The Many Roads of Esophageal Cancer: Treatments, Side Effects and Common Complications

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- Esophageal cancer treatments have evolved greatly over the last few decades. Depending on depth of invasion, endoscopic therapies are now part of the treatment algorithm. We will follow two cases from diagnosis to treatment to highlight therapeutic options and common side effects and complications.

Patient 1

- 55 yo M with PMH significant for obesity, CAD, HTN, HL, obesity, long standing GERD who presents for management of GERD symptoms..
- - Review risk factors for Barretts and screening
- - Review red flag symptoms that warrant
- - EGD done - results showing early cancer
- - Endoscopic treatment options
- - :
  - RFA vs cryp vs EMR
  - Reasons to go down each pathway
  - Common post procedures symptoms complications
  - Post care

Patient 2

- Case 2: 65 yo male with HTN, ETOH use, HL, GERD who presents with new dysphagia, weight loss .
- - Review red flag symptoms
- - EGD : partially obstructing mass. Biopsy- invasive adenocarcinoma
- - Referral to MTOP
- - Chemo/xry and surgery
- - after surgery complications/common symptoms
  - GERD
  - Weight loss, dysphagia, pain
- - Management: team approach
  - Nutrition,
  - GERD management!!
- § Aggressive and lifestyle modifications
  - overlay of VH
- -

- 95% of esophageal cancers are either adenocarcinomas or squamous cell carcinoma
- In the mid 20th century a majority of esophageal cancers were squamous cell
- This has slowly changed and now almost 2/3 are adenocarcinoma in the US (not the same worldwide)
- These tend to occur in the distal esophagus and GEJ (1)
- Common causes of scc is etoh and tobacco
- Common causes of adeno are Barrett's, tobacco, reflux

	Squamous cell	Adenocarcinoma
Incidence rate, per 100,000 population	1.2	2.8
Male-to-female ratio	2.5:1	6.5:1
White-to-black ratio	1:4	4:1
Most common locations	Middle esophagus	Distal esophagus
Major risk factors	Smoking, alcohol	Barrett's esophagus

- Epidemiology of esophageal cancer in the United States, 2012

Data from: Thrift AP. The epidemic of oesophageal carcinoma: Where are we now? Cancer Epidemiol 2016; 41:88.
Graphic 78167 Version 3.0

- surgery is the primary treatment modality unless cancer is quite superficial. It is an option for both esophageal as well as cancers at the GE junction.
- For T3 or node positive- tend to get neoadjuvent therapy first
- >1/2 at time of discovery are unresectable, locally advanced or metastatic (2)

How people present

- About 10% are asymptomatic at the time of discovery- usually found during a screening for Barrett's or Barrett's surveillance.
- Most present with progressive dysphagia and weight loss. When diameter is <15 mm you start noticing difficulty. Solids first and then as it progresses liquids as well.
- Mets are most common to the liver, lungs, bone and adrenals (3)
- Majority of cancers are found in the distal esophagus. < 10% are in the cervical esophagus - although presentation is the same

Making the diagnosis

- Upper endoscopy with esophageal biopsies
- Once diagnosed, then next steps are EUS (to look at extent of local/regional spread and CT/PET scan to look for more distant metastasis

Staging

- TNM staging- last consensus in 2017
- One more nuanced thing for esophageal is the center of the tumor. If the tumor is at the GEJ and the center does not cross more than 2 cm into the stomach it is treated as esophageal. If it > 2 cm into the stomach or a cancer of the cardia it is treated as a stomach cancer
- Another thing that has changed is that number of lymph nodes more than location matter in staging (from periesophageal to celiac lymph nodes)
- EUS tells you where in the 5 layers things go (show pic)
- Sensitivity (81-92 %)and specificity (94-97%) to correctly identify staging. Better at t4 then t1
  - T1a- mucosal disease alone (can do EMR
  - T2 – involves the muscularis propria but does not invade thru the esophageal wall
  - T3 tumors are extraeesophageal and extend into the adventitia
  - T4 invade the muscularis propria and adventitia to involve mediastinal structures such as the pericardium, aorta, bronchus, or pleura

Endoscopic therapies

- Cryotherapy
- Radiofrequency ablation
- EMR

Cryotherapy

- Liquid nitrogen or nitrous oxide to rapidly freeze tissue
- Eradicates HGD in 95-100%, dysplasia in 85-90% and complete eradication of IM in 55%
- Long term data unavailable
- Tortuous esophagus
- Esophageal strictures or narrowing
- Palliation

Radiofrequency ablation (RFA)

- Uses heat to eradicate BE, HGD or cancer cells by changing the cellular proteins
- Most common ablative therapy
- 92% achieve complete eradication of HGD or early cancer
- 88% achieve complete eradication of IM
- Cannot be used if there is nodularity
- Higher risk of strictures

Endoscopic mucosal resection (EMR)

- Performed when there is nodularity
- Risks
  - Stricture
  - Bleeding
  - Perforation

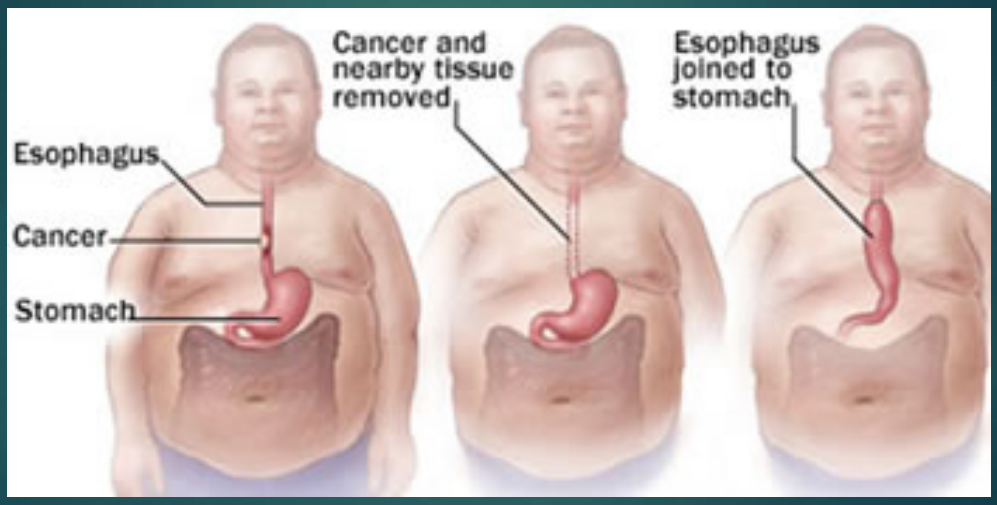
EMR

- PICTURE

Endoscopic therapy

- Highly successful
- May circumvent the need for esophagectomy
- Most recurrence occurs within the first year
- Poor surgical candidates will receive endoscopic therapy as palliation

Esophagectomy



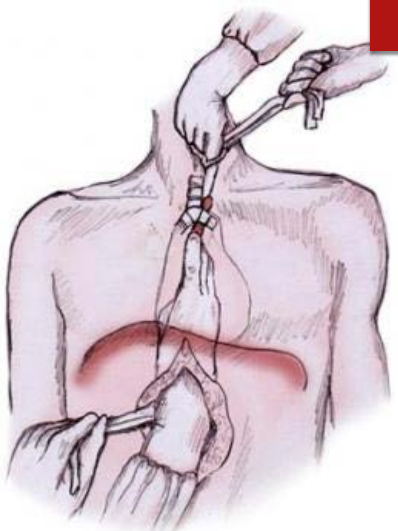
What happens when endoscpic therapy is not an option?

Esophagectomy

- High morbidity and mortality
- Risks/benefits
- Postoperative care

Transhiatal esophagectomy

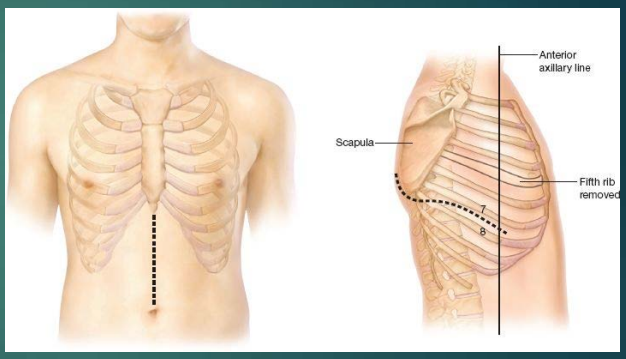
- Mortality – 1%
- Anastomotic leak – 9%
- Atelectasis – 2%
- Pneumonia – 2%



Esophageal mobilization on anterior aspect

Ivor- Lewis esophagectomy

- Done thru an abdominal incision and right thoracotomy (newer approach is minimally invasive)
- Intra-thoracic incision
- Allows you to avoid a neck dissection
- Less risk for damage to recurrent laryngeal nerve
- Anastomotic leaks are harder to manage
- Can't access proximal esophagus well to get margins
- Risk of bile reflux

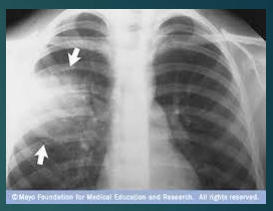


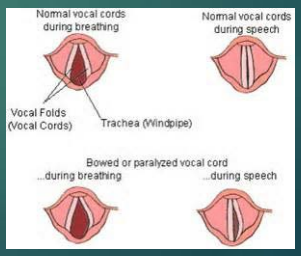
Tri-incisional esophagectomy

- Combines the transhiatal and trans thoracic approach
- Transthoracic esophagectomy is done
- Anastomosis is cervical

Common complications- immediate post-op

- Pneumonia
- MI
- Recurrent laryngeal nerve injury
- Anastomotic leak

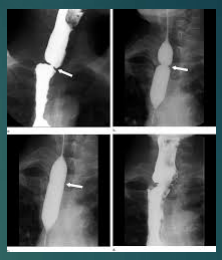


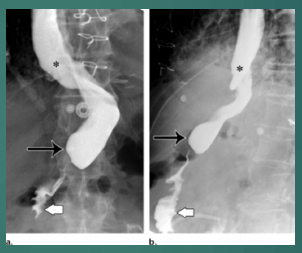


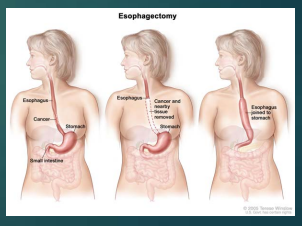
https://paralysis-vocalfolds.weebly.com/-vocal-fold-paralysis.html

GI specific complications

- Anastomotic Stricture
  - Dysphagia
- Delayed Gastric emptying
- Reflux
- Dumping syndrome



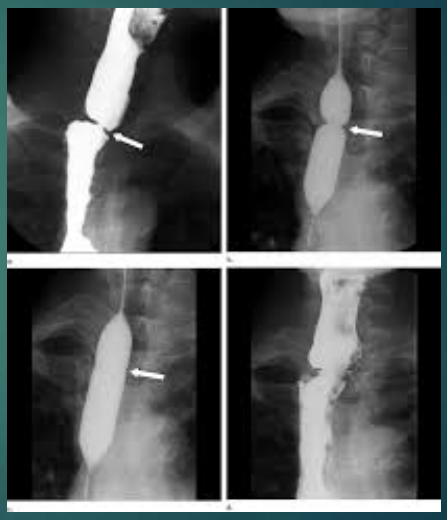




DOI: https://doi.org/10.1097/01.RVI.0000185417.89885.2E
https://www.cancer.gov/types/esophageal/patient/esophageal-treatment-pdq

Anastomotic stricture

- Common cause of dysphagia post esophagectomy
  - Mild to moderate dysphagia
  - Can effect nutrition
  - Can limit types of foods
- Variable rates (9-40%)
- Treatment : endoscopic dilation



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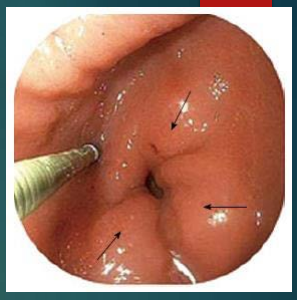
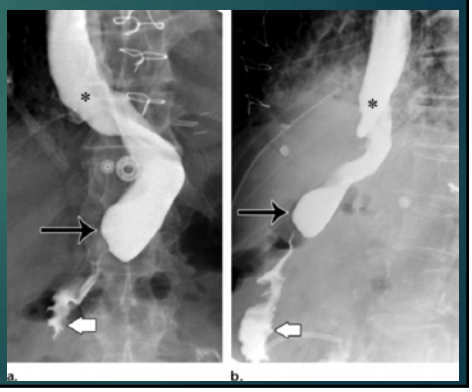
Delayed gastric emptying



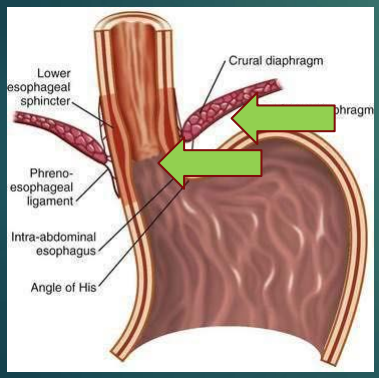
- Up to 50% of patients post-esophagectomy
- Due to truncal vagotomy performed during resection

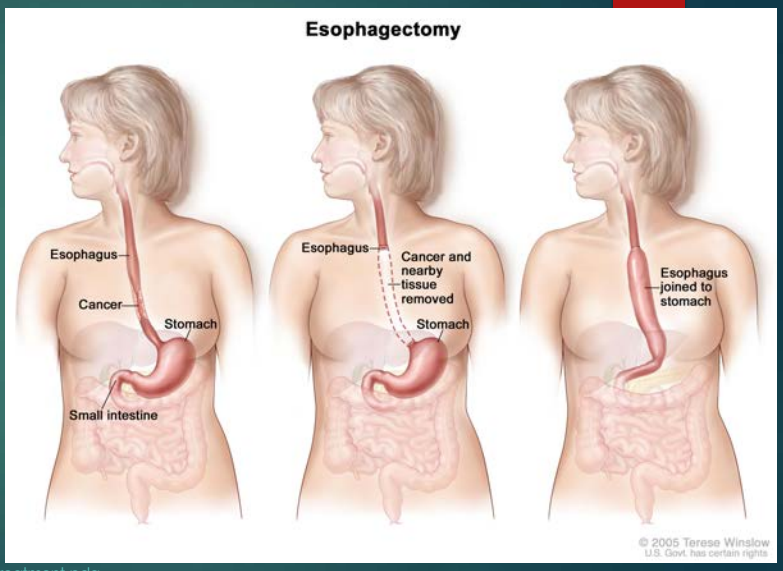
- Treatment:
  - Small meals throughout the day
  - Avoid simple sugars
  - If poor response, can consider pyloric botox



https://www.wjgnet.com/1948-5190/full/v7/i8/790.htm

Reflux

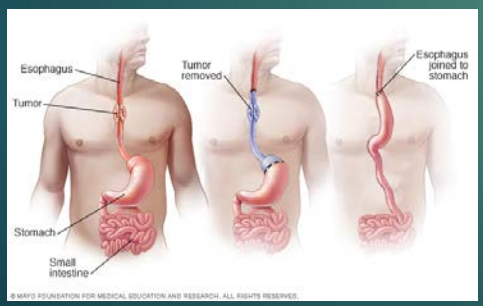




https://www.cancer.gov/types/esophageal/patient/esophageal-treatment-pdq
https://clinicalgate.com/gastroesophageal-reflux-disease-2/

Reflux – But why?

- Loss of LES (lower esophageal sphincter) and diaphragmatic pinch
- Intra-abdominal pressure allows for reflux thru anastomosis
- Altered motlity of the gastric conduit and remnant esophagus



https://www.mayoclinic.org/diseases-conditions/esophageal-cancer/diagnosis-treatment/drc-20356090

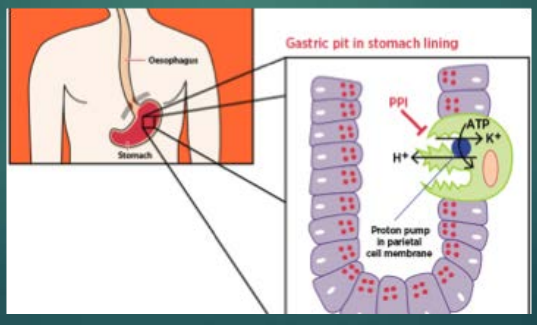
Treatment options - PPI

- •Most potent inhibitor of gastric acid secretion
- •Most commonly prescribed medication in the US
  - > 100 million prescriptions filled yearly [1]
  - In head to head trials, randomized control trials etc
  - PPI>H2RA>placebo[2]

Arch Intern Med 2010;170:747-748
www.effectivehealthcare.ahrq.gov/reports/final.cfm

Treatment options- PPI

- Proton pump inhibitor suppresses gastric basal and stimulated acid secretion by inhibiting the parietal cell H+/K+ ATPase pump

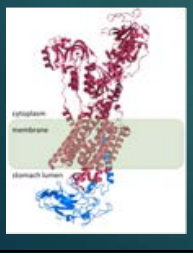


How PPI's work

- •H-K-ATPase present in the parietal cell is highest after a prolonged fast

–recommend taking 30 min before breakfast

– recommended to be taken daily

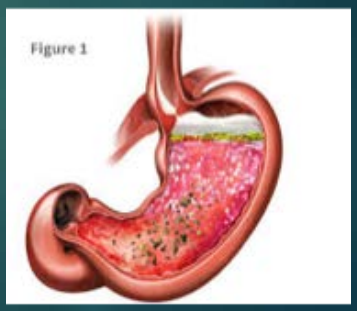


Treatment options- lifestyle modifications

- Elevation of the head of the bed
- 3-4 hour gap (perhaps longer between dinner and bed

Treatment options

- Alginates
- Contains long chain carbohydrate molecules
  - When exposed to acid and liquid, form a "raft barrier"
  - Displace post-prandial gastric acid pocket

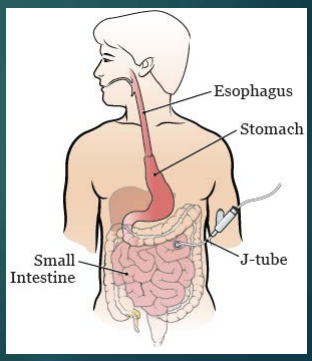


Dumping syndrome

- Within less then 60 minutes (most within 30 minutes)
  - gastric contects rapidly travel to the small intestine – due to altered motility in the stomach after surgery
  - " Rapid gastric emptying"
  - Associated with simple sugards
  - Associated with:
    - Nausea
    - Cramping
    - Diarrhea
    - vomiting

Nutrition

- All patients who get an esophagectomy will have a jejunostomy tube placed
- This is inserted distal to the ligament of Treitz
- Feeds are normally started around day 2
- slowly advanced to goal
- Barium swallow is done to make sure no leak



https://www.mskcc.org/cancer-care/patient-education/nutrition-during-treatment-esophageal-cancer

Nutrition

- If no leak, ok to start liquids
- Most stayo n liquids for the first few weeks
- Most nutrition comes from J tube feeds
- Patients slowly expand as tolerated

References

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