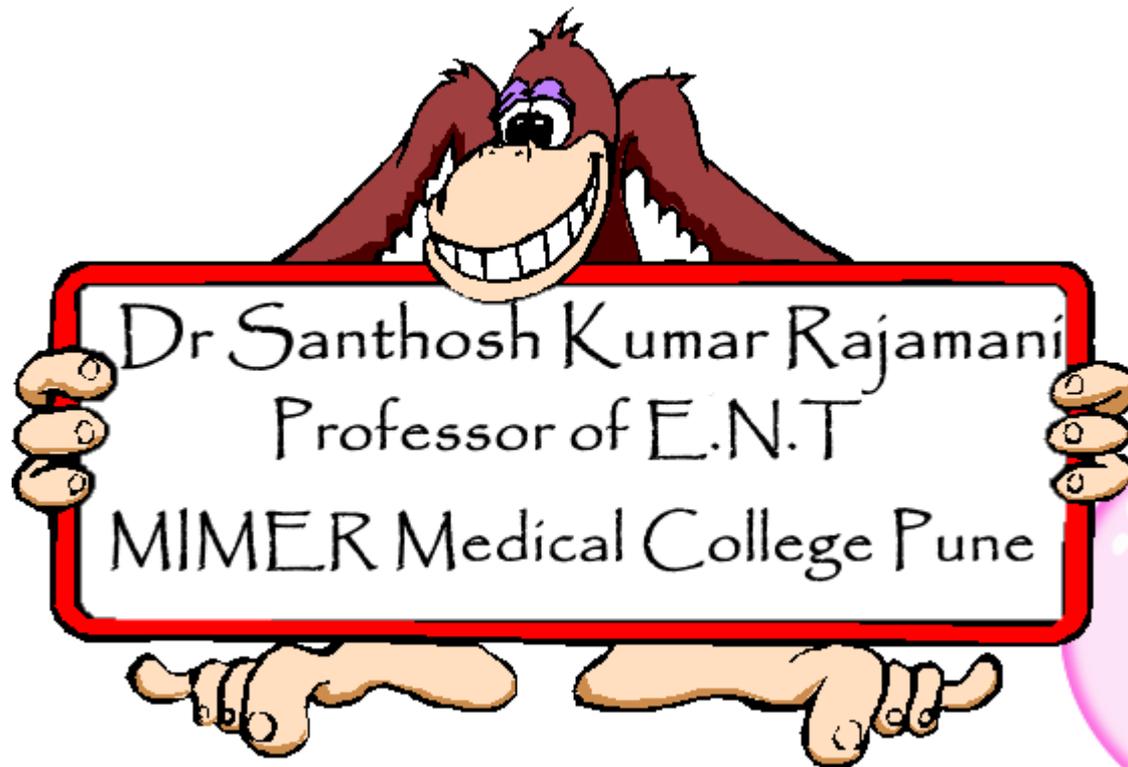
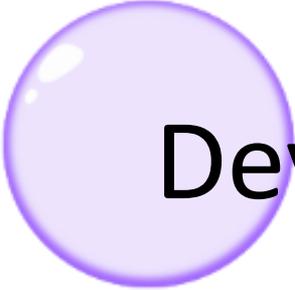


EN4.52 CBME (2019) Lecture -20

Diseases of Oesophagus

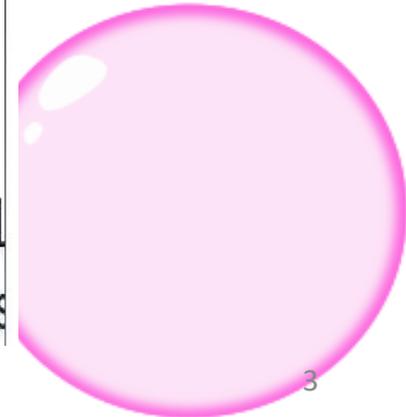
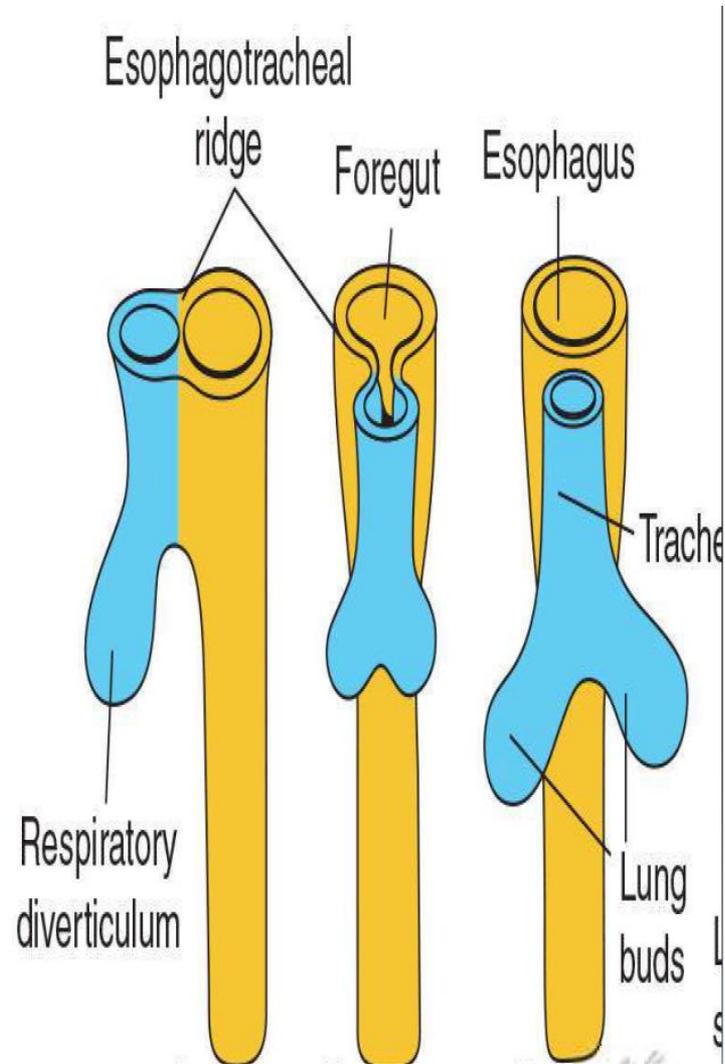




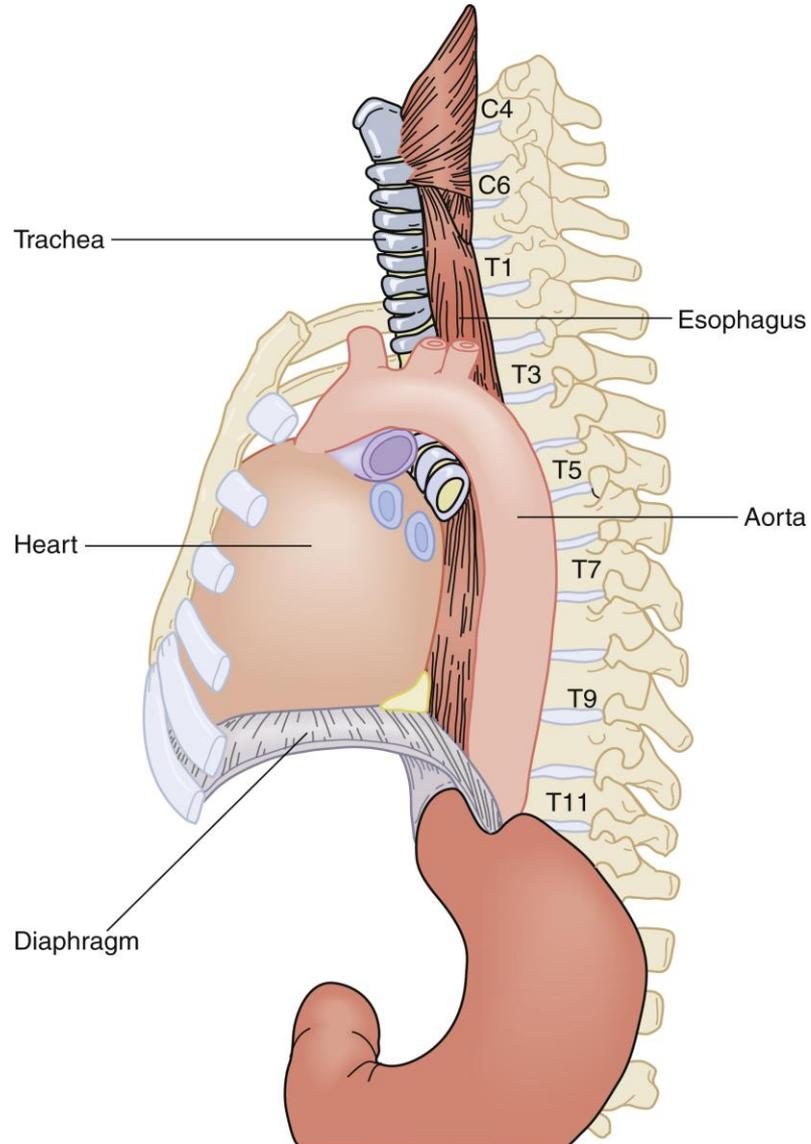
Development of the Oesophagus

- During the 4th wk., a small diverticulum appears in the ventral wall Of Tracheoesophageal Septum'
- gradually separates the ventral Respiratory diverticulum from the dorsal part of foregut.
- Pharynx is divided into; a ventral portion the respiratory primordium
- Dorsal portion, the Oesophagus
- descent of heart & lung it rapidly lengthens

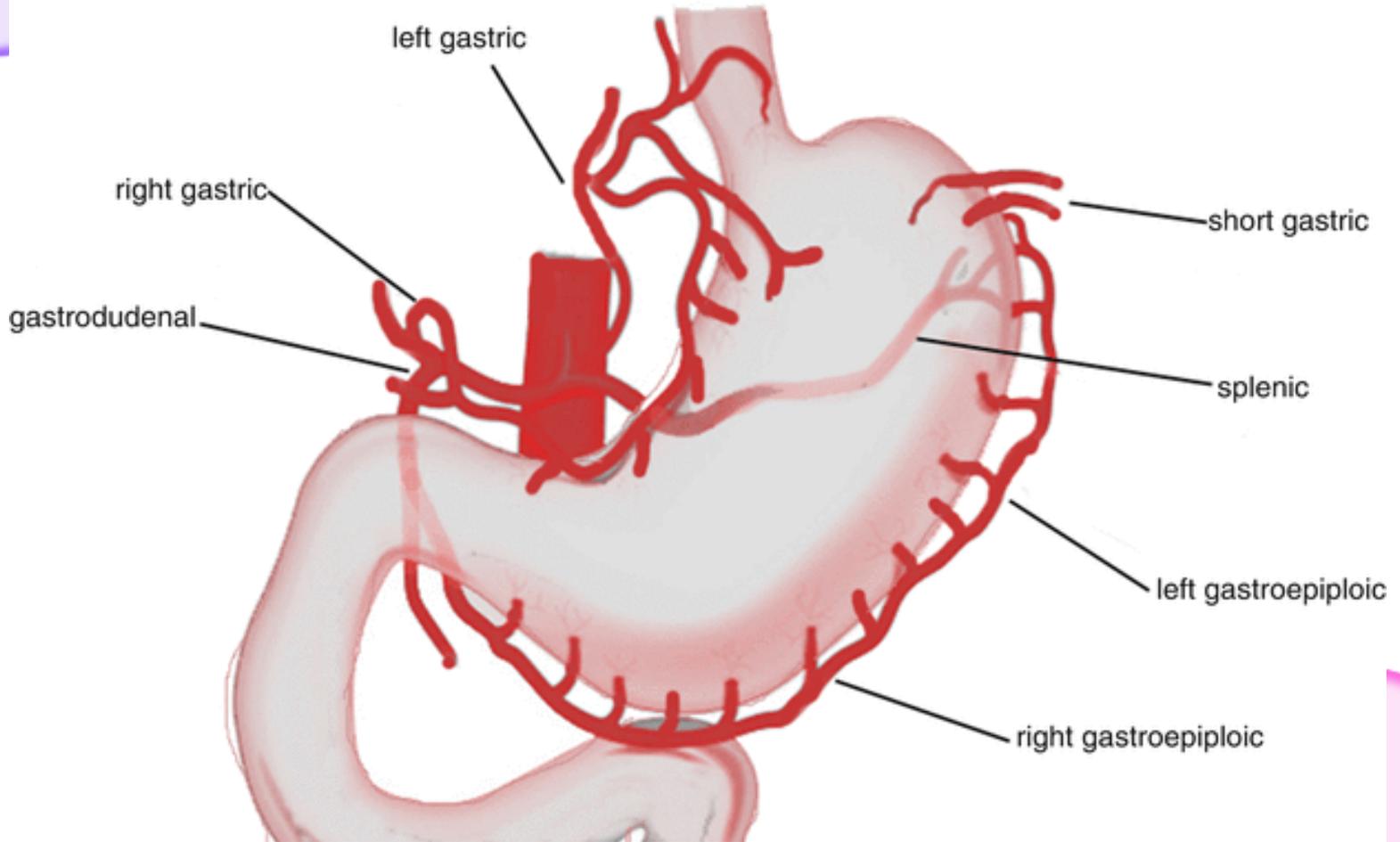
Development of the Oesophagus



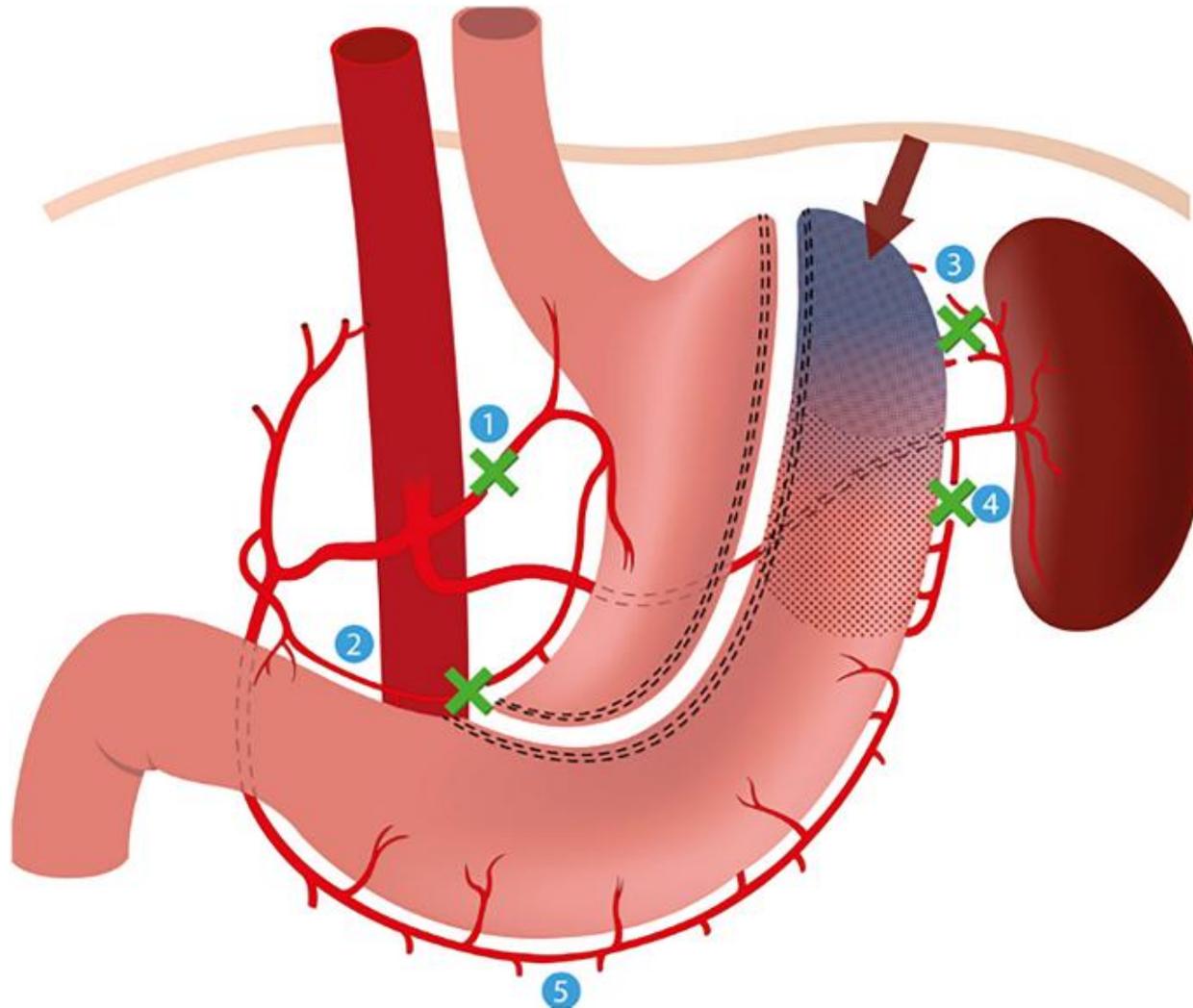
Anatomy of Oesophagus



Anatomy of Blood supply to Stomach

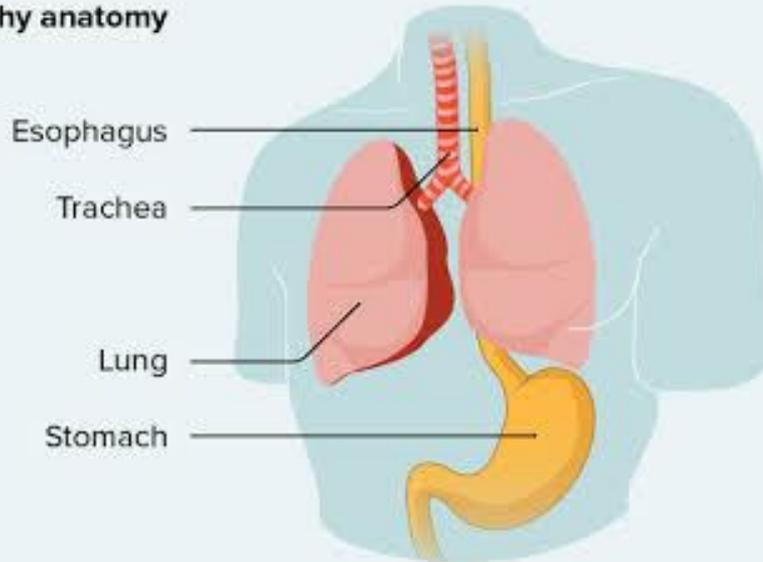


Gastric Pullup



Types of Esophageal Atresia and Tracheoesophageal Fistula

Healthy anatomy



Type A
Artesia



Type B
Artesia with
Proximal Fistula



Type C
Artesia with
Distal Fistula



Type D
Artesia with
Double Fistula



Type E
Fistula

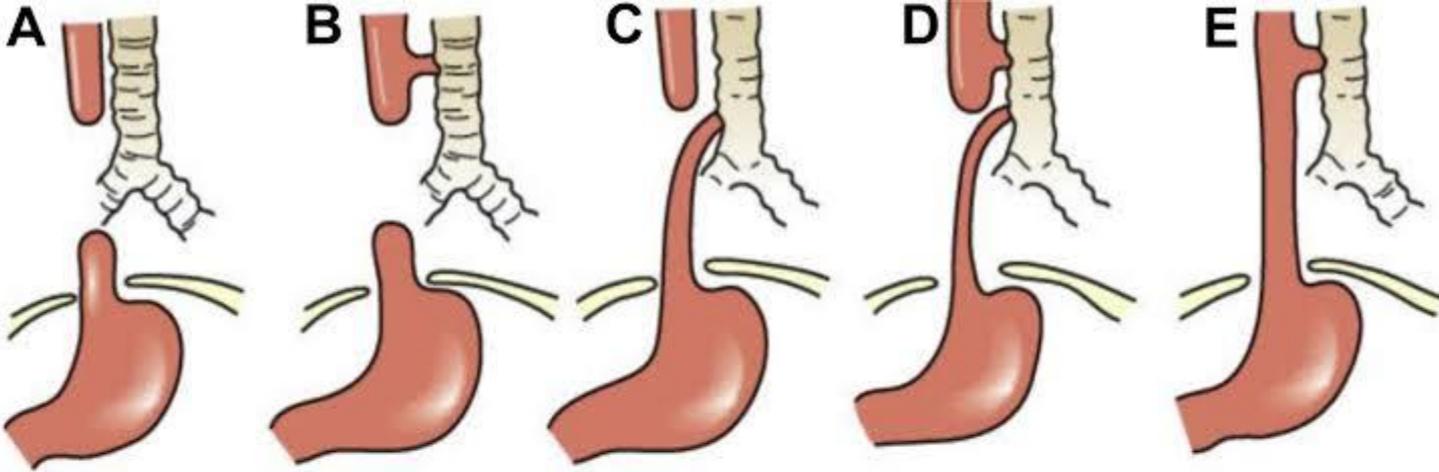




Oesophageal Atresia

- * Type A: Esophageal atresia without a fistula (atresia means blockage). This is the rarest type of EA/TEF, and it occurs when the esophagus is completely blocked with no connection to the trachea or stomach.
- * Type B: Esophageal atresia with a proximal fistula. This type of EA/TEF occurs when the upper part of the esophagus ends in a pouch and connects to the trachea, and the lower part of the esophagus is connected to the stomach.

Incidence



8%

- Atresia alone, no fistula
- Small stomach, gasless abdomen
- Usually has a long gap between the esophageal ends
- Gross type A

1%

- Proximal tracheoesophageal fistula
- No distal fistula
- Small stomach, gasless abdomen
- Often has a long gap between esophageal ends
- Gross type B

86%

- Most common abnormality
- Gross type C

1%

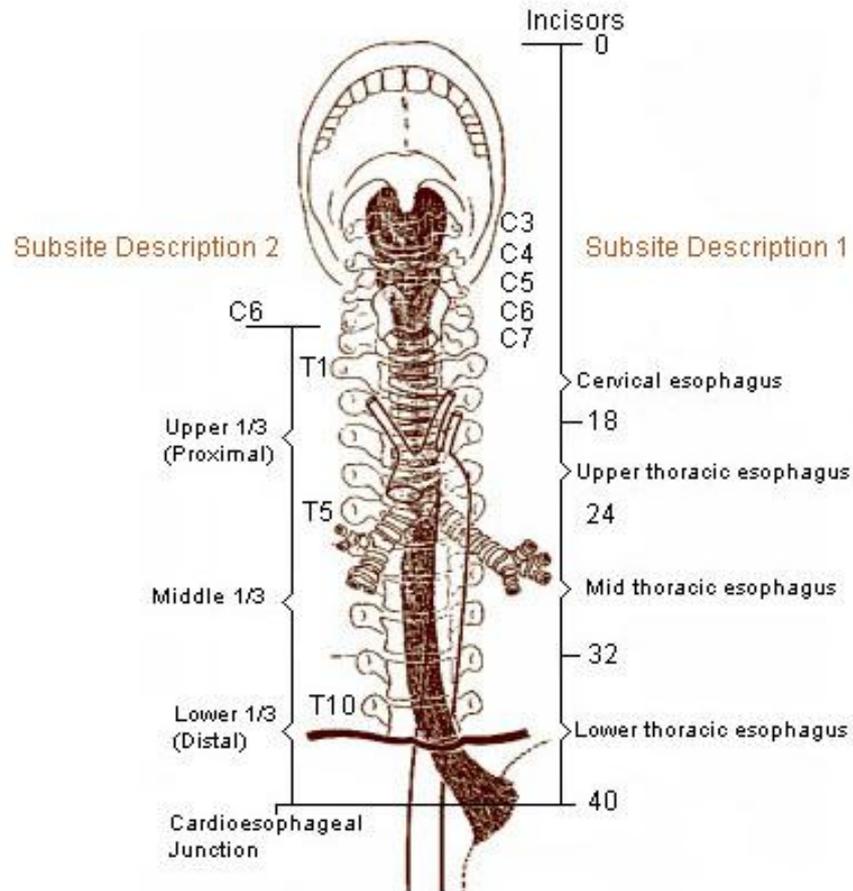
- Proximal and distal fistulas
- "Double Fistula"
- Gross type D

4%

- No atresia of the esophagus
- Congenital tracheoesophageal fistula
- H or N fistula
- Gross type E

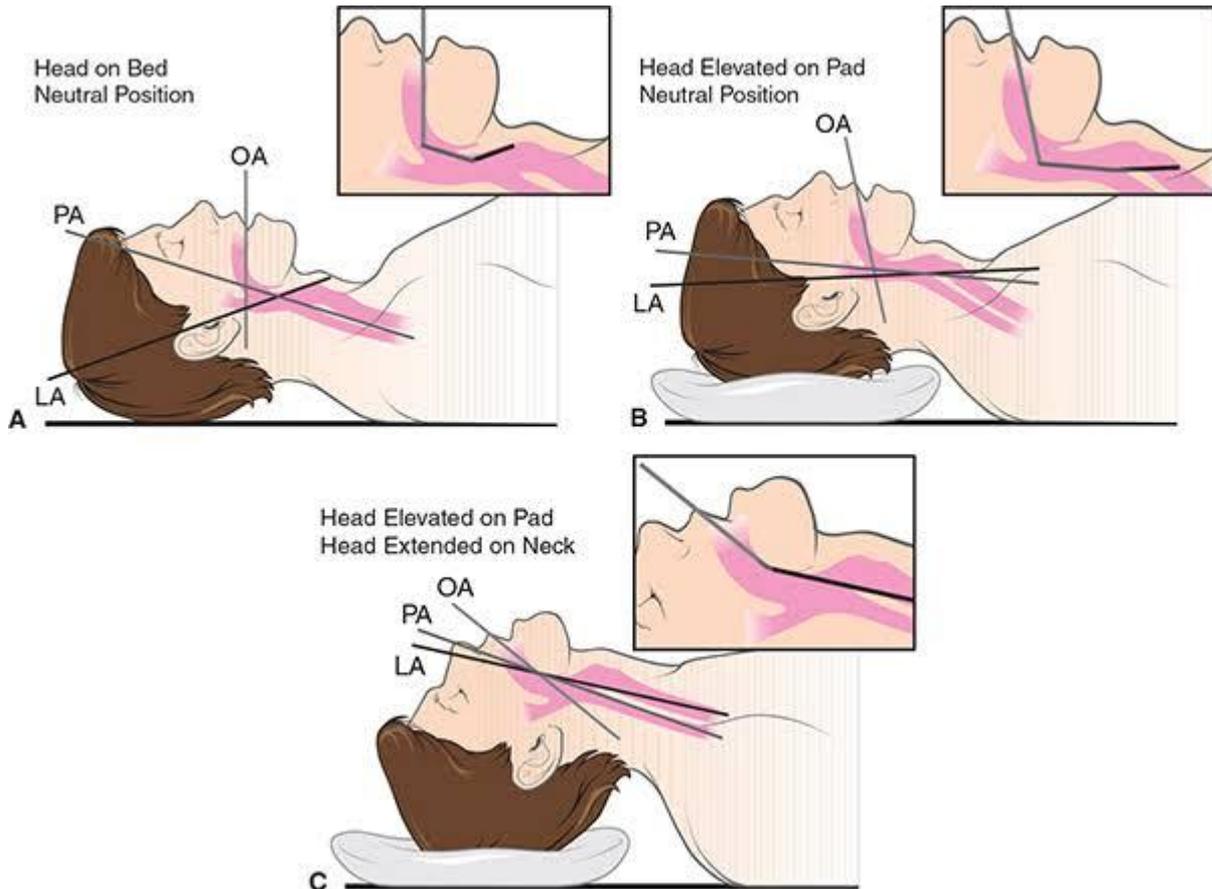
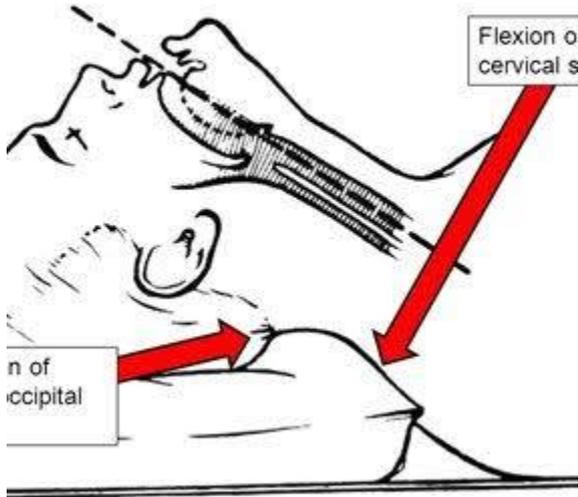
- * Type D: Esophageal atresia with proximal and distal tracheoesophageal fistula. This type of EA/TEF is less common and occurs when both the upper and lower portions of the esophagus connect to the trachea, and there is a blockage in between.
- * Type E: H-type tracheoesophageal fistula without esophageal atresia. This is the rarest type of EA/TEF, and it occurs when there is an abnormal connection between the trachea and esophagus, but the esophagus is otherwise normal.

Levels and Lengths

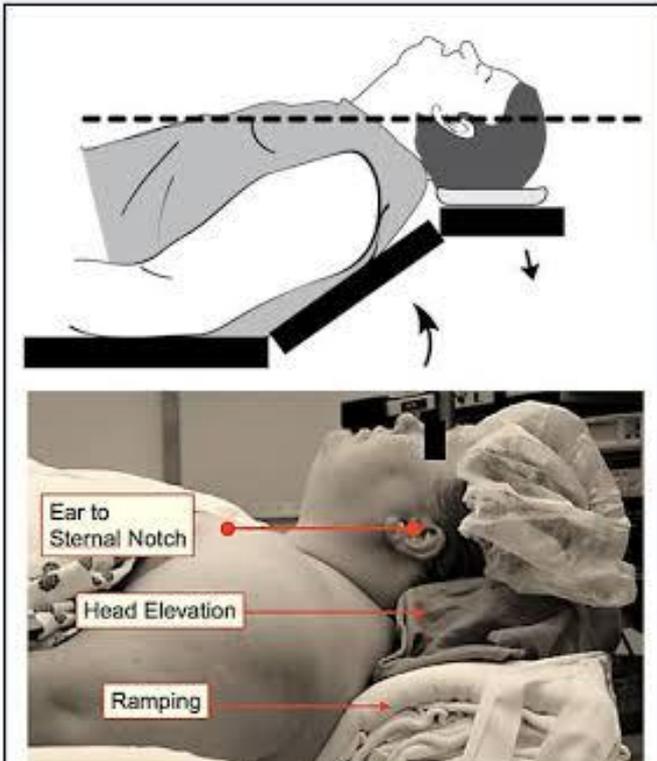


Upper Aerodigestive Endoscopy- Boyce Position

Sniffing Position



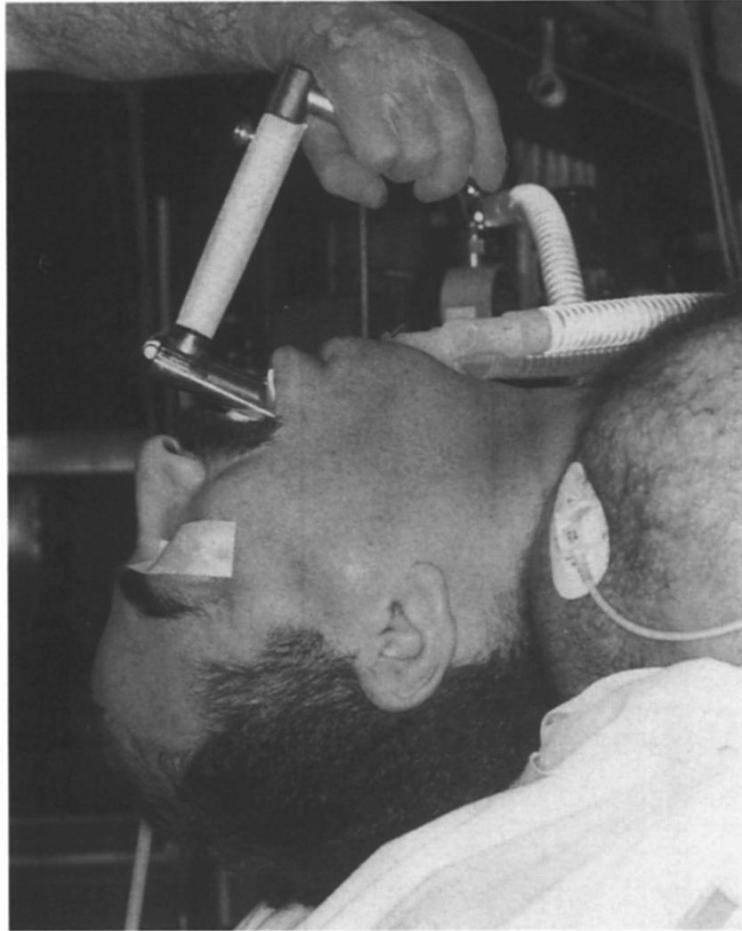
RAMPING



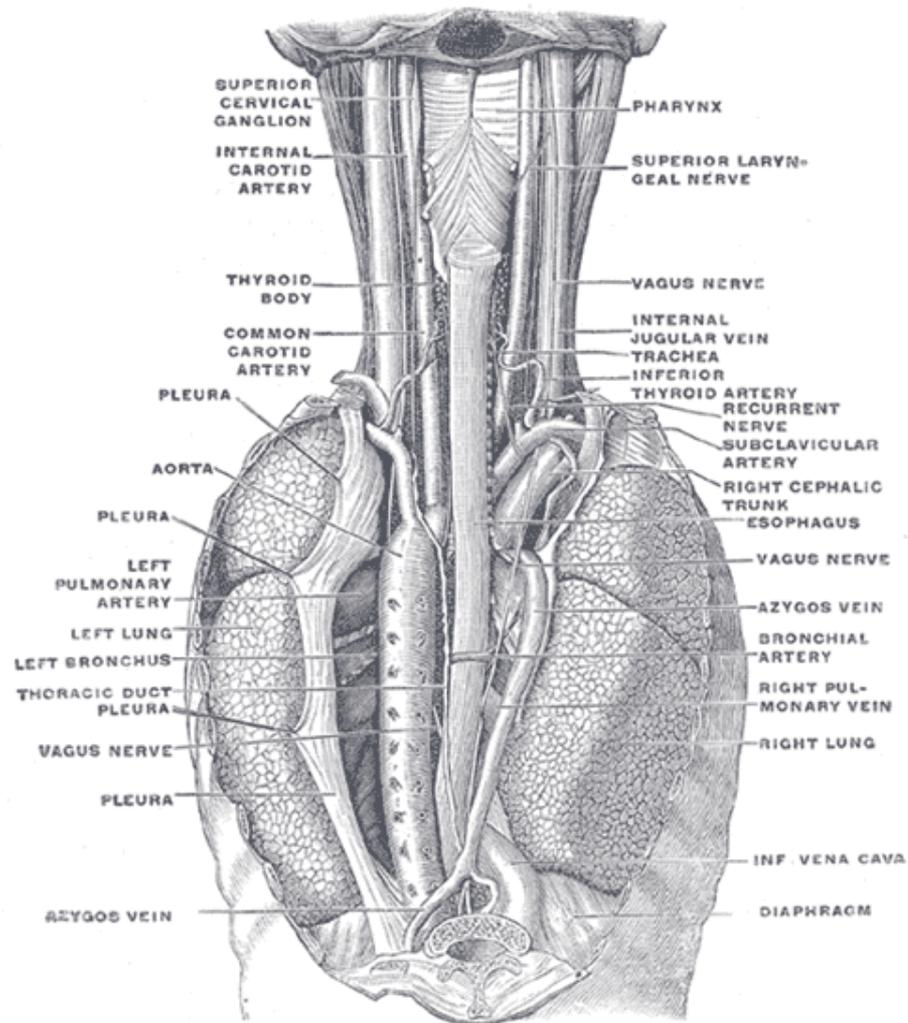
Positioning

- **Ramping**: place folded towels beneath the head until the **external auditory meatus** is on the same horizontal plane as the **sternum**
- Extend the head slightly, so that the patient's face is parallel to the **ceiling**

Actual position



Oesophagus



Histology

Stratified Squamous
Non-Keratinized
Epithelium

Lamina Propria

Muscularis
Mucosa

Esophageal
Glands

Adipocytes

Inner Circular
Layer

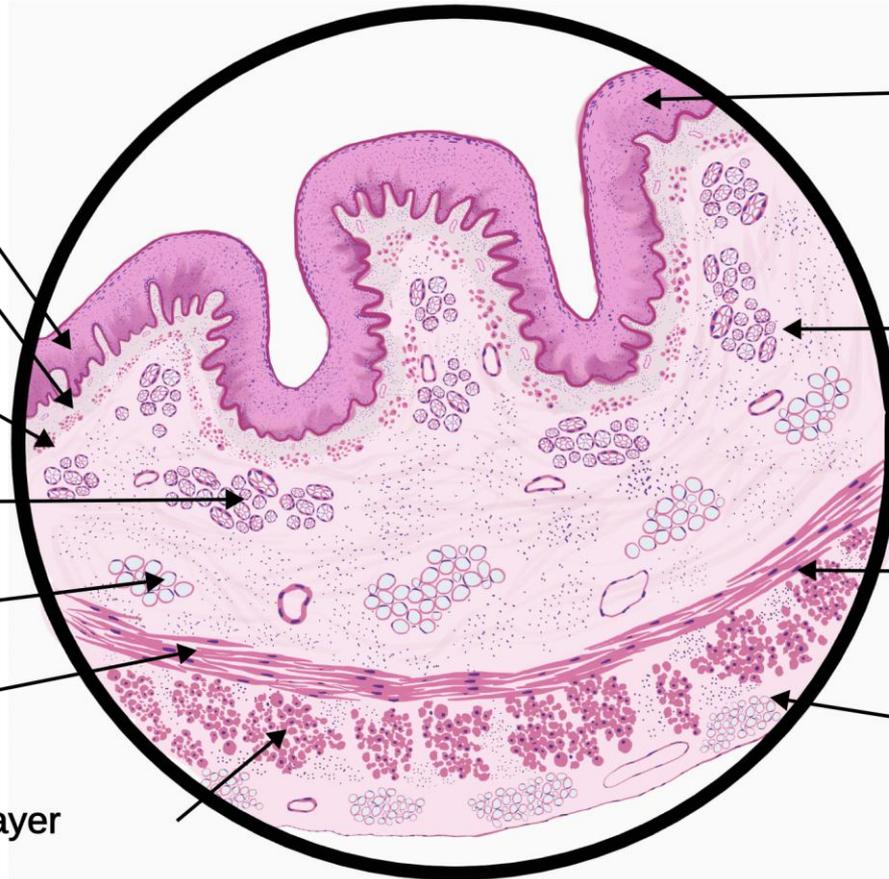
Outer Longitudinal Layer

Mucosa

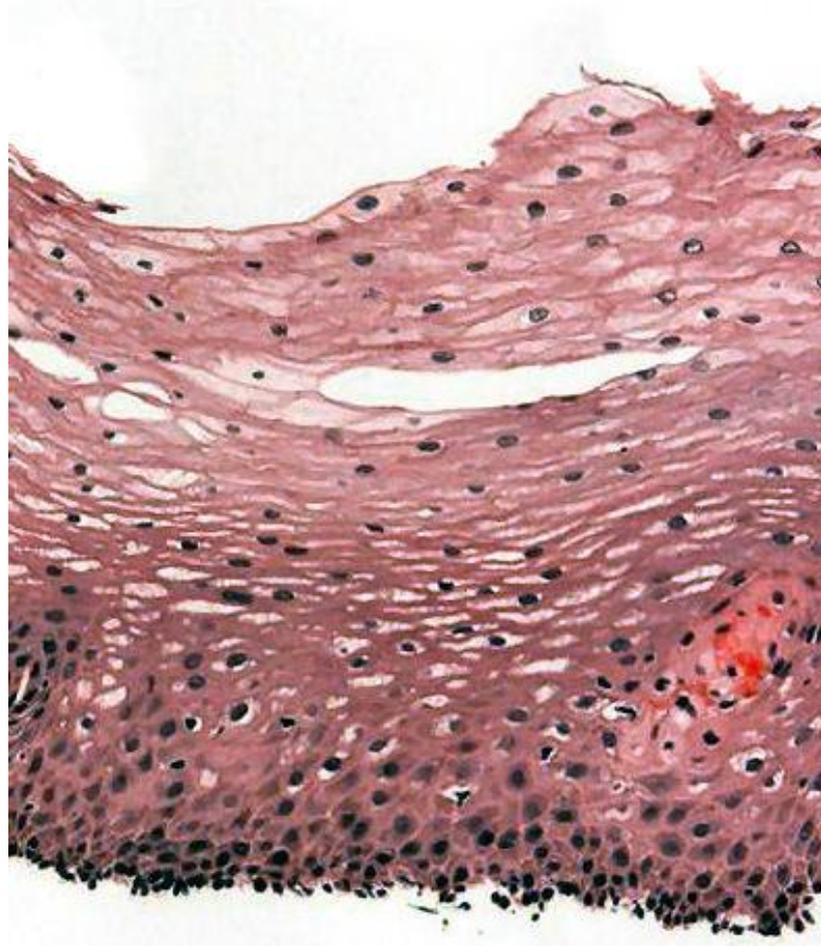
Submucosa

Muscularis
Externa

Adventitia

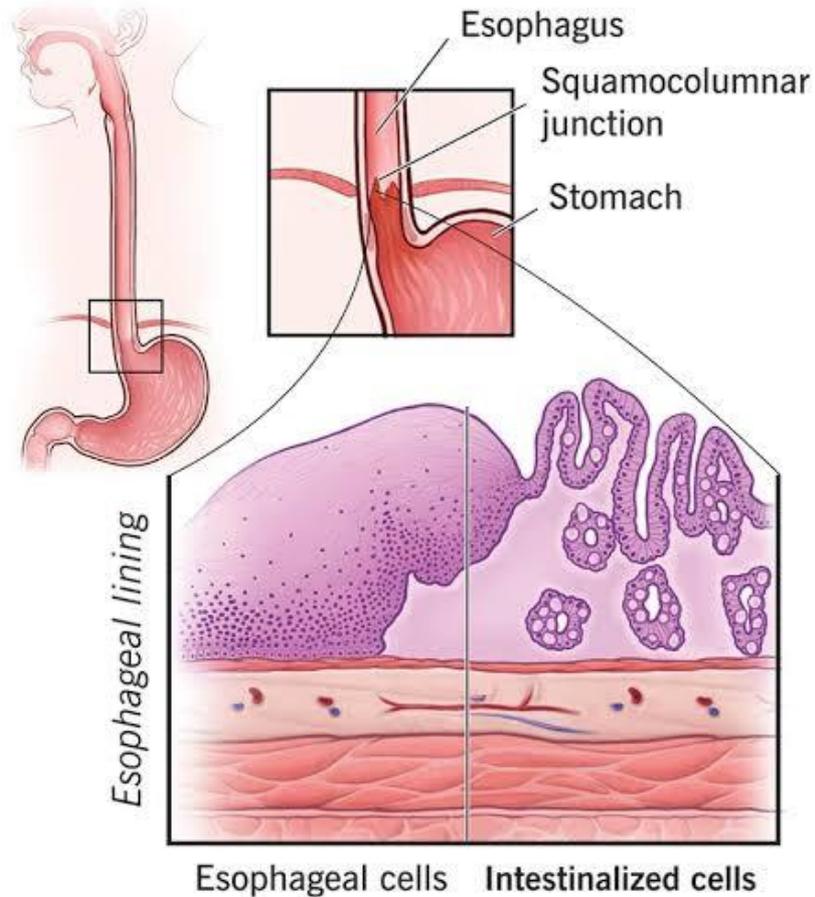


HPE Actual

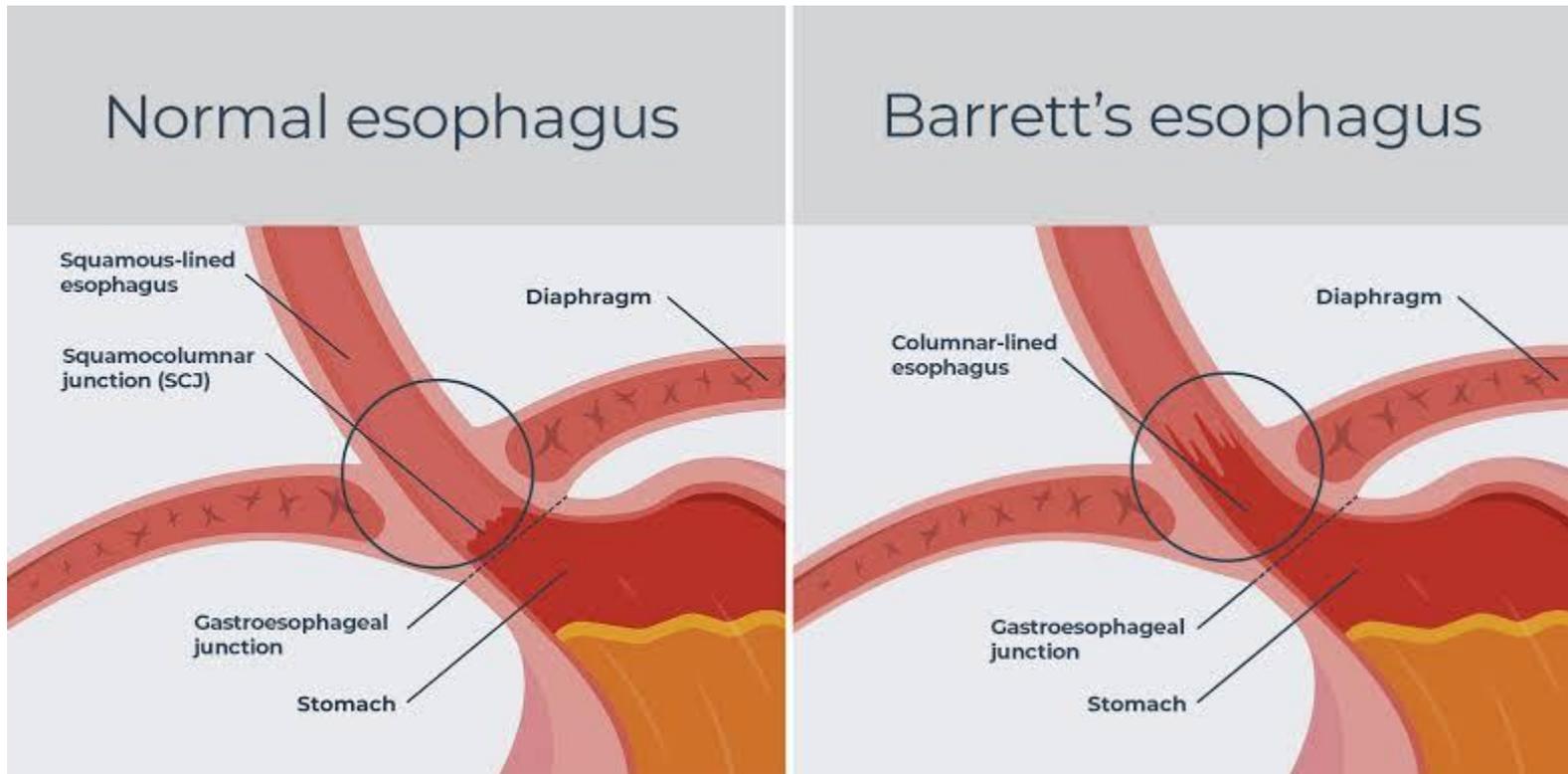


Barret Oesophagus

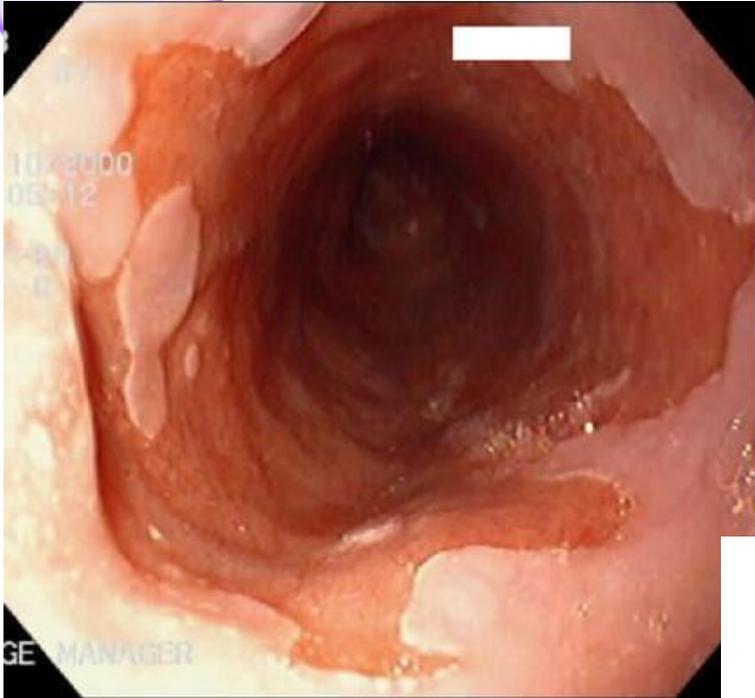
Barrett's esophagus



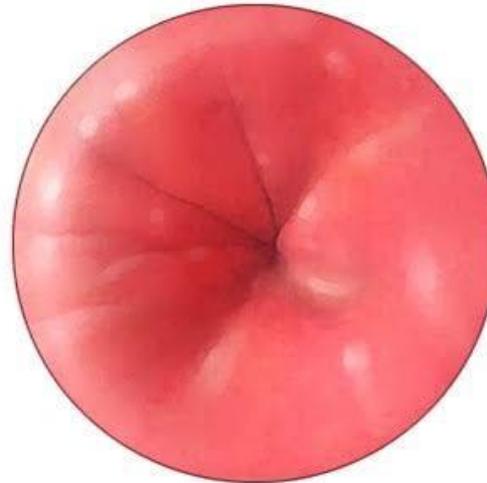
Normal vs Barret Oesphagus



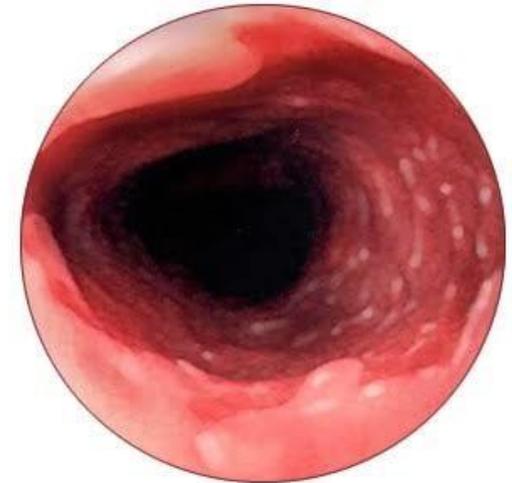
Barret Oesophagus



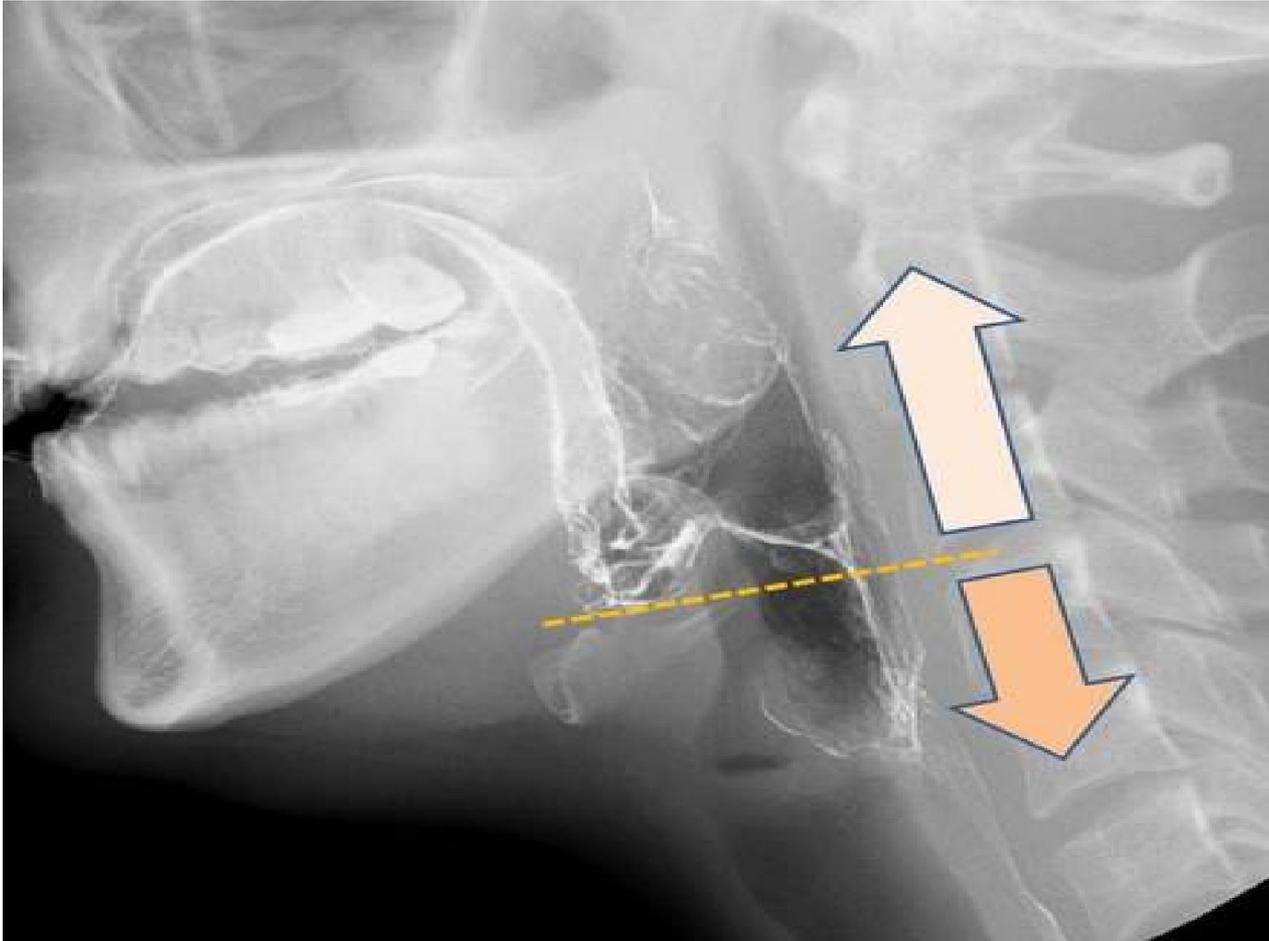
Normal lower esophagus



Barrett's esophagus



Barium Swallow

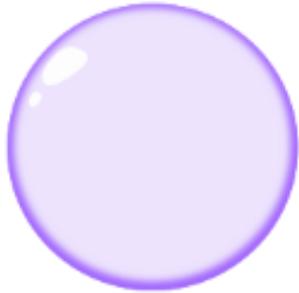


Barium swallow

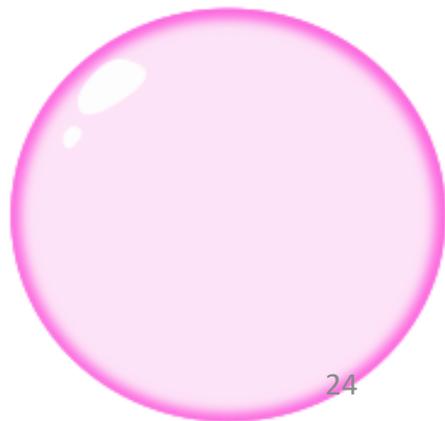
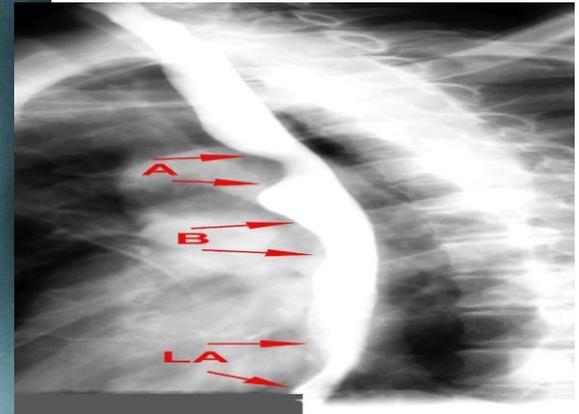
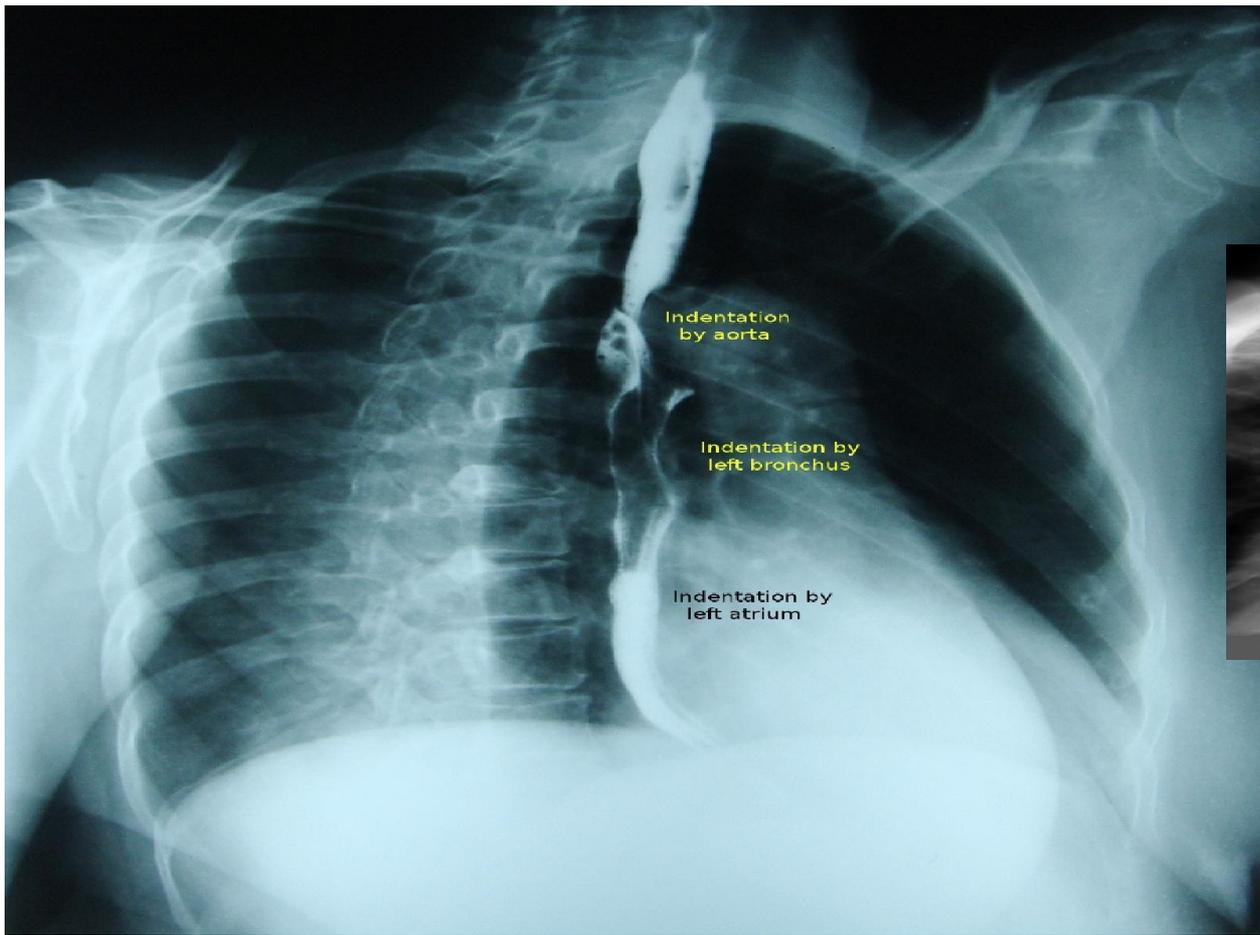


Barium swallow



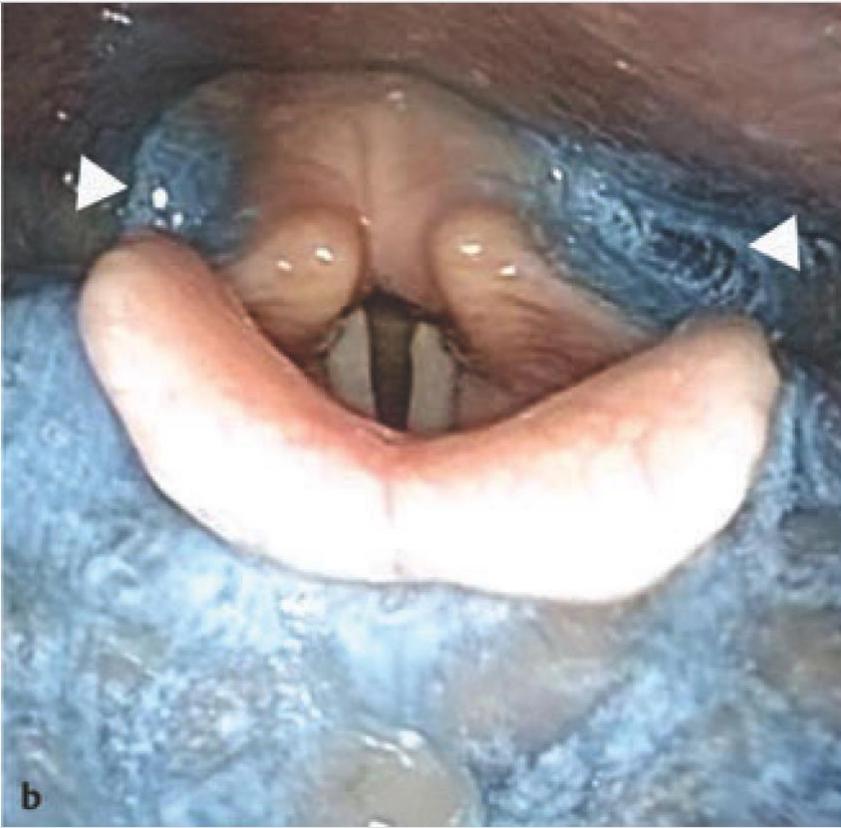
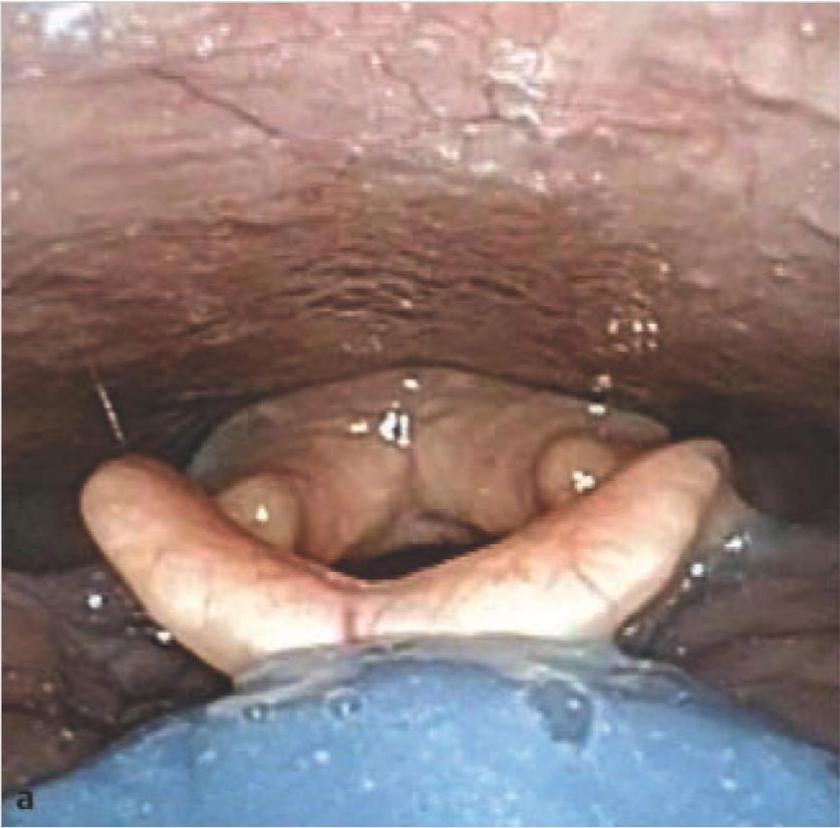


RAO View

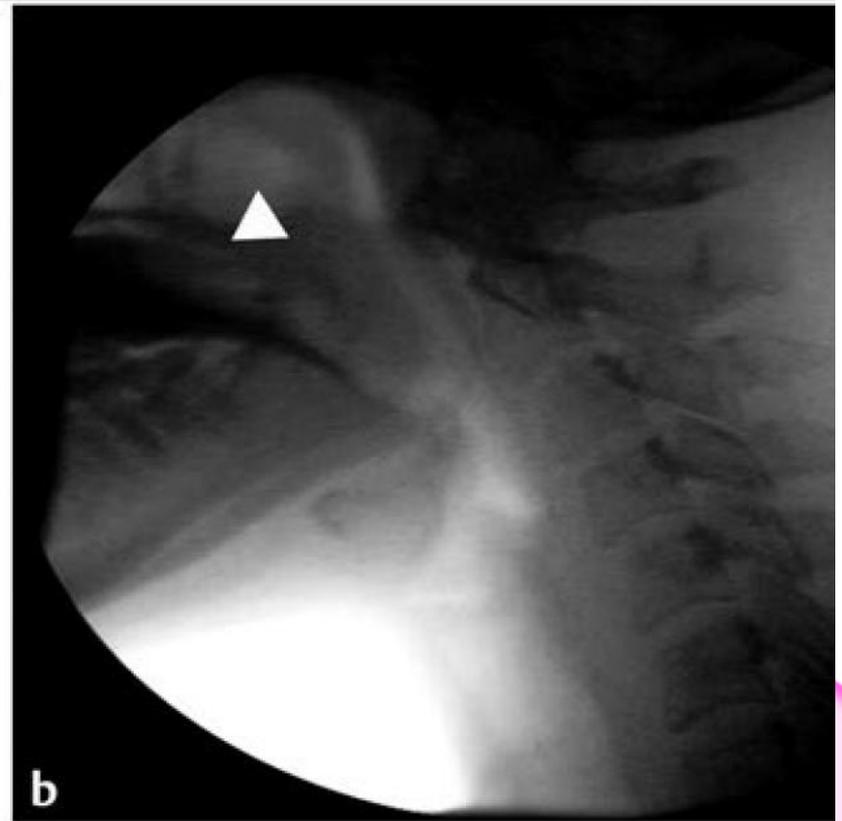




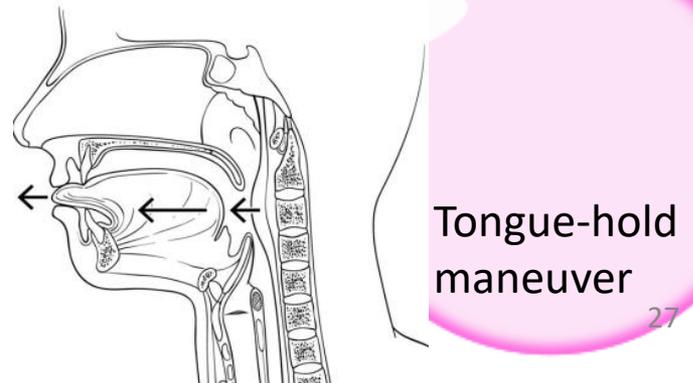
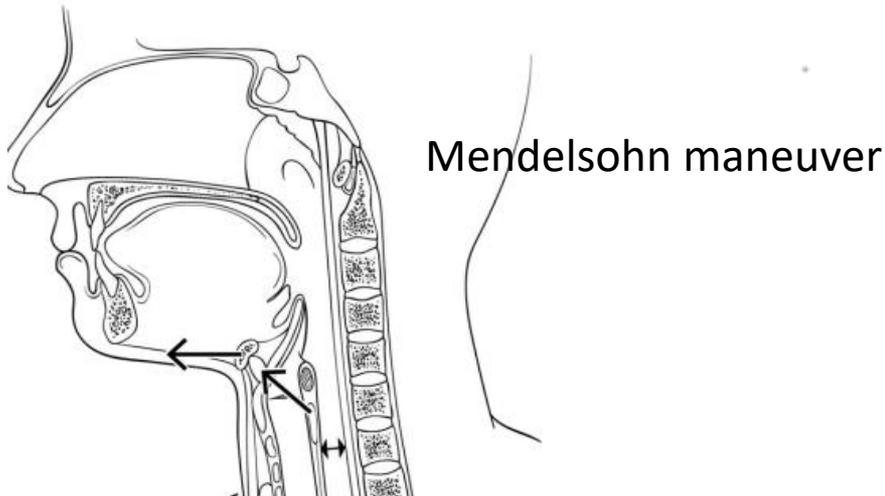
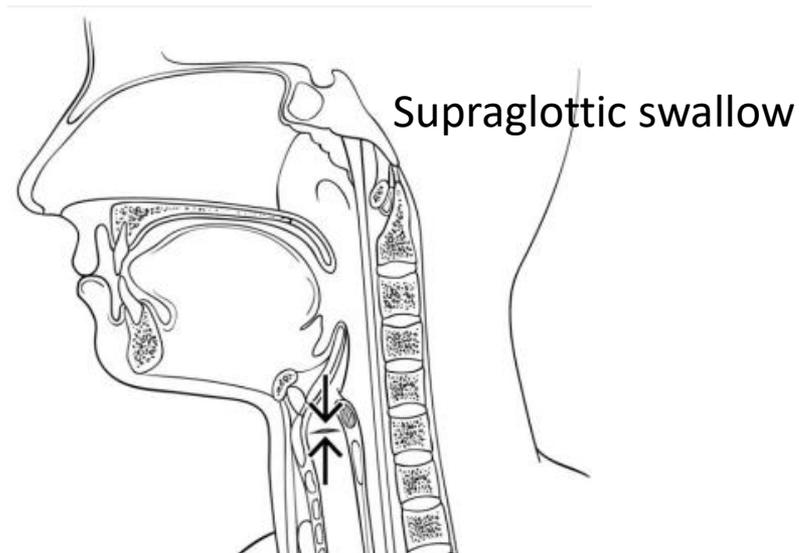
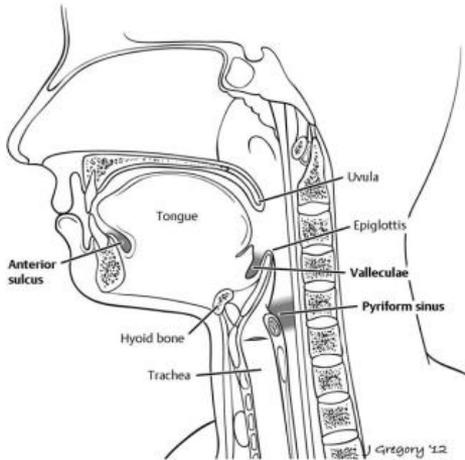
FEES



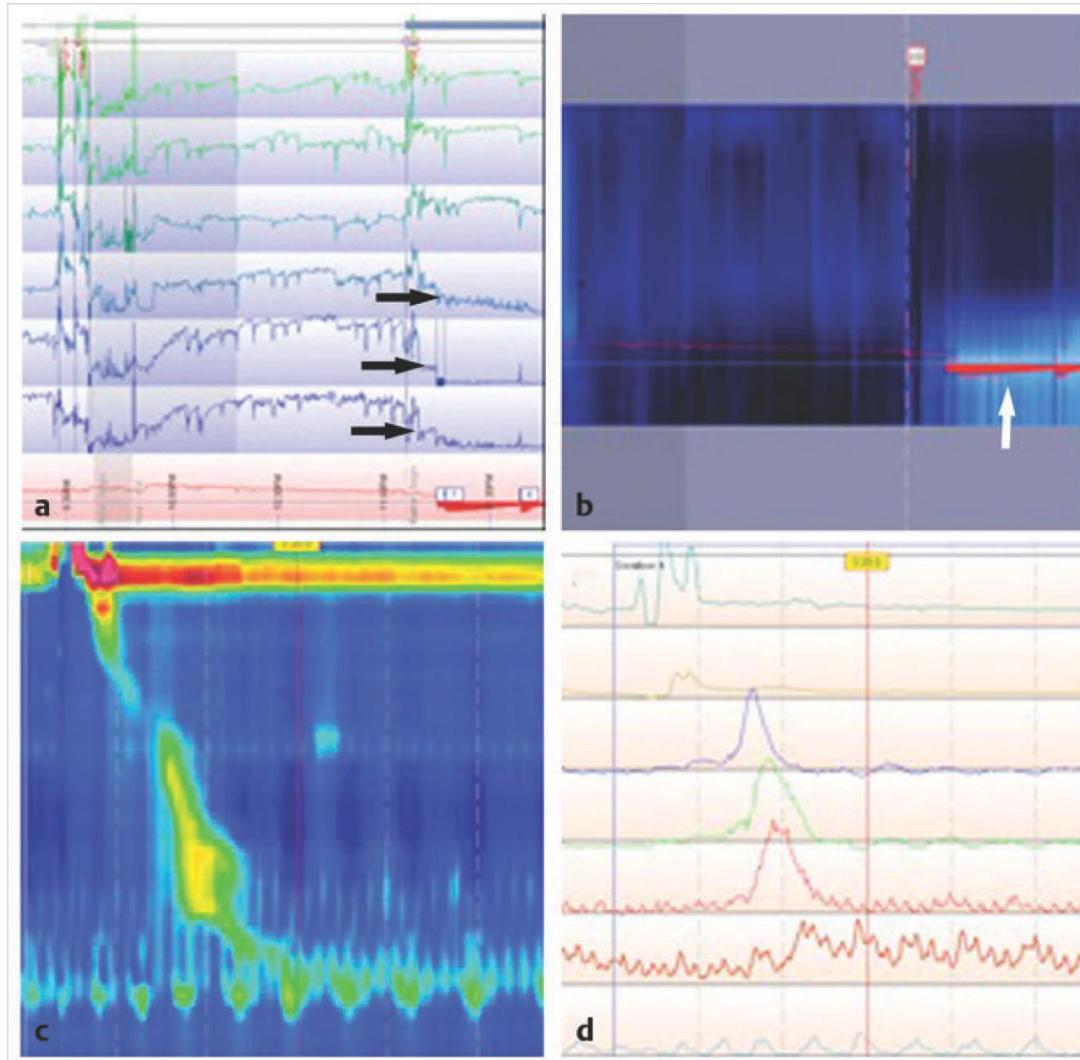
VFS Swallowing study - Bolus



Common areas of bolus residue. It is residue to be located in the anterior sulcus, vallecula, or piriform sinuses

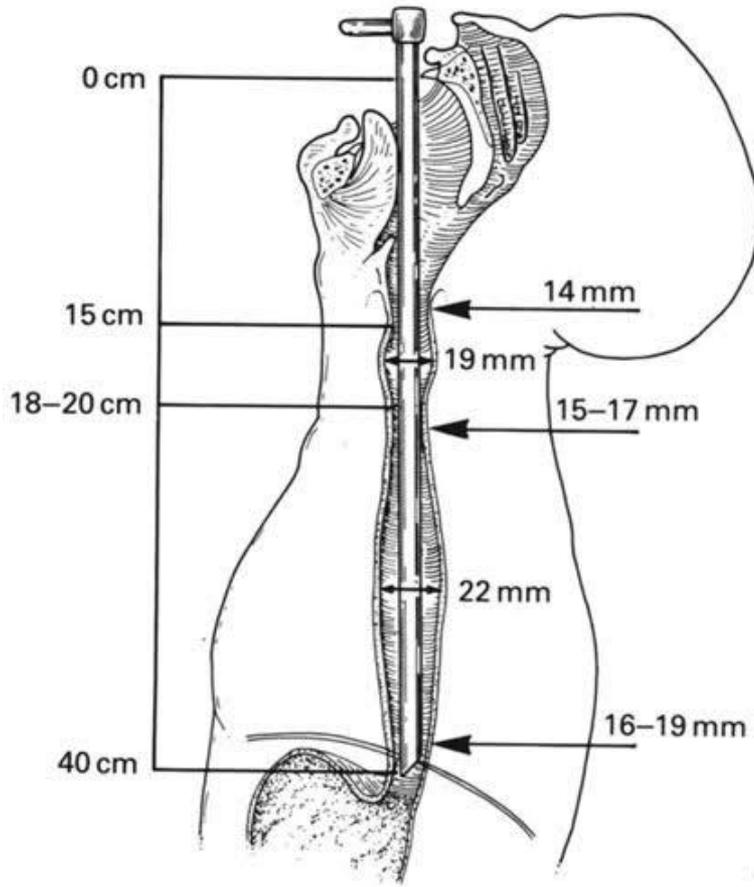


pH/Impedance and manometric evaluation of the esophagus

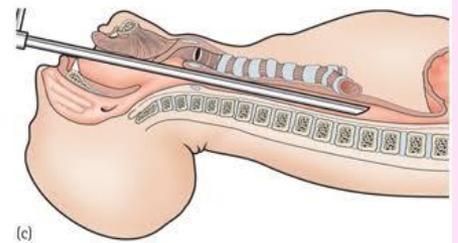
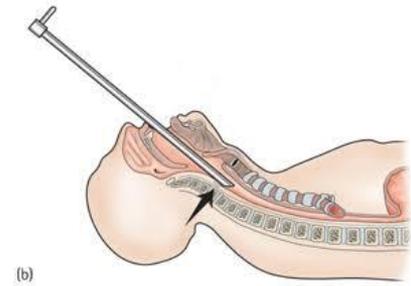
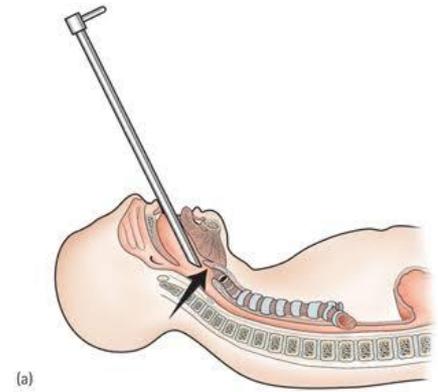


Oesophagoscopy

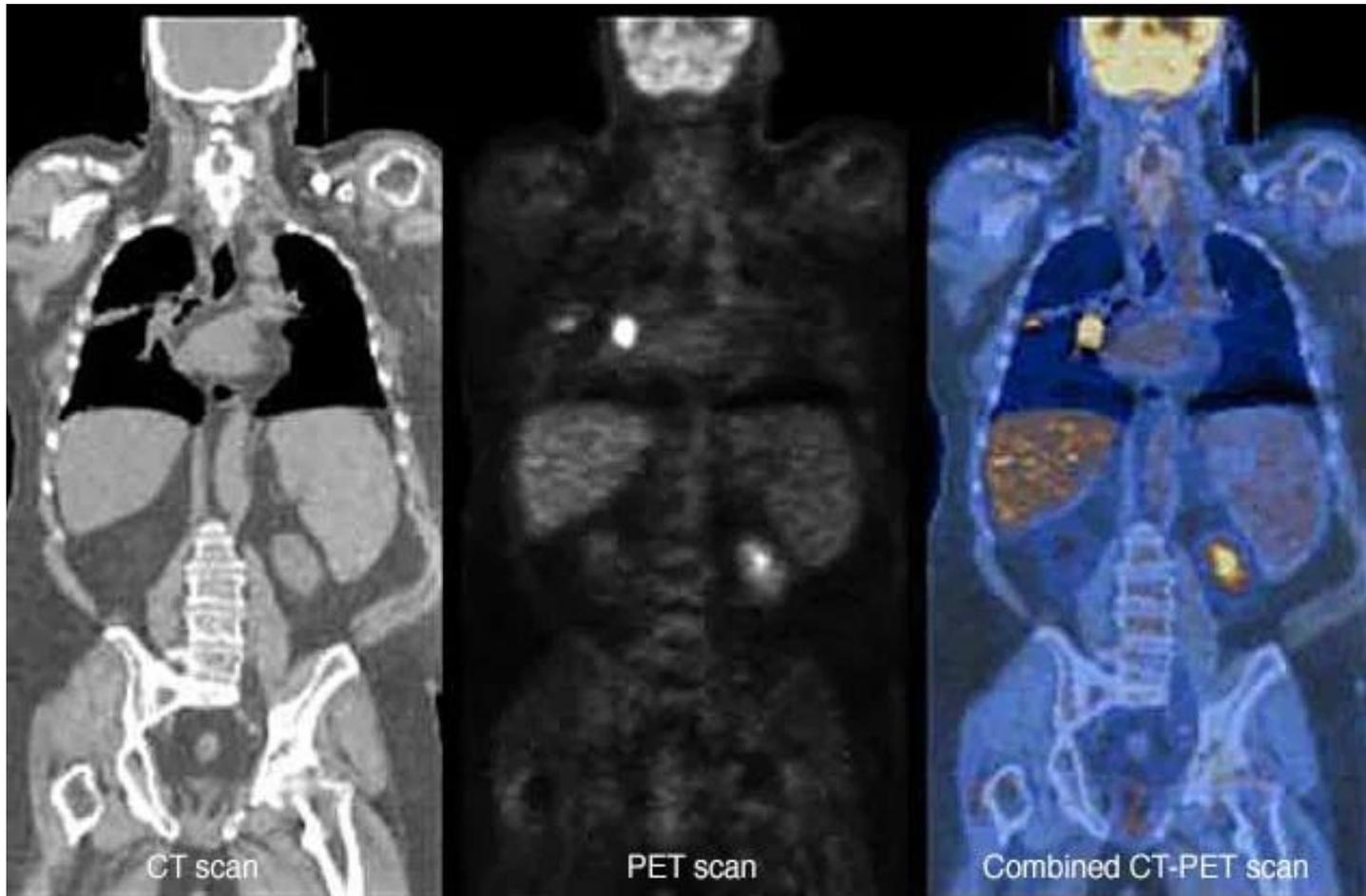
- During its initially in the midline, but once the halfway point reached it slightly to the left.



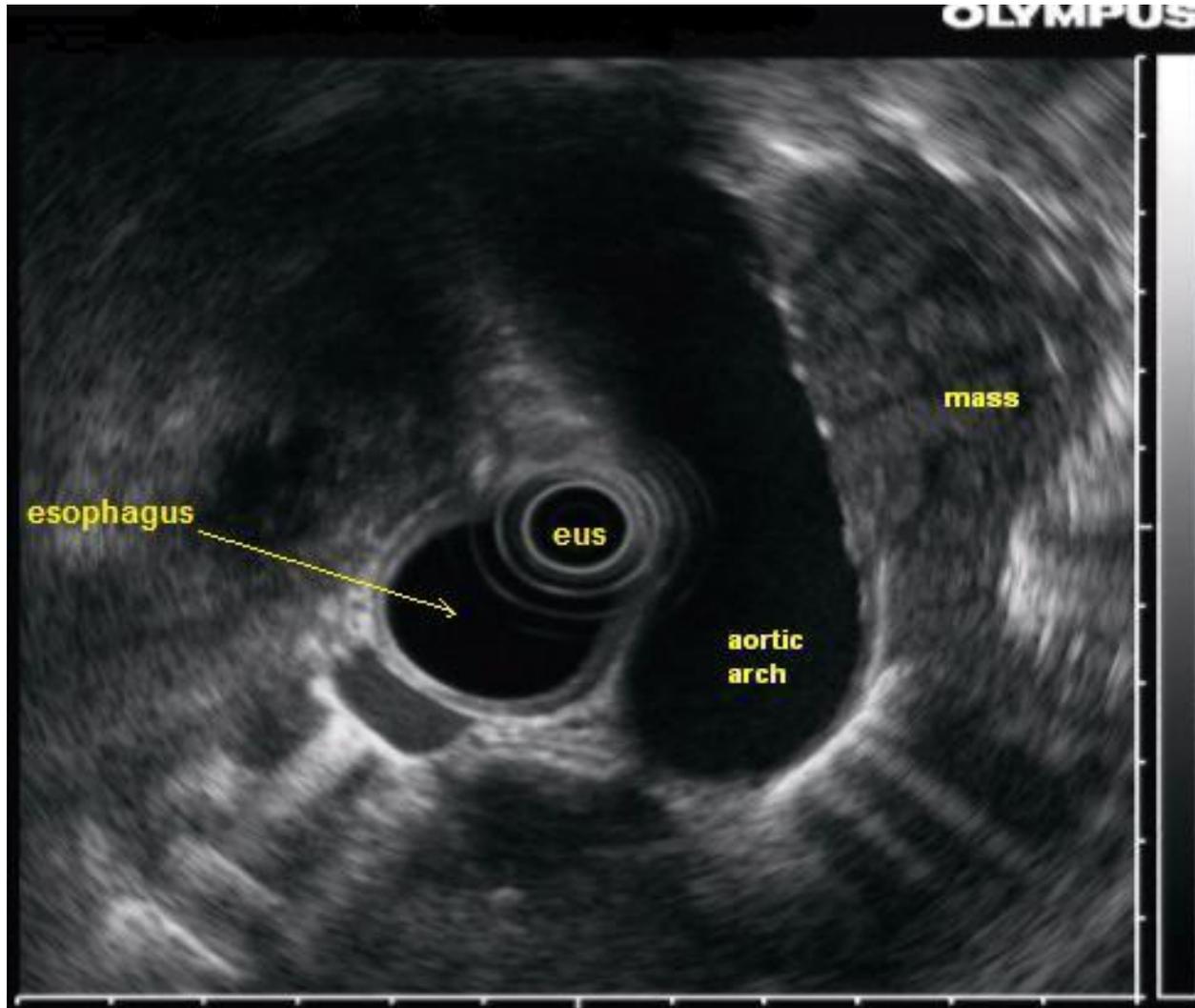
High-low technique



CT-PET SCAN



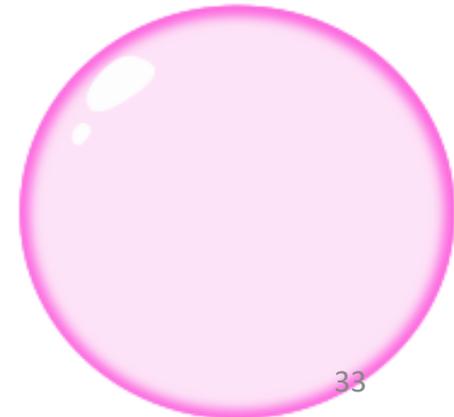
Endoscopic USG Scan





Zenker Diverticulum

- Killian's triangle,
- bordered superiorly by the inferior pharyngeal constrictor
- inferiorly by the cricopharyngeus muscle.

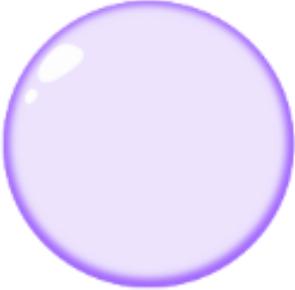




Pathophysiology

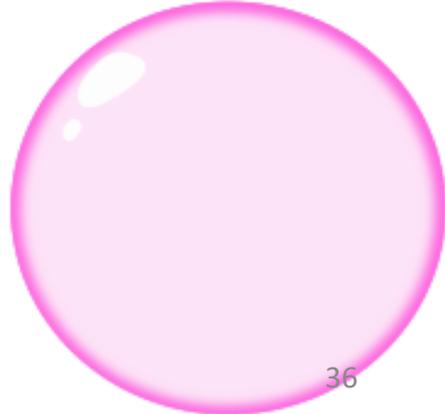
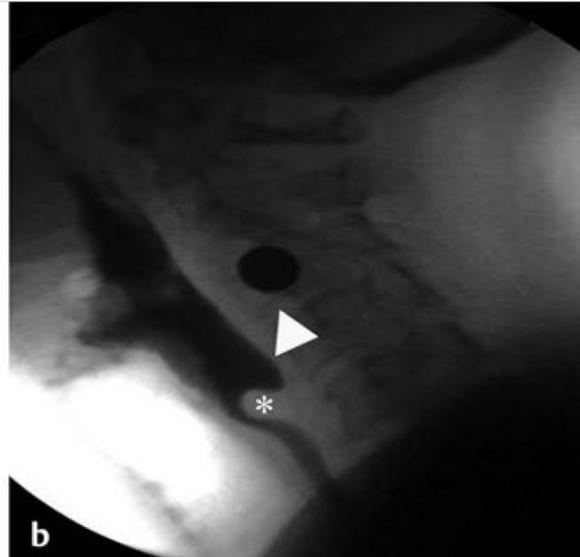
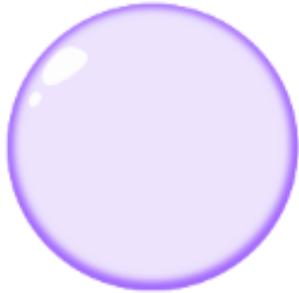
- Second swallow -> persistent pharyngeal contraction against a closed or incompletely opened PES
- increases pressures proximally, exploiting
- anatomical weakness in the hypopharyngeal wall





Second swallow

- premature return to tonic contraction before swallow is complete,
- poor coordination of pharyngeal contractions
- CP relaxation have all been proposed.
- anatomical weakness between the lower border of the inferior constrictor and the

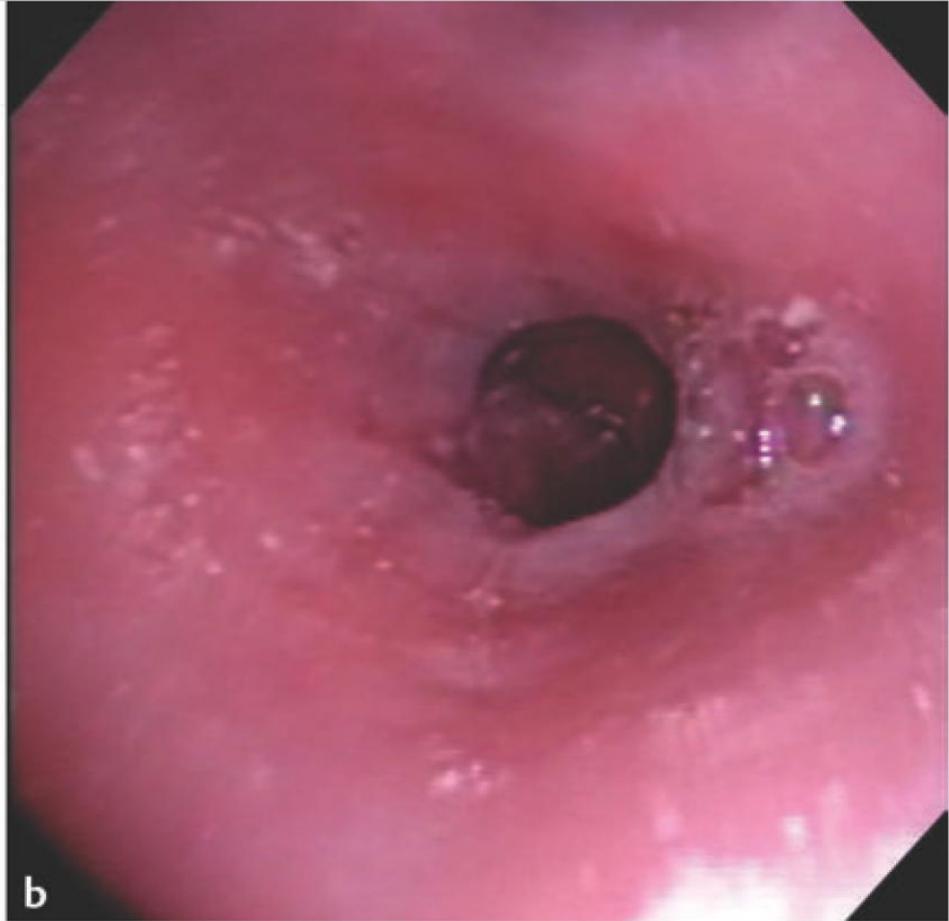
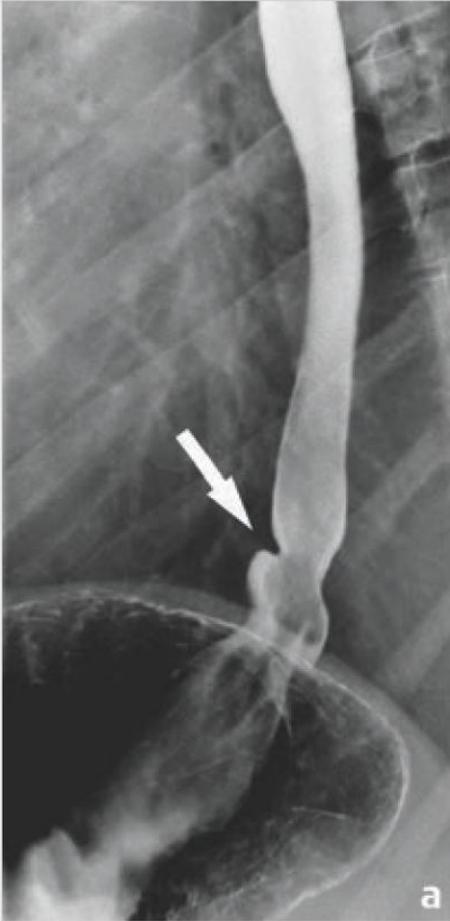




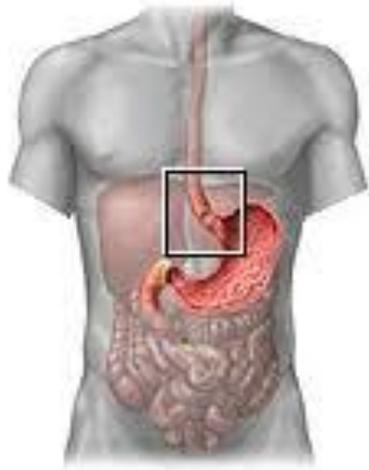
Symptoms and Signs

- men between the ages of 60 and 70.
- solid boluses sticking in the throat,
- Chronic cough occurs in 30% to 40%
- Aspiration and weight loss may occur in severe cases.
- laryngopharyngeal reflux,
- audible gurgling sound on swallowing or signs of malnutrition
- Ba swallow - hypopharyngeal pouch, usually protruding posteriorly and to the left.

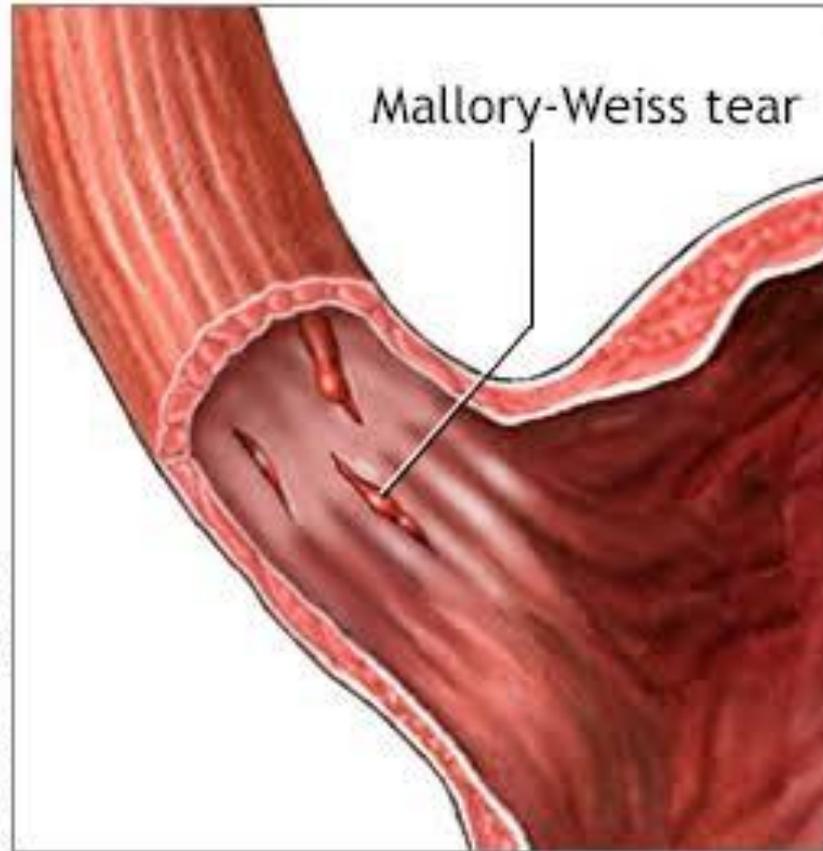
Schatzki ring



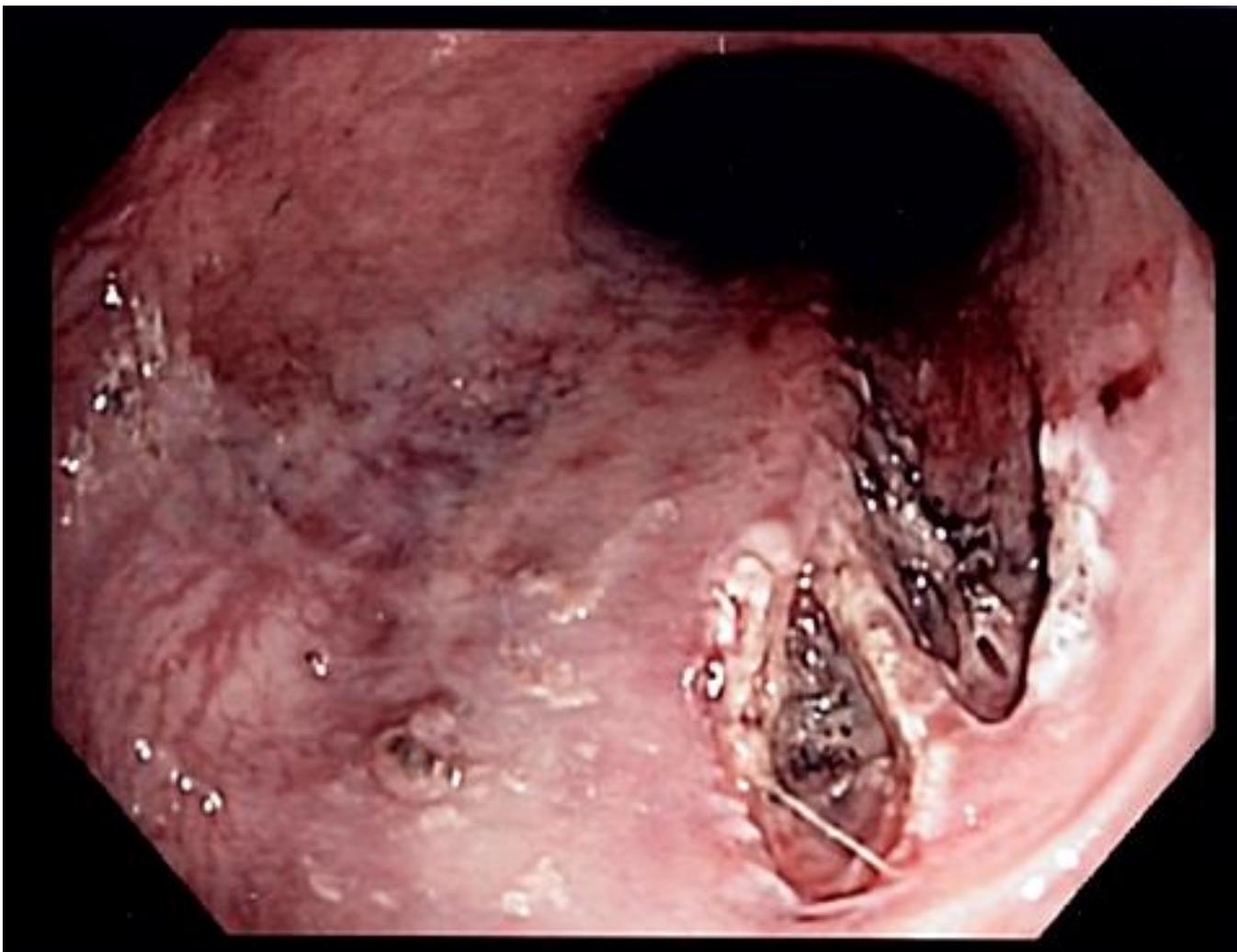
Mallory-Weiss Tear



Mallory-Weiss tear is a tear in the mucosal layer at the junction of the esophagus and stomach.



MW tear



Infographic

Eponymous Anonymous

Shout out to the lesser-known eponyms you might see in the ED

This week it's **B** for Boerhaave's syndrome

(though in **Scotland** it should be called **Boke**-haave's syndrome cos it can come on after a forceful **boke**)

classically presents as chest pain + vomiting + surgical emphysema (present in 14% of people) (say whaaaaa?!)

(Mackler's triad)



these patients are **BIG SICK** (universally ~~fatal~~ before advent of surgery)

associated with **gluttony** **alcoholism** and bulimia

ok ok ok ok.... it is **oesophageal rupture** from **forceful vomiting** against a **closed glottis**



Herman Boerhaave
Physician 18th

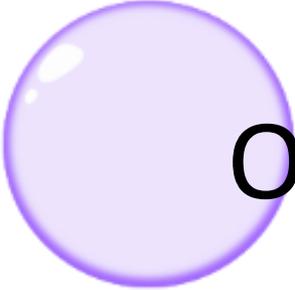
he wasn't the one who vommed!

that was **Baron Jan Gerrit van Wassenaer** Grand Admiral of the Dutch Fleet who **vomited** after a gluttonous feast.

Boerhaave's. Fascinating condition yes. Devastating condition also yes. **het einde. proost.**

References

Slide 6: <https://psibay.com/illustrations/beer-bottle-hairlines?3-379883/>
Slide 5: <https://psibay.com/wectors/dickie-roast-dinner-roasted-meat-37385/>
Slide 3: Case courtesy of Dr Vikas Shah, MD
<https://radiopaedia.org/cases/41297?title=41297%2Fcase>
Slide 9: <https://psibay.com/wectors/netherlands-flag-national-erdig-18864/>
<https://radiopaedia.org/articles/boerhaave-syndrome?lang=gb>
https://en.wikipedia.org/wiki/Herman_Boerhaave
<https://canadapress.com/article/what-caused-the-death-of-the-grand-admiral/>



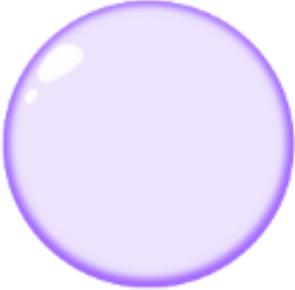
Oesophageal perforation (OP)

- Cervical esophagus
- least common location, typically caused by iatrogenic injury during procedures like endoscopy or placement of feeding tubes.
- Mid-thoracic esophagus
- **more frequent site**
- spontaneous perforation due to
- severe vomiting (Boerhaave syndrome)
- Lower esophageal (gastroesophageal junction)
- Iatrogenic perforations are more common in this region
fundoplication for gastroesophageal reflux disease (GERD).

Mackler's triad

- Vomiting (—80%)
- Lower chest pain
- Subcutaneous emphysema (—25%) Rare
- Common misdiagnosis / DD
- PPU
- Myocardial infarction
- Pneumonia
- Pulmonary embolism
- Aortic dissection
- Pancreatitis

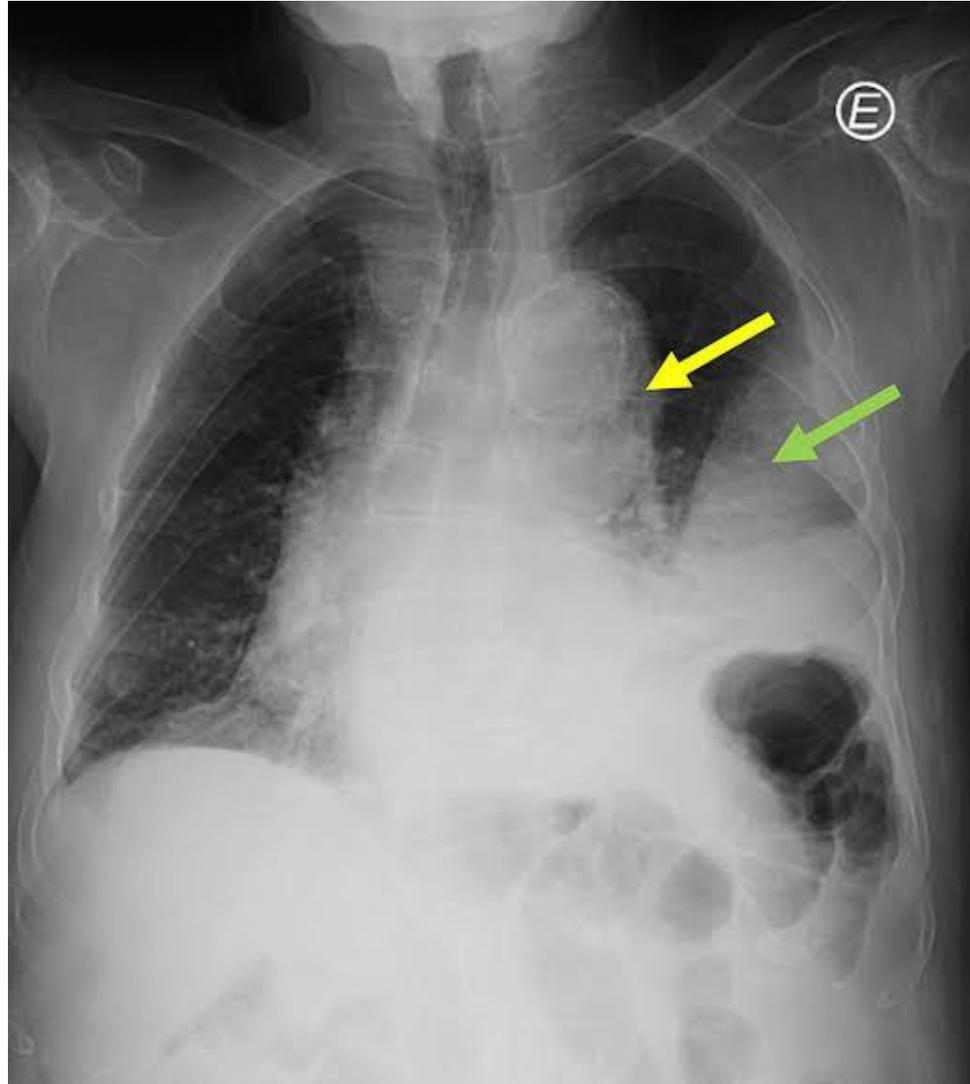


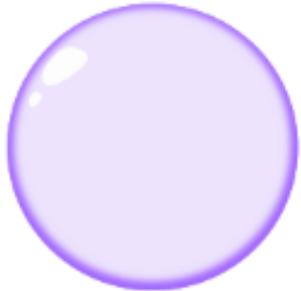


Hamman's crunch

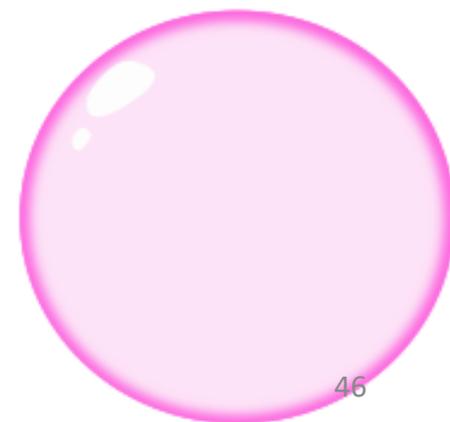
- due to air in the
- **Pleural effusion**
- Usually left-sided
- **Thoracentesis** — undigested food and gastric juice — pH <6; sq cells; elevated amylase
- High Fever; tachycardia; hypotension; abdominal pain

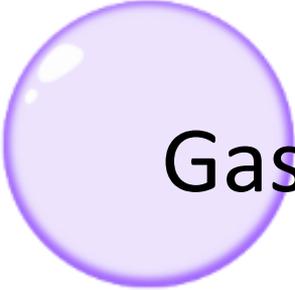
Perforation of Oesophagus





- Cervical perforation may present with subcutaneous emphysema in the neck
- lower esophagus might cause abdominal pain.





Gastroesophageal reflux disease (GERD)

- lower esophageal sphincter (LES) dysfunction allows stomach contents to reflux into the esophagus
- causing irritation and inflammation.
- laryngopharyngeal reflux (LPR)



Pathology

- LES Dysfunction: Weakening of the LES, the muscular valve between the esophagus and stomach, allowing backflow of stomach acid.
- Increased Intra-abdominal Pressure: Obesity, pregnancy, tight clothing, all contribute to pressure pushing stomach contents upwards.
- Hiatal Hernia: Protrusion of a portion of the stomach through the diaphragm, further weakening the LES barrier.
- Dietary Factors: Fatty, spicy, acidic foods, chocolate, and peppermint can relax the LES and irritate the esophagus.

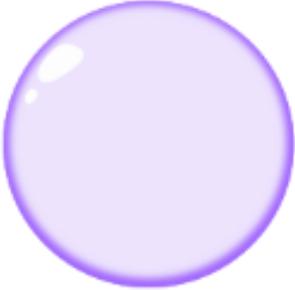




Symptoms

- Heartburn: A burning chest pain radiating upwards due to esophageal mucosal exposure to acidic stomach contents.
- Regurgitation: The involuntary passage of stomach contents back up into the mouth, often with a sour or bitter taste.
- Atypical symptoms: May include chronic cough, hoarseness, chest pain (non-cardiac), dysphagia (difficulty swallowing), and erosion of dental enamel





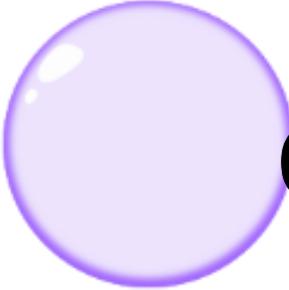
Complications

- Esophagitis: Inflammation of the esophageal lining due to chronic acid exposure
- Esophageal Ulcers: Open sores in the esophageal lining caused by prolonged acid exposure.
- Esophageal Strictures: Narrowing of the esophagus due to scarring from chronic inflammation.
- Barrett's Esophagus: Precancerous condition where the esophageal lining transforms due to acid reflux, increasing risk of esophageal adenocarcinoma



Management

- Esophagoduodenoscopy (EGD): Endoscopic visualization of the esophagus and stomach to identify abnormalities.
- Esophageal pH monitoring: Measures acid levels in the esophagus over a period to assess reflux severity.
- Management:
- Lifestyle modifications: Dietary adjustments, weight management, avoiding trigger foods, elevating the head of the bed during sleep.
- Pharmacological therapy: Use of medications like antacids to neutralize stomach acid, or proton pump inhibitors (PPIs) to suppress acid production.
- Surgery- Nissen's 270 degree Fundoplication



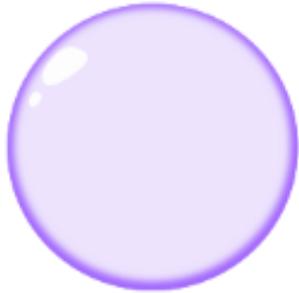
Oesophageal foreign bodies

- concern for children and individuals with mental disabilities
- coins, buttons, and disc batteries, which can cause tissue necrosis
- Dysphagia
- Chest or abdominal pain
- Gagging or coughing
- Stridor!!

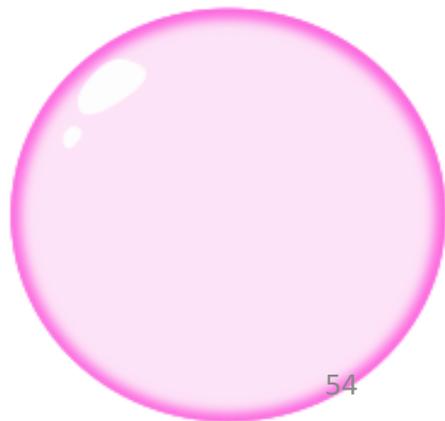
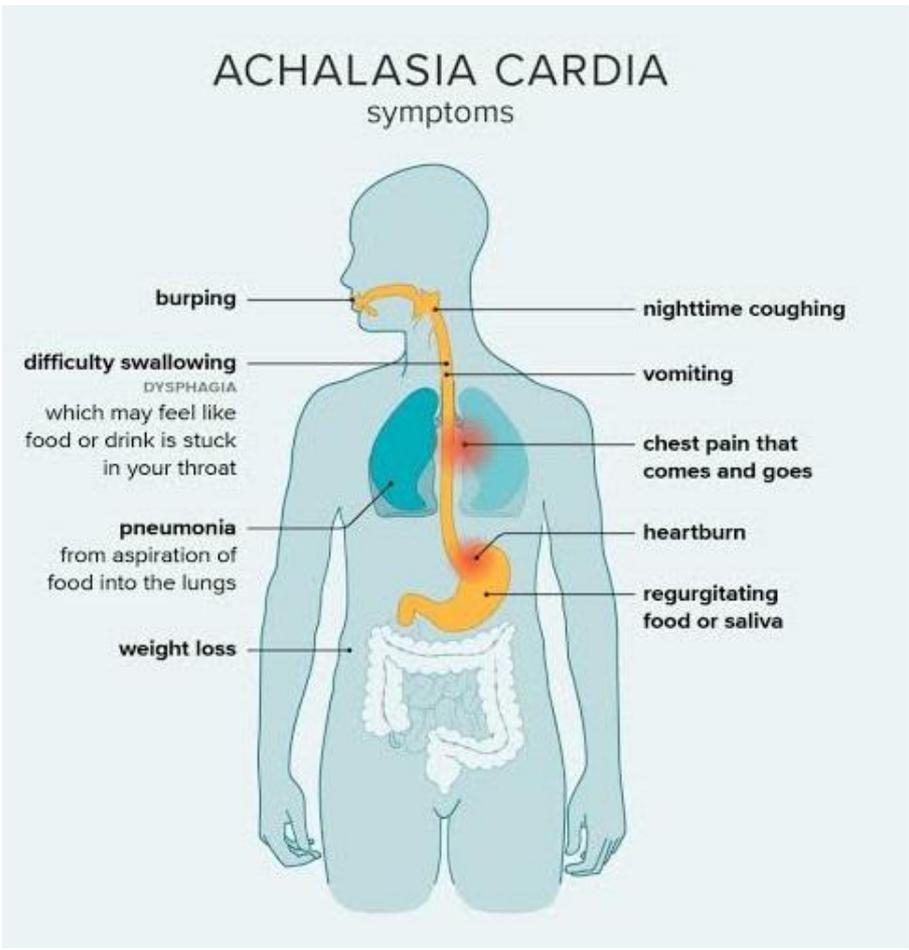


Achalasia Cardia

- esophageal motility disorder characterized by the failure of the lower esophageal sphincter (LES) to relax and impaired esophageal peristalsis
- Difficulty swallowing (dysphagia) of both solids and liquids, which worsens progressively
- Chest pain behind the breastbone (non-cardiac chest pain) that can be severe and mimic a heart attack.
- Weight loss due to difficulty eating.
- Nighttime cough due to aspiration of food or saliva.



Achalsia Cardia



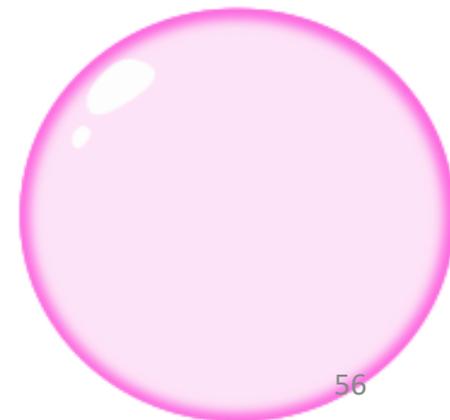
Cucumber Oesophagus





Operation

- Laparoscopic Heller myotomy: Minimally invasive surgical procedure to cut the muscle fibers of the lower esophageal sphincter.
- POEM (peroral endoscopic myotomy): A newer endoscopic technique to create a small incision in the lower esophageal sphincter muscle.



Stricture of Oesophagus

Oesophageal Benign Stricture



1. What is the investigation ?
 - Barium Swallow .
2. What is radiological appearance ?
What are the radiological findings in this film ?
 - Long stricture of esophagus with smooth outline and dilated funnel shape upper end in AP view of barium swallow..
3. What is your diagnosis ?
 - Oesophageal benign stricture.
4. What is the common cause of benign esophageal stricture ?
 - Corrosive ingestion.

Carcinoma of Oesophagus



1. What is the investigation ?
 - Barium Swallow
2. What is radiological appearance ?
What are the radiological findings in this film ?
 - Narrowing of lumen of the esophagus with destruction of mucosa and irregular outline with sharp shoulder edges and dilated upper part of the esophagus in A,P view of the barium swallow.
3. What is your diagnosis ?
 - Carcinoma of esophagus

Achalasia

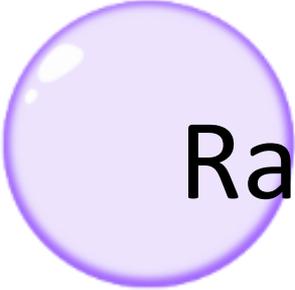


1. What this is Investigation ?
 - Barium Swallow
2. Describe the radiological features of this film.
 - Dilated smooth outlined barium filled esophagus with narrow tapering lower end of the esophagus with smooth outline and absence of fundal gas in stomach. .
 - (Rat Tail or Bird Beak Deformity)
3. What is your diagnosis ?
 - Achalasia
4. A "beaked" distal esophagus indicates what disease ?
 - Achalasia.

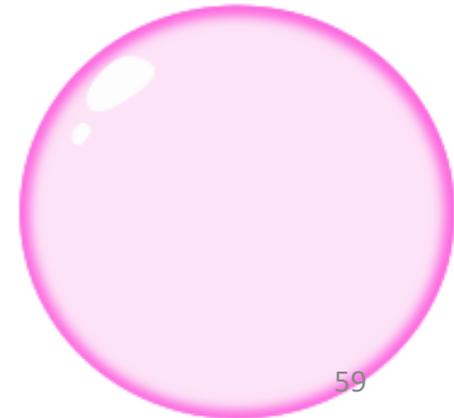


Adenocarcinoma of the Oesophagus

- most common type of esophageal cancer in Western countries,
- with a rising incidence compared to squamous cell carcinoma.
- glandular cells lining the esophagus, often in the lower portion near the junction with the stomach.



Rat tail Sign and Apple core sign



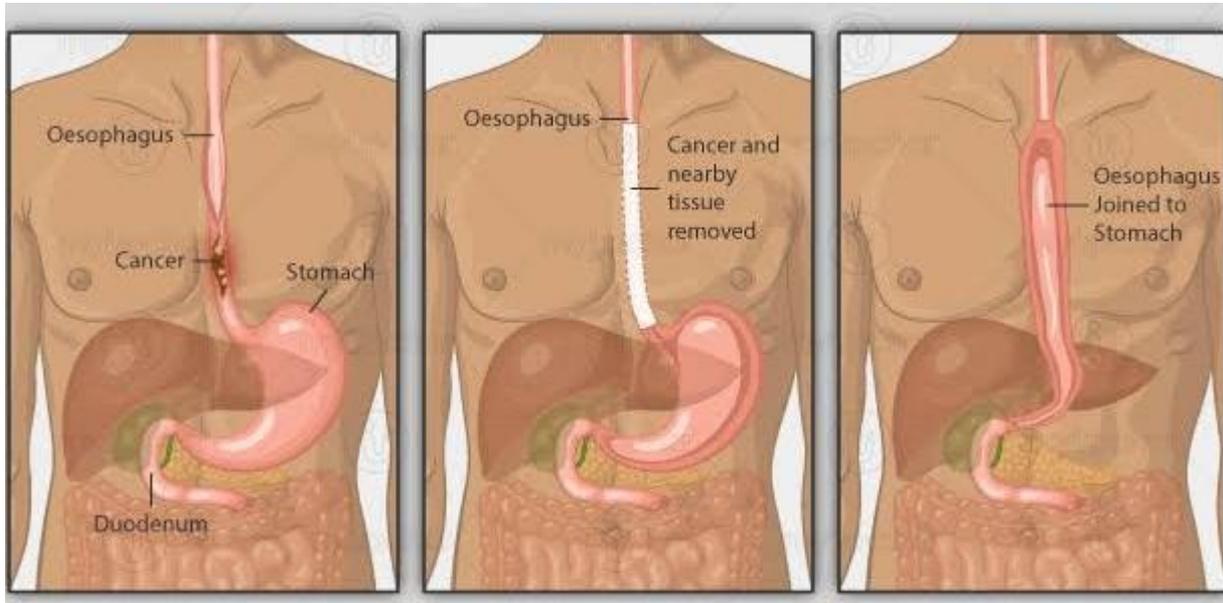


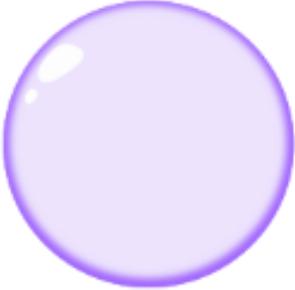
Lewis-Tanner operation

- Stage 1: The surgeon creates an incision in the abdomen and removes the cancerous part of the esophagus. The stomach is then mobilized, meaning the muscles and tissues connecting it to surrounding structures are loosened.
- Stage 2: The surgeon creates an incision in the chest and brings the mobilized stomach up into the chest cavity. The remaining esophagus is then reconnected to the stomach (esophagogastric anastomosis).
- The Ivor Lewis esophagectomy is another surgical procedure for esophageal cancer, named after the surgeon who first performed it. Here's a comparison of the two procedures in bullet points:



Ivor-lewis operation





Ivor Lewis Operation

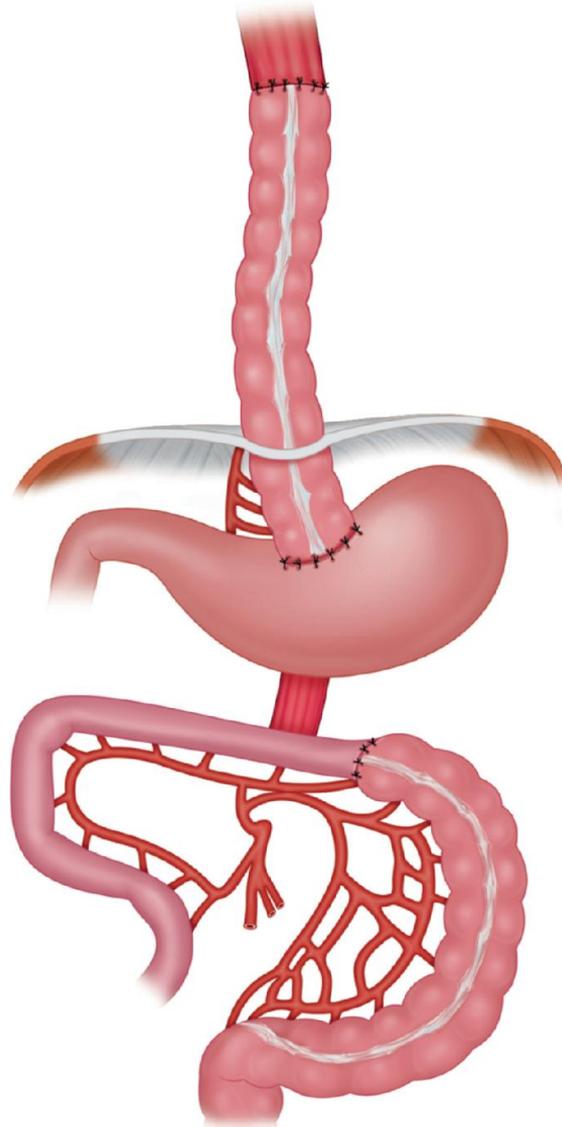
- One-stage surgery with incisions in the abdomen and chest. The esophagus and stomach are removed together, and the remaining esophagus is reconnected to the stomach in the upper chest.
- Esophageal reconstruction with gastric pull-up is a well-established surgical technique for restoring swallowing function after esophagectomy, the removal of the esophagus
- Intended for: Esophageal reconstruction following esophagectomy due to malignancy, trauma, or congenital atresia.

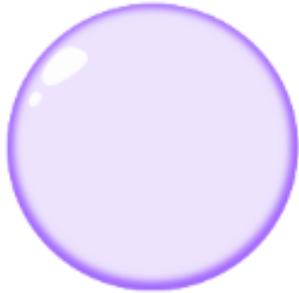


Colonic interposition

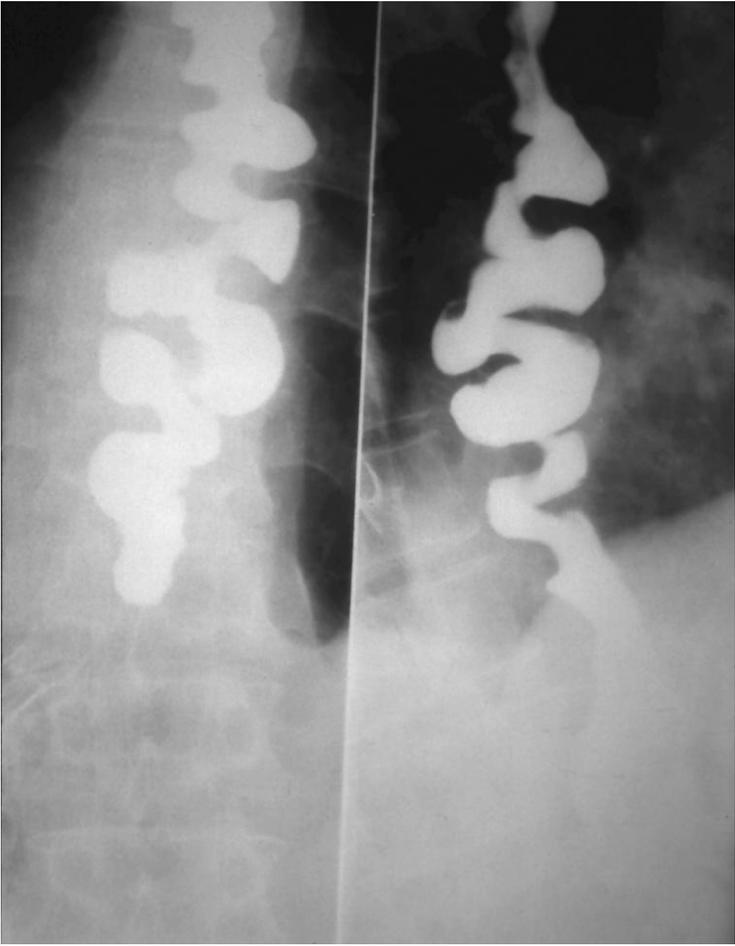
- Colonic interposition serves as a salvage procedure for esophageal reconstruction when the stomach is unavailable due to prior gastrectomy, extensive adhesions, or contraindications to gastric pull-up.

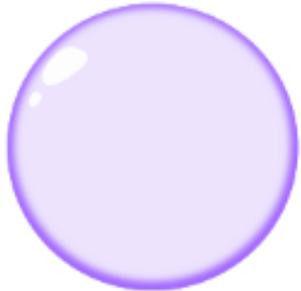
Colonic interposition





Cockscrew Oesophagus





Thank you!

