Investigation of the gastrointestinal tract (GIT)

Oral contrast investigation

Barium sulphate is the best contrast medium for the gastrointestinal tract.

- its atomic number is high
- it produces excellent opacification
- good coating of the mucosa
- non-absorbable
- non-toxic
- it is completely inert

Limitations

- causes chemical peritonitis when extravasates into the peritoneal cavity, hence it is not used in suspected perforation of stomach and intestine
- extravasation into bronchial tree will cause inflammation and granuloma formation
- barium inspissations in case of colonic obstruction hard stones

Single and double contrast studies are done with barium

- In single contrast method bowel is filed only with barium.

- In double contrast, the mucosa is coated with barium and introduction of gas distends the lumen of the bowel. Double contrast method demonstrates mucosal irregularities which are obscured in single contrast.

Gastrograffin

- Other available oral contrast for GIT is gastrograffin, which is a water soluble contrast medium, which does not cause chemical peritonitis or colonic obstruction.

- The principal value of water soluble contrast media is to demonstrate leaks from the bowel and outlining fistulous tracts as they are safe in perforation cases.

Barium swallow

- It is the contrast study of the swallowing mechanism and passage of food bolus from mouth up to the fundus of the stomach

Barium examinations of the oesophagus

Indications:

- dysphagia (causes: corrosive strictures, carcinoma and achalasia)
- motility disorders of oesophagus
- pharingo-oesophageal malignancies
- pharyngeal diverticula
- webs

Contraindications:

- tracheo-oesophageal fistula
- perforation
- because the barium should not pass into the respirator passage.

  Therefore, to diagnose these conditions water soluble non-ionic contrast media such as omnipaque, ultravist are used.

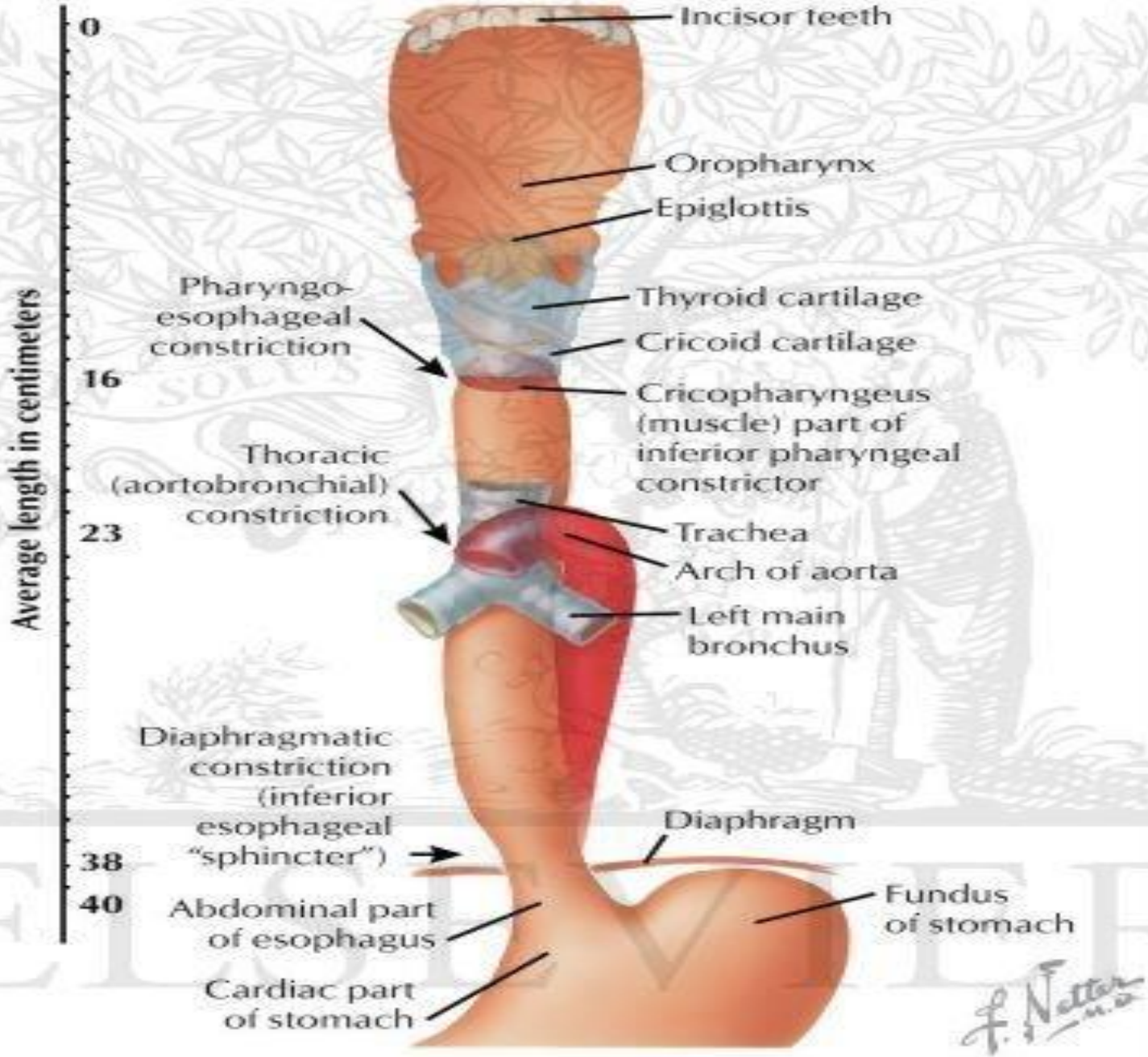
Procedure

- The patient drinks some barium and its passage down the esophagus is observed on a television monitor.
- Films are taken with the esophagus both full of barium to show the outline, and following the passage of the barium to show mucosal pattern (films are taken in filling phase and empty phase).
- Films are taken in frontal and lateral projections during the process of swallowing.

The flow of barium is noted fluoroscopically through the:

- pharynx
- cervical oesophagus
- epiphrenic oesophagus
- gastro-oesophageal junction

Gross Anatomy of the Esophagus



Upper esophageal sphincter

Barium examinations of the stomach

- It is a radiological study of the stomach, duodenum and proximal jejunum. It is done by oral administration of barium.

Indications:

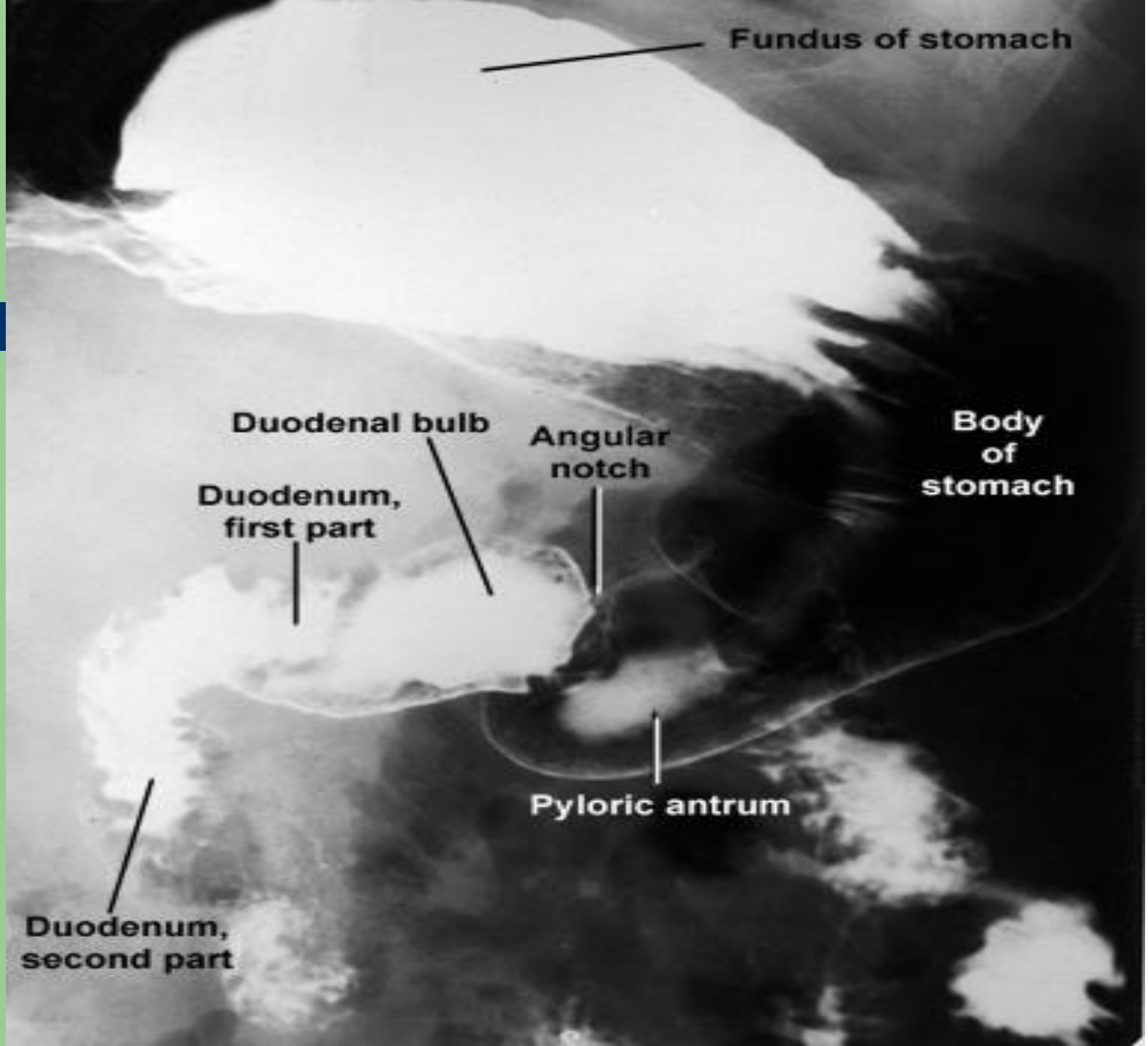
- suspected malignancies of gastro-esophageal junction, stomach and duodenum
- gastric or duodenal obstructive lesions
- gastric or duodenal ulcers
- motility disorders
- congenital anomalies

Contraindications:

- suspected gastro-duodenal perforation
- large bowel obstruction
- recent biopsy from GIT.

Procedure

- The patient fasts for at least 6 hours to the examination. Single and double contrast studies are performed after the patient swallows around 250 ml of barium suspension. Air is used to produce double contrast effect. Films are taken in various positions with the patient both erect and lying flat, so that each part of the stomach and duodenum is seen.


Fundus of stomach
Duodenal bulb
Angular notch
Body of stomach
Duodenum, first part
Pyloric antrum
Duodenum, second part

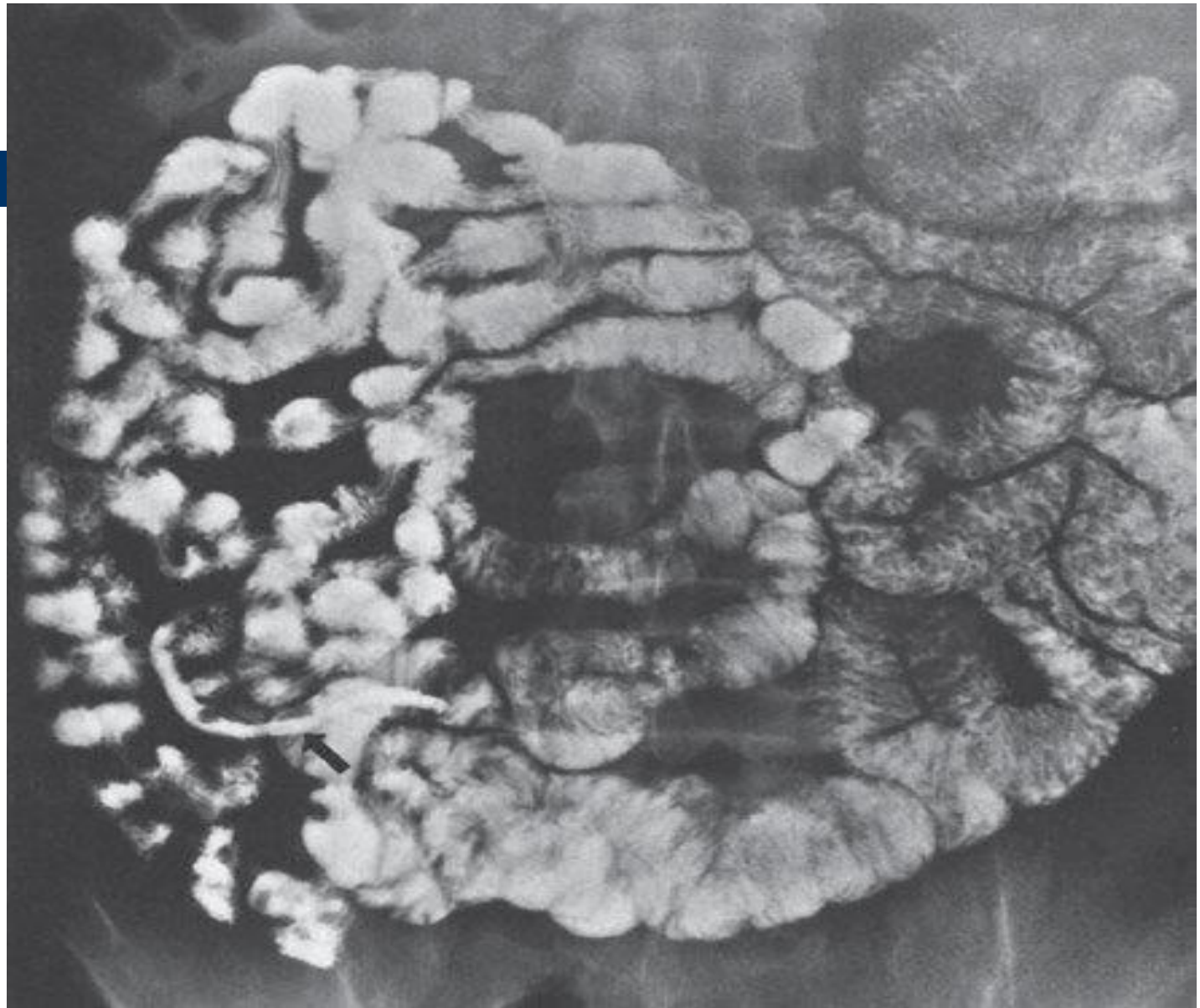
Examinations of the Small Intestine

The radiographic examination of the small bowel evaluates the mesenteric portion of the organ, which consists of the jejunum and ileum.

The following luminal contrast methods can be used to examine the small intestine:

- * peroral small-bowel series;
- * enteroclysis;
- * various retrograde techniques (e.g., via an ileostomy).

peroral small bowel study



Enteroclysis

Examinations of the Large Intestine

- The radiographic examination of the large bowel evaluates the entire organ from the rectum to the caecum. Reflux of barium suspension into the ileum and the appendix, if present, occurs commonly.
- The colon can be evaluated by several techniques, which include single-contrast and double contrast barium enemas.

- The single-contrast method simply involves filling the colon with a dilute barium suspension, whereas the double-contrast technique requires a denser, more viscous barium suspension and air.
- In both methods, large and small compression images of all segments of the colon are obtained.

Indications

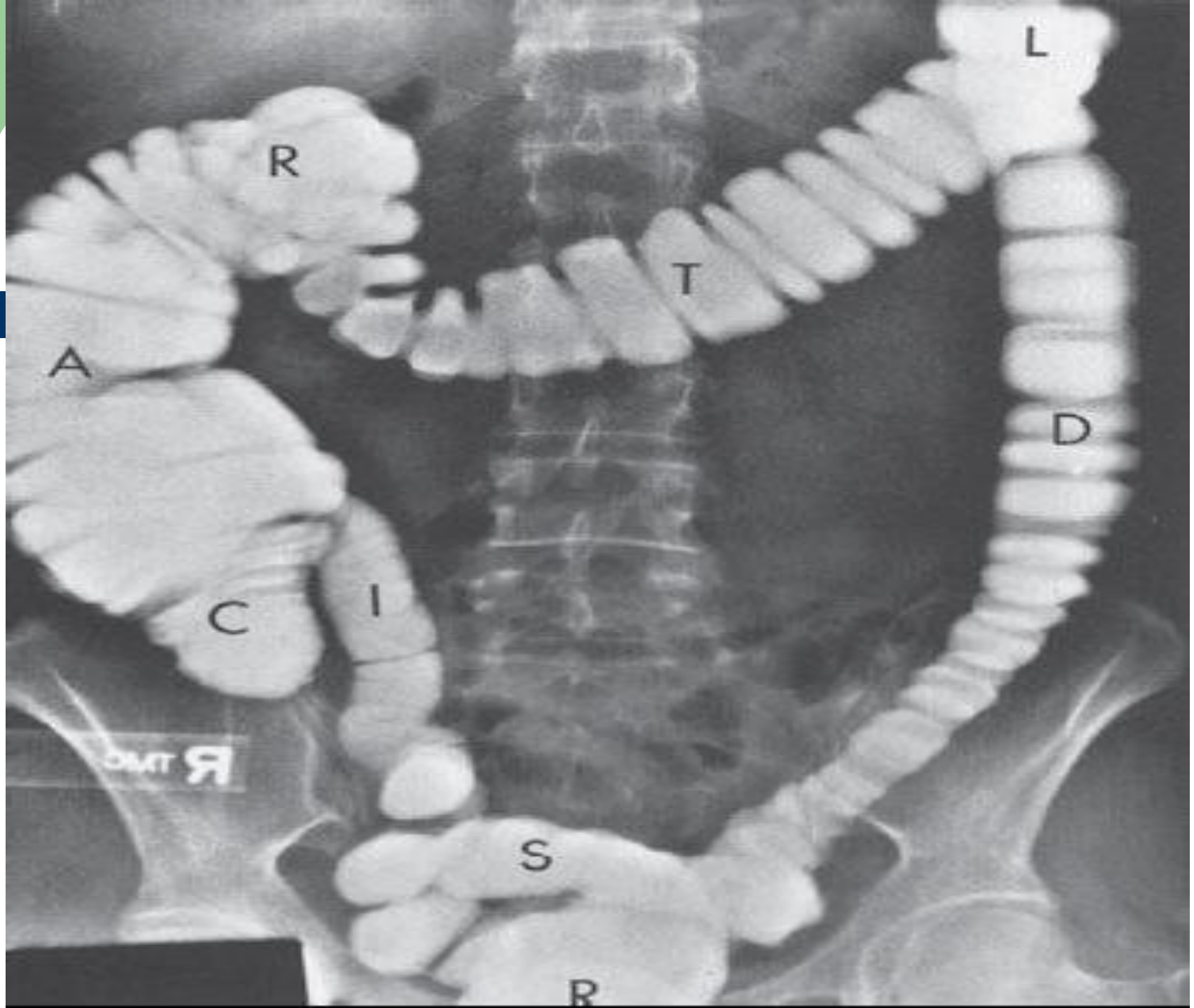
- change in bowel habit
- hemorrhage
- investigation of an abdominal mass
- location of the site of large-bowel obstruction

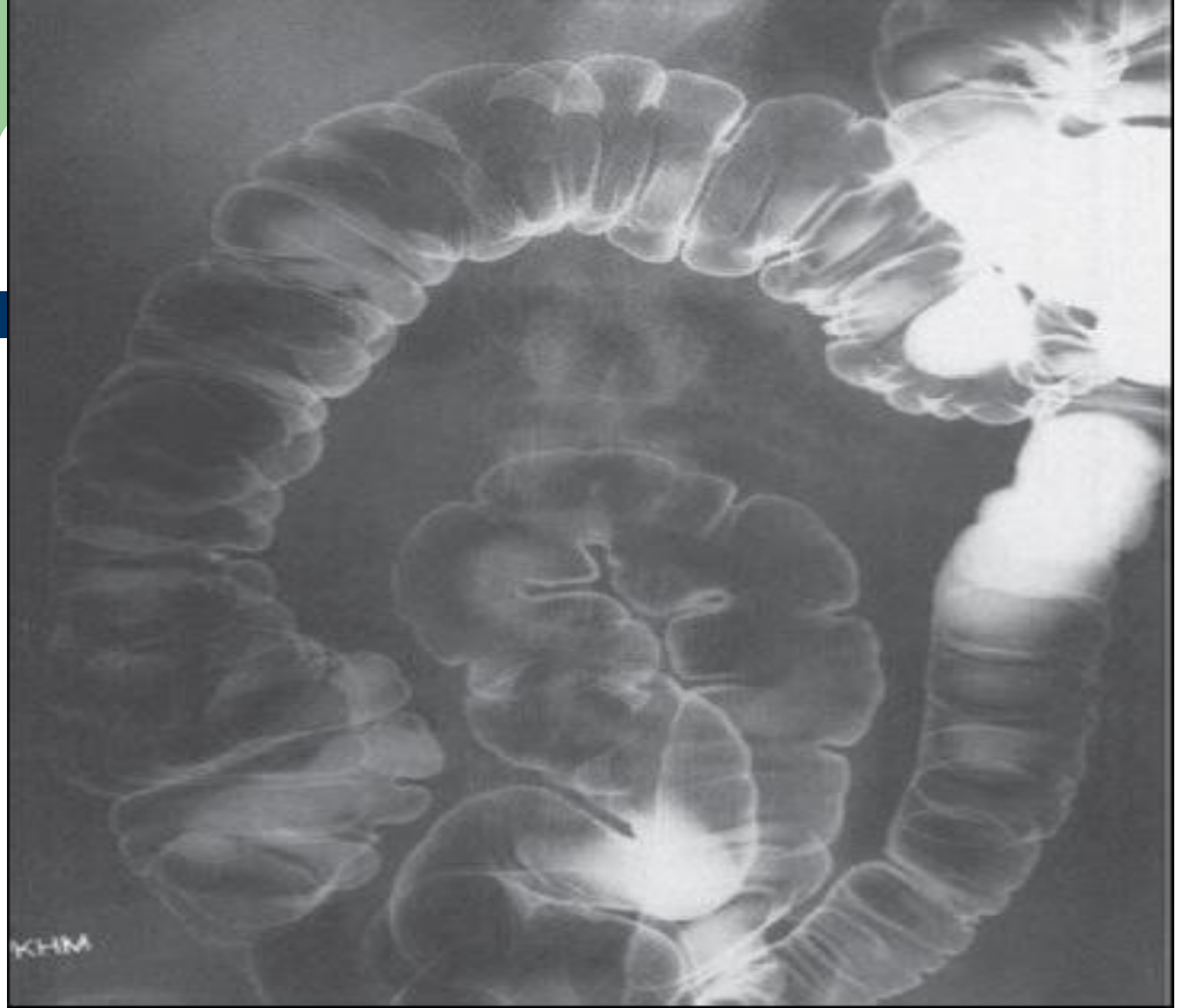
Contraindication

- toxic megacolon
- pseudomembranous colitis
- recent radiotherapy
- full thickness bowel wall biopsy

The standard preparation includes

- (1) a 24-hour clear liquid diet
- (2) oral hydration;
- (3) a saline cathartic (e.g., magnesium citrate) in the afternoon;
- (4) an irritant cathartic (e.g., castor oil) in the early evening; and
- (5) a tap-water cleansing enema the morning of the radiographic examination (30 to 60 minutes before the barium enema).

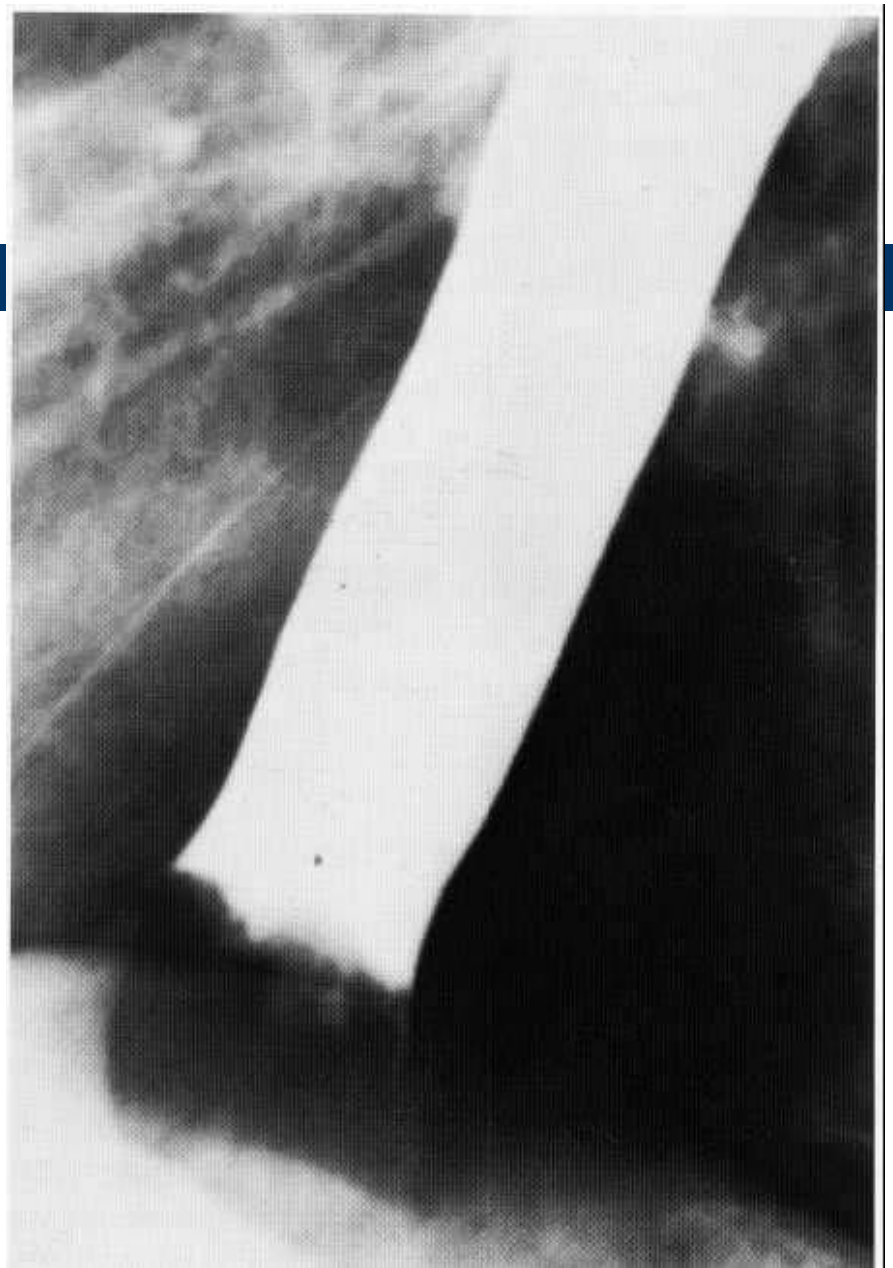

L
R
T
A
D
C
I
S
R



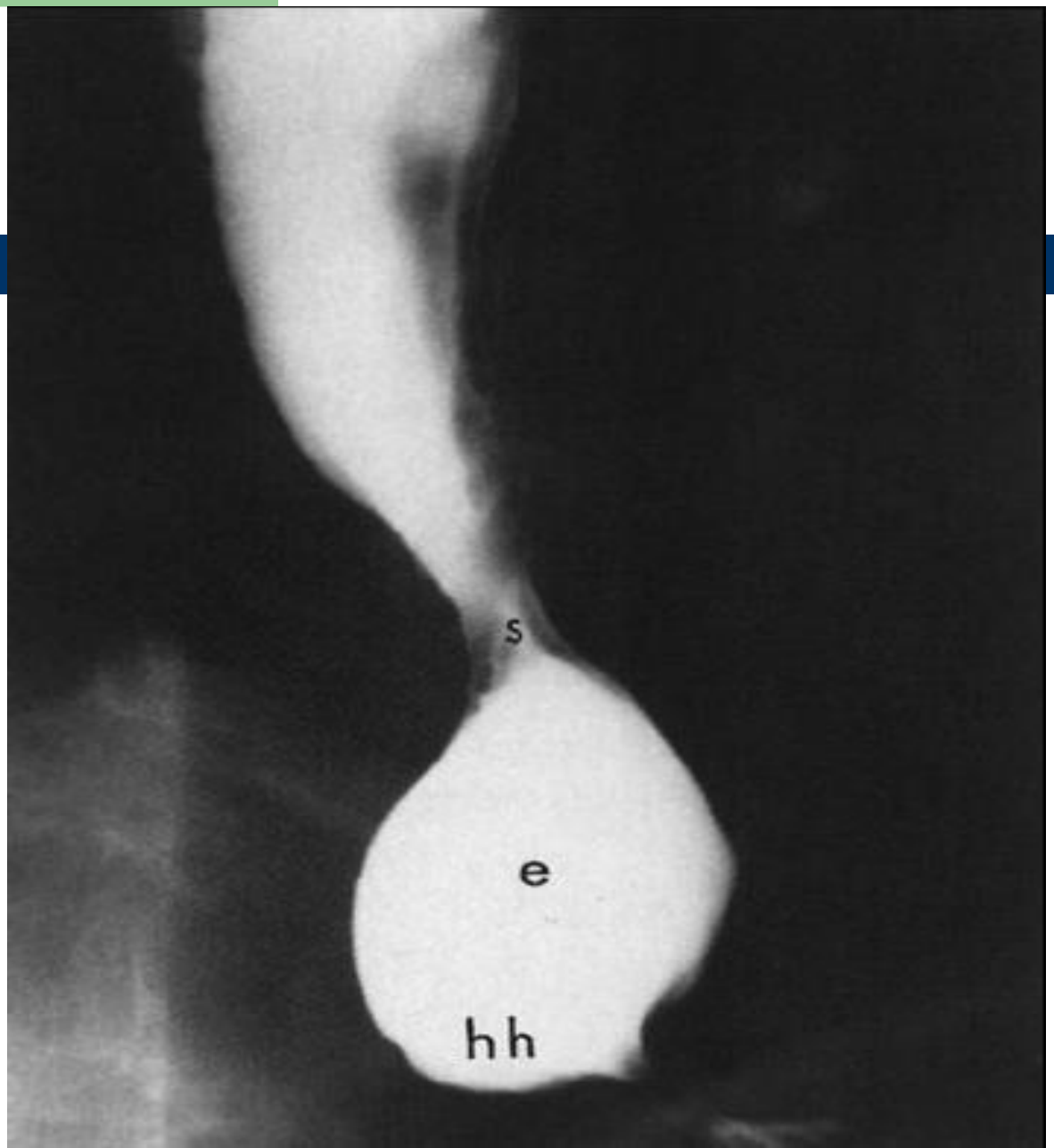
Carcinoma of oesophagus

- Irregular narrowing of the lumen with slight proximal dilatation

Lower oesophageal obstruction

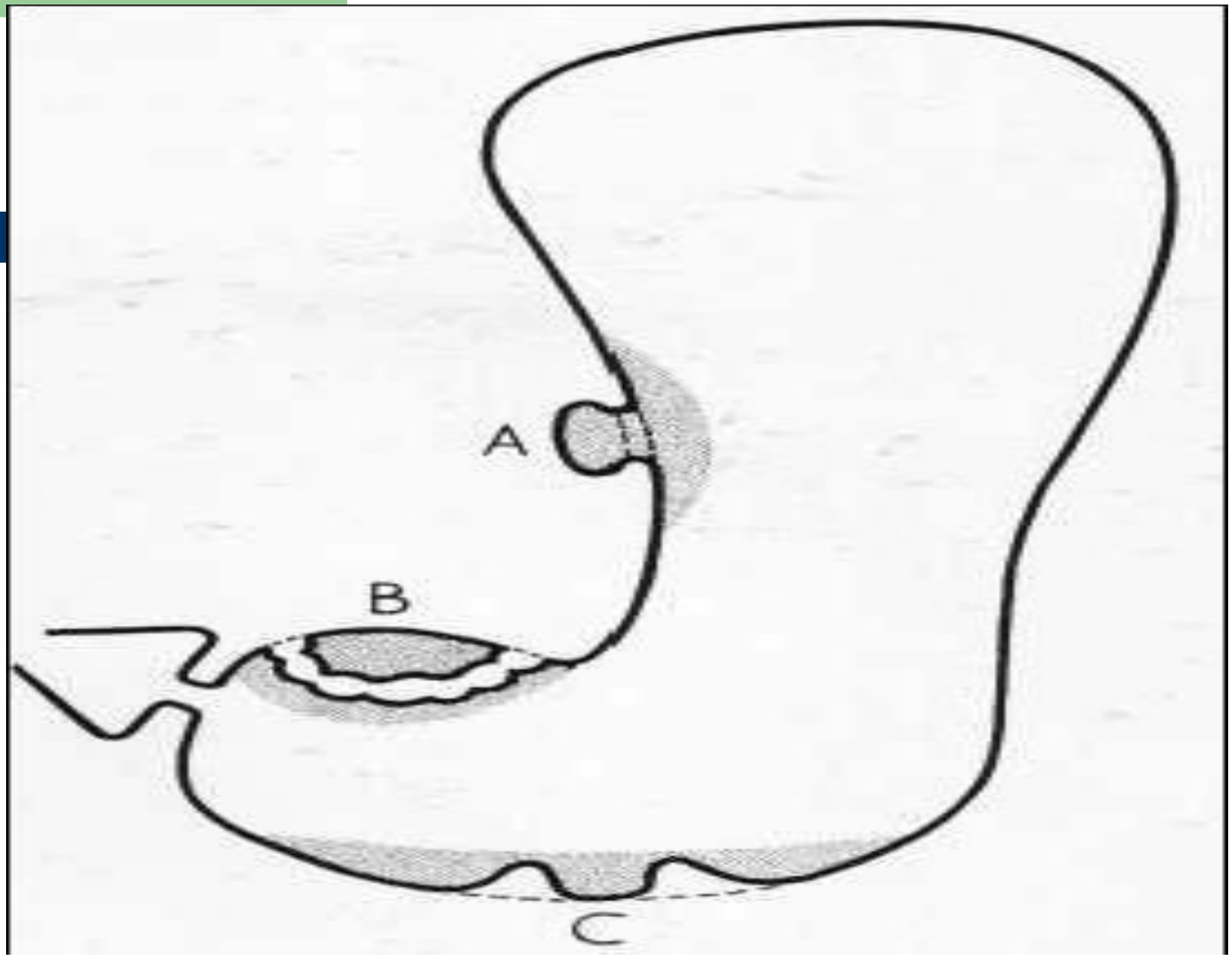


Benign stricture

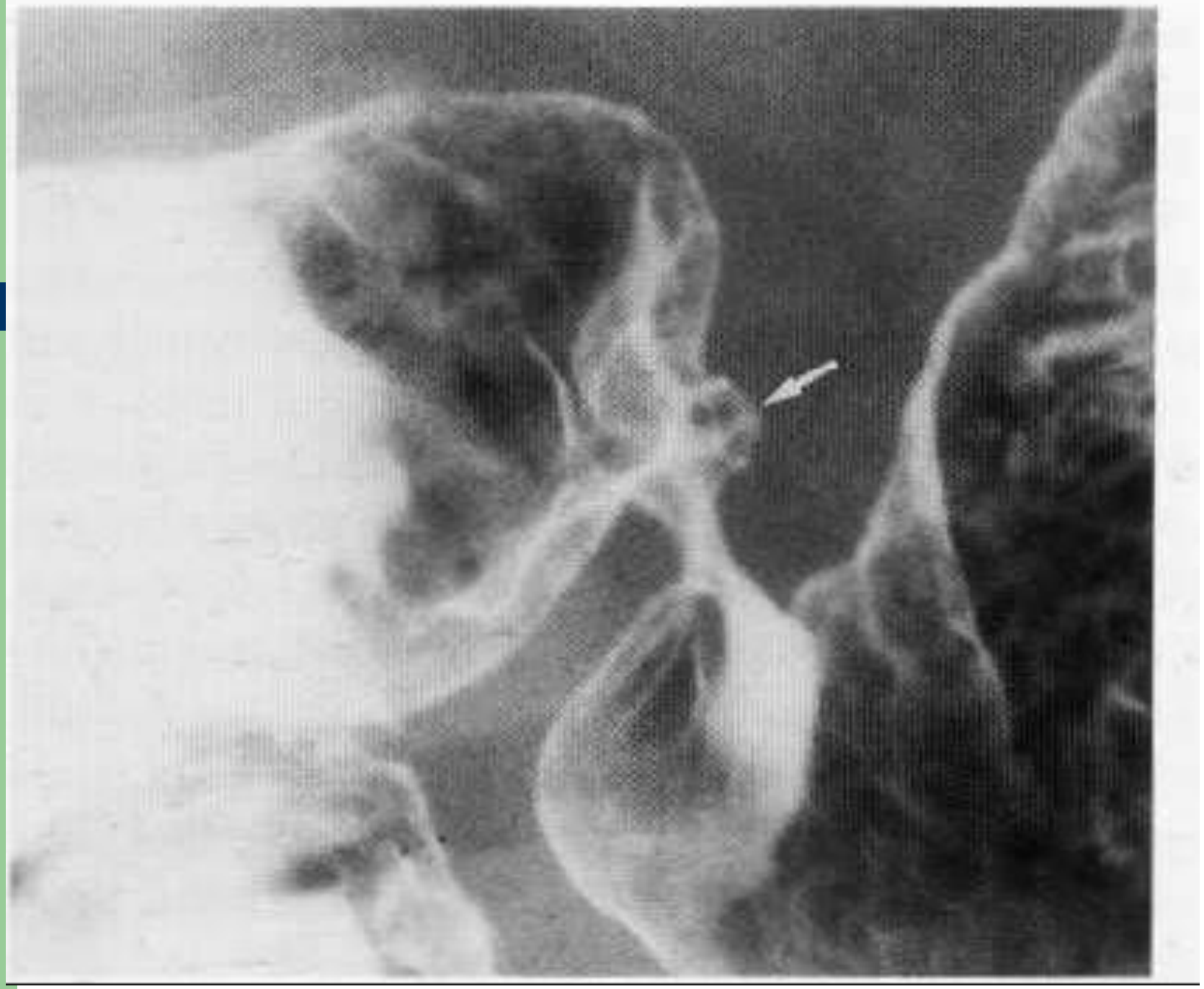


C

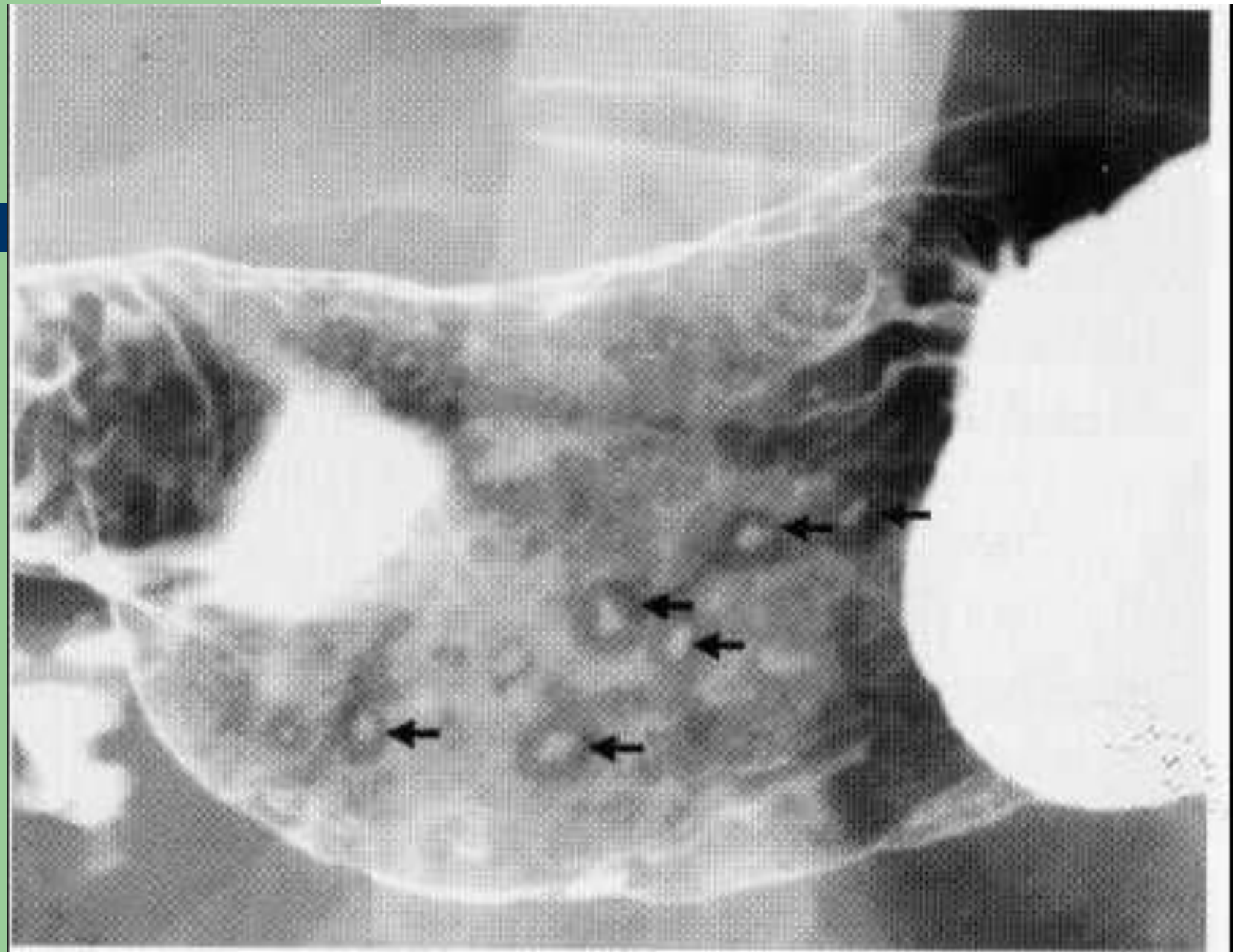
.A = benign;B = malignant; C = non-projecting benign;



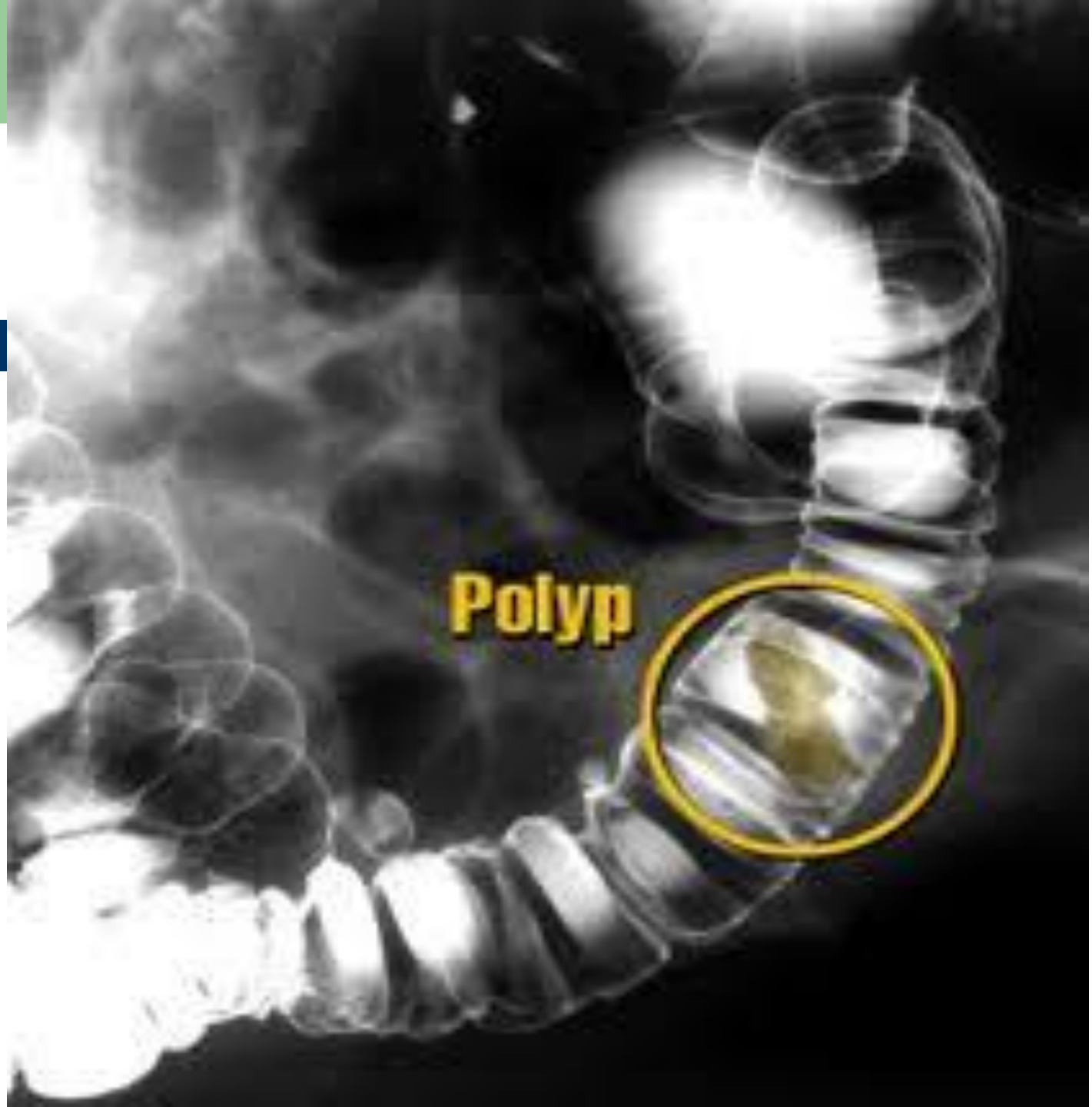

A

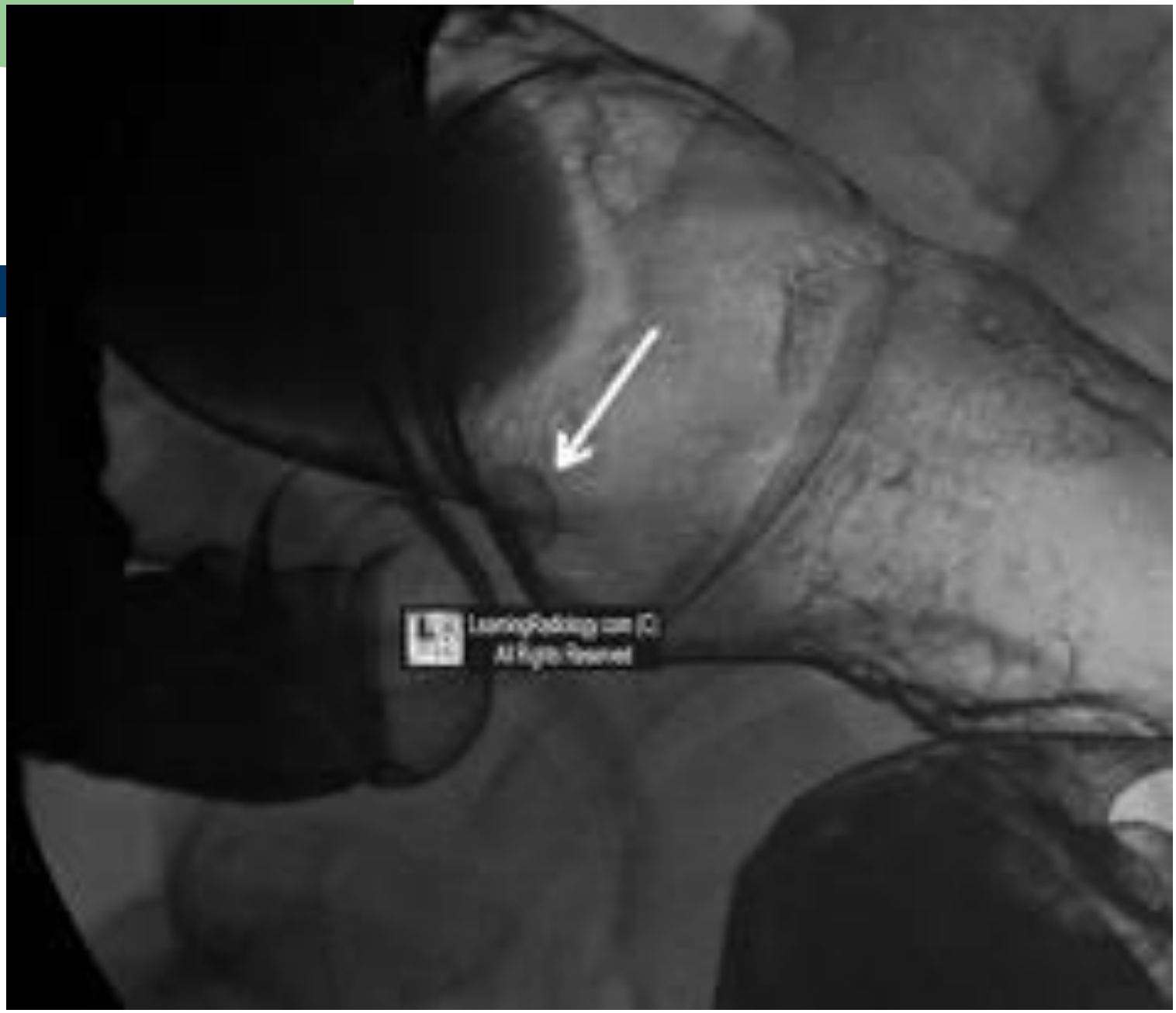


Acute erosive gastritis.




SCIENCEphotoLIBRARY


Polyp


LearningRadiology.com (C)
All Rights Reserved

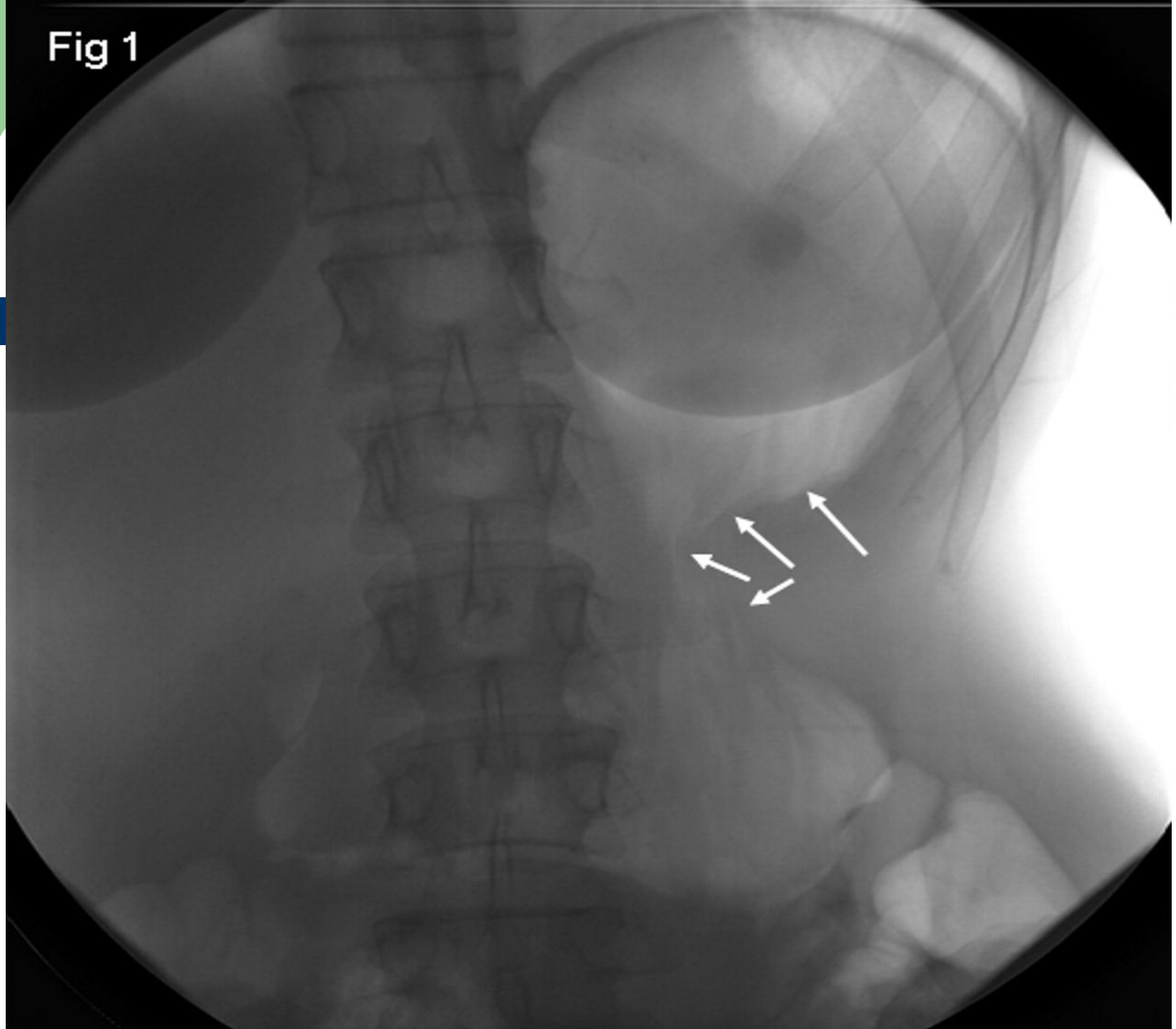


Fig 1