# BARIUM SWALLOW

# BARIUM SWALLOW

- It is a medical imaging procedure used to examine upper gastrointestinal tract,which include the esophagus and to a lessr extent the stomach.

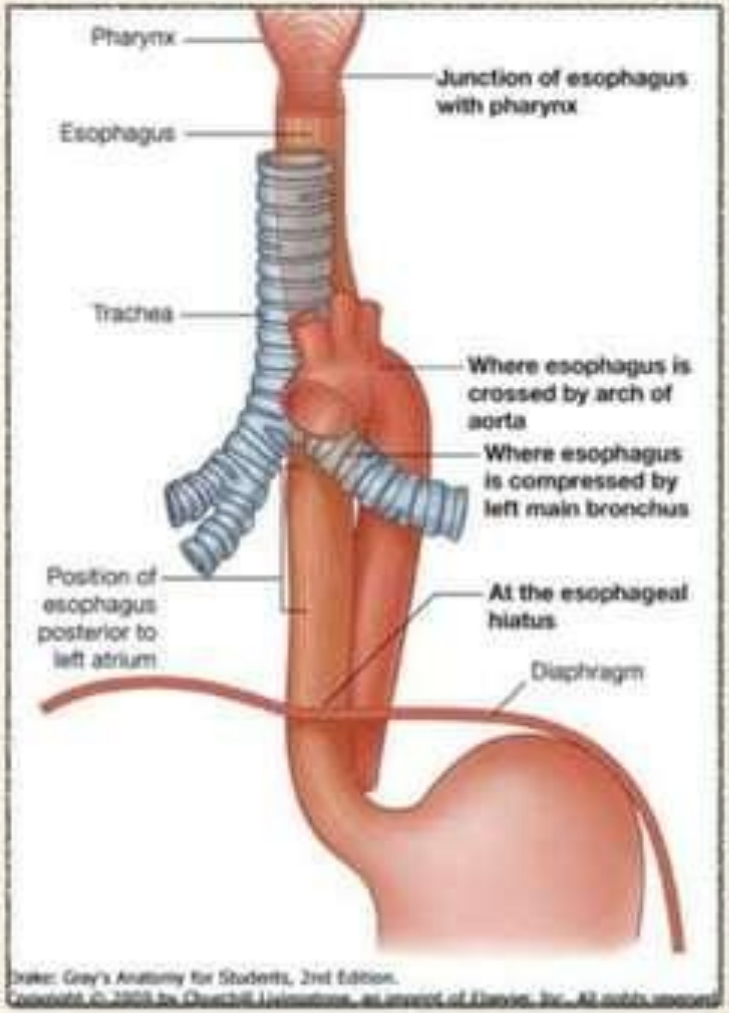
- The contrast used is barium sulfate.

# Anatomy

- The oesophagus begins at the upper oesophageal sphincter at the level of C6 and finishes at lower oesophageal sphincter at T11 and is approx 25 cm.

# CONSTRICTIONS

- superiorly: level of Cricoid cartilage, juncture with pharynx
- Middle: crossed by aorta and left main bronchi
- Inferiorly: diaphragmatic sphincter



# SPHINCTERS

Two high pressure zones prevent the backflow of food:

- Upper Esophageal sphincter.
- Lower Esophageal sphincter.
- It is located at upper and lower end of esophagus.

# CONTRAST

- TYPES OF CONTRAST STUDY

  (i) SINGLE CONTRAST STUDY

  (ii) DOUBLE CONTRAST STUDY

# CONTRAST USED

- 100% BARIUM SULPHATE PASTE
- 80% BARIUM SULPHATE SUSPENSION
- 30% BARIUM SULPHATE SUSPENSION FOR HIGH KV TECHNIQUE
- 200-250% HIGH DENSITY,LOW VISCOSITY FOR DOUBLE CONTRAST STUDY

# INDICATIONS

- Dysphagia
- Heart burn, retrosternal pain, regurgitation & odynophagia.
- Hiatus hernia
- Reflux oesophagitis
- Stricture formation.
- Esophageal carcinoma.
- Motility disorder like
  i. Achalasia
  ii. diffuse esophageal spasms.
- Pressure or invasion from extrinsic lesions.
- Assessment of abnormality of
  i. pharyngo esophageal junction including zenkers diverticulum
  ii. cricoid webs
  iii. cricopharyngeal Achalasia.

# CONTRAINDICATIONS

- Suspected leakage from esophagus into the mediastinum or pleura and peritoneal cavities.
- Tracheo-esophageal fistula

# VIEWS

- SOFT TISSUE NECK – AP & LAT – SCOUT
- NECK-AP & LATERAL
- THORAX-RAO VIEW

# NORMAL-AP /LAT VIEW - SCOUT

# RIGHT ANTERIOR OBLIQUE VIEW

# Patient Preparation

- None in particular but advisable to be in NPO prior to the procedure .
- Ensured that no contraindication to the pharmacological agent used.
- Check pregnancy state.
- Procedure should be explained to patient before undergoing the procedure.

# TECHNIQUE

- PHARYNX
- -One mouthful contrast bolus with high density(250% w/v).
- -Patient is asked to swallow once and stop swallowing there after.

-This is to get optimum mucosal coating.

-frontal and lateral view x-ray taken.

- ESOPHAGUS
- Single contrast
- -Multiple mouthful 80% w/v barium suspension given.
- -prone swallow to assess esophageal contraction.
- -useful in esophageal compression, displacement or disordered motility.

- Double contrast
- -Contrast high density,low viscosity(200-250%).
- -15-20 ml given & asked to swallow.
- -Then effervescent powder given with another mouthful of barium.
- -In erect posture,gas tend to stay up so adequate distention stays longer time.
- Inj.buscopan I.V given before the procedure to keep esophagus distended for longer time.

# SPECIFIC CONDITIONS

# ESOPHAGEAL WEB

1) May be demonstrated on high-volume barium oesophagrams when the oesophagus is fully distended .
2) a "jet effect" of contrast passing distal to the web may be seen .

# oesophageal web

More commonly occur in the cervical oesophagus near cricopharyngeus muscle than in the thoracic oesophagus. They typically arise from the anterior wall and never from the posterior wall; they can also be circumferential.

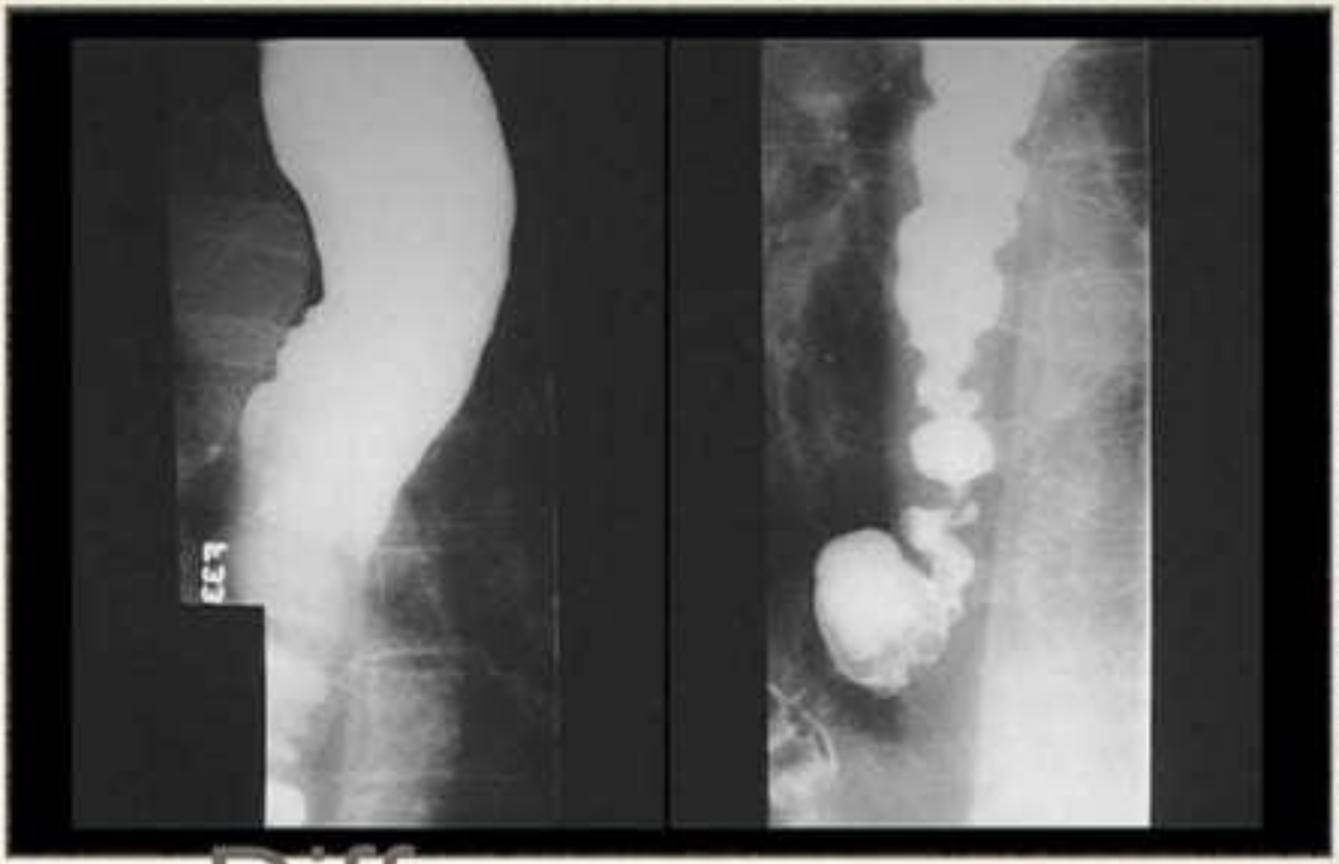
**Associations**

- Plummer-Vinson syndrome
- GvHD
- GORD/GERD (especially a distal oesophagus web)
- external beam radiation.

# Foreign Body Impaction

- To detect the level of obstruction in case of radiolucent foreign body in esophagus,marsh mellow coated with barium is swallowed.
- Passage of marsh mellow will be hindered at the level of obstruction

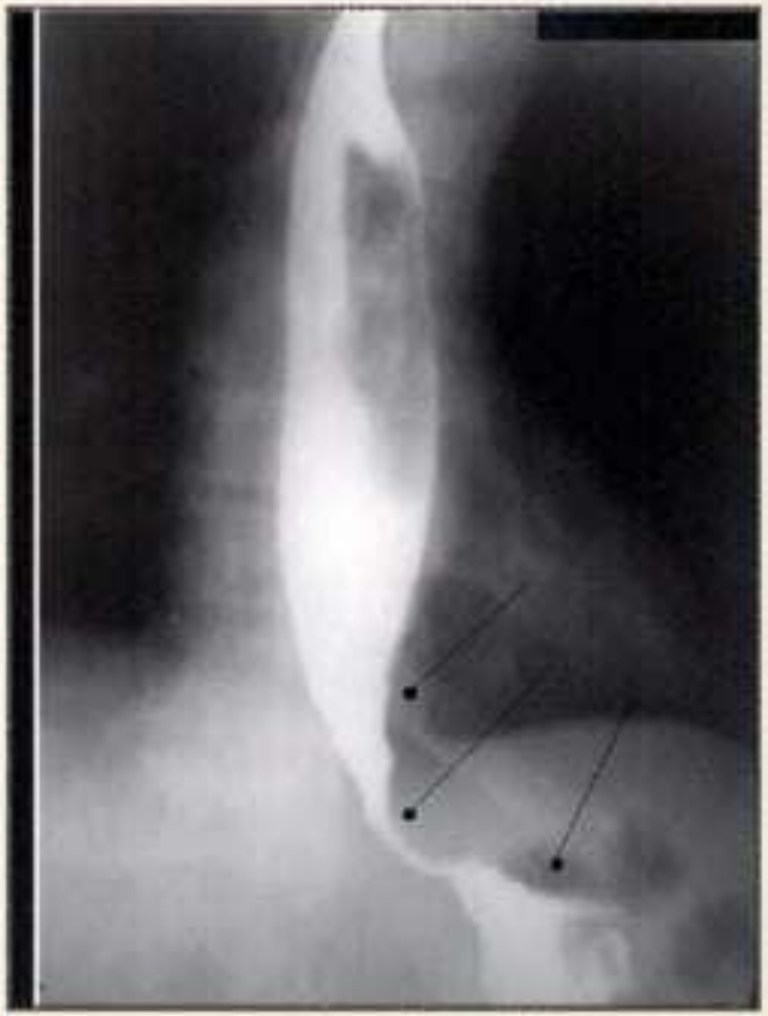
- Barium swallow shows irregular areas of narrowing and dilatation ----- "Shish kebab" "corkscrew" "rosary bead" esophagus
  The esophageal muscle is hypertrophied, but histologically normal



# Diffuse oesophageal spasm

# CA ESOPHAGUS

- Preferably high viscosity with normal density barium is used.
- Classical finding in carcinoma –rat tail appearance



# ACHALASIA CARDIA

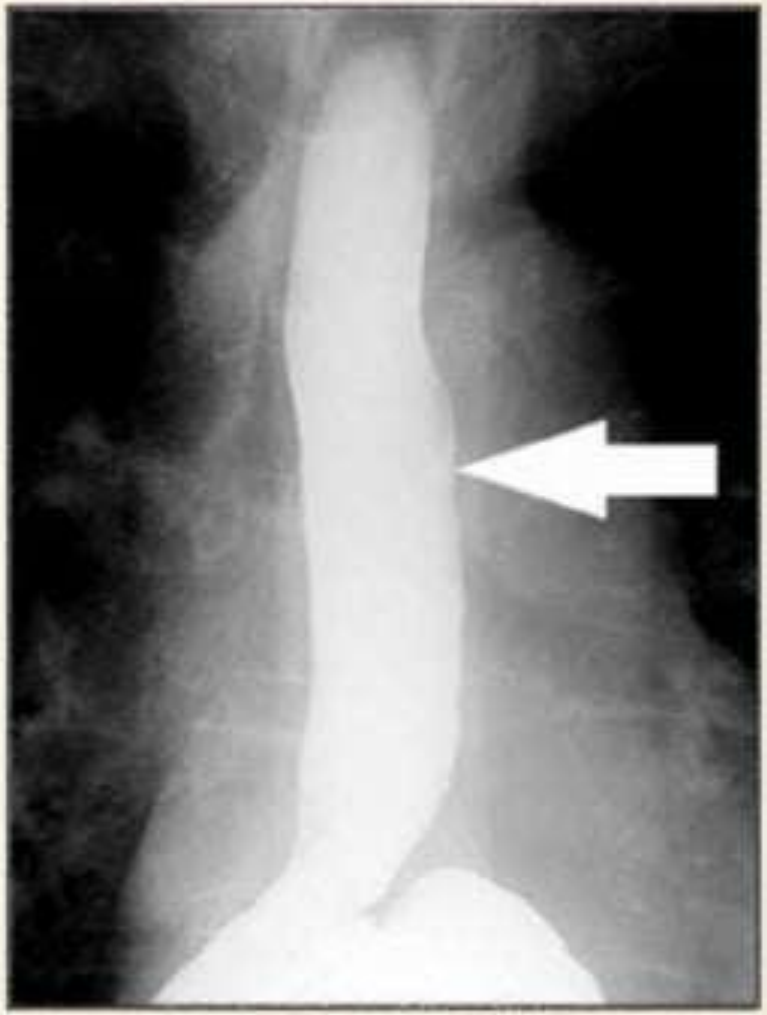
- Barium swallow showing dilatation of the esophageal body

  *With short segment stricture.

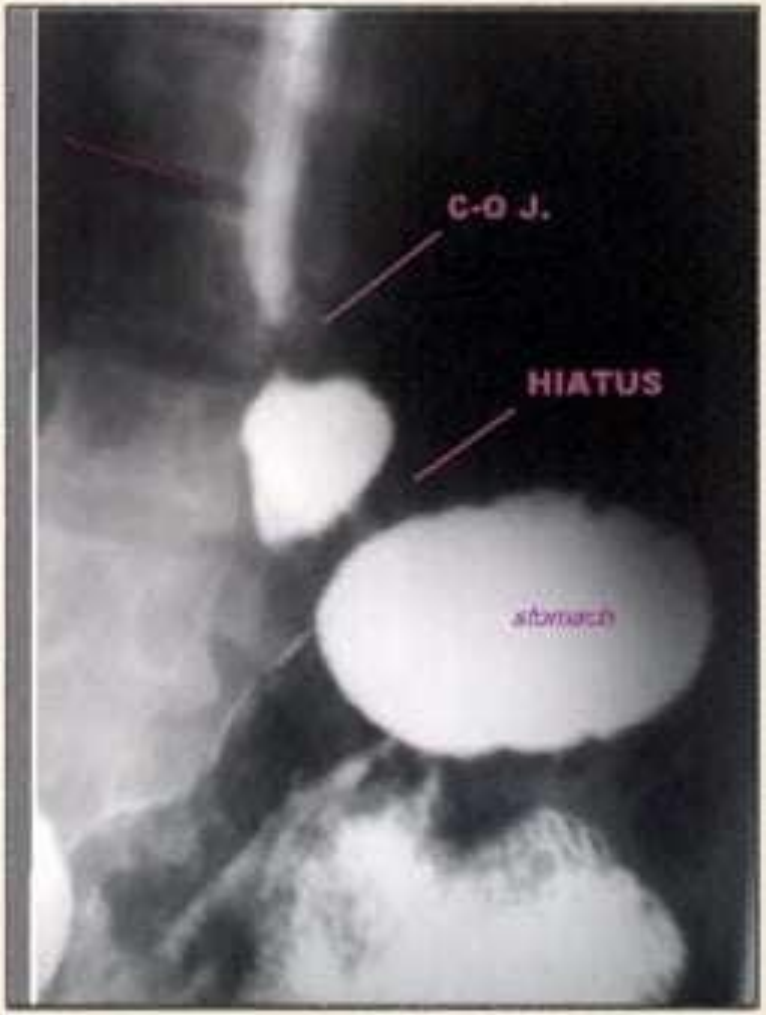
  * A “bird-peak " like tapering of the esophagus at the GE junction.

# HIATUS HERNIA

- High abdominal pressure is required to demonstrate.
- Pt has to strain.
- Lie down,straighten legs & then raise them up.
- Manual compression of abdomen.
- Pt stands upright,ask him to bend downward with leg straight.
- Stomach should be distended to demonstrate HH.

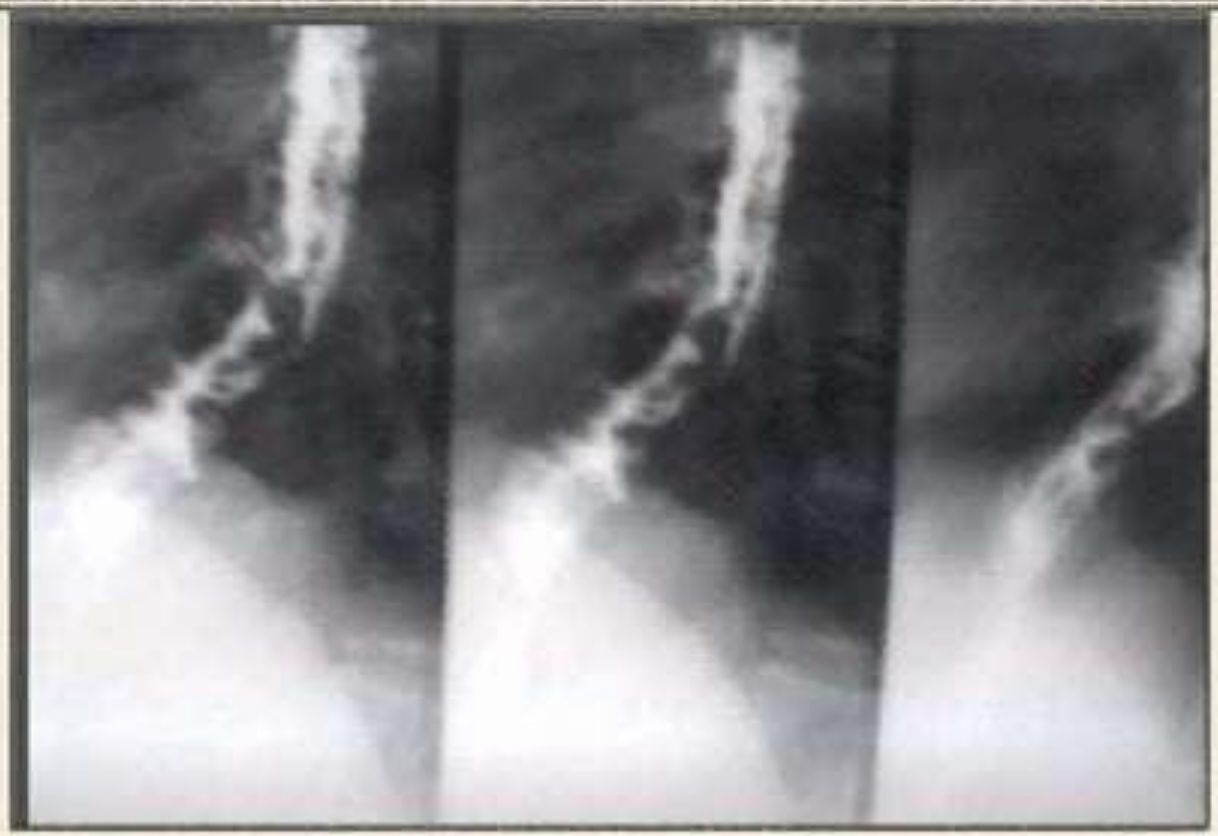


Barium meal in Trendlenberg position.
Displacement of the cardio-esophageal junction above the esophageal hiatus .
Part of the stomach is present in the chest .
Reflux of barium into the esophagus



# ESOPHAGEAL VARICES

- Varices are best demonstrated in mucosal relief study after using Buscopan/ valsalva maneuver.



- Mild dilatation of the esophagus
  with multiple persistent filling defects in the lower third
  of the esophagus and/or longitudinal furrows.

# Gastro esophageal reflux

- SIPHON TEST
- Fill the stomach with 50% barium(150-200ml)
- Follow this 1-2 mouthful of water to remove traces of barium in esophagus
- Pt in supine with left side raised 15% up
- Keep one mouthful of water in pt mouth
- Ask pt to swallow water-a jet of barium will shoot into water column as it enter GO junction
- Alternatively with full stomach,ask pt to roll side to side
- Reflux will be seen

# Oesophageal reflux

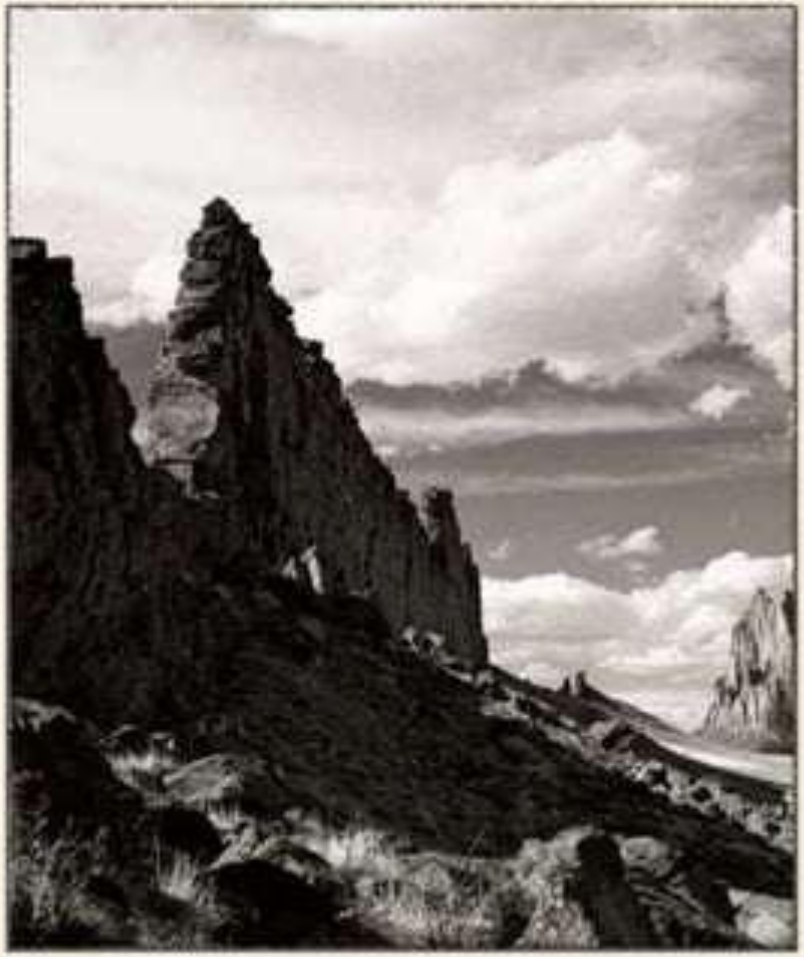
- **Reflux oesophagitis with a deep ulcer (*straight arrow*).** There is also asymmetric narrowing of the distal esophagus with a relatively abrupt cutoff (curved arrow) at the proximal border of the narrowed segment

# Barrett's oesophagus

- The reticular mucosa is characteristic of Barrett's columnar metaplasia, especially with the associated web-like (arrow) stricture.

# Zenker's Diverticulum

- A Zenker's diverticulum is a pulsion hypopharyngeal false diverticulum with only mucosa and submucosa protruding through triangular posterior wall weak site (Killian's dehiscence) between horizontal and oblique components of cricopharyngeus muscle.
- The esophagram shows collection with midline posterior origin just above cricopharyngeus protruding lateral, usually to left, and caudal with enlargement



# KILLIAN JAMIESON DIVERTICULUM

- **Killian-Jamieson diverticulum** is a pulsion diverticulum, that protrudes through a lateral anatomic weak site of the cervical esophagus below the cricopharyngeus muscle.
  AP view shows diverticulum (arrow) originating laterally.
  Lateral view confirms diverticulum does not originate posteriorly as a Zenkers diverticulum would.

# Candida esophagitis

Shaggy esophagus associated with Candida infection , image "A" depicts the longitudinally oriented plaque-like lesions visible in Candida esophagitis , image "B" depicts the granular appearance of the esophageal mucosa secondary to edema and inflammation

# Candida Esophagitis

**Candida Esophagitis :**

-In immunocompromised patients

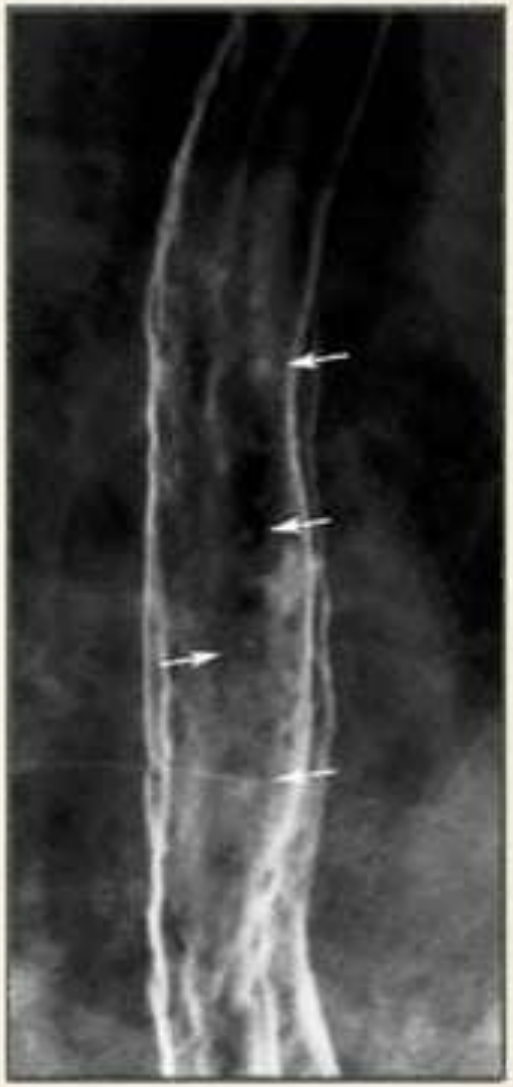
-Discrete plaque-like lesions

-Larger plaques may coalesce to produce "cobblestone" appearance

-Ulcers invariably appear only on a background of diffuse plaque formation , not as isolated findings

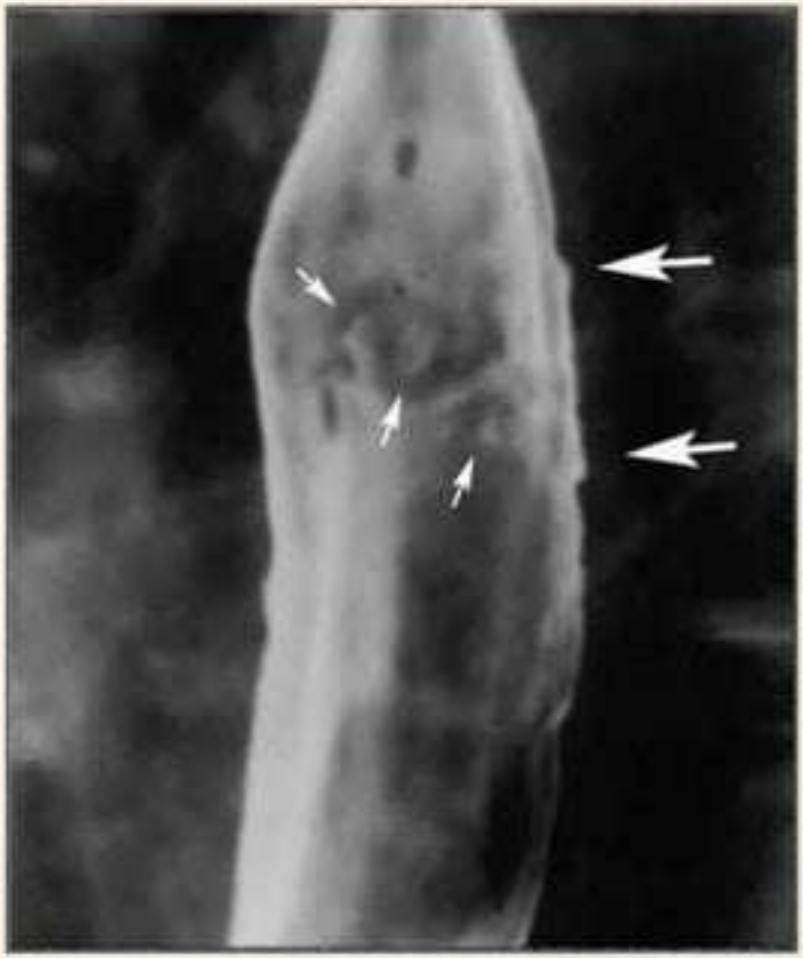
-Further coalescence produces (shaggy) contour

- Herpes , double-contrast esophagram shows small discrete ulcers (arrows) in the midesophagus on a normal background mucosa , note the radiolucent mounds of edema surrounding the ulcers , in the appropriate clinical setting , this appearance is highly suggestive of herpes esophagitis since ulceration in candidiasis almost always occurs on a background of diffuse plaque formation .



# Cytomegalovirus esophagitis

- Cytomegalovirus esophagitis in a patient with AIDS
- Double-contrast esophagram shows a large flat ulcer in profile (large arrows) in the midesophagus with a cluster of small satellite ulcers (small arrows)



AIDS patient with an infectious esophagitis due to Cytomegalovirus. , such giant ulcers can also be due to HIV alone

- Drug induced esophagitis has variable appearances depending on the culprit. Antibiotics such as tetracycline and doxycycline tend to cause small shallow ulcers.
- potassium chloride and alendronate are more injurious and can lead to large ulcers and strictures.
- Radiation and caustic oesophagitis are usually suggested by history, both tend to produce long strictures and predispose to squamous cell carcinoma.

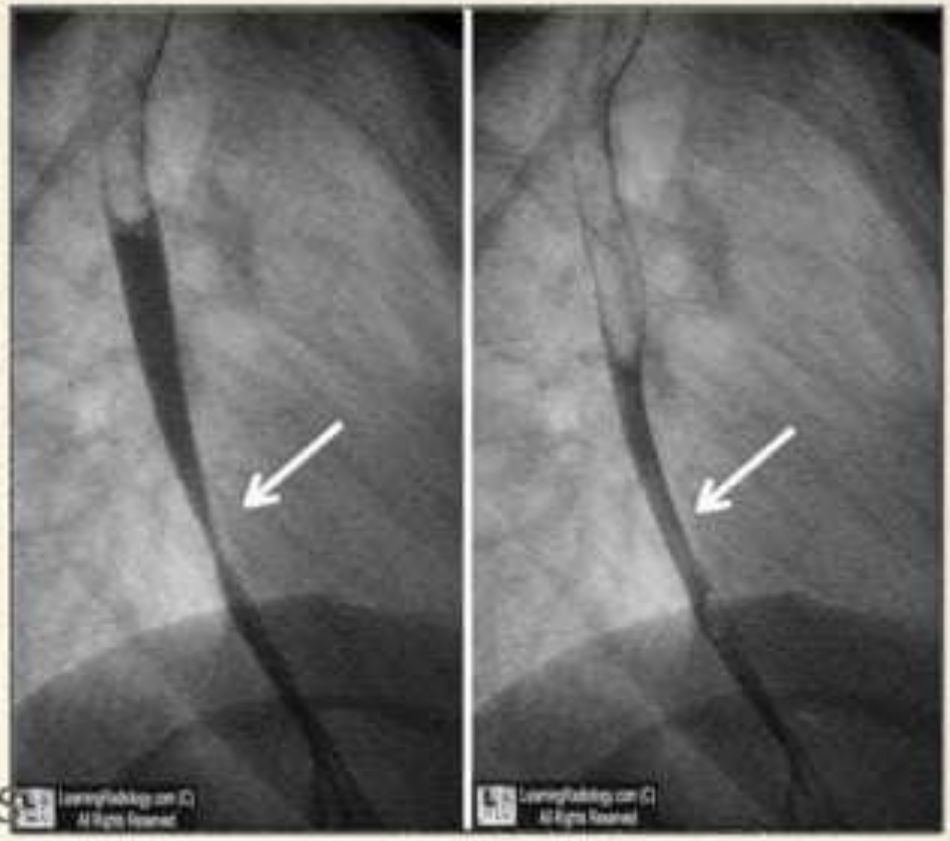
# Feline oesophagus

The folds are 1-2 mm thick and run horizontally around the entire circumference of the oseophageal lumen.
The folds are angled with respect to centre of oesophagus in a HERRING BONE pattern.

# FELINE OESOPHAGUS

**Feline oesophagus** also known as **oesophageal shiver**, refers to the transient transverse bands seen in the mid and lower oesophagus on a double contrast barium swallow.
The appearance is almost always associated with active gastro oesophageal reflux and is thought to be due to contraction of the muscularis mucosae with resultant shortening of the oesophagus and 'bunching up' of the mucosa in the lumen .

# Eosinophilic esophagitis



- *small calibre oesophagus*
- *transient or fixed circular rings are seen.*

# Schatzki rings

Single-contrast solid barium swallows (especially in the RAO prone position) are more sensitive than endoscopy in detecting Schatzki rings . On barium swallow the following features may be seen;

- full-column barium swallow will reveal a circumferential narrowing at the gastro-oesophageal junction, often a few centimeters above the diaphragmatic hiatus
- thin smooth ring, 2-4 mm
- double contrast studies are less sensitive
- performing a Valsalva manoeuvre may improve sensitivity
- barium-tablet or barium-coated marshmallow may also improve sensitivity

# Schatzki rings

- A **Schatzki ring**, also called **Schatzki-Gary ring**, is symptomatically narrow oesophageal B-ring occurring in the distal oesophagus and usually associated with a hiatus hernia.
- Depending on its luminal diameter, an oesophageal B-ring may be symptomatic or asymptomatic 4:
- • <13 mm: almost always symptomatic
- • 13-20 mm: sometimes symptomatic
- • >20 mm: rarely symptomatic
- When it is symptomatic, it is termed a "Schatzki ring".
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# Dysphagia lusoria

- The oesophagus may be compressed by a congenitally aberrant right subclavian artery.
- If this is symptomatic a diagnosis of dysphagia lusoria is made
- Here it is seen as oblique tubular extrinsic compression in upper oesophagus.

# COMPLICATION

- Leakage of barium from unsuspected perforation

# COMPLICATION

- ASPIRATION

# *“THANK YOU”*

*–*

*Dr.Varsha*