

Patient

- Male
- 76 year old
- C.C: abdominal pain



Bowel stool retention



Suspected pulmonary
TB at right upper lung

Infiltration in right
lower lung

Pleural thickening at the
Right chest

Localized dilated small
Intestine in left abdomen

Abdominal sonography

- Thickened gastric wall at antrum
- Diagnosis :
 - s/p cholecystectomy
 - s/p left nephrectomy
 - Thickened gastric wall (antrum), R/O gastric lesion
 - suggest PES

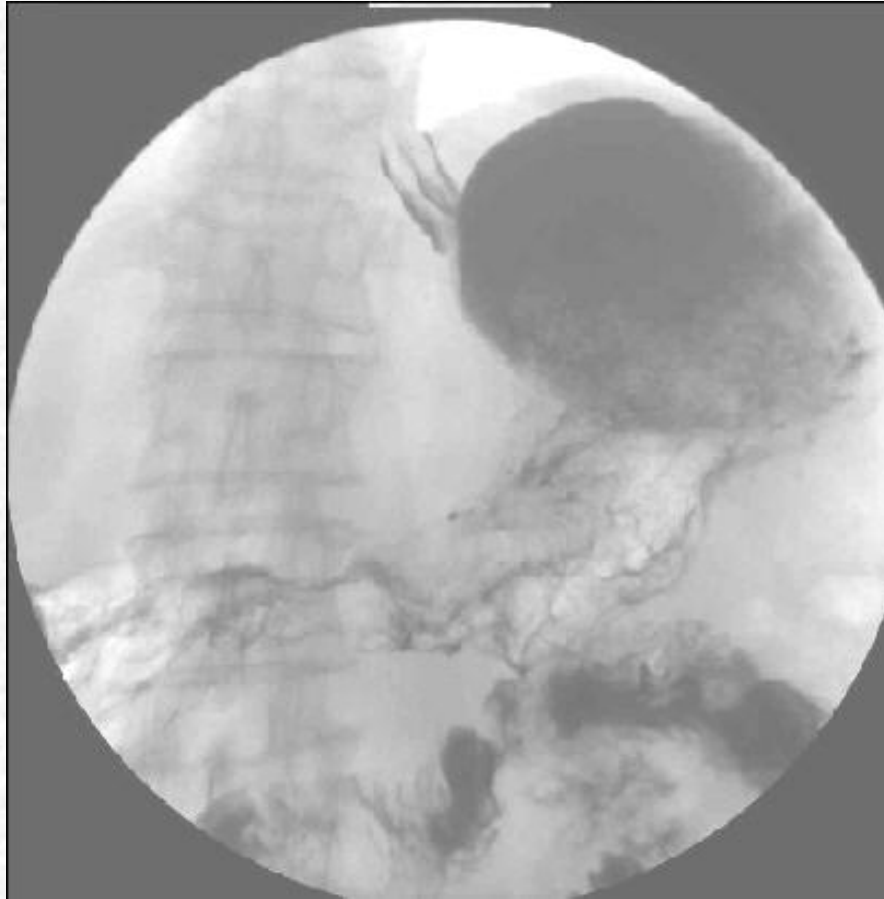
Endoscopic report

- ✓ Gaint folds formation on antrum and angle ,with shadow ulcers discrete on it.
- ✓ biopsy x6 to R/O lymphoma
- ✓ Impression:
 - (1)R/O lymphoma, antrum and angle
 - (2) R/O Gastric CA



No obvious flow obstruction
Loss of motility

Obvious annular narrowing
Of stomach, involving
Lower body, antrum, and
pylorus



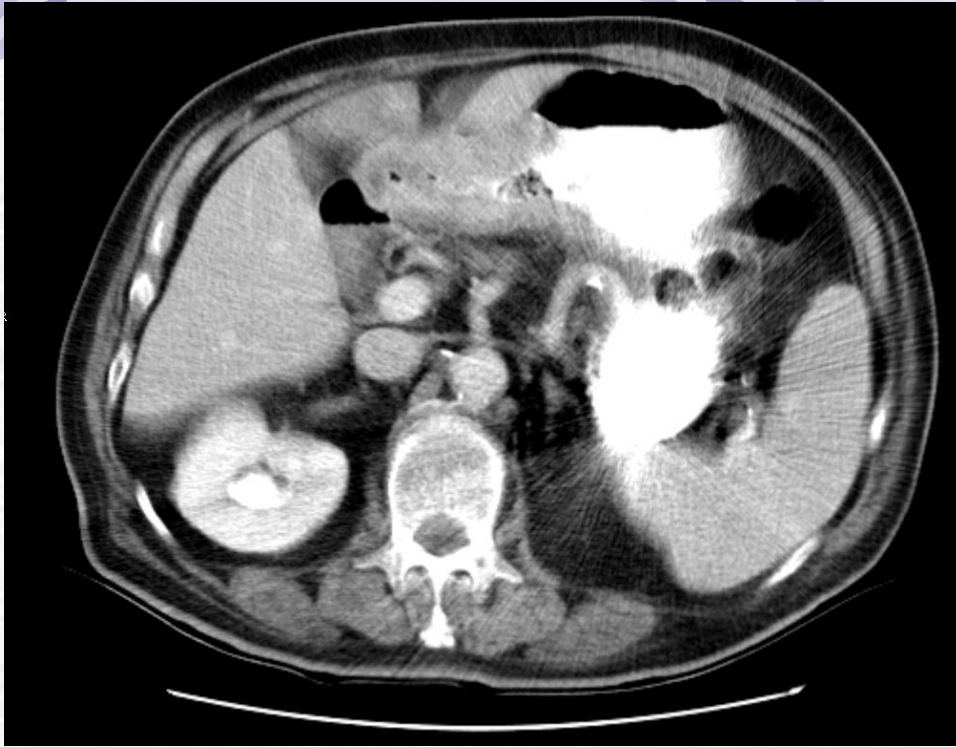
Infiltration of high body and 1st
Duodenum could not be ruled out

R/o gastric lymphoma
R/o gastric cancer with
linitis plastica



Marked distention stomach
Increased rigidity and aperistalsis





Diffusely gastric wall thickening with annular narrowing at lower body, Antrum, and pylorus

Nodular mucosal thickening
Also noted at high gastric body

Scirrous type gastric cancer
Should be considered

endoscopic biopsy

- Stomach, antrum and angle
- moderately to poorly differentiated adenocarcinoma
- solid tumor nests and occasional tubular pattern infiltrating in the gastric mucosa

D/D

- ✓ Gastric lymphoma
- ✓ Gastric carcinoma
 - early and advanced
- ✓ Gastric ulcer
 - benign and malignant
- ✓ GIST

Lymphoma

- Stomach: most common site for GI lymphoma
- Celiac disease
- H.pylori → MALT lymphoma (low grade B-cell lymphoma)
- >90 %: non-Hodgkin's lymphoma
- Polypoid, ulcerating, infiltrative types like gastric carcinoma

More specific types of Lymphoma

- ✓ Polypoid tumors: multiple, central ulceration (Bull's eye)
- ✓ Giant cavitating lesions
- ✓ Extensive infiltration: pronounced thickening of the gastric fold
- ✓ Submucosal infiltration: distensibility of stomach is preserved.



Gastric lymphoma: a bulky ulcerating tumor which perforate posteriorly to form a lesser sac abscess

CT features suggest lymphoma

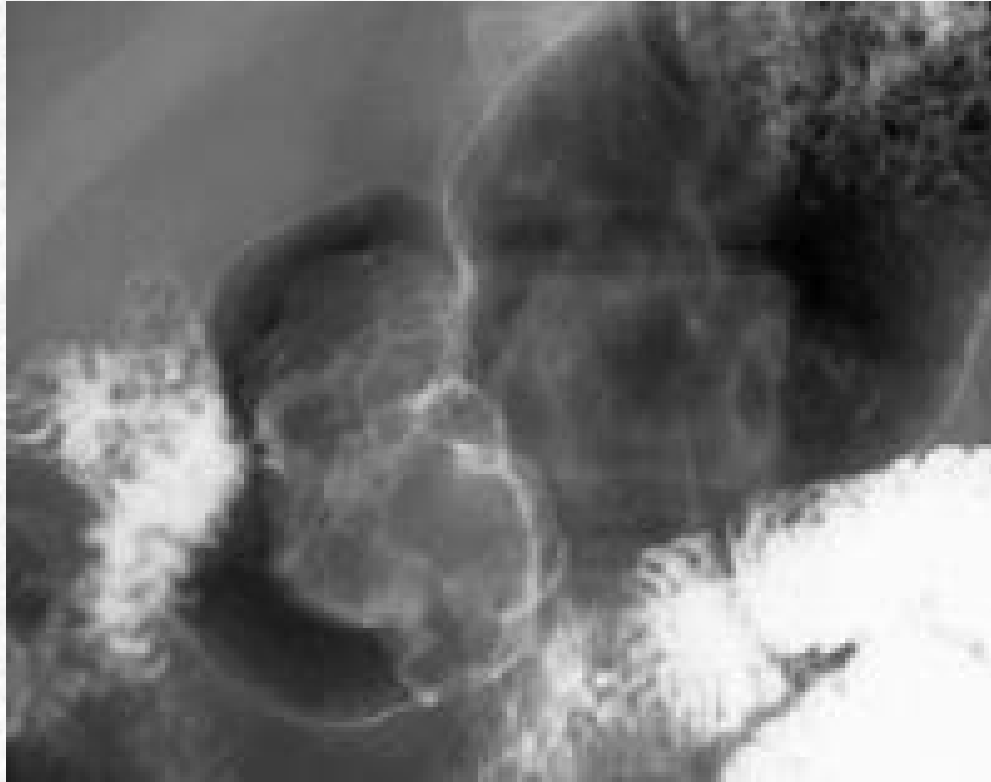
- ✓ Bulky tumor producing pronounced thickening of the gastric wall.(>4cm)
- ✓ Preservation of perigastric fat
- ✓ Significant growth outside the stomach
- ✓ Transpyloric spread
- ✓ Multicentricity
- ✓ Widespread nodal disease
- ✓ Splenic enlargement

Early gastric cancer

- Double-contrast upper GI examination is widely recognized as the radiologic technique of choice for diagnosing early gastric cancers. These lesions are confined to the mucosa or submucosa and are classified into 3 types:
- Type I lesions are elevated and protrude more than 5 mm into the lumen.
- Type II tumors are superficial lesions that are elevated (IIa), flat (IIb), or depressed (IIc).
- Type III early gastric cancers are shallow, irregular ulcers surrounded by nodular, clubbed mucosal folds.

Advanced carcinoma

- occasionally on plain KUB as abnormalities in the gastric contour or as soft-tissue masses indenting the gastric contour. Rarely, mucin-producing carcinomas may show areas of punctate calcification
- On barium studies, gastric carcinomas may be polypoidal, ulcerative, or infiltrating lesions.



- ← Polypoid carcinoma of the body of the stomach.
- lobulated masses that protrude into the lumen
- They may contain 1 or more areas of ulceration

Advanced ca (ulcerative type)

- irregular crater is located in a ring of malignant tissue. tumor nodules may be in the adjacent mucosal folds; the mucosal folds that converge to the edge of the ulcer may be blunted, nodular, or clubbed from tumor infiltration.
- these lesions are intraluminal, whereas benign ulcers project beyond the contour of the stomach. The radiating folds associated with a benign ulcer are regular and extend close to the ulcer



- Gastric ulcer with symmetrical, radiating mucosal folds. At histologic evaluation, no evidence of malignancy was observed.
- Endoscopy and biopsy are generally required to confirm or rule out malignancy in most cases of gastric ulcers.



- Infiltrating carcinoma involving the greater curve of the stomach.
- result in irregular narrowing of the stomach, with nodularity or spiculation of the mucosa

Special consideration

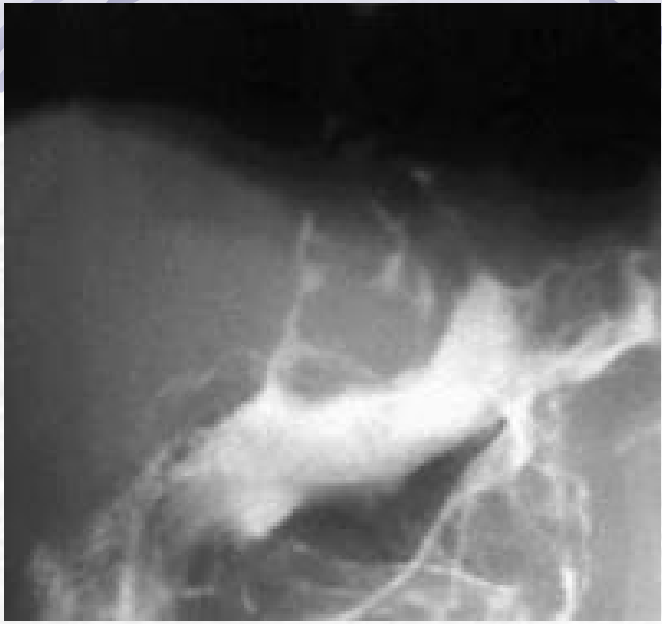
- Scirrhou carcinoma typically cause irregular narrowing and rigidity of the stomach, giving rise to the typical linitis plastica, or leather-bottle appearance.
- some are lobulated lesions in the fundus or body, others consist of thickened, irregular mucosal folds and nodularity without significant narrowing.



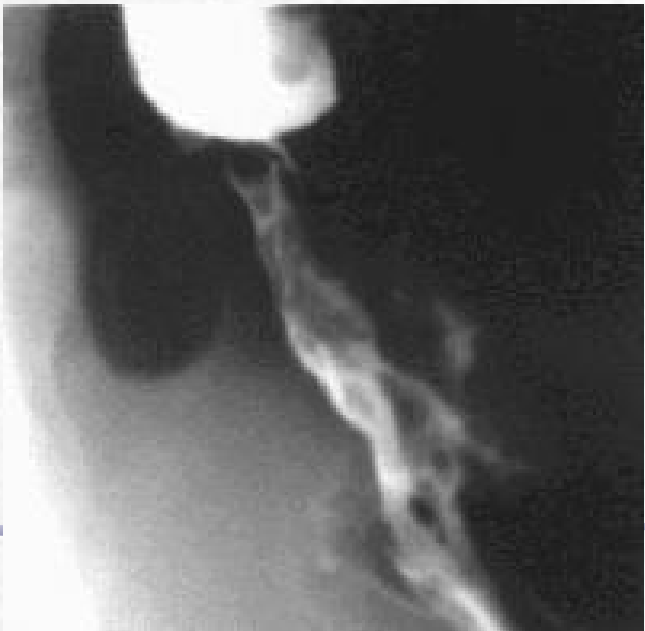
➤ Linitis plastica

Special consideration

- Carcinomas of the cardia are often missed during single-contrast examinations.
- In double-contrast studies, normal anatomic landmarks are obliterated and replaced by a plaquelike lesion with nodularity or ulceration.
- The distal esophagus is often involved



- Gastric carcinoma. Extensive carcinoma involving the cardia and fundus.



- Gastric carcinoma. Carcinoma of the cardia with involvement of the distal esophagus

Special consideration

- Submucosal spread of tumor may result in pseudo-achalasia or secondary achalasia with tapered, beaklike narrowing of the distal esophagus and infiltration of the gastric cardia.

Gastric ulcer

- usually seen as round or ovoid collections of barium
- can also be linear or rod or star shaped
- Linear ulcers are often observed in the healing stages.



- Gastric ulcer.
Image from an upper GI series.
A 1-cm lesser-curve ulcer is depicted en face.
Note the radiating mucosal folds.

Gastric ulcer

- Ulcers smaller than 5 mm may not be detected on barium studies
- Giant ulcers (>3 cm) have a greater risk of complications such as bleeding and perforation.
- A gastric diverticulum, which usually arises from the posterior wall of the fundus, should not be confused with a large ulcer.



← A 5-cm ulcer crater in the lesser curve of the stomach is depicted en face. The filling defects in the ulcer crater are due to a blood clot from recent bleeding.



← Large gastric diverticulum in the fundus.

Gastric ulcer

- Most benign ulcers are located in the lesser curve or posterior wall of the antrum or body of the stomach.
- Only about 5% of benign ulcers are located in the anterior wall or greater curvature.
- Antral ulcers are associated with younger patients and upper lesser-curve ulcers with the elderly.

Gastric ulcer

- The incidence of multiple gastric ulcers varies with the imaging technique.
- Single-contrast studies are associated with an incidence of 2-8%; double-contrast studies, about 20%; and endoscopy, as high as 30%.
- Multiple ulcers are more common in patients using aspirin or NSAIDs. Multiple gastric ulcers are usually located in the antrum or body.

Appearances suggestive of a benign ulcer

- The ulcer projects beyond the healthy lumen on the profile view.
- The margin of the ulcer crater is sharply defined and smooth en face.
- Any filling defect that surrounds the ulcer, as a result of edema, is smooth and symmetric and merges with the healthy mucosa.
- The mucosal folds radiate to the edge of the ulcer.



Benign
ulcer

Appearances suggestive of malignancy

- The ulcer crater has an intraluminal location. Exceptions are ulcers in the antrum or greater curvature, where benign ulcers are often drawn inward because of muscle spasm in the adjacent stomach wall.
- The margins may be irregular and nodular.
- The ulcer crater is surrounded by an asymmetric mass that has an abrupt outer border with the healthy mucosa.
- Clubbed mucosal folds terminate short of the ulcer crater.
- Ulcers in the fundus are rare, and almost all are malignant.



- Image from an upper GI series shows gastric ulceration with coarse irregular mucosal folds. Histologic evaluation revealed an adenocarcinoma.

GIST

- subset of GI mesenchymal tumors of varying differentiation.
- classified as GI leiomyomas, leiomyosarcomas, leiomyoblastomas, or schwannomas as a result of their histologic findings and apparent origin in the muscularis propria layer of the intestinal wall

GIST

- barium-enhanced images demonstrate predominantly intramural masses with potential exophytic components.
- The tumor margins usually are smooth, but with ulceration, some surface irregularity is present.
- En face, the intraluminal surfaces often have well-defined margin



- Gastric gastrointestinal stromal tumor in a 49-year-old woman. The mass was found incidentally during an upper GI workup for peptic disease. The smooth appearance suggests a submucosal process.



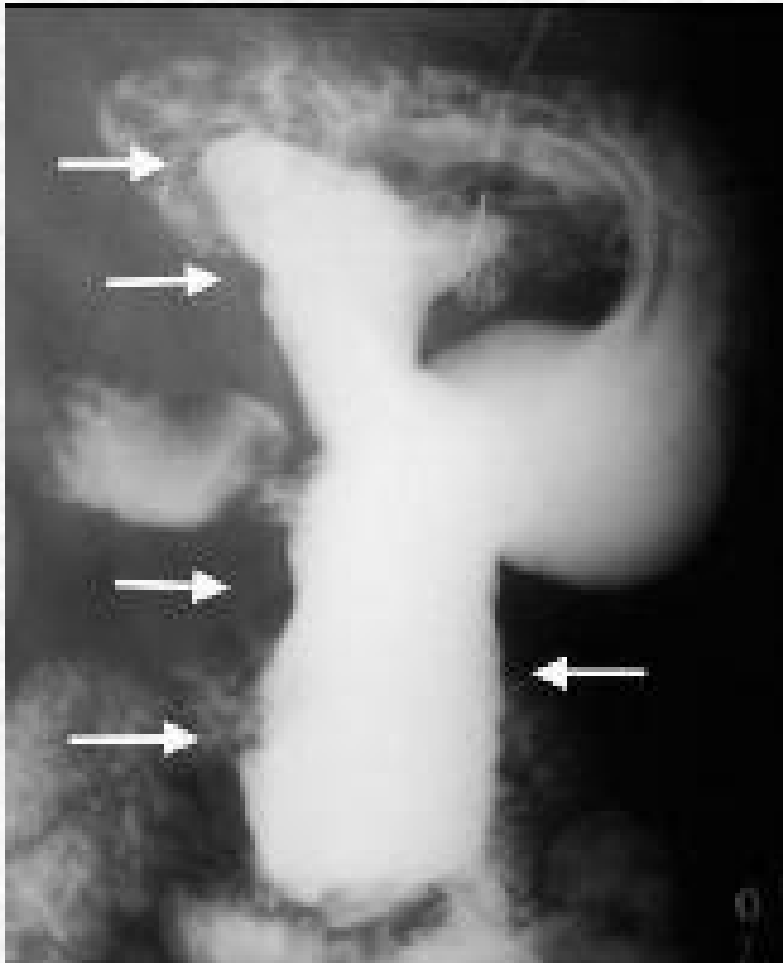
Gastric gastrointestinal stromal tumor (GIST) en face. Upper GI image obtained during the single contrast enhancement portion shows an incidentally found mass. The smooth borders suggest a submucosal process. At surgery, a GIST was found.

GIST

- Because the tumors are intramural but extramucosal, the overlying mucosa can be intact.
- However, overlying mucosal ulcerations are often present; they are more common in malignant GISTs. These ulcerations fill with barium, causing a bull's eye or target-lesion appearance.



- Gastrointestinal stromal tumor with central bull's eye appearance, which is compatible with contrast material collection in an ulceration.

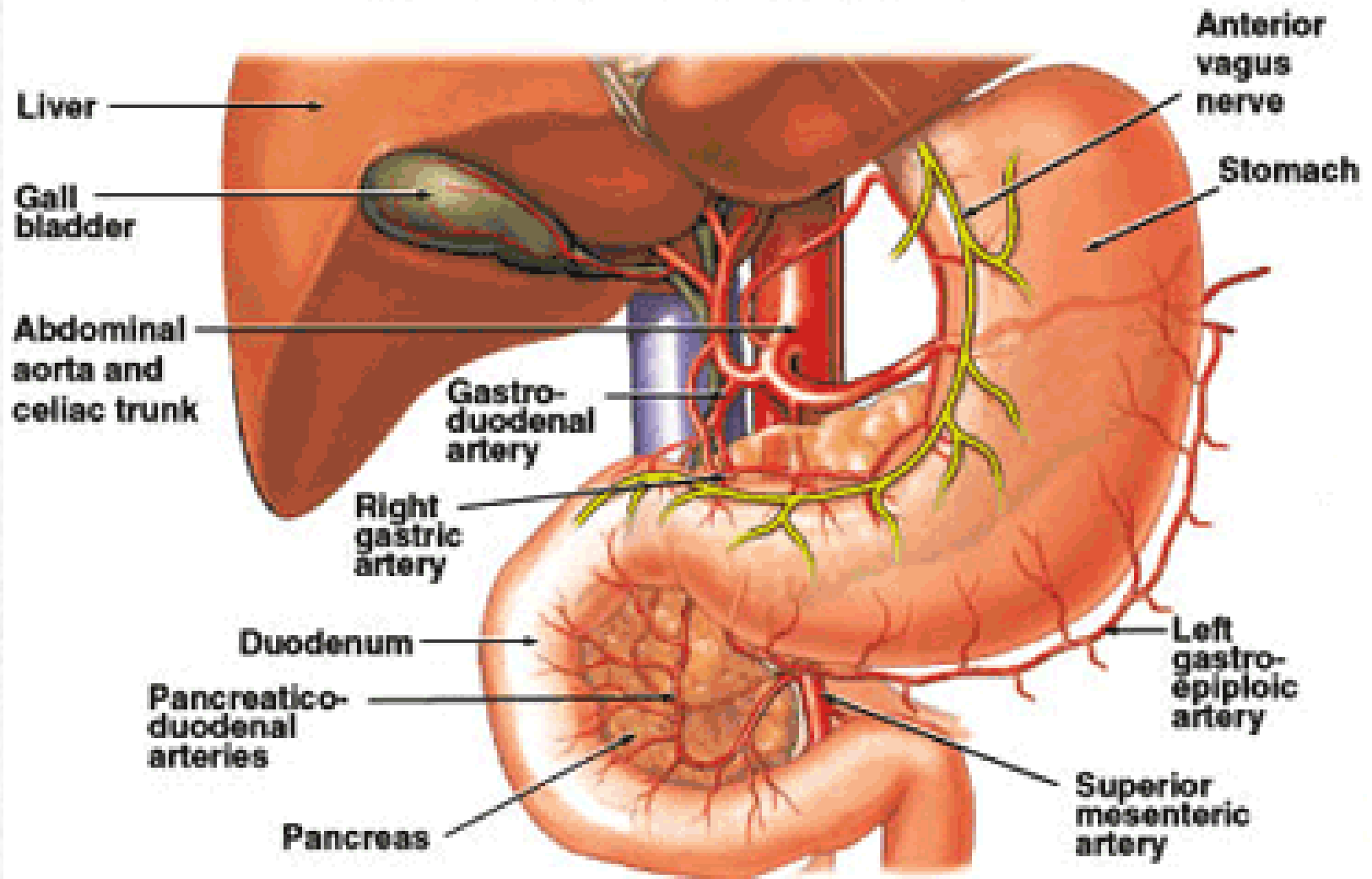


- If necrosis and cavitation are present, barium may fill the inner parts of the tumor mass
- Gastric gastrointestinal stromal tumor with huge exophytic component, which has become ulcerated. Barium collects in the exophytic ulcer crater

Discussion (background)

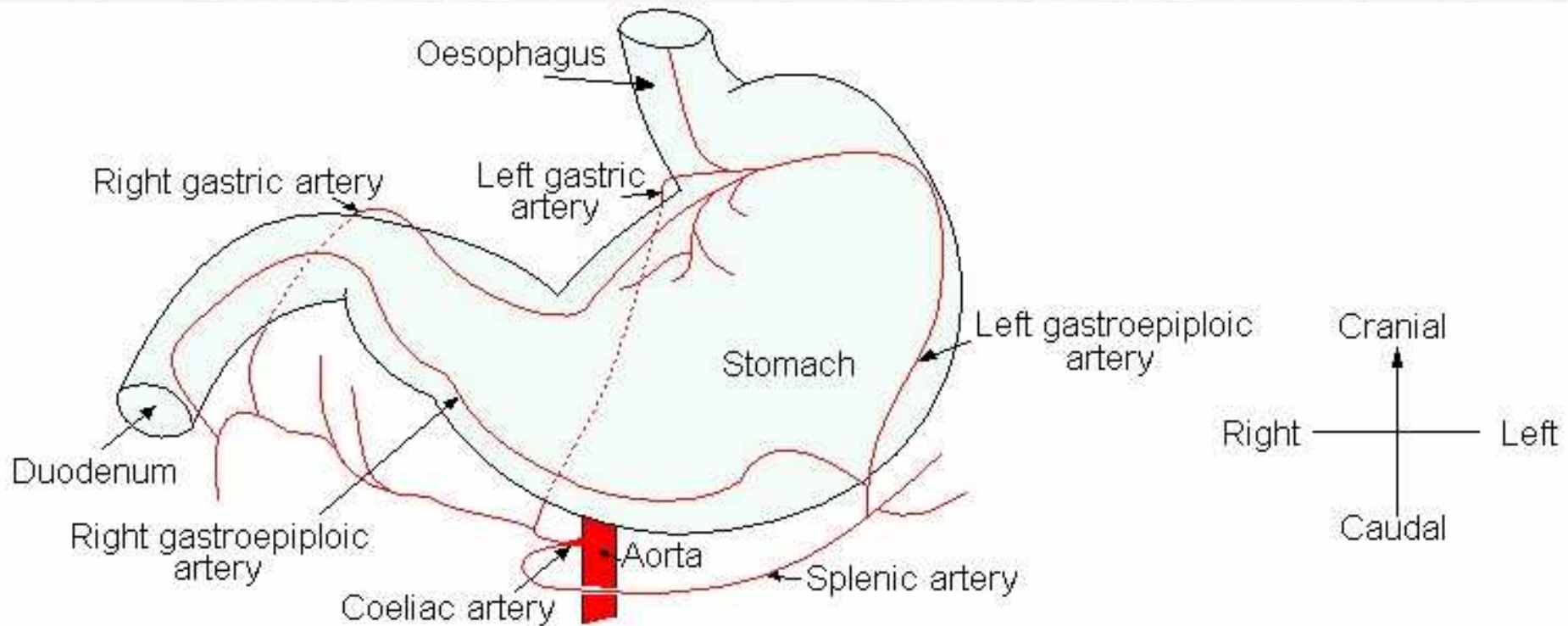
- second most common cause of cancer-related death in the world
- right portion of the anterior gastric surface is adjacent to the left lobe of the liver and the anterior abdominal wall. left portion of the stomach is adjacent to the spleen, the left adrenal gland, the superior portion of the left kidney, the ventral portion of the pancreas, and the transverse colon

Anatomy of the Stomach



Anterior View

Blood supply



Lymph node



Race

- higher in Asian countries than in the United States
- in many Asian studies, patients with resected stage II and III disease tend to have better outcomes than similarly staged patients treated in Western countries
- median age at diagnosis is 65 years

Clinical symptoms

- Early disease has no associated symptoms
- Most symptoms of gastric cancer reflect advanced disease
- indigestion, nausea or vomiting, dysphagia, postprandial fullness, loss of appetite, and weight loss.

Physical examination

- All physical signs are late events
- succussion splash; primary mass (rare); and enlarged liver
- signs of weight loss
- pallor from bleeding and anemia

Risk factors

- *Helicobacter pylori* infection, previous gastric surgery, pernicious anemia, adenomatous polyps, chronic atrophic gastritis, genetic factors, and previous radiation therapy

Lab studies

- A complete blood cell count can identify anemia
- 30% of patients have anemia

Image

- Esophagogastroduodenoscopy
- Double-contrast upper GI series
- Chest radiograph
- CT scan or MRI of the chest, abdomen, and pelvis
- Endoscopic ultrasound: useful as a staging tool when the CT scan fails to find evidence of T3, T4

Classification

- The Borrmann system has 5 categories: type I tumors are polypoid or fungating; type II are ulcerating lesions surrounded by elevated borders; type III have ulceration with invasion of the gastric wall; type IV are diffusely infiltrating (ie, linitis plastica); and type V cannot be classified

- ✓ Primary tumor
- ✓ TX = primary tumor (T) cannot be assessed
- ✓ T0 = no evidence of primary tumor
- ✓ Tis = carcinoma in situ, intraepithelial tumor without invasion of lamina propria
- ✓ T1 = tumor invades lamina propria or submucosa
- ✓ T2 = tumor invades muscularis propria or subserosa
- ✓ T3 = tumor penetrates serosa (ie, visceral peritoneum) without invasion of adjacent structures
- ✓ T4 = tumor invades adjacent structures

Staging

- Regional lymph nodes
- NX = regional lymph nodes (N) cannot be assessed
- N0 = no regional lymph node metastases
- N1 = metastasis in 1-6 regional lymph nodes
- N2 = metastasis in 7-15 regional lymph nodes
- N3 = metastasis in more than 15 regional lymph nodes

- ✓ Distant metastasis
- ✓ MX = distant metastasis (M) cannot be assessed
- ✓ M0 = no distant metastasis
- ✓ M1 = distant metastasis

Prognostic factors

- ▮ depth of cancer invasion through the gastric wall
- ▮ absence of regional lymph node involvement

Treatment

- **Surgery:** randomized trial comparing subtotal with total gastrectomy for distal gastric cancer revealed similar morbidity, mortality, and 5-year survival rates
- maintain a 5-cm surgical margin proximally and distally to the primary lesion, due to extensive lymphatic network

Treatment

- Lymph node dissection: controversial
- 5-year survival rate for a curative surgical resection ranges from 30-50% for patients with stage II disease and from 10-25% for patients with stage III disease
- adjuvant therapy
- postoperative chemoradiotherapy

Prognosis

- most patients undergo a surgical resection experience a tumor recurrence and die
- radiotherapy is to provide additional local-regional tumor control
- Adjuvant chemotherapy is used either as a radiosensitizer or as definitive treatment for presumed systemic metastases

Prognosis

- Some authors suggest that intraoperative radiotherapy (IORT) shows promising results