Esophageal cancer & GERD

**Speaker**

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Fig. 10. Schematic of cross-section of esophagus showing histologic layers and corresponding view of echoendoscopic layers (upper picture). Photograph of echoendoscopic view (lower picture). (From Johns Hopkins Digestive Disease e-Library.)
*Cancer of oesophagus is the ninth most common cancer in the world

*It’s a disease of mid-late adulthood

*5-year survival (5-10%)
Pathology & Etiology

The commonest type:

1-**Squamous cell ca**: affect upper 2/3

2-**Adenocarcinoma**: affect lower 1/3

***There are exception to that rule

Esophageal cancer is a relatively rare form of cancer, but some world areas have a markedly higher incidence than others: China, Iran, Iceland, India and Japan, as well as the United Kingdom, appear to have a higher incidence, as well as the region around the Caspian Sea.
The incidence of adenocarcinoma of the oesophagus is increasing (60-75%).
Risk factors

- **Age**: Most patients are over 60
- **Sex**: It is more common in men.
- **Heredity**.
- **Tobacco smoking** and heavy **alcohol** use increase the risk
- * 90% of cases of esophageal cancer are attributed to tobacco or alcohol.
- **Gastroesophageal reflux disease** (GERD) and its resultant **Barrett's esophagus** increase esophageal cancer risk due to the chronic irritation of the mucosal lining (**adenocarcinoma** is more common in this condition, while all other risk factors predispose more for squamous cell carcinoma).
- Human papillomavirus (HPV)
- Corrosive injury to esophagus by swallowing strong alkalines (lye) or acids.
- Particular dietary substances, such as nitrosamine.
- A medical history of other head and neck cancers increases the chance of developing a second cancer in the head and neck area, including esophageal cancer.
- Plummer-Vinson syndrome (anemia and esophageal webbing)
- Tylosis and Howel-Evans syndrome (hereditary thickening of the skin of the palms and soles).
- Radiation therapy for other conditions in the mediastinum.
- Coeliac disease
- Obesity increases the risk of adenocarcinoma four fold. It is suspected that increased risk of reflux may be behind this association.
- Thermal injury as a result of drinking hot beverages
- Alcohol consumption
- Achalasia
Why oesophageal cancer has poor prognosis?

1-Locoregional spread: through the wall into adjacent structures & through submucosal lymphatics

*Skip metastasis (Aberrant L.N)

Involvement coeliac axis nodes is a bad prognostic sign.

2-Systemic spread (LIVER----LUNGS---BRAIN---BONE----SKIN)
Clinical Feature

*Dysphagia & odynophagia & pain
*Wt loss
*Non-specific dyspeptic symptoms.

*Hoarseness of voice.
*Palpable L.N

*Screening of Barrett’s
*Upper airway obstruction & aspiration pneumonia

*Nausea, vomiting, regurgitation
Most of the people diagnosed with esophageal cancer have late-stage disease. This is because people usually don't have significant symptoms until half of the inside of the esophagus, called the lumen, is obstructed, by which point the tumor is fairly large.
Diagnosis

Barium swallow or barium meal

Esophagogastroduodenoscopy

Computed tomography (CT) of the chest, abdomen and pelvis,

Esophageal endoscopic US (EUS)

Bronchoscopy: for Upper & middle part to R/O tracheobronchial invasion

Laparoscopy (staging)
### Stagging

**TNM**

**Stage**

**Description**
- **T1** --through lamina propria but limited to submucosa
- **T2** --into muscularis propria
- **T3** --to adventitia
- **T4** --direct extension into adjacent organ / structure

**N0**  no nodal involvement
**N1** --<= 6 regional nodes involved
**N2** --7 - 15 regional nodes involved
**N3** --> 15 regional nodes involved

**M0**  no mets
**M1** --mets or positive coeliac axis in the context of squamous cell carcinoma of oesophagus

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### The AJCC staging

**Stage**

**Description**

**TNM equivalent**
- **I** ---limited to submucosa  
  (T1 N0 M0)
- **IIA** ---into / through muscularis mucosa  
  (T2, N0, M0 or T3, N0, M0)
- **IIB** ---nodal involvement  
  (T1, N1, M0 or T2, N1, M0)
- **III** -----extensive local disease  
  (T3, N1, M0 or T4, any N, M0)
- **IVA**-----distant metastases  
  (Any T, Any N with M1)
Management

Surgical resection is curative with any involved stomach & loco regional L.Ns

1-Total oesophagectomy with usage of either gastric, large bowel or small bowel as substitutes

2-Subtotal oesophagectomy:
* Ivor lewis approach
* McKeown operation (preserve blood supply as [possible as you can])
*Transhiatal oesophagectomy (without thoracotomy)*

- Left thoracoabdominal approach
- Thoracoscopic oesophagectomy
Fig. 2. Esophageal mobilization.
Fig. 7. As the esophagus is elevated, blunt dissection of the esophagus from the superior mediastinum is carried out while keeping the volar aspects of the fingers closely applied to the esophagus. (From Orringer MB. Transhiatal esophagectomy without thoracotomy. Oper Tech Thorac Cardiovasc Surg 2005;10:63, with permission.)
Fig. 24. Completed colonic interposition using the right ileocolonic segment in a patient with previous partial gastrectomy. EI, esophagoileal anastomosis in the neck; CJ, colojunual anastomosis in the abdomen; IL, ileocolic anastomosis.
Endoscopic therapy for localized tumor:

Endoscopic mucosal resection (EMR) and mucosal ablation using photodynamic therapy, Nd-YAG laser, or argon plasma coagulation.

1- T1 (mucosa & submucosa) less than 2 cm
2- No L.Ns
3- Carcinoma insitu or dysplasia
4- Stage 0, 1
Photodynamic therapy

a type of laser therapy, involves the use of drugs that are absorbed by cancer cells; when exposed to a special light, the drugs become active and destroy the cancer cells.
Reflux may be limited by:

1- subtotal oesophagectomy & gastric transposition high in the chest. the vertical stomach empties rapidly & functions as a barrier to reflux.

2- Resection of a generous portion of proximal stomach if an anastamosis is made to the lower oesophagous. this reduce gastric secretion.

3- Roux-en-Y reconstruction with along ascending jejunal limb (50-60) cm.

4- Interposition of jejunum or colon.

Pyloroplasty----→ Delayed gastric emptying so reduce Dumping syndrome.
Multimodality therapy
Pre-op assess fitness for surgery

1- Nutritional status
2- C.V.S & respiratory system
3- Lung function test (FEV>1L)
4- Bronchoscopy
5- Endoscopic US
6- Thoracic C-T scan
7- Laparoscopy
Chemotherapy depends on the tumor type, but tends to be cisplatin-based (or carboplatin or oxaliplatin) every three weeks with fluorouracil (5-FU) either continuously or every three weeks.

The phase II/III REAL-2 trial – for example – compares four regimens containing epirubicin and either cisplatin or oxaliplatin and either continuously infused fluorouracil or capecitabine.

Radiotherapy is given before, during or after chemotherapy or surgery, and sometimes on its own to control symptoms.
Palliative therapy

*Intubation (Titanium expandable stent)
*Endoscopic Laser
*Brachytherapy.
*Chemotherapy:

In more recent studies, addition of epirubicin (ECF) was better than other comparable regimens in advanced non respectable cancer:
Mousseau-Barbin tube

Atkinson tube

Celestin tube
Prognosis

the overall **five-year survival rate** (5YSR) < 5%. The **mucosa** have about an 80% 5YSR, **submucosal** less than 50%. **Muscularis propria** (muscular layer of the esophagus) has meant a 20% 5YSR extension to the structures adjacent to the **esophagus** results in a 7% 5YSR. Patients with **distant metastases** have a less than 3% 5YSR.
Anatomy of G-E junction
Endoscopic view of the cardiac orifice from below, showing the valve-like fold illustrated.

Diagram showing the valve-like structure formed by the cardiac angle wall at the cardiac orifice.
Fig. 14. Coronal section through gastroesophageal junction and esophageal hiatus of diaphragm.
1- Loss of competence of L.O.S

Loss of it’s basal tone & has shorter length exposed to intra-abdominal pressure

*** Length & pressure of L.O.S is also important
(Physiological reflux mostly occurs during transient lower esophageal sphincter relaxation

***Most GERD suffers don’t have hernia &
many of those with a hernia don’t have GERD

2- H. pylori infection increase secretion & increase the incidence of GERD ???

May due to Obesity
Clinical feature

1- Dyspepsia with fatty foods is more common in GERD than gallstone disease
2- Heartburn & epigastric pain
3- Dysphagia
4- Unpleasant mouth taste
5- Angina like chest pain
6- Aspiration & chocking
Diagnosis

1-Upper GIT endoscopy: reflux oesophagitis, peptic stricture or Barrett’s
Esophageal manometry & 24-hours esophageal PH recording (Gold Standard)

Usage of PPI → false -ve ....... so stop it 2 weeks.

Barium swallow & meal {best to give G-E anatomy}
To diagnose type of hernia or short oesophagus
50% sensitive to DX GERD (trendelerberg position)

**** Achalasia & GERD are confused
Management

Conservative
1- Avoid precipitating factor
2- Antacid, antacid-alginate preparation
   H2 receptor antagonist
3- PPI most effective medication
   Patients are very reluctant to stop taking them
Indication for surgery

1-who are symptomatic on PPI
2-Failure PPIs  * volume reflux
   * Hermit life style
   * psychological stress
   * poor compliance

#The results of antireflux surgery are generally good
Types of operation

Total or partial fundoplication

Partial fundoplication (to minimize S.E., but recurrence rate is high)

1-Neissen fundoplication: (360°)
Fig. 2. Division of the phrenoesophageal ligament and opening the lesser omentum above and below the hepatic branch of the vagus nerve.
Fig. 3. Tape passed around the esophagus, lifting the esophagogastric junction forward, to display the posterior hiatus.
Fig. 4. Repair of the hiatus by suturing the hiatal pillars behind the esophagus.
Fig. 5. The anterior fundus is passed behind the esophagus, and manipulated with Babcock forceps.
Fig. 6. Placement of sutures for the fundoplication.
Fig. 7. The fundoplication is checked by passing a finger between the fundoplication and the esophagus while a bougie is positioned in the lumen of the esophagus.
Fig. 8. The completed Nissen-Rossetti fundoplication.
2-Hill procedure:

Cardia is tightened & fixed to pre-aortic fascia
3- Belsey Mark:

Thoracic procedure in which oesophagous is sutured to the diaphragm & to the fundus of stomach (240°).
Fig. 15. The completed Belsey 240-degree partial fundoplication showing the right and left crura approximated by tying the previously placed sutures. The position of the tied holding sutures is also shown.
Fig. 19. Construction of a Belsey 240-degree partial fundoplication around the gastroplasty tube. The first row of sutures is placed 1.5 cm above the end of the gastroplasty tube. Particular attention must be given to place the right lateral suture far to the right to avoid constructing a partial fundoplication that covers only the left anterior lateral portion of the gastroplasty tube.
4- **Angelchik prosthesis:**

A silastic prosthetic collar is placed around the lower oesophagous cause limitation distention of cardia

5- **Roux-en-y diversion**
Complication of anti-reflux surgery

1- Mortality rate 0.1-0.5%

2- Failure of operation 5-10%

3- Dysphagia, gas bloating & discomfort 10%
Complications of GERD

1- Reflux oesophagitis
2- Stricture (Dilatation + long term PPI)
3- Oesophagous shortening due to long standing reflux oesophagitis
4- Barrett’s oesophagous
Barrett’s oesophagus
(Norman Barrett in 1950)

Metaplastic change in the lining mucosa of the oesophagus in response to chronic GERD

10% of patients with GERD develop Barrett’s

**The squamous-columnar epith junction migrate proximally

*Intestinal metaplasia increase the risk of oesophagus to cancer (1% per year)*

25-30 folds
Regular screening endoscopy annually

Once there was severe dysplasia or Ca-insitu
Go for oseophagectomy

**Barrett’s oesophagus was not diagnosed until there was at least 3 cm of columnar epithelium in distal part of oesophagus**
Closure of tracheogastric fistula by video-assisted tracheoscopy, direct repair, and self-expandable titanium stent in a patient with total laryngopharyngoesophagectomy

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A fistula between the trachea and an oesophago-gastric anastomosis after oesophagectomy is uncommon.\(^1\)
An alternative means of reconstruction after laryngopharyngoesophagectomy should be considered.\(^2\)
Kalm’ar and associates\(^3\) used the pectoralis major muscle flap to prevent recurrence of the fistula. The advent of video-assisted technology provided an effective, definitive, and one-stage repair of tracheogastric fistula (TGF).

Clinical Summary
A 33-year-old man was known to have squamous cell carcinoma of the hypopharynx, to have hypertension, and to be a smoker. He reported dysphagia, weight loss, and hoarseness. An endoscopic examination of the upper gastrointestinal tract showed stenotic stricture at the cricopharyngeal junction. The biopsy result was moderately differentiated squamous cell carcinoma.

The patient underwent 28 fractions of radiotherapy and 25 sessions of chemotherapy (5-fluorouracil and cisplatin), then total laryngectomy, pharyngectomy, esophagectomy and gastric pull up (transhiatal approach). He was discharged in good general condition.

Three months later, the patient was admitted via the casualty department with shortness of breath, choking, and coughing, especially with water, after meals. Because TGF was suspected, an examination with a rigid bronchoscope was performed, which disclosed TGF at the upper membranous part of trachea (Figure 1). A biopsy specimen was negative for tumor.

The TGF was closed directly through video-assisted thoracic surgery (VATS) by 2-0 Vicryl polyglactin 910 sutures reinforced by insertion of a self-expandable titanium stent (see video). Five days later, the patient was readmitted with recurrence of the fistula. The stent was removed and the fistula resutured by VATS, taking

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Thank you