage \ Dilatation . 2-Surgery \ Resection .

CARCINOMA ESOPHAGUS

Carcinoma of the esophagus is a disease of men between age (50-70) .Two risk factors:- smoking and high consumption of alcohol.

Predisposing lesions : Achalasia , Barret esophagus & Corrosive stricture

Pathology Squamous cell carcinoma > 95% most common (body) , Primary adenocarcinoma < 1-7% most common of them is adenocarcinoma arise in Barrett's esophagus ,Mucoepidermoid &Adenocystic carcinoma.

Spread : Direct extension OR Lymphatic to cervical ,mediastinal and sub diaphragmatic OR Blood metastases liver ,lung &bone

Clinical manifestations : Dysphagia ,to solid later to liquid ,Weight loss ,Aspiration pneumonia .Pressure symptoms .

Barium –swallow : irregular ragged mucosal pattern with annular luminal narrowing .

Esophagoscopy : to see the tumor , to take biopsy(tissue diagnosis) ,and esophageal wash for cytology .

CT with oral contrast

Treatment : 1-**Chemo-therapy:** little value 2-**Radio-therapy :** useful but it may cause post radiation stricture ,radiation pneumonitis . 3-**Surgery:** a- palliative
b- Resection - partial gastrectomy ,partial esophagectomy &gastro esophageal anastomosis (Ivor lewis operation) through lapratomy & thoracotomy .

Gastro Oesophageal Reflux Disease (GORD)

Heartburn:-Mild , intermittent reflux of gastric content into the esophagus without tissue injury .Common among adult .

GORD :-Esophagitis with varying degree of erythema , edema & friability of the distal esophageal mucosa .

Aetiology :- Lower esophageal sphincter (LES) incompetence , Gastric outlet obstruction , 50% of patients have an associated hiatal hernia , Defective esophageal function (Scleroderma)

Mechanism of Anti –Reflux

- 1-High resting pressure in the distal esophagus (10-20 mm Hg).
- 2- the right crus of the diaphragm around the esophago -gastric junction .
- 3-The phreno esophageal membrane .
- 4-The presence of the intra abdominal segment of the esophagus
- 5-The oblique angle of insertion of the esophagus into the stomach (angle of His) .
- 6-The small diameter of the esophagus entering abruptly into the large diameter (stomach) Law of Laplace .

Clinical features :- Epigastric or retro sternal pain , after meal or at night , Pain similar to angina , Reflux of food or gastric content , occurs with bending , Odynophagia , Pulmonary aspiration , nocturnal cough

Diagnosis :- History and physical examination , Barium swallow , Oesophago gastro duodenoscopy (OGD) & biopsy , Ambulatory 24 hours PH monitoring , Esophageal manometry

Treatment:- **1- Medical :-** Weight reduction , Change diet (light frequent meal) , Stop smoking , Elevate the head of the bed (4-5 inches) , Anti acid , Metoclopramide increase LES pressure & gastric emptying , H2 receptor blockers , Ranitidine (Zantac) , Proton pump inhibitor omeprazole. **2- Surgical:-** Indications :- Failure of medical treatment , Presence of complications (stricture , respiratory symptoms) , Patient preference . Surgery :- Laparoscopic Nissen 's fundoplication , Laparotomy Nissen 's fundoplication , Thoracotomy Belsey's mark 1V repair

Esophageal hiatal hernia It is the herniation of the stomach through the esophageal hiatus of the diaphragm. Hiatal Hernia are of two types ; **1-Type 1 axial (sliding H.H.)** is common , usually insignificant , in which there is hiatus opening dilatation and or stretching of phrenoesophageal membrane , so that a portion of the fundus will slide upward into the hiatus . No true sac. In some patients a large pouch can occur producing abnormal degree of GE reflux . (significant) ..

2-The Para-esophageal (rolling) less common but more significant , there is a defect of phreno –esophageal mm. So this allows protrusion of the peritoneum through the fascia (true hernial sac) .this will lead to progressive enlargement of the

hernia .the entire stomach may herniated. May lead to gastric volvulus, strangulation and intrathoracic gastric distention.

Combined H.H. In which herniation of the cardia well above the diaphragm in addition to paraesophageal hernia .

Multiorgan H.H. other organs herniated (colon , small intestine) .

Clinical presentation : Heart burn &Regurgitation aggravated by posture Commonly after meal , Dysphagia , Aspiration into the chest can occur often awaken the patient can lead to lung abscess .

Treatment : the principal indication is paraesophageal type (II) H.H. & no indication for repair of type(I) unless severe reflux. **Medical:-** should started once reflux diagnosed

Surgical :-Nissen 's fundoplication (lapratomy or laparoscopic) , Beksy's mrak IV repair (Thoracotomy)

Esophageal diverticulae Are epithelial -lined mucosal pouches that protrude from the esophageal lumen. Classified into :-Pharyngo esophageal , Parabronchial (midesophageal) , Epiphrenic (Supra diaphragmatic)

Sideropenic Dysphagia (Plummer-Vinson or Patterson-Kelly syndrome) .Cervical dysphagia in patients with iron defficiency Anemia ,Usually women over the age of (40) years , It is pre malignant condition,Treatment dilatation &correction of anemia

Schatzki s Ring (Distal esophageal web)Commonly seen in patient with a sliding H.H.,appearing as annular strictures projecting into the lumen.

Mallory-Weiss Syndrome A history of emesis followed by either melena or hematemesis ,May occur in pregnancy ,alcoholism, bowel obstruction