

# GASTRIC ADENOCARCINOMA

Presenter:

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Moderator:

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# References

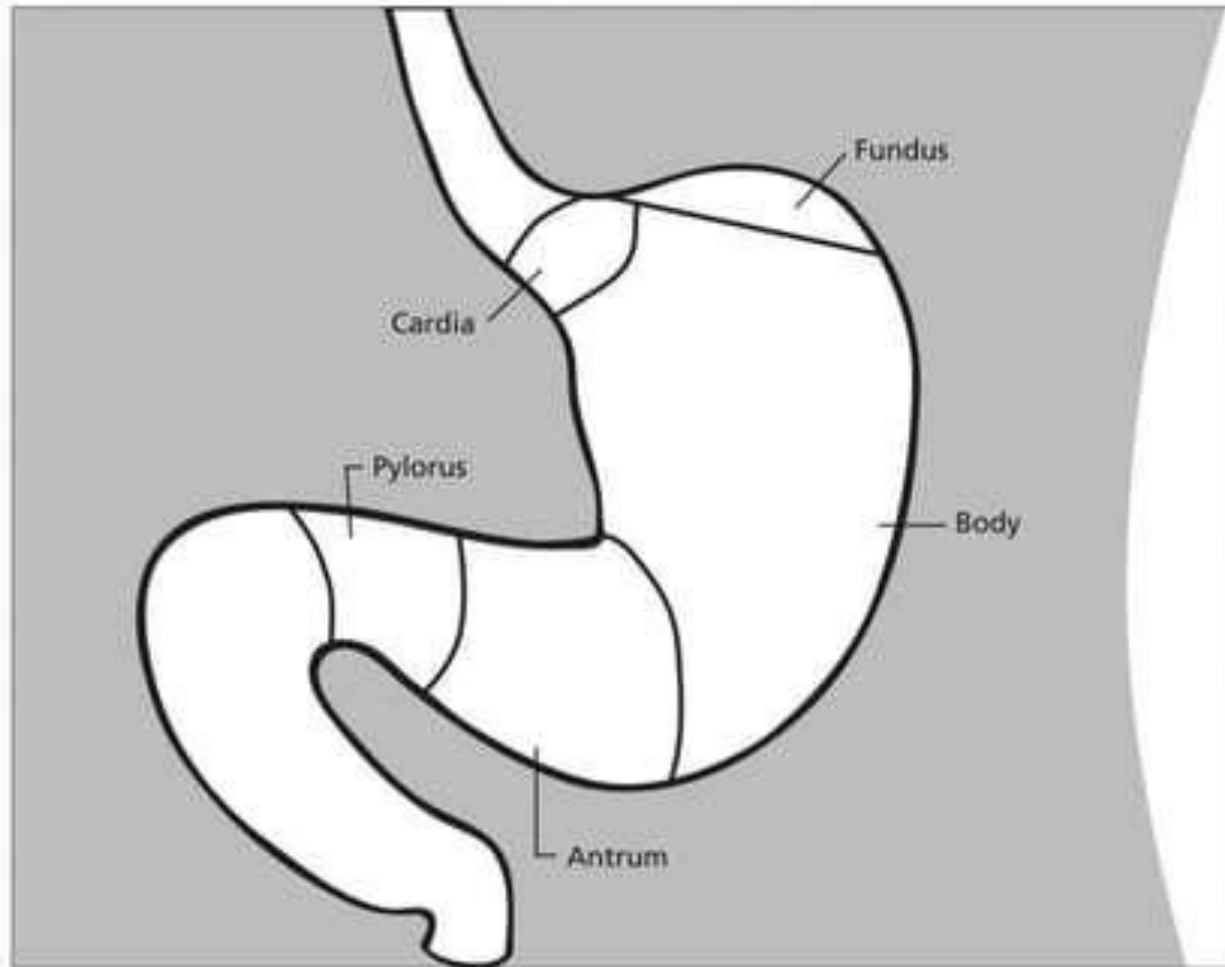
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- Bailey & Love;short practice of surgery (26<sup>th</sup> edition).
- Robbins text book of pathology.
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# Anatomy

# Parts of the stomach

The stomach has 5 parts



- Cardia: The first portion (closest to the esophagus)
- Fundus: The upper part of the stomach next to the  
cardia.
- Body (corpus): The main part of the stomach,  
between the upper and lower parts.
- Antrum: The lower portion (near the intestine),  
where the food is mixed with gastric juice.
- Pylorus : The last part of the stomach, which acts as a  
valve to control emptying of the stomach contents into  
the small intestine.

- 
- The first 3 parts of the stomach (cardia, fundus, and body) are sometimes called the proximal stomach.
  - Some cells in these parts of the stomach make acid and pepsin (a digestive enzyme), the parts of the gastric juice that help digest food.
  - They also make a protein called intrinsic factor, which the body needs to absorb vitamin B12.

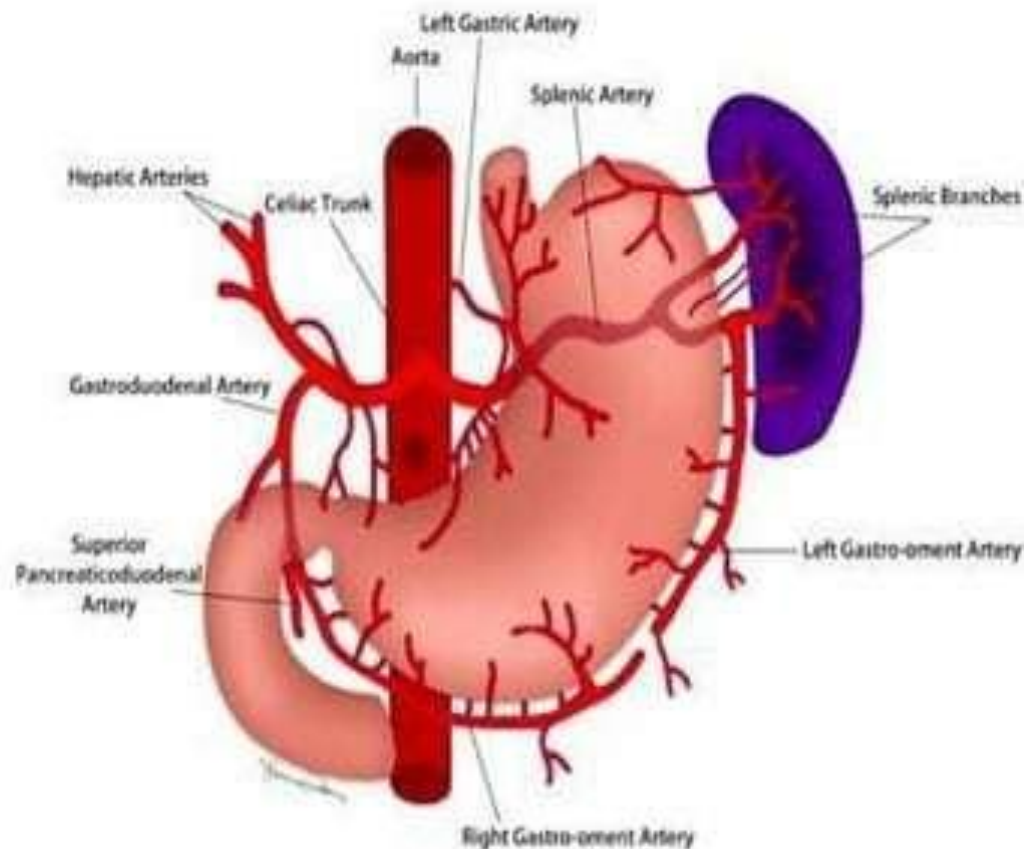
- The lower 2 parts (antrum and pylorus) are called the distal stomach.
- The stomach has 2 curves, which form its inner and outer borders. They are called the lesser curvature and greater curvature, respectively.

# Blood supply

- Most of the blood supply to the stomach is from

Four main arteries:

- Left gastric artery a branch of celiac trunk, and right gastric artery a branch of the proper hepatic artery along the lesser curvature.
- Right gastroepiploic artery branch of gastro duodenal artery, and left gastroepiploic artery branch of splenic artery, along the greater curvature.
- Blood supply to the proximal stomach also comes from the inferior phrenic and short gastric arteries.



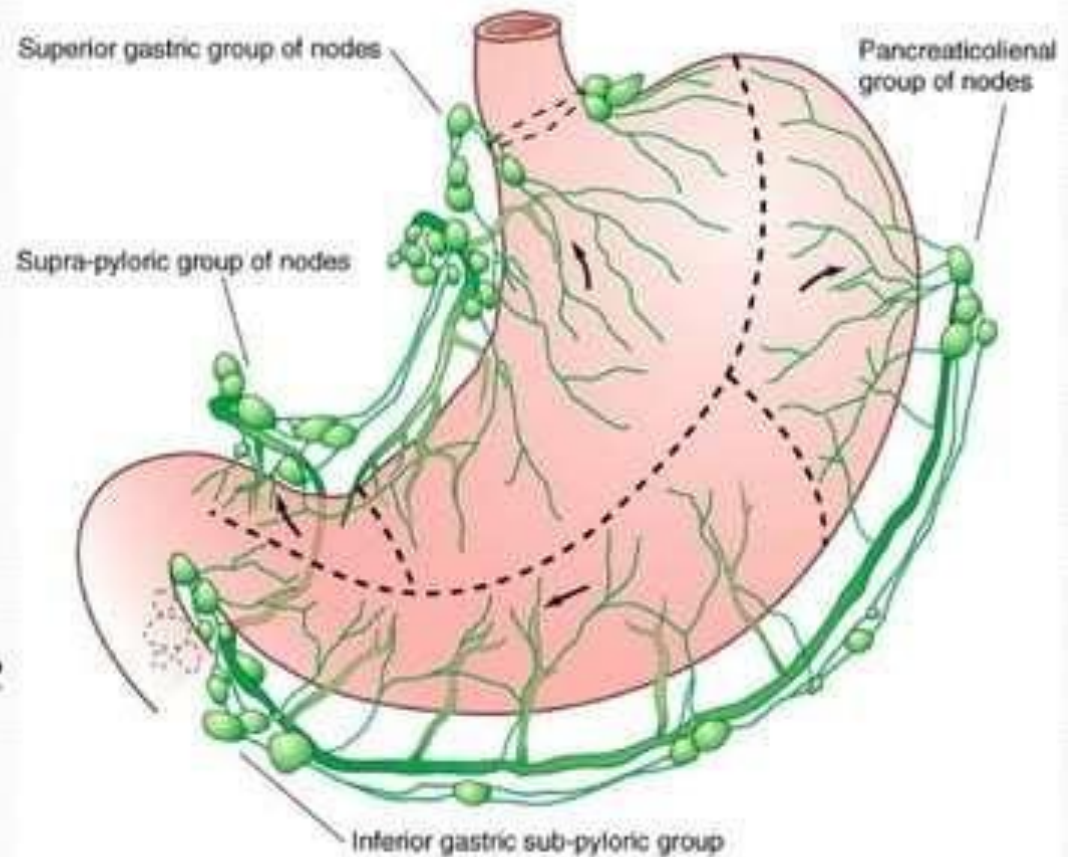


- Occasionally (15-20%) an aberrant left hepatic artery arises from the left gastric – a concern if the left gastric needs to be divided.
- The extensive anastomotic connections between these arteries allow, in most cases, three of the four vessels to be ligated as long as the arcades between the curvatures are not disturbed.

- Venous drainage parallels the arterial supply
  - Left and right gastric veins drain into the portal vein
  - Right gastroepiploic drains into the SMV
  - Left gastroepiploic drains into the splenic vein

➤ Lymphatic drainage is into four zones:

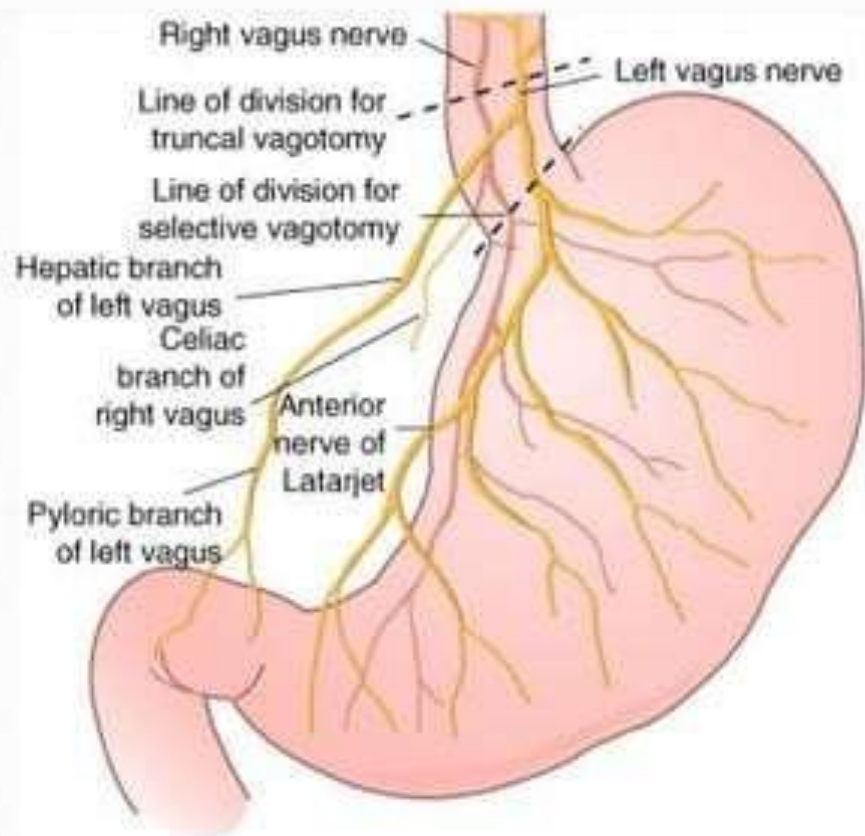
- Superior gastric
  - Suprapyloric
  - Pancreaticocoliinal
  - Inferior gastric/subpyloric
- All four drain into the celiac group of nodes and into the thoracic duct.
- Gastric cancers drain into any of these groups



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➤ **Innervation:**

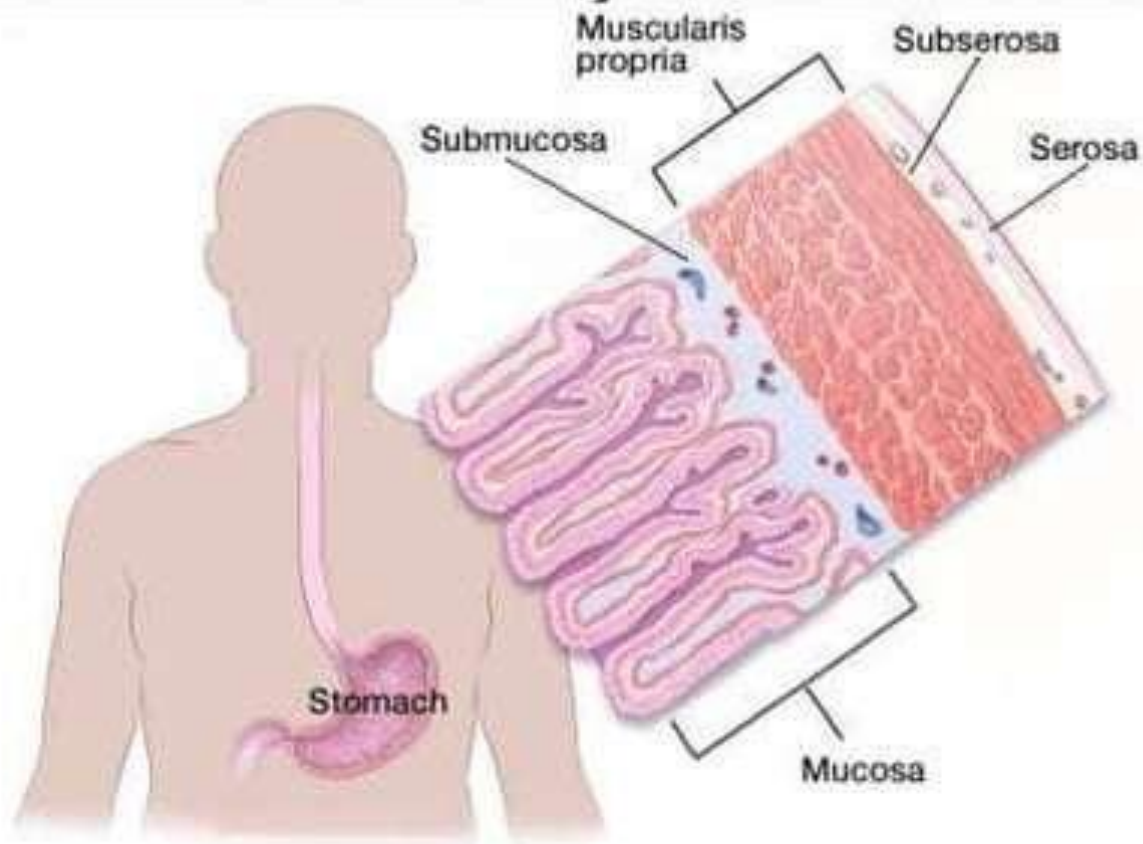
- Parasympathetic via the vagus. [left anterior and right posterior.]
- Sympathetic via the celiac plexus.




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# Histology

➤ Stomach has five layers:



- Mucosa
  - Epithelium, lamina propriae, and muscularis mucosa\*
- Sub mucosa
- Smooth muscle layer
- Sub serosa
- Serosa

- 
- The layers are important in determining the stage (extent) of the cancer and in helping to determine a person's prognosis (outlook).
  - As a cancer grows from the mucosa into deeper layers, the stage becomes more advanced and the prognosis is not as good.

# Gastric Carcinoma:

## Etiological factors

### Predisposing :

1. Pernicious anaemia & atrophic gastritis (achlorhydra)
2. Previous gastric resection
3. Chronic peptic ulcer (give rise to 1%)
4. Smoking.
5. Alcohol.

### Environmental:

1. H.pylori infection  
Sero(+) patients have 6-9 folds risk
2. low socioeconomic Status
3. Nationality (JAPAN)
4. Diet (prevention)

### Genetic:

1. Blood group A
2. HNPCC:  
Hereditary non-polyposis colon cancer.






# Clinical Presentation

Most patients present with advanced stage..because there are no early specific signs and symptoms. Time lag between onset of disease and onset of symptoms.

## **Common clinical Presentation:**

- 3A's:**
- 1. Anaemia (due to bleeding from tumour)**
  - 2. Asthenia (septic absorption from the tumour)**
  - 3. Anorexia**

- Recent onset of early satiety, dyspepsia, epigastric discomfort,
- Specific symptoms depending on the site of tumour.
- Tumour in pyloric region may present with gastric outlet obstruction.
- Tumour in proximal region may present with dysphagia, haematemesis.
- From the body of stomach may present as only mass per abdomen (silent variety).

- 
- Metastatic disease may present with-  
jaundice,ascites

# signs

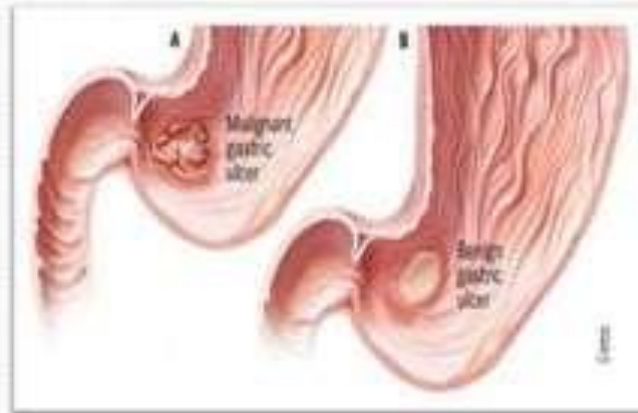


- Grossly Anemic,
- Cachexia,
- Epigastric mass, liver secondaries.
- Blumer shelf secondaries.
- Virchows node
- Sister mary joseph node
- Krukenberg tumor
- Irish node



# Morphology:

- Polypoid
- Ulcerative
- Superficial spreading
- Infiltrative [Linitis plastica, Leather bottle stomach]



# Pathological classification.

## Lauren Classification:

### 1. Intestinal Gastric ca.

It arises in areas of intestinal metaplasia to form polypoid tumors or ulcers.

### 2. Diffuse Gastric ca.

It infiltrates deeply in the stomach without forming obvious mass lesions but spreads widely in the gastric wall "Linitis Plastica" & it has much more worse prognosis

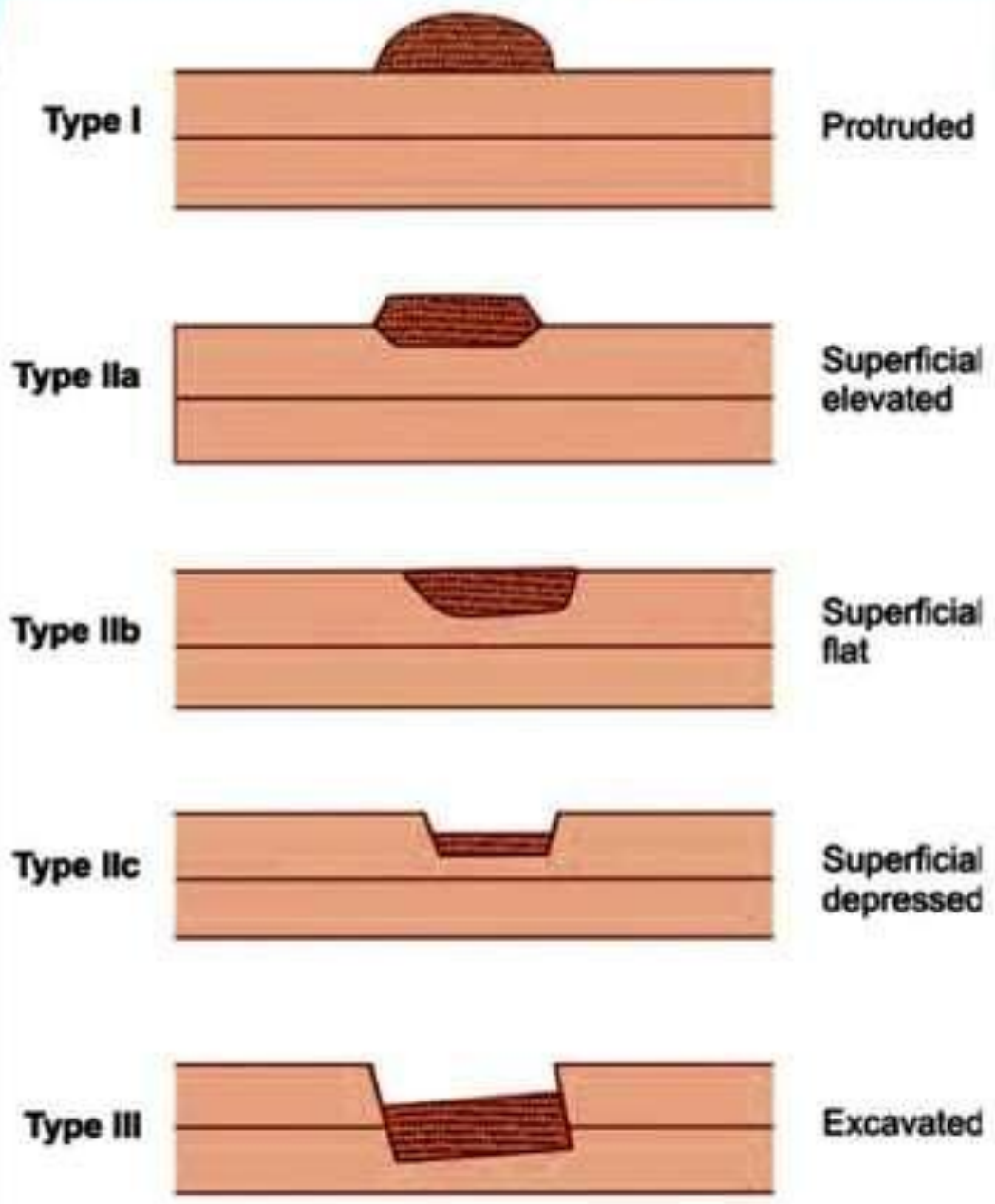
## Gastric cancer can be divided into:

### ➤ Early:

- Limited to mucosa & submucosa with or without LN (T<sub>1</sub>, any N)
- >> curable with 5 years survival rate in 90%.(japanese classification)

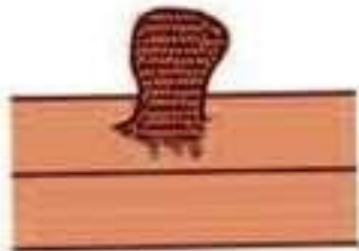
### ➤ Late:

- It involves the Muscularis.
- It has 4 types( Bormann's classification). Type III & IV are incurable.



**Fig. 20.72:** Japanese's classification for early gastric cancer.

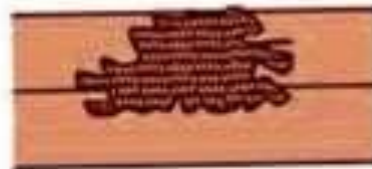




**Polypoid**



**Ulcer-clear margin**



**Ulcer without clear margin**



**Diffuse type**

**Fig. 20.71: Borrmann's classification of the advanced gastric cancer.**

## Spread of Gastric Cancer

### Direct Spread

Tumor penetrates the muscularis, serosa & Adjacent organs  
(Pancreas, colon & liver)

### Lymphatic spread

What is important here is Virchow's node  
(Trosier's sign)

### Blood-borne metastasis

Usually with extensive Disease where liver 1<sup>st</sup> Involved then lung & Bone

### Transperitoneal spread

This is common  
Anywhere in peritoneal cavity  
(Ascitis)  
Krukenberg tumor (ovaries)  
Sister Joseph nodule  
(umbilicus)

## Staging of gastric cancer

**T<sub>1</sub> lamina propria & submucosa** ●

**T<sub>2</sub> muscularis & subserosa** ●

**T<sub>3</sub> serosa** ●

**T<sub>4</sub> Adjacent organs** ●

**N<sub>0</sub> no lymph node** ●

**N<sub>1</sub> Epigastric node** ●

**N<sub>2</sub> main arterial trunk** ●

**M<sub>0</sub> No distal metastasis** ●

**M<sub>1</sub> distal metastasis** ●

# INVESTIGATIONS

- Full blood count
- LFT,RFT,
- Stool examination for occult blood,
- CXR.
- Serum tumor markers (CA 72-4,CEA,CA19-9)



➤ **Specific:**

➤ UGI endoscopy with biopsy,

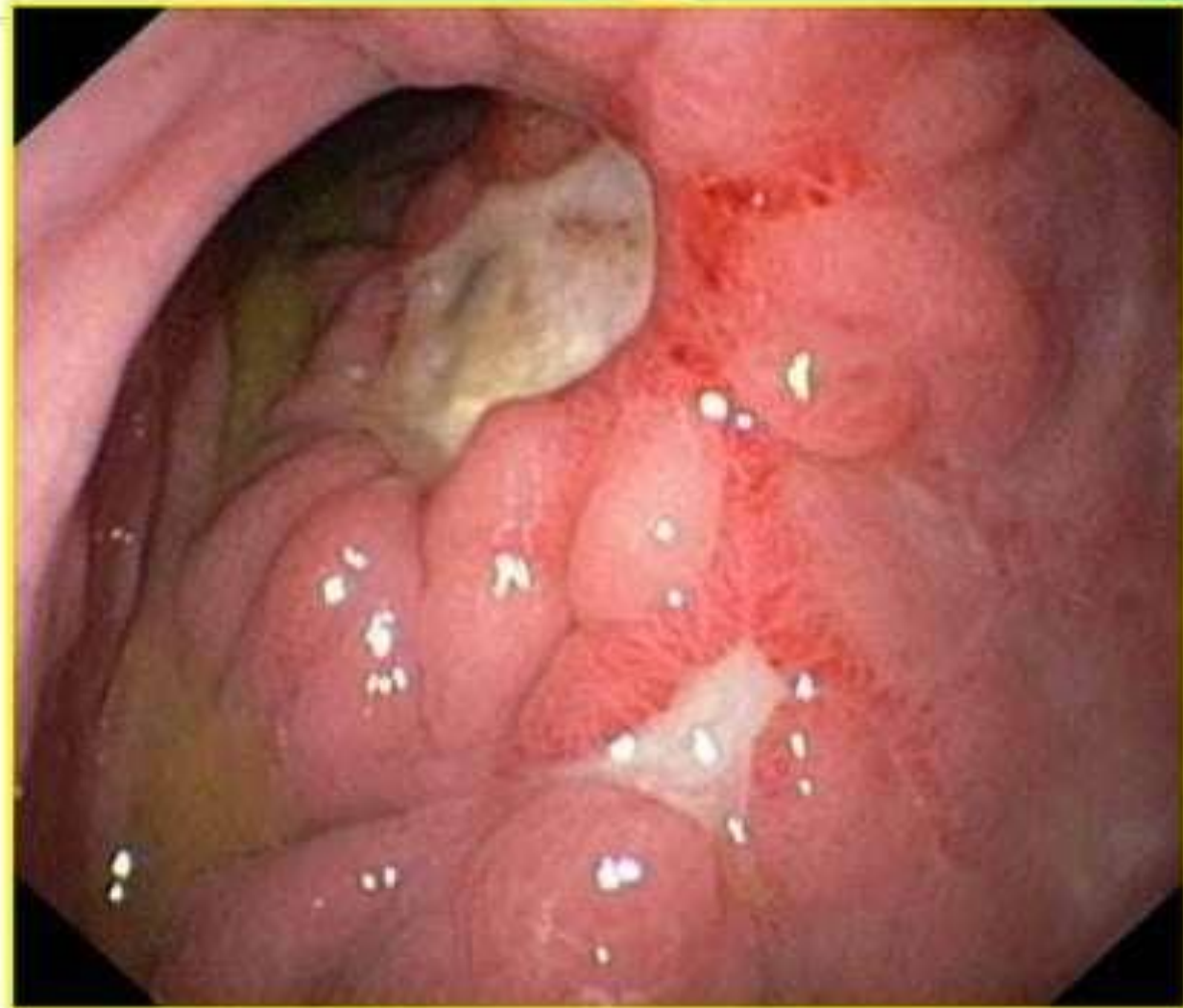
➤ CT, MRI & US

➤ Laparoscopy

Upper gastro intestinal endoscopy.

Diagnostic accuracy is 98%  
if upto 7 biopsies is taken.

**Diagnostic study of Choice**



- You may see an ulcer (25%), polypoid mass (25%), superficial spreading (10%), or infiltrative (linitis plastica)-difficult to be detected.
- Accuracy 50-95% it depends on gross appearance, size , location & no. of biopsies



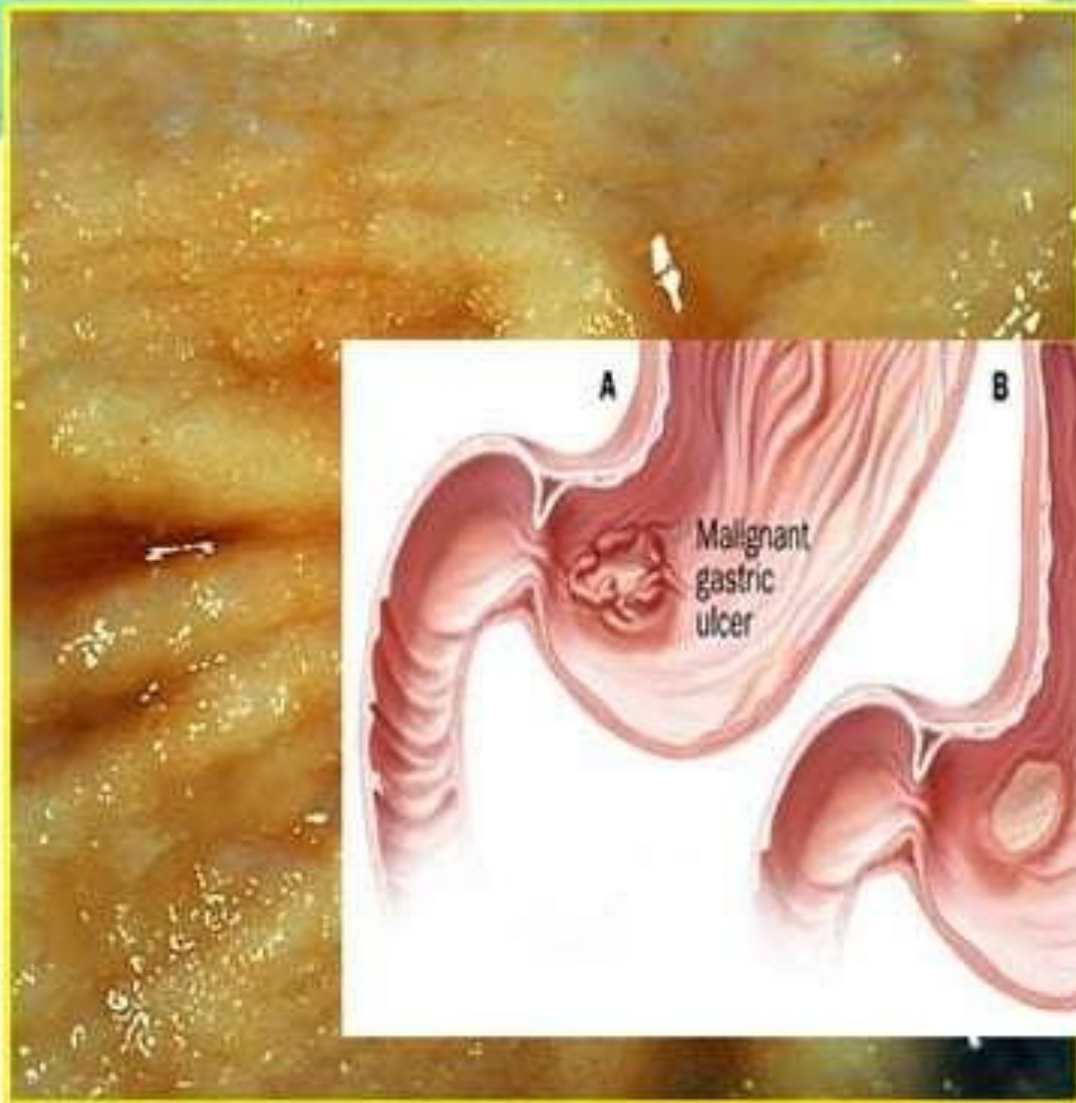
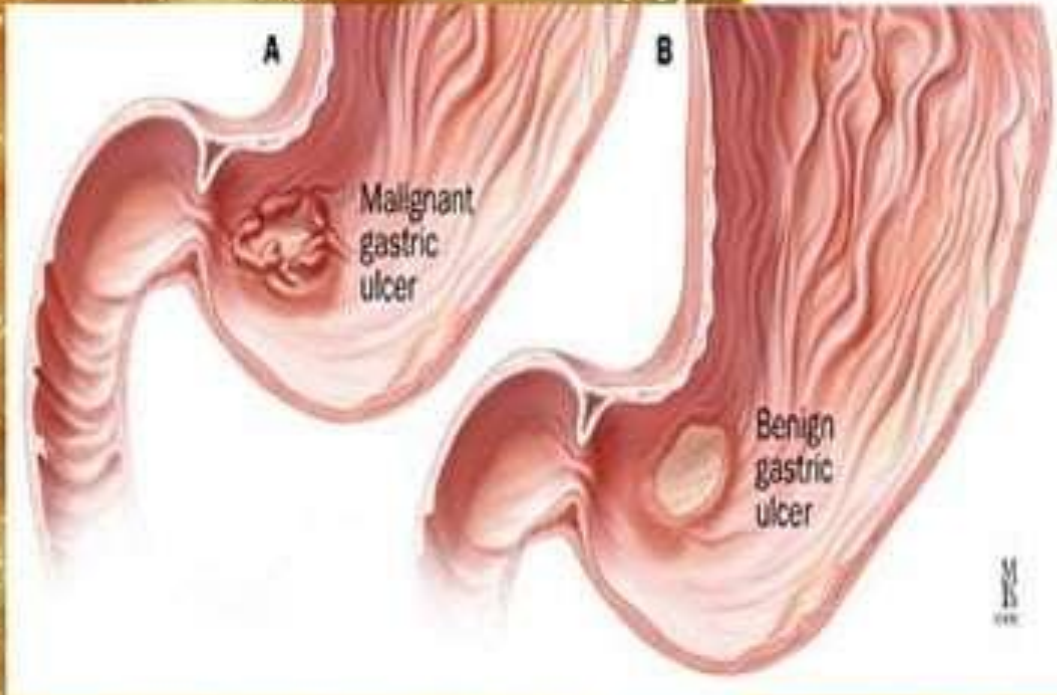
## IF YOU SEE ULCER ASK YOURSELF... BENIGN OR MALIGNANT?

### ➤ BENIGN

- Round to oval punched out lesion with straight walls & flat smooth base
- Smooth margins with normal surrounding mucosa
- Mostly on lesser curvature
- Majority < 2cm
- Normal adjoining rugal folds that extend to the margins of the base

### ➤ MALIGNANT

- Irregular outline with necrotic or hemorrhagic base
- Irregular & raised margins
- Anywhere
- Any size
- Prominent & edematous rugal folds that usually do not extend to the margins



✓ **CT, MRI & US:**

Help in assessment of wall thickness,  
metastases (peritoneum ,liver & LNs)

✓ **Laparoscopy:**

Detection of peritoneal  
metastases

# Management

- **Surgery**
- **Chemotherapy**
- **Radiotherapy**

# Treatment

## Initial treatment:

1. Improve **nutrition** if needed by parenteral or enteral feeding.
2. **Correct** fluid & electrolyte & anemia if they are present.

## Preoperative Care

Preoperative Staging is important because we don't want to subject the patient to radical surgery that can't help him.

# PROGNOSTIC FEATURES

**2 important factors** influencing survival in resectable gastric cancer:

- ❖ depth of cancer invasion
- ❖ presence or absence of regional LN involvement
- 5yrs survival rate:
  - 10% in USA
  - 50% in Japan

Table 18.6 Examples of stages of gastric cancer and their prognosis

Stage	5-yr survival (%)
T <sub>1</sub> N <sub>0</sub> M <sub>0</sub>	95+
T <sub>1</sub> N <sub>1</sub> M <sub>0</sub>	70-80
T <sub>2</sub> N <sub>1</sub> M <sub>0</sub>	45-50
T <sub>3</sub> N <sub>2</sub> M <sub>0</sub>	15-25
M <sub>1</sub>	0-10

# Disease R Status

- Tumor status following resection.
- Assigned based on pathology of margins.
- R0- no residual gross or microscopic disease.
- R1- microscopic disease only.
- R2- gross residual disease.
- Long term survival only in R0 resection.

# “D” Nomenclature

- Describes extent of resection and lymphadenectomy.
- D1- removes all nodes within 3cm of tumor.
- D2- D1 plus hepatic, splenic, celiac, and left gastric nodes.
- D3- D2 plus omentectomy, splenectomy, distal pancreatectomy, clearance of porta hepatis nodes.
- Current standards include a D1 dissection only.



# Approaches

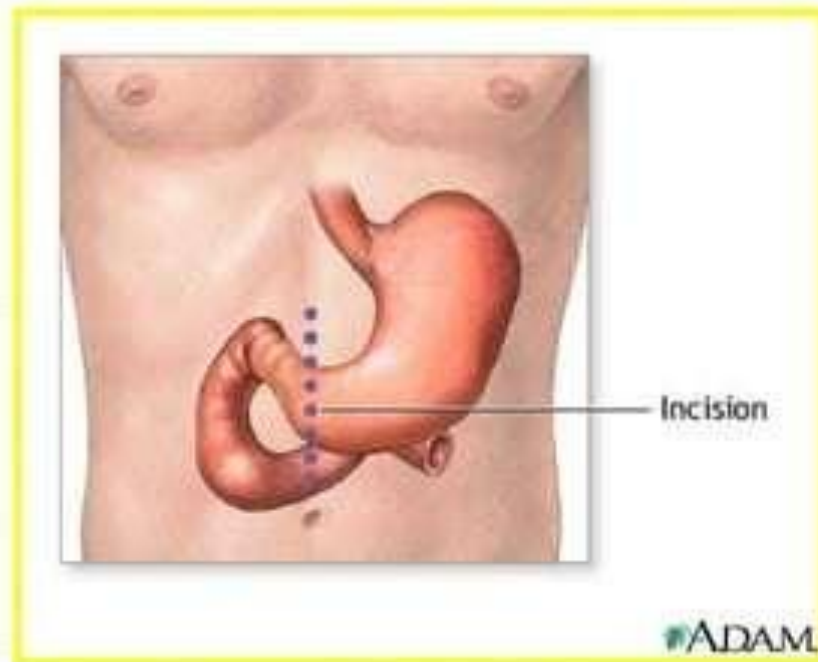
- Though some superficial cancers can be treated endoscopically, gastrectomy is the most widely used approach
  - Total gastrectomy - usually performed for lesions in the upper third (proximal) stomach
  - Distal subtotal gastrectomy - performed for tumors in the distal (lower two-thirds) of the stomach

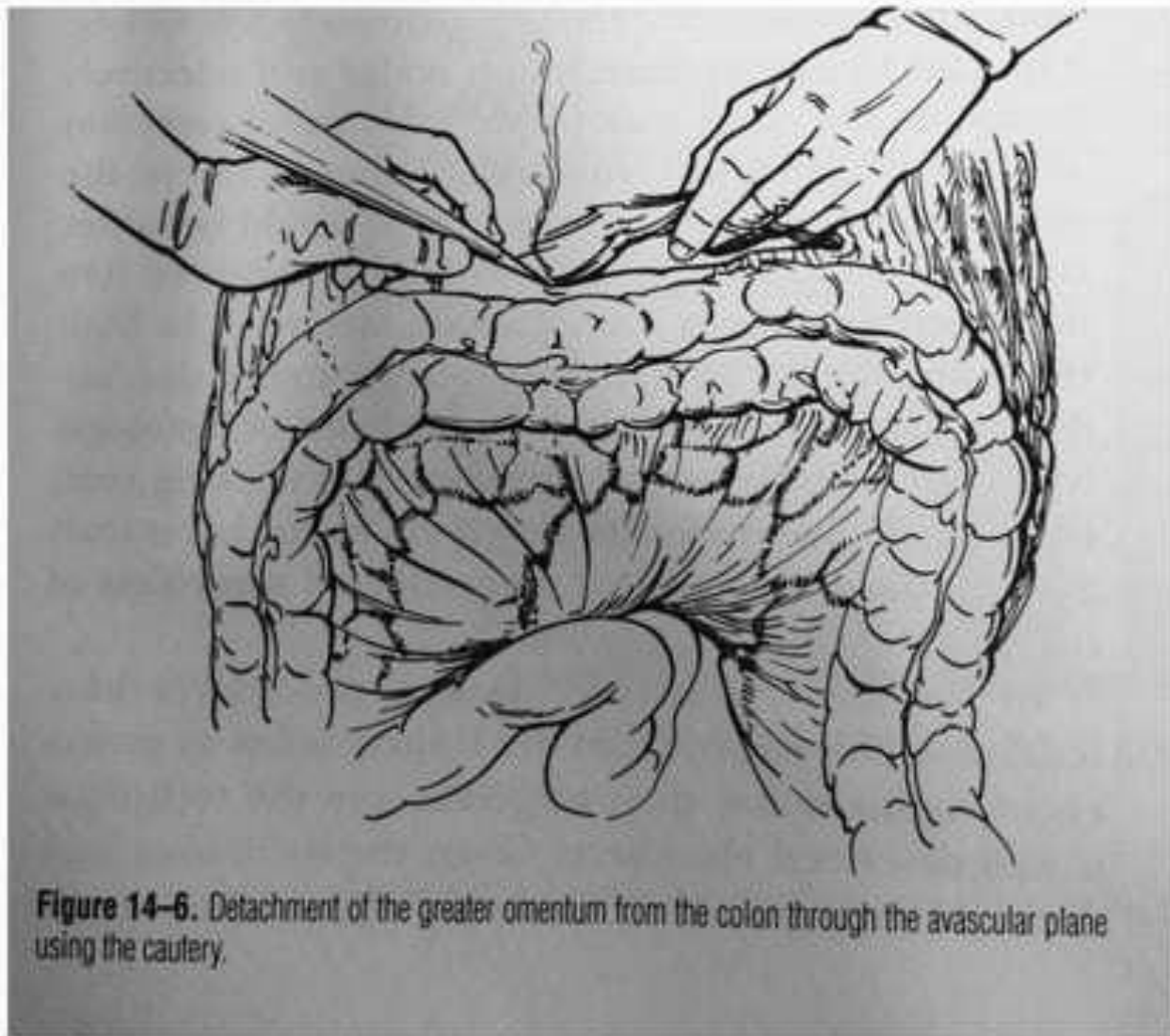
# RADICAL GASTRECTOMY

- Remove the stomach + distal part of esophagus + proximal part of duodenum + greater & lesser omentum + LNs
- Oesophagojejunostomy with roux-en-y .

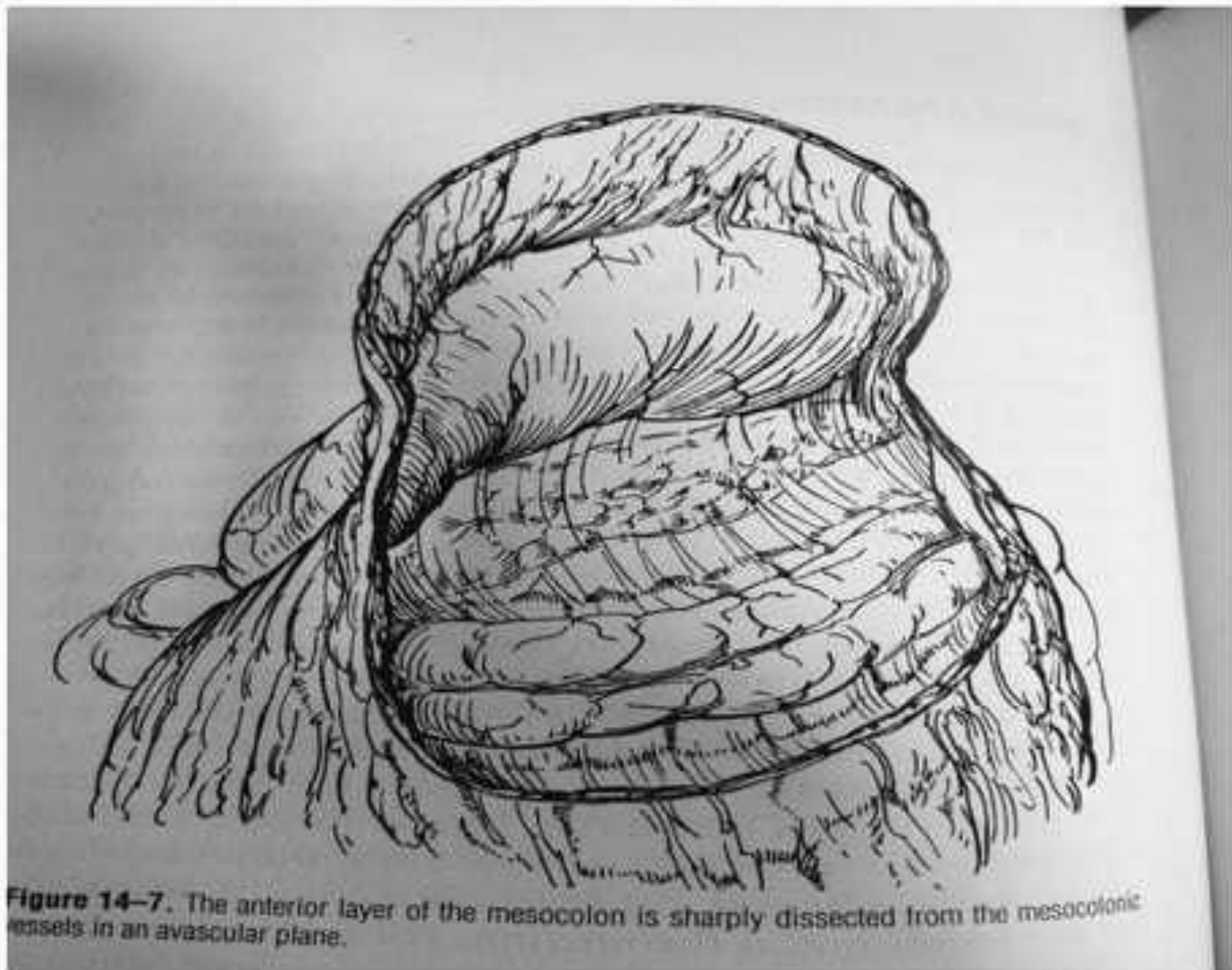
# Procedure of radical gastrectomy

- incision

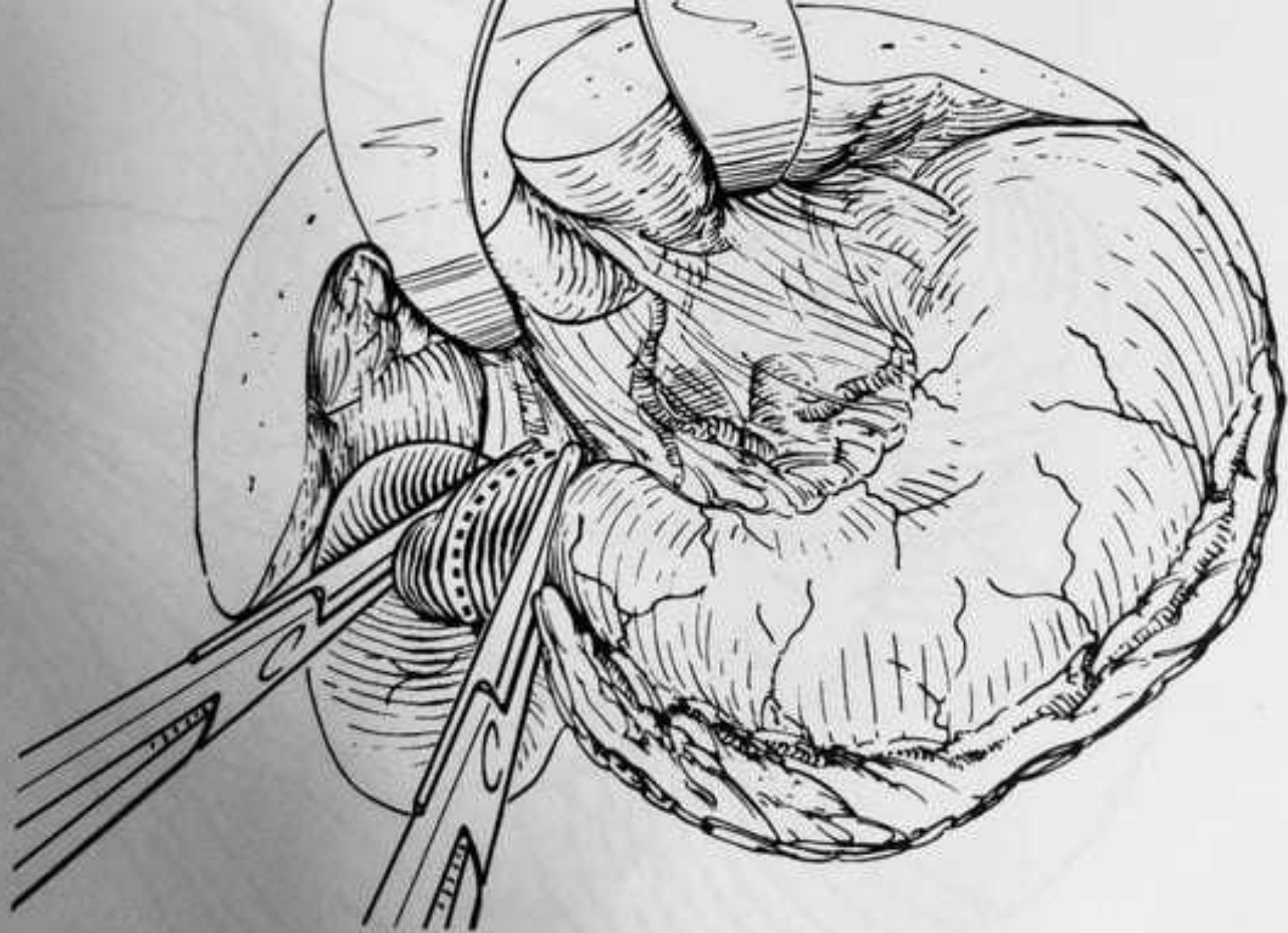




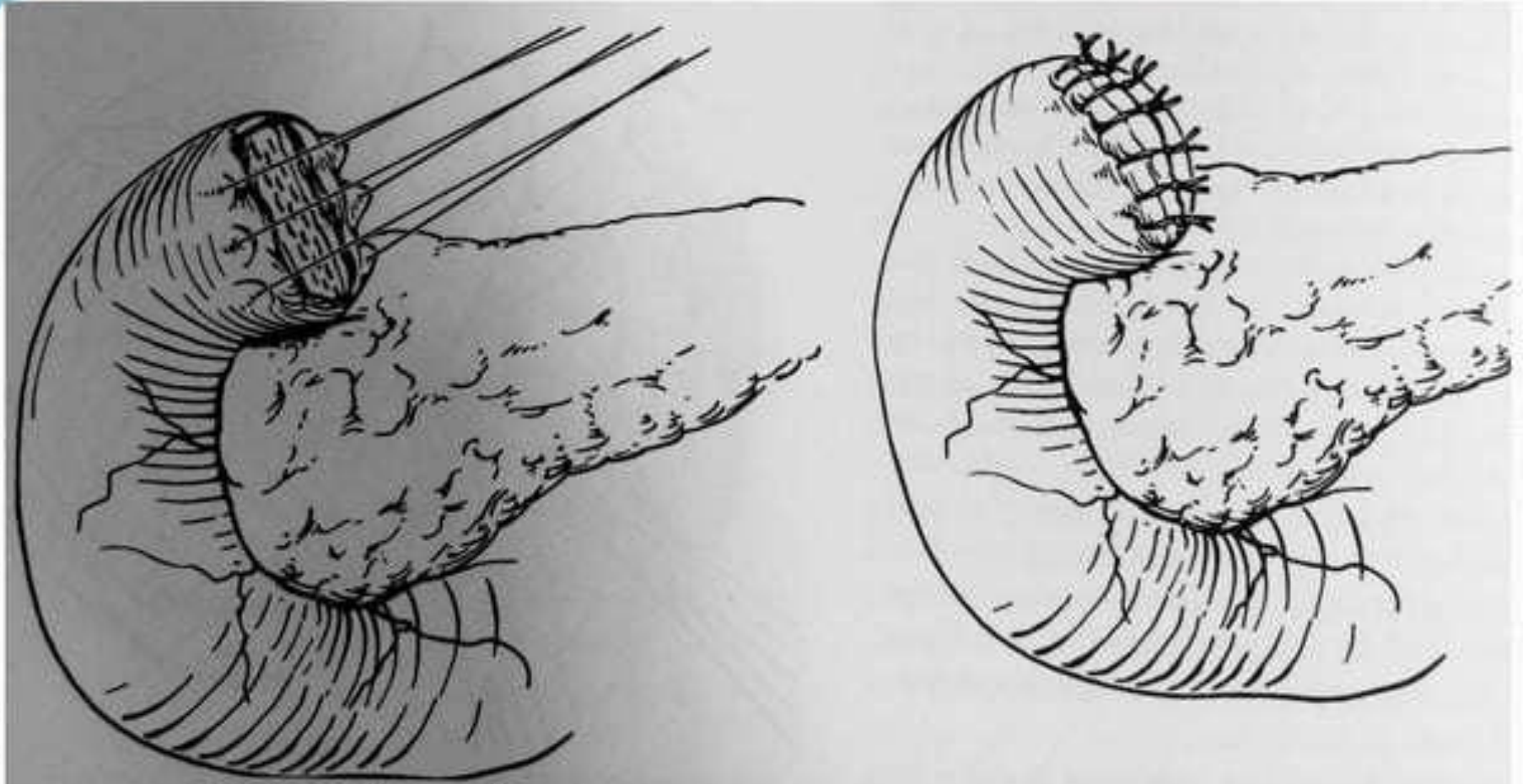
**Figure 14-6.** Detachment of the greater omentum from the colon through the avascular plane using the cautery.



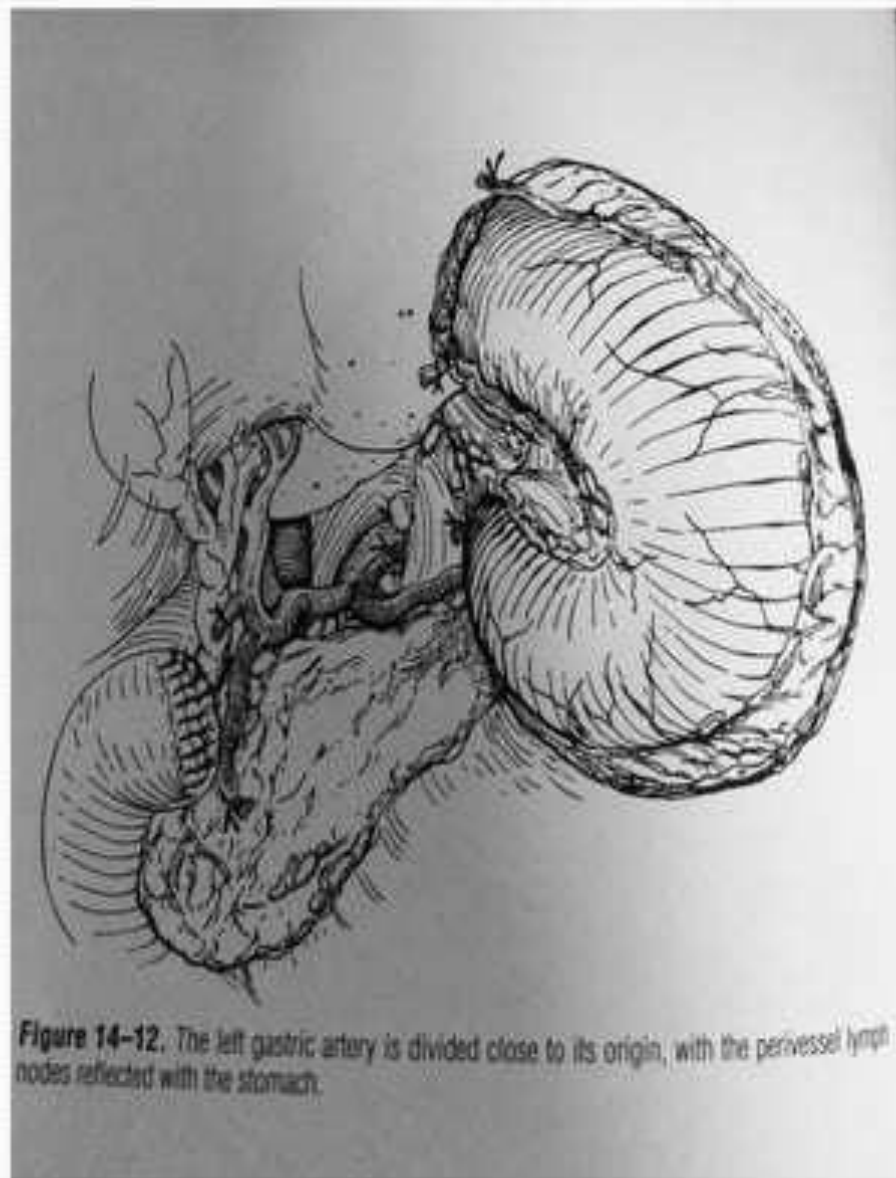
**Figure 14-7.** The anterior layer of the mesocolon is sharply dissected from the mesocolonic vessels in an avascular plane.



**Figure 14-9.** The duodenum is divided carefully with the scalpel between straight clamps.

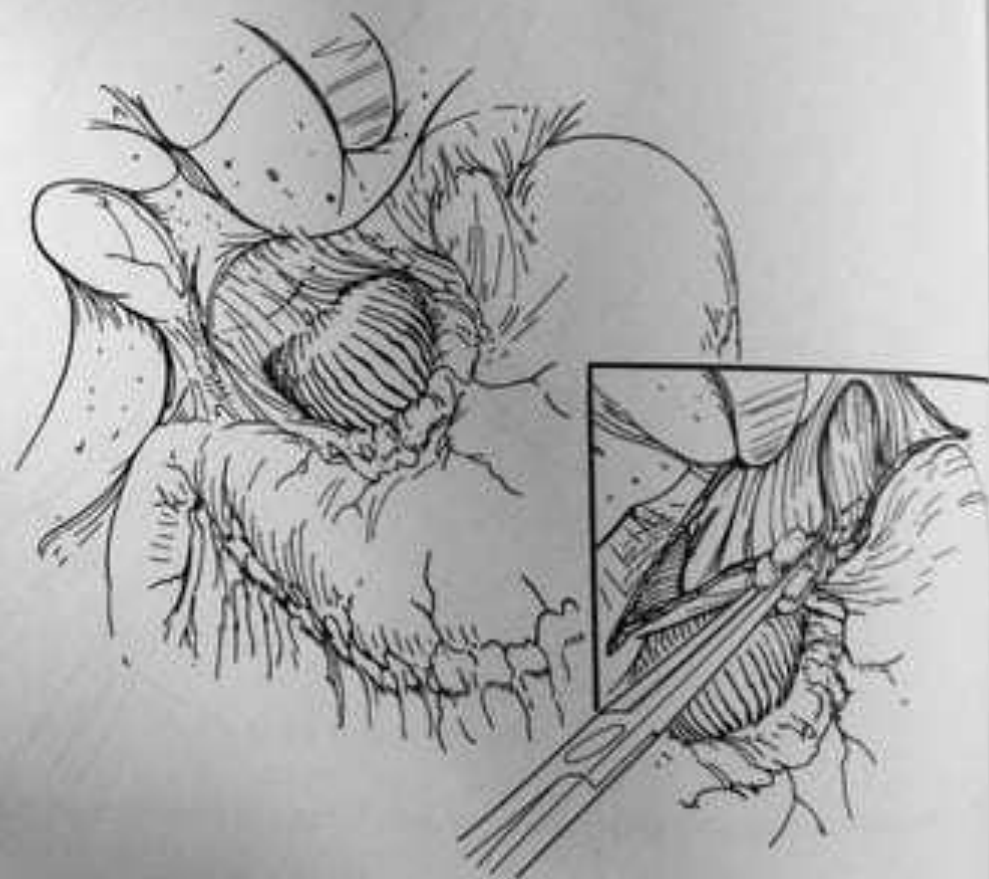


**Figure 14-11.** After division, the duodenum is closed carefully with an outer layer of monofilament absorbable interrupted sutures.

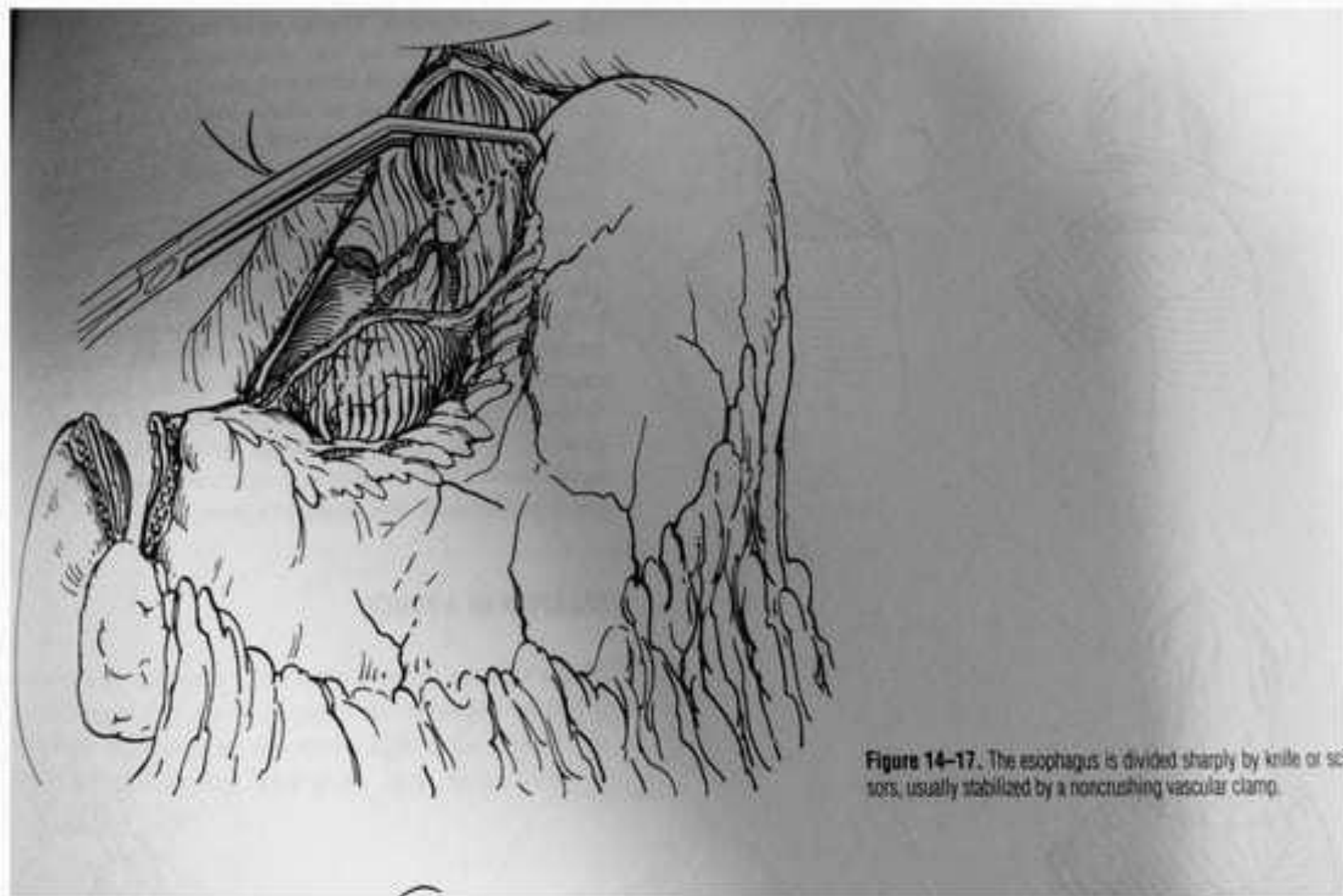


**Figure 14-12.** The left gastric artery is divided close to its origin, with the perivessel lymph nodes reflected with the stomach.



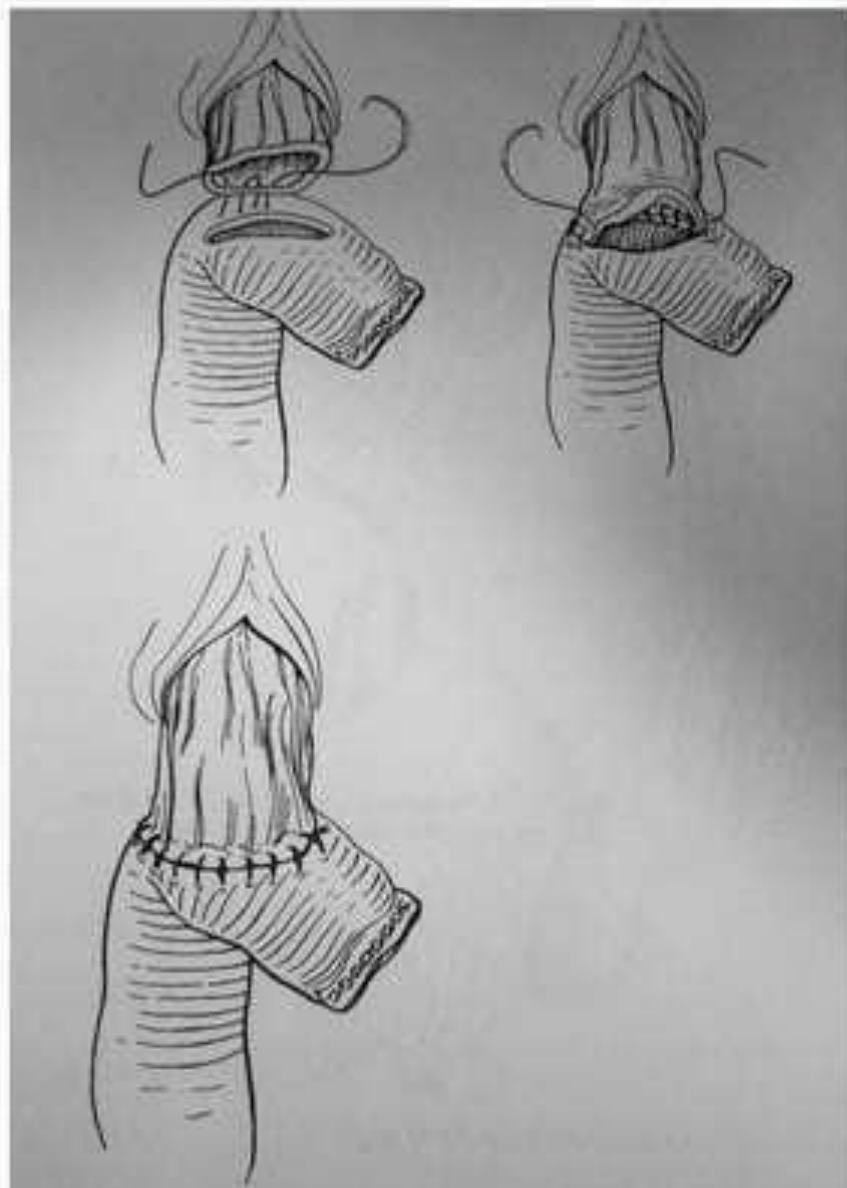


**Figure 14-16.** Mobilization of the esophageal hiatus is completed by detaching the peritoneal reflection from the diaphragm.

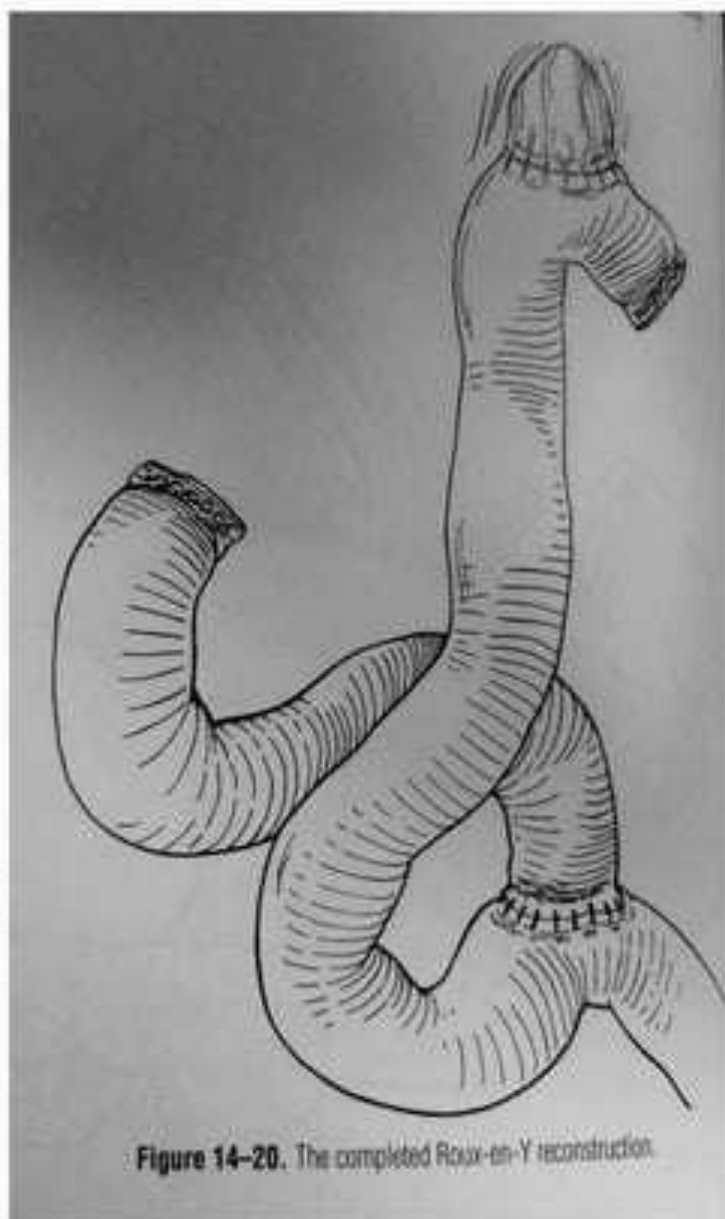


**Figure 14-17.** The esophagus is divided sharply by knife or scissors, usually stabilized by a noncrushing vascular clamp.

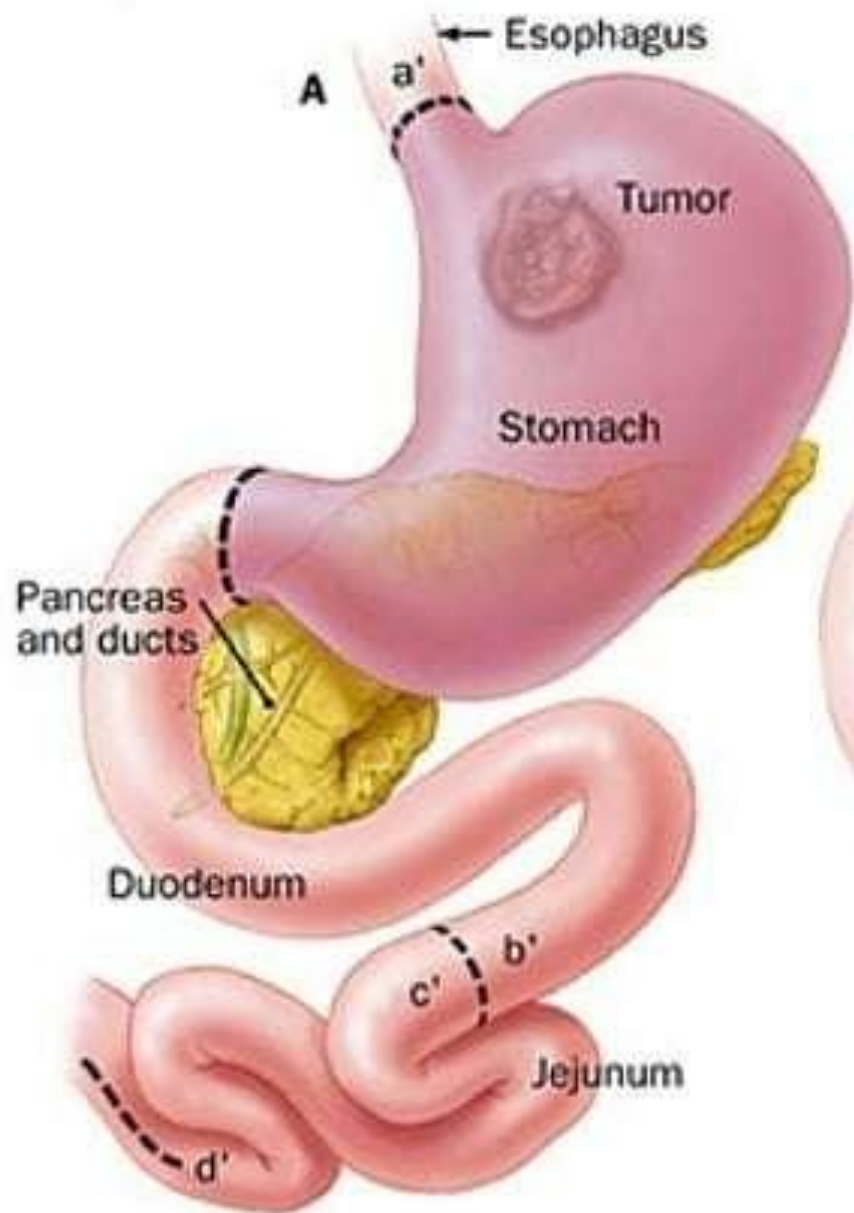




**Figure 14-19.** Standard end-to-side reconstruction using monofilament absorbable sutures in a single continuous layer.

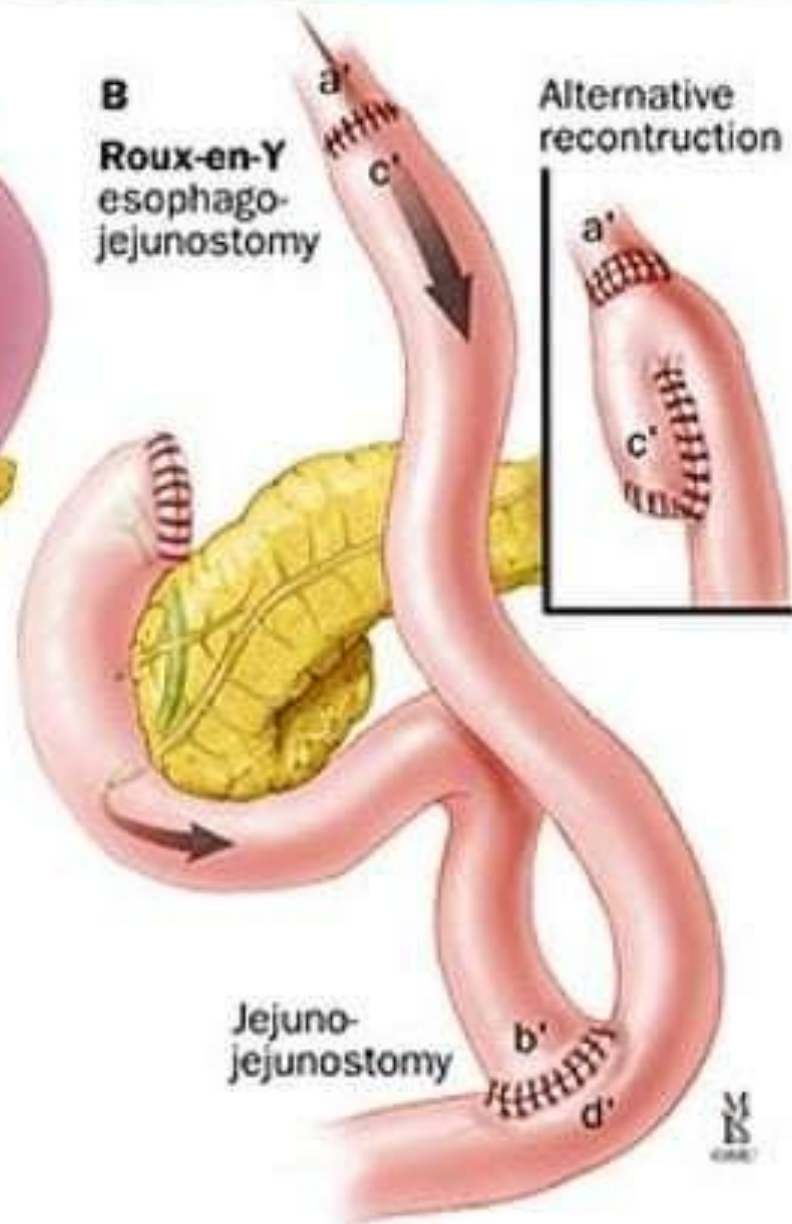


**Figure 14-20.** The completed Roux-en-Y reconstruction.



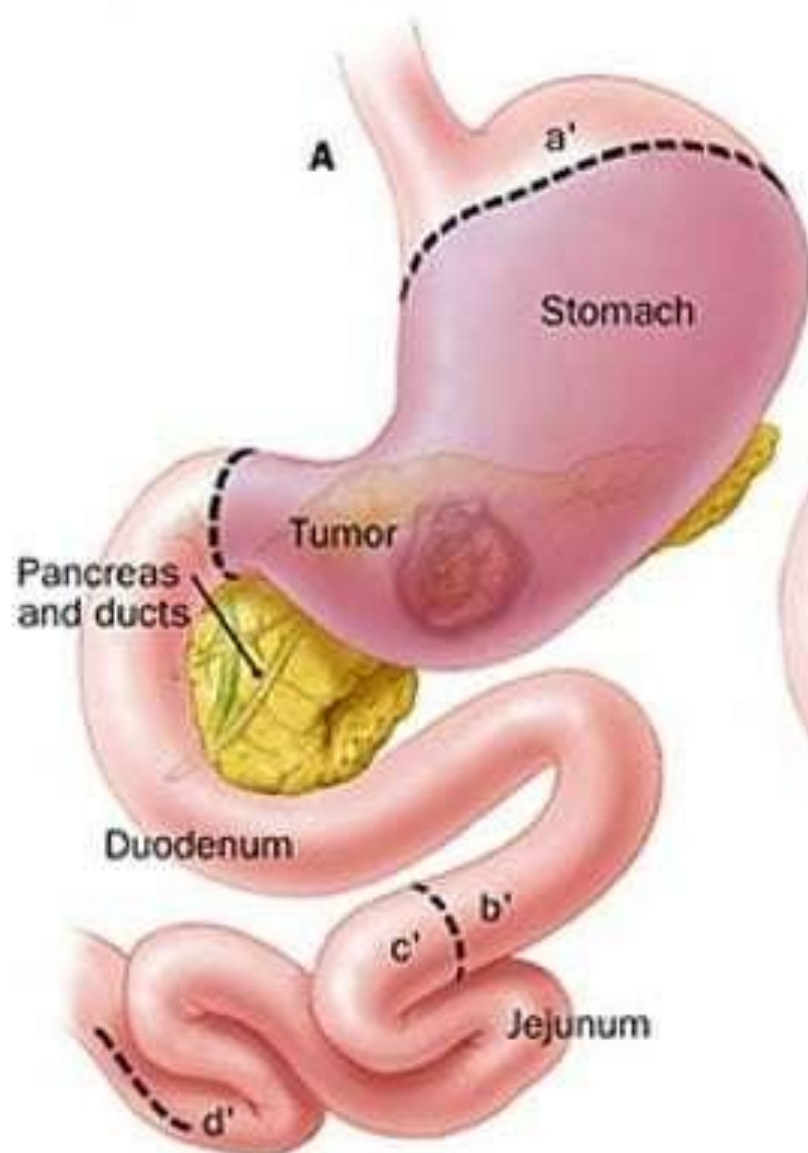
**B**  
Roux-en-Y  
esophago-  
jejunostomy

Alternative  
reconstruction



# SUBTOTAL GASTRECTOMY

- Similar to total one except that the PROXIMAL PART of the stomach is preserved
- Followed by reconstruction & creating anastomosis
- ( by gastrojejunostomy, billroth II )





# PALLIATIVE SURGERY

- For pts suffering from bleeding
- Palliative radical (anastomosis)

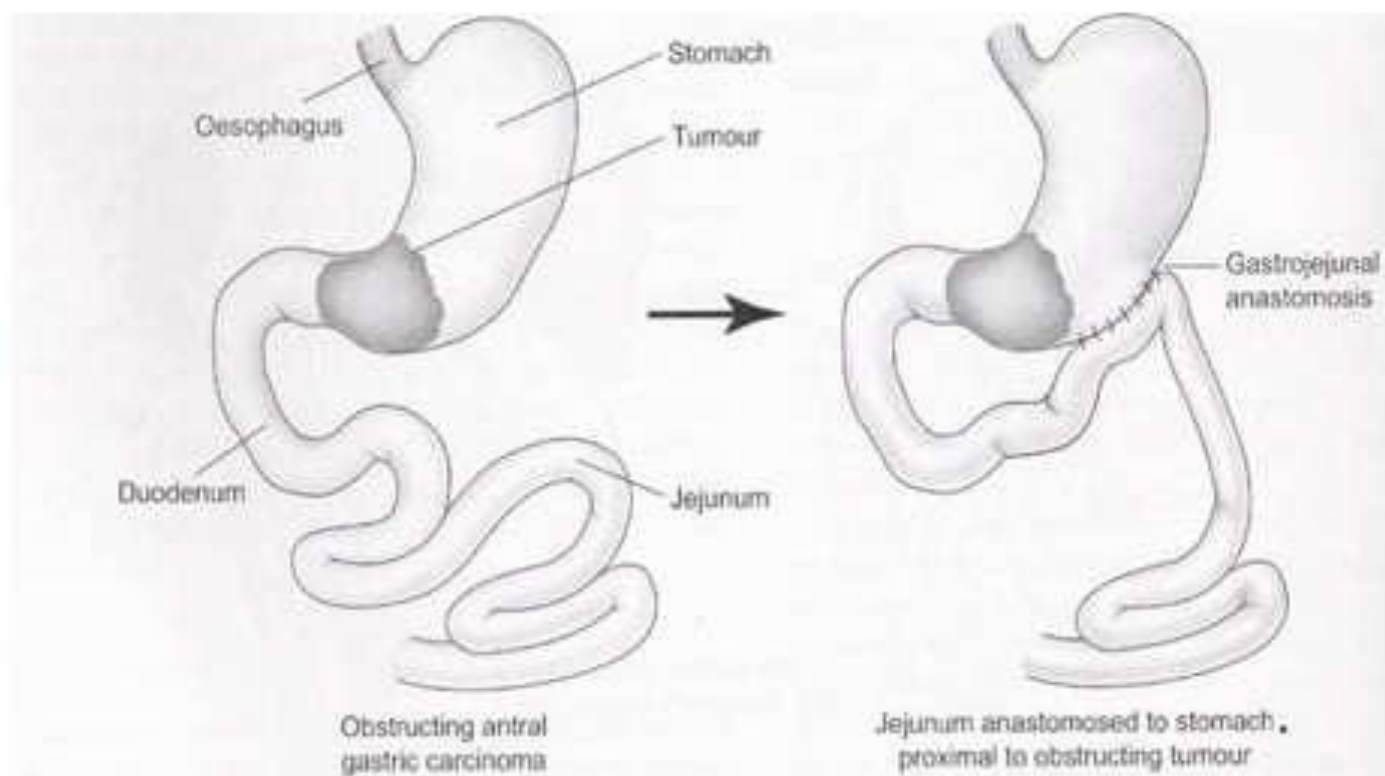


Fig. 18.14 Palliative bypass procedure for gastric carcinoma.

# POSTOPERATIVE ORDERS

- **Admit to PACU**
- **Detailed nutritional advise (small frequent meals)**

# Post-Operative Complications

- 1. Leakage from duodenal stump.**
- 2. Secondary hemorrhage.**
- 3. Nutritional deficiency in long term.**



## 2. Chemotherapy:

Responds well, but there is no effect on survival.

Marsden Regimen

Epirubicin, cisplatin & 5-fluorouracil (3 wks)

6 cycles

Response rate : 40% .

## 3. Radiotherapy:

**Postoperative-radiotherapy:** may decrease the recurrence.

THANK  
YOU! 😊