MRAD 254: Fluoroscopic Imaging

Outcomes: 2 and 3

UGI Protocols

Objectives

2.9) Indicate the common anatomical structures presented on images of the digestive system

3.1) Determine the protocols and positioning requirements of a facility

3.2) Describe the technical imaging considerations that are specific to examinations of the digestive system

3.3) State the projections and positions used in digestive procedures and examinations

3.4) Identify topographical landmark locations of the digestive system

3.6) Determine if corrective and supplemental images are needed

UGI Routines

- Will vary with site and radiologist
- Want to see each part of the upper GI system at least twice

- Orthogonal views – Two views 90° to each other

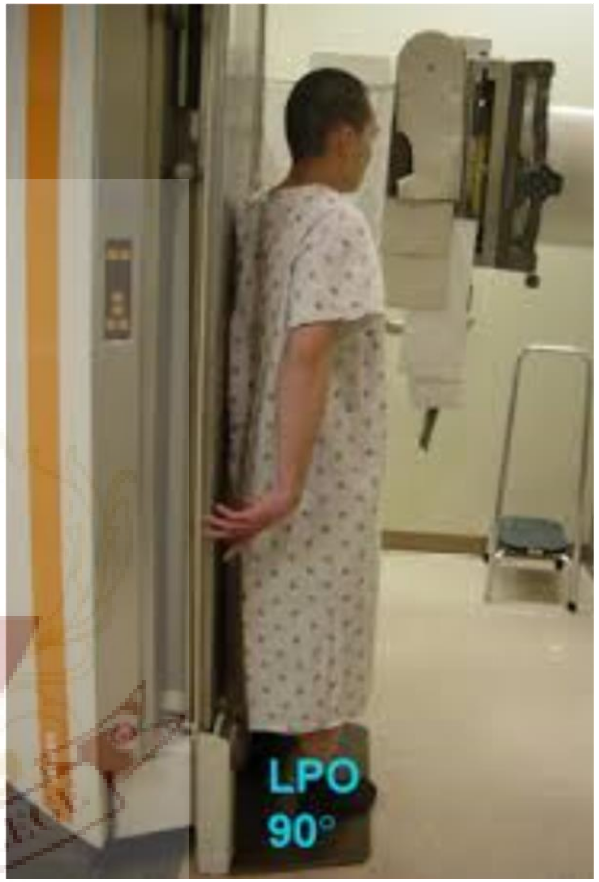
- Try to get each area in both single and double contrast

Upright Swallow

- LPO

- Esophagus between spine and heart shadow
- Fields open up and down
- Collimate side to side
- Top of light at EAM
- Need pharynx
- Rad will live fluoro to get right position

https://www.med-ed.virginia.edu/courses/rad/gi/esophagus/uppergi06.html



Upright Swallow cont.

- Expose @ 2 frames/second

- Large swallows to expand esophagus

- Superior in single contrast, inferior in double





- From pharynx to GE junction

Left Lateral

- True lateral, not oblique
- Barium in fundus, air in pylorus
- Double contrast – Anterior wall ofstomach body and posterior fundus
- Look for spine
- On left side of image
- Looks lateral





Left Posterior Oblique

- Duodenum has moved over spine
- Barium filling whole fundus
- Double contrast view of pylorus
- Look for scotty dogs





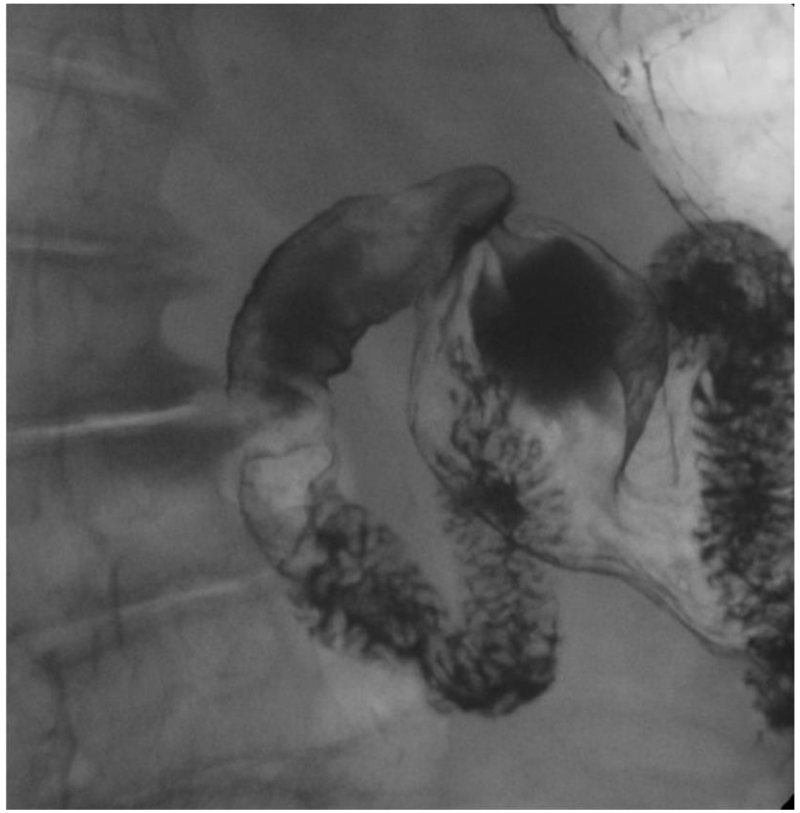
LPO – Duodenal Bulb

- Usually magnified

- Prime site for pathology

- Must see in double contrast withgood distention





Supine

- Barium in fundus
- Double contrast body
- Duodenum must crossmidline to Ligament of Treitz
- Spine looks AP

Right Lateral



- Barium in antrum and pylorus

- Double contrast fundus

- Encourages gastric emptying
- Talk about food





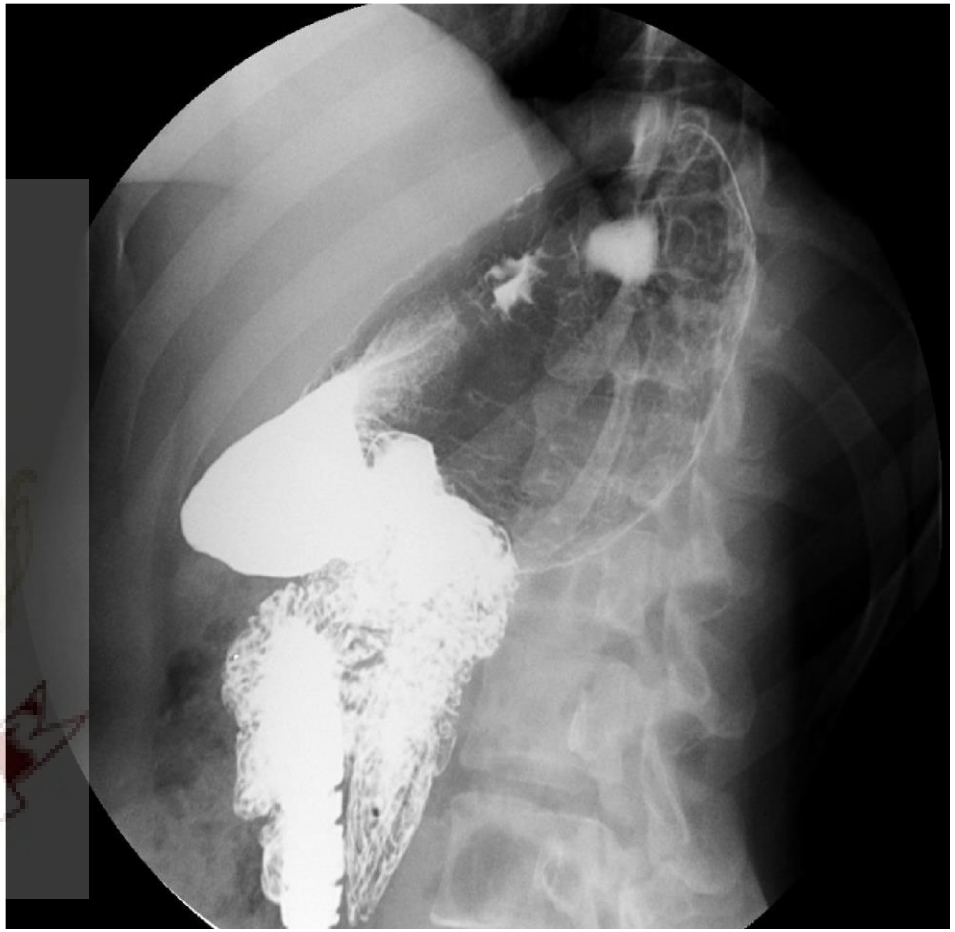
Image courtesy of Canada Diagnostic Centres

Right Posterior Oblique

- Fundus has moved over spine

- Assess the greater and lesser curvatures

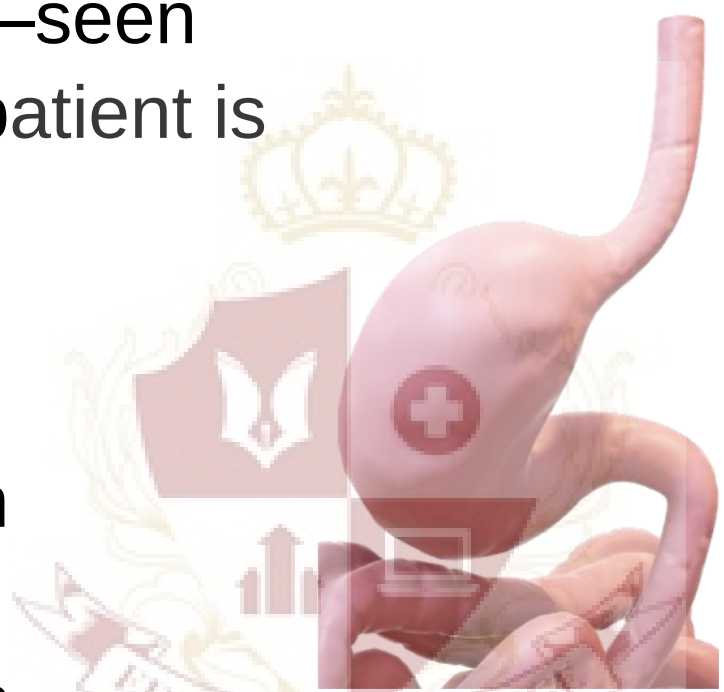




Right Anterior Oblique

- Modern fluoro spots –seen on left of image (as patient is positioned)
- Older films – viewed inanatomical position
- Look for air in fundus
- Shows us GE junctionagain

Prone

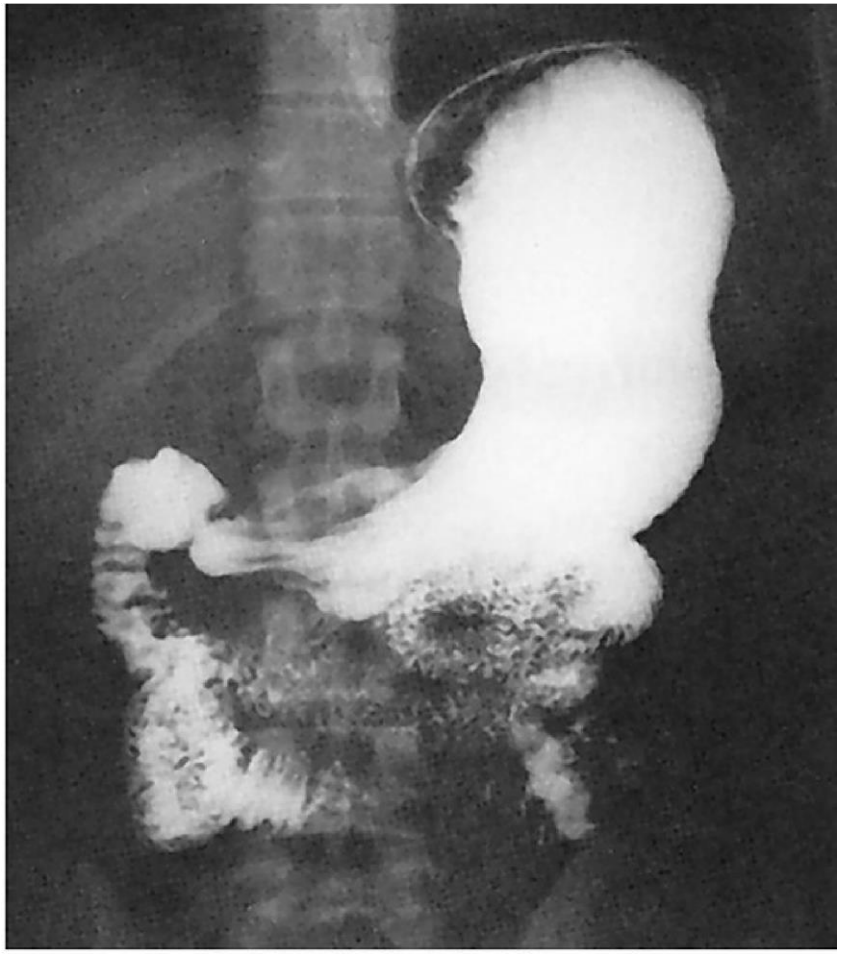




- Single contrast body



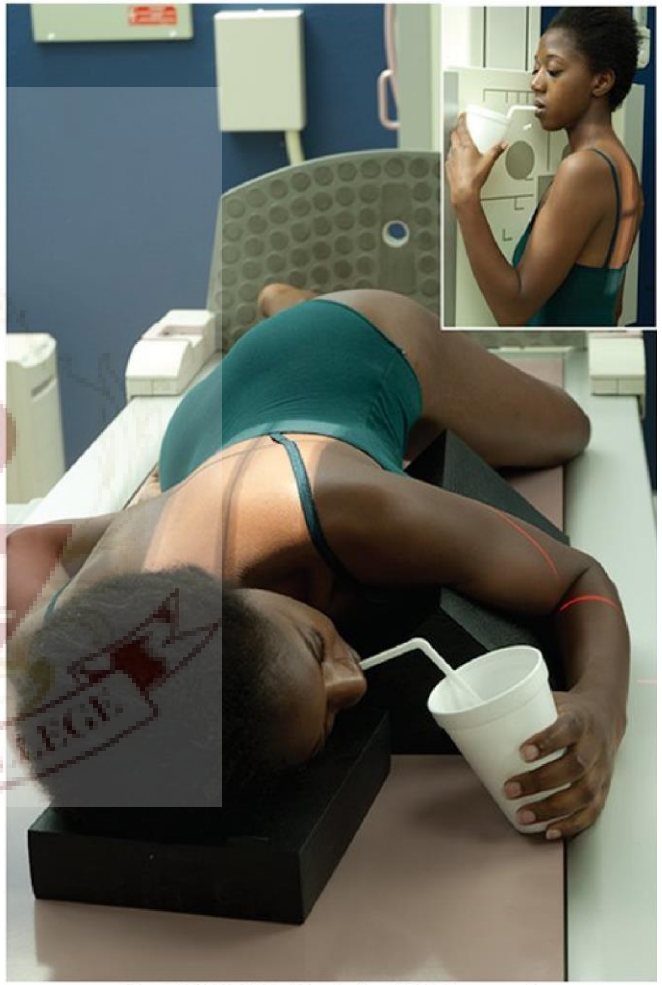
- Air filled fundus



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Prone Swallow

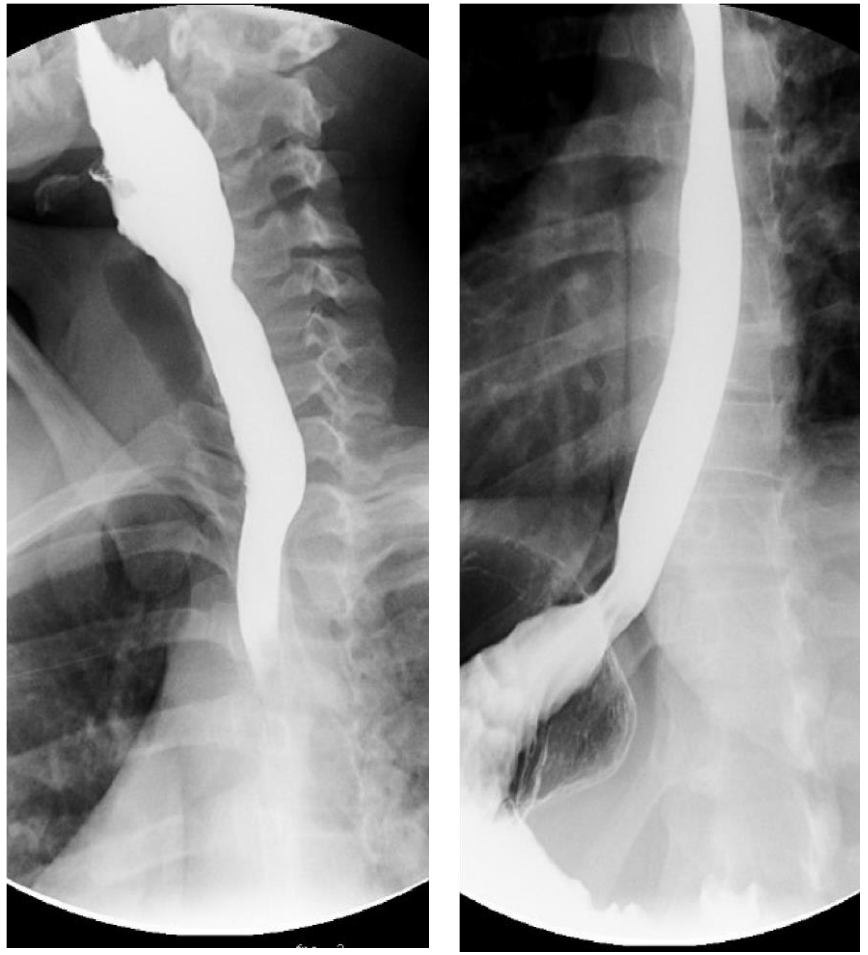
- RAO position
- 1-2 large swallows
- 2 frames/second
- Nasopharynx to GE junction


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Prone Swallow cont.

- Single contrast swallow
- Large bolus fills esophagus and putspressure on walls.
- Evaluates muscular strength without aidof gravity

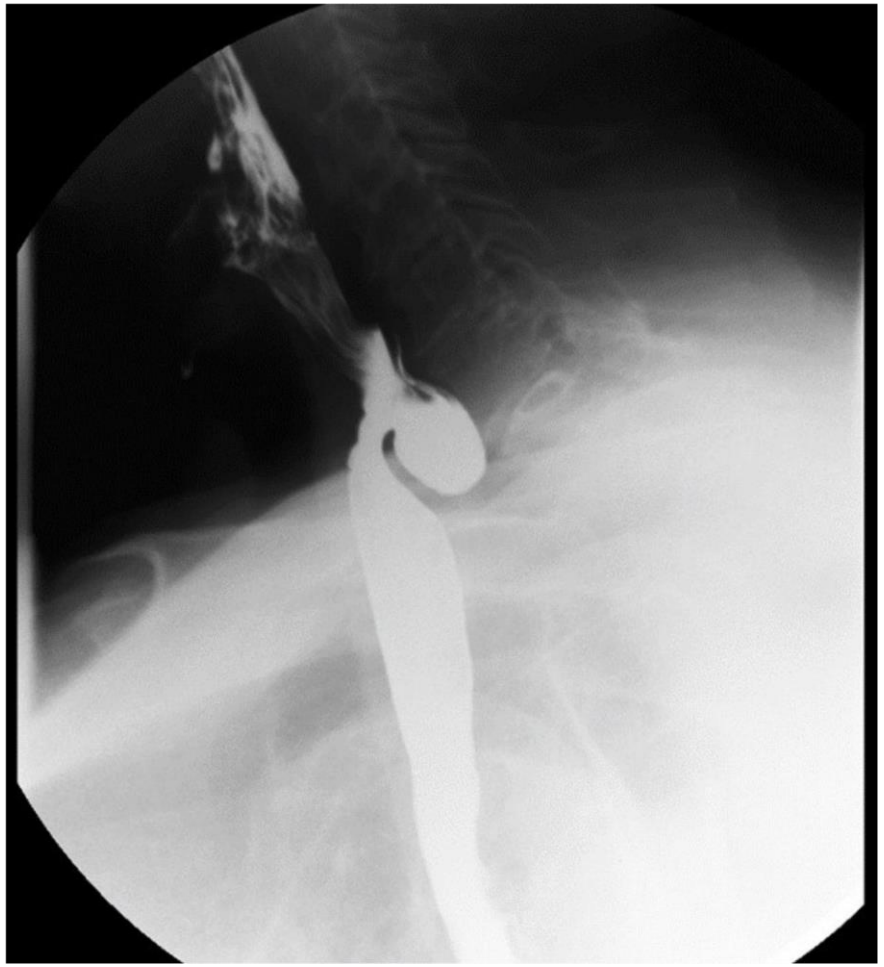
Esophageal Pathology - Diverticula



- Weakness in the muscular wall ofesophagus – mucosal layer protrudes through
- Most common – Zenker’s Diverticulum
- On req – regurgitation, dysphagia, orhalitosis
- True AP and Lateral swallows to evaluatesize and location

Strictures

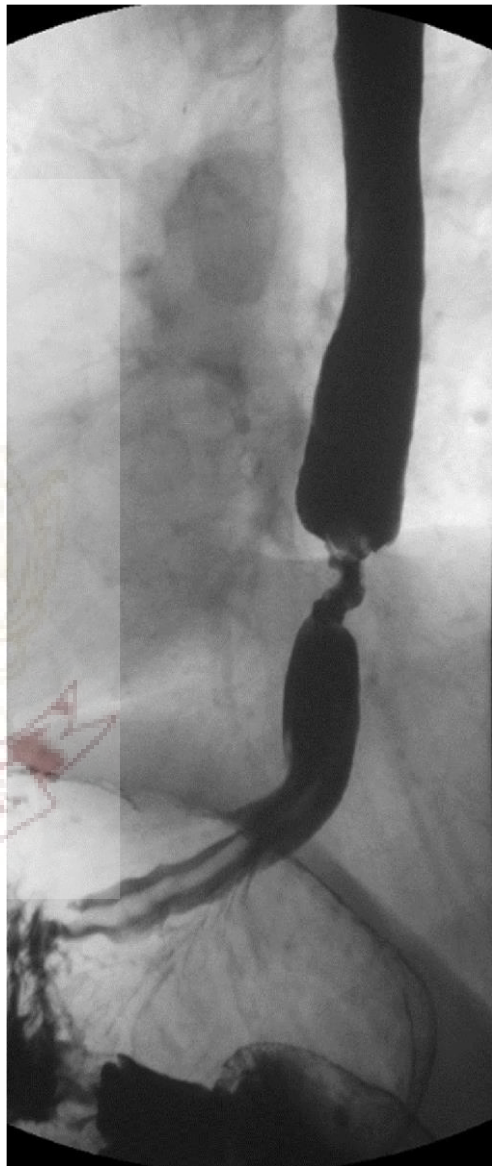
- Narrowing of a lumen



- Often causes dilation of esophagus above stricture
- Food backs up at the bottleneck
- Several different forms



Carcinoma



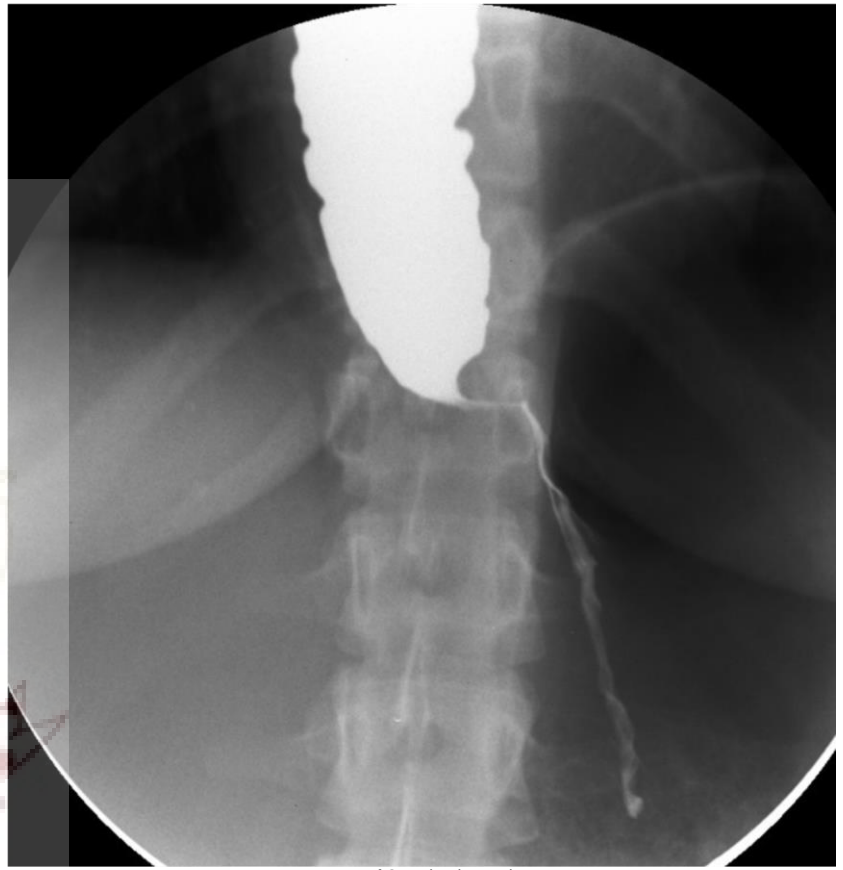
- Tumor infiltrates wall of esophagus

- Most common near GE junction
- Changing tissue type

- Rough margins

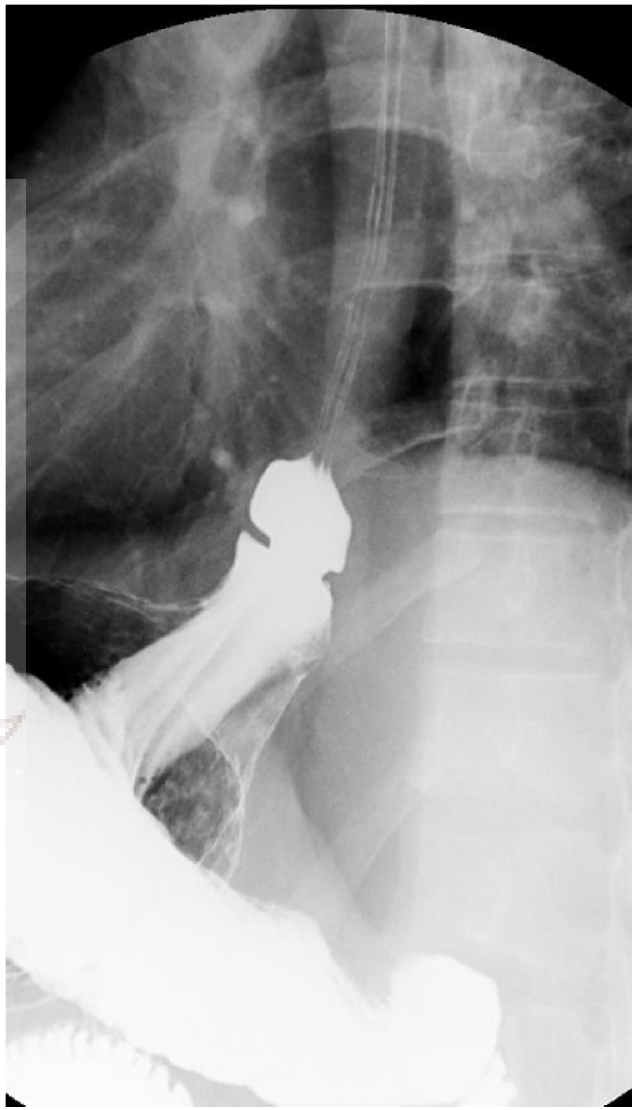
Achalasia

- Cardiac sphincter fails to open.Possibly caused by nerve damage
- Bird beak and string sign
- Food trickles through stricture



Images courtesy of Canada Diagnostic Centres

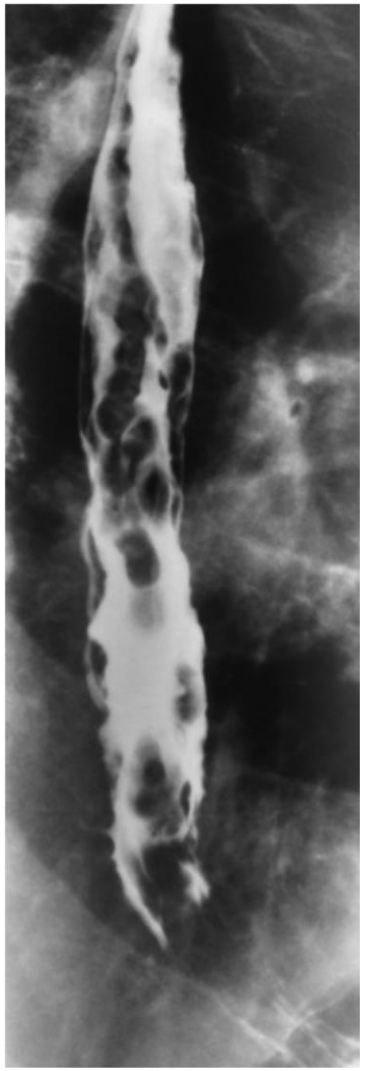
Schatzki Ring



- Short sharp stricture
- Like a rubber band around esophagus
- Always accompanies a hiatus hernia
- Best seen on prone swallow

Esophageal Varices

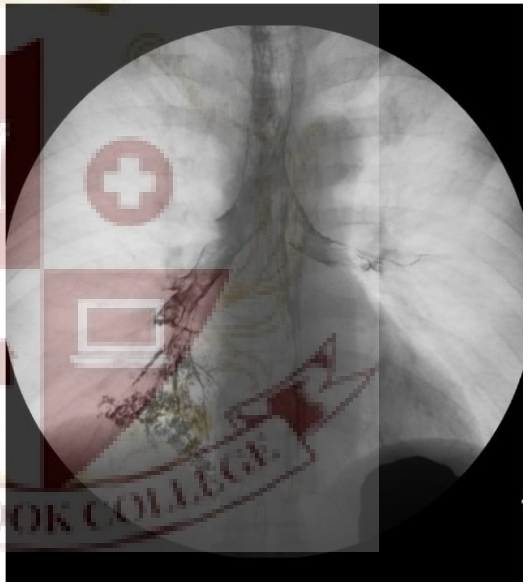
- Veins around distal esophagus dilate
- Press into esophagus when full of barium
- Dark worm-like impressions
- Best seen on prone swallow

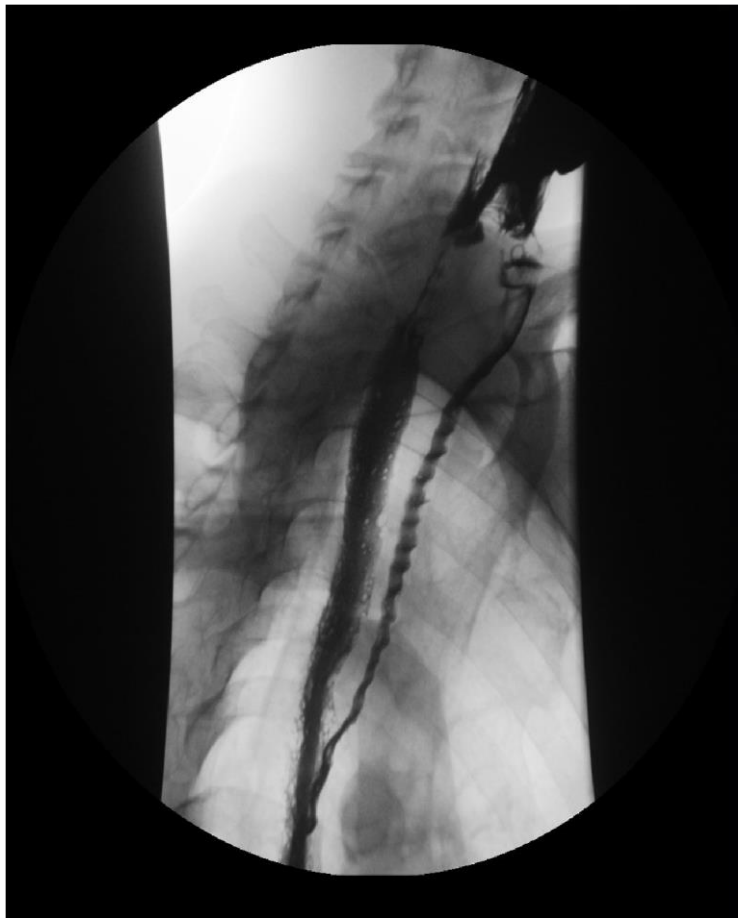


https://basicmedicalkey.com/gastrointestinal-system-3/

Aspiration

- Food penetrates trachea
- May reach bronchi
- Should cause coughing
- If barium reaches carina, no more barium.



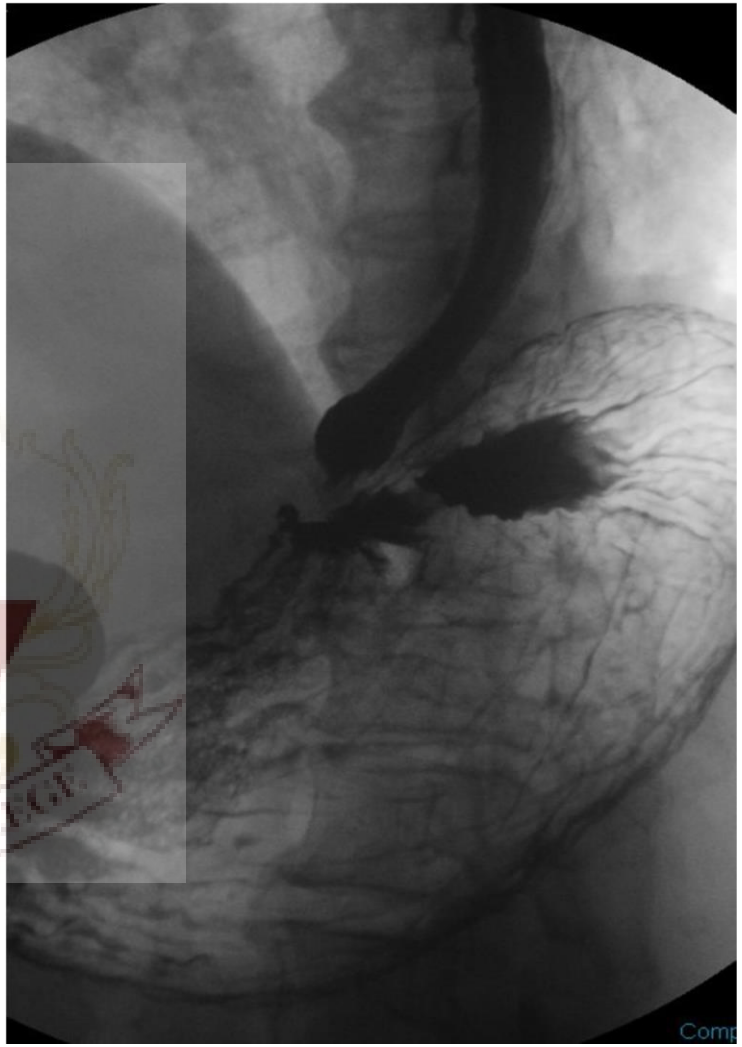


Modified Barium Swallow

- Speech pathologist and radiologist
- Various food and liquids coated in Barium
- Live fluoro while the patient eats
- Develop a safe diet

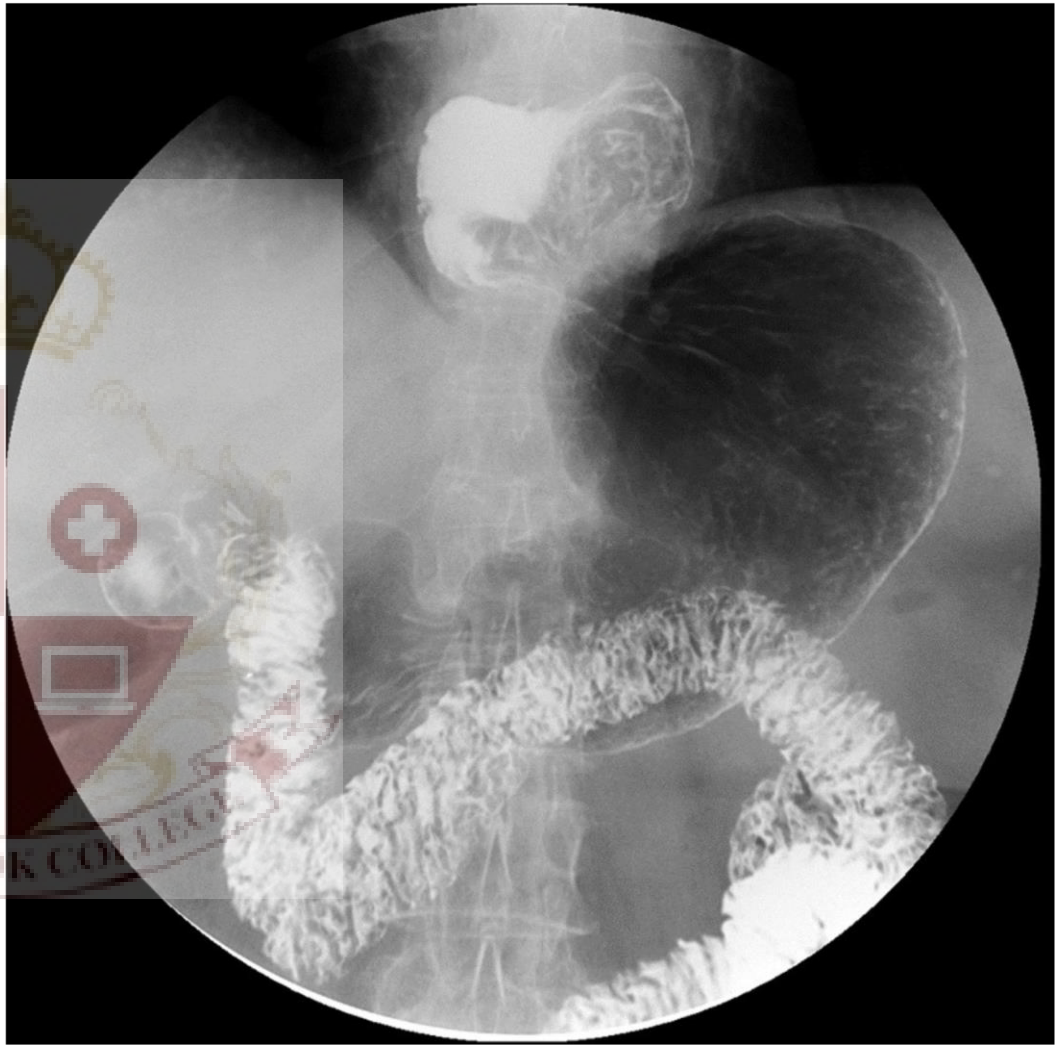
GERD

- Gastroesophageal Reflux Disease
- Weakness of cardiac sphincter
- Happens more while recumbent
- RPO will encourage it
- Can watch on live fluoro



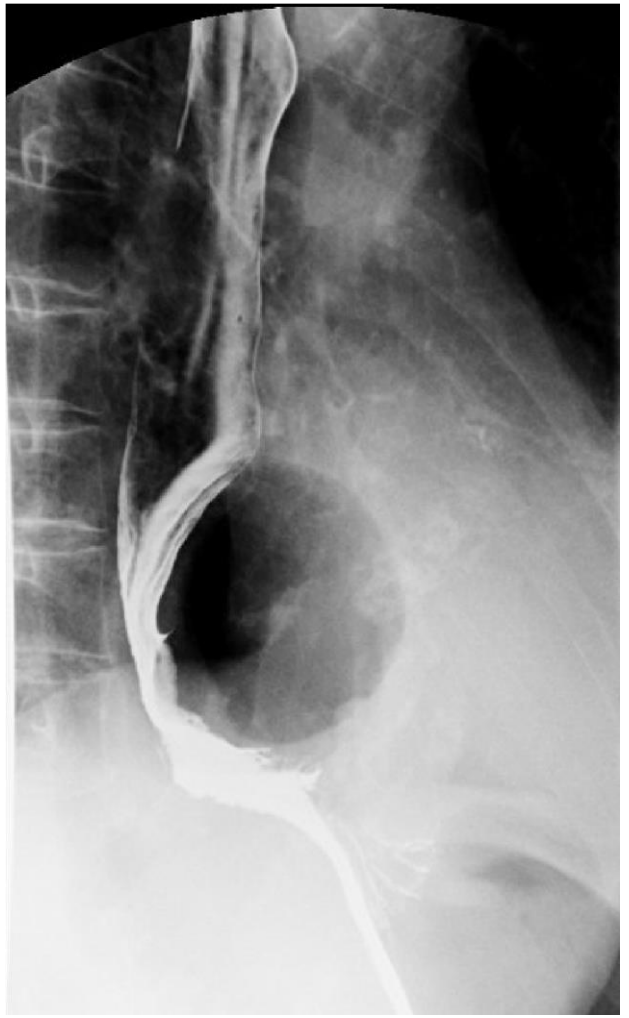
Hiatus Hernia – Sliding/Rolling

- Gastric cardia (part attached toesophagus) slides up through hiatus
- Reduces itself when standing
- Easiest to see on recumbentimages
- Valsalva maneuver
- Look for rugae abovediaphragm



Hiatus Hernia - Paraesophageal

- Gastric tissue protrudes through hiatusalongside esophagus
- Can see GE junction still below diaphragm
- Occasionally only fills with air
- Tissue strangulation and death



Ulcers

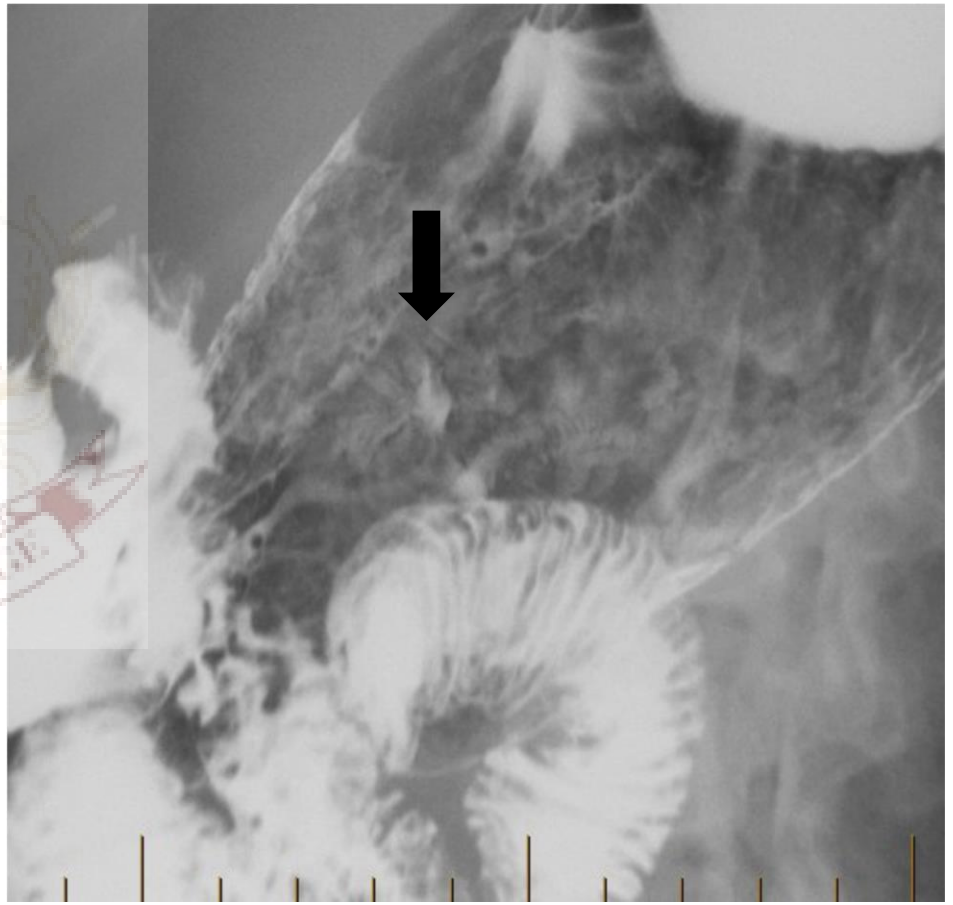
- Erosions in mucosal layer

- Helicobacter Pylori
- Bacteria in stomach of 50% of pop.
- May predispose to ulcers
- Common history on requisition

- Gastric/Peptic or duodenal

Gastric/Peptic Ulcers

- Star sign
- Barium pools in crater andcreates the star pattern
- Good distention essential fordiagnosis
- Hides in the folds if stomach iscollapsed



Duodenal Ulcers


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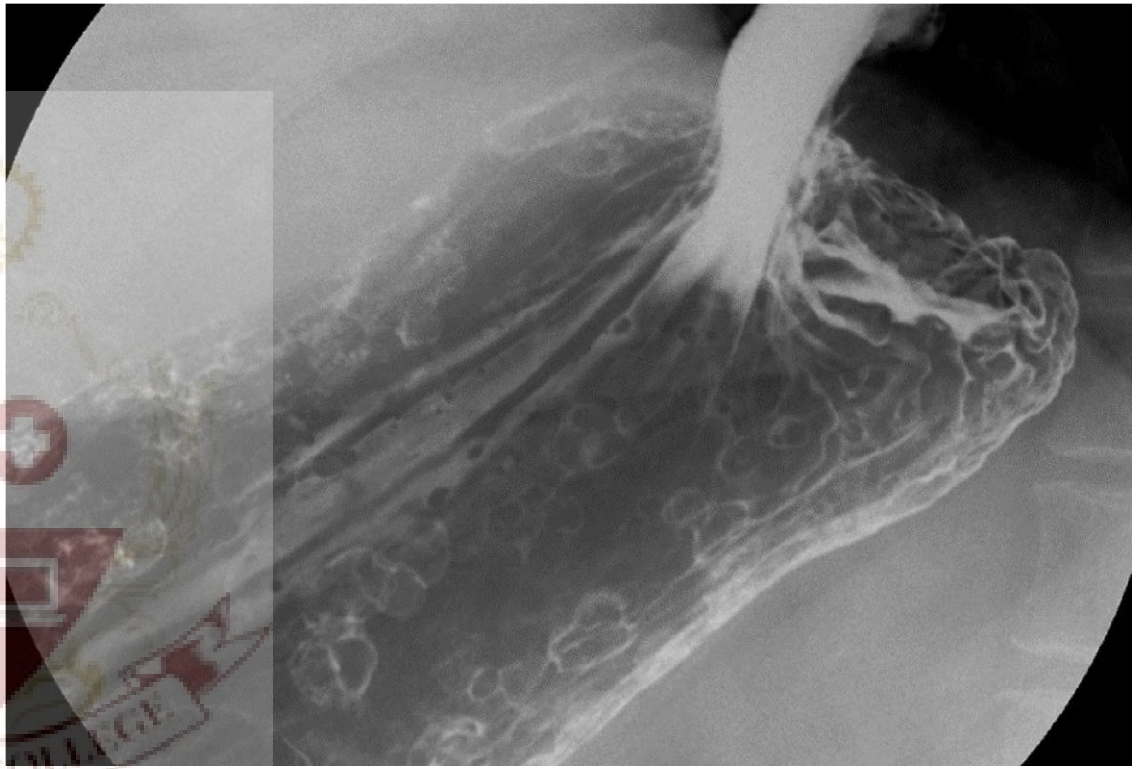
- Cloverleaf sign
- Ulcer causes wall ofduodenum to pull in on itself
- Distension very important

Gastric Polyps

- Thin rim of barium around

small mass of tissue

- Sessile or pedunculated
- Often caused by long termPPI use
- Looks like food in stomach
- Good distention essential



Gastritis

- Inflammation of the stomachmucosa
- Can happen anywhere along GItract
- Thich rugal folds
- Poor distention makes diagnosisalmost impossible

Poor Adhesion of Barium


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Small Bowel Malrotation

- Small bowel rotation not completed inutero
- Duodenal sweep never crossesmidline to Ligament of Treitz
- Small bowel appears on right, largeon left
- Symptomatic in infants, rarely inadults



Retained Food



ImagecourtesyofCanadaDiagnosticCentres