Carcinoma stomach

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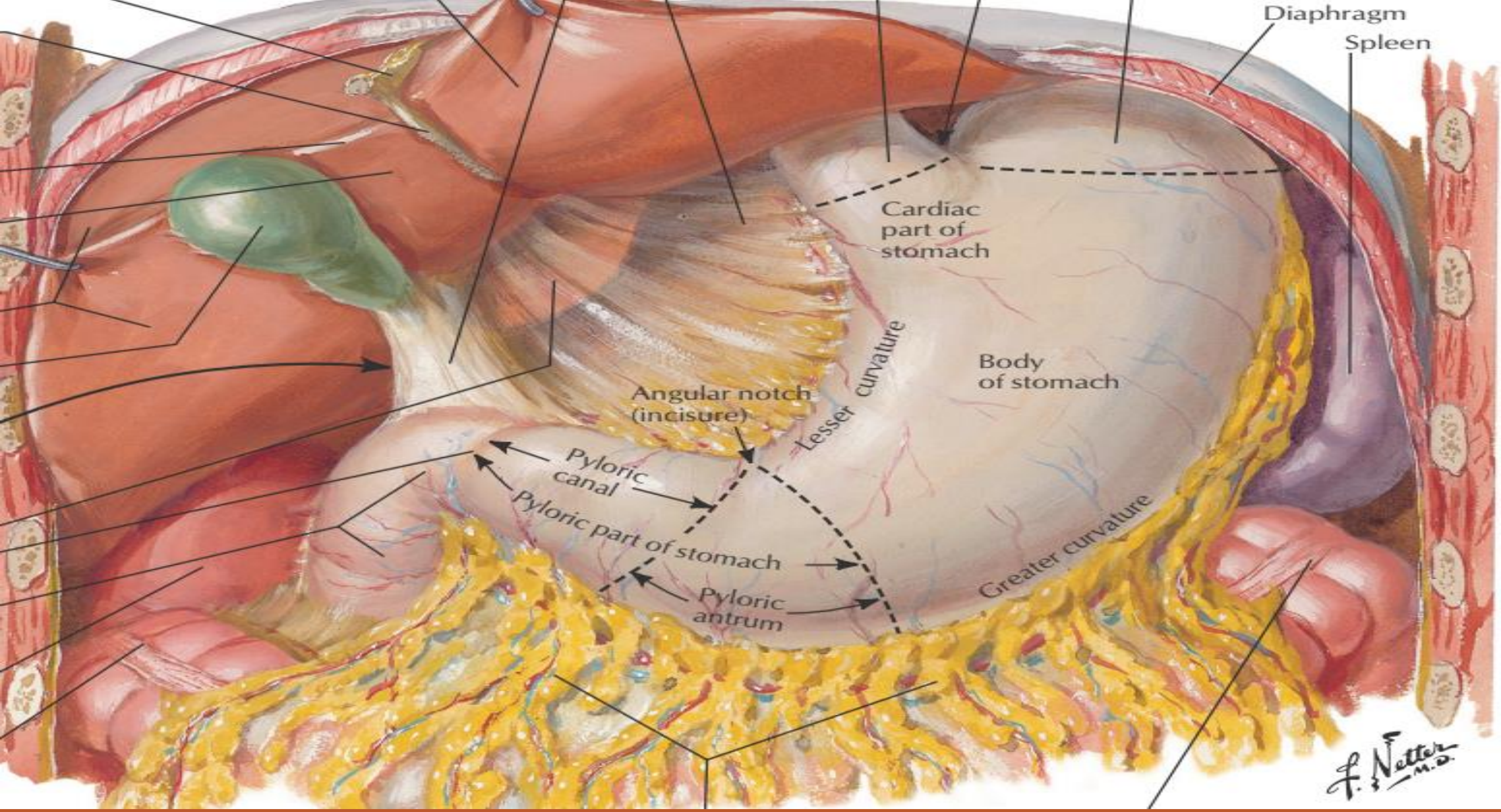
DEPT OF SURGERY

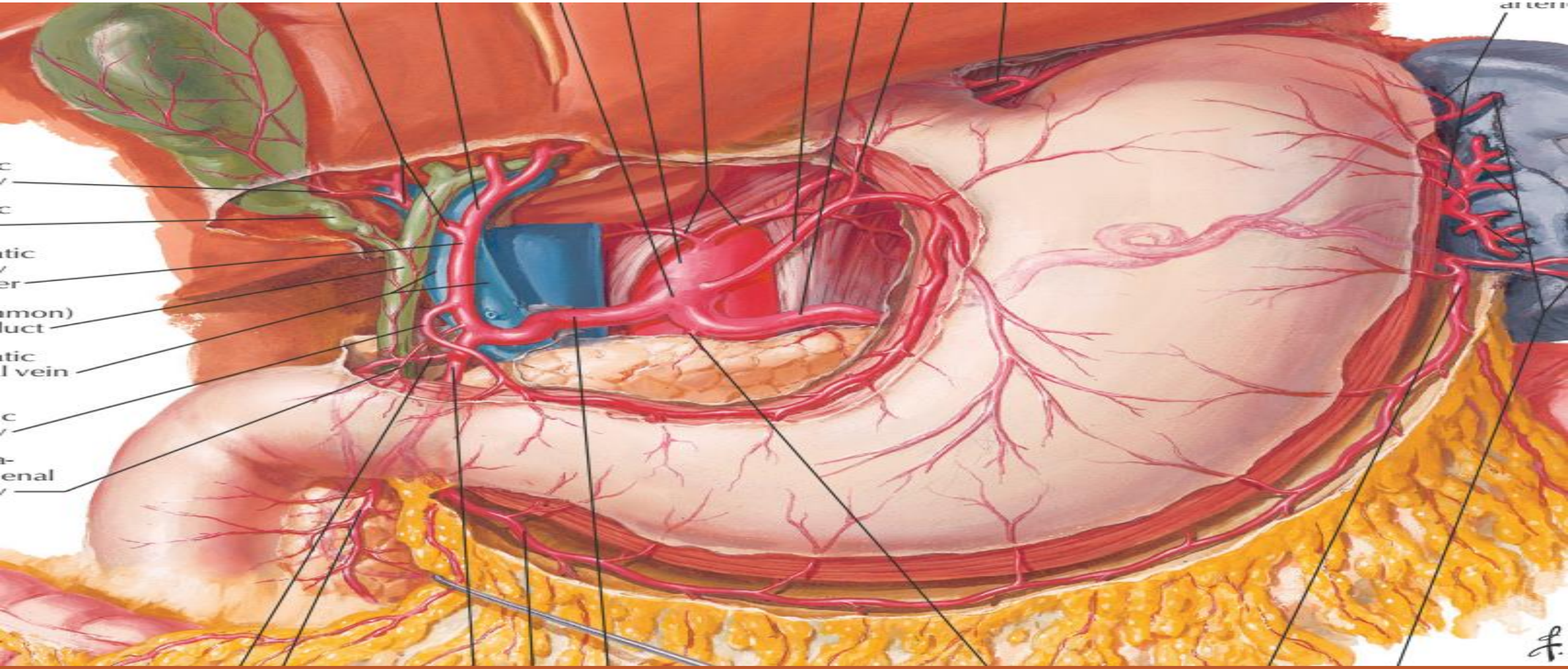
VMCHRI

Anatomy

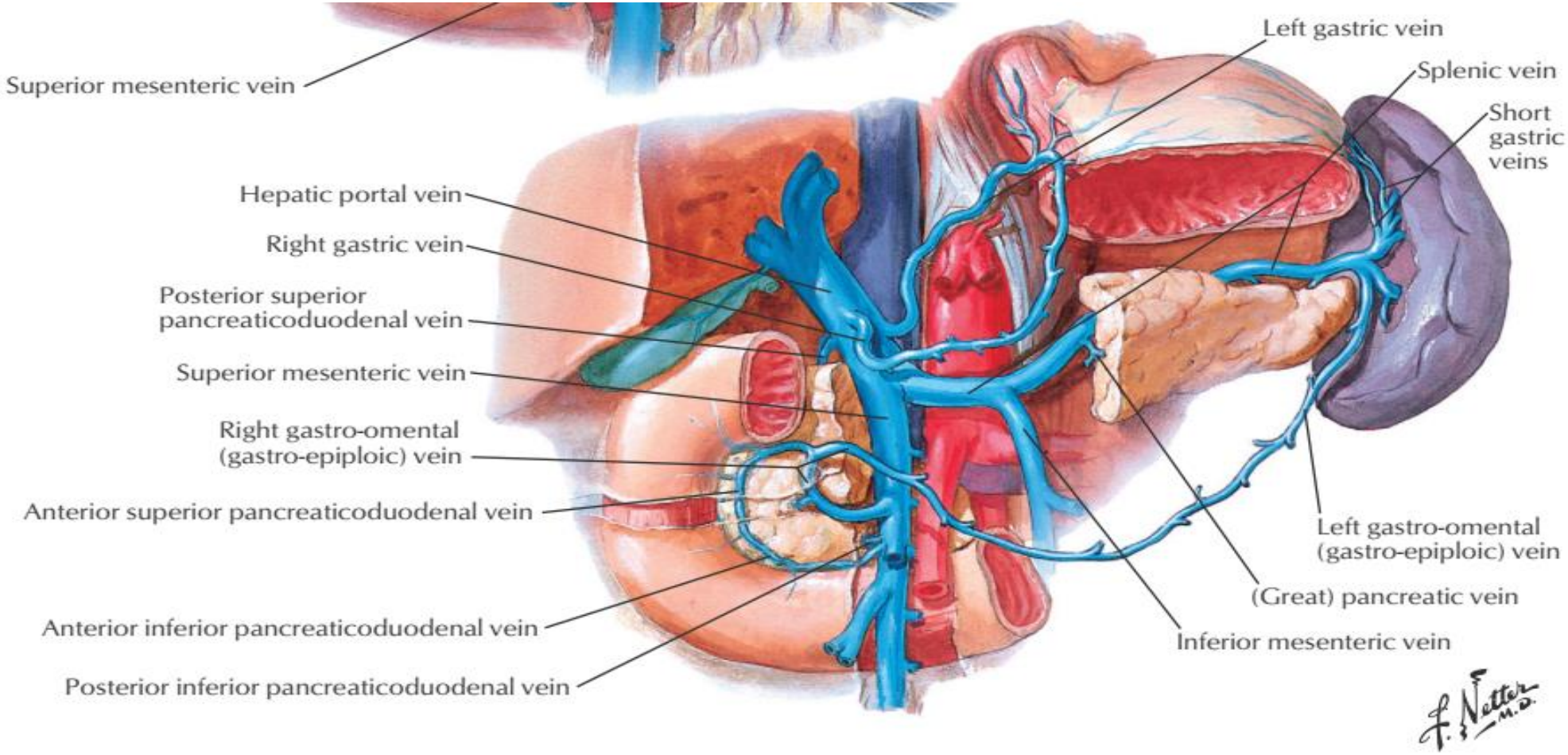
- Stomach is a distended portion of foregut act as reservoir of ingested food and initiate the digestion process by antral milling.
- It is bounded above by diaphragm and laterally by spleen ,medically by liver and inferiorly by transverse colon.
- Upper and lower portions are fixed but middle part is freely mobile.


Diaphragm
Spleen
Cardiac part of stomach
Lesser curvature
Body of stomach
Angular notch (incisure)
Pyloric canal
Pyloric part of stomach
Pyloric antrum
Greater curvature
F. Netter M.D.

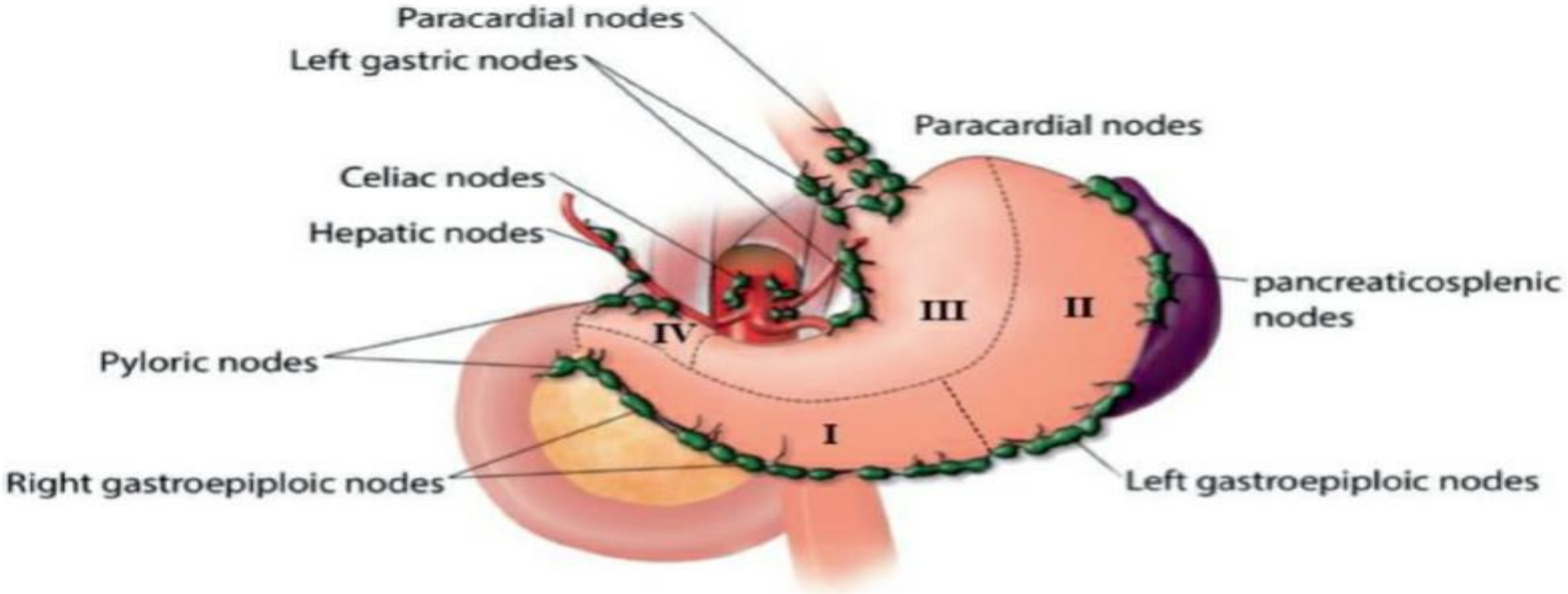
Arterial supply



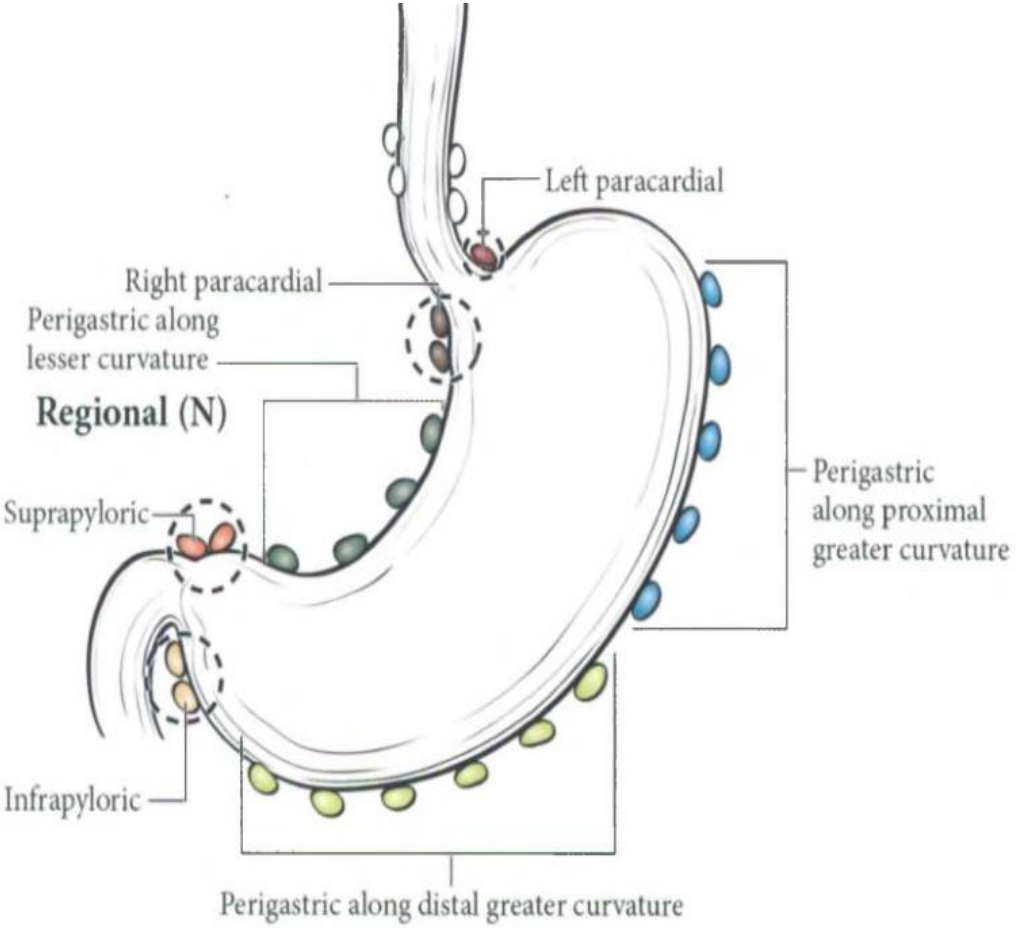
Venous drainage

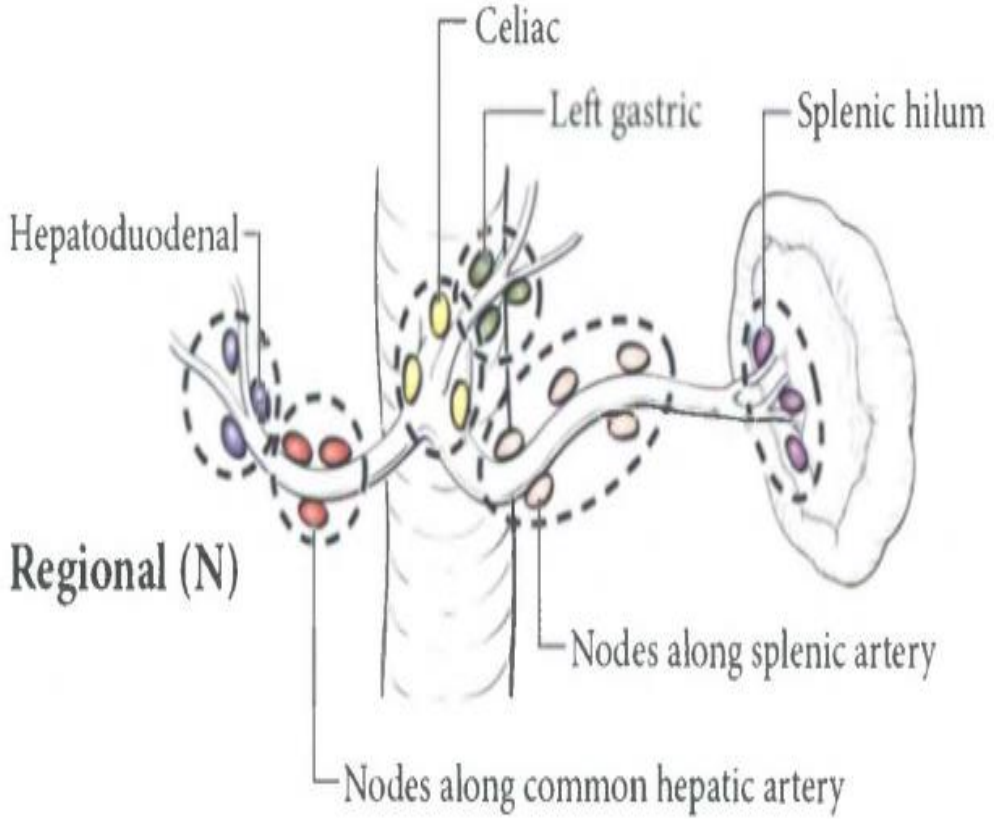


Lymphatic drainage



Lymph node stations





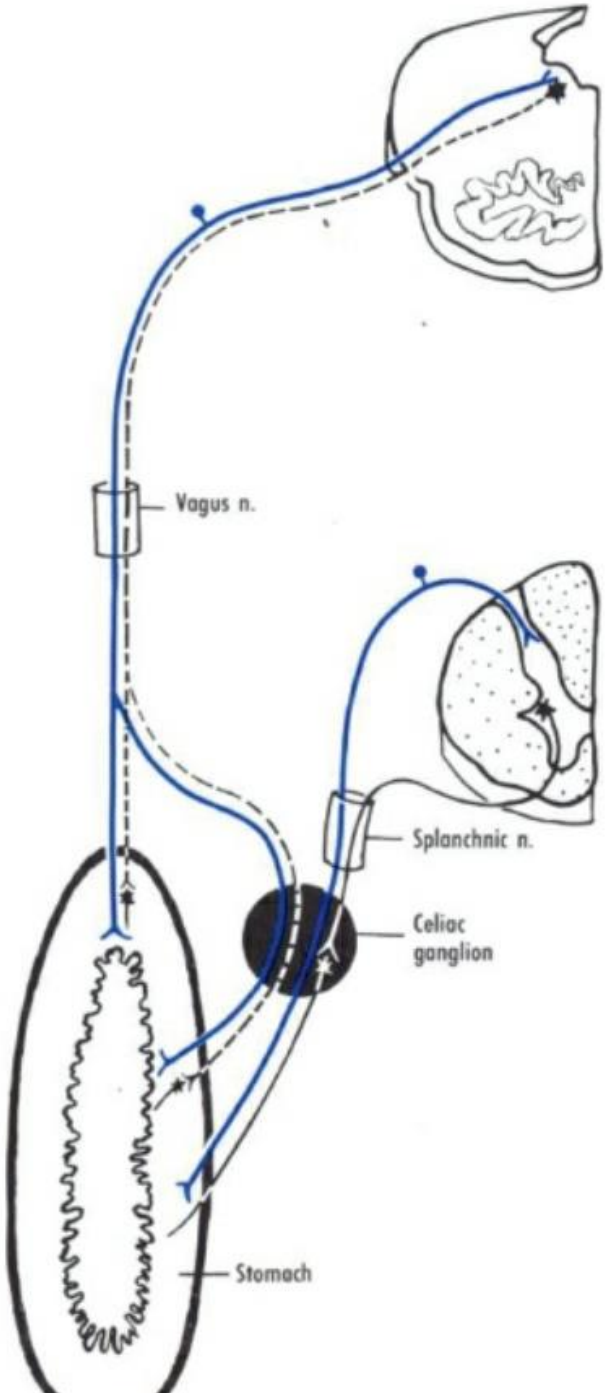
Nerve supply

Stomach contains two groups of nervous system

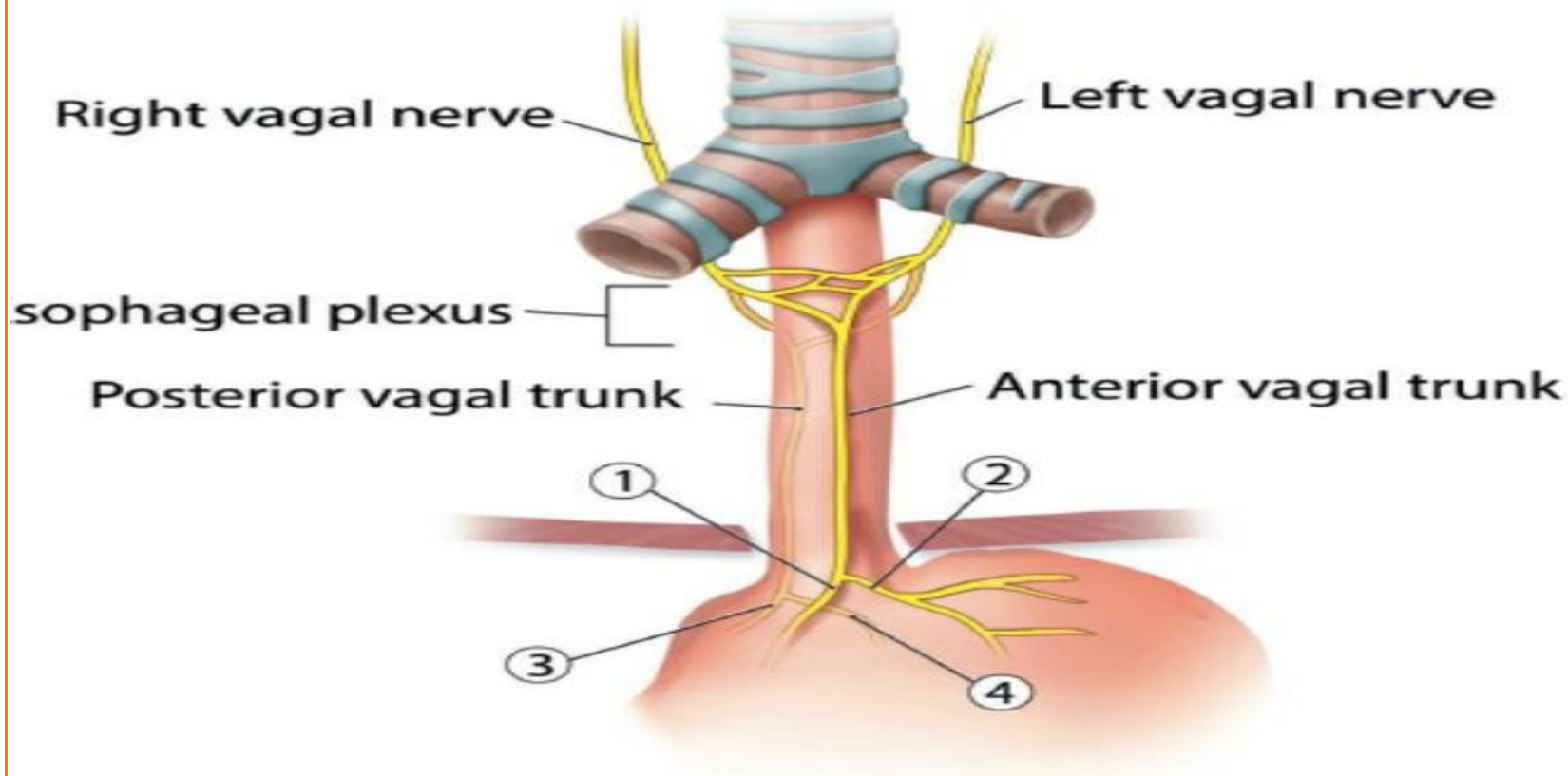
- Intrinsic nervous system :

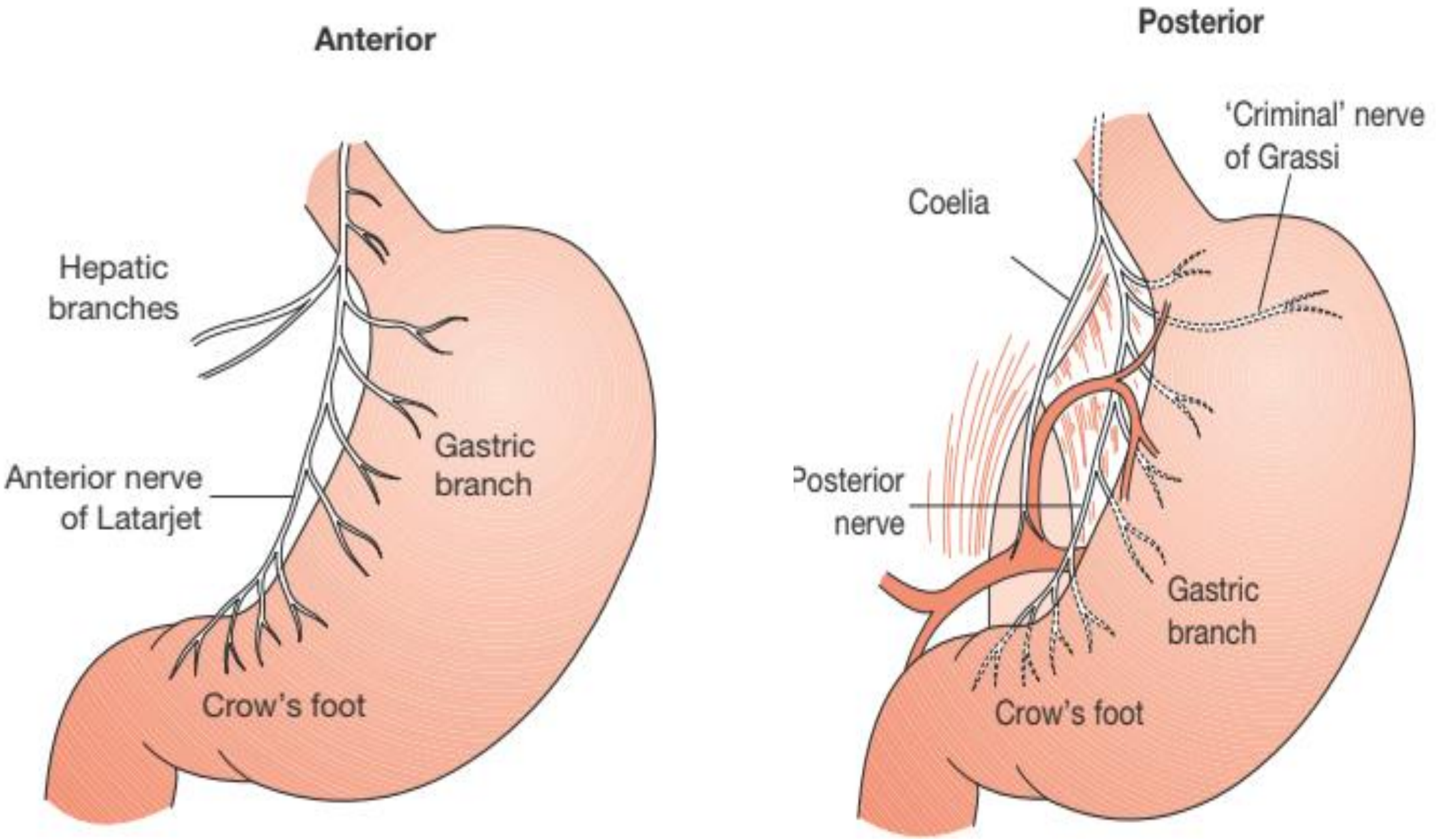
    1)Meisner’s submucosal plexus- controls secretion of glands

    2) Auerbach’s myenteric plexus- controls intrinsic motility



- Extrinsic nervous system:
  1) Parasympathetic- anterior & posterior
     Vagal trunk
  2) Sympathetic- celiac ganglion.

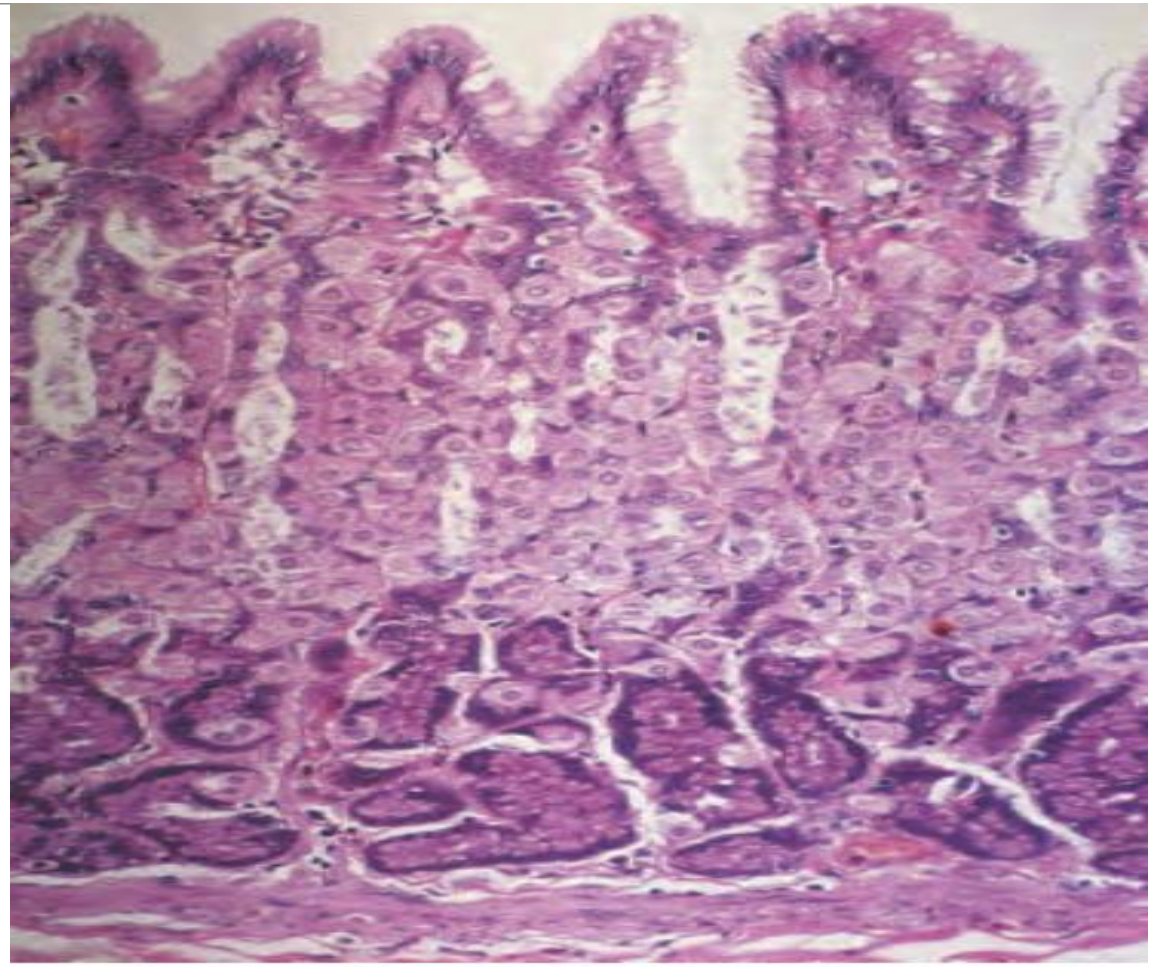



Anterior
Hepatic branches
Gastric branch
Anterior nerve of Latarjet
Crow's foot
Posterior
'Criminal' nerve of Grassi
Coelia
Posterior nerve
Gastric branch
Crow's foot

Microscopic anatomy

Cells in stomach

- Goblets cells
- Parietal cells
- Chief cells
- Endocrine cells (G cells & ECL)
- D cells



Epidemiology

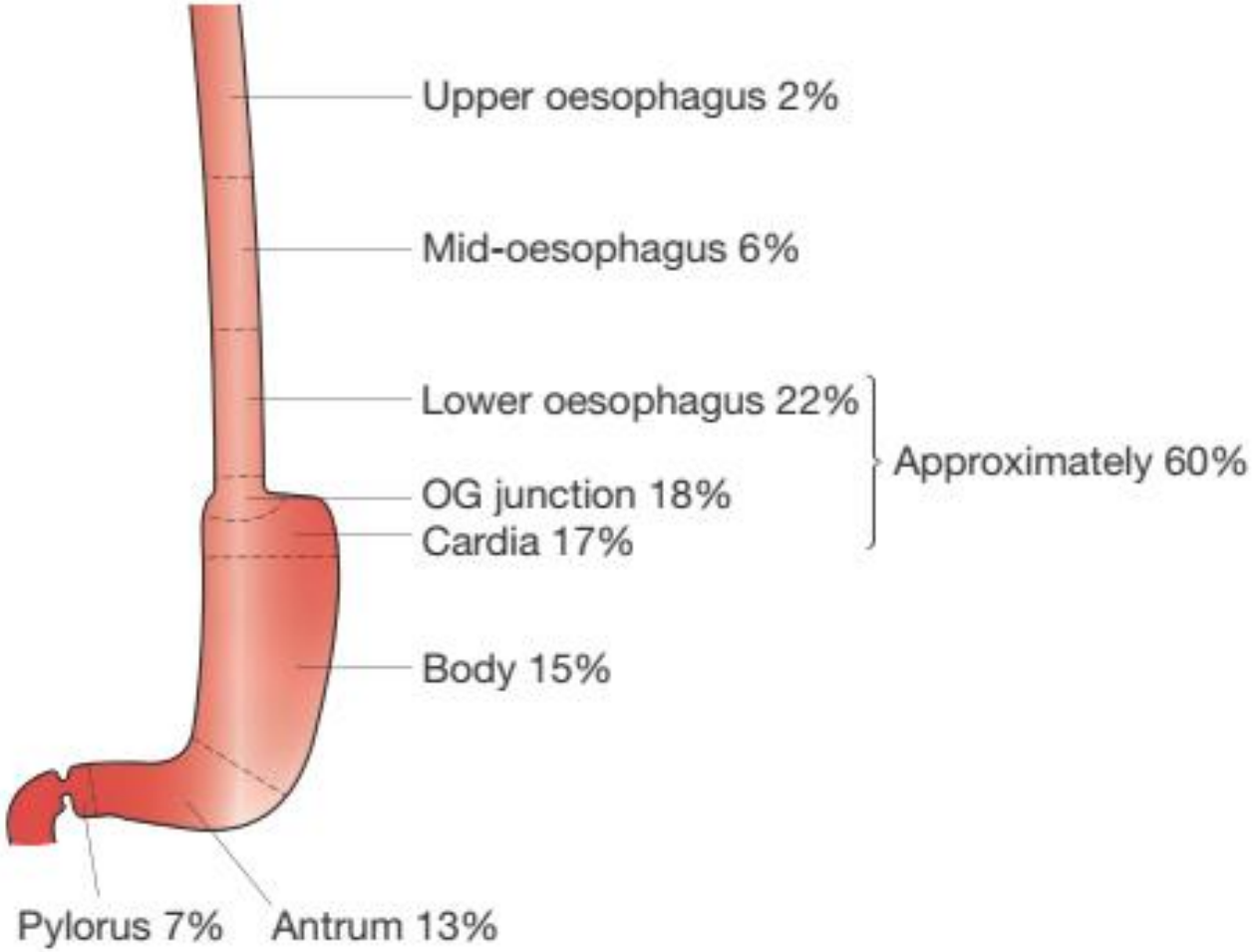
- Fourth most common cancer worldwide.
- Second leading cause of cancer deaths.
- Disease of older individuals, peak incidence at there’re 6th decade.
- Men >>> women.
- Most common cancer in japan- their disease specific mortality reduced to 50%
- Majority are distal gastric cancer.

Risk factors

- Male sex
- Smoked ,salted food(N – intra so compounds)
- Low fat ,protein and anti- oxidants
- High complex carbohydrates
- Smoking
- H.pylori
- Gastric adenomatous polyp

Genetic factors

- E- Catherine mutation (80% lifetime risk of diffuse gastric cancer).
- FAP(85% associated with funding gland polyp)
- HNPCC
- LI-frauameni syndrome
- Micro satellite instability – 20% associated with intestinal type of gastric malignancy.



Most common site

Pathological type

- Intestinal type adenocarcinoma
- Adenosquamous variety
- Diffuse type- signet ring cell variety
- Gastric lymphoma
- Gastro- intestinal stromal tumors.

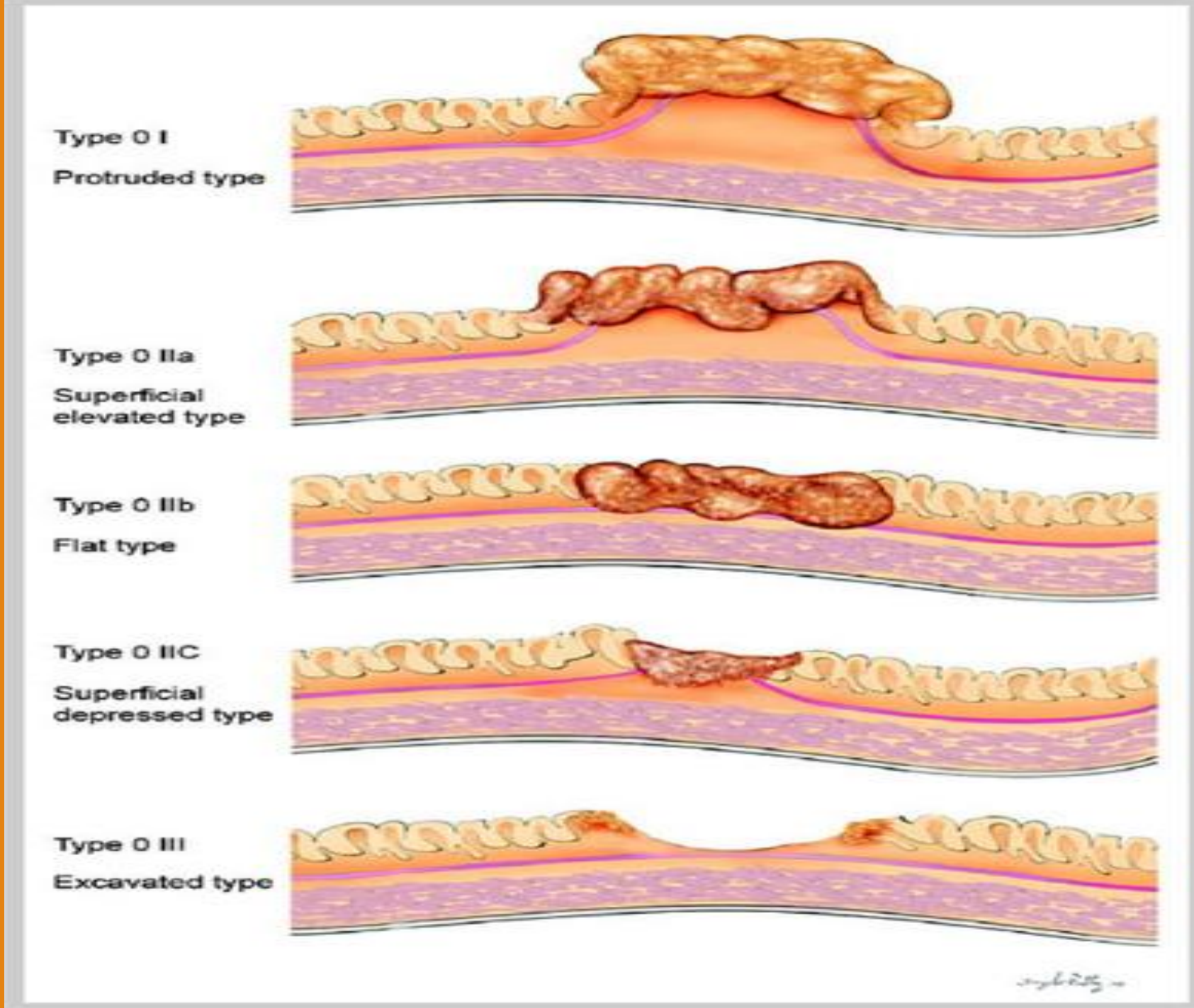
Clinicopathological classification

TABLE 48-6 Lauren Classification System

INTESTINAL	DIFFUSE
Environmental	Familial
Gastric atrophy, intestinal metaplasia	Blood type A
Men > women	Women > men
Increasing incidence with age	Younger age group
Gland formation	Poorly differentiated, signet ring cells
Hematogenous spread	Transmural, lymphatic spread
Microsatellite instability	Decreased E-cadherin
APC gene mutations	
p53, *p16* inactivation	*p53*, *p16* inactivation

Endoscopic classification of Early gastric cancer(Japanese classification)

- Involvement of mucosa and submucosa with or without nodal involvement.



Boremann classification of advanced CA

Table 2
The Borrmann classification of advanced gastric cancer

Type I		Polypoid tumors
Type II		Fungating carcinomas
Type III		Ulcerated carcinomas
Type IV		Infiltrating carcinomas

Symptoms & signs

- Dyspepsia
- Early satiety
- Loss of weight & appetite.

In advanced disease

- Epigastric pain which is constant and Jaundice
- Obstruction or dysphagia (depends on location)
- Bleeding

On examination

Special attention should be given to metastatic signs .

- Virchow’ Node
- Sister Mary Joseph nodule
- Krukenberg deposits
- Blumer shelf.

Spread of carcinoma stomach

- Direct spread – adjacent organ such as pancreas,colon,liver.
- Lymphatic spread-regional nodes & virchow’s nodes
- Blood spread- liver,Lung& bone.
- Trans peritoneal –blumer shelf ,krukrnberg and sister Mary Joseph’s nodule.

Staging workup

- Upper GI endoscopy and biopsy
- Contrast enhanced CT or MRI (cross sectional study)
- EUS
- PET –CT
- Diagnostic laparoscopy

Definition of Primary Tumor (T)

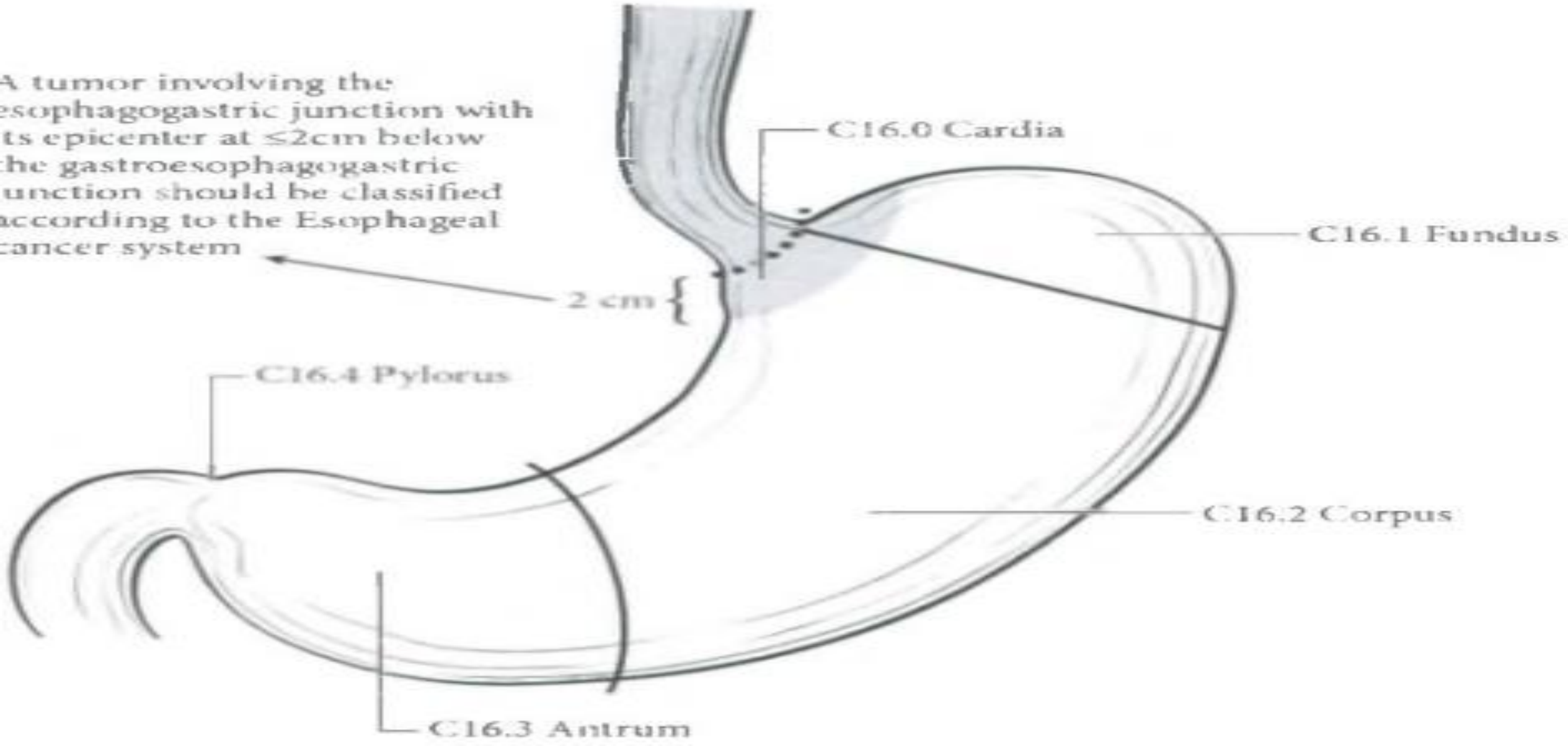
T Category	T Criteria
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	Carcinoma *in situ*: intraepithelial tumor without invasion of the lamina propria, high-grade dysplasia
T1	Tumor invades the lamina propria, muscularis mucosae, or submucosa
T1a	Tumor invades the lamina propria or muscularis mucosae
T1b	Tumor invades the submucosa
T2	Tumor invades the muscularis propria*
T3	Tumor penetrates the subserosal connective tissue without invasion of the visceral peritoneum or adjacent structures**,***
T4	Tumor invades the serosa (visceral peritoneum) or adjacent structures **,***
T4a	Tumor invades the serosa (visceral peritoneum)
T4b	Tumor invades adjacent structures/organs

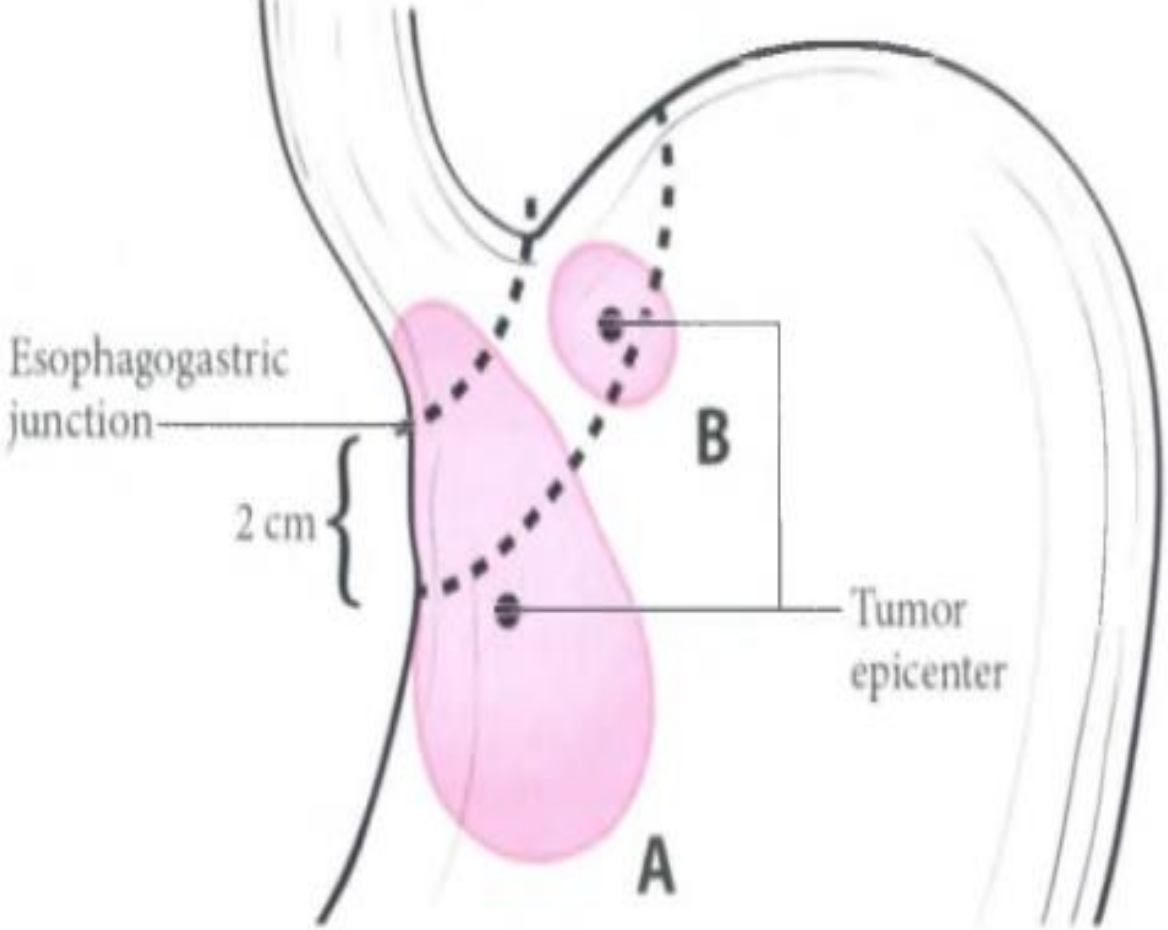
N Category	N Criteria
NX	Regional lymph node(s) cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in one or two regional lymph nodes
N2	Metastasis in three to six regional lymph nodes
N3	Metastasis in seven or more regional lymph nodes
N3a	Metastasis in seven to 15 regional lymph nodes
N3b	Metastasis in 16 or more regional lymph nodes

Definition of Distant Metastasis (M)

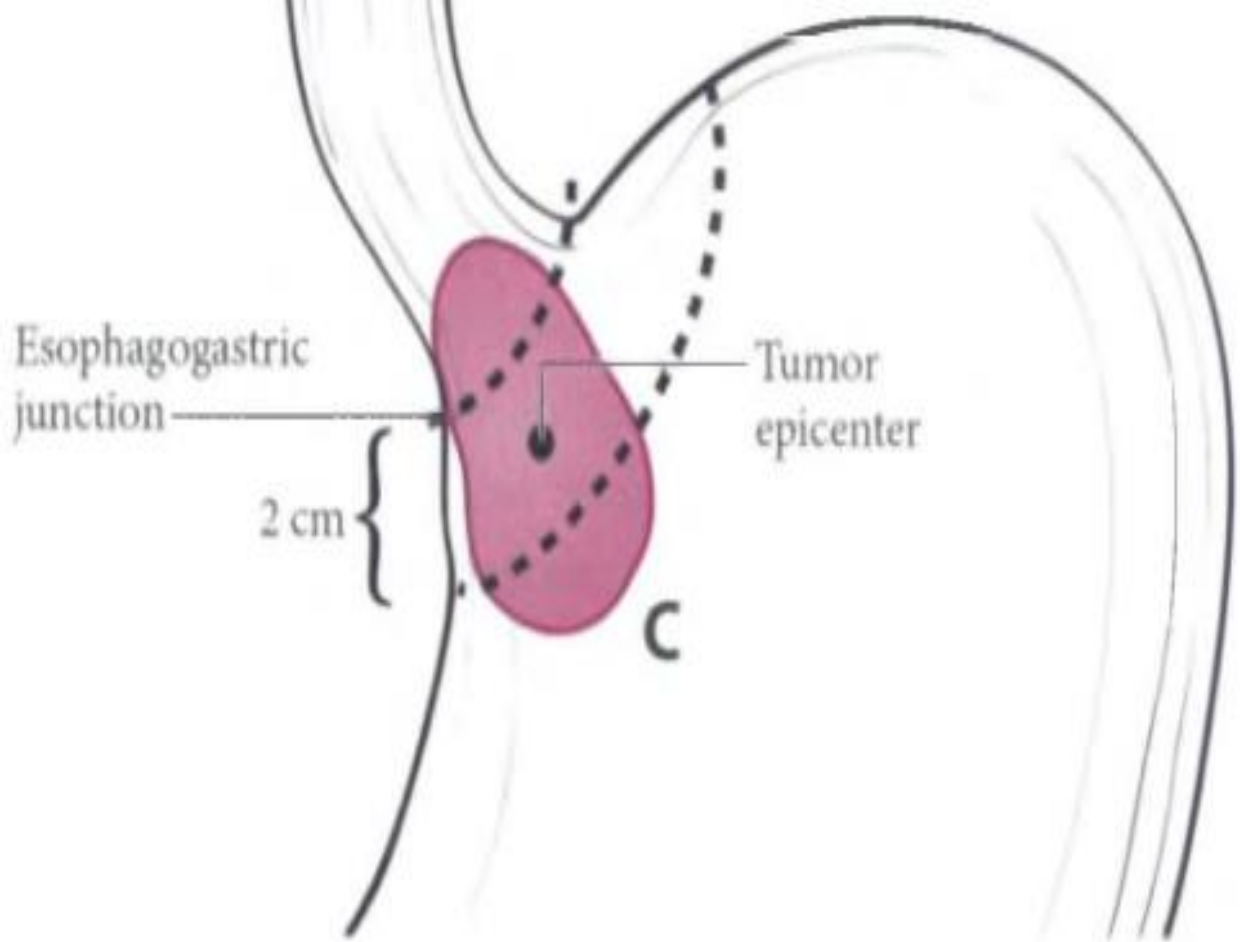
M Category	M Criteria
M0	No distant metastasis
M1	Distant metastasis

Seiwert classification





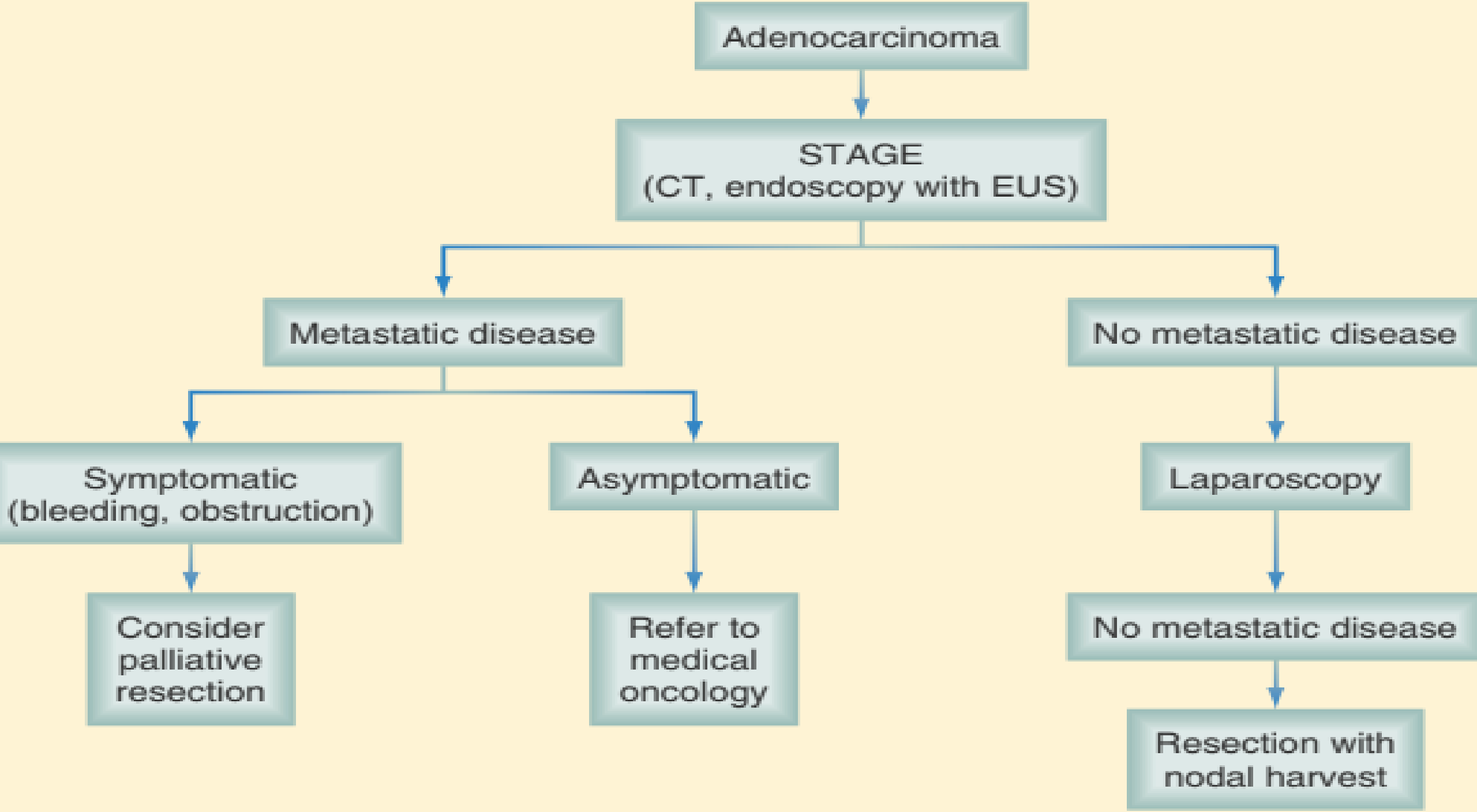
A tumor that has its epicenter located >2 cm from esophagogastric junction (A) or a tumor located within 2 cm of the esophagogastric junction (B) but does not involve the esophagogastric junction is classified as stomach cancer.

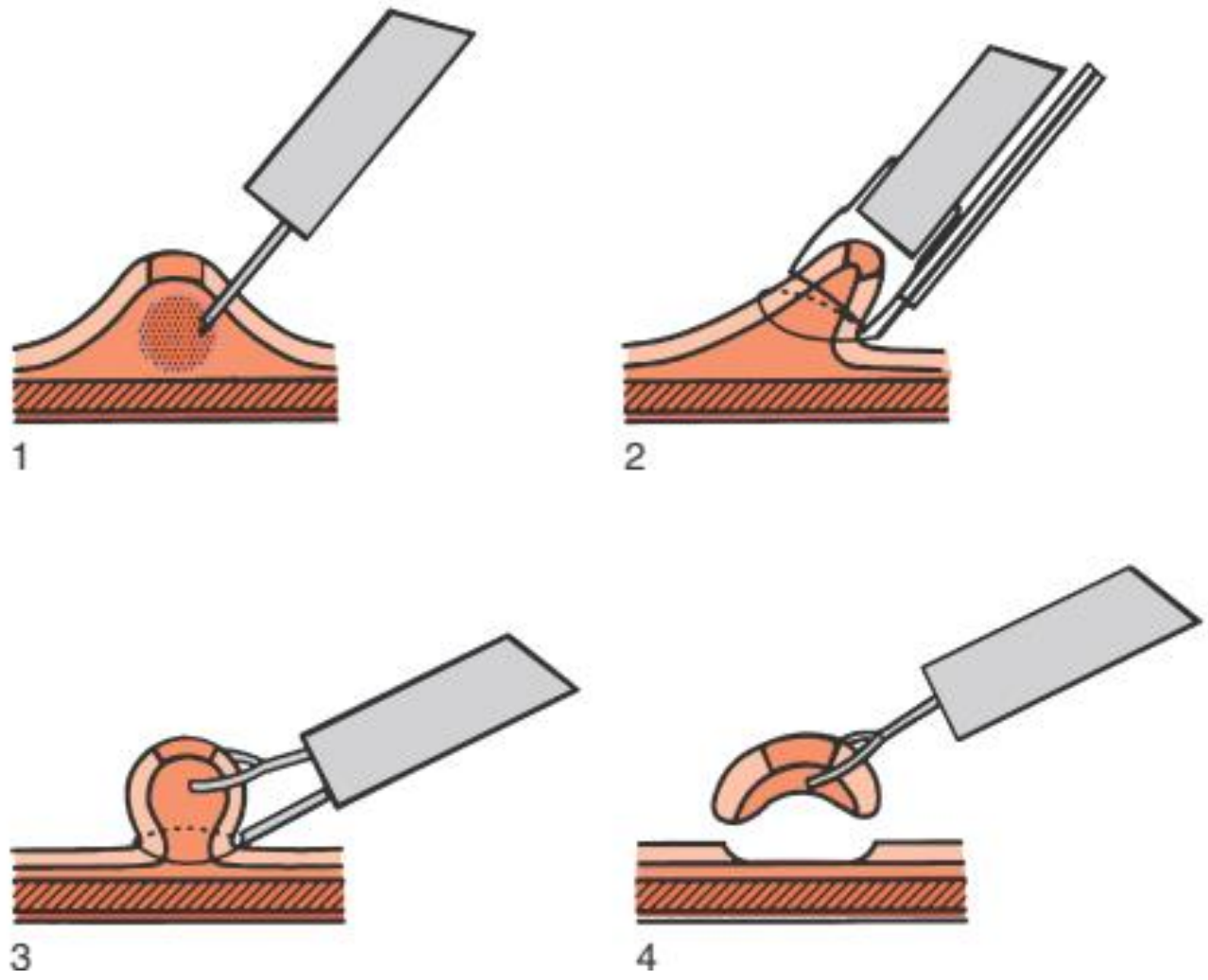


A tumor that has its epicenter located within 2 cm of esophagogastric junction and involves the esophagogatric junction (C) is classified as esophageal cancer.

Signs of inoperability

- Virchow’s node
- Sister Mary Joseph nodule
- Blumer shelf
- Krukenberg deposits
- Peritoneal deposits
- Involvement of major vessels


Adenocarcinoma
STAGE
(CT, endoscopy with EUS)
Metastatic disease
No metastatic disease
Symptomatic
(bleeding, obstruction)
Asymptomatic
Laparoscopy
Consider
palliative
resection
Refer to
medical
oncology
No metastatic disease
Resection with
nodal harvest



Surgical therapy

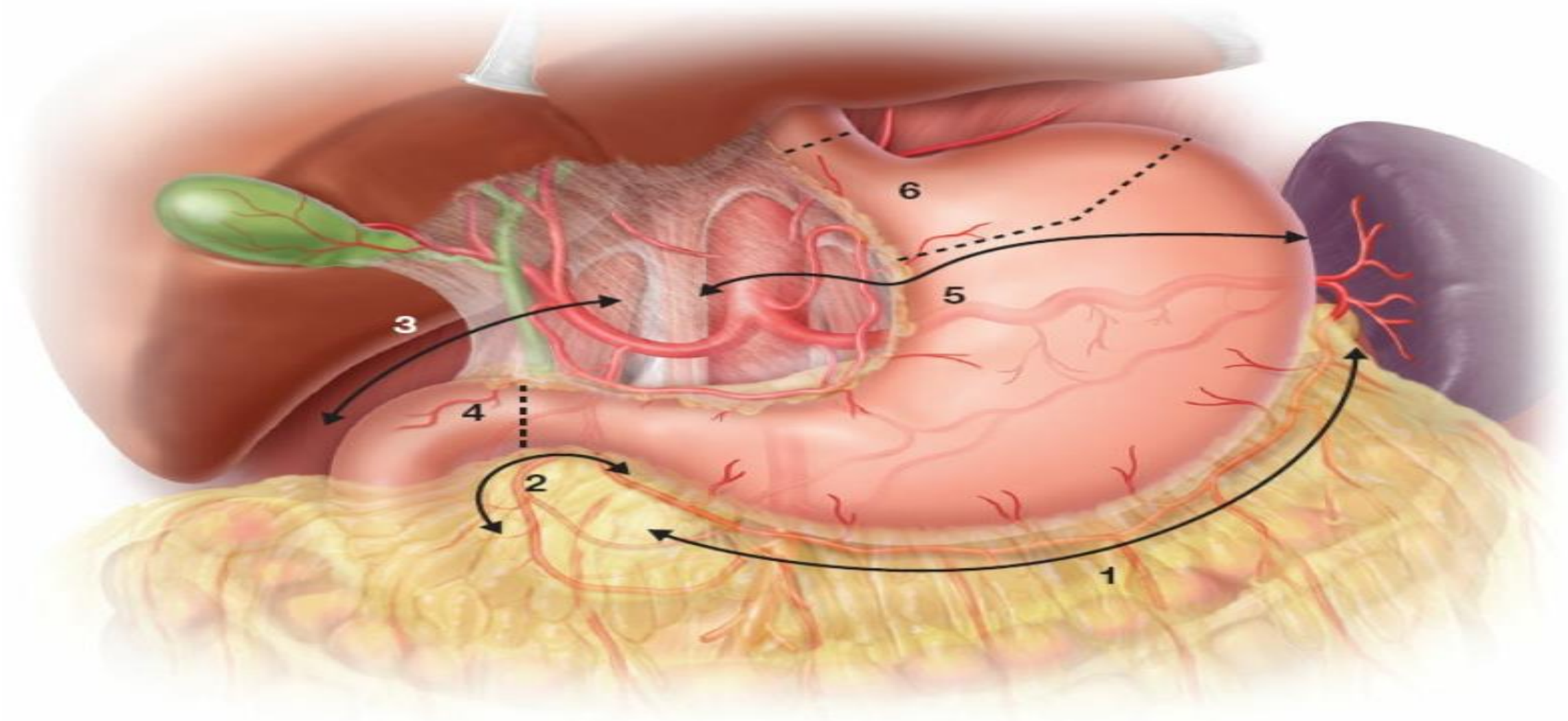
- Endoscopic mucosal resection

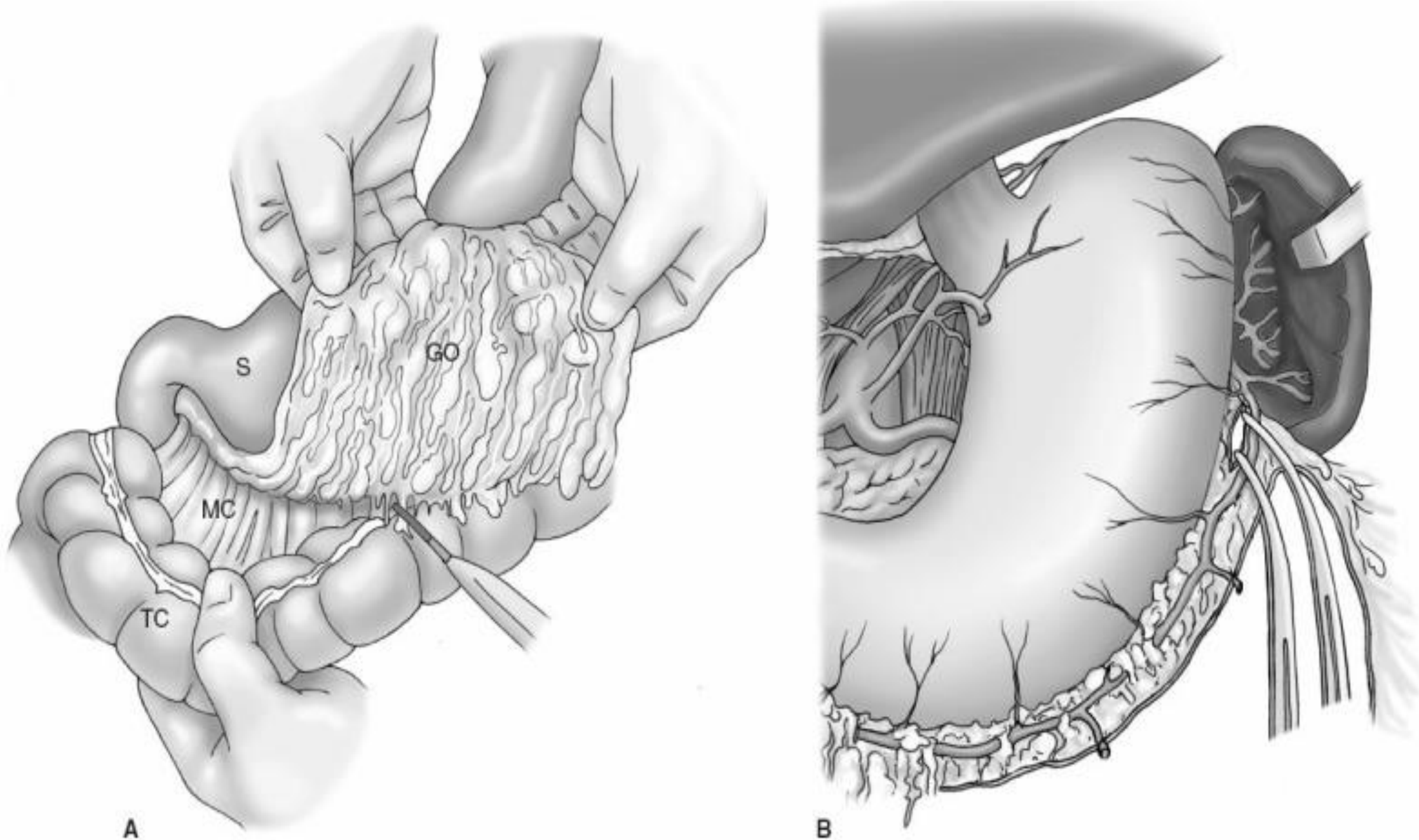
Tumour involving mucosa and submucosa without nodal involvement

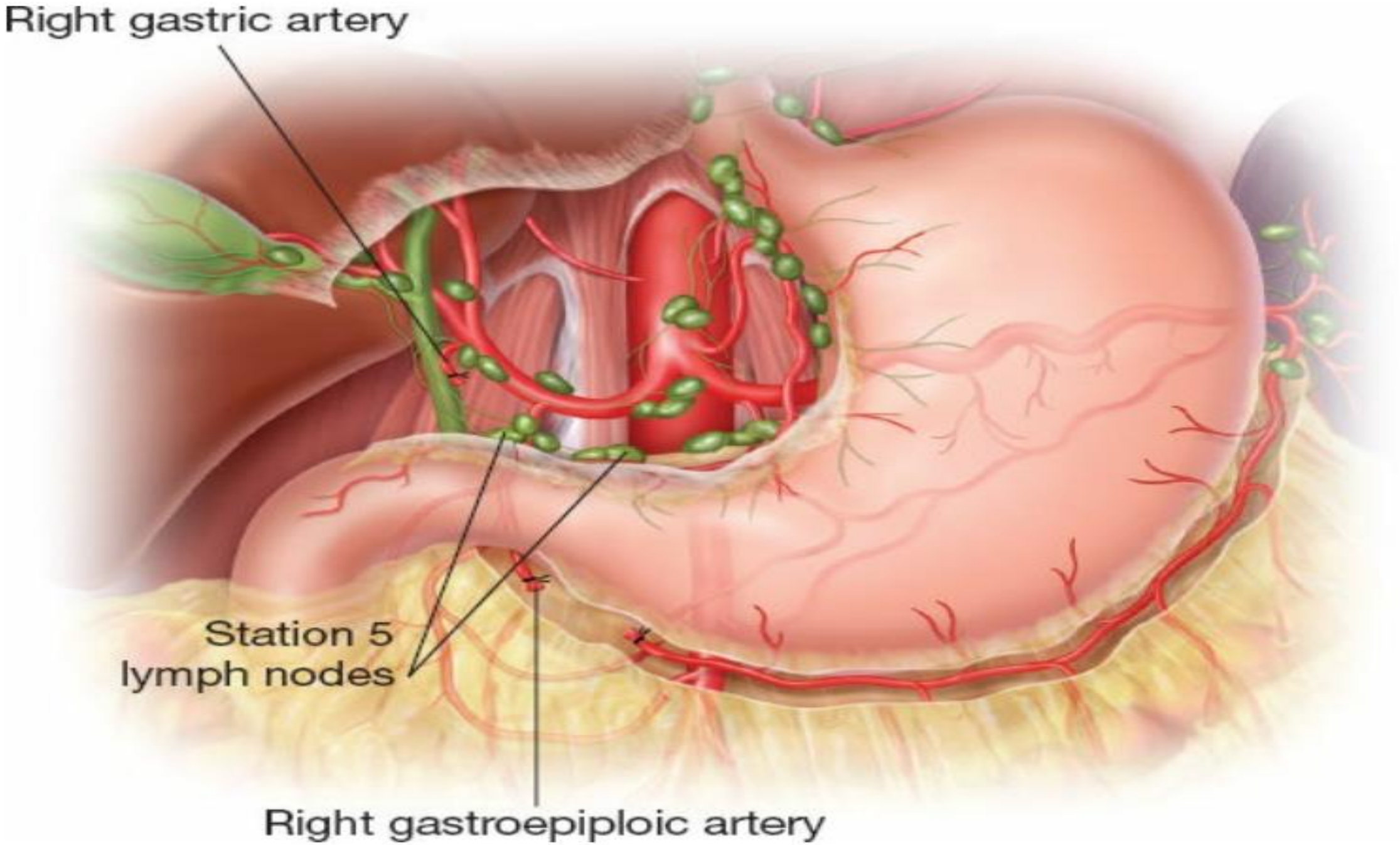
Radical surgery

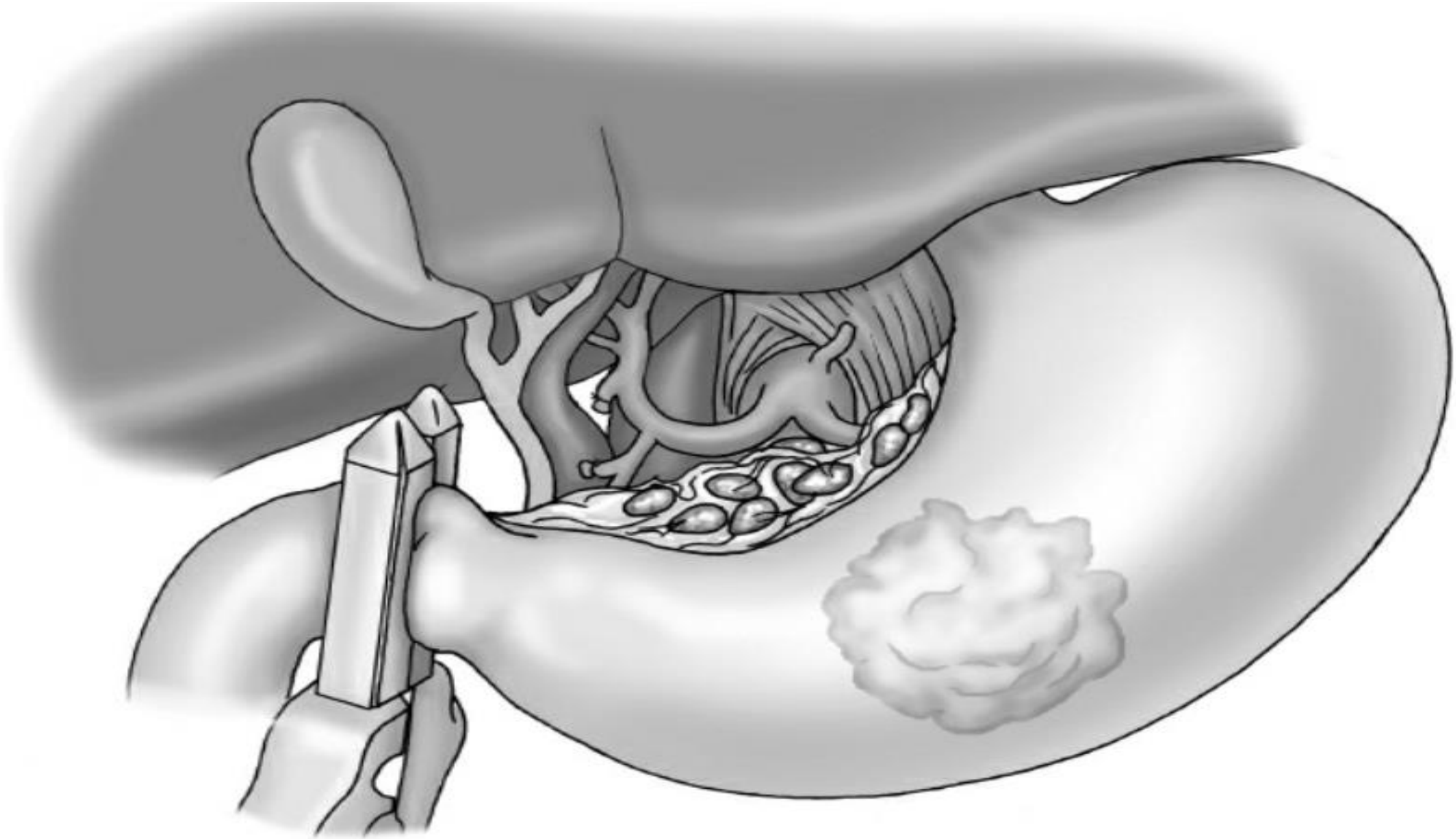
Distal partial gastrectomy or total gastrectomy with D2 lymph node dissection with reconstruction .

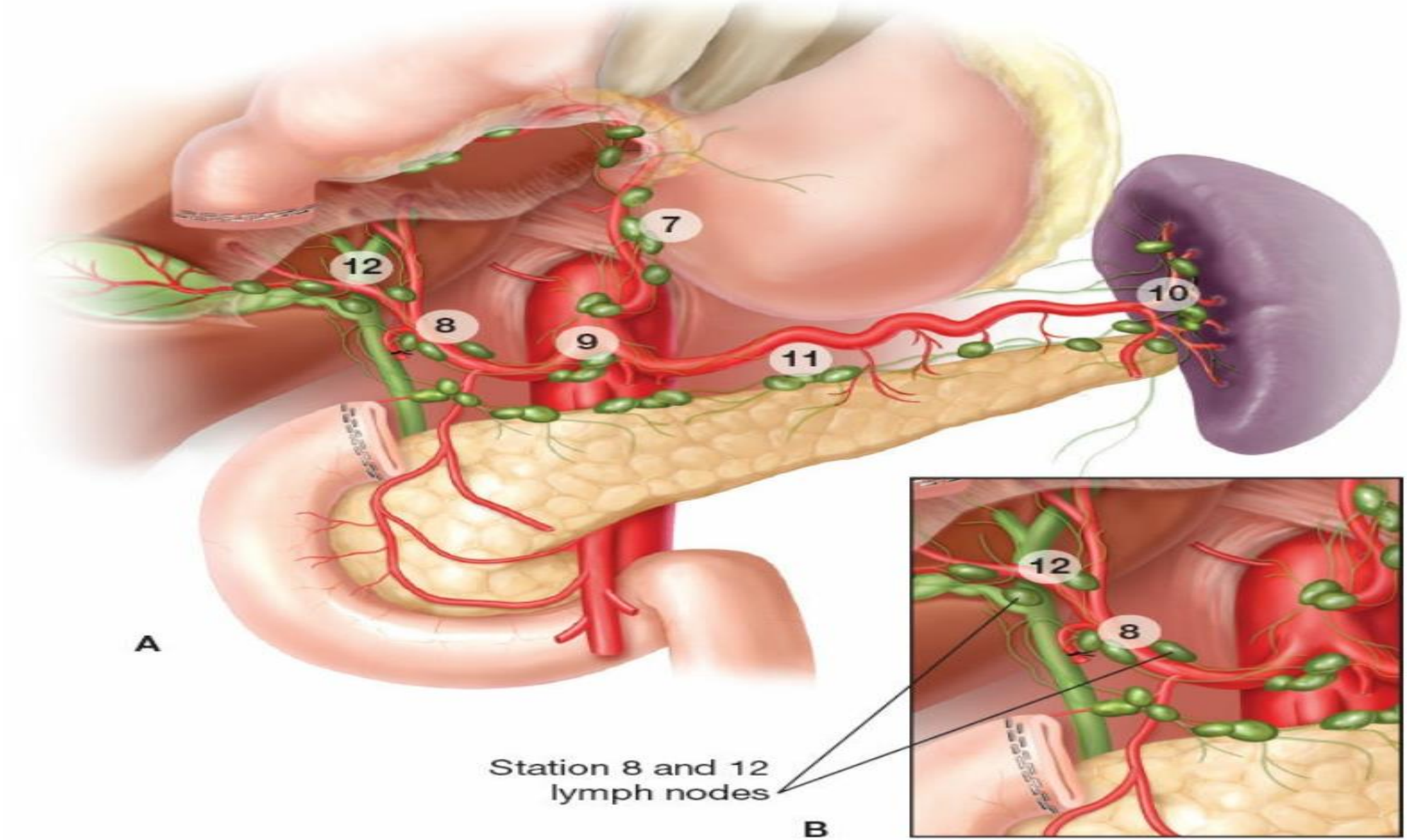
Steps in D2 gastrectomy

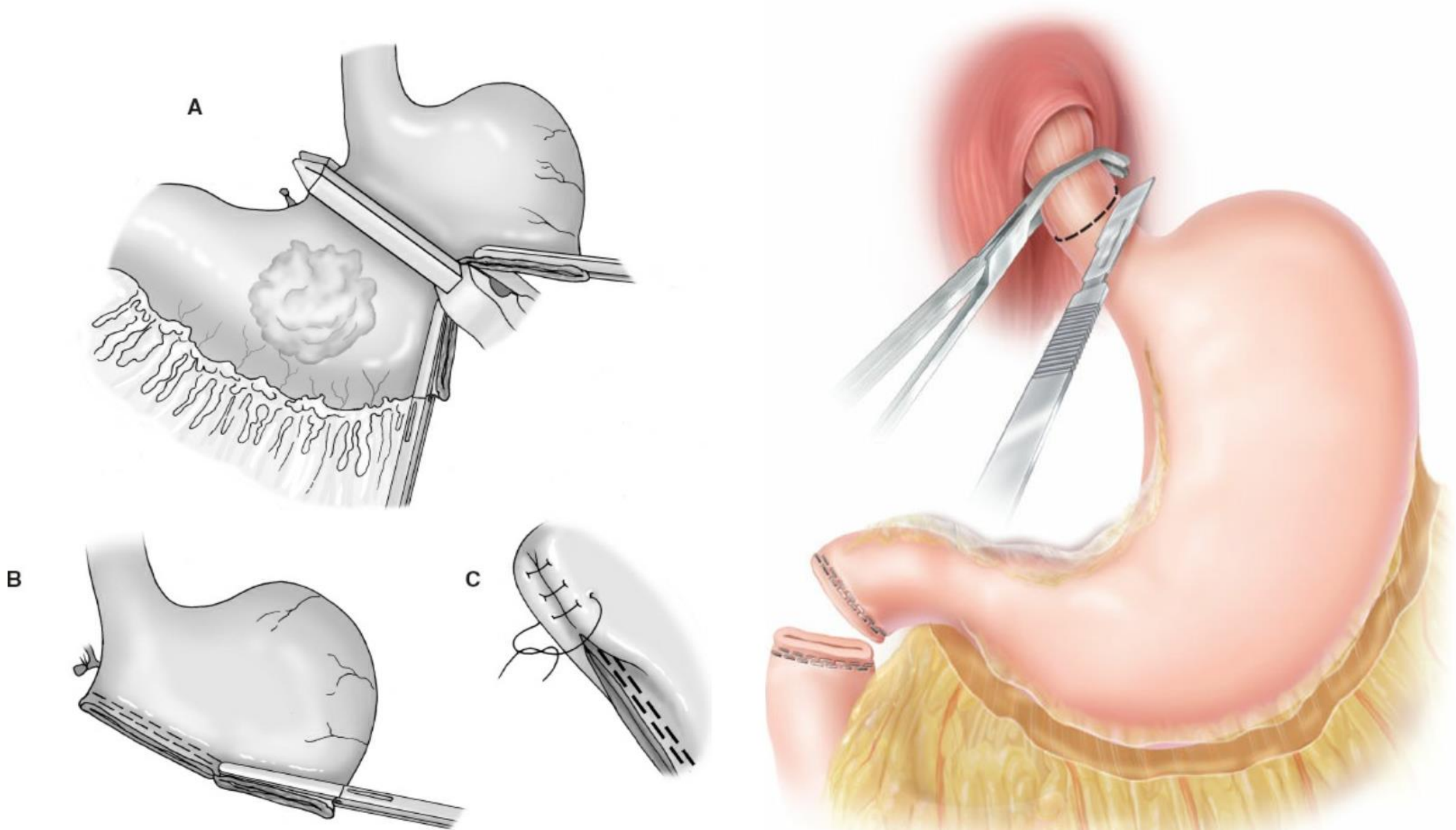


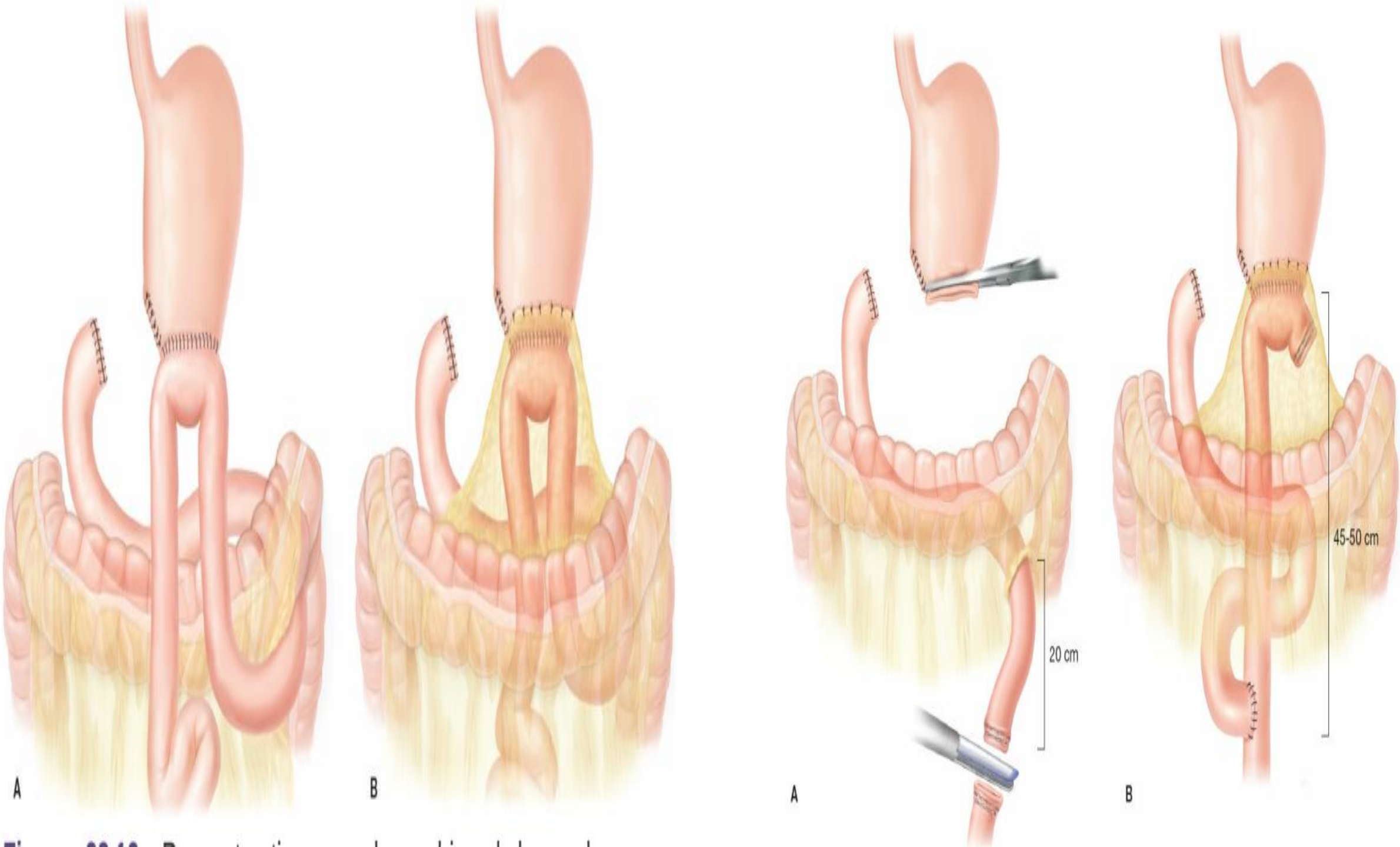

S
GO
MC
TC
A
B

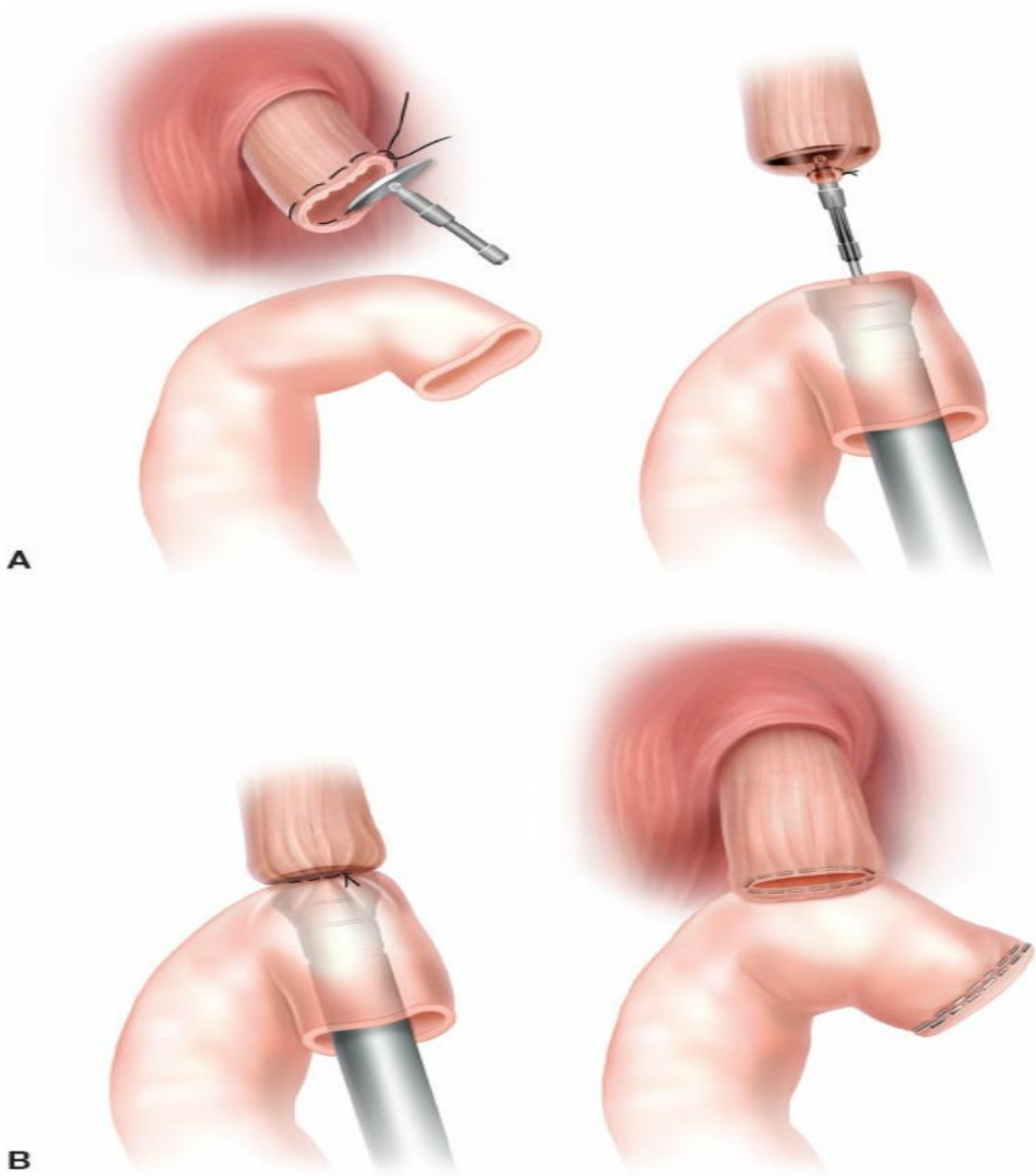

Right gastric artery
Station 5
lymph nodes
Right gastroepiploic artery




7
12
8
9
11
10
A
12
8
Station 8 and 12
lymph nodes
B


A
B
C


A
B
20 cm
45-50 cm
A
B


A
B

Complications

- Anaemia
- Wound complications
- Anastomotic leak
- Duodenal stump blow out

Adjuvant chemotherapy

- Even with R0 resection – 30% recurrence occurs in 2 yrs
- Inference from MAGIC Trial says that peri-operative chemotherapy (3 cycles before surgery+ 3 cycles after surgery) helps in significant reduction in recurrence and 5-year survival.
- Chemotherapy regimen- EPIRUBICIN+ cisplatin+ 5 FU

Unresectable disease

- Pain management
- Stenting or GJ
- Palliative chemotherapy.

Gastric lymphoma

- Most common site for GI lymphoma
- Accounts for <15% of gastric malignancy
- Primary gastric lymphoma very rare
- Most common in antrum & involves entire wall of the stomach
- Most common in elderly male
- Associated with H. PYLORI and EBV

Pathology

- Diffuse large B Cell lymphoma (55%)
- MALT lymphoma(40%)
- Burkitt lymphoma(3%) – most aggressive
- Mantle cell lymphoma (<1%)
- Follicular lymphomas (<1%)

Symptoms

- Non- specific
- Early satiety
- Loss of weight
- B symptoms of lymphoma rare
- May present as perforation

Diagnosis

- Endoscopy- Non diagnostic
- EUS guided biopsy of gastric wall & LN
- Upper airway evaluation
- Bone marrow aspiration
- CECT- chest & abdomen

Treatment

- Chemotherapy is the principal treatment- CHOP regime

Indications of surgery ;

- Lymphoma limited to stomach
- Treatment failure or recurrence
- Bleeding
- Gastric outlet obstruction