

# Barium X-Rays (Upper and Lower GI)

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## ► **What are barium X-rays?**

- A barium X-ray is a radiographic (X-ray) examination of the gastrointestinal (GI) tract. Barium X-rays are used to diagnose abnormalities of the GI tract, such as tumors, ulcers and other inflammatory conditions, polyps, hernias, and strictures.
- The use of barium with standard X-rays contributes to the visibility of various characteristics of the GI tract. Barium is a dry, white, chalky powder that is mixed with water to make barium liquid. Barium is an X-ray absorber and appears white on X-ray film. When instilled into the GI tract, barium coats the inside wall of the esophagus, stomach, large intestine, and/or small intestine so that the inside wall lining, size, shape, contour, and patency (openness) are visible on X-ray. This process shows differences that might not be seen on standard X-rays. Barium is used only for diagnostic studies of the GI tract.
- Fluoroscopy is often used during a barium X-ray.
- In a barium X-ray, fluoroscopy allows the radiologist to see the movement of the barium through the GI tract as it is instilled through the mouth or the rectum.



## ▶ **Why are barium X-rays performed?**

- ▶ Reasons for performing barium X-ray procedures may include the following:
- ▶ Abdominal pain
- ▶ Bleeding from the rectum
- ▶ Unexplained vomiting
- ▶ Bowel movement changes
- ▶ Chronic diarrhea or constipation
- ▶ Pain or difficulty swallowing
- ▶ Unexplained weight loss
- ▶ Unusual bloating
- ▶ To detect anatomical abnormalities

# Types of Barium studies

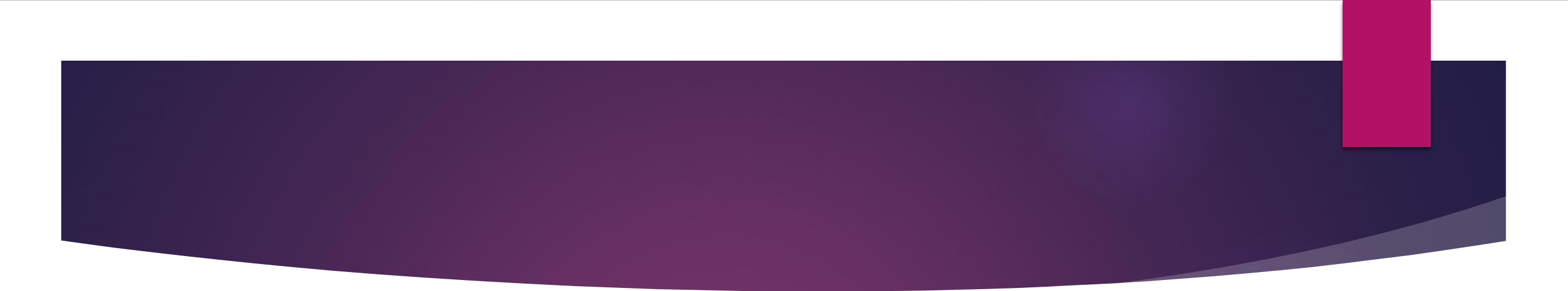
- ▶ There are three types of barium X-ray procedures:
- ▶ Barium enema(also called lower GI series)
- ▶ Barium small-bowel follow through
- ▶ Barium swallow(also called upper GI series)

## **Barium Enema**

- ▶ A barium enema involves filling the large intestine with diluted barium liquid while X-ray images are being taken. Barium enemas are used to diagnose disorders of the large intestine and rectum. These disorders may include colonic tumors, polyps, diverticula, and anatomical abnormalities.

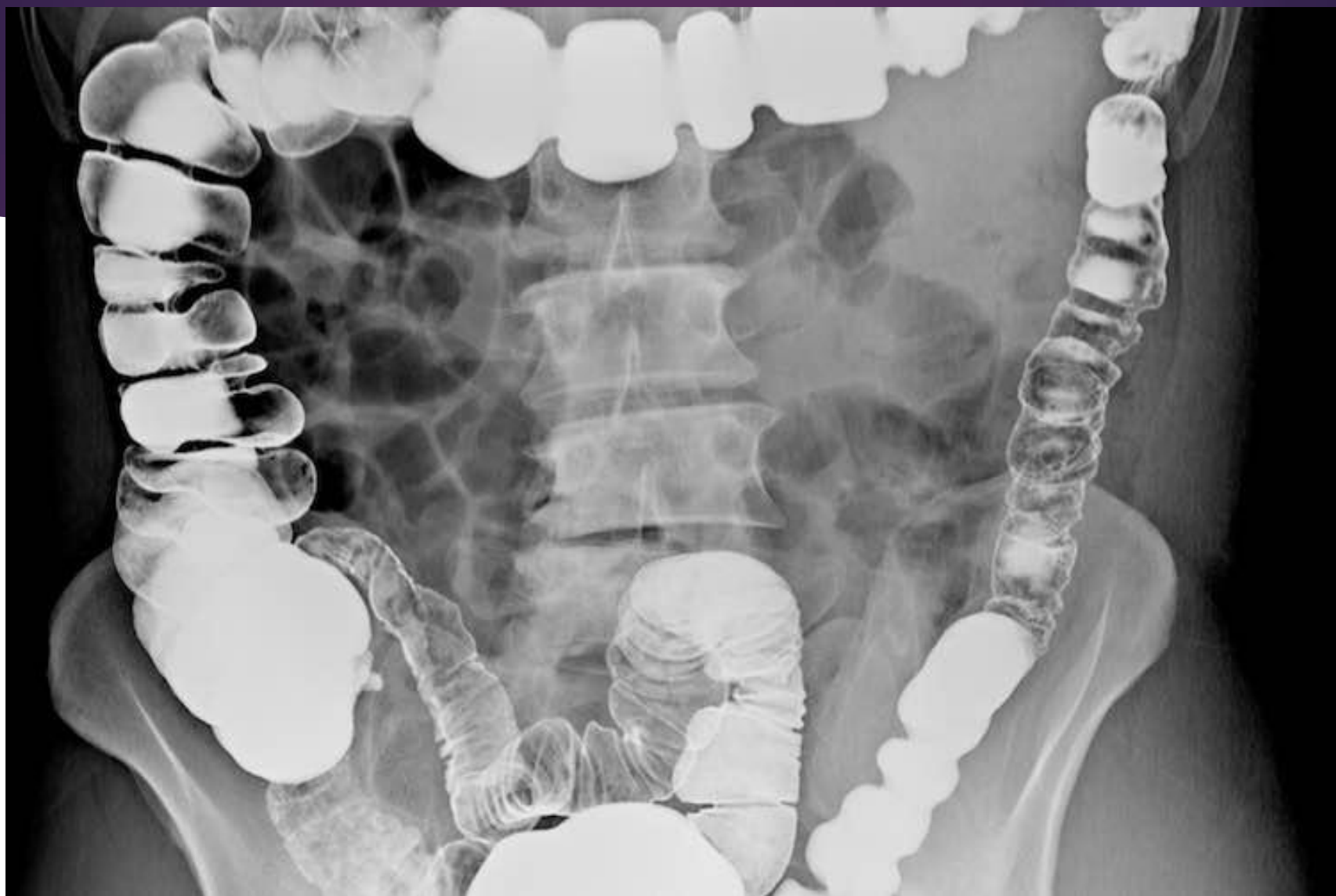
### ▶ **How is a barium enema performed?**

- ▶ Usually, a barium enema can be performed on an outpatient basis. The patient may be asked to do the following in preparation for a barium enema:
- ▶ Drink clear liquids the day before the examination.
- ▶ Follow a special liquid diet one to two days prior to the procedure.
- ▶ Take a laxative, suppository, or drug to cleanse the bowel.
- ▶ Refrain from eating and drinking after midnight on the night before the examination.
- ▶ These measures are done to empty the large intestine, as any residue (feces) can obscure the image.

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- ▶ Barium enemas are performed in two ways:
  - ▶ Single-contrast image. The entire large intestine is filled with barium liquid. Single-contrast images show prominent abnormalities or large masses in the large intestine.
  - ▶ Double-contrast image. A smaller quantity of thicker barium liquid is introduced to the large intestine, followed by air. Double-contrast images show smaller surface abnormalities of the large intestine, as the air prevents the barium from filling the intestine. Instead, the barium forms a film on the inner surface.

# How to perform Barium enema

- ▶ The patient will be positioned on an examination table.
- ▶ A rectal tube will be inserted into the rectum to allow the barium to flow into the intestine.
- ▶ The radiologist will use a machine called a fluoroscope (a device used for the immediate showing of an X-ray image).
- ▶ During the procedure, the machine and examination table will move and the patient may be asked to change positions.







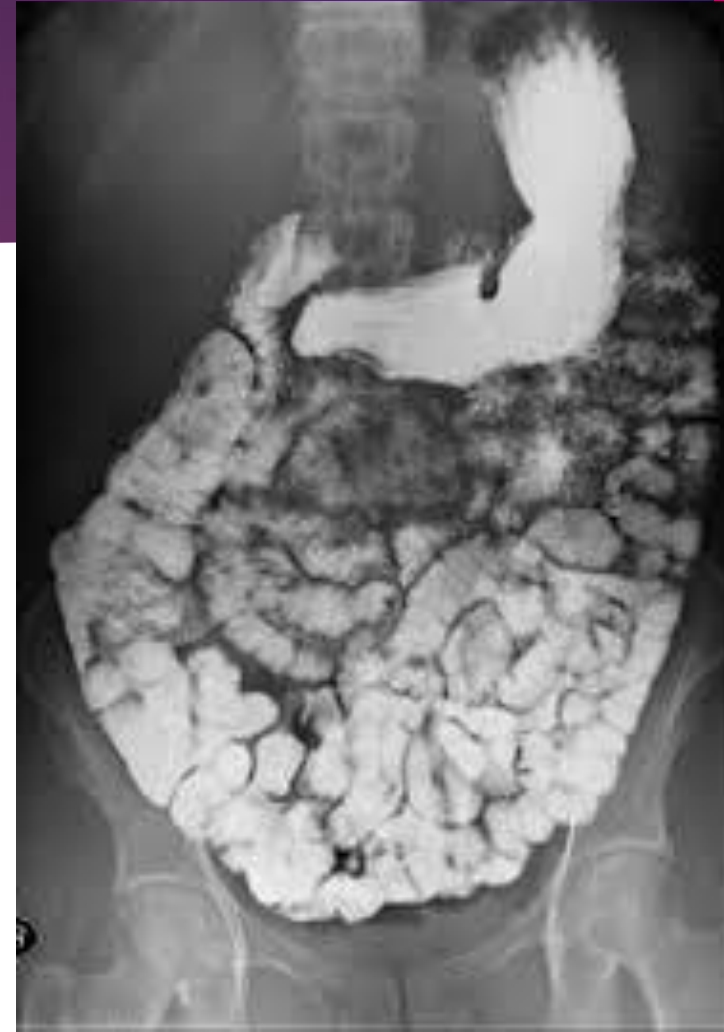
Malignant stricture (colonic ca)

# Barium small-bowel follow through

- ▶ A barium small-bowel follow through involves filling the small intestine with barium liquid while X-ray images are being taken.
- ▶ **INDICATIONS:** • Pain • Diarrhea • Anemia • Gastrointestinal bleeding • Malabsorption • Crohn's Disease
- ▶ **CONTRAINDICATIONS :** • Complete obstruction • Suspected perforation
- ▶ **How is a barium small-bowel follow through performed?**
- ▶ Usually, a barium small-bowel follow through can be performed on an outpatient basis. Patients may be asked to refrain from eating or drinking after midnight on the night before the examination. An enema or laxative may be given on the day before the test to clear feces from the bowel.

# Procedure

- ▶ the patient is given a bottle of barium to drink.
- ▶ The patient is positioned on the examination table.
- ▶ The radiologist uses a machine called a fluoroscope (a device used for the immediate showing of an X-ray image).
- ▶ X-rays are taken every 20 to 30 minutes over the next hour or two until the entire small bowel is opacified. This exam can take several hours



# Upper GI series

- ▶ An upper GI series is an examination of the esophagus and stomach using barium to coat the walls of the upper digestive tract so that it may be examined under X-ray. An upper GI that focuses on the esophagus is also known as a barium swallow. Barium swallows and upper GI series are used to identify any abnormalities such as tumors, ulcers, hernias, pouches, strictures, and swallowing difficulties.
- ▶ • The contrast used is barium sulfate

## **How is an upper GI series/barium swallow performed?**

- ▶ The patient will be asked to drink the barium liquid and to swallow baking soda crystals. It is important not to belch, as the gas assists the radiologist in evaluation.
- ▶ The patient will stand behind a machine called a fluoroscope (a device used for the immediate showing of an X-ray image).
- ▶ The patient may be asked to move in different positions and to hold his or her breath while the X-rays are taken.
- ▶ If the small intestine is to be examined, the patient may be asked to drink additional barium and a series of X-rays will be taken until the barium reaches the colon.
- ▶ Following the examination, barium may cause constipation. The patient may be advised to drink plenty of fluids and eat foods high in fiber to expel the barium from the body.

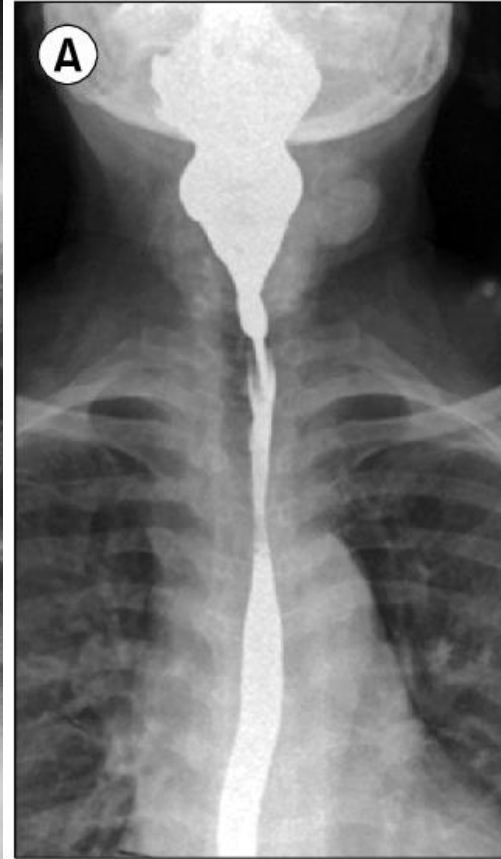
# INDICATIONS of Barium swallow:

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

# CONTRAINDICATIONS:

- ▶ • Suspected leakage from esophagus into the mediastinum or pleura and peritoneal cavities (Diatrazole Meglumine - 66% to be used)
- ▶ • Tracheo-esophageal fistula (Diatrazole Meglumine -66% to be used)
- ▶ • Recent Biopsy
- ▶ XRAY VIEWS:
- ▶ • SOFT TISSUE NECK – AP & LATERAL
- ▶ • NECK-AP & LATERAL
- ▶ • THORAX-RAO (right anterior oblique) VIEW



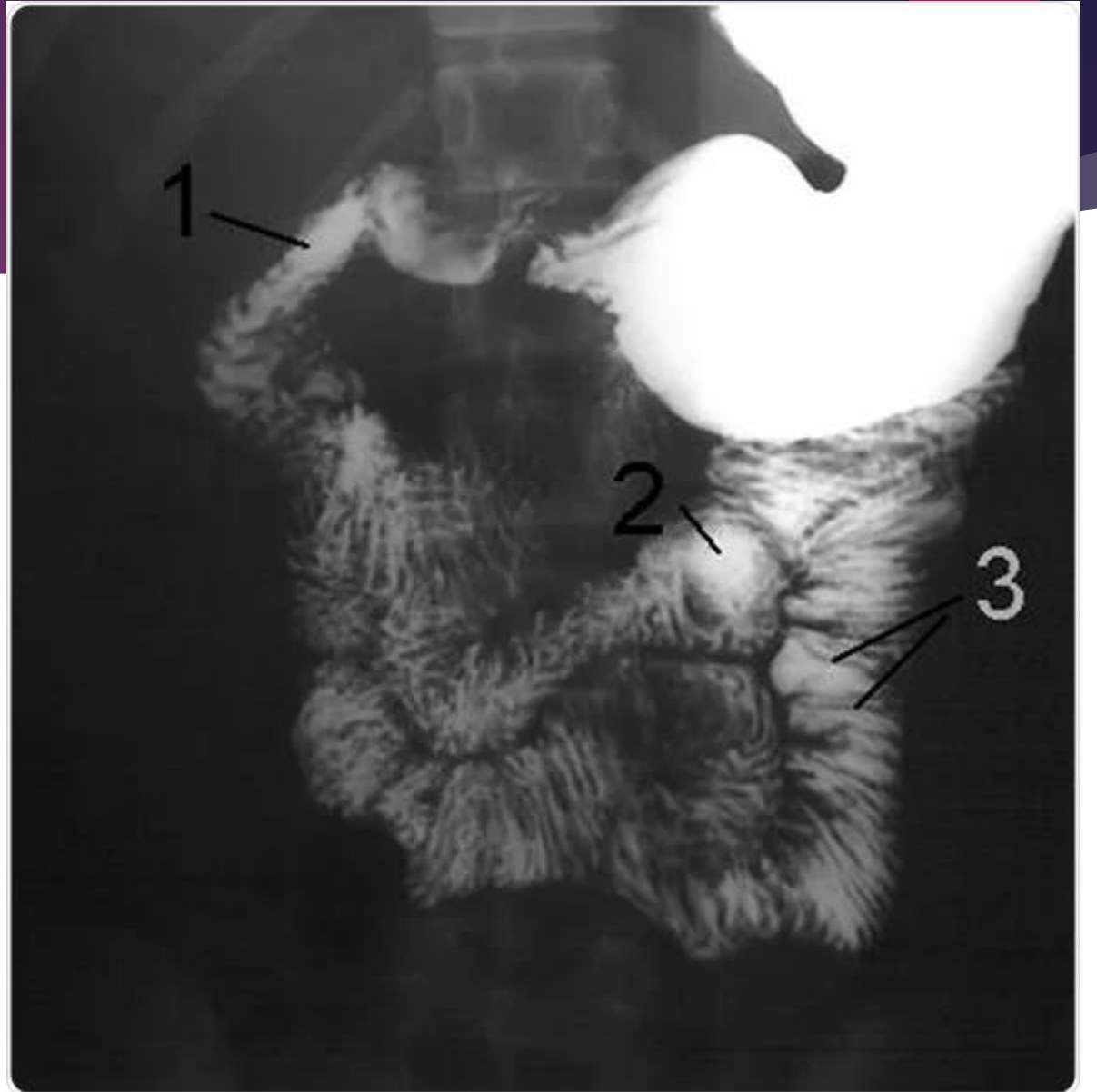


The barium swallow test in the anteroposterior (A) and lateral views (B) showing esophageal stricture with an anterior shelf-like projection at the hypopharynx and cervical esophagus, suggestive of cricopharyngeal web.



# Indication of Barium meal

- ▶ • 1.Dyspepsia
- ▶ • 2.Weight loss
- ▶ • 3.Upper abdominal mass
- ▶ • 4.Gastrointestinal hemorrhage or unexplained iron deficiency anemia
- ▶ • 5. Partial obstruction
- ▶ **CONTRAINDICATIONS:**
- ▶ • Complete large bowel obstruction
- ▶ • Suspected Perforation





**THANK  
YOU**