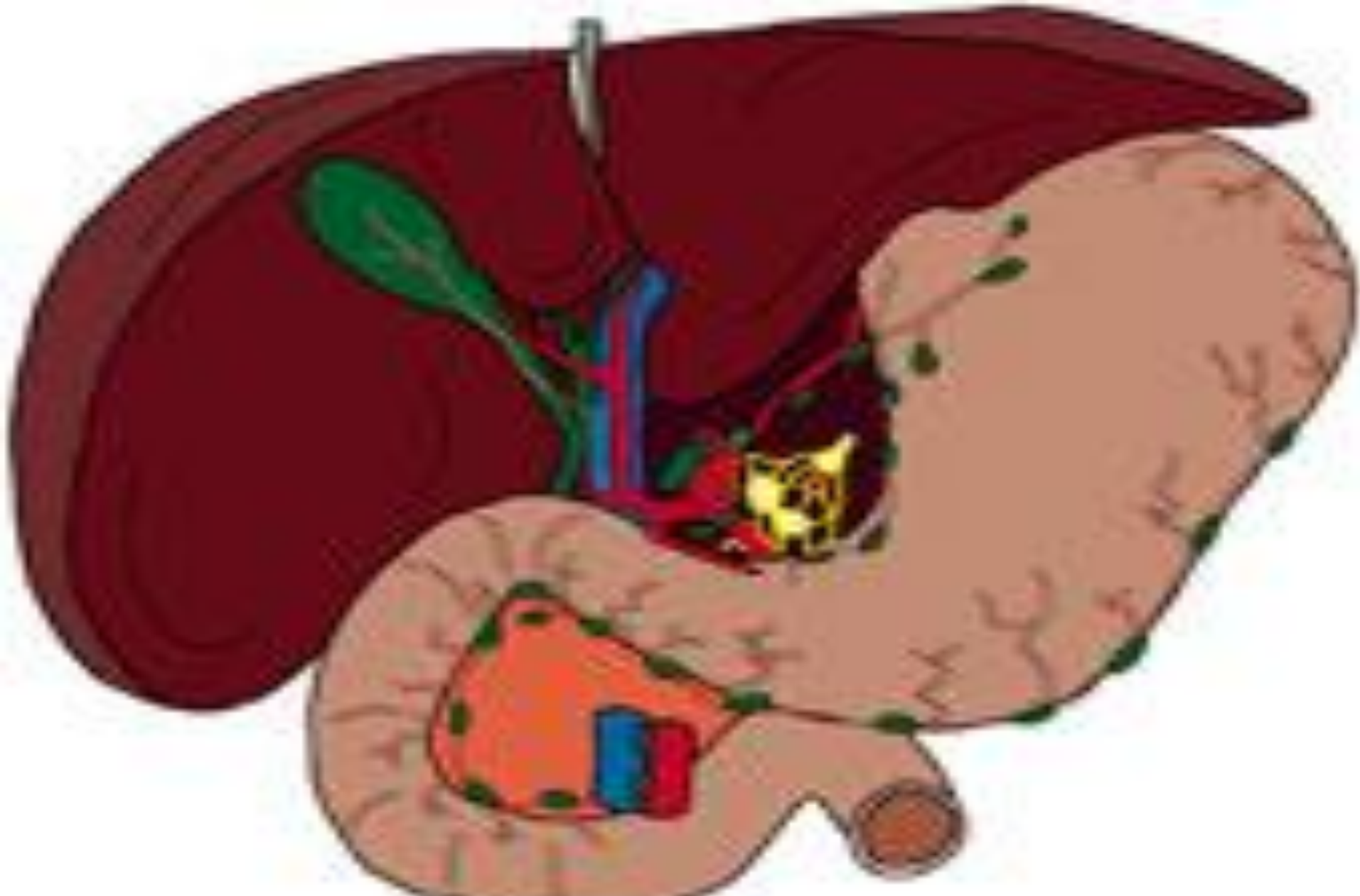
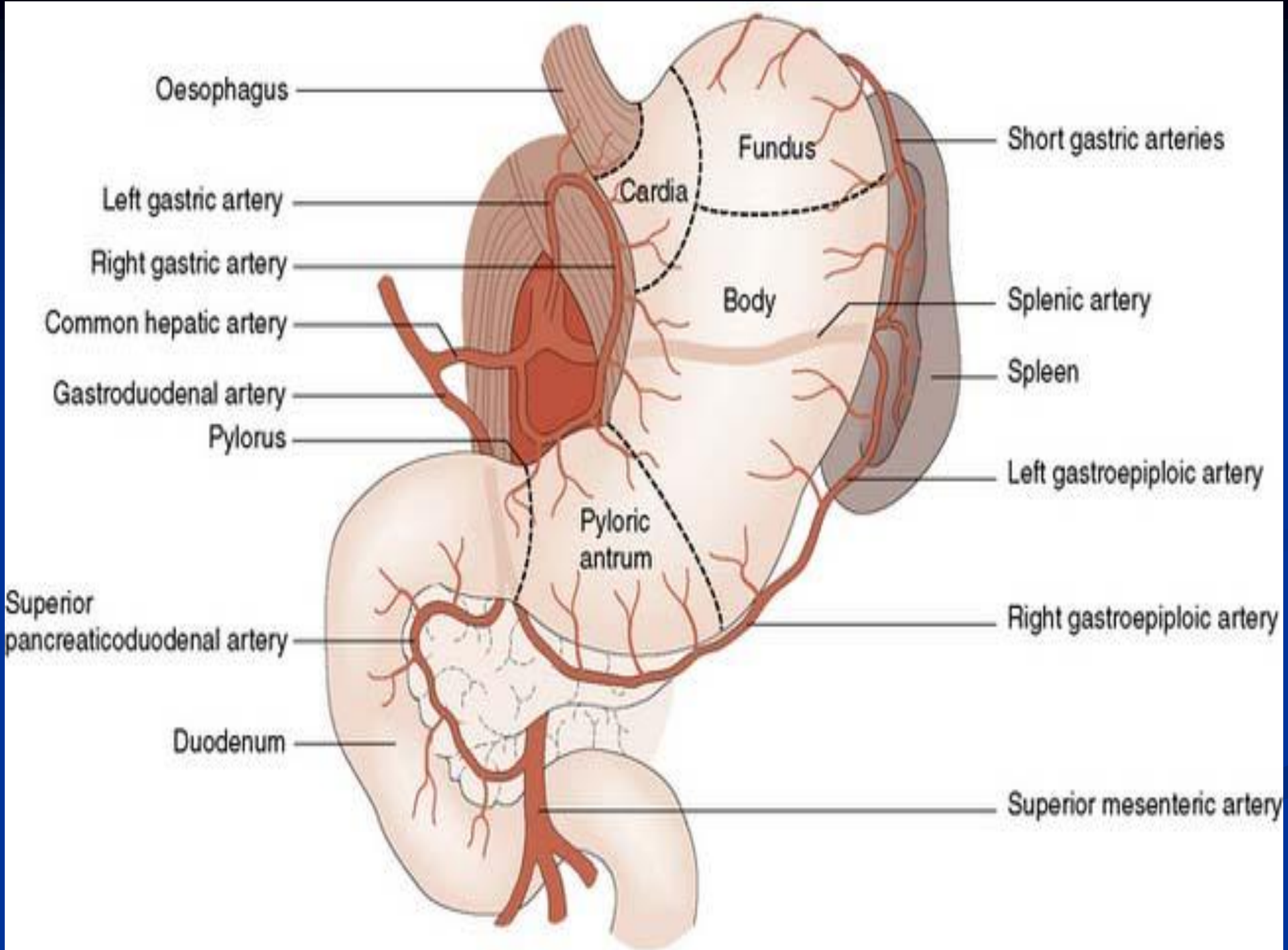
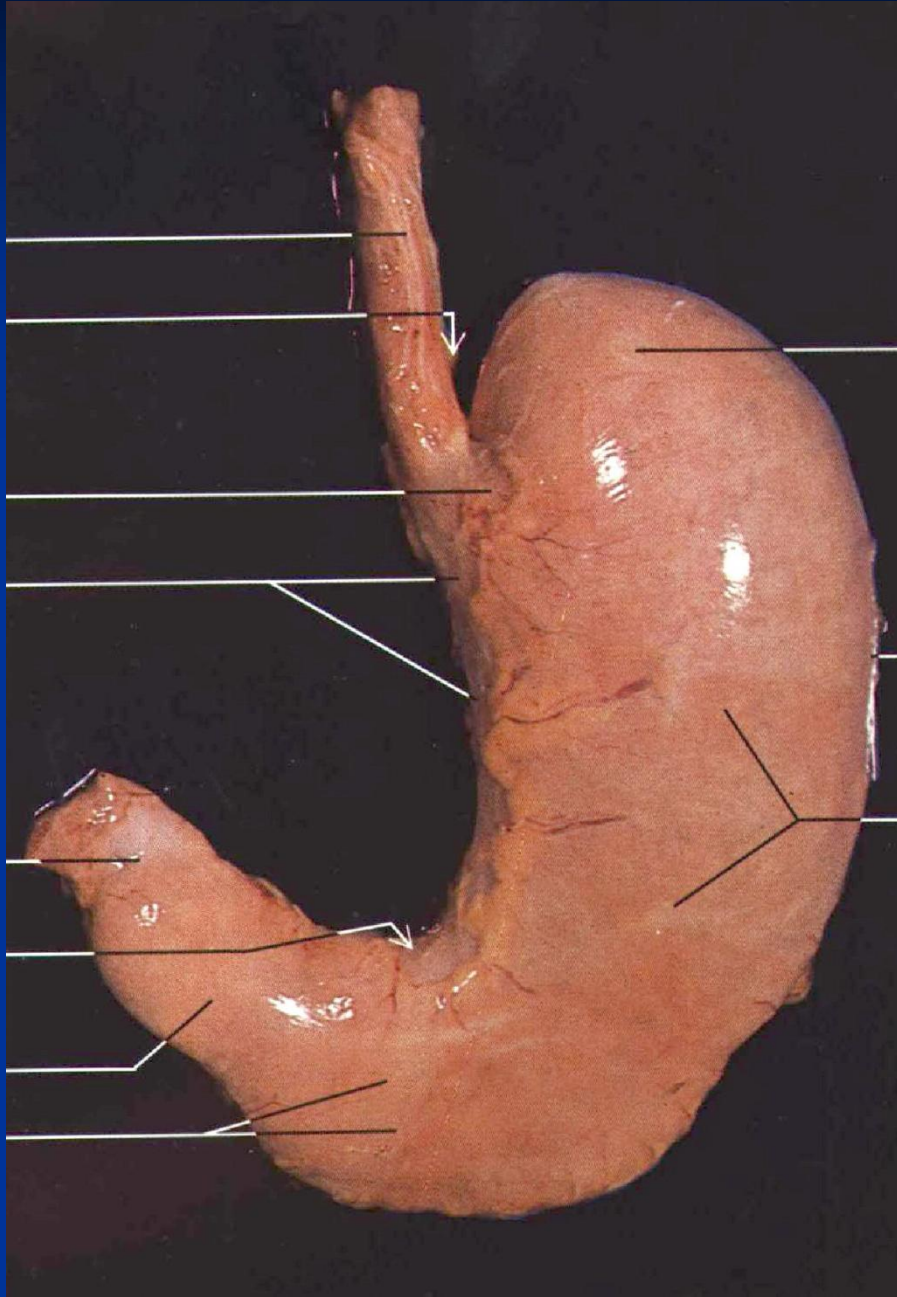
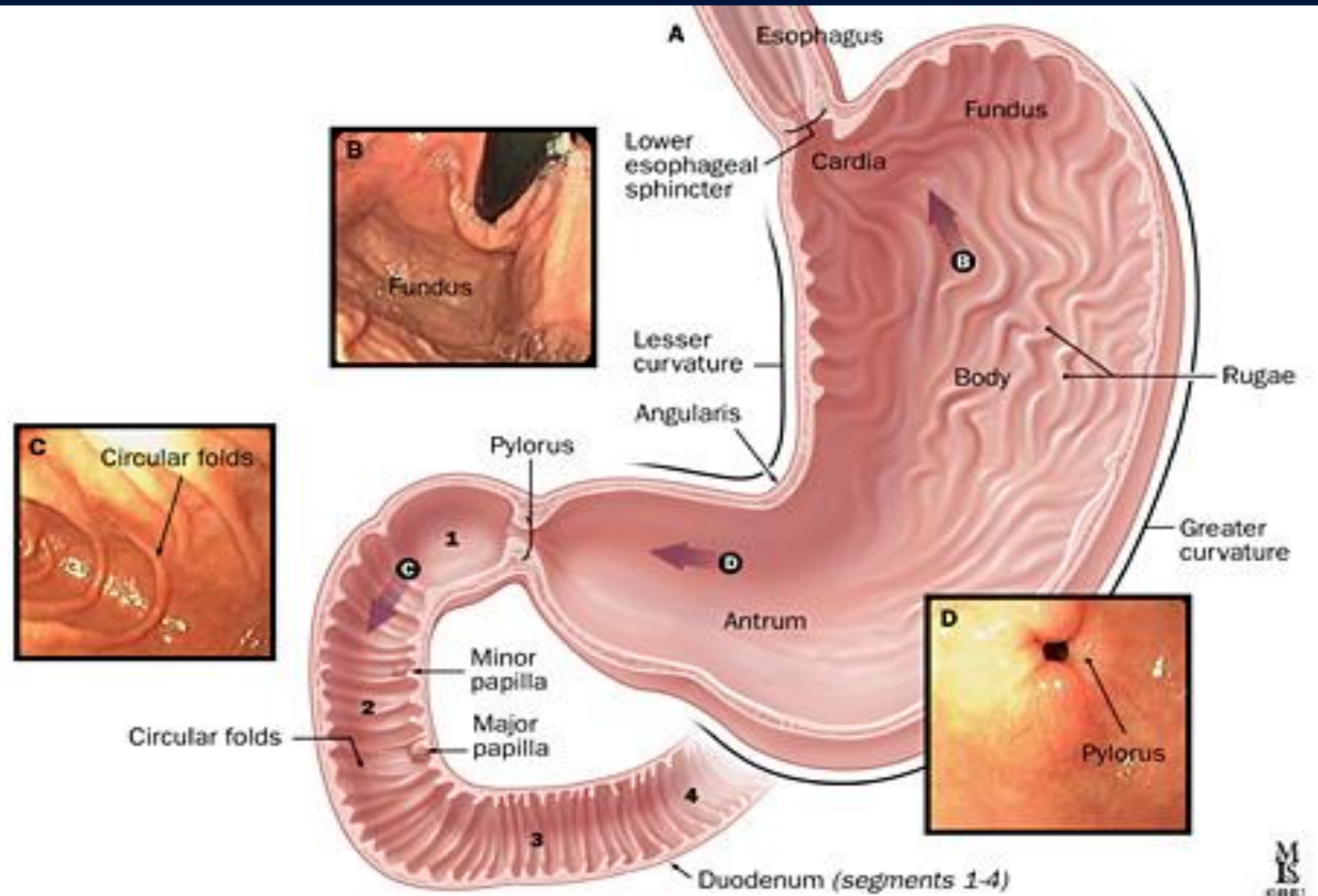


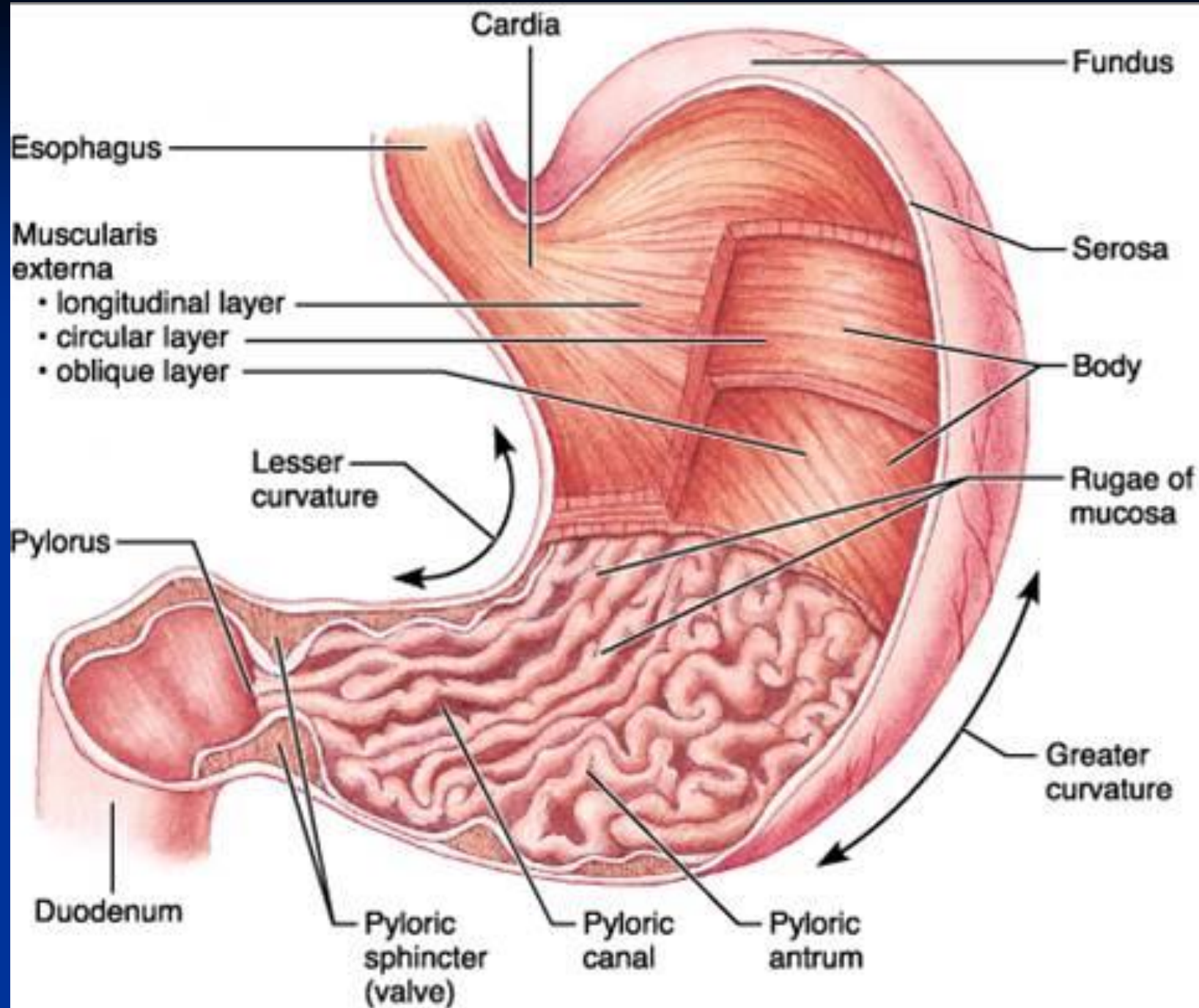
STOMACH and DUODENUM











Arterele gastrice scurte

Au traseu ascendent pentru a iriga fundul stomacului.

Venele gastrice scurte

Drenează în vena splenică.

Vena gastroepiploică dreaptă

Drenează sângele în vena mezenterică, ce se unește cu vena splenică pentru a forma vena portă.

Vena portă

Artera gastroepiploică dreaptă

Asigură vascularizația porțiunii inferioare a marii curbur.

Artera gastrică stângă

Vascularizează mica curbura a stomacului.

Vena gastrică stângă

Drenează în vena portă, de mare calibr.

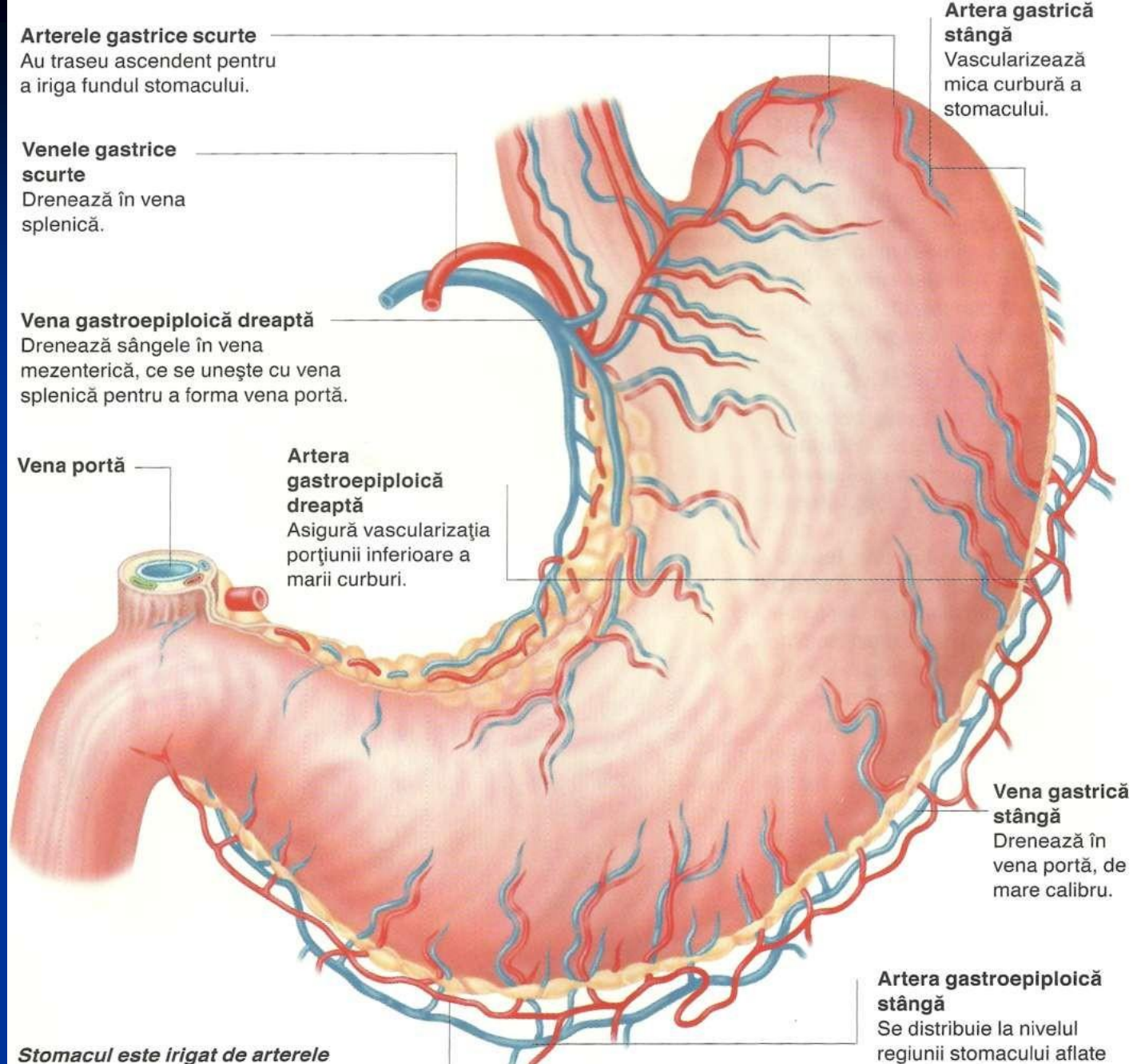
Artera gastroepiploică stângă

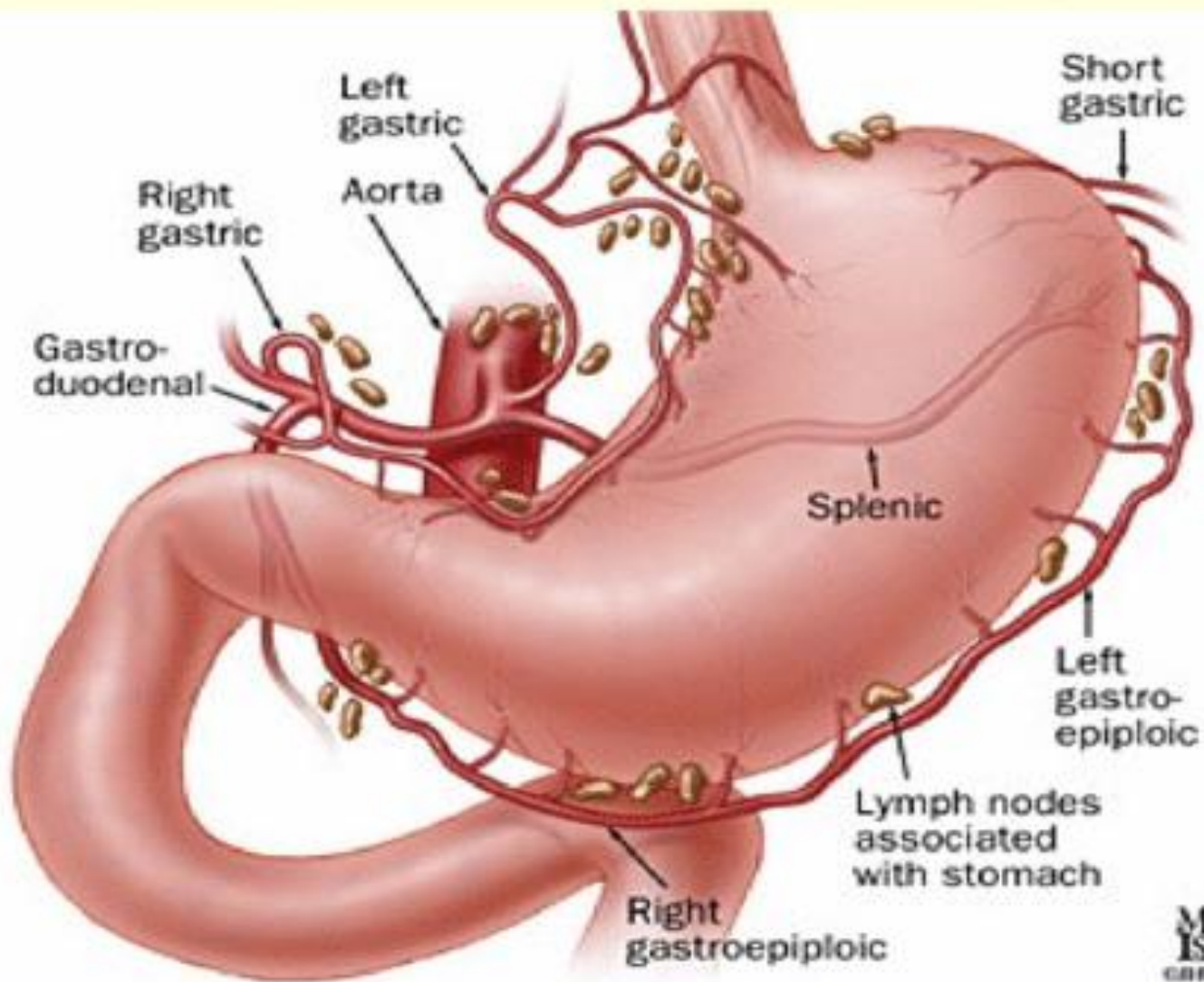
Se distribuie la nivelul regiunii stomacului aflate de-a lungul porțiunii superioare a marii curbur.

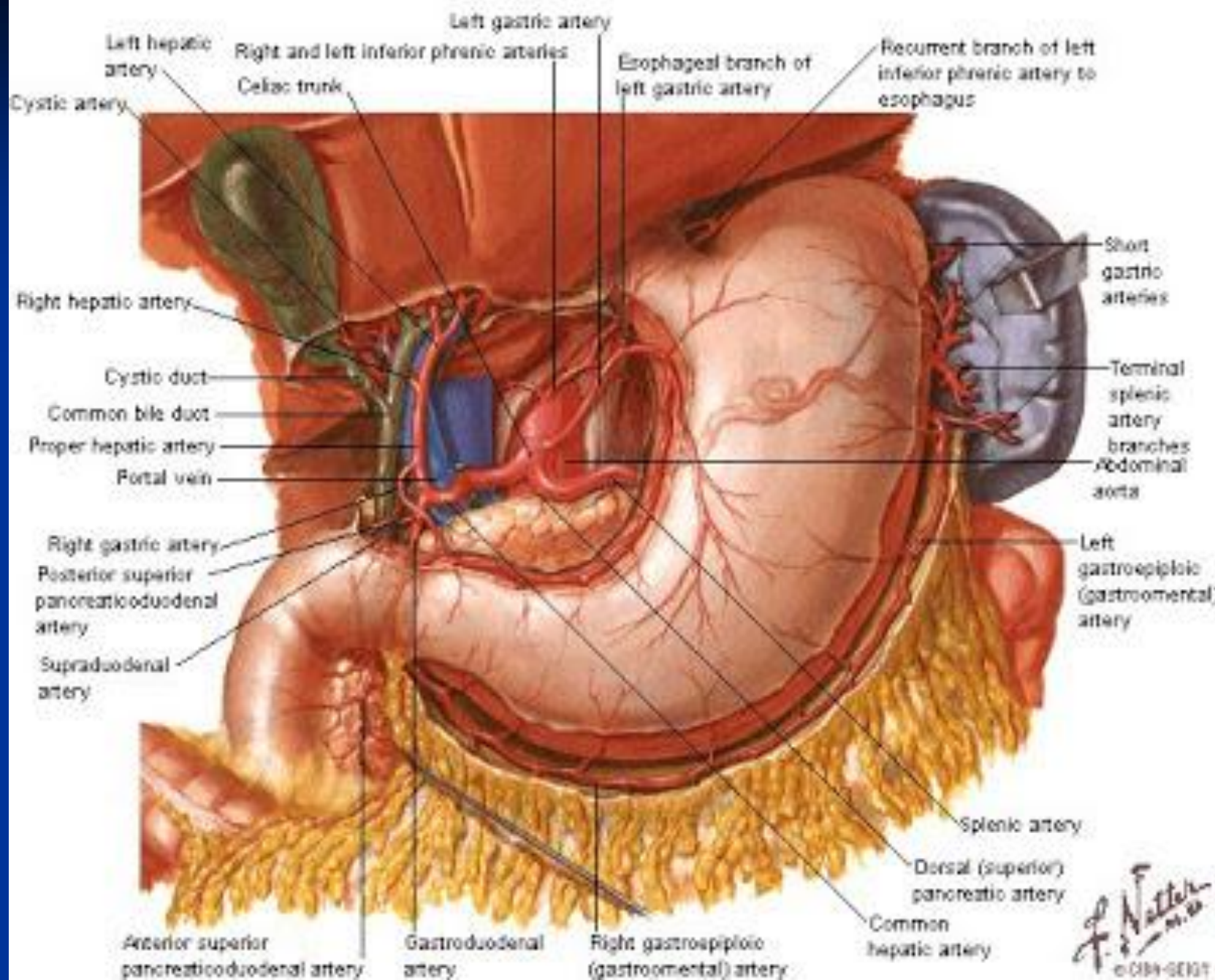
Stomacul este irigat de arterele desprinse din trunchiul celiac, care la rândul lui constituie o ramificație a aortei abdominale.

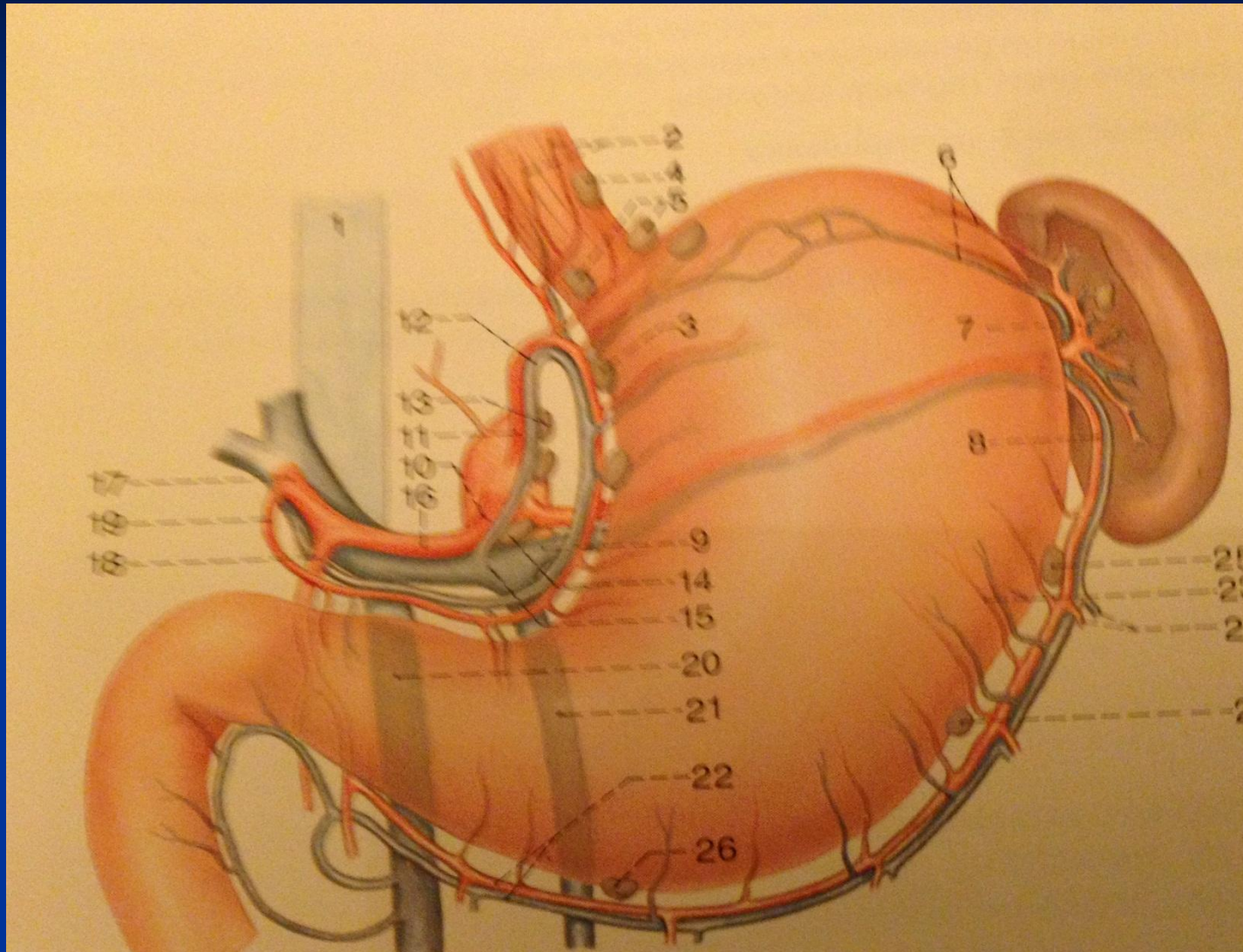
Artera gastroepiploică dreaptă

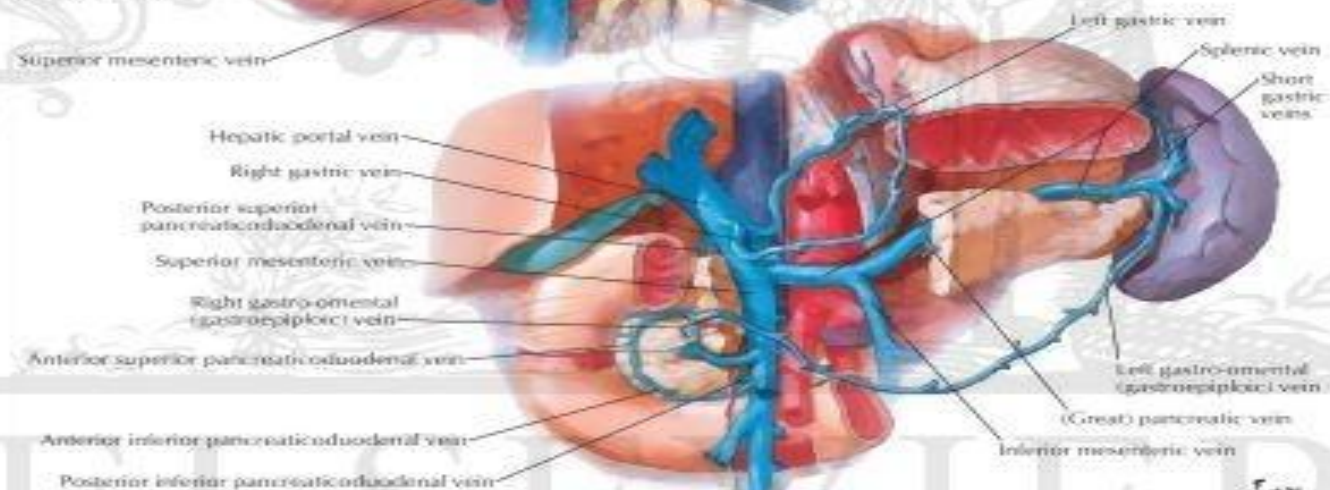
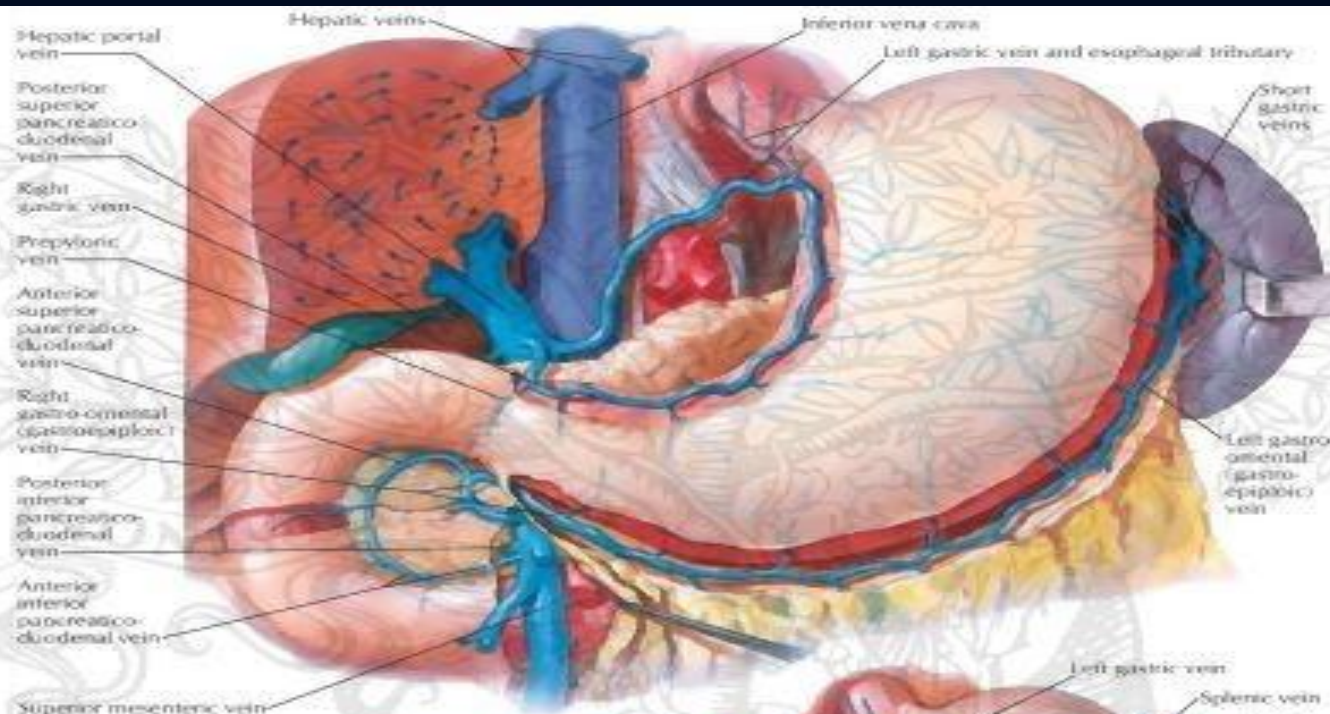
Asigură vascularizația porțiunii inferioare a marii curbur.

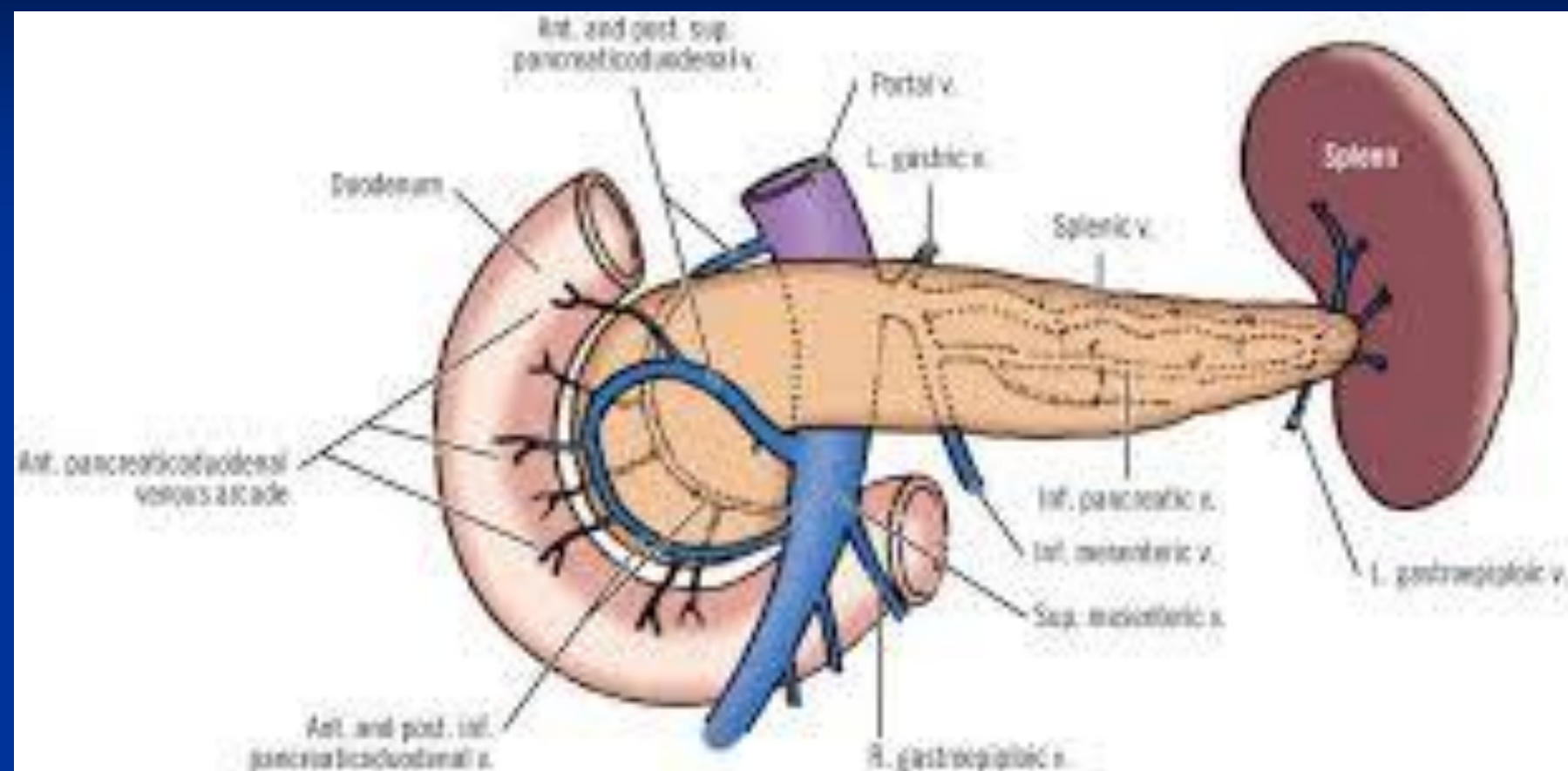


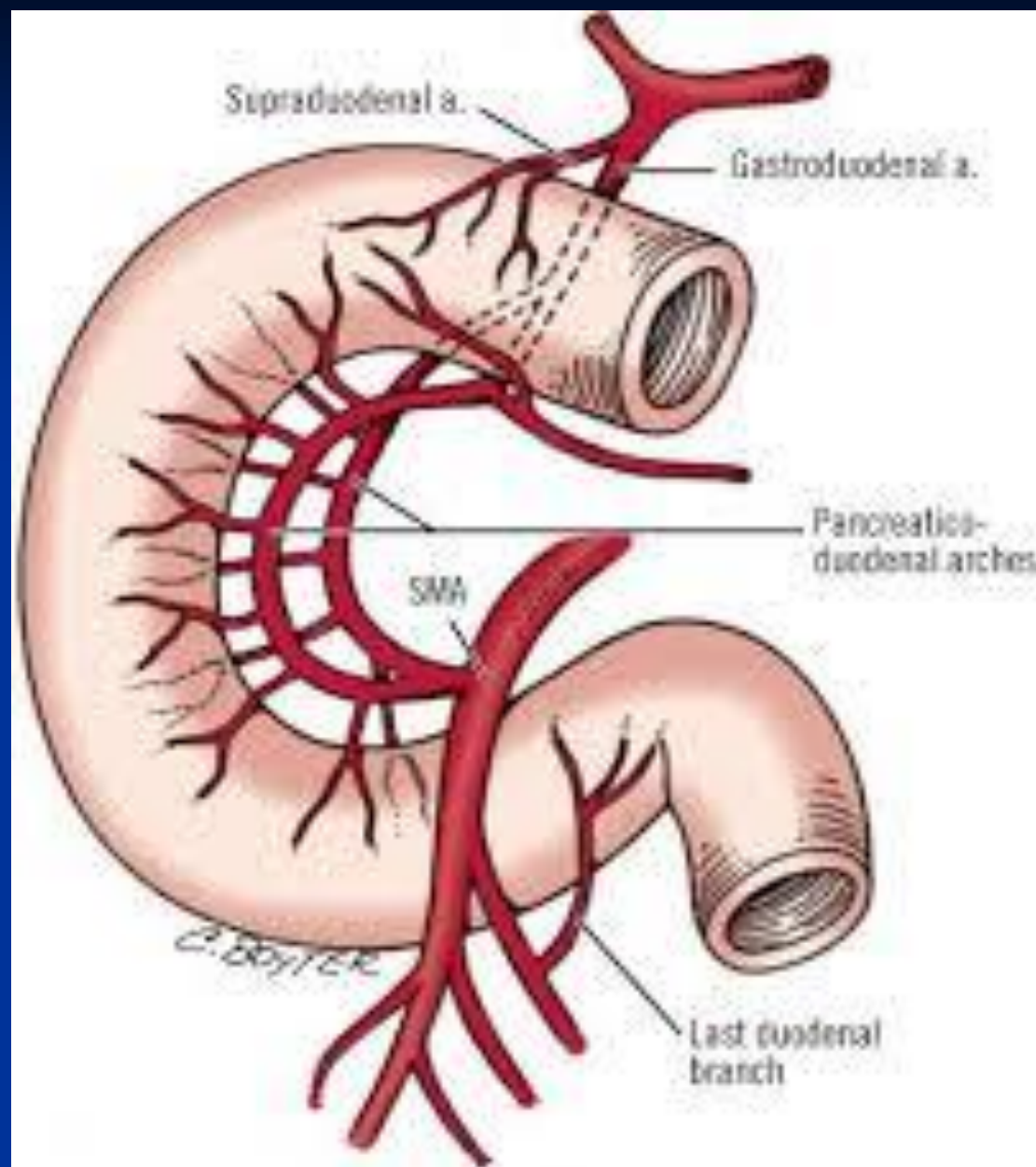


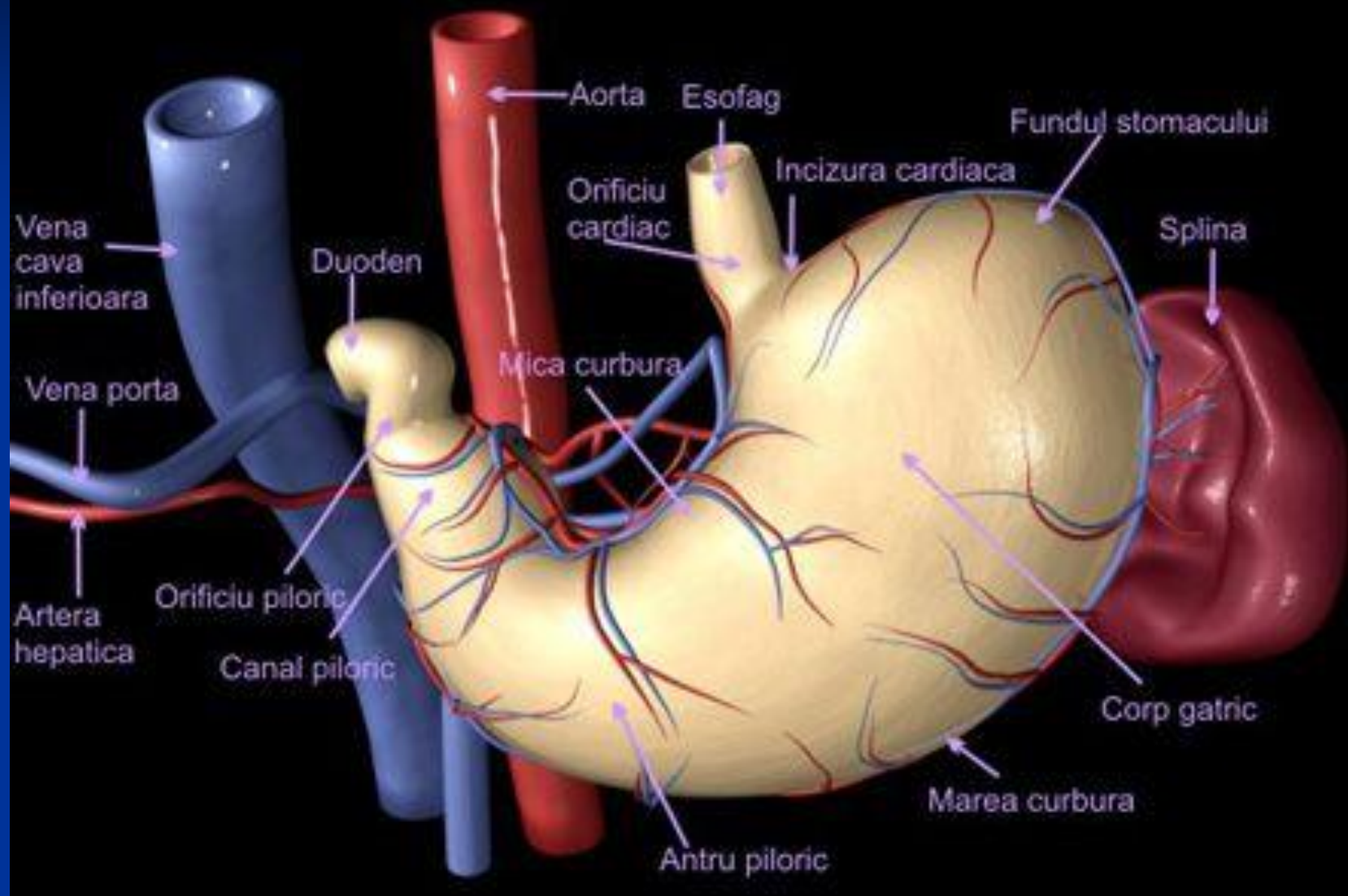


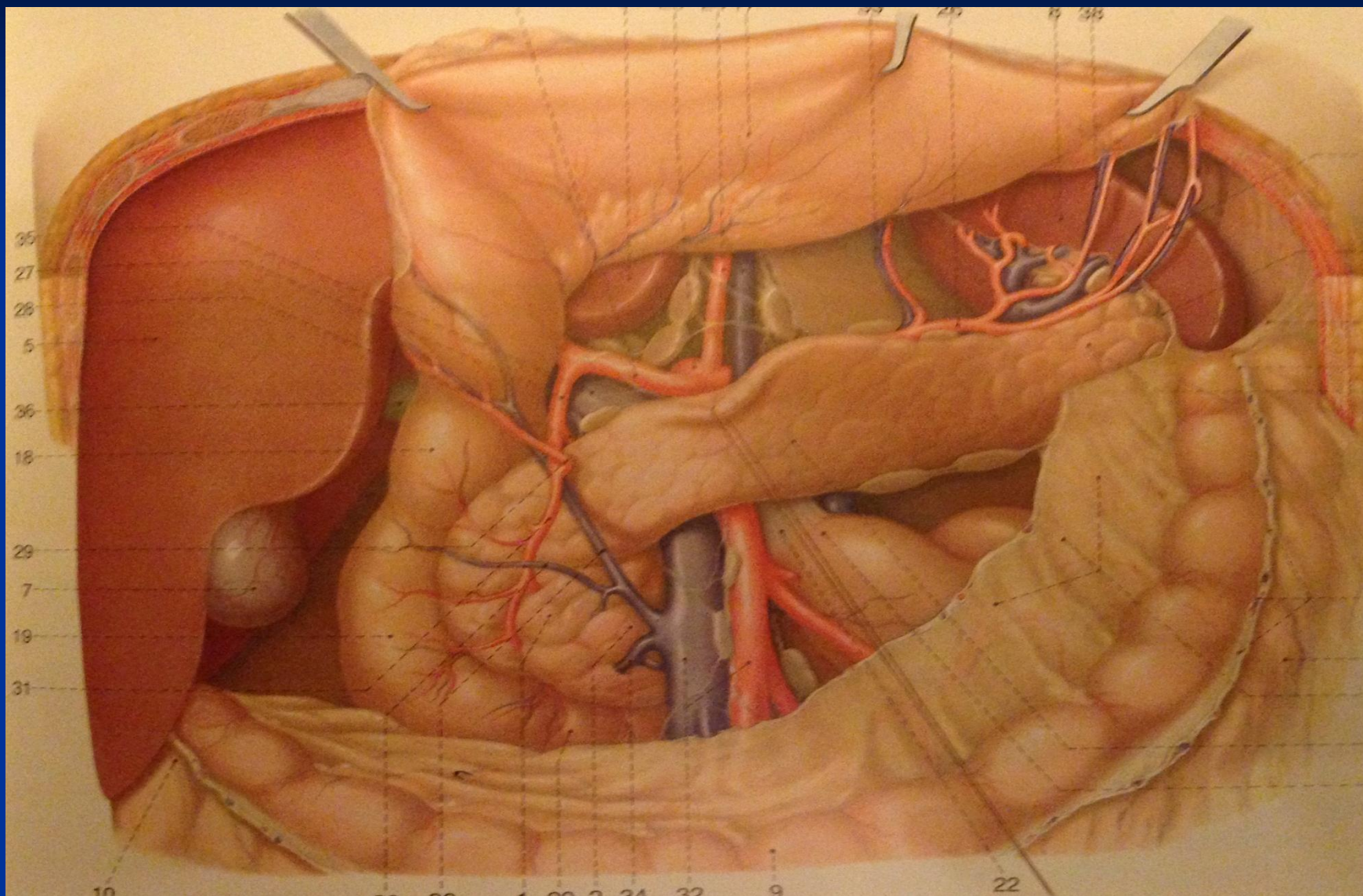












DUODENUM





FORAMEN
OF WINSLOW



NORMAL
DUODENAL BULB



STOMACH and DUODENUM

Gastroduodenal ulceration

The stomach serves as a temporary reservoir for food and drink. Here, food is mixed, diluted and acidified before being passed into the duodenum as a small boluses of chyme.

Congenital malformation are rare.

Apparently peptic ulcer is not one disease, but genetically, etiologically, and pathogenetically is a heterogeneous group of diseases that share a common endpoint, an **ulcer crater** in those parts of the gastrointestinal tract exposed to acid and pepsin.

STOMACH and DUODENUM

Gastroduodenal ulceration

Morphological aspect:

ulcer is a lack of tissue of the gastric or duodenal wall beginning from the mucous layer and is defined by 3 parameters:

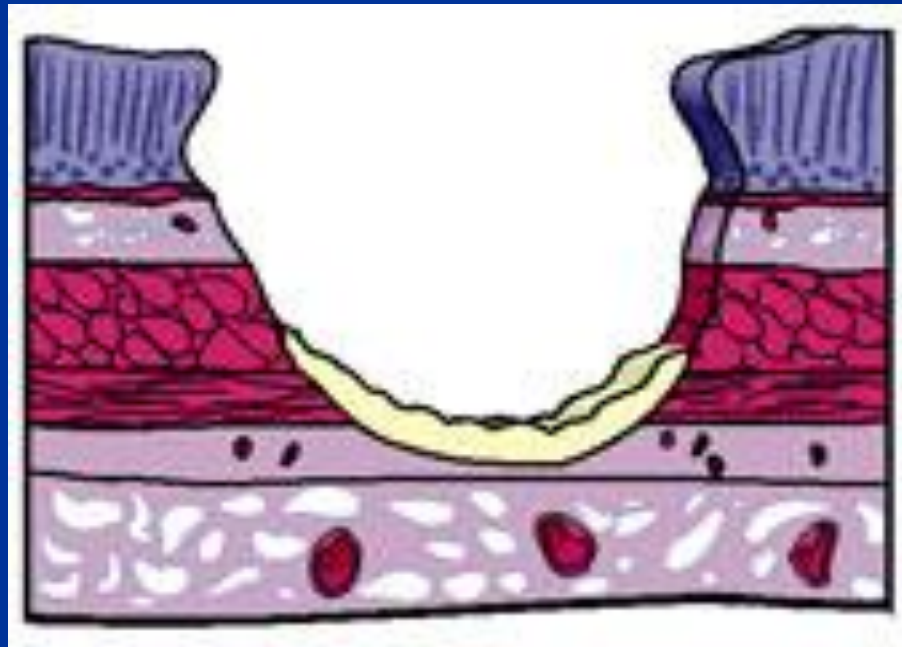
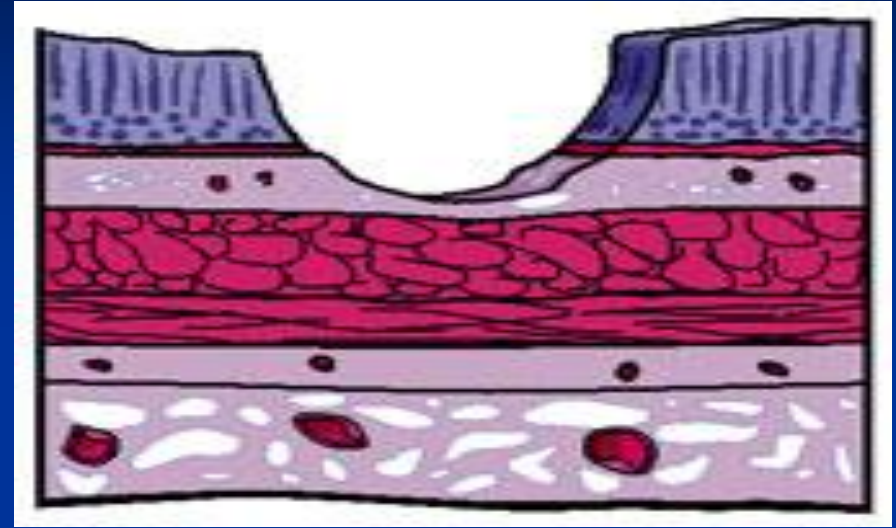
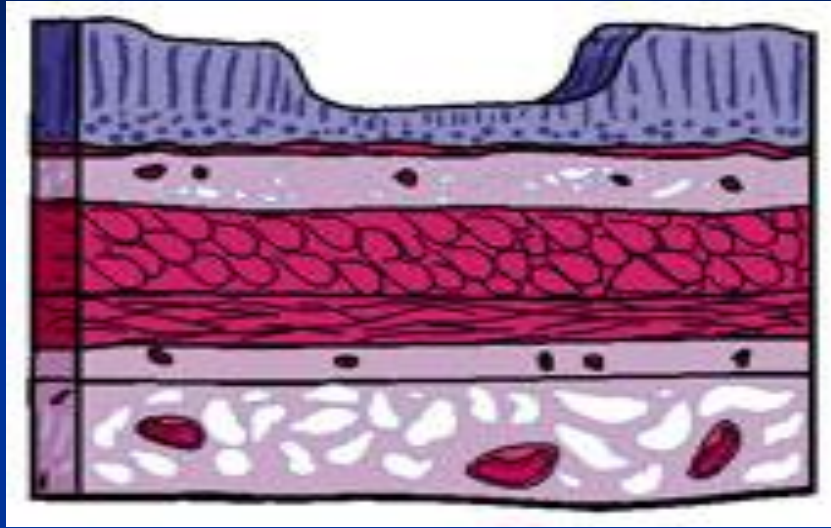
- **base or bottom of ulcer:** smooth and covered with fibrin deposit;
- **ulcer edges:** clean cut and regular, round or oval, with edema or sclerosis, depending on the age of ulceration
- **neighbourhood lining:** peptic lesions

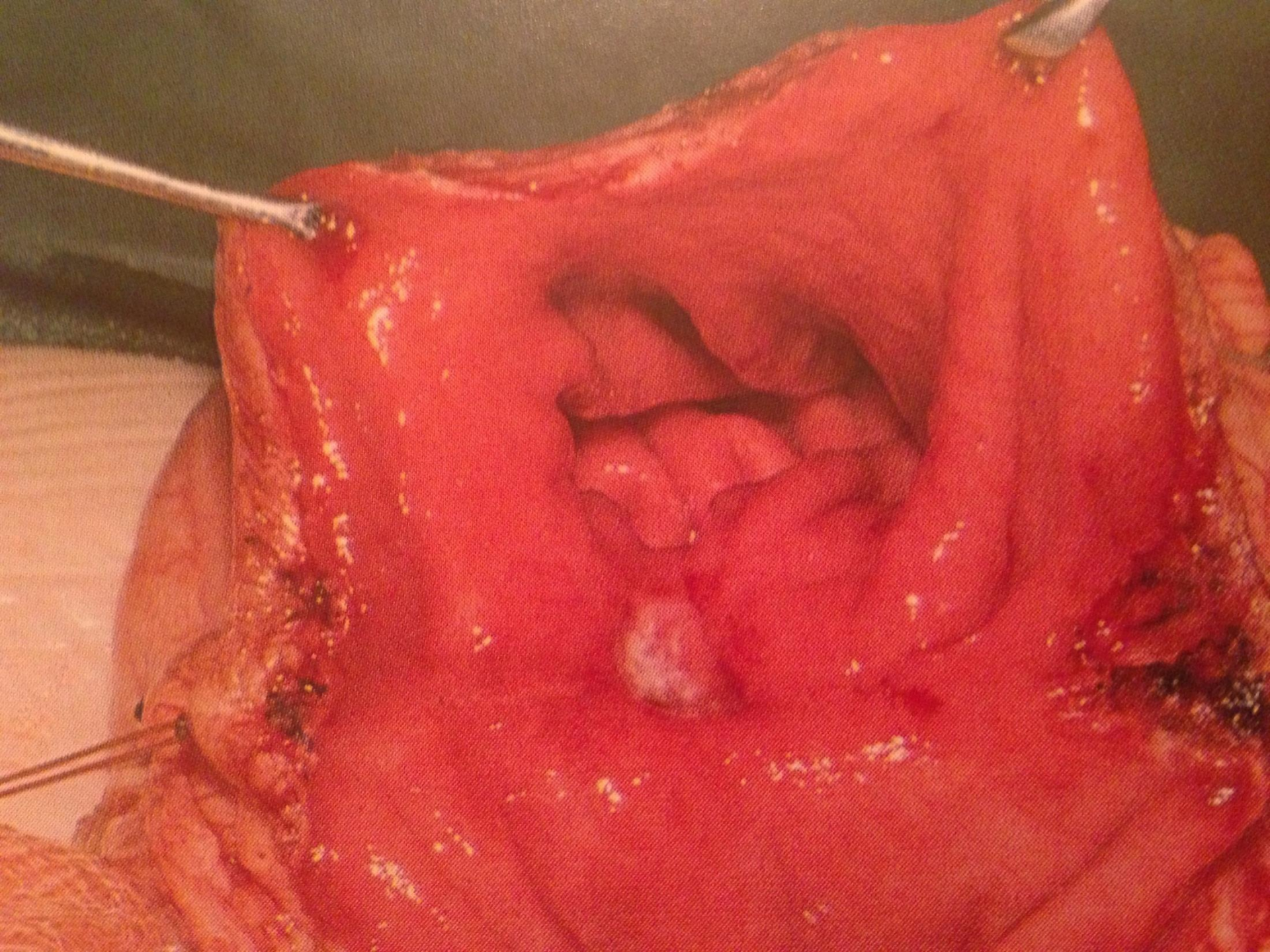
Pathogeny: affect the balance between aggressive factors and defensive factors of gastric and duodenal mucosa:

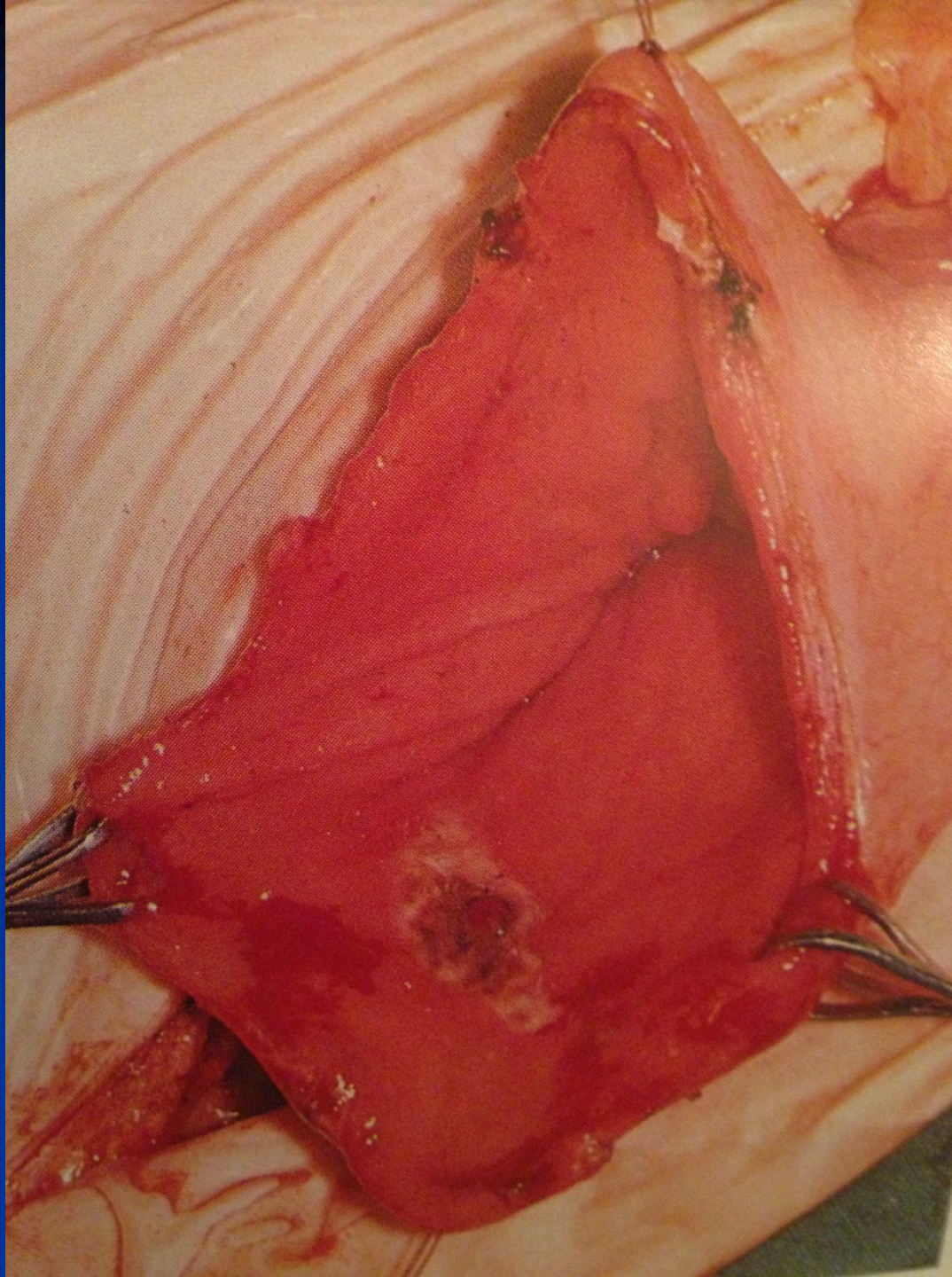
- increased aggressive factors (prevalent in duodenal ulcer)
- reduced protection factors (characteristic of stomach ulcer)

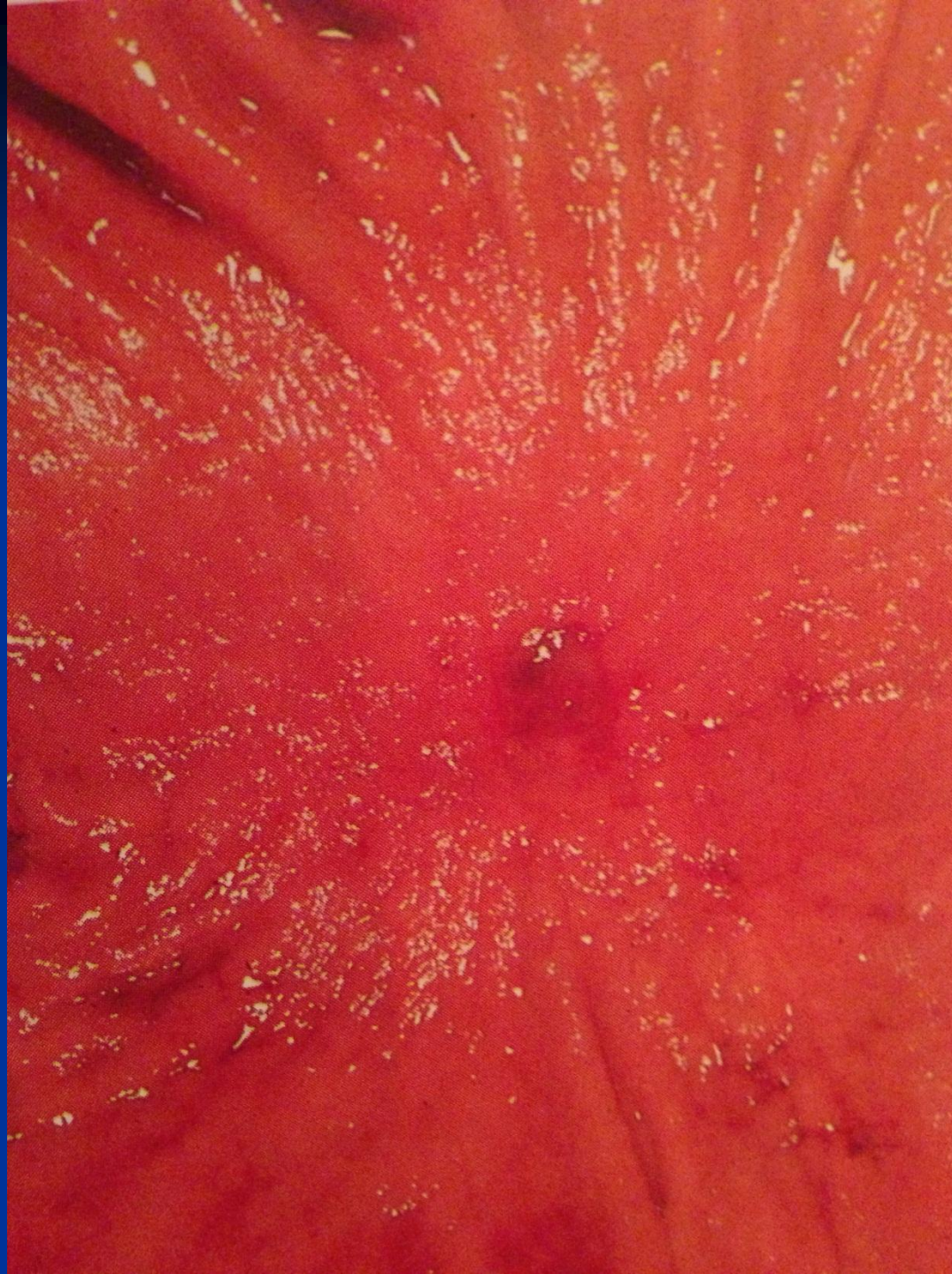
Morphological aspect:

Ulcer is a lack of tissue of the gastric or duodenal wall beginng from the mucous layer







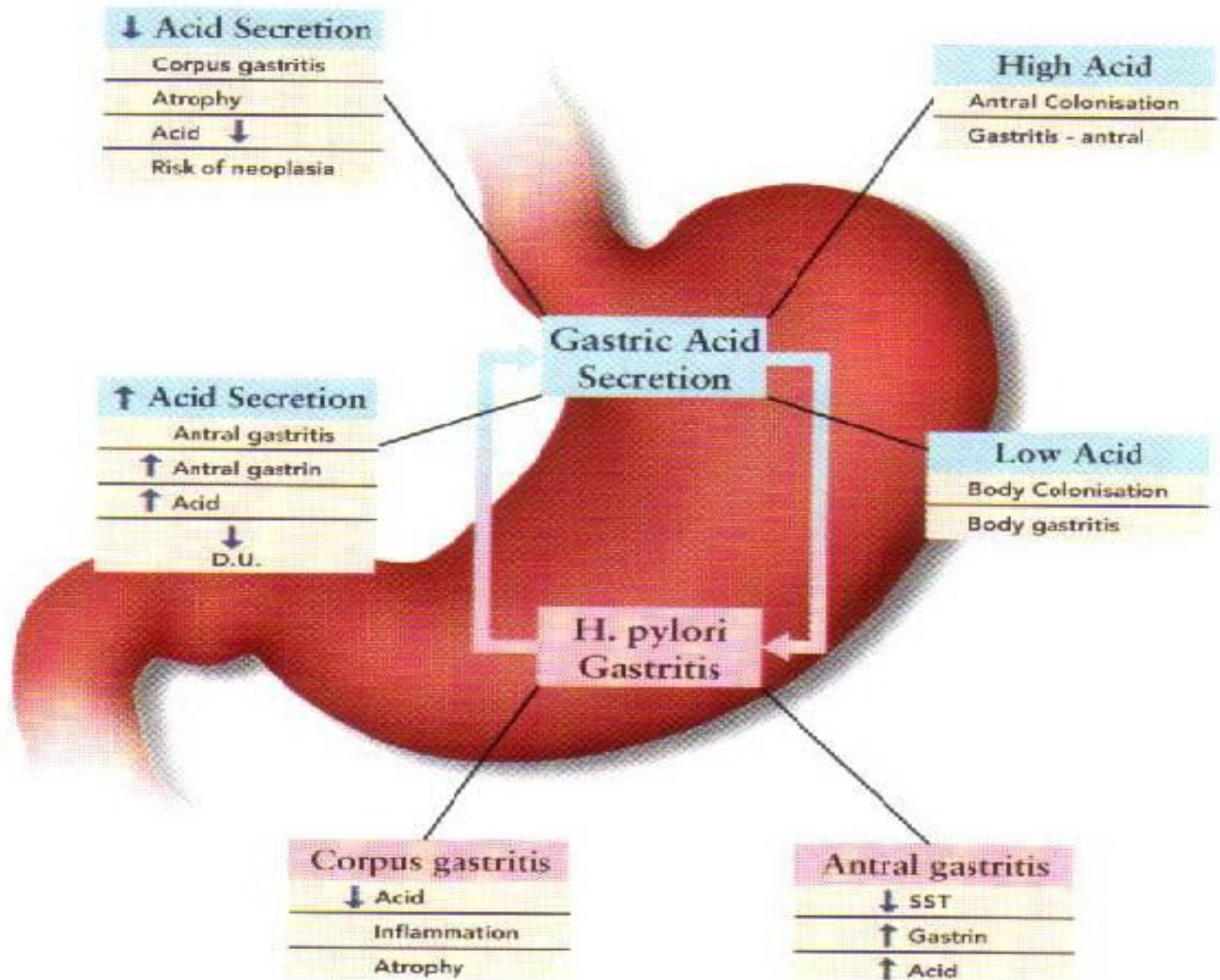


STOMACH and DUODENUM

Gastroduodenal ulceration

Ethiology

- ❑ The **degree of acid secretion varies** between extreme hyperacidity of Zollinger Ellison syndrome and hypoacidity present with type I and IV gastric ulcers
- ❑ Acid hypersecretion is not necessary to create ulcers
- ❑ Important is **the time** that the acid is secreted: patients have high secretory volumes in a basal state
- ❑ **Gastric stasis**
- ❑ **Drugs**: nonsteroidal anti-inflammatory induce disruption of the mucous gel layer and consequent minimal amounts of acid cause maximal ulceration
- ❑ **Helicobacter pylori** is an important pathogen in gastroduodenal inflammation and ulceration
- ❑ A decrease in **↓ bicarbonate** production by the stomach



STOMACH and DUODENUM

Gastroduodenal ulceration

Topographyc Classification of gastric ulcer (Johnson)

Type 1:

- ☐ located in the body of the stomach
- ☐ Low gastric acid secretion
- ☐ Inadequate mucosal protection

Type 2: combined with a present or past duodenal ulcer

Type 3: located in the prepyloric area, high level of acid production

Type 4, located on the lesser curvature, subcardial

Type 5, located on the greater curvature.

Morphologic classification:

- ☐ acute ulcers, surrounded by edema
- ☐ chronic ulcers:
 - ☐ ulcer callosum
 - ☐ ulcers like tumors (fibrous blocks)
 - ☐ penetrating ulcer

STOMACH and DUODENUM

Gastroduodenal ulceration

Topographyc Classification of gastric ulcer (Johnson)



STOMACH and DUODENUM

Gastroduodenal ulceration

Clinical findings (acute, uncomplicated ulcers):

☐ Acute pain:

- located in epigastrium,
- depending on the location of the ulcer, occurs immediately after meals or after one or more hours;
- is relieved by food, antacids (duodenal ulcer) or antacids, vomits (gastric ulcers)

☐ Nausea

☐ Epigastric fullness

☐ Vomiting

STOMACH and DUODENUM

Duodenal Ulcer

Although the incidence is decreasing D.U. remain a major health problem.

Clinical findings

Subjective complaints may range from a feeling of hunger to burning, gnawing **pain** in the epigastrium.

When severe, the pain may radiate through to the back.

Food or antacid will relieve the pain.

Objective: mild tenderness in the epigastrium.

STOMACH and DUODENUM

Gastroduodenal ulceration

Diagnosis:

Endoscopy: biopsy

Barium contrast studies

Occult blood in stool

STOMACH and DUODENUM

Diagnostic

Radiology: contrast upper gastrointestinal series or
Endoscopy confirm the diagnosis, is helpful in following the healing process and in evaluating the possibility of recurrent ulcers in those patients who have undergone surgery.

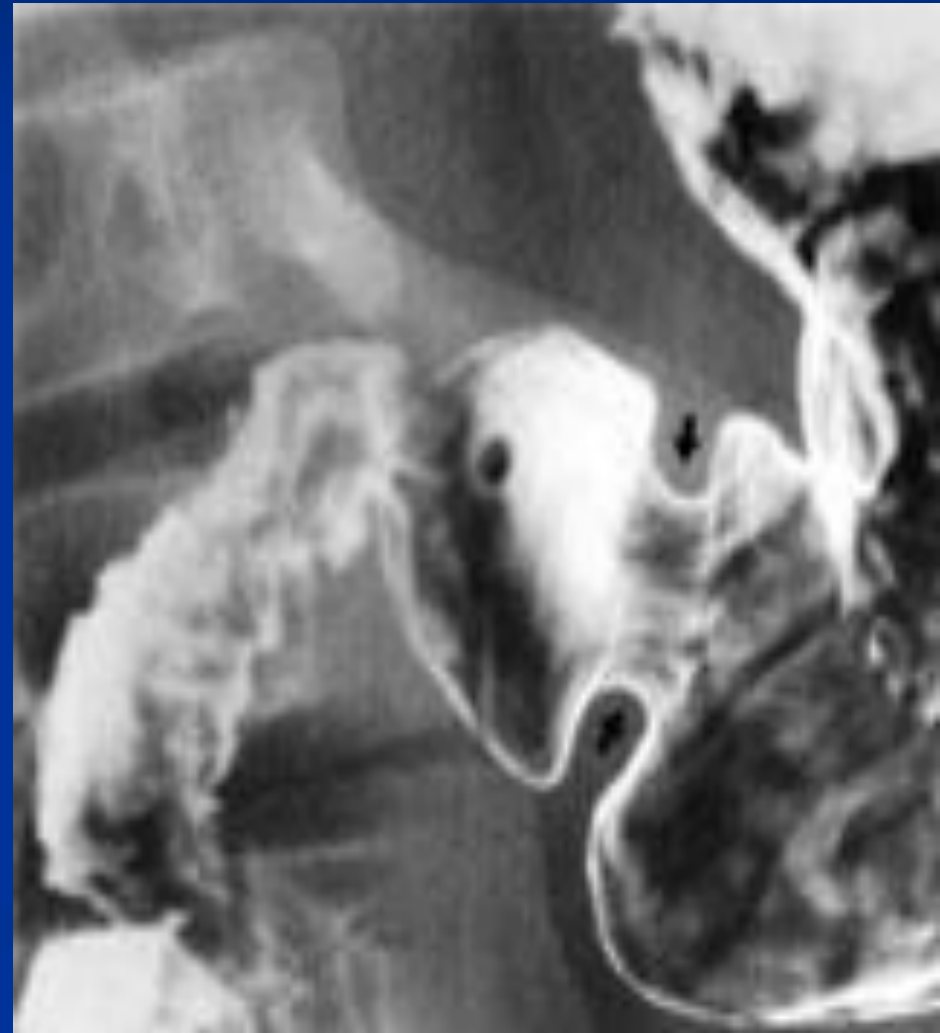
Treatment

Most D.U. can be managed by medical means including removal or control of acid-stimulating drugs or foods and the use of antacids or H₂ blockers. In those patients for whom medical management fails, complications that require surgical intervention may occur.

STOMACH and DUODENUM

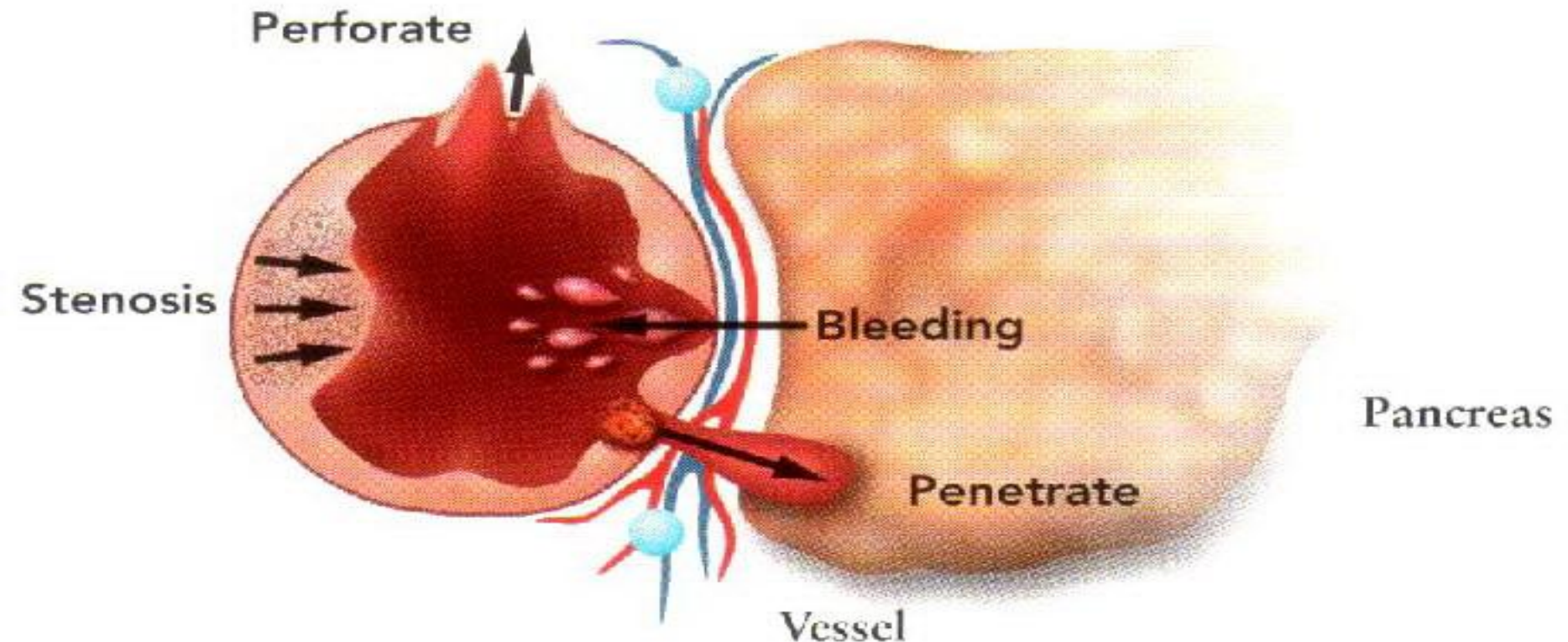
Gastroduodenal ulceration

Diagnosis: Barium contrast studies



STOMACH and DUODENUM

Gastroduodenal Complications



STOMACH and DUODENUM

Gastroduodenal ulceration

Complications

Acute perforation:

- ☐ abrupt onset of severe epigastric pain
- ☐ Shock with hypotension and sweating
- ☐ Abdominal radiograph reveal gas beneath the diafragm
- ☐ the patient had previous ulcer symptoms

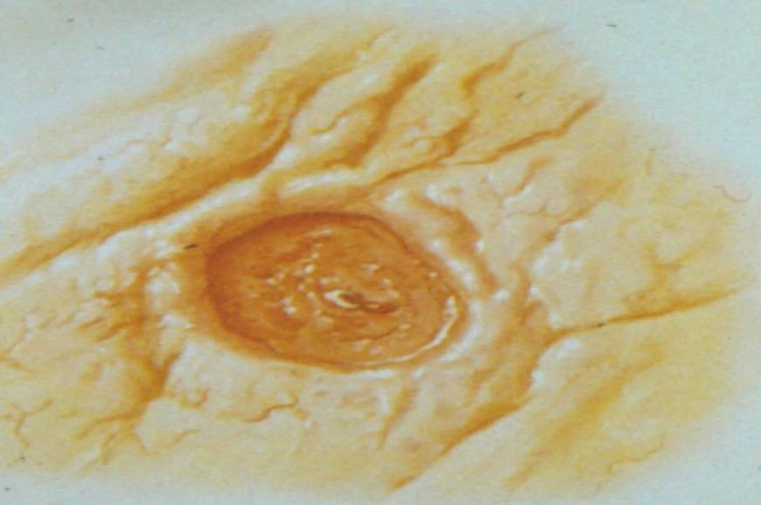
Acute massive haemorrhage:

- ☐ Vomits blood
- ☐ Signs of shock
- ☐ History of ulcer or intake of gastro-agressive drugs

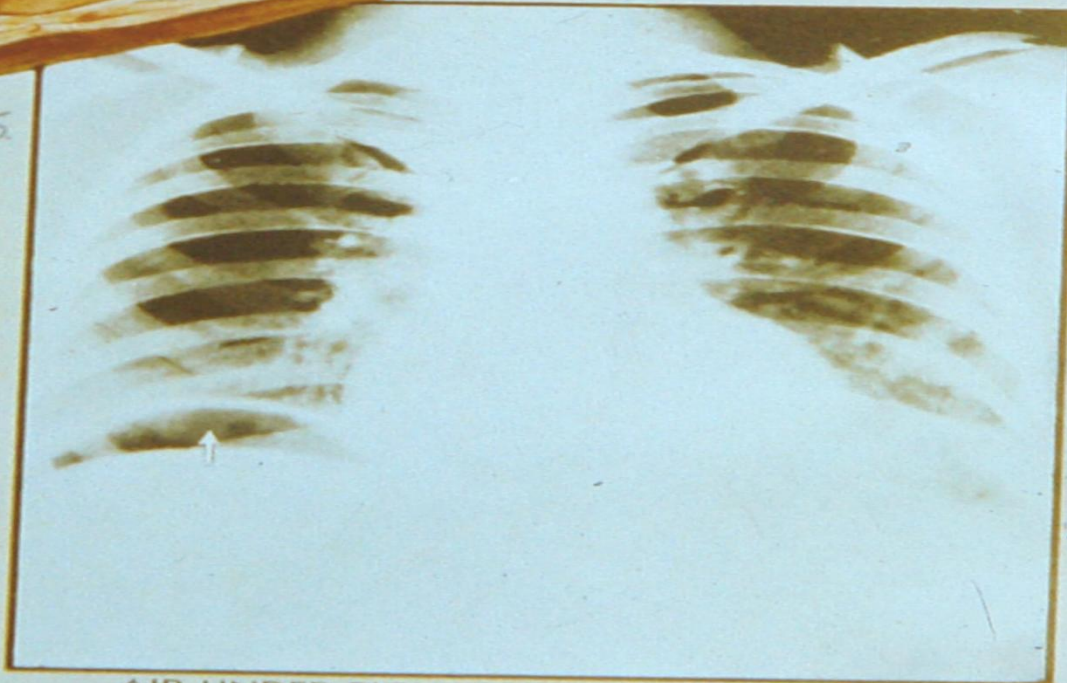


PERFORATED
ULCER OF
LESSER CURVATURE

F. Netter
M.D.
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BLEEDING GASTRIC ULCER



AIR UNDER RIGHT DIAPHRAGM RESULTING
FROM PERFORATED ULCER

STOMACH and DUODENUM

Gastroduodenal ulceration

Complications

Gastric obstruction clinical findings

- ☐ Repeated vomiting, vomiting food, food eaten several days ago
- ☐ Hyponatremia, hypochloremia
- ☐ If is accompanying with ulcer pain is due by oedema about an active ulcer
- ☐ If is not accompanying with ulcer pain is due by fibrous scars
- ☐ Distended stomach is palpable
- ☐ Peristaltic waves can be observed in thin patients
- ☐ Diagnosis is confirmed by barium studies or endoscopy

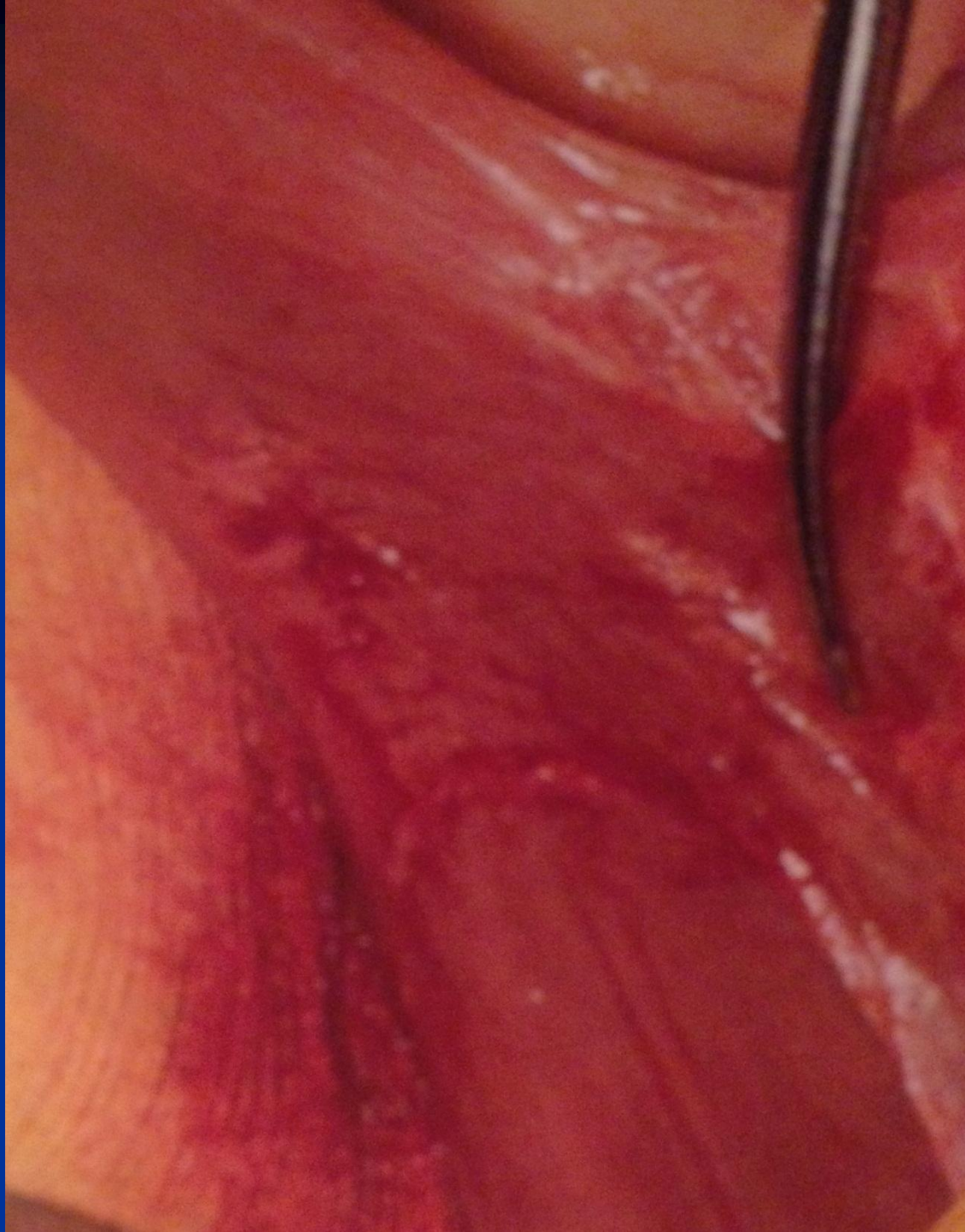
STOMACH and DUODENUM

Gastroduodenal ulceration

Complications

Stomal (anastomotic) ulcer:

- ❑ Occurs to the anastomosis of the stomach to other segment of the gastrointestinal tract
- ❑ Direct relationship between vulnerability of the intestine to gastric acid and distance from the pylorus
- ❑ Symptoms: pain, haemorrhage, perforation
- ❑ Diagnosis: endoscopy, barium studies, selective angiography in bleeding,
- ❑ Complication: gastro-jejuno-cholic fistula (after Billroth II gastrectomy or gastrojejunostomy)



STOMACH and DUODENUM

Gastroduodenal ulceration

Clinical forms

Cushing's ulcer

- ☐ Deep, frequently perforated ulcers
- ☐ Arise in the oesophagus, stomach or duodenum
- ☐ Occur after neurosurgical illnesses

Curling's ulcer

- ☐ Duodenal ulcers
- ☐ Occur in burned or operated patients

Ulcers due to gastric irritants

Aspirin ► superficial bleeding ulcerations

Ibuprofen and alcohol

Acids or alkalines

- ☐ Alkalis, effect mainly on the oesophagus
- ☐ Acids, effect mainly on the body of the stomach

STOMACH and DUODENUM

Gastroduodenal ulceration

Clinical forms

Ulcers due to steroid therapy

Stress ulcers

- ☐ Superficial ulcerations
- ☐ after burns, sepsis, severe trauma, operations
- ☐ Involve only the mucosa
- ☐ Perforation is rare
- ☐ diagnosis of stress ulcer, endoscopyc

Treatment:

- ☐ prevention of gastric distension, respiratory care,
- ☐ Medical:antiacids, H₂ receptor antagonists, antacids is th most effective treatment
- ☐ Endoscopyc:electrocoagulation of bleeding ulcerations
- ☐ Surgical:unsatisfactory
 - High subtotal gastrectomy and vagotomy
 - Total gastrectomy when the condition cannot be treated by less radical measures

STOMACH and DUODENUM

Gastroduodenal ulceration

Clinical forms

Hypergastrinaemia

Gastrinomas (Zollinger - Ellison)

- ☐ Severe peptic ulcers, located in unusual locations
- ☐ Excessive amounts of gastric secretion of high acidity
- ☐ Non β cell pancreatic tumors, or outside
- ☐ 25% of patients have multiple endocrine neoplastic tumors
- ☐ Clinical symptoms:
 - epigastric pain
 - Weight loss
 - Vomiting
 - Severe diarrhoea
 - evolution slowly or rapidly
- ☐ Laboratory findings
 - Elevated serum gastrin level (over 350pg/ml)
 - Basal acid of the stomach, over 4 m Eq /h for women and 6 m Eq /h for men,
 - secretin i.v. elevates,
 - serum gastrin to at least 200 pg/ml

STOMACH and DUODENUM

Treatment of gastric and duodenal ulcer

Dietary regime: avoid gastric irritants (tobacco, alcohol, caffeine, antiinflammatory drugs, acidic beverages), regular food, taken at regular interval, small frequent meals

Medical Therapy:

Antacid drugs:

- sodium bicarbonate
- Magnesium carbonate,
- Aluminium hydroxide

H₂ receptor antagonists

- Cimetidine
- Ranitidine

Mucosal coating agent: Sucralfate

Omeprazole acts upon intracellular proton pump

Prostaglandins-increase the blood supply to the gastric mucosa, decrease the damaging effects of antiinflammatory drugs (misoprostol)

STOMACH and DUODENUM

Gastroduodenal ulceration

Clinical forms

Hypergastrinaemia

Gastrinomas (Zollinger - Ellison)

Treatment:

- ☐ total gastrectomy
- ☐ Removal of gastrinomas
- ☐ relief symptoms: H₂ receptor antagonists or Omeprazole
- ☐ Medical therapy has to continue all life
- ☐ Treatment of metastasis: chemotherapy, somatostatin analogues

Other causes of hypergastrinaemia

- ☐ G-cell hyperplasia,
- ☐ Retained antrum
- ☐ Pyloric obstruction
- ☐ Pernicious anemia
- ☐ Gastrin levels may also be elevated after treatment with H₂ receptor antagonists and Omeprazole

STOMACH and DUODENUM

Surgical Treatment of gastric and duodenal ulcer

Indications:

- fails to show evidence of healing within 1 month of treatment (for gastric ulcers)
- Recurs after therapy

Emergency indications:

- Perforation
- Acute, massive haemorrhage

Major indications:

- Gastric, pylorus stenosis
- Intractability

Less common indications:

- Repeated episodes of minor bleeding
- fistula

STOMACH and DUODENUM

Surgical Treatment of gastric and duodenal ulcer

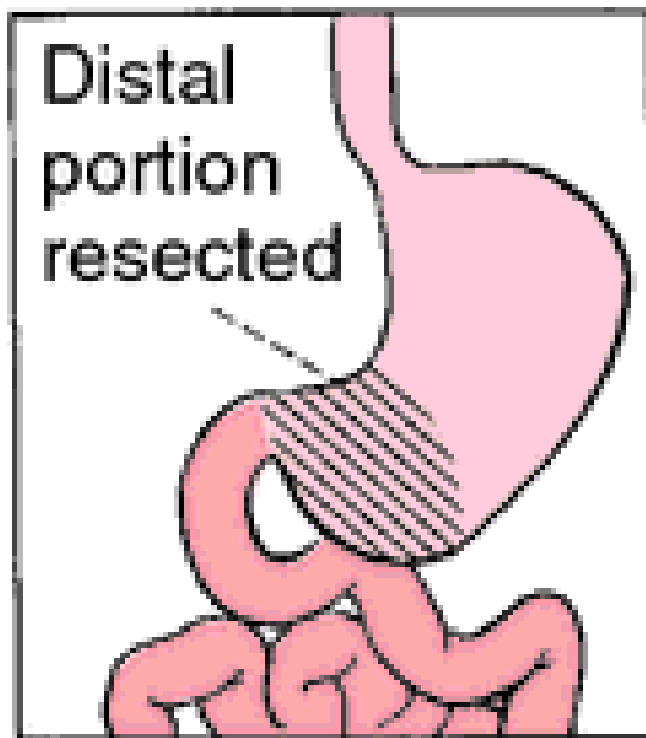
Types of operations

gastric ulcer:

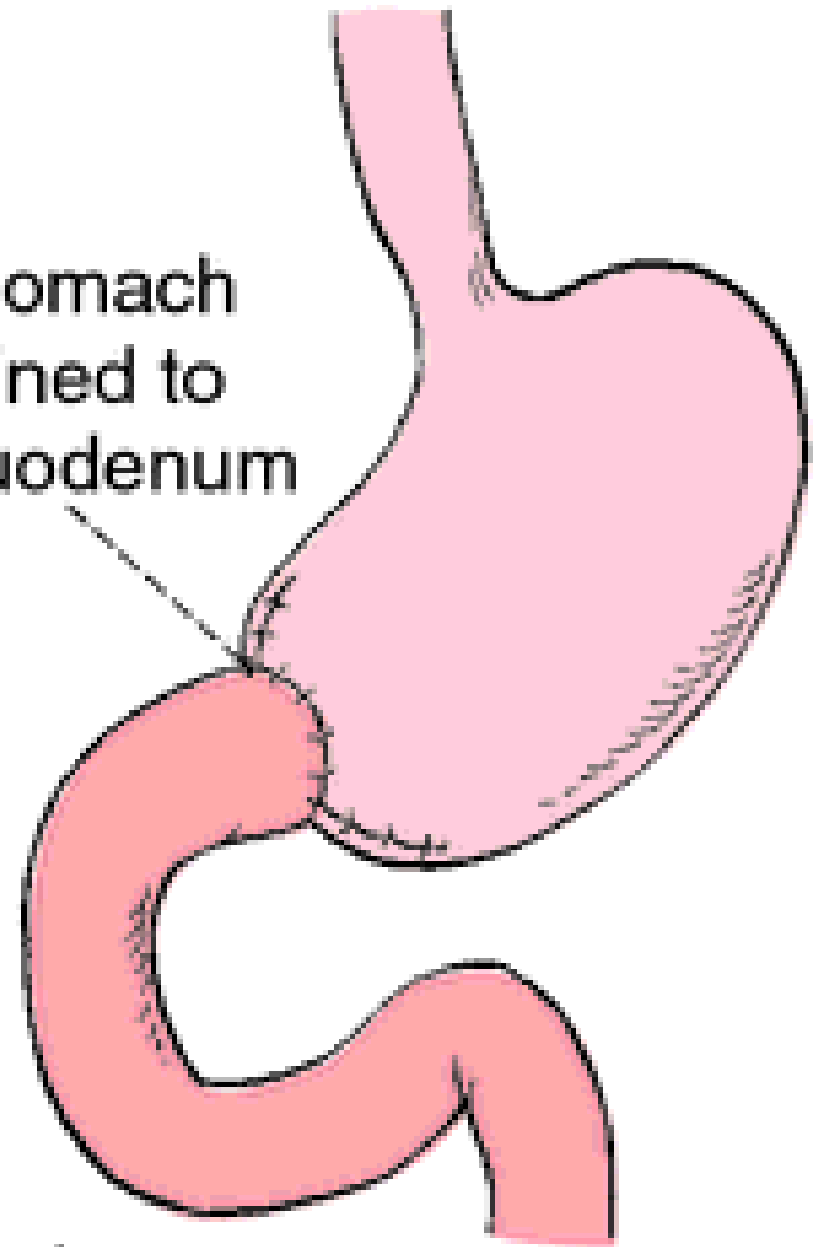
- ☐ Partial gastrectomy with gastroduodenal anastomosis (Billroth I procedure) or gastrojejunal anst. (Billroth II), gastrectomy includes entire antrum and the ulcer
- ☐ Antrectomy and Billroth II anastomosis, leaving the ulcer (juxtaoesophageal)

duodenal ulcer:

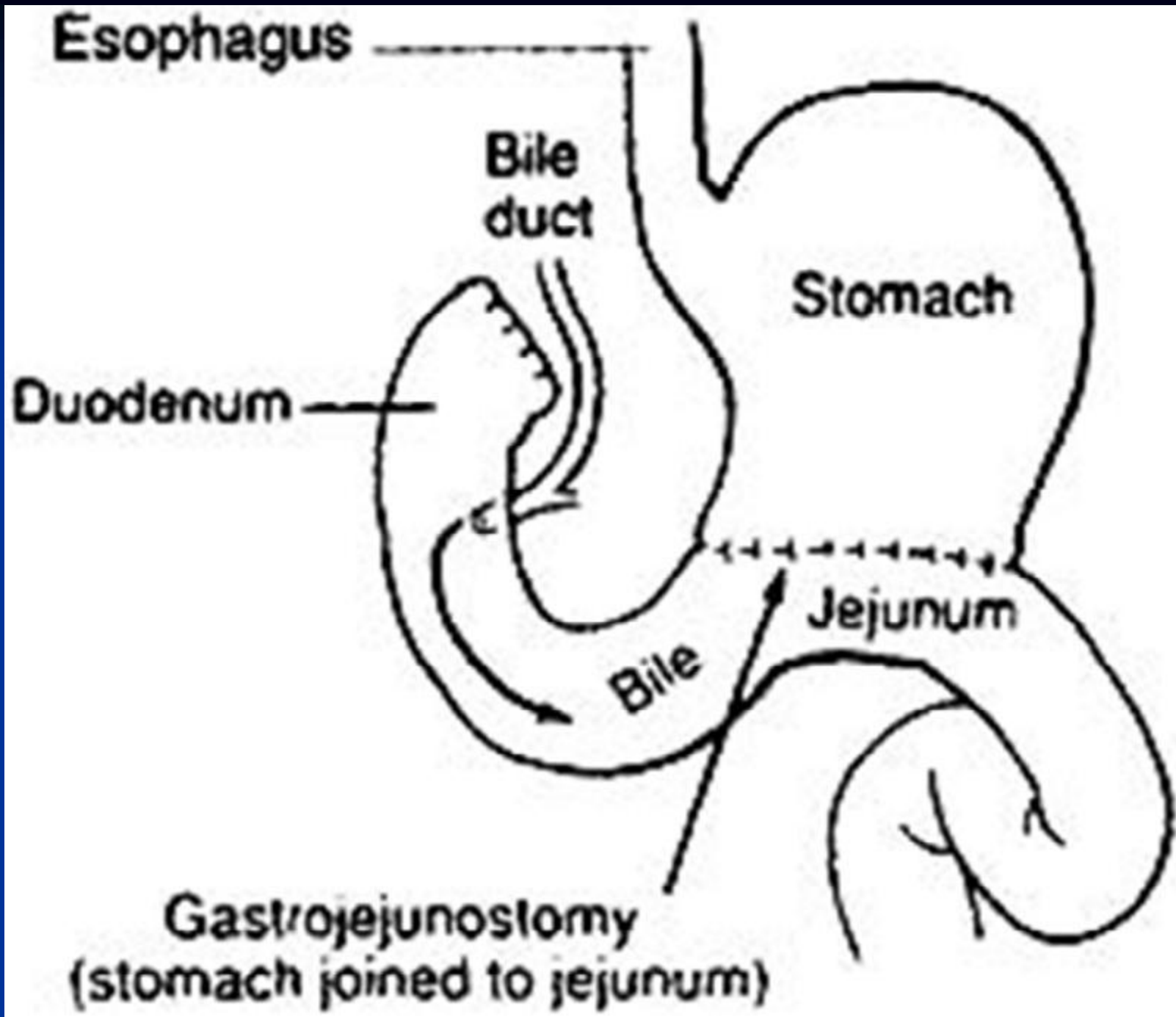
- ☐ Bulbantrectomy (hemigastrectomy) and bilateral vagotomy
- ☐ Vagotomy procedure:
 - Truncal: denervates the entire stomach, and gastrointestinal tract
 - Selective: denervates the entire stomach, leaves nerves to the pylorus, gallbladder and bowel intact
 - Proximal gastric vagotomy, without pyloroplasty, gastroenterostomy or antrectomy
- ☐ Pyloroplasty and bilateral truncal vagotomy
- ☐ Proximal gastric vagotomy



Stomach
joined to
duodenum

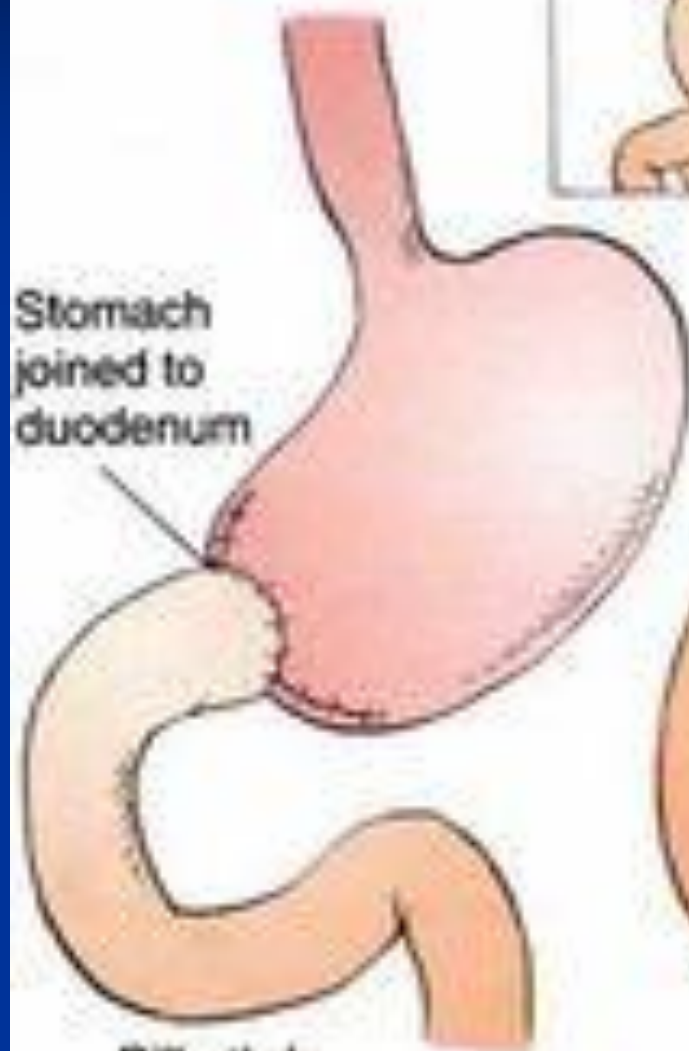


Billroth I
(gastroduodenostomy)





Stomach joined to duodenum

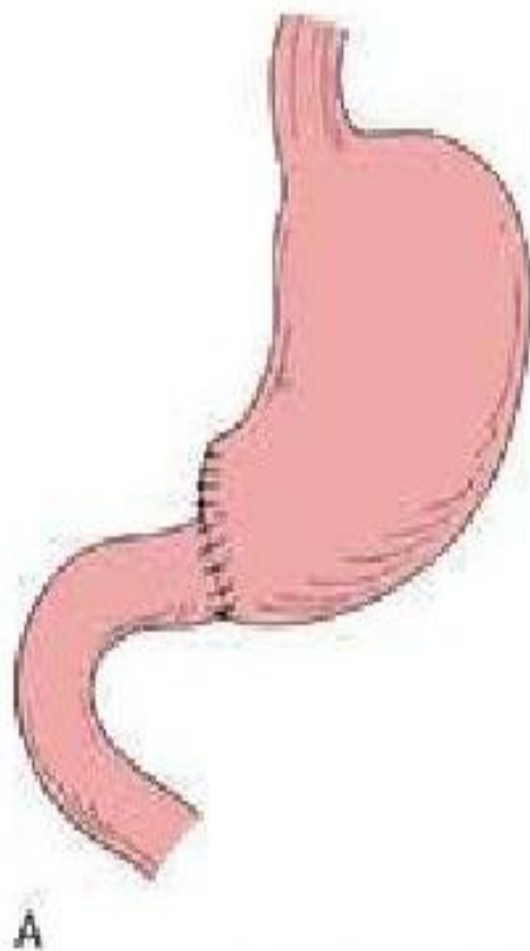


Billroth I
(gastroduodenostomy)

Stomach joined to jejunum

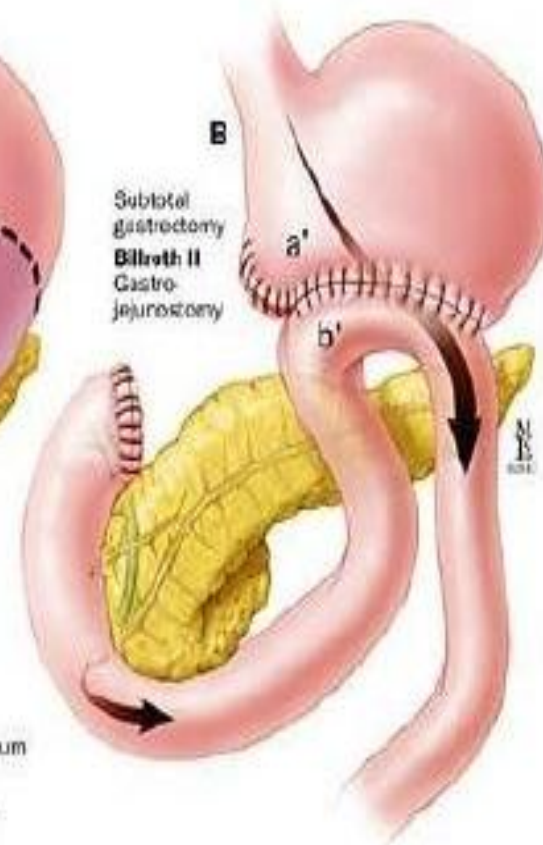
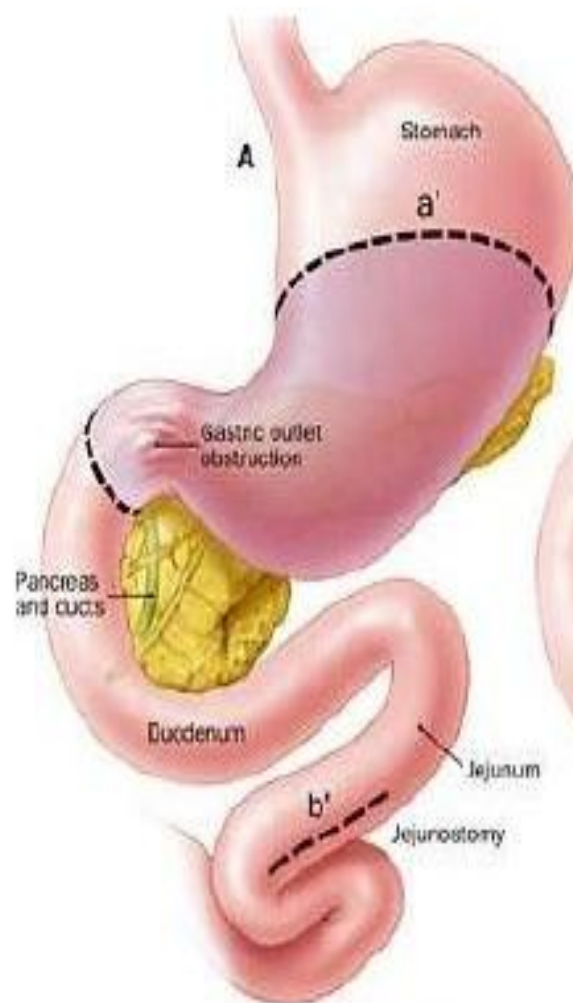


Billroth II
(gastrojejunostomy)



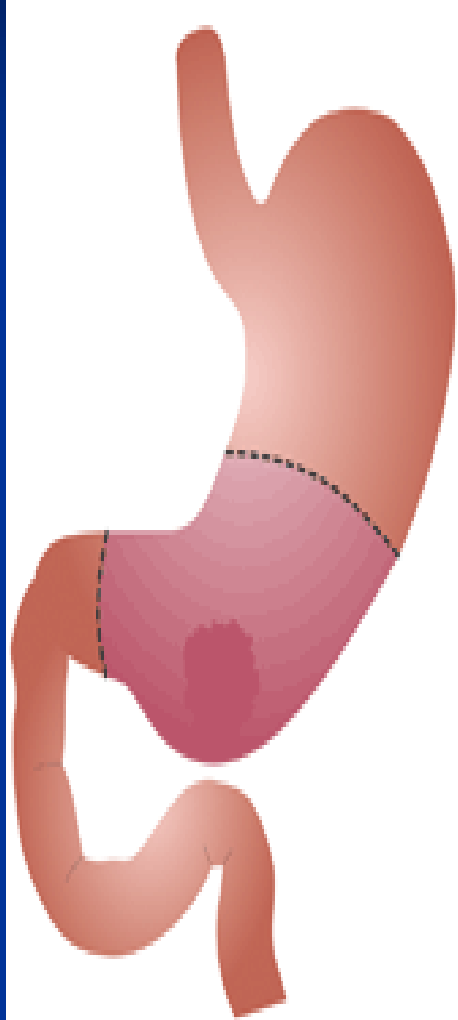
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Billroth I



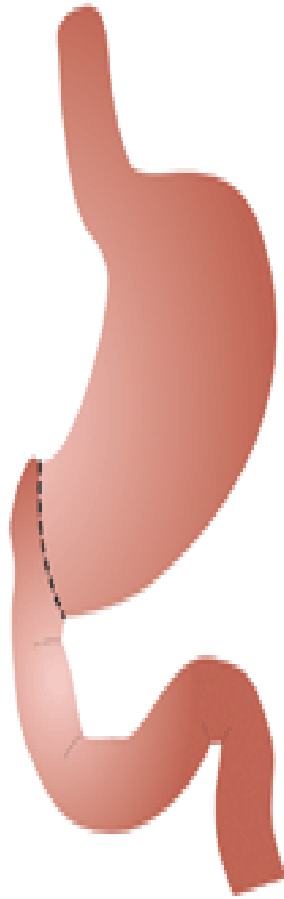
Billroth II

Bilroth I



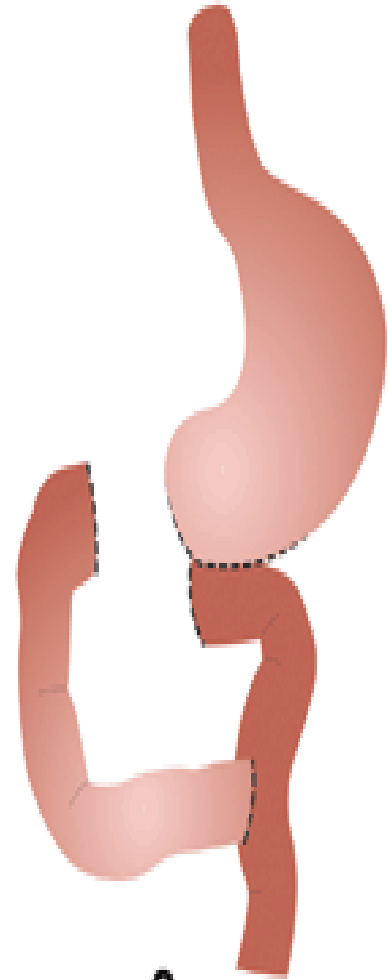
a

Bilroth II



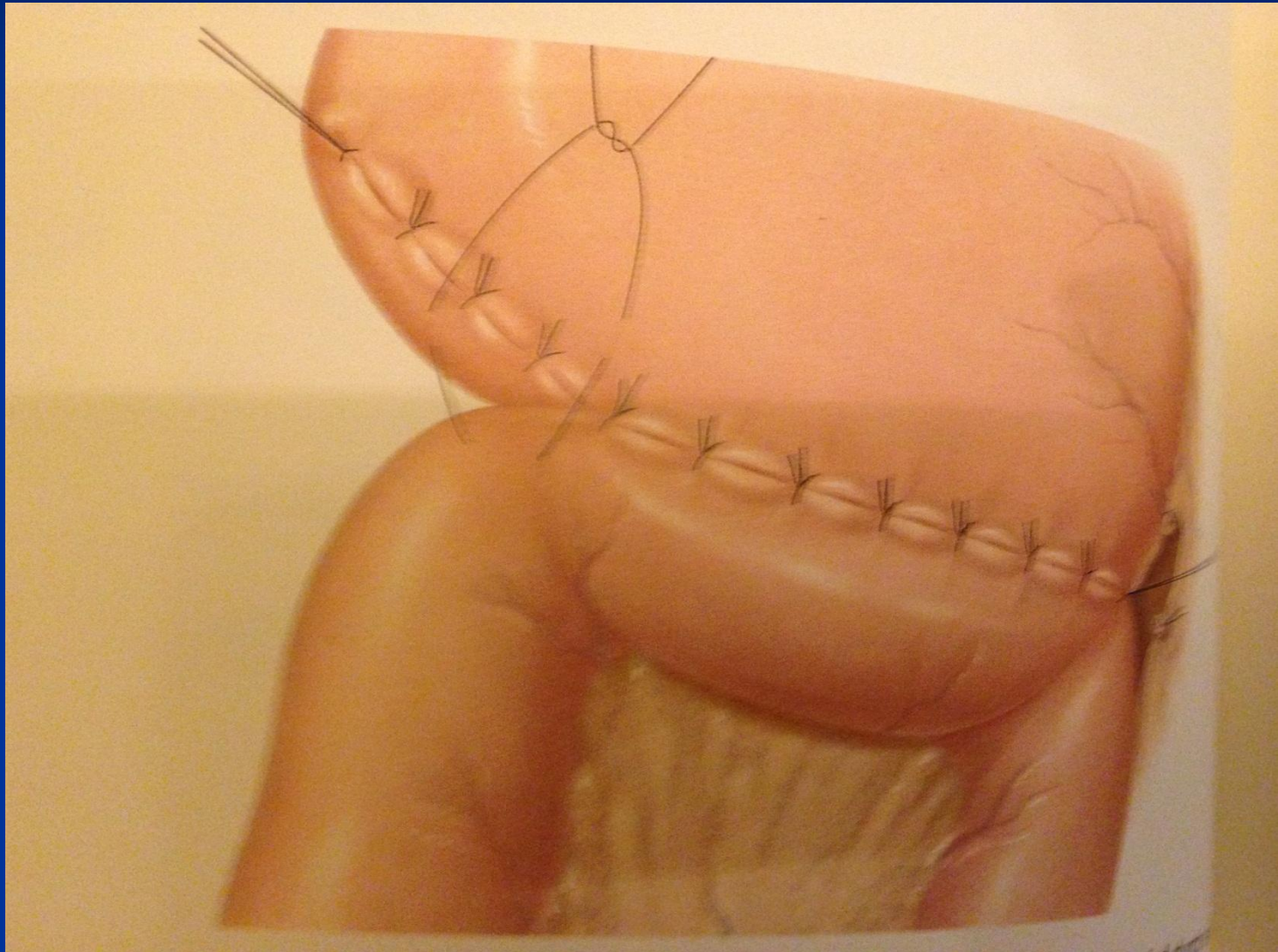
b

Roux-en-Y



c

Mayo technique (to prevent the elongation of the anastomosis)



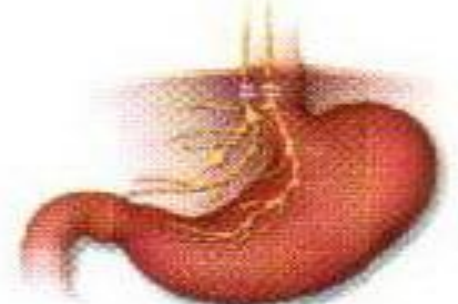
HISTORY OF THE VAGOTOMY)



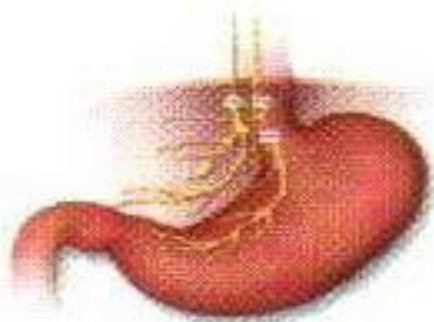
Brodie - 1814



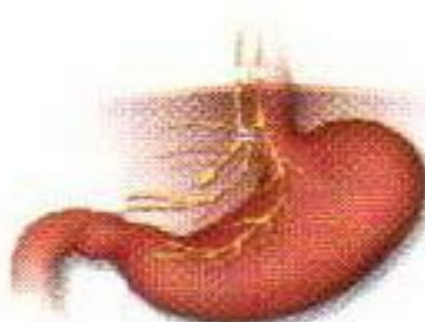
Jaboulay - 1901



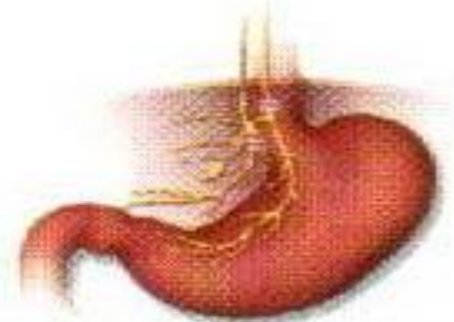
Latarjet - 1921



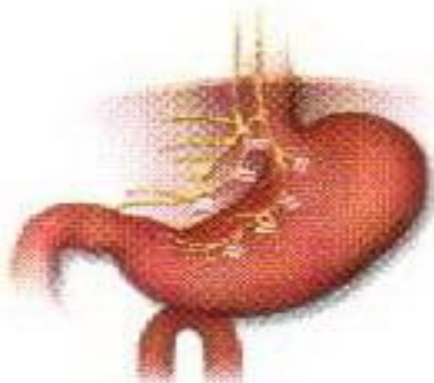
Berg - 1930



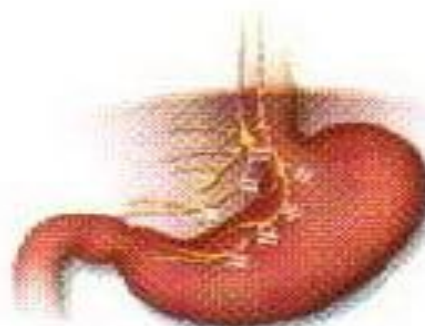
Dragstedt - 1943



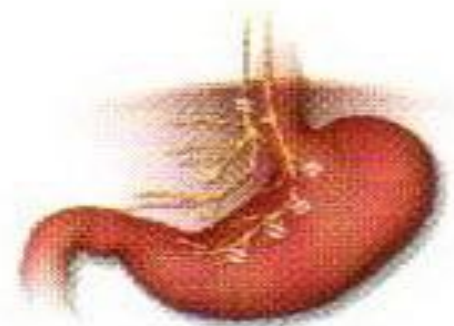
Griffith - 1960



Holle & Hart
- 1967

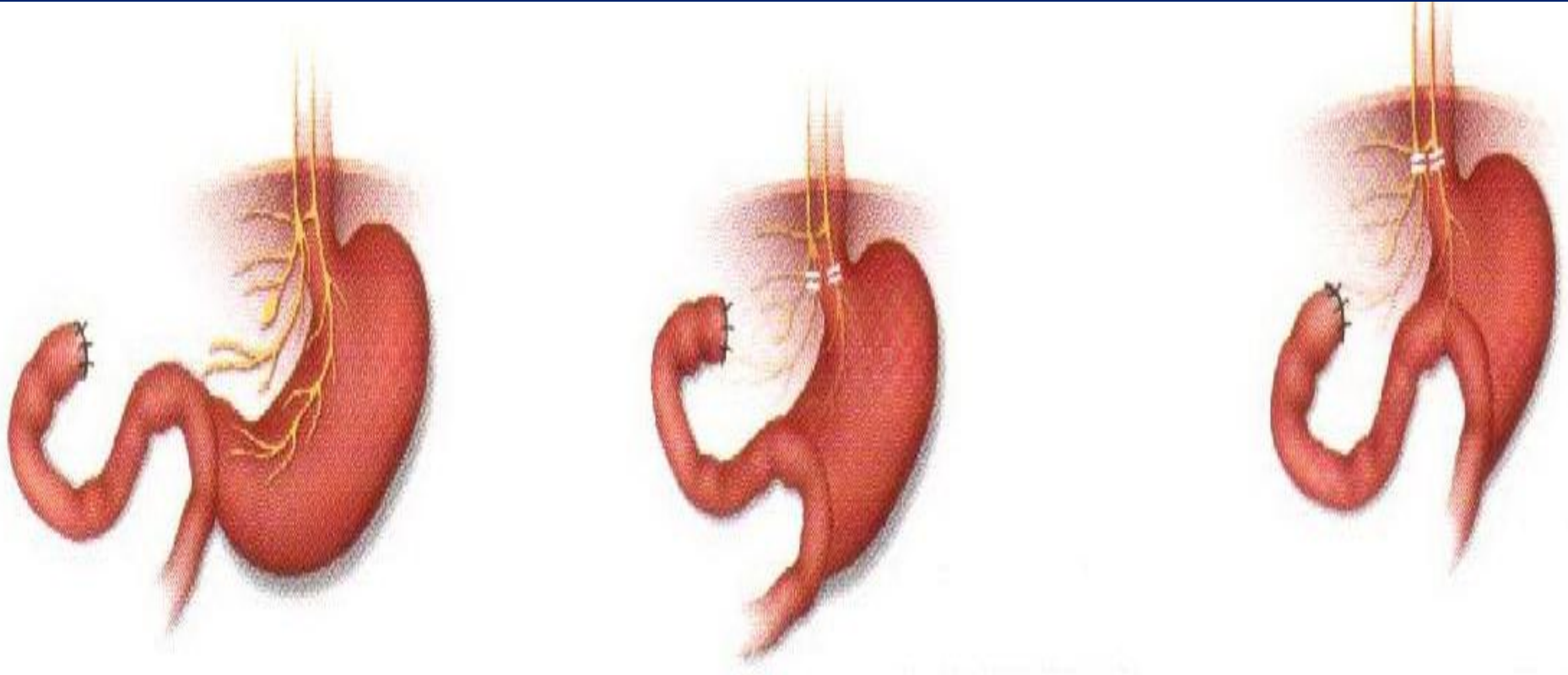


Johnston & Amdrup
- 1969



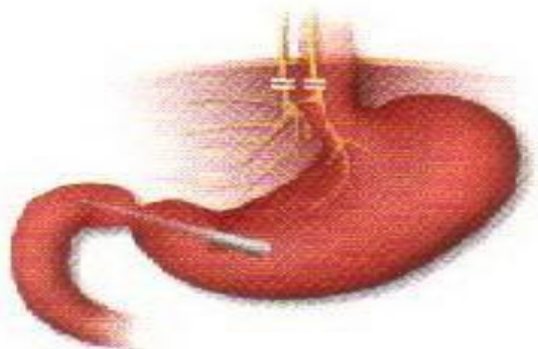
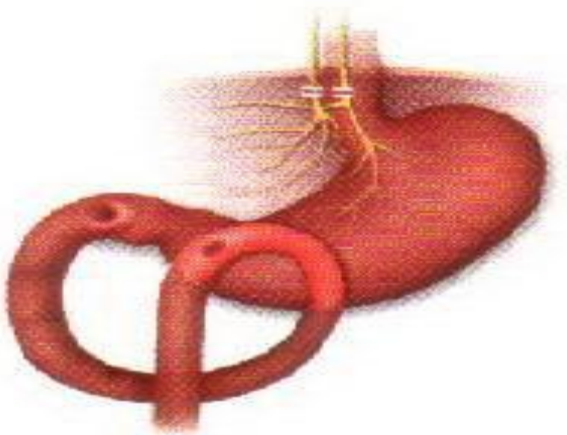
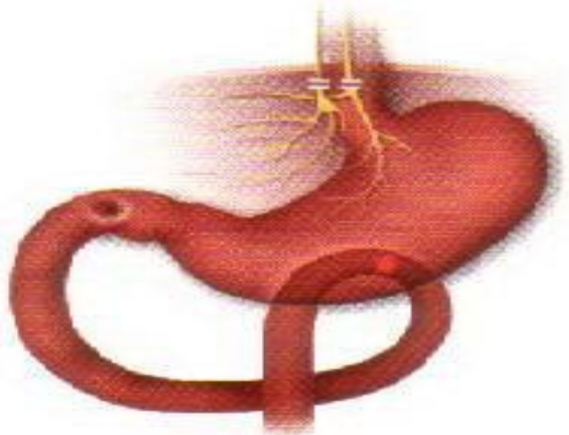
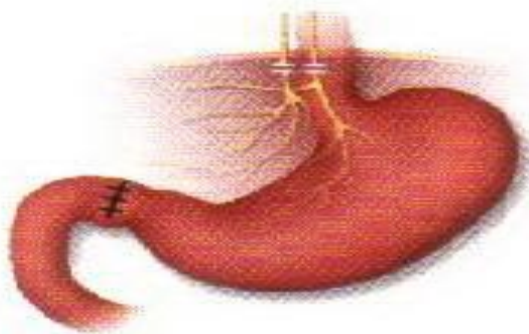
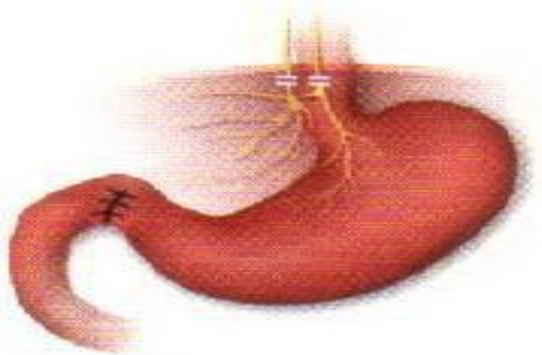
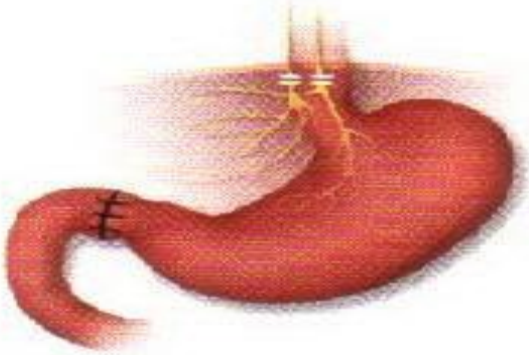
Taylor - 1979

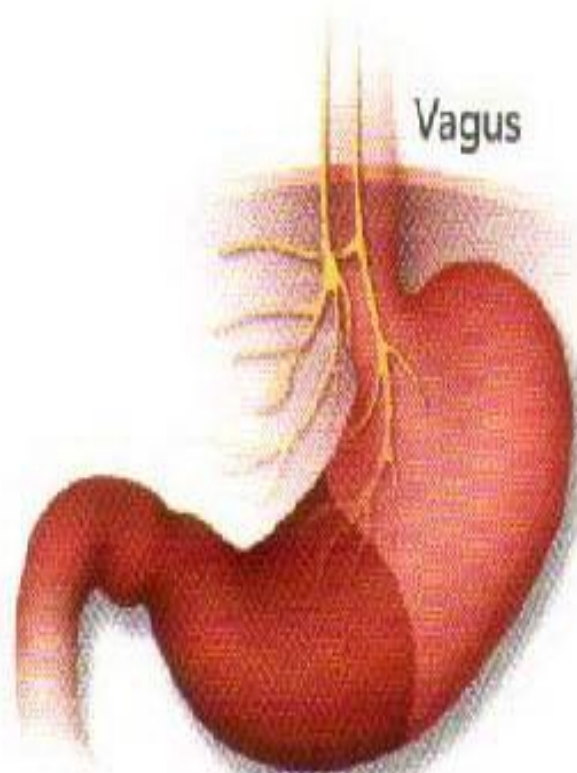
TRUNCAL VAGOTOMY



T
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Antrum

Fundus



Selective Vagotomy

- Preserve innervation to the remaining G.I.T.



Partial Fundectomy

- Decrease parietal cell mass

Billroth I - Anastomosis

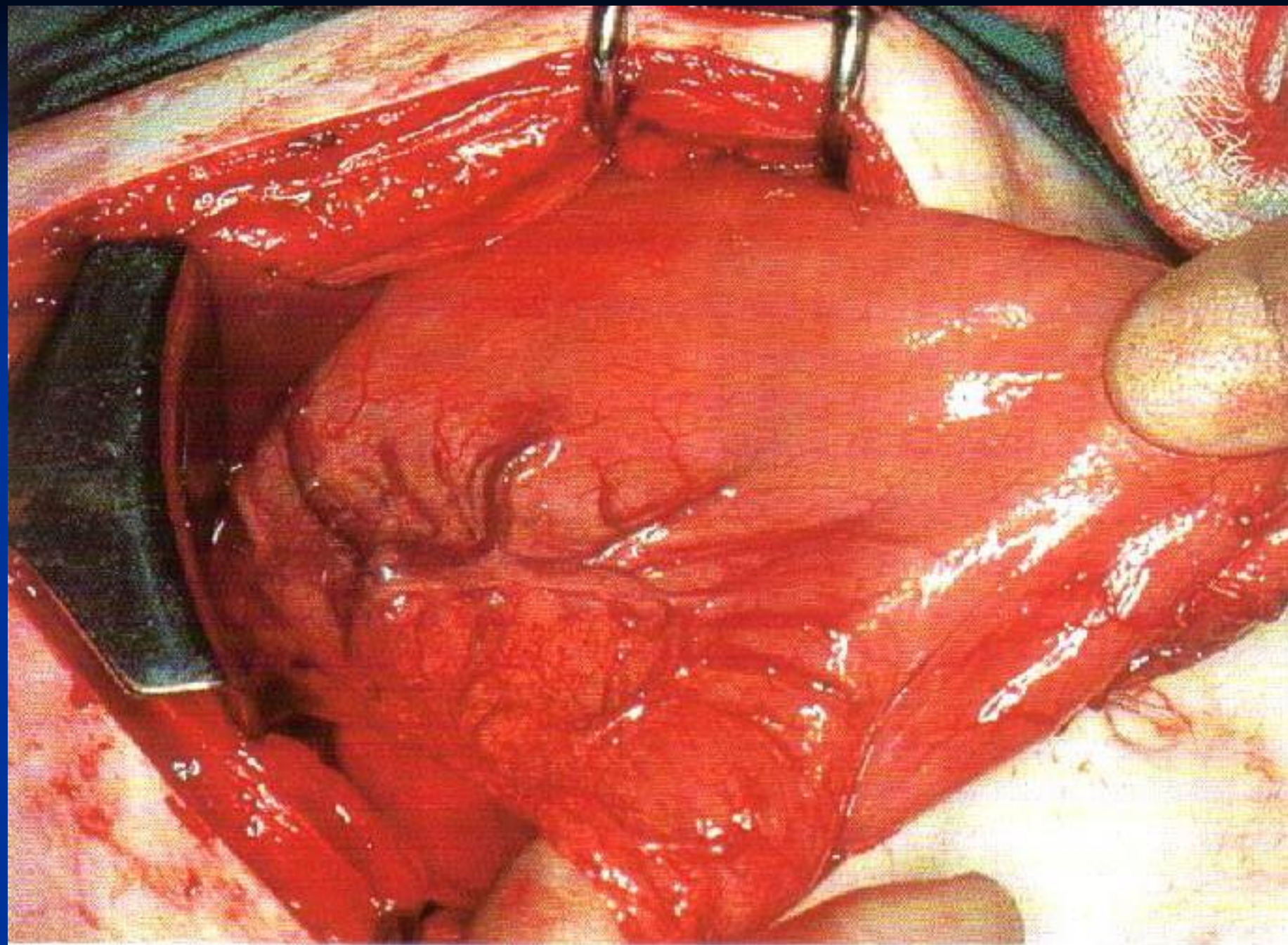
- Maintain integrity of gastro-entero pancreatic axis

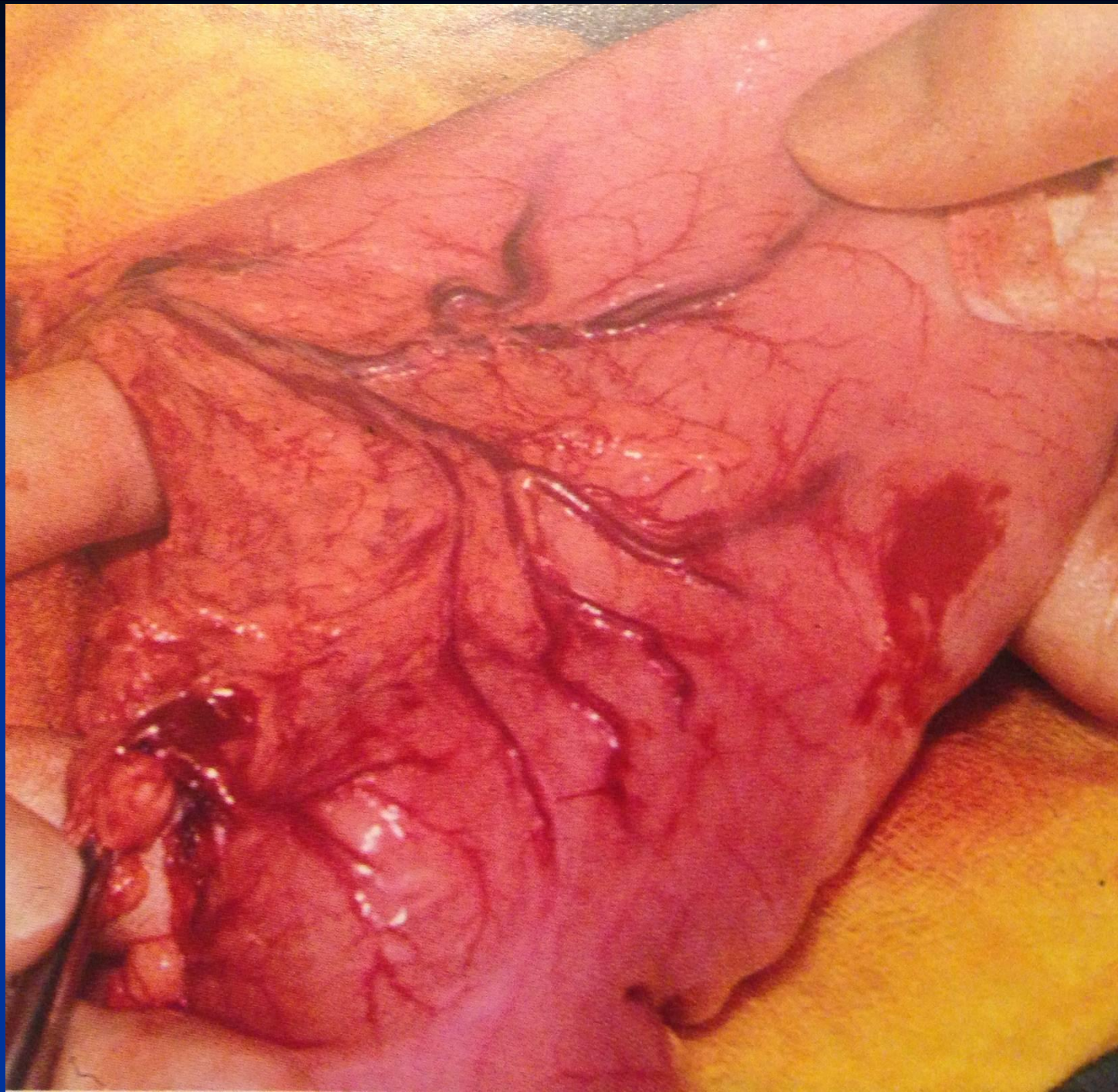
Antrectomy

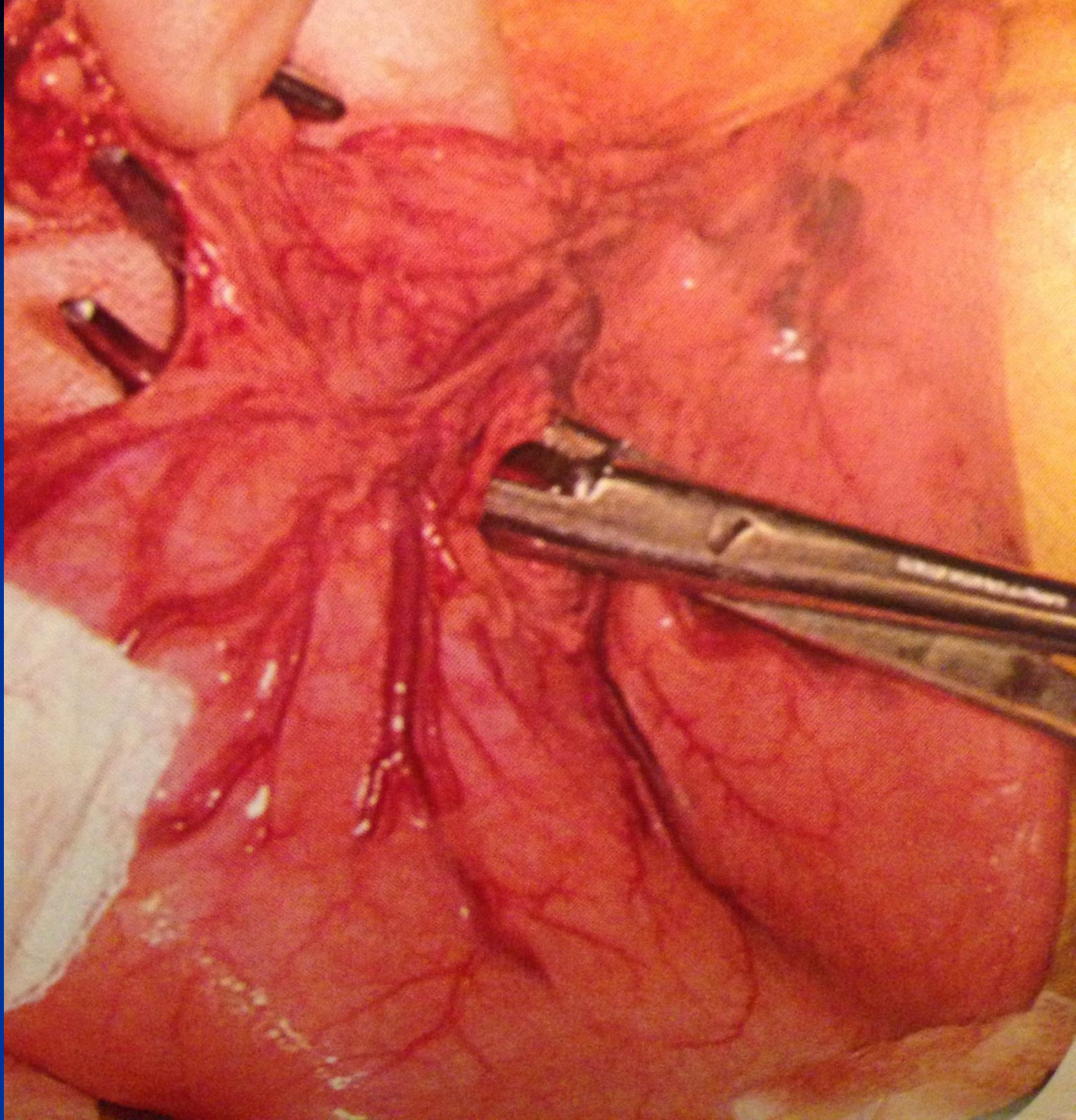
- Decrease gastrin

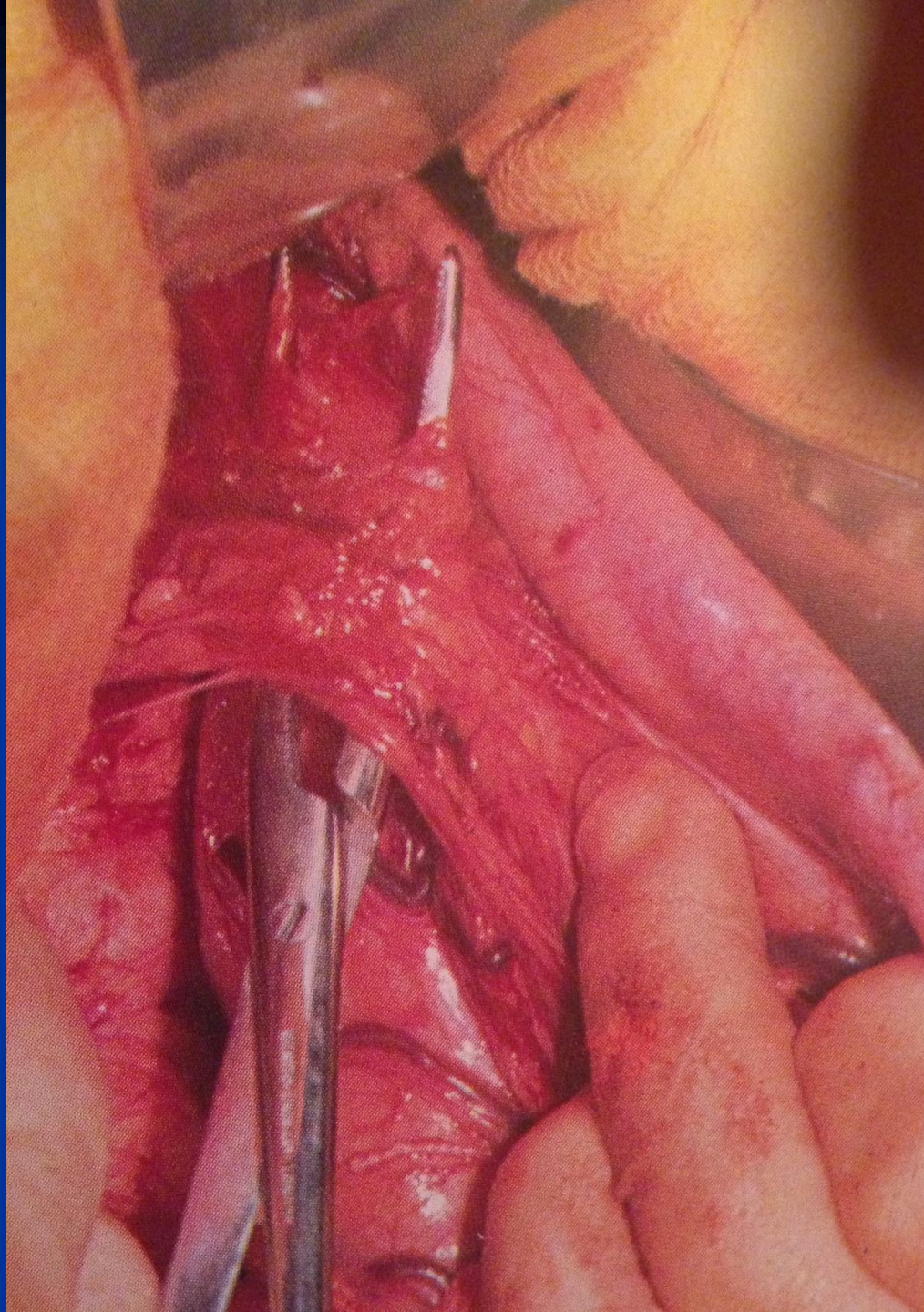
An intraoperative photograph showing a surgical dissection. A pair of surgical forceps is visible in the lower-left quadrant, holding a structure. The surrounding tissue is highly vascularized and appears reddish. The text "Posterior vagal trunk" is overlaid in the center-left area.

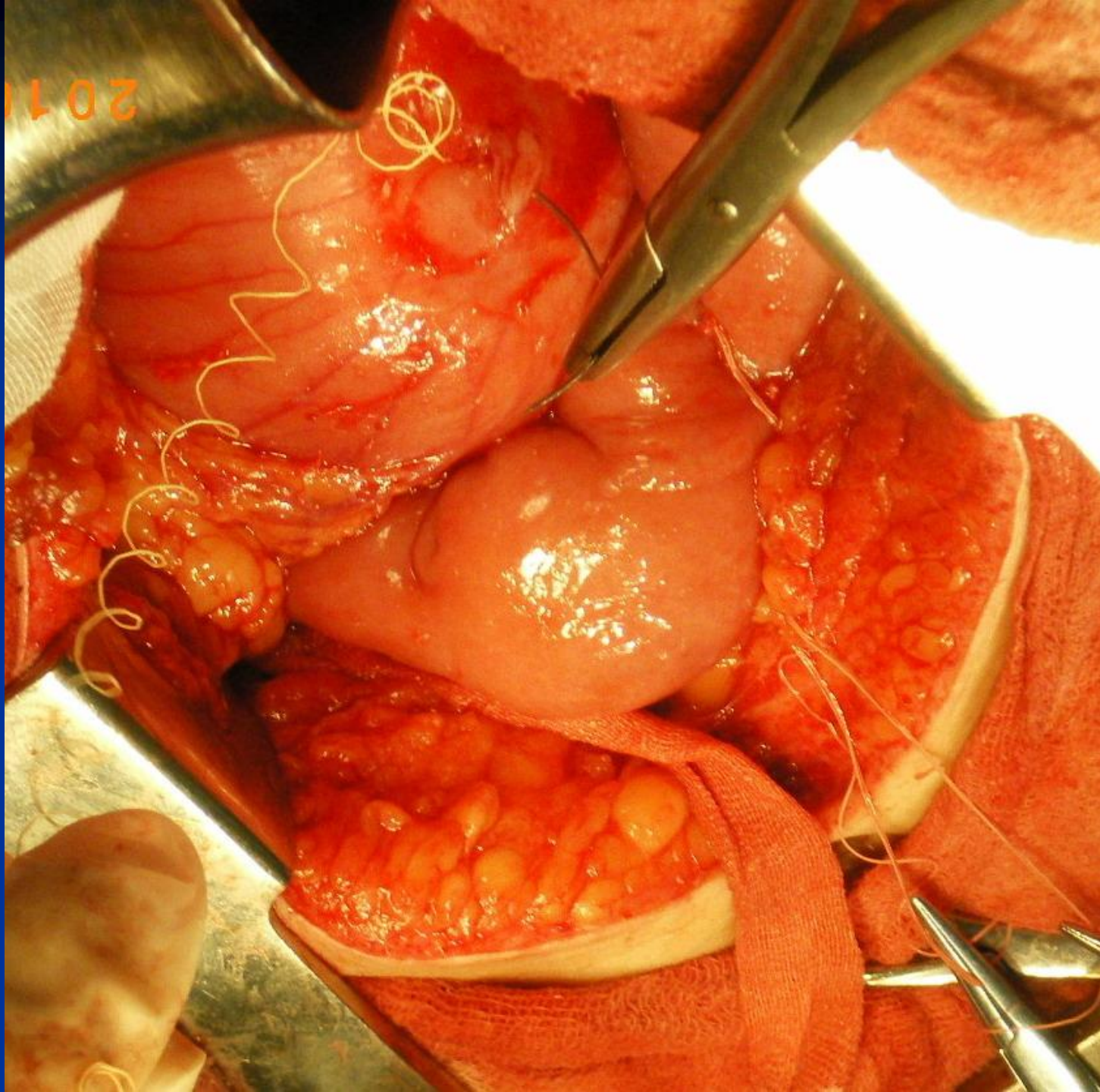
Posterior vagal trunk



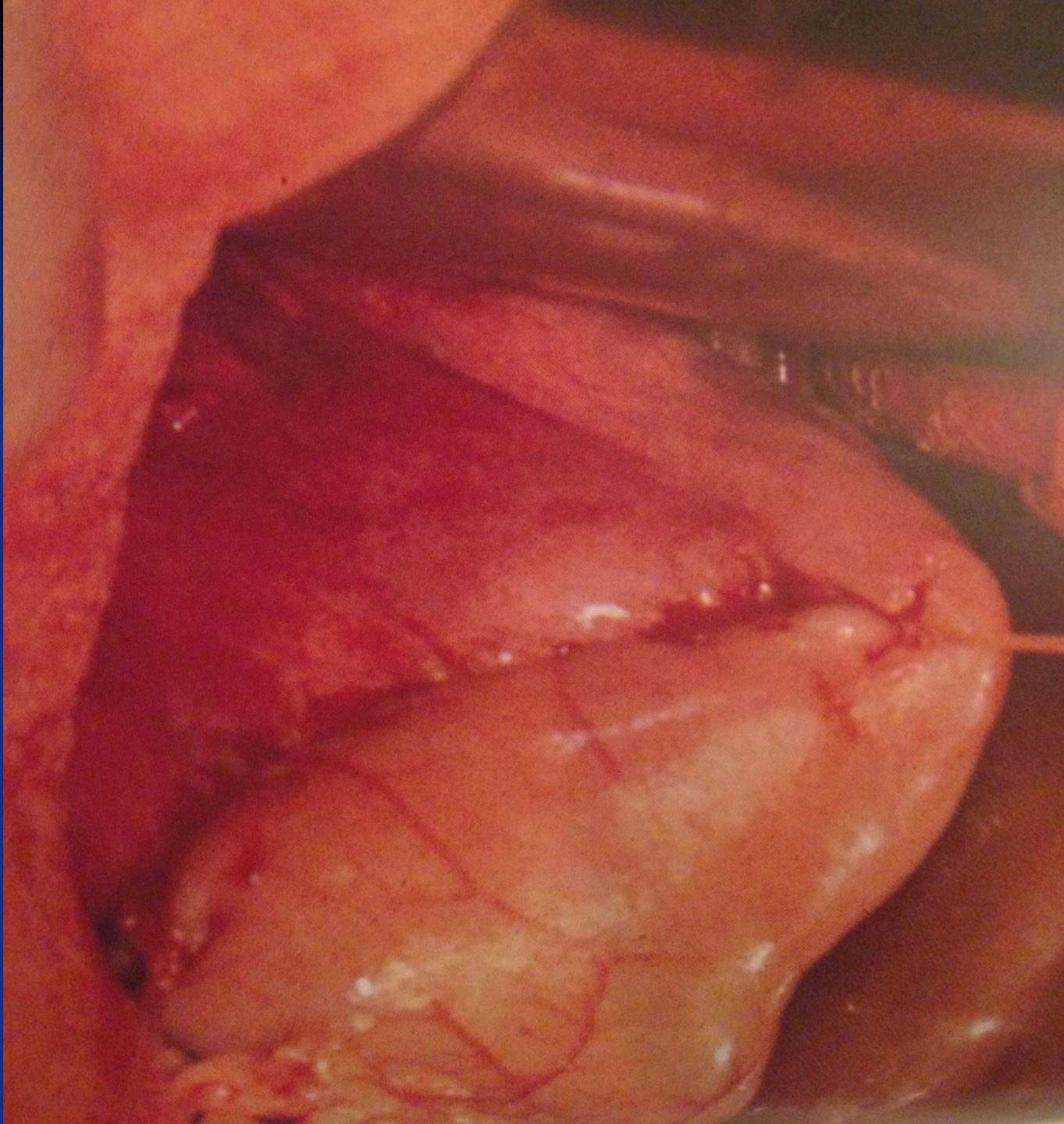


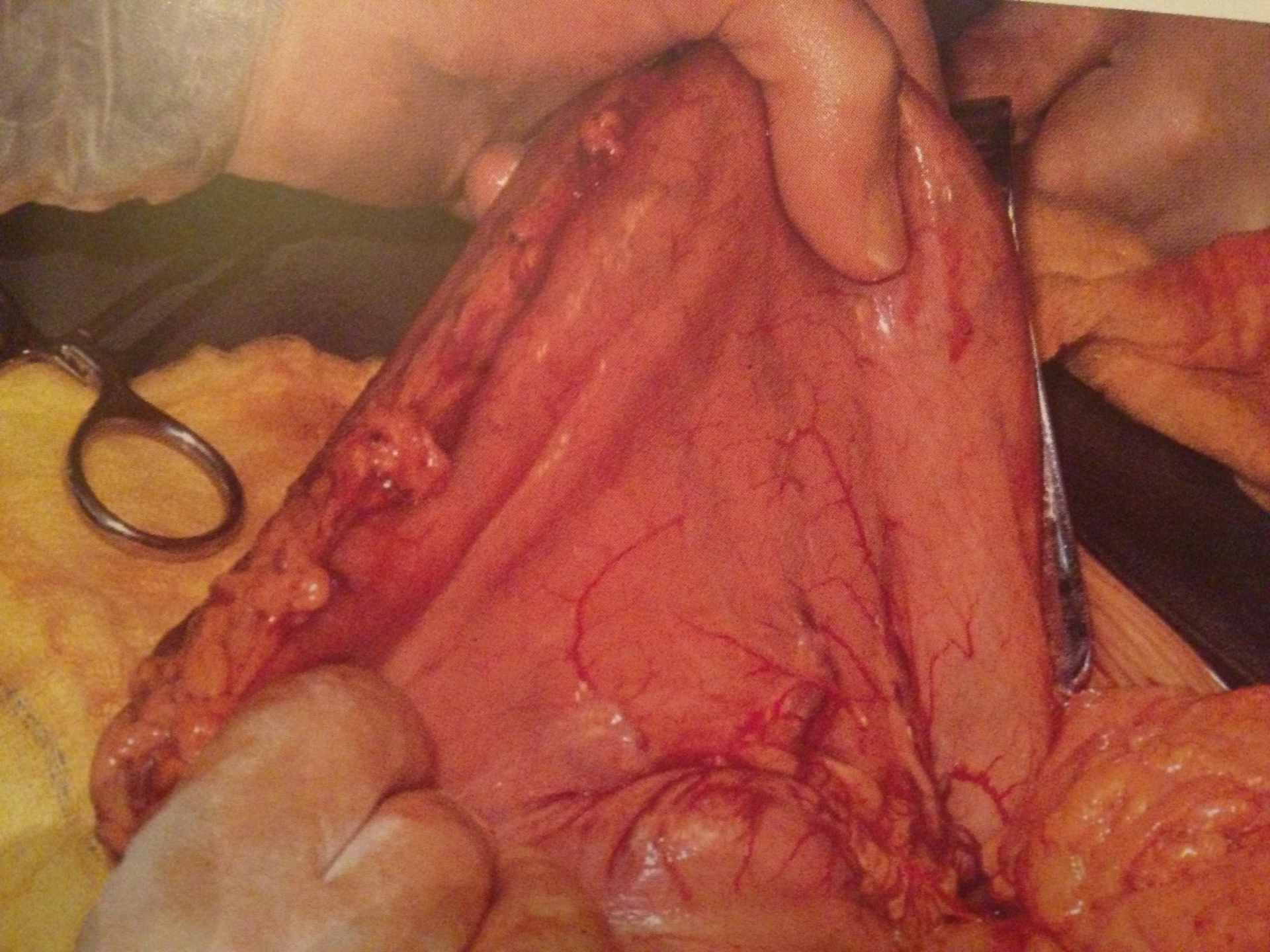




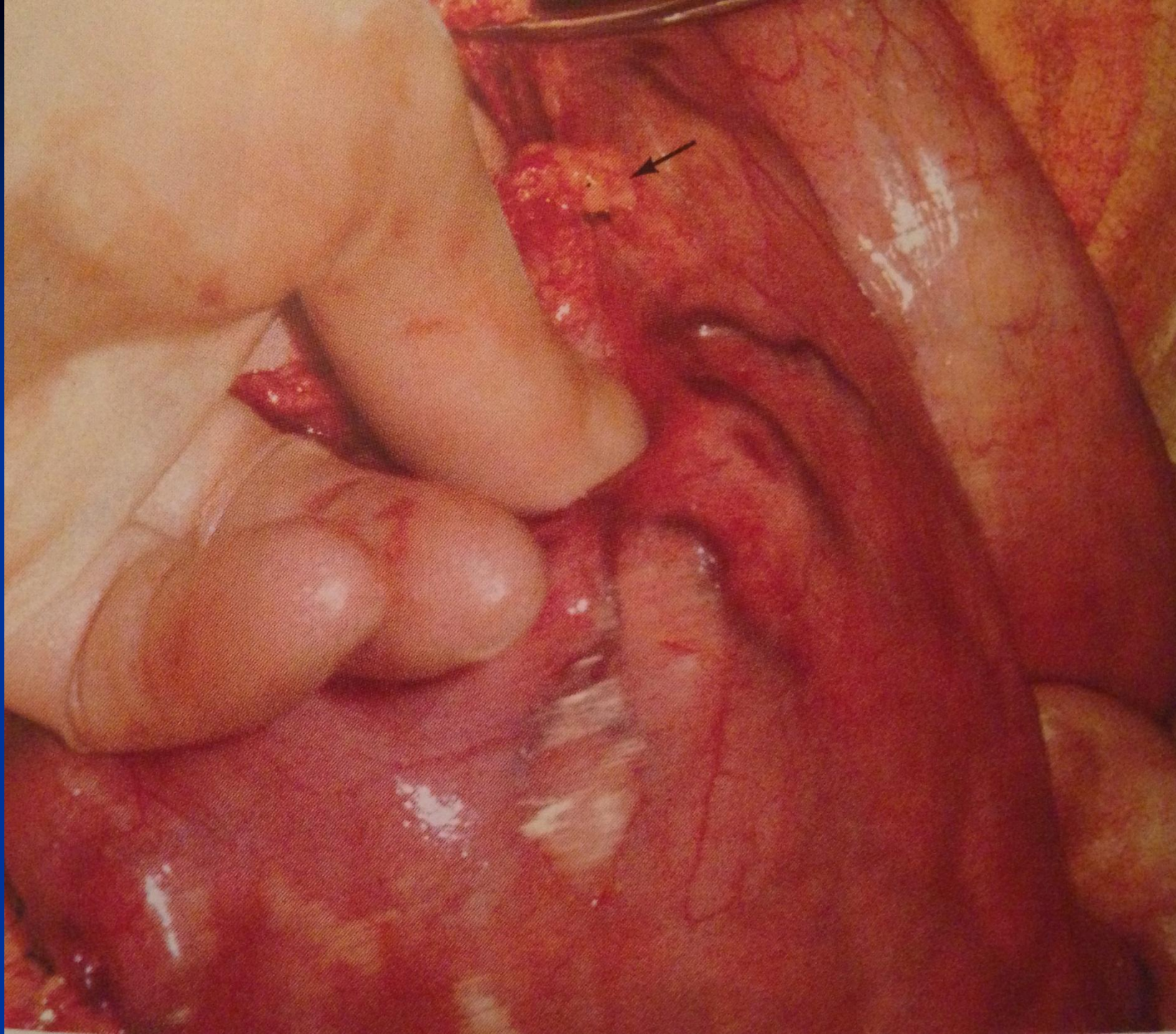


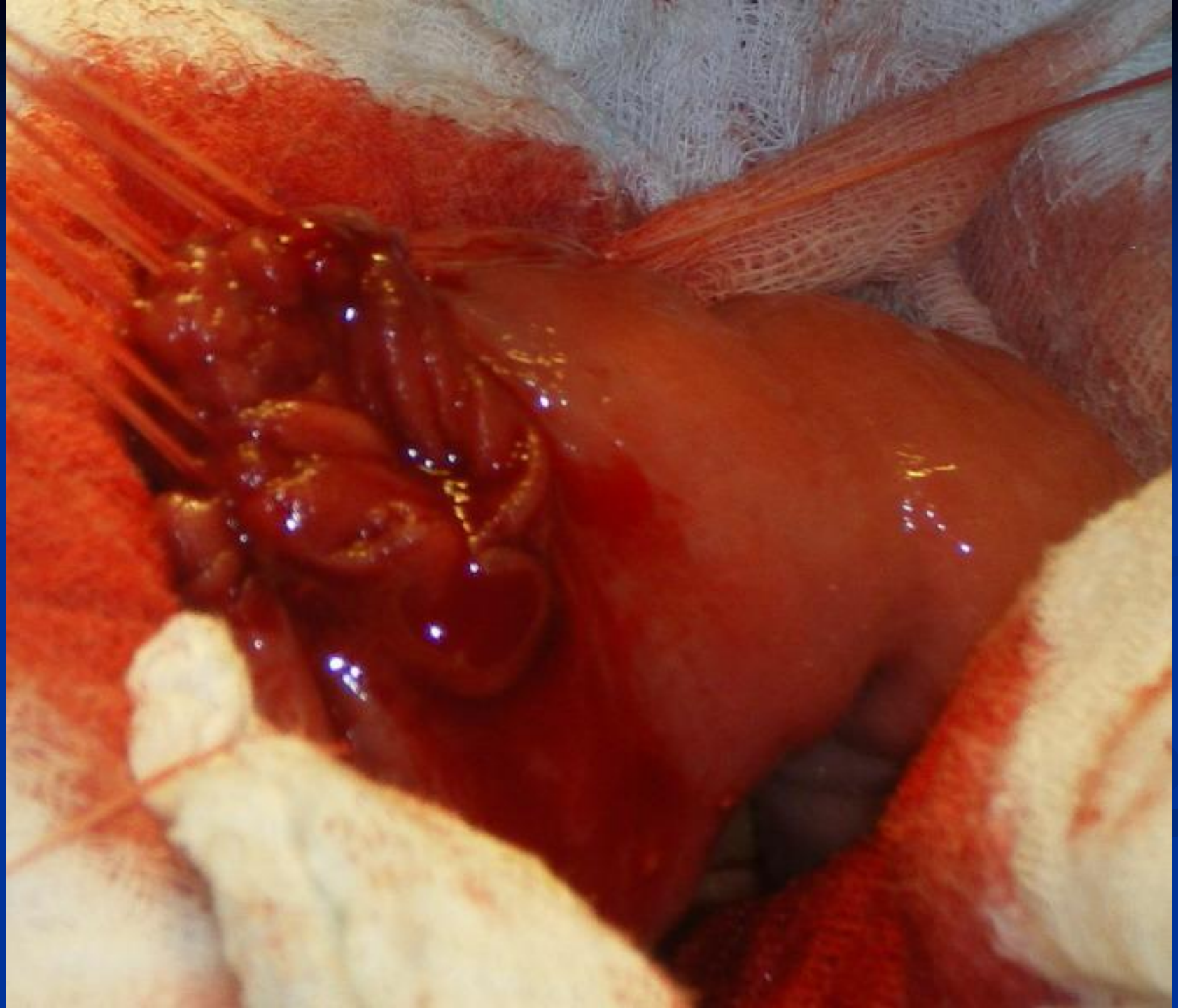












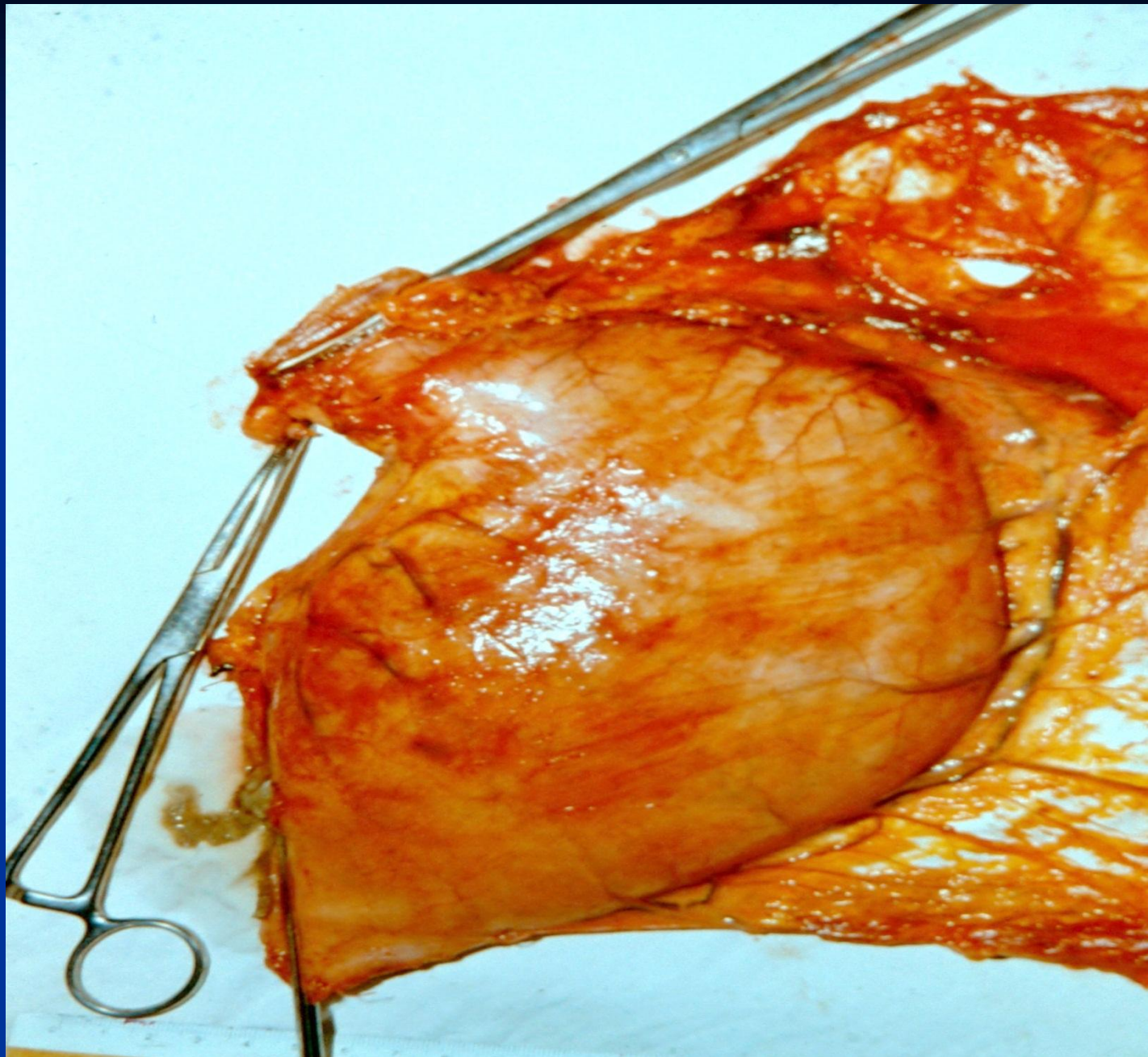










Fig. 129 Fixarea primei anse jejunale la marea curbură gastrică cu două fire de reper (după L. Schultz)

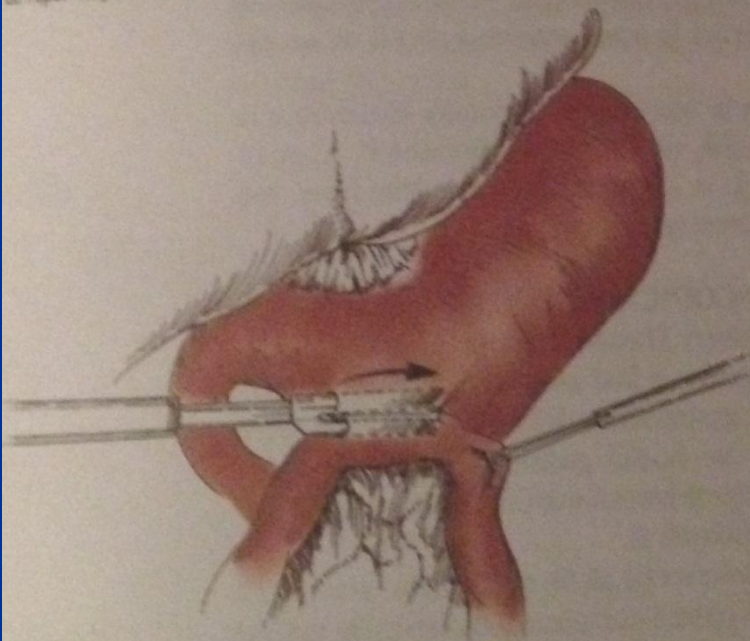


Fig. 130 Gastroenteroanastomoză cu staplerul liniar (după L. Schultz)

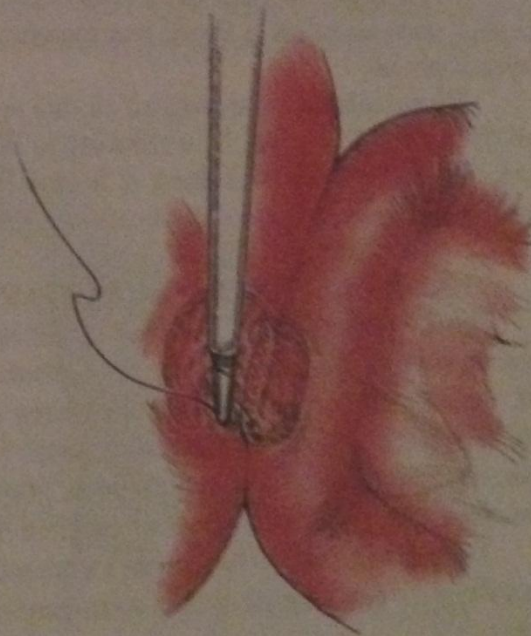
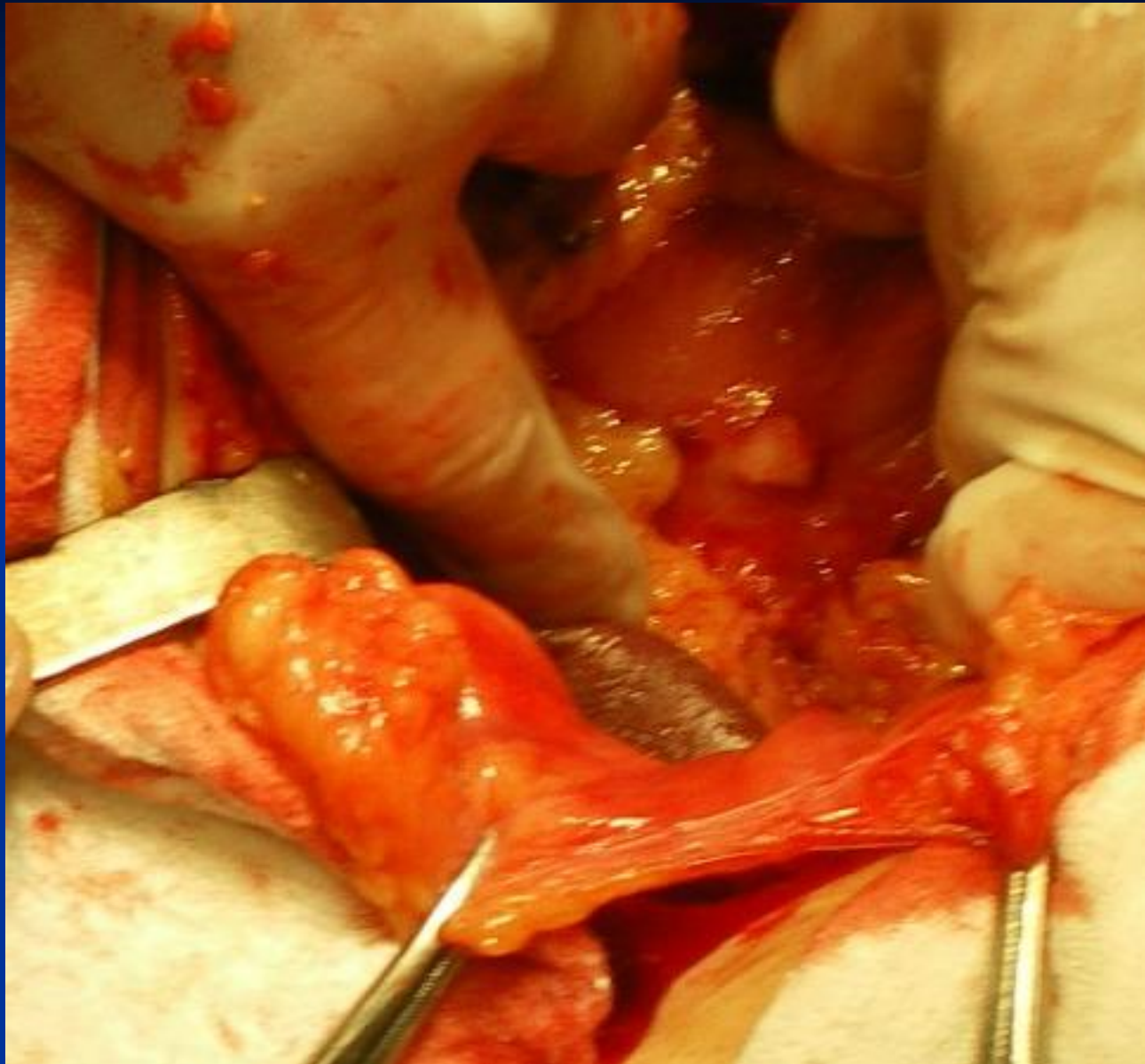
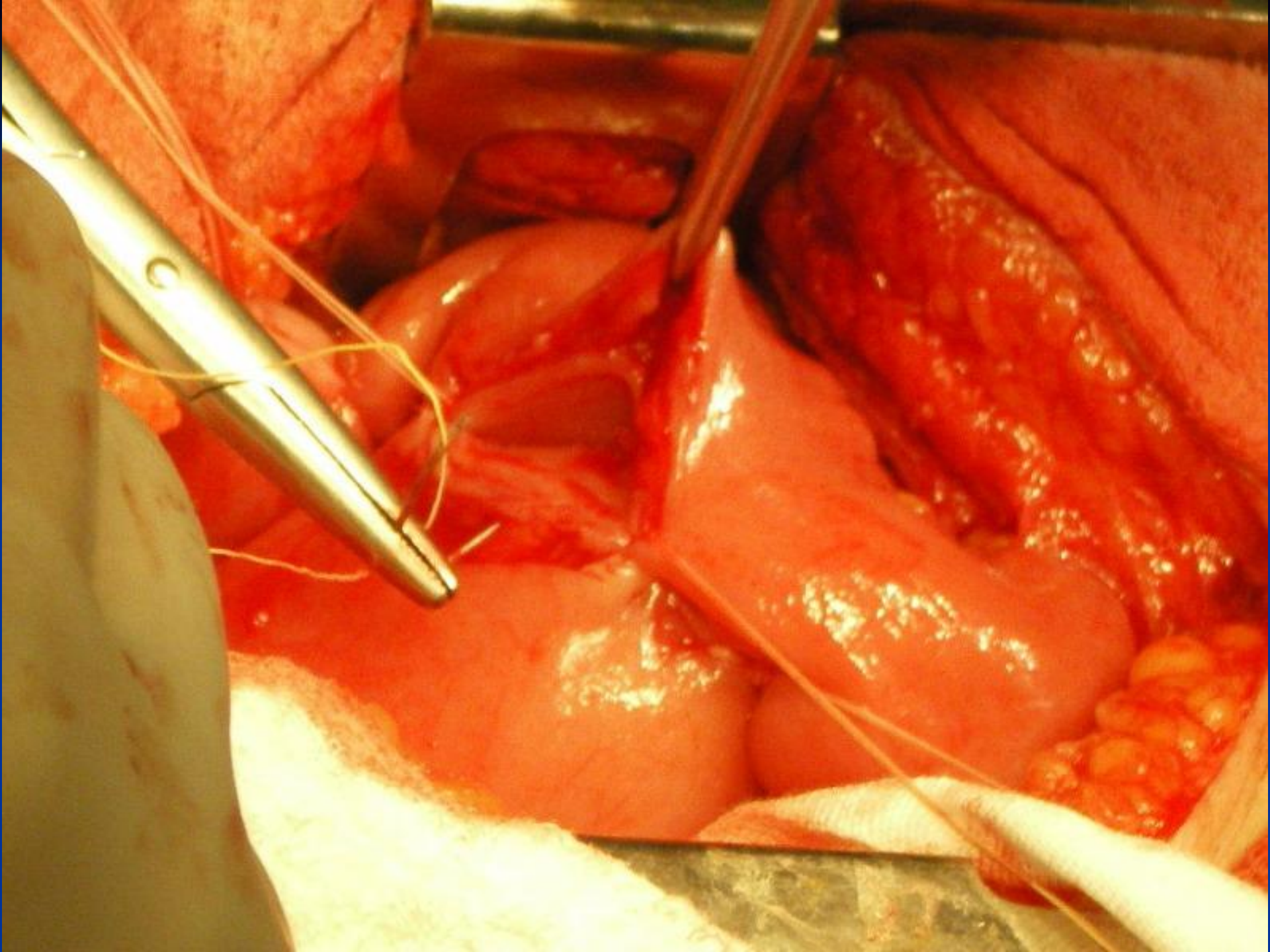


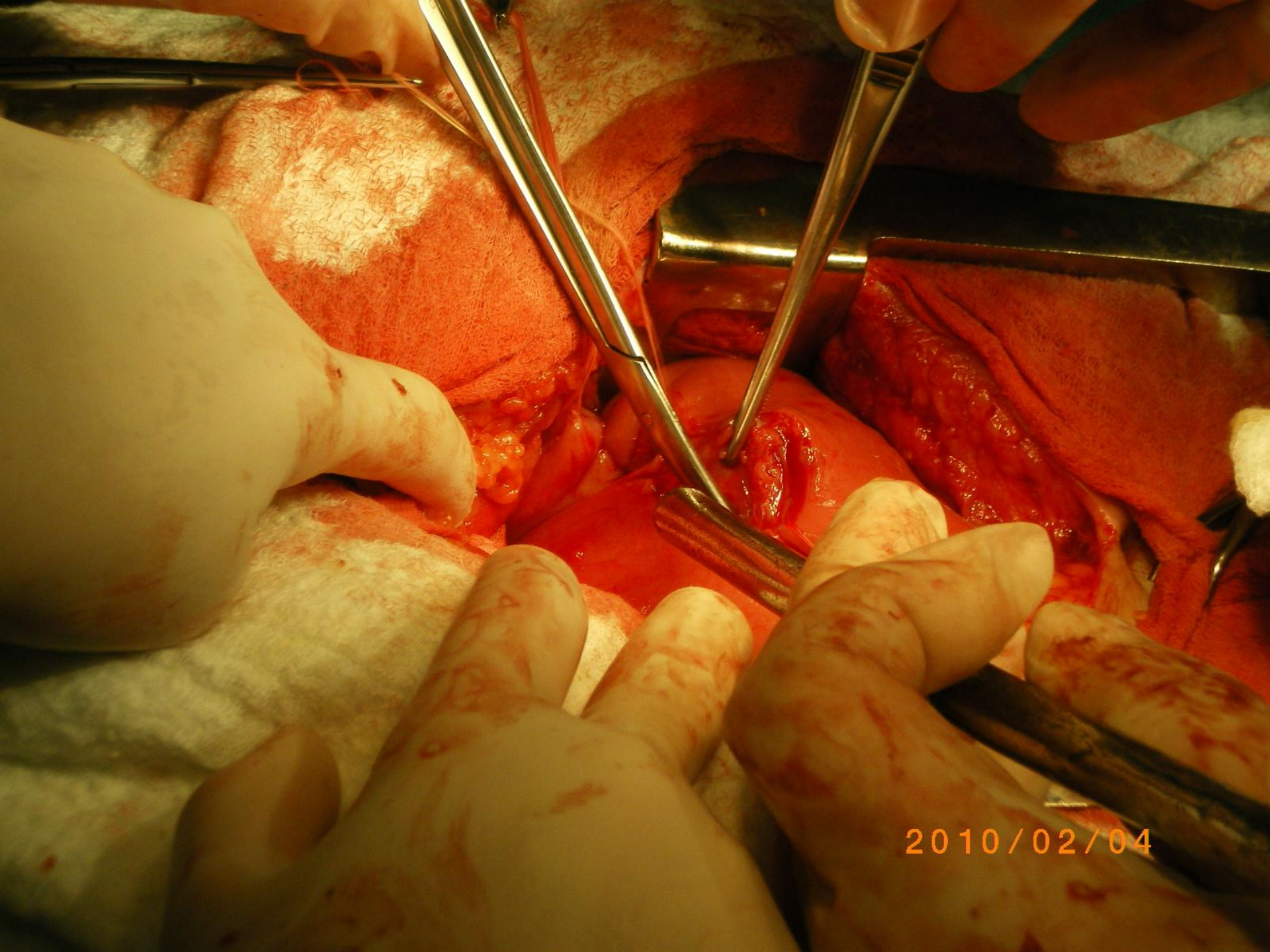
Fig. 131 Închiderea orificiilor prin care a fost introdus staplerul



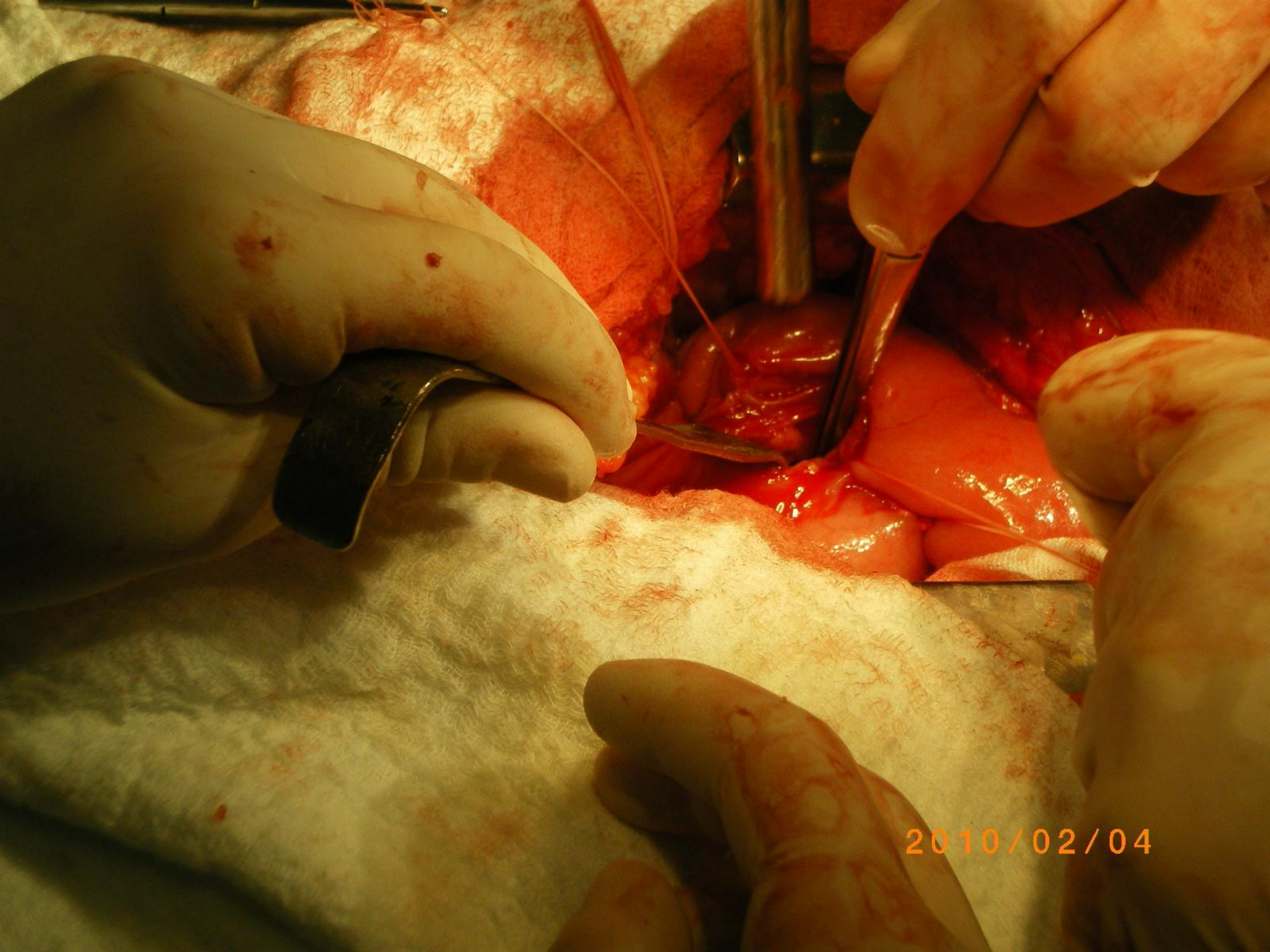




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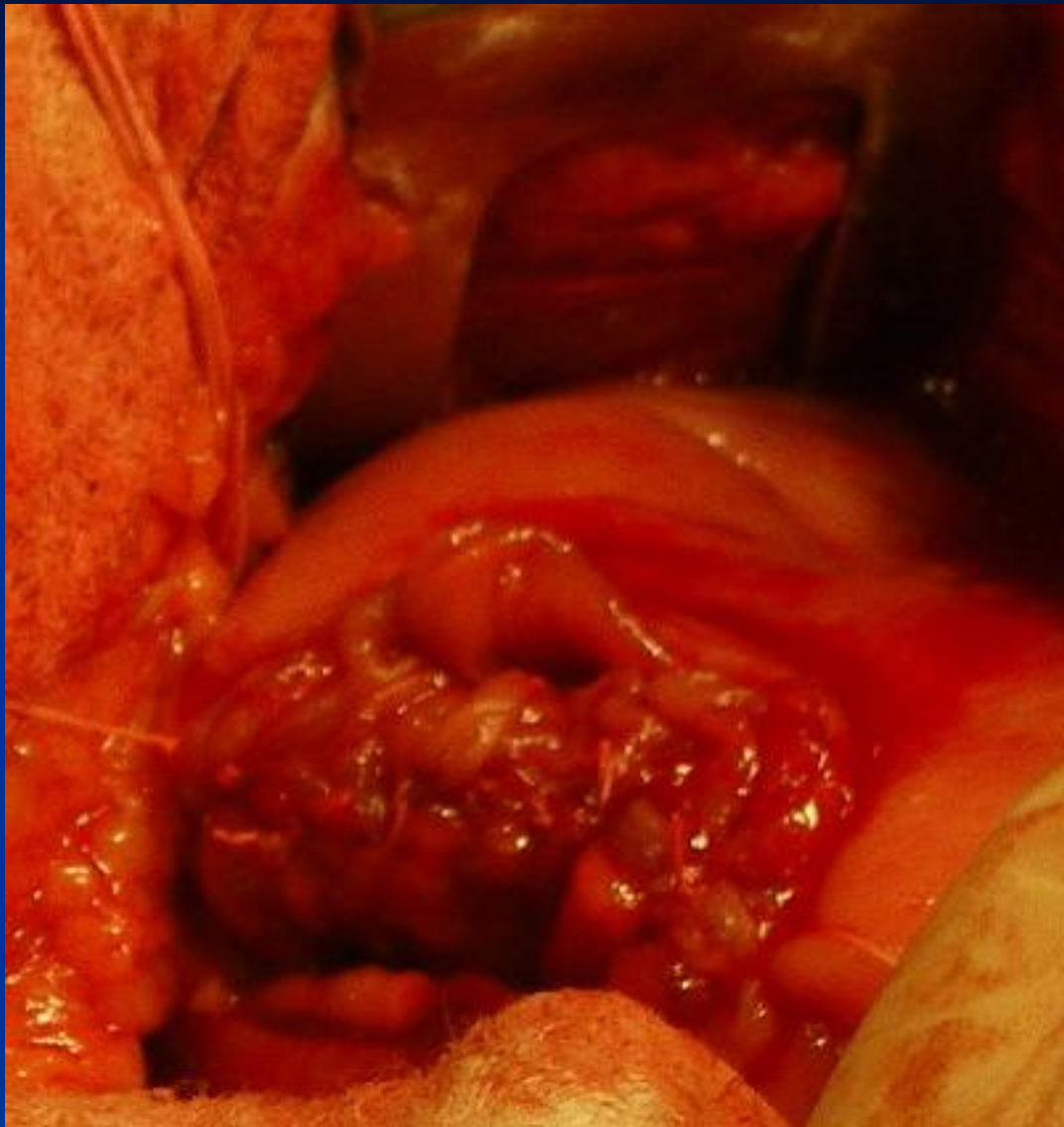


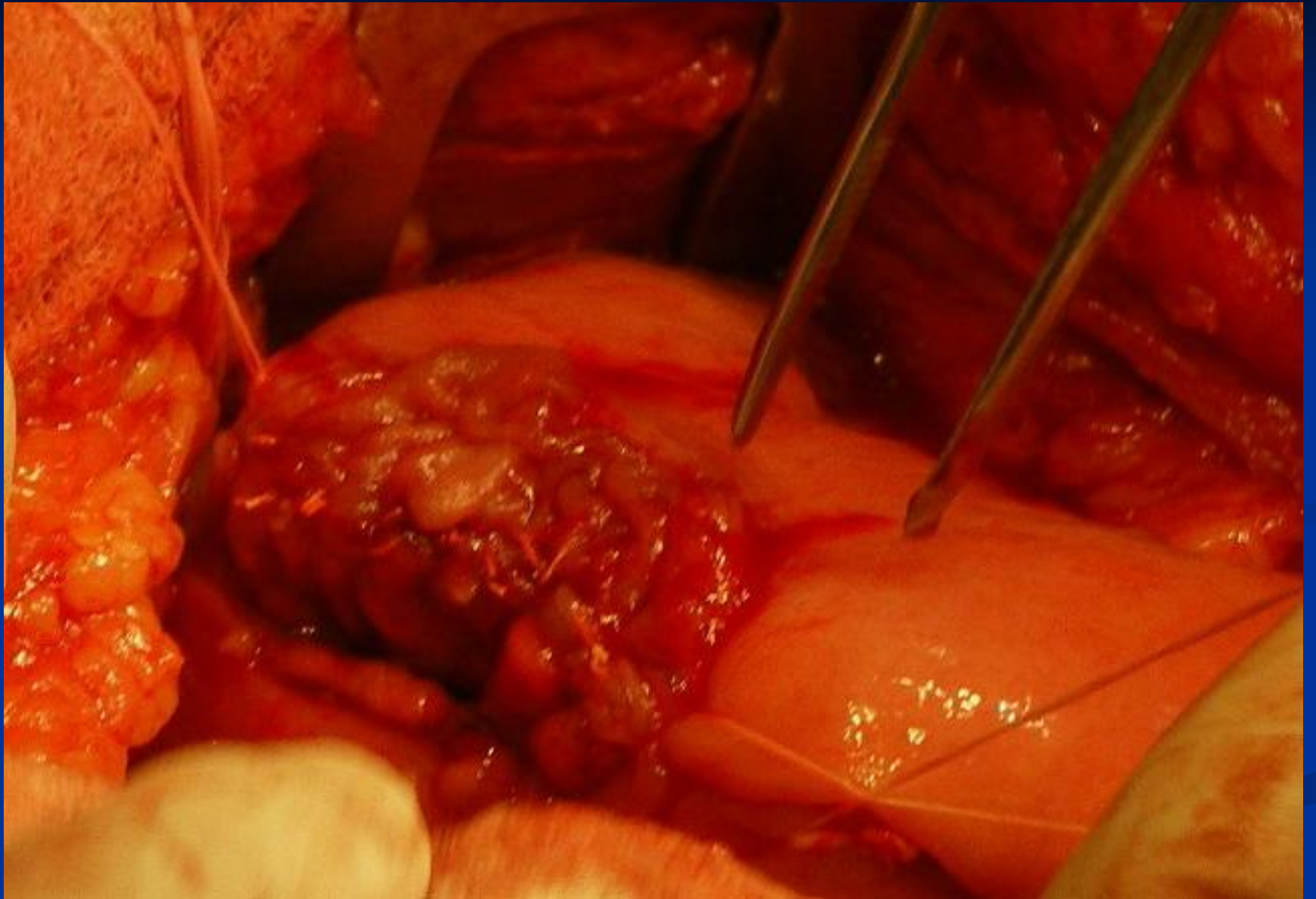
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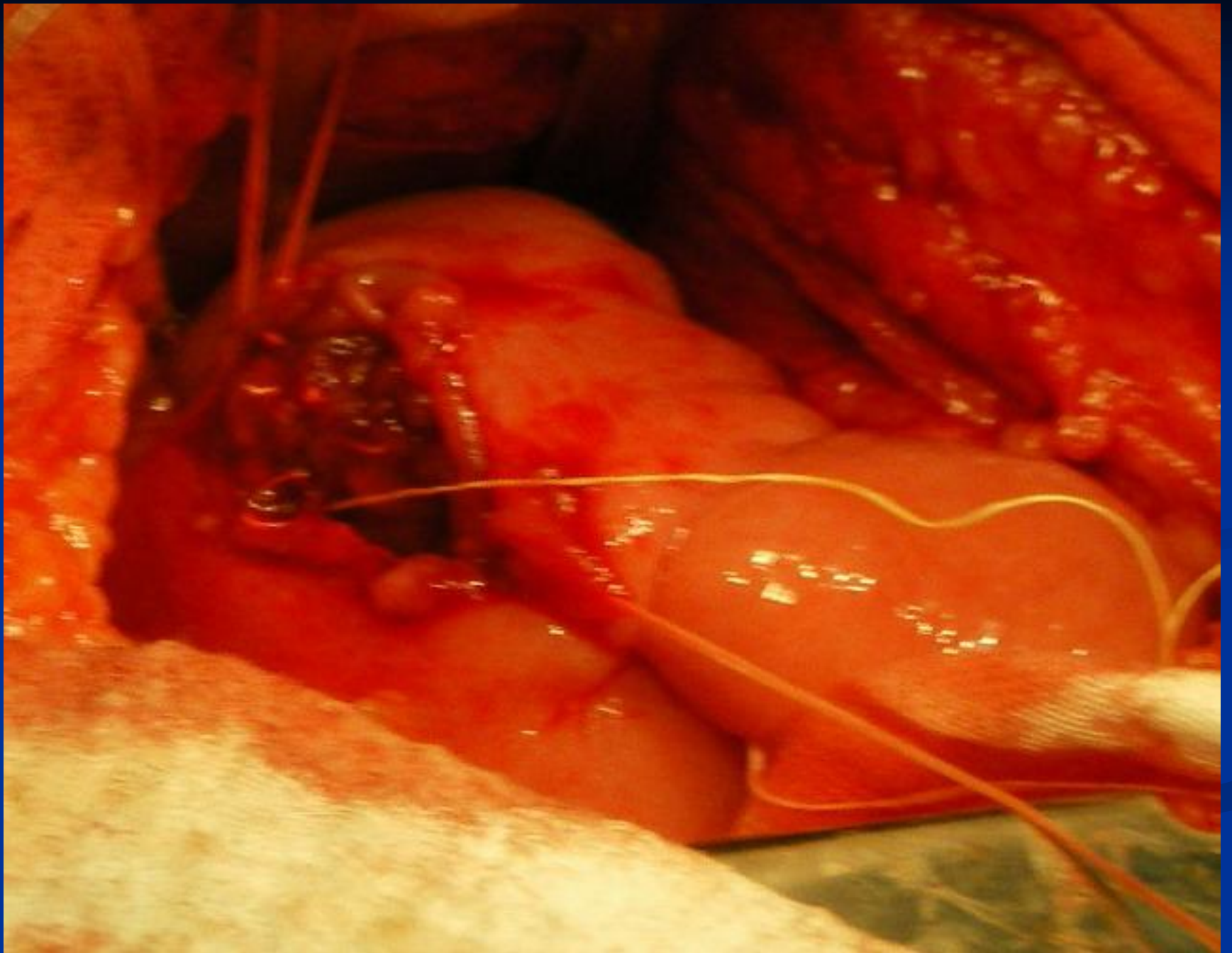


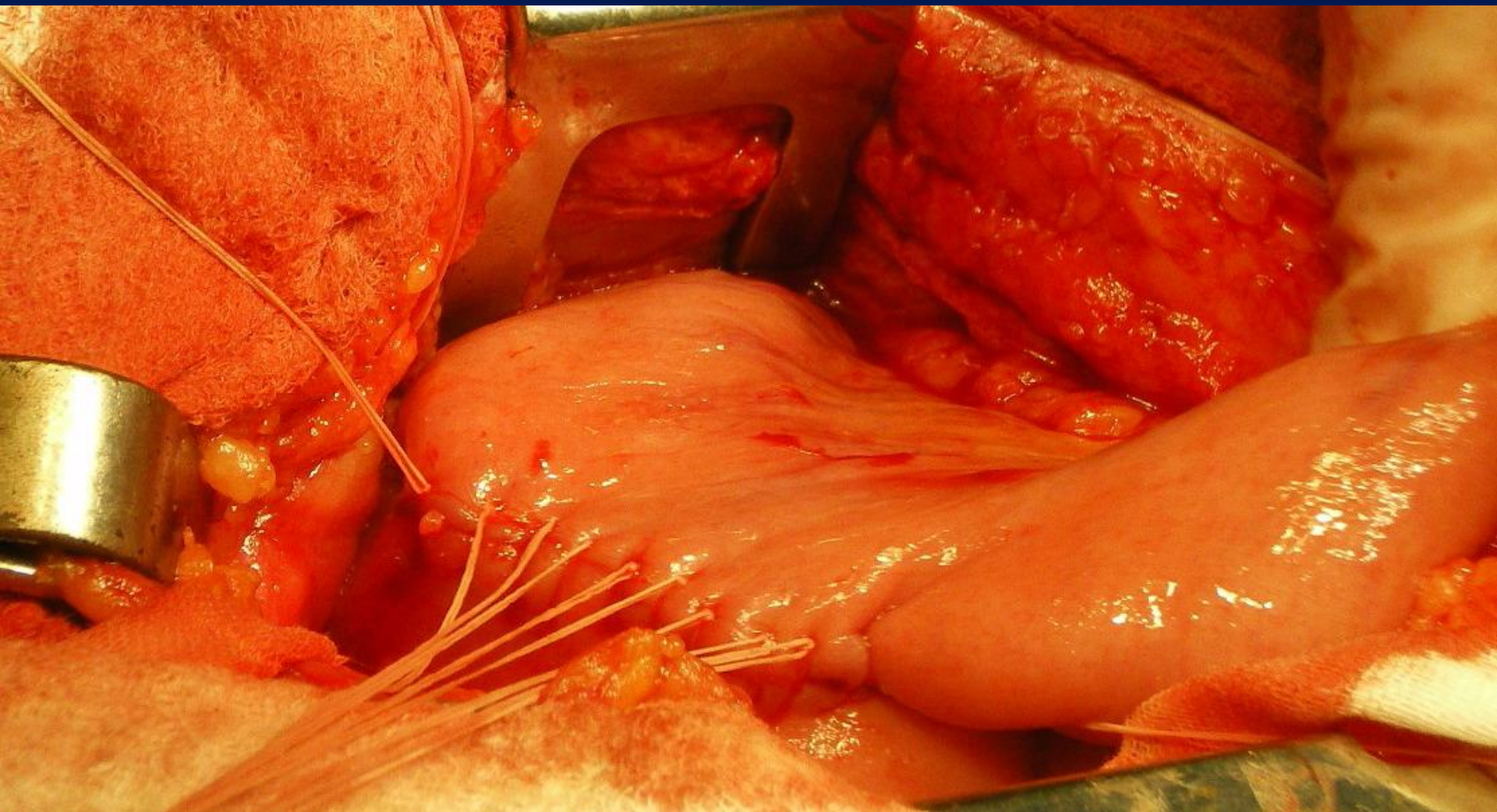
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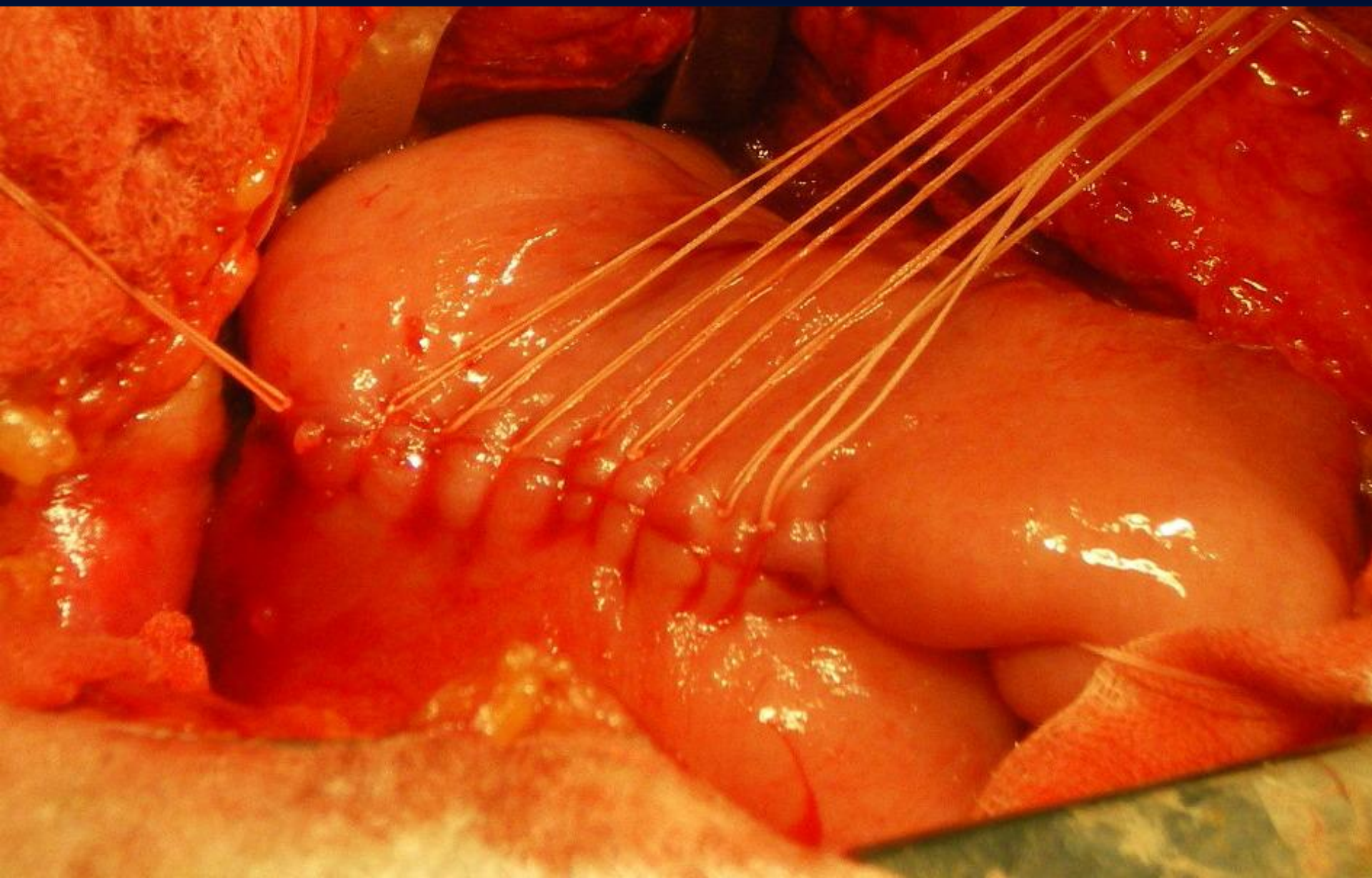




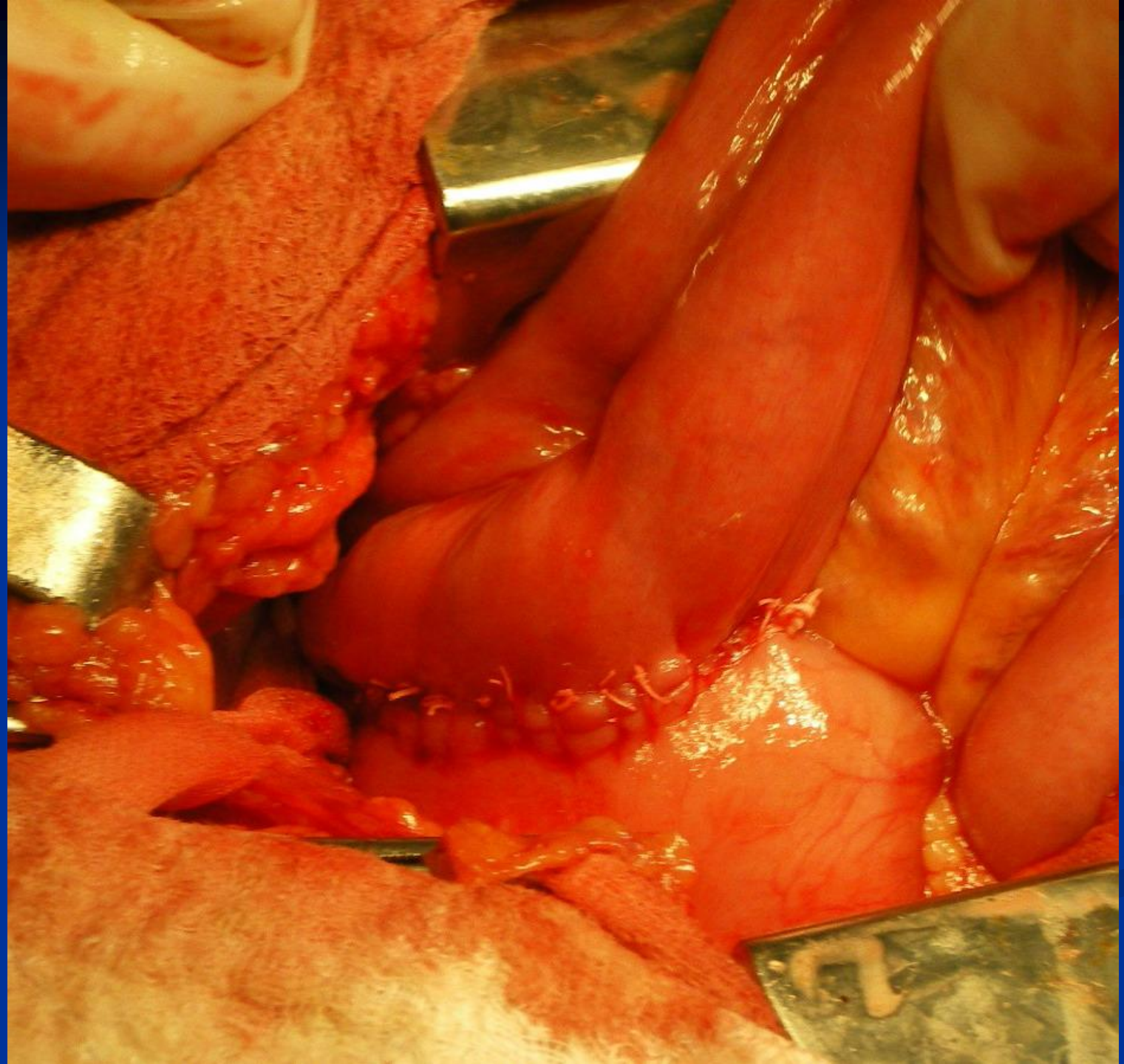


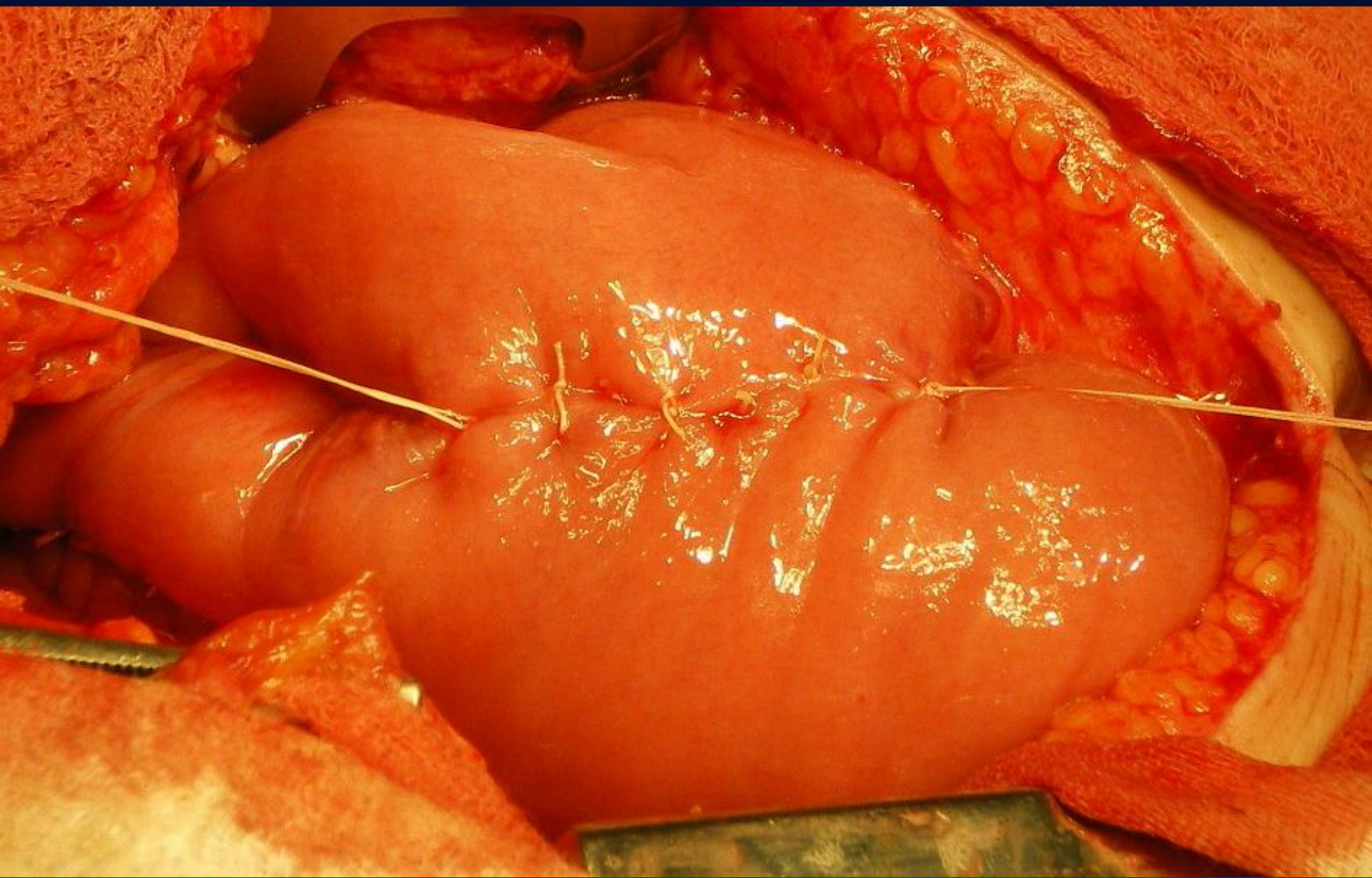




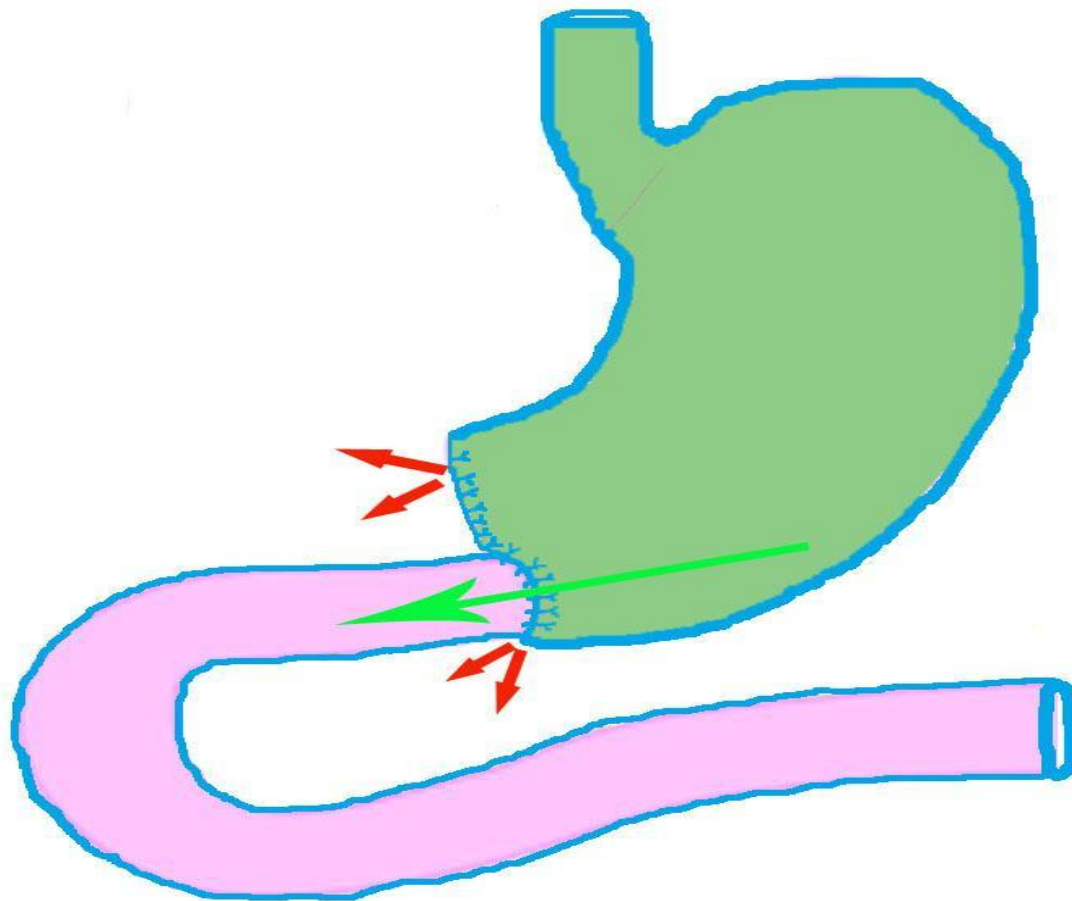




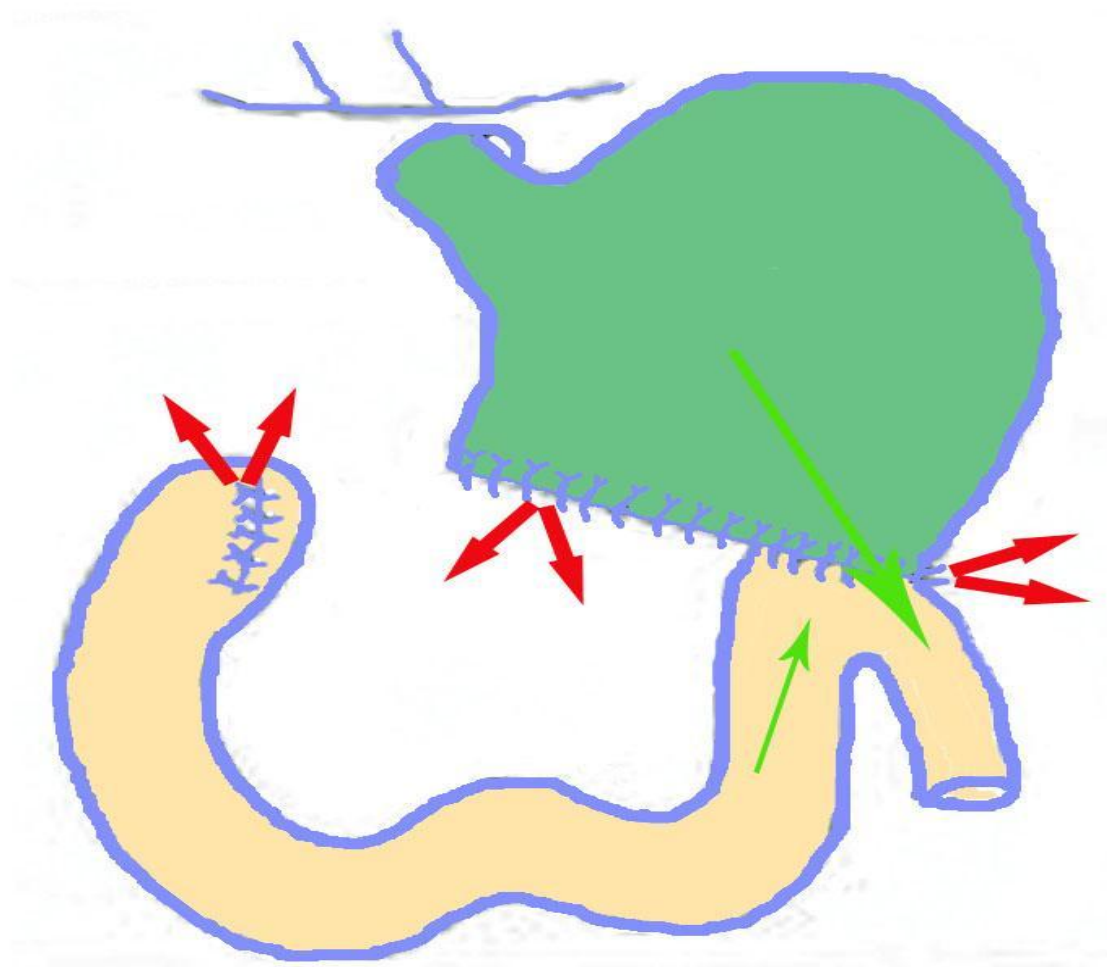




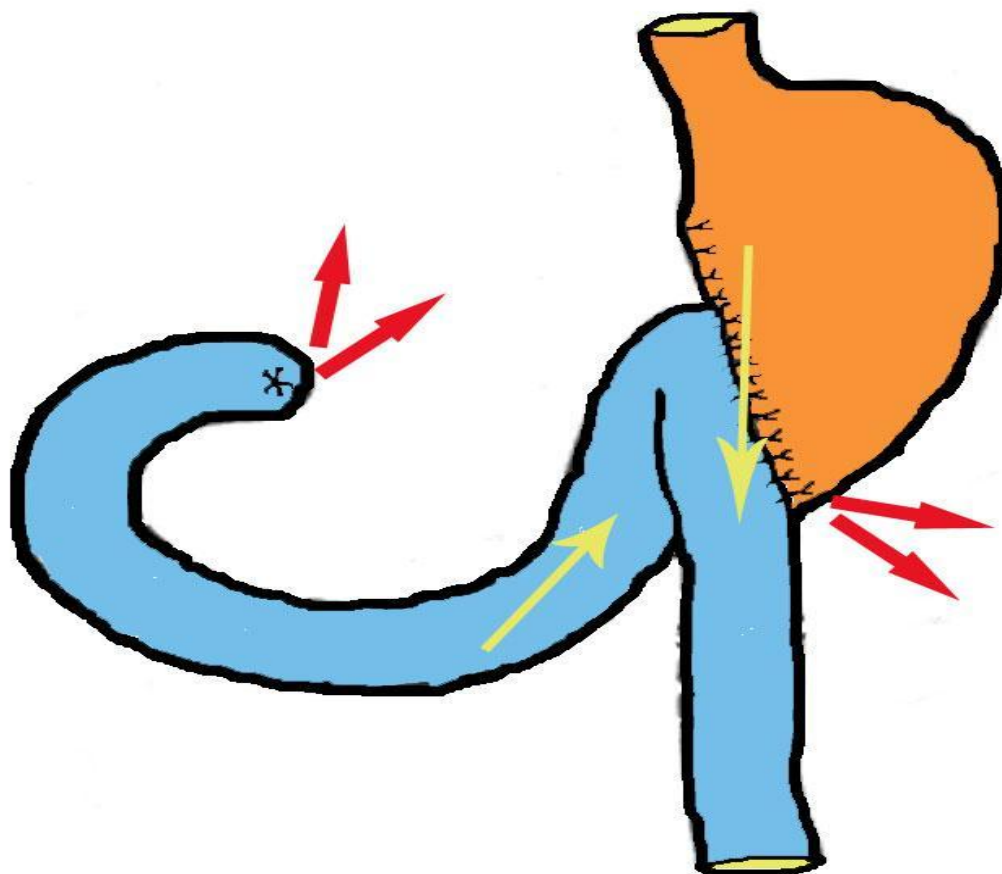




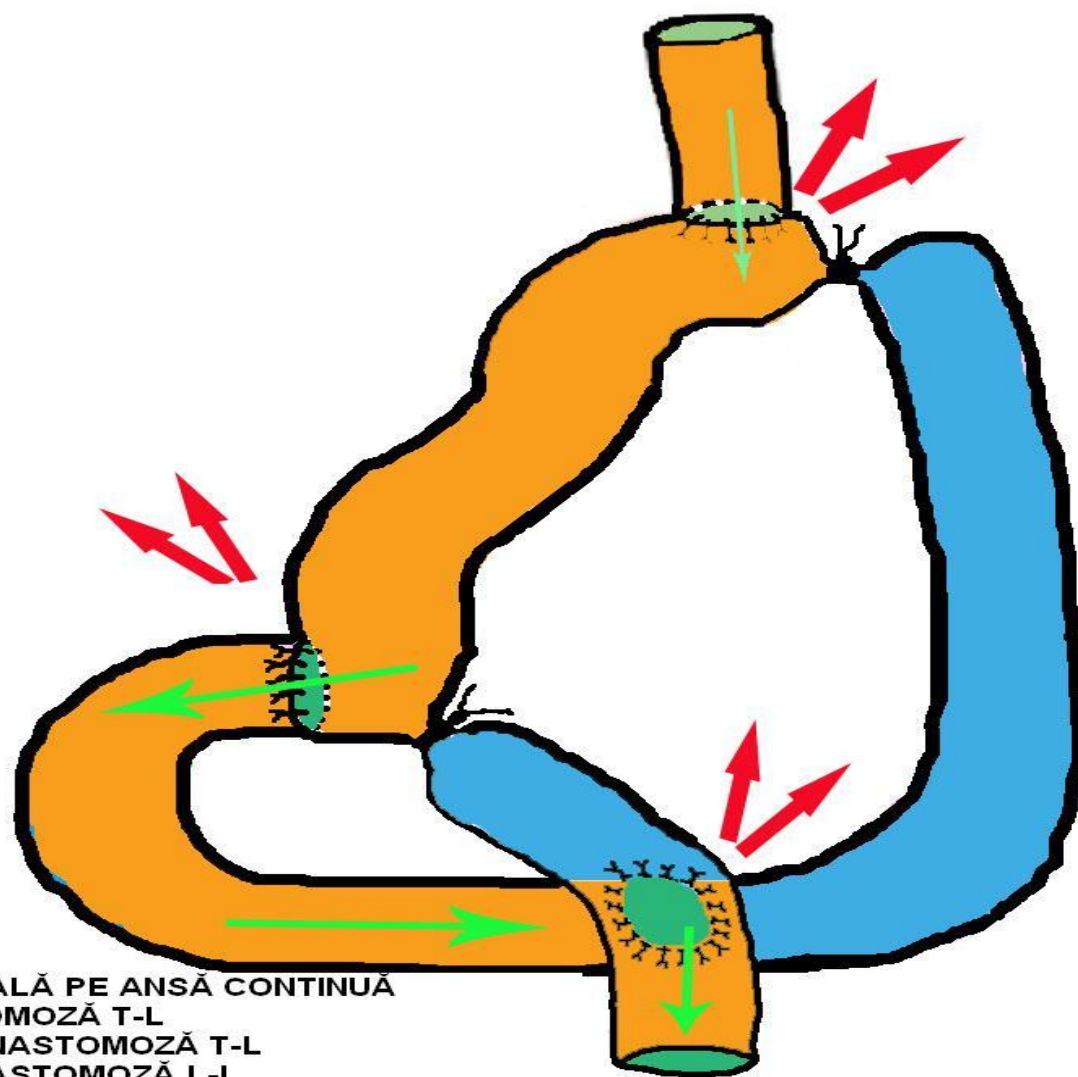
REZECȚIE GASTRICĂ PEAN - BILLROTH I



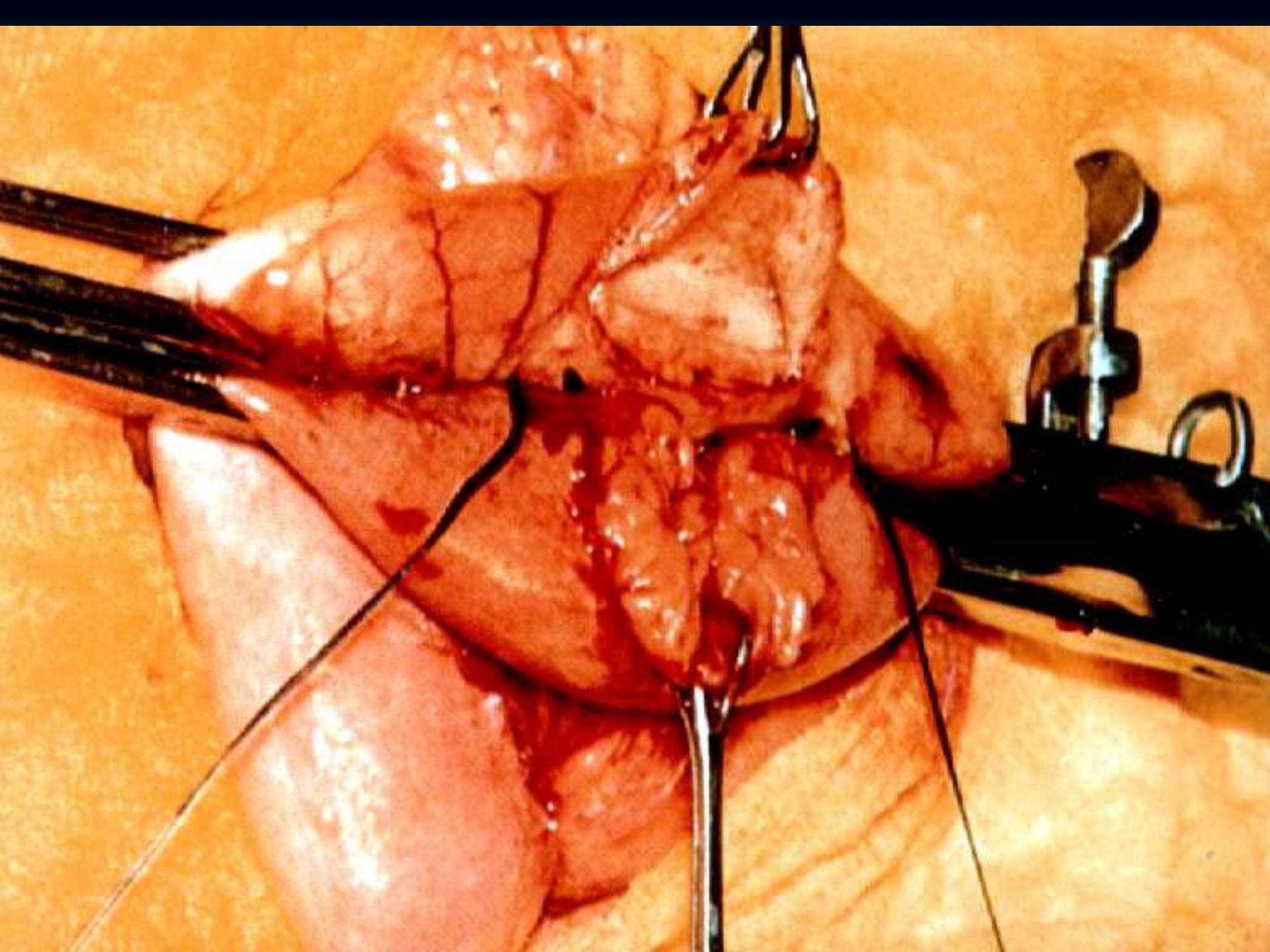
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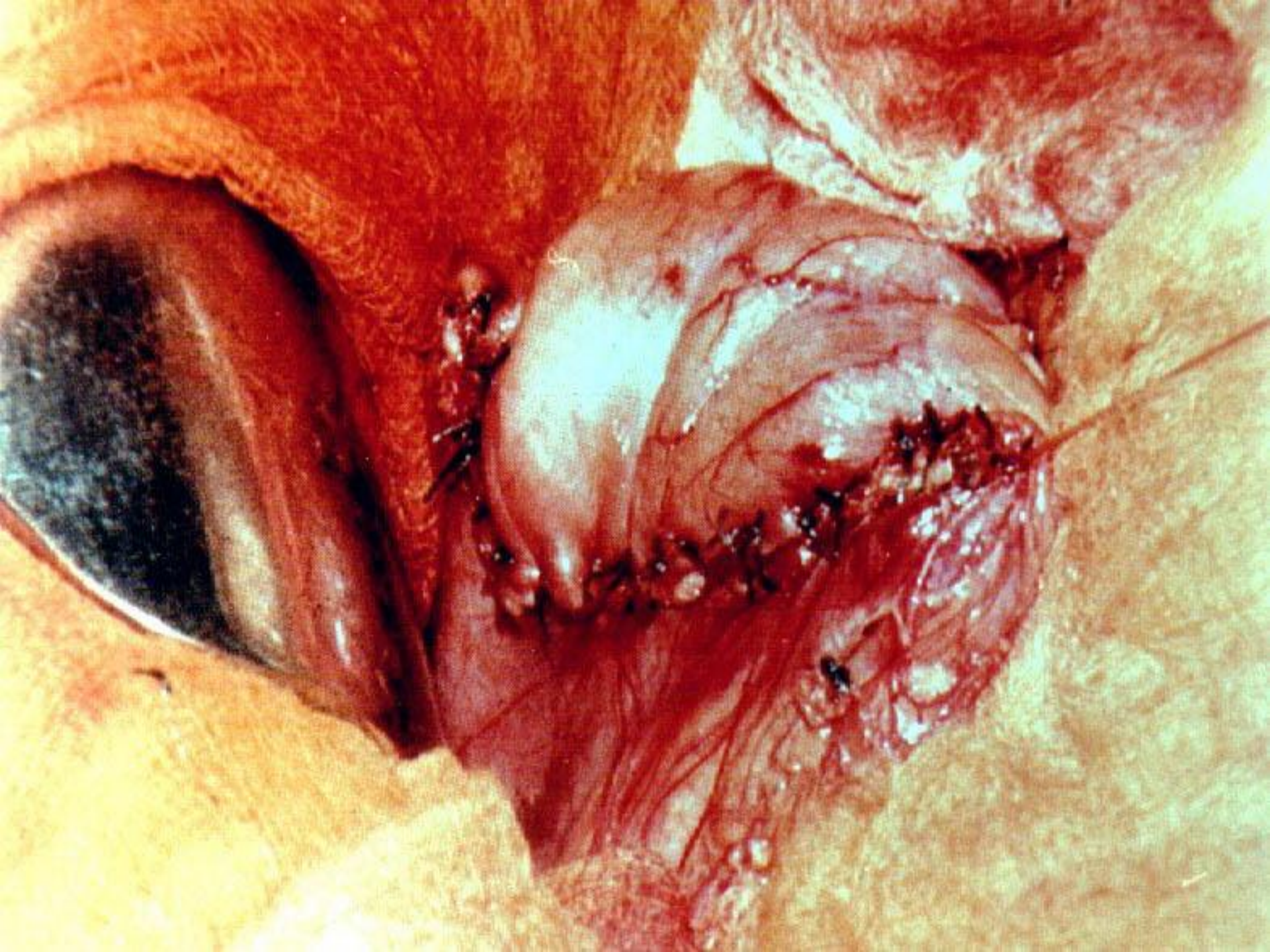


REZECȚIE GASTRICĂ KRONLEIN-REICHEL-POLYA



GASTRECTOMIE TOTALĂ PE ANSĂ CONTINUĂ
 -ESO-JEJUNOANASTOMOZĂ T-L
 -DUODENO-JEJUNOANASTOMOZĂ T-L
 -ENTERO-ENTEROANASTOMOZĂ L-L





STOMACH and DUODENUM (Acute complications)

PERFORATION

Diagnostic:

- ☐ Severe epigastric pain
- ☐ Shock
- ☐ Vomiting
- ☐ Prostration
- ☐ Cardiovascular collapse

STOMACH and DUODENUM (Acute complications)

PERFORATION

Physical exam

- ☐ abdominal wall muscle contraction with defense
 - ” abdominal wall as wood ”
- ☐ absence of peristaltic waves and bowel noises
- ☐ abdominal cutaneous hyperesthesia later

Abdominal radiograph: shows free air beneath the diafragm (sitting position)

Differential diagnosis:

with other causes of acute abdomen:

- ☐ perforation of other portions of intestinal tract,
- ☐ acute perforated appendicitis,
- ☐ acute pancreatitis,
- ☐ mesenteric thrombosis,
- ☐ strangulating intestinal obstruction,
- ☐ acute cholecistitis

STOMACH and DUODENUM (Acute complications)

PERFORATION

Treatment

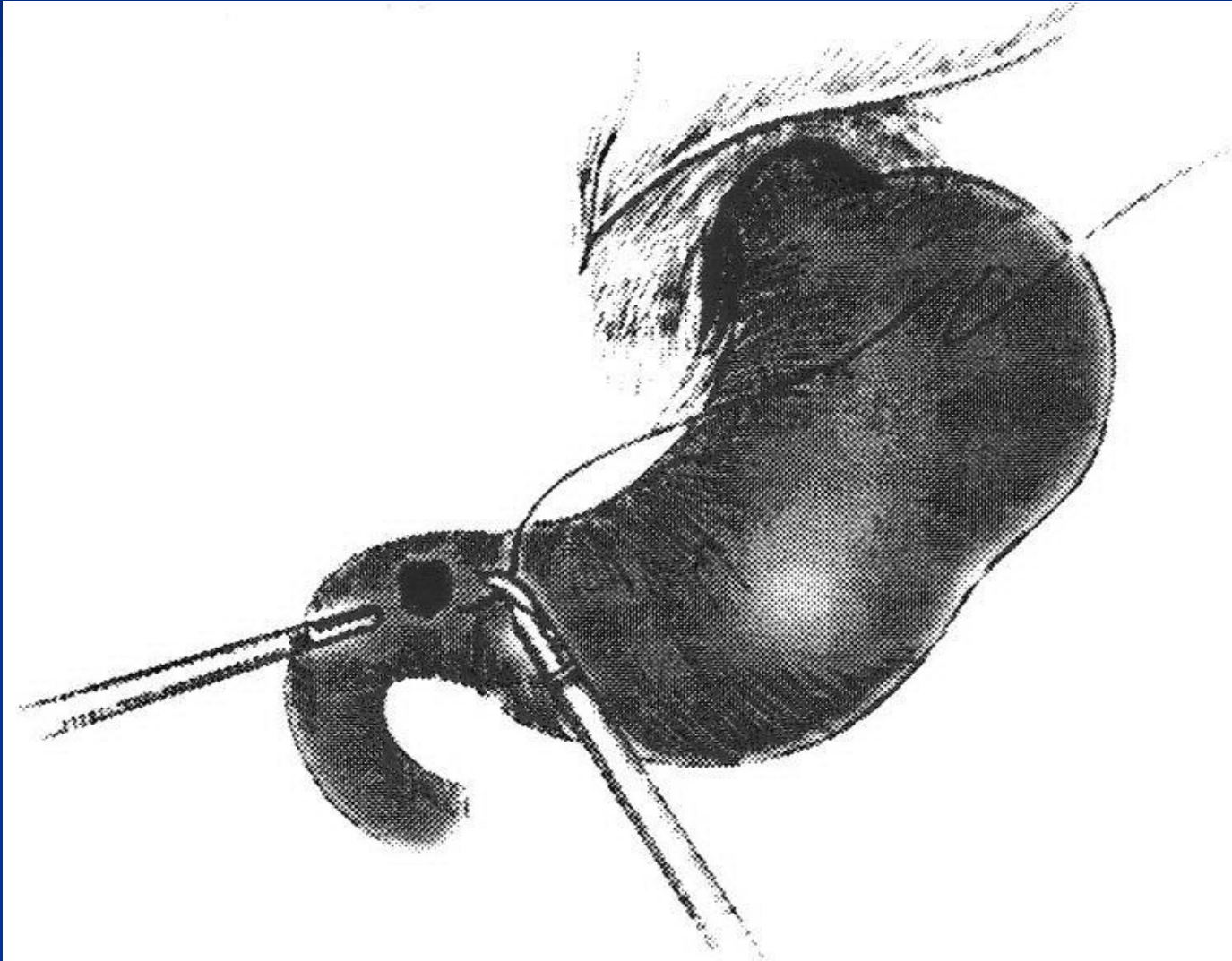
- ❑ Simple closure of perforation or
- ❑ definitive procedure to prevent recurrences:
 - gastric resection (with or without truncal vagotomy)
 - Pyloroplasty and bilateral truncal vagotomy
 - Bilateral truncal vagotomy and antrectomy

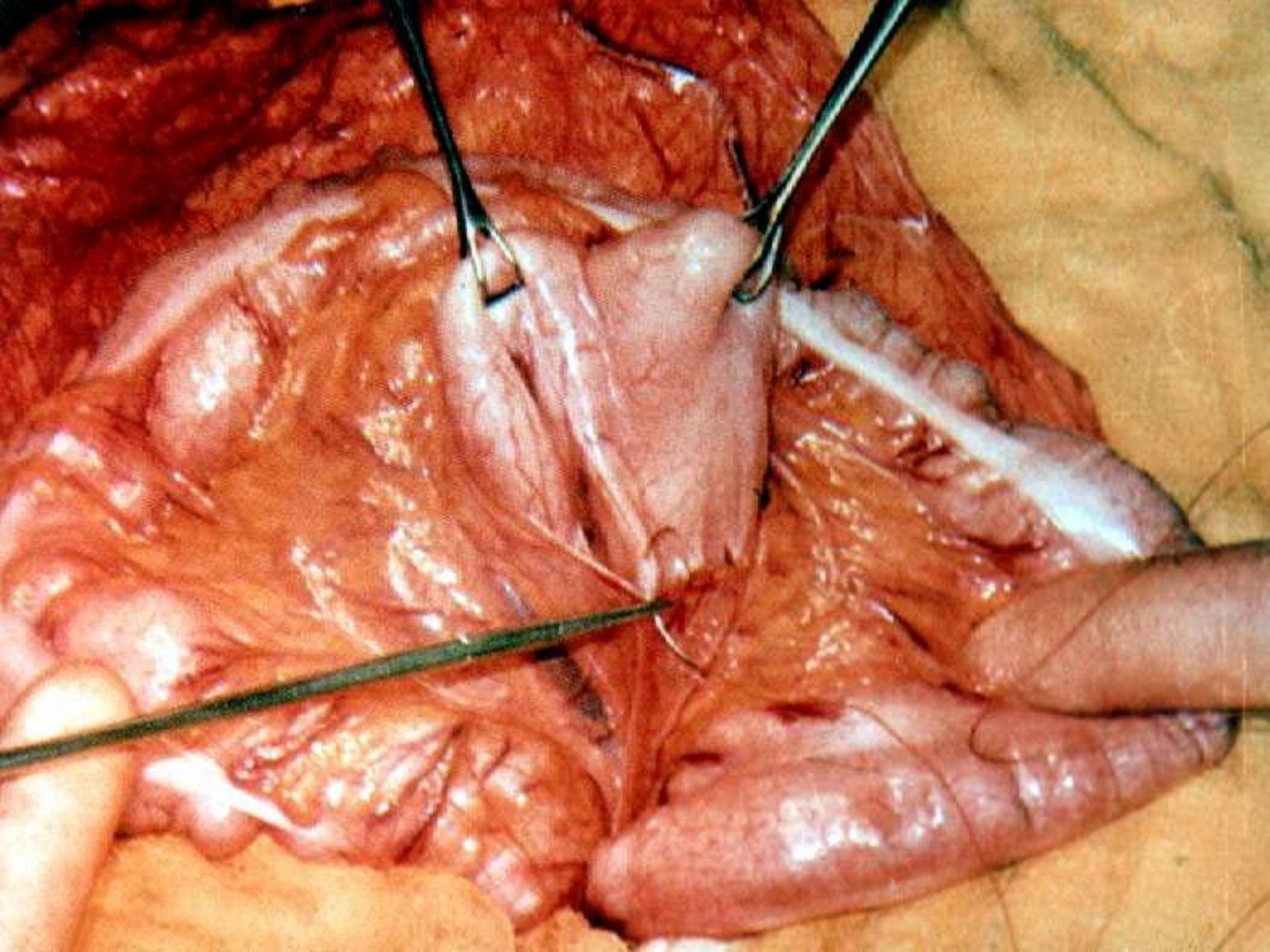
STOMACH and DUODENUM (Acute complications)

PERFORATION

Treatment

- ❑ Simple closure of perforation

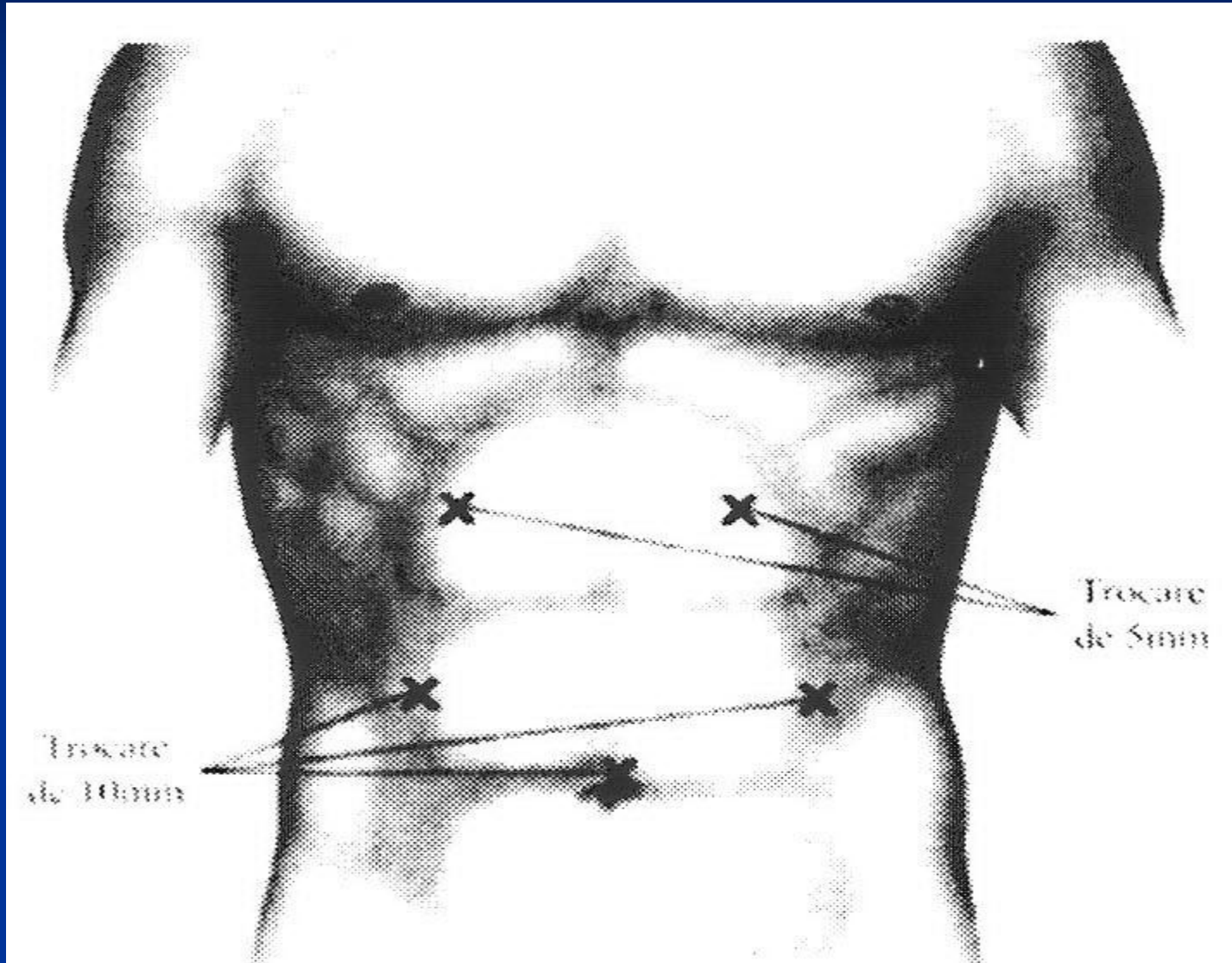




STOMACH and DUODENUM (Acute complications)

PERFORATION

Treatment



STOMACH and DUODENUM (Acute complications)

HAEMORRHAGE

Diagnostic:

History

- ☐ Ulcer disease
- ☐ Ingestion of gastric irritants (Aspirin, ibuprofen)
- ☐ Vomiting of blood
- ☐ haematochezia

Clinical signs

- ☐ Exteriorization of blood (haematemesis or / and melena)
- ☐ Haemorrhagic shock: arterial pressure-down, pulse-high, cold sweat

Exploration

- ☐ Endoscopy
- ☐ Selective angiography-not always available
- ☐ Barium contrast studies
- ☐ Laparotomy

STOMACH and DUODENUM (Acute complications)

HAEMORRHAGE

Treatment

- ❑ Injection of vasopressin into a peripheral vein
- ❑ Irrigation of the stomach for removal of blood clots
- ❑ Continued naso-gastric suction
- ❑ Elimination of oral intake
- ❑ Intravenous replacement of blood, fluids, and electrolytes
- ❑ Control the bleeding by endoscopic techniques: electrocoagulation, laser, sclerotherapy, clips
- ❑ Angiographic embolization of the gastroduodenal or the left gastric arteries
- ❑ Early operation indicate in: bleeding from gastroduodenal artery or bleeding from a gastric ulcer
- ❑ Types of surgical procedures:
 - Haemostasis in situ after detected the site of bleeding
 - Hemigastrectomy and truncal vagotomy followed by a Billroth II anastomosis (better control of bleeding)
 - Pyloroplasty with truncal vagotomy
 - Excision of the ulcer
 - Ligation of the left gastric artery with intragastric plication of the ulcer
 - Simple plication for all gastric ulcer

STOMACH and DUODENUM (Acute complications)

OBSTRUCTION

Diagnostic

Long history of peptic ulcer disease

Clinical signs: vomiting, weight loss, palpation of the stomach

Exploration:

- ☐ **Barium contrast:very large stomach, withot emtying in several hours**
- ☐ **Endoscopy:stenosis of the pylorus**
- ☐ **Laboratory:hyponatremia, hypoclorema, alkalosis**

Treatment

- ☐ **Gastric resection**
- ☐ **Gastroenterostomy (older patients in poor condition)**

INTRACTABILITY

- ☐ **a patient with an ulcer has been treated with the best available medical therapy but is still symptomatic**
- ☐ **Duodenal or prepyloric ulcer**
- ☐ **Treatment: proximal gastric vagotomy**

STOMACH, DUODENUM

Postoperative complications-P.C.

EARLY P.c.

1.Haemorrhage

Signs of postoperative bleeding:

- ☐ low blood pressure
- ☐ High pulse rate
- ☐ Low haematocrit after operation
- ☐ Blood in the aspirate from a nasogastric tube:
 - No blood in the aspirate= extragastric bleeding (splenic damage, vessels damage)
 - Blood in the aspirate:from a suture line, another area in the mucosa, from the site of insertion of a gastrostomy tube
- ☐ Occurs within the first few hours or the first day after op
- ☐ Nasogastric tube irrigation and aspiration is necessary
- ☐ Intravenous replacement of fluids and blood
- ☐ If continued bleeding, re-exploration

EARLY P.c. 2.Suture line leakage

May occur at any time after operation:

- ☐ **disunion suture, after resumption of bowel,**
- ☐ **fistula, after 8 days**

Clinical signs:

- ☐ **distension,**
- ☐ **absence of peristaltic waves,**
- ☐ **severe local pain and tenderness,**
- ☐ **spontaneous drainage of intestinal contents**

Terapy:

- ☐ **if is duodenal stump leakage is necessary immediate operation and drains**
- ☐ **If is a leak from a gastroduodenostomy or gastrojejunostomy terapy varies:**
 - **Early stage: repair of anastomosis, bolster with the omentum the suture line**
 - **Later stage, fistula is sure:**
 - **May heal spontaneously, rarely,**
 - **Often require surgical repair**

Postoperative complications-P.C.

EARLY P.c.

3. Damage of the adjacent tissue or organs

Acute pancreatitis, after gastric resection

After truncal vagotomy :

- ☐ Splenic injury,
- ☐ Perforation of the oesophagus,
- ☐ Rupture of the diaphragm

4.Stomal delay

The stoma is not functioning normally 10 days after operation

Causes:

- ☐ A low serum potassium or albumin level can lead to malfunction
- ☐ Starch peritonitis,
- ☐ fat necrosis in the large omentum,
- ☐ mechanical obstruction from adhesions

Endoscopy reveal if the anastomosis is patent or not

Treatment

- ☐ Parenteral nutrition
- ☐ Monitoring
- ☐ Medication:bethanecol, metoclopramide
- ☐ Reoperation if is no improvement after 2 weeks

Postoperative complications-P.C.

LATE SEQUELAE

The afferent loop syndrome

- ☐ Mechanical problem when a long jejunal loop was used for a Billroth II procedure
- ☐ An inadequate anastomotic opening
- ☐ Symptoms
 - Attacks of severe vomiting of bile, unmixed with food
 - Anemia and malnutrition
- ☐ Treatment:surgical conversion to a Billroth I anastomosis

Sequelae due to technical errors

- ☐ Gastroileostomy
- ☐ Severe diarrhoea
- ☐ Late defects in absorption of food, vitamins

Microcytic anemia

- ☐ After high subtotal resection
- ☐ after total gastrectomy
- ☐ vitamin B12 inj

Absorption of fats, proteins, carbohydrates decreases directly with an increase in the amount of stomach resected

Iron poor absorption after Billroth II (duodenum is the major site of absorption)

STOMACH, DUODENUM (Postoperative complications-P.C.)

LATE SEQUELAE

Small gastroduodenostomy

- ❑ Symptoms:
 - Of partial obstruction
 - Epigastric fullness
 - Heartburn
 - Episodes of vomiting
- ❑ Conversion of a Billroth I to a Billroth II anastomosis relieves symptoms

Vagal diarrhoea

Uncontrollable explosive diarrhoea, after truncal VT, incidence 1%

Malnutrition

Cause: small gastric reservoir, total gastrectomy

MAJOR SEQUELAE

Recurrent ulcer

- ❑ After proximal gastric vagotomy can be treated with H₂ receptor antagonists
- ❑ After gastric resection for type I gastric ulcer the recurrence rate is low and late sequelae are minimal
- ❑ Higher rate of recurrence is after proximal gastric vagotomy; can be successfully treated by gastric resection
- ❑ After a Billroth II gastric resection the recurrence rate is lower than Billroth I

STOMACH, DUODENUM (Postoperative complications-P.C.)

MAJOR SEQUELAE

Dumping syndrome

- ☐ **Mechanism:**gastric content is discharged rapidly into the duodenum or jejunum
- ☐ accentuated by any mechanism that destroys pyloric sphincter
- ☐ Sweet liquids with high osmolarity initiate the symptoms
- ☐ **Symptoms:**
 - Fall in blood pressure
 - Sweating
 - Pallor
 - Abdominal distension
 - Cramps
 - Diarrhoea
 - Weakness, desire to lie down
- ☐ **Clinical forms:**
 - Early dumping in 15 to 30 min after eating
 - Late dumping 2 hours after eating,
- ☐ most common after gastric resection
- ☐ Least common after proximal gastric vagotomy

STOMACH, DUODENUM (Postoperative complications-P.C.)

MAJOR SEQUELAE

Dumping syndrome

❑ Medical therapy:

- conservative attitude is warranted, tends to disappear after month or years
- Solid rather than liquid meals
- Small but repeat servings
- Low intake of carbohydrates

❑ Surgical treatment:

- interposition of a retroperitoneal 10 cm loop of jejun, between the distal end of stomach and the duodenum
- Vagotomy must be added if one has not already been performed

STOMACH, DUODENUM (Postoperative complications-P.C.)

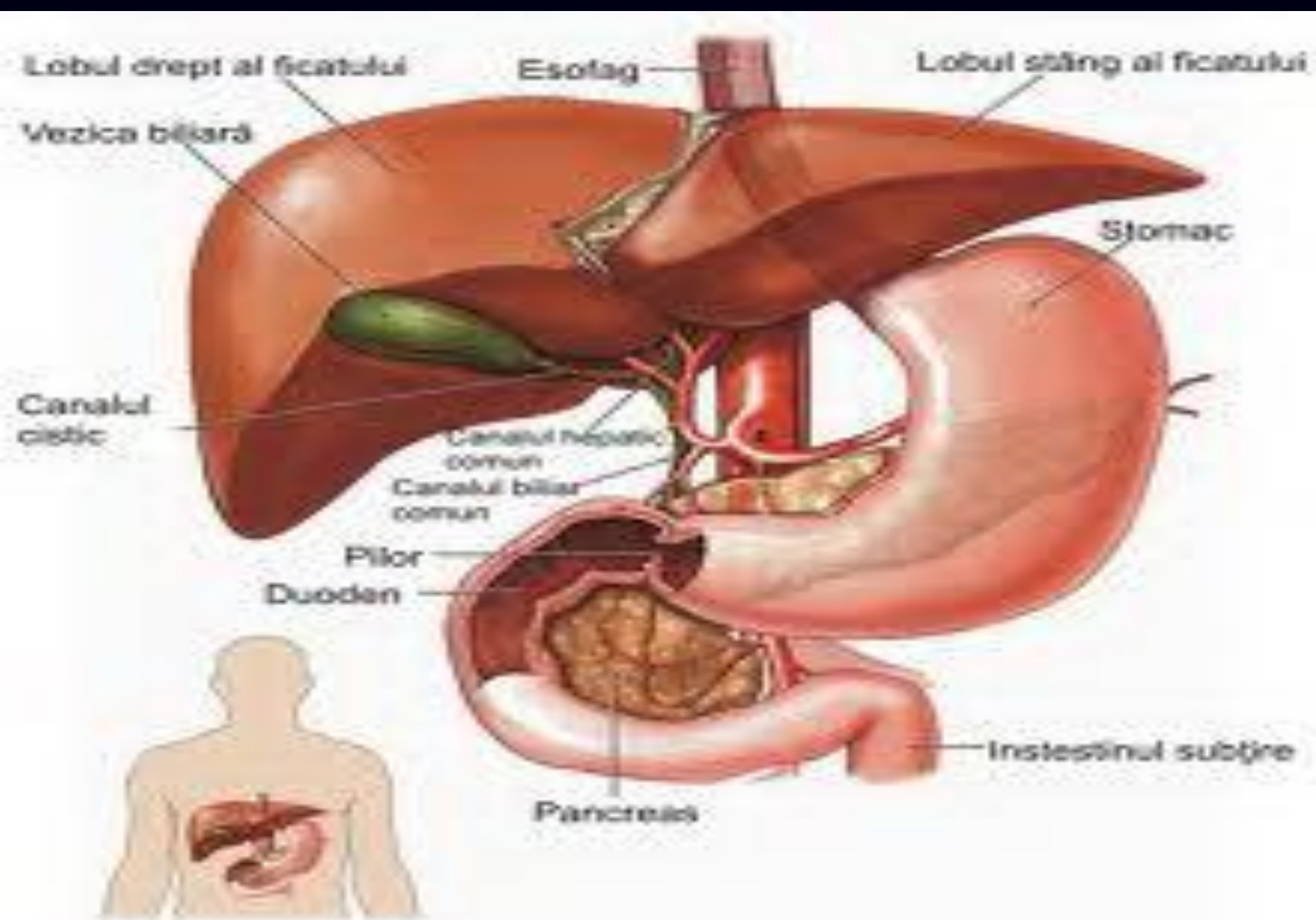
MAJOR SEQUELAE

Alkaline gastritis

- ☐ **Mechanism:** due to the regurgitation of bile and duodenal contents in the stomach
- ☐ **Symptoms:**
 - Epigastric distress
 - Nausea vomiting
 - Diarrhoea
- ☐ Most common after Billroth II gastrectomy
- ☐ Occurs rarely after proximal gastric vagotomy
- ☐ Tends to diminish in time
- ☐ **Conservative** approach is indicated
- ☐ **Surgical treatment**
 - Roux en Y anastomosis (jejunum+divided+the proximal end anastomosed to the descending jejunum 45 below the stomach)
 - High gastric resection

Cancer of the stomach after gastric operation

- ☐ Gastrectomy is a risk factor for the cancer of the gastric stump
- ☐ Change of the histologic structure of gastric mucosa to the intestinal mucosa is a precursor to development of the gastric cancer



STOMACH, DUODENUM

BENIGN TUMORS

☐ Incidence:

- 7% of gastric tumors,
- Greater in females

☐ Clinical findings:

- occur in the middle decades of life
- Located in the gastric antrum or corpus
- Epigastric discomfort
- Fullness caused by the large size of tumors
- Episodic obstruction
- If they are located near cardia or pylor determine partial or complete obstruction
- Pedunculated-intermittent obstruction
- Gastroduodenal intussusception may occur

☐ Endoscopy:diagnosis

☐ Barium series can detect the tumor

STOMACH, DUODENUM BENIGN TUMORS

- ❑ Histological diagnosis by endoscopic polypectomy or surgical excision is mandatory
- ❑ Indications for extirpation:
 - Elimination of clinical symptom
 - To exclude a diagnosis of malignancy

STOMACH, DUODENUM

CARCINOMA of the STOMACH

- ❑ Occur between the 50th and 70 th decade
- ❑ The most common site is antral and prepyloric
- ❑ Tumors located in the fundus are more aggressive
- ❑ Proximally tumors have a worse prognosis

STOMACH, DUODENUM

CARCINOMA of the STOMACH, Risk factors:

- ☐ genetic: 4% family history of the disease, blood group A
- ☐ environmental and dietary: diets poor in milk, animal proteins, vitamins, rich in starch, in polycyclic hydrocarbons, benzopyrene (smoked fish and meats), Nitrosamines
- ☐ Atrophic gastritis and associated low HCL in stomach
- ☐ Premalignant conditions:
 - Hypogammaglobulinaemia
 - Pernicious anemia
 - Chronic atrophic gastritis
 - Intestinal metaplasia
 - Helicobacter pylori infection
 - Gastric ulcer, polyps
 - Previous gastric surgery

STOMACH, DUODENUM

CARCINOMA of the STOMACH

Pathology: macroscopic: **early gastric cancer**

- ❑ tumorous confined to the gastric mucosa and submucosa (close relation between the depth of invasion and postoperative survival)
- ❑ Early carcinoma of the stomach is divided into 3 main groups:
 - Type I protruding
 - Type II superficial
 - Elevated
 - Flat
 - depressed
 - Type III excavated

STOMACH, DUODENUM

CARCINOMA of the STOMACH

Pathology

Macroscopic: **Advanced gastric ulcer:**

- ☐ polypoid fungating tumors
 - Nodular polypoid surface with superficial ulceration
 - Good prognosis, many being well-differentiated adenocarcinomas
- ☐ Ulcerating or penetrating cancers
 - Occur in more than 50%
 - Sesile
 - May have the appearance of a benign gastric ulcer
 - Diffusely infiltrative over a wide area
 - Is predominantly confined to the mucosa and submucosa
- ☐ Linitis plastica carcinoma
 - Extensive infiltration of the submucosa and muscular layers
 - Marked fibroblastic reaction
 - Extension into the oesophagus and mesentery
 - Advanced tumorous may involve the entire stomach
 - Poor prognosis

STOMACH, DUODENUM

CARCINOMA of the STOMACH

Microscopic, WHO classification, based of morphology:

- ☐ **adenocarcinoma: papillary, tubular, mucinous, signet ring**
- ☐ **Adenosquamous carcinoma**
- ☐ **Squamous cell carcinoma**
- ☐ **Undifferentiated carcinoma**
- ☐ **Unclassified carcinoma**

Typical of GC is the tendency to spread intramurally via lymphatic channels, the surgical resection borders must be at distance from the palpable edge of the tumor

STOMACH, DUODENUM

CARCINOMA of the STOMACH

Spread and metastasis

- ❑ **Penetration of the gastric serosa**
 - 80% of patients have lymph node metastases
 - Spread by direct extension, invasion of adjacent structures (liver, pancreas, spleen)
- ❑ **Lymphatic drainage and lymph node involvement**
 - **Zones of lymph drainage**
 - Zone 1: gastrocolic omentum along the right gastroepiploic vessels
 - Zone 2: gastrocolic and gastrosplenic omentum around the left gastroepiploic vessels
 - Zone 3: surrounds the left gastric artery
 - Zone 4 the hepatic artery and para-aortic lymph nodes
 - Cc at the cardia may involve lymph node in the mediastinum
 - Any involvement of the lymph nodes is a poor prognostic indicator

STOMACH, DUODENUM

CARCINOMA of the STOMACH

Spread and metastasis

☐ Distant metastasis

- Liver 49%
- Lung 33%
- Ovary 14%
- Bones 11%
- Cervical and supraclavicular nodes, Virchow sign, 8%

STOMACH, DUODENUM

CARCINOMA of the STOMACH

Staging for gastric carcinoma

Primary tumor (T)

- T1** limited to mucosa and submucosa
- T2** involves the mucosa and the submucosa
- T3** penetrates through the serosa without invading contiguous structures
- T4** penetrates through the serosa and invading contiguous structures

Nodal involvement (N)

- N0** no metastases to regional lymph nodes
- N1** involvement of perigastric lymph node within 3 cm of the primary tumor along the lesser or greater curvature
- N2** involvement of the regional lymph nodes, more than 3 cm from the primary tumor
- N3** involvement of other intra-abdominal lymph nodes

Distant metastasis

- M0** no (known) distant metastasis
- M1** distant metastasis present

Surgical results ®

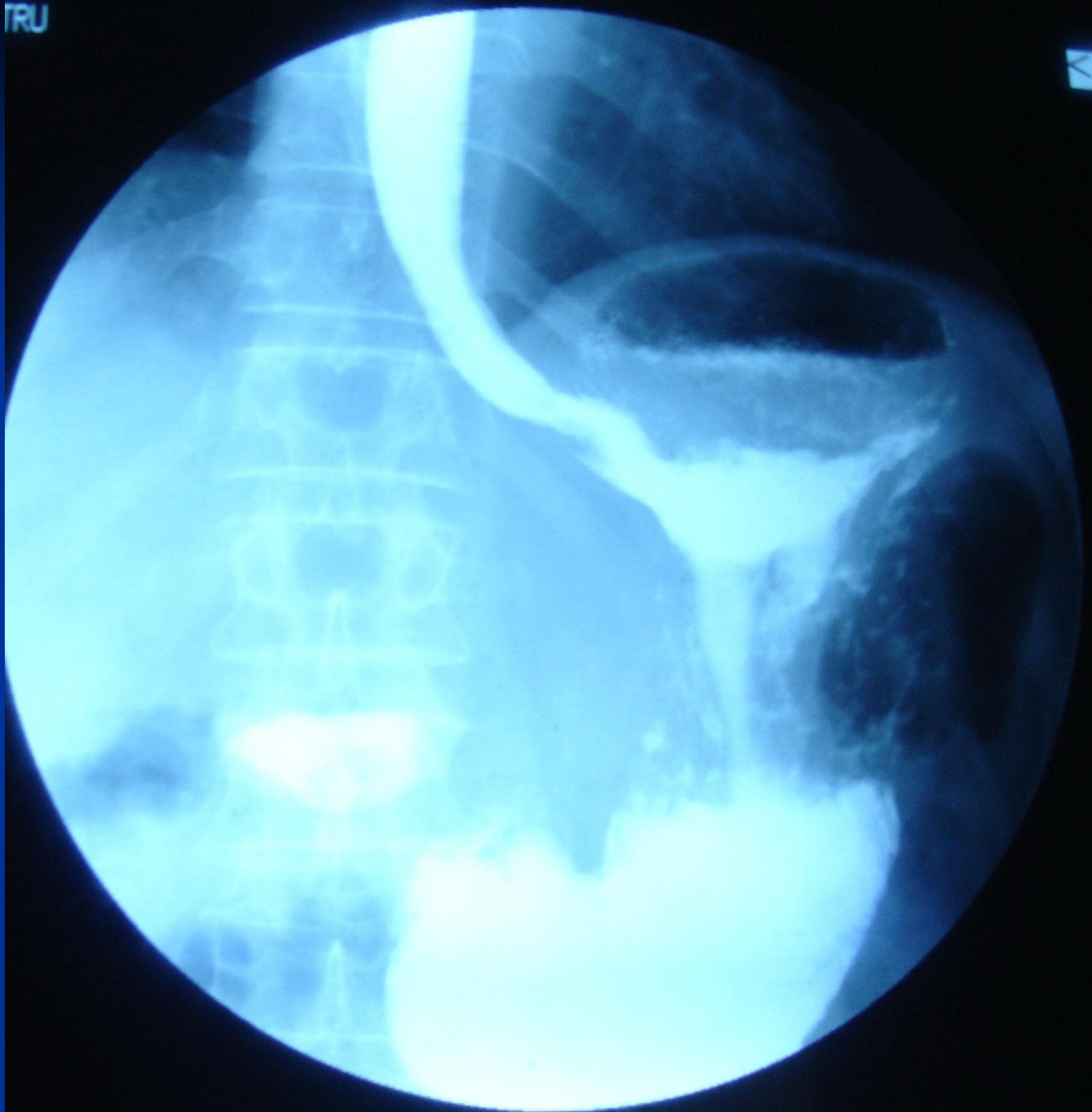
- R0** no residual tumor
- R1** microscopic residual tumor, **R2** macroscopic residual tumor

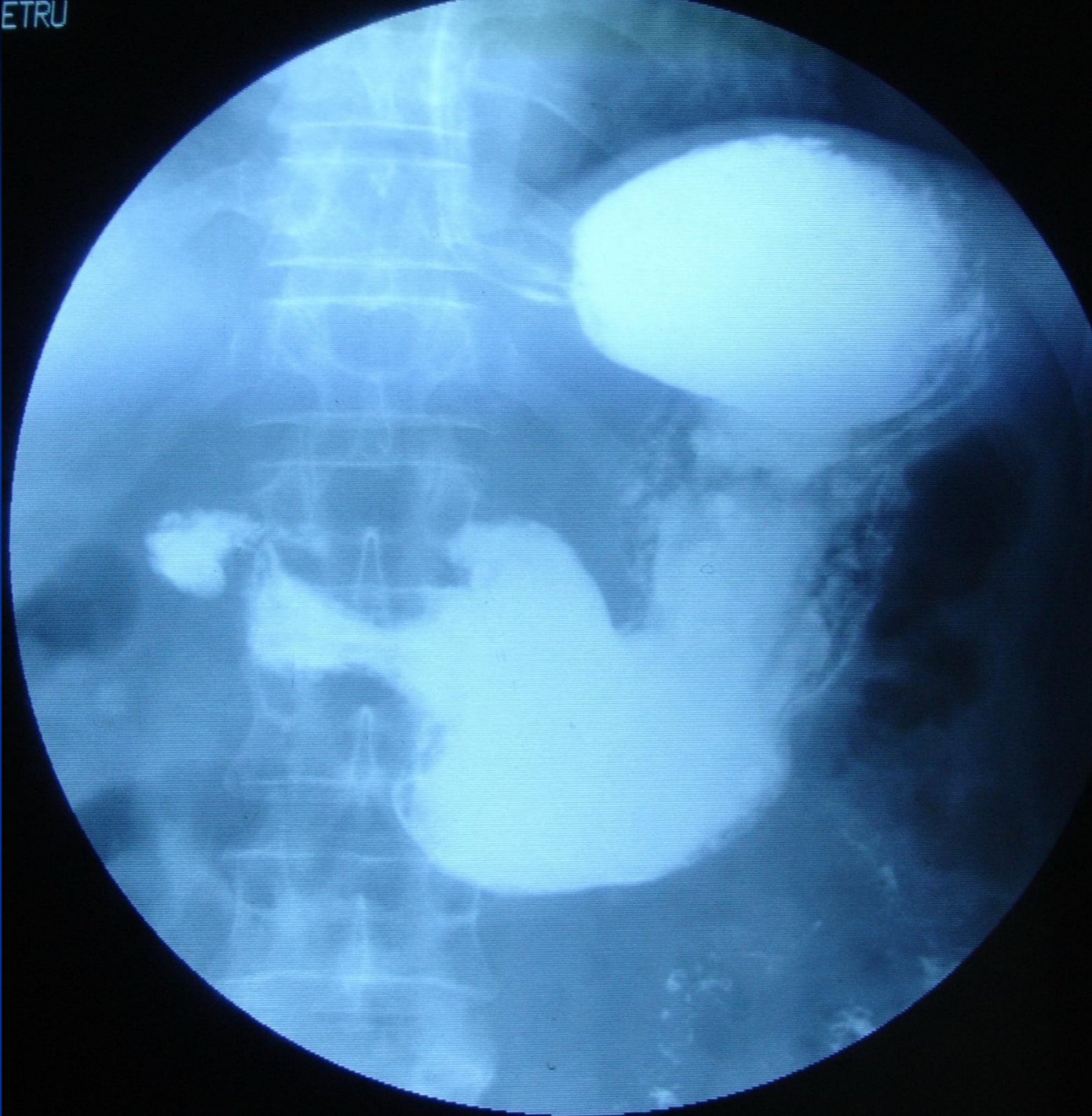
STOMACH, DUODENUM

CARCINOMA of the STOMACH

Clinical presentation

- ☐ Vague symptoms, non-specific
- ☐ Indigestion
- ☐ Upper abdominal epigastric pain
- ☐ Weight loss
- ☐ Nausea and vomiting
- ☐ Haematemesis and melena
- ☐ anorexia
- ☐ Early satiety, flatulence
- ☐ The pain mimic angina pectoris, or benign gastric disease
- ☐ Dysphagia (tumor located near the cardia)
- ☐ Dyspepsia (early gastric cancer)
- ☐ Epigastric tenderness
- ☐ Epigastric mass is later sign
- ☐ Palpable cervical lymph nodes, ascites, jaundice, a palpable abdominal or a pelvic mass-poor prognosis
- ☐ **Troisier's sign**, an enlarged lymph node in the left supraclavicular fossa (Virchow node) reveal lymphatic spread via the thoracic duct
- ☐ Superficial thrombophlebitis on the legs (**Trousseau's sign**)

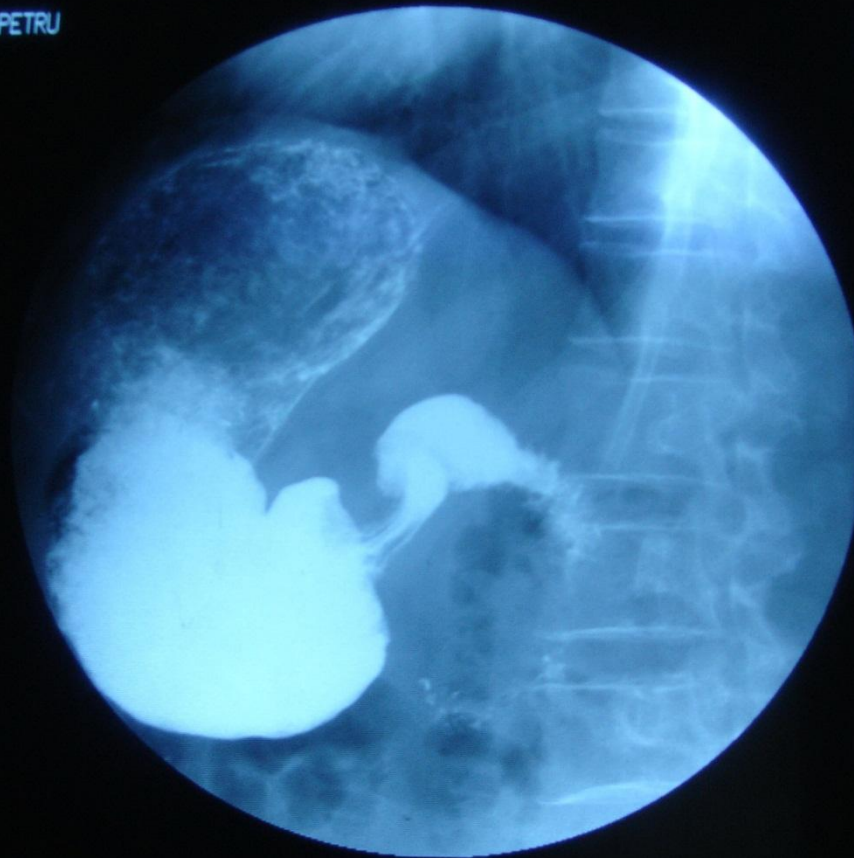




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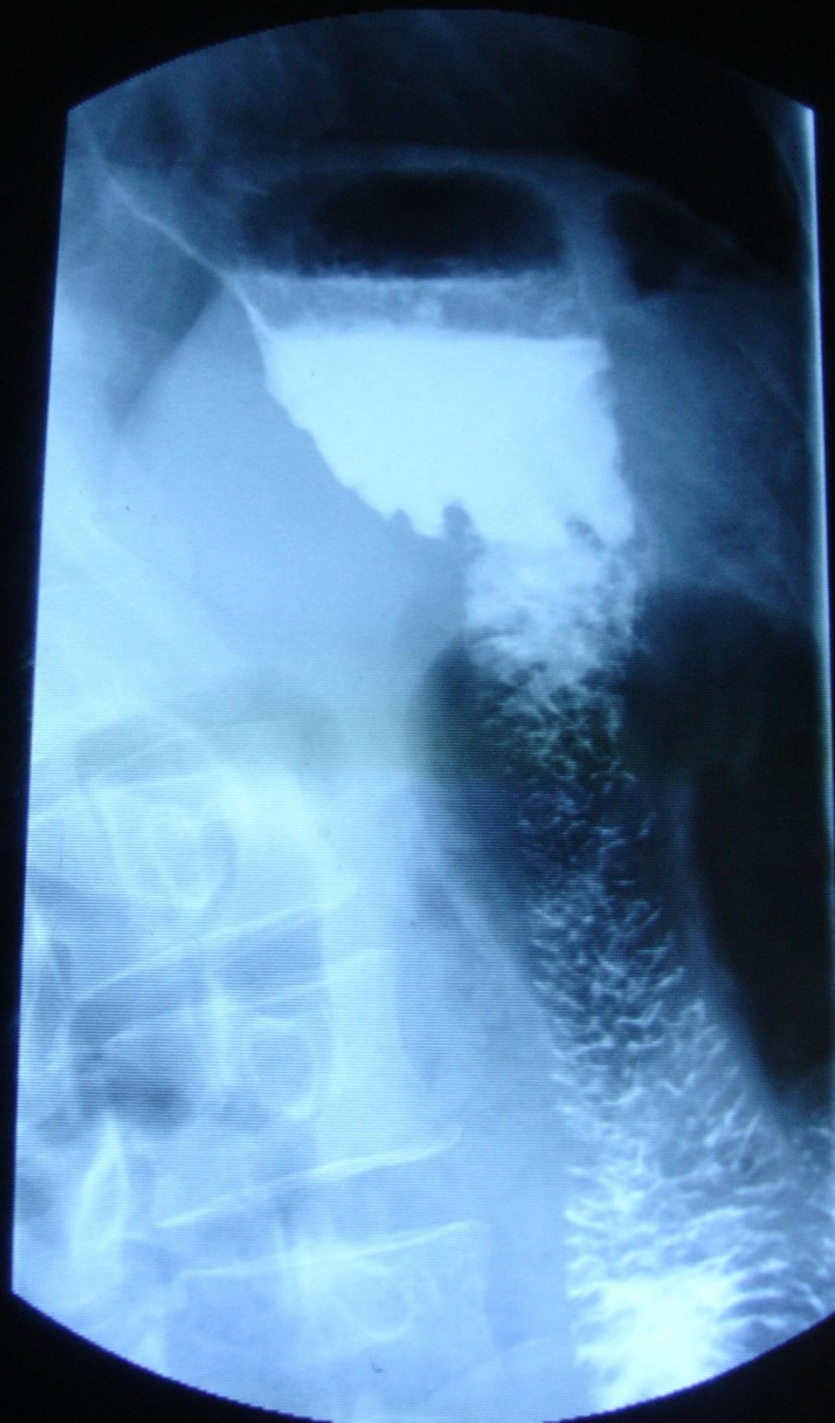
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STOMACH, DUODENUM

CARCINOMA of the STOMACH

Laboratory

- ☐ Anemia
- ☐ Occult blood in the stool-positive
- ☐ Achlorhydria-little diagnosis relevance
- ☐ Carcinoembryonic antigen in the serum is elevated
- ☐ Oncofetal antigen is elevated

Radiology

- ☐ Barium contrast studies
- ☐ Double contrast air/barium

Computerized tomography: for metastasis

Ultrasonography for metastasis

Magnetic resonance for metastasis

Endoscopy and biopsy: directed visualization of the stomach

4-6 biopsies should be taken from each lesion founded

Cytology of gastric aspirate for exfoliated malignant cells

Monoclonal targeted isotopes, endoscopic lymphography, endoluminal ultrasound, dynamic CT for preoperative localization of lymph node involvement

Laparoscopy an initial operative assessment to exclude extensive disease and **laparotomy** is necessary in all patients with local disease

STOMACH, DUODENUM

CARCINOMA of the STOMACH

Treatment

Radical excisional surgery offers the best chance of cure

Radical curative surgery

Extent of gastric resection

- Gastrectomy, partial or subtotal if the tumor is distal
- Gastrectomy total if the tumor is proximal
- Resection margins in the stomach are defined as an 8-10 cm proximal and distal clearance in the unstretched stomach

Methods of reconstruction

- Total gastrectomy: Roux en Y gastro-jejunostomy
- After partial gastrectomy: antecolic Polya type of gastrojejunostomy

Extent of lymphadenectomy

R 0 gastrectomy-not remove any lymph node group

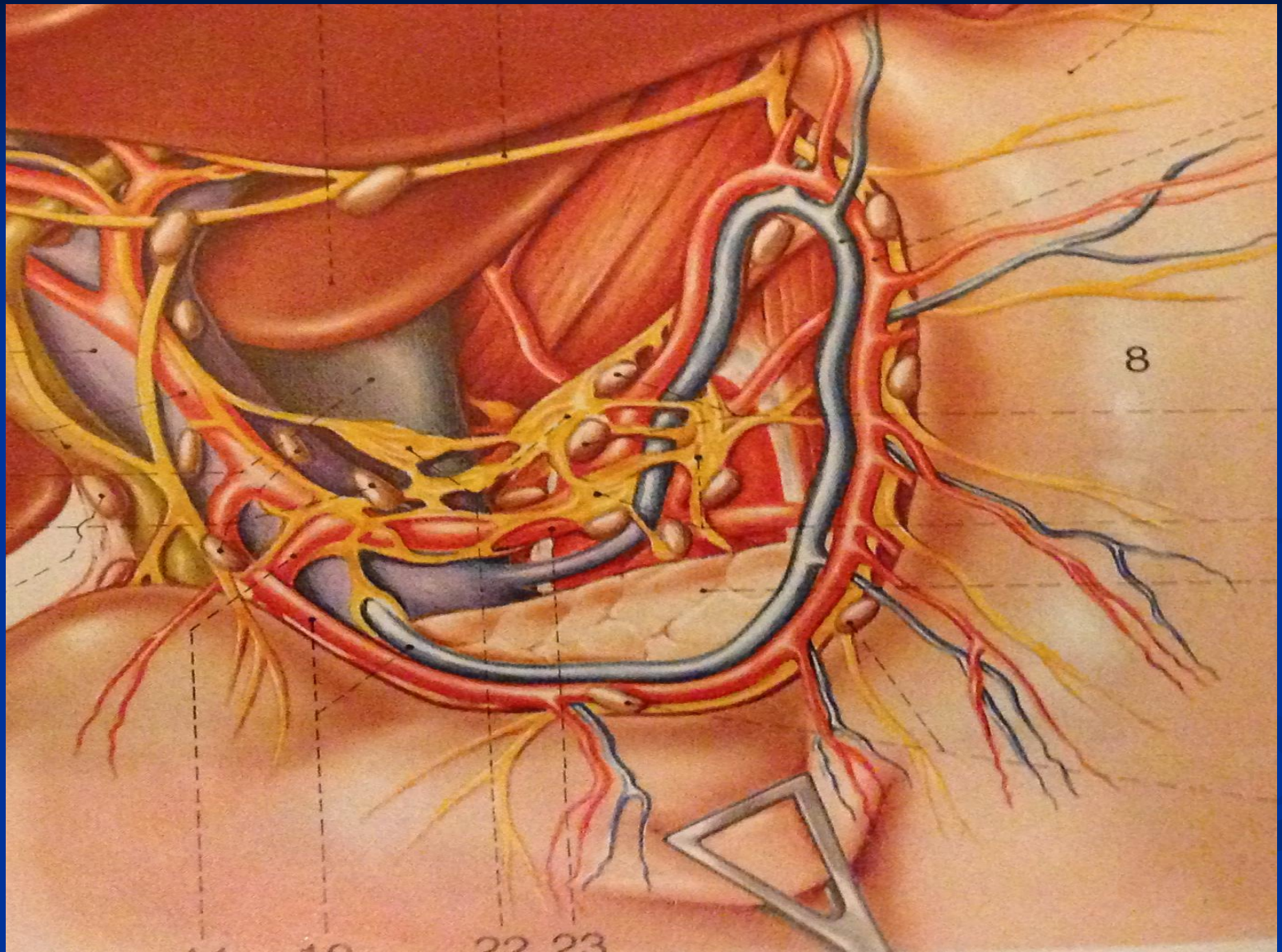
R 1 gastrectomy- removes nodes in group 1 (N1)

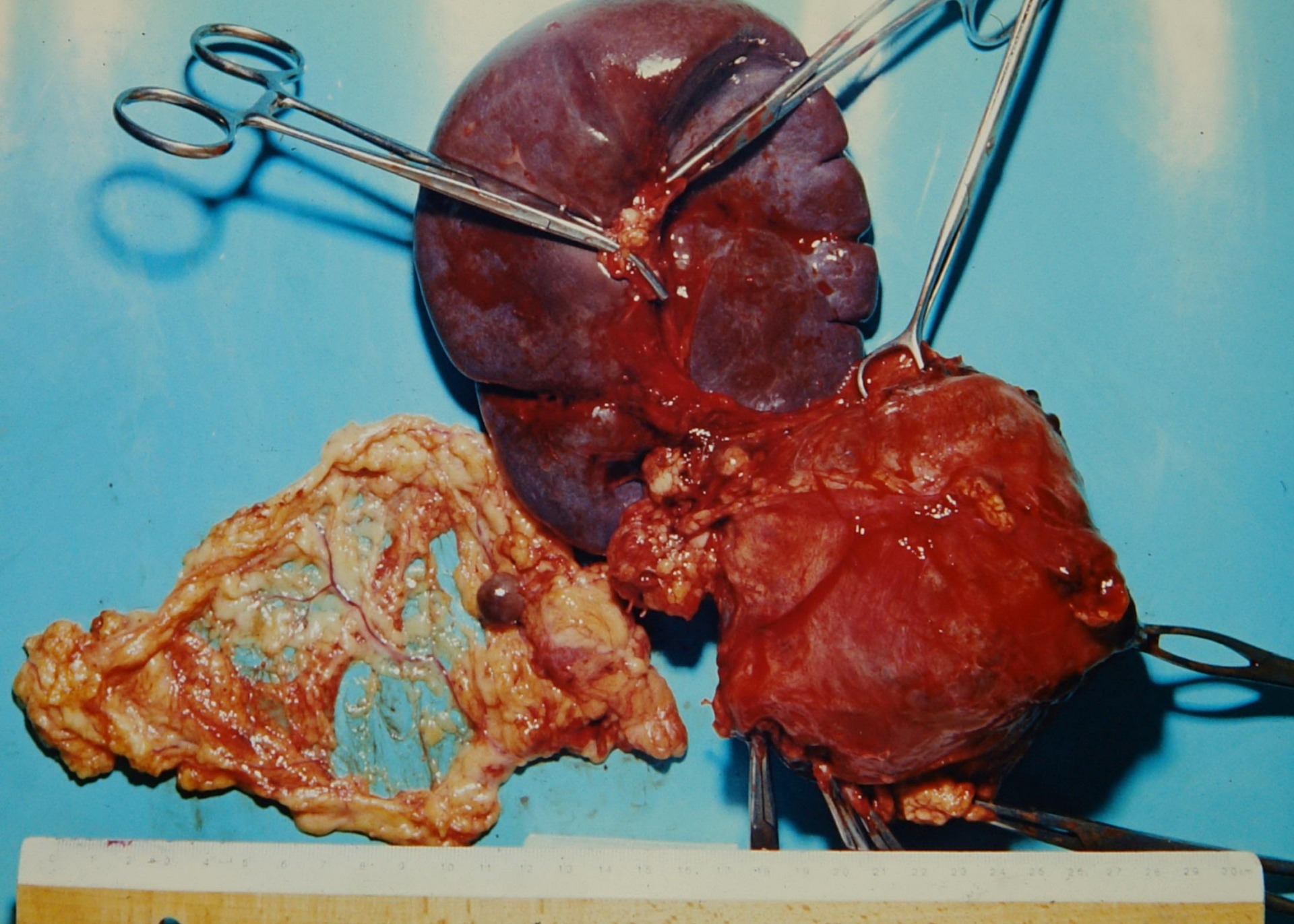
R 2 gastrectomy-removes N2

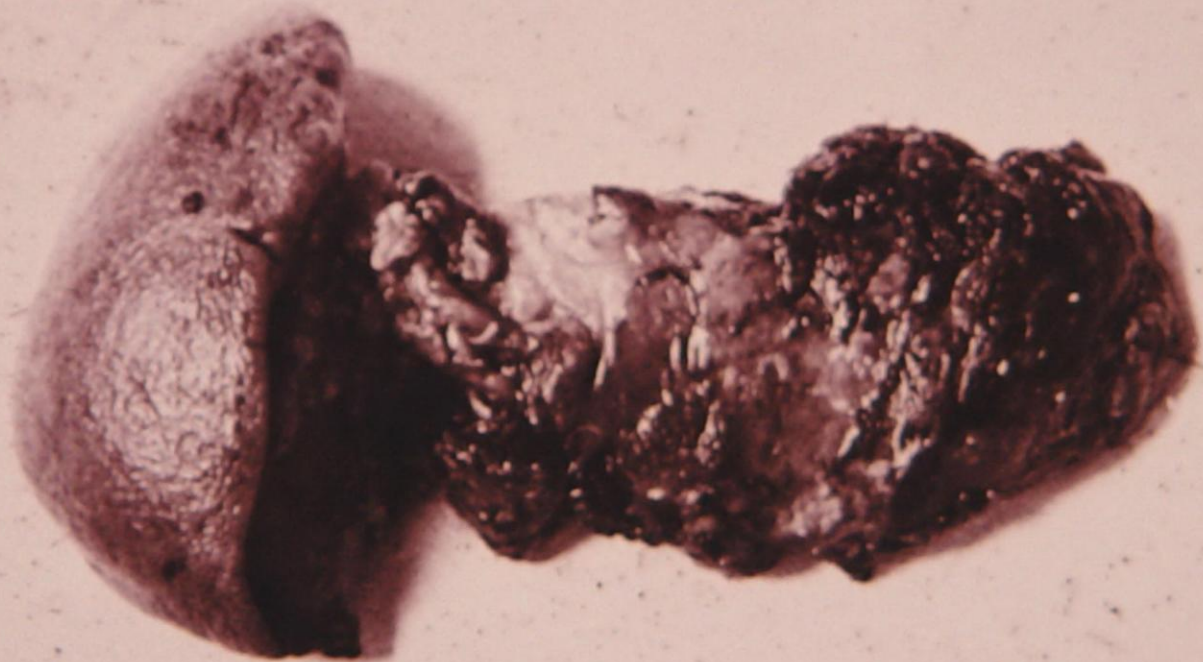
R 3 gastrectomy remove N3, involves pancreatic and splenic resection

Lesions at the cardia-total gastrectomy (R3)+ mediastinal dissection

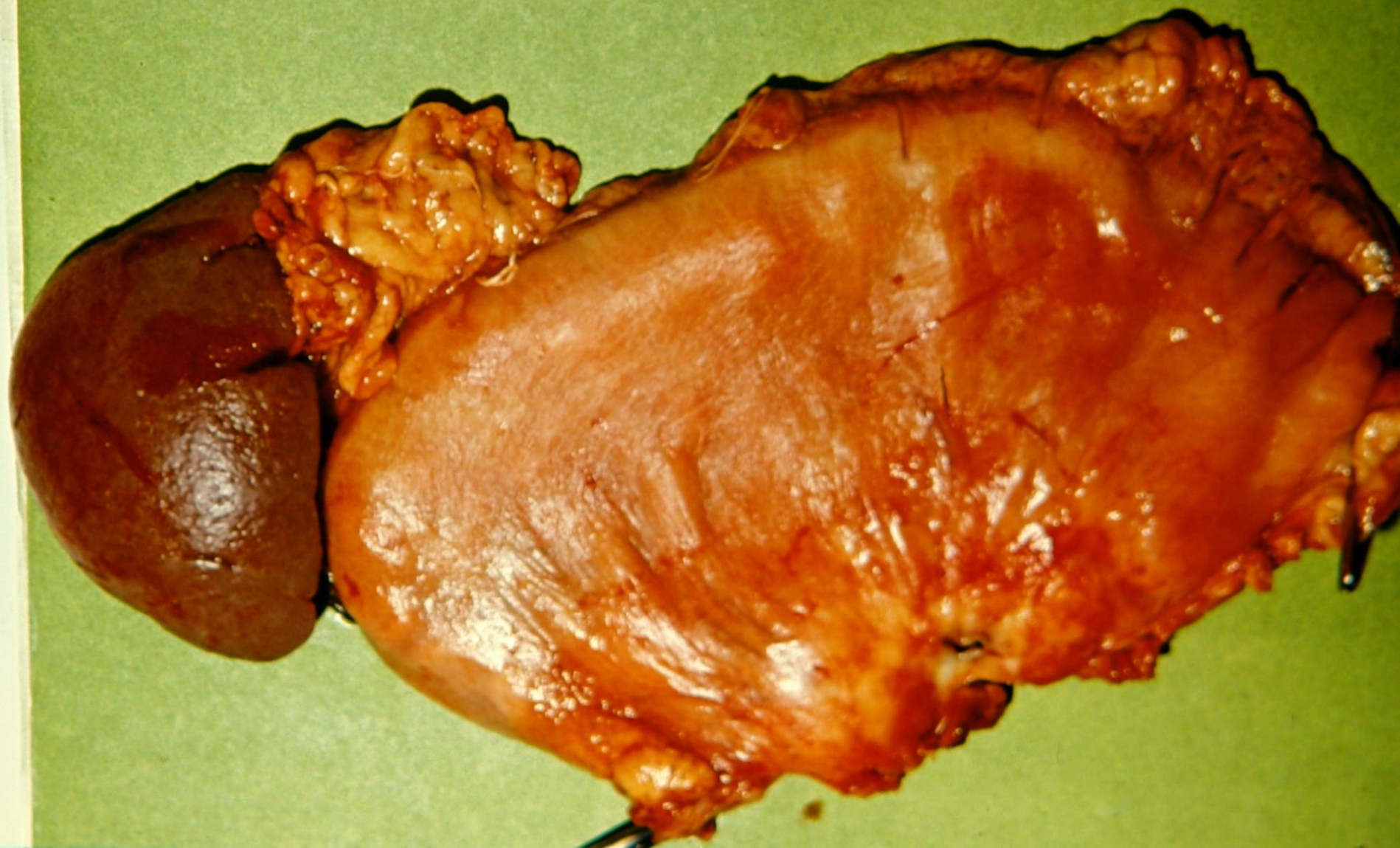
The treatment of stump cancer:same principle for radical excision

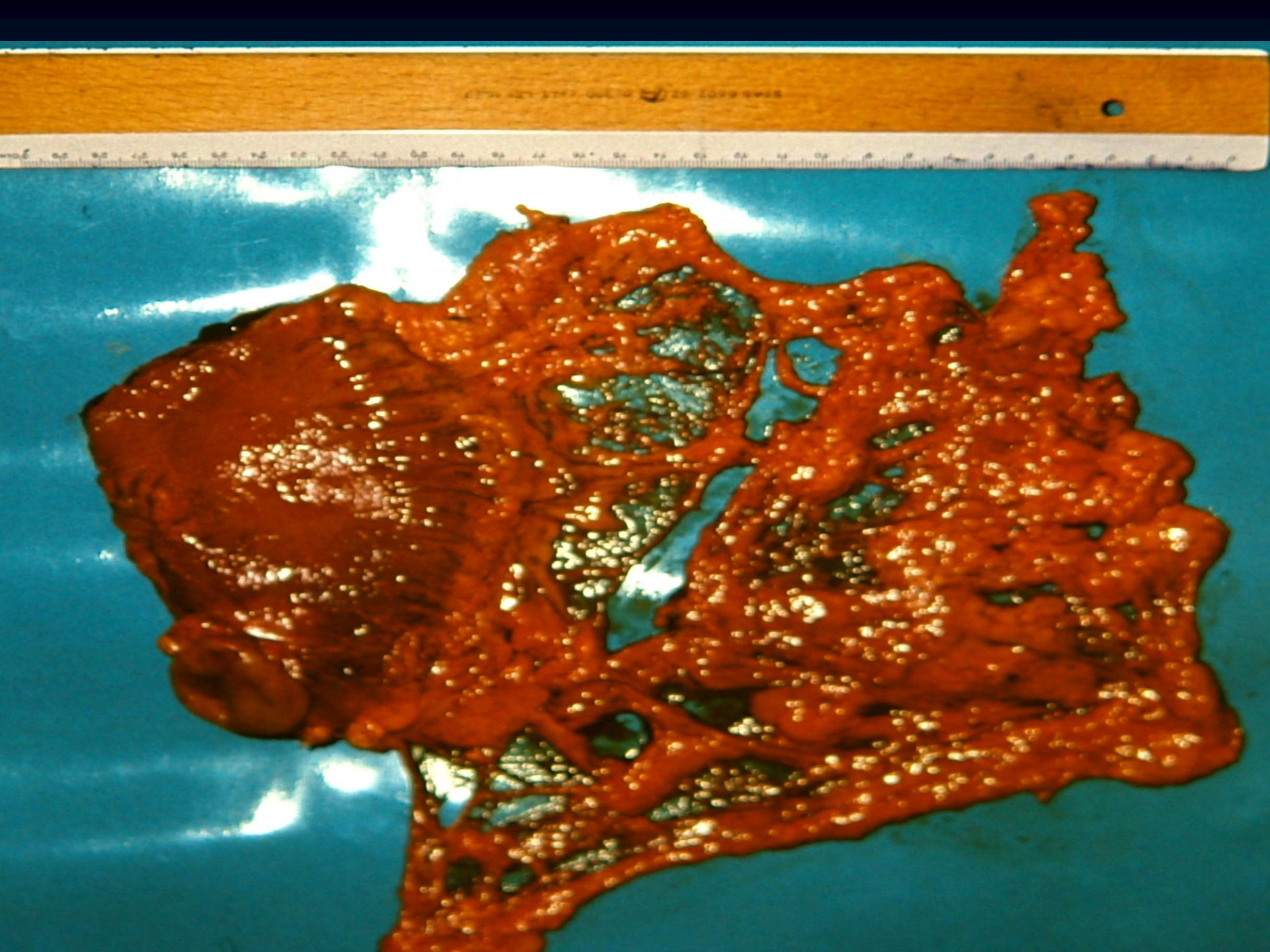


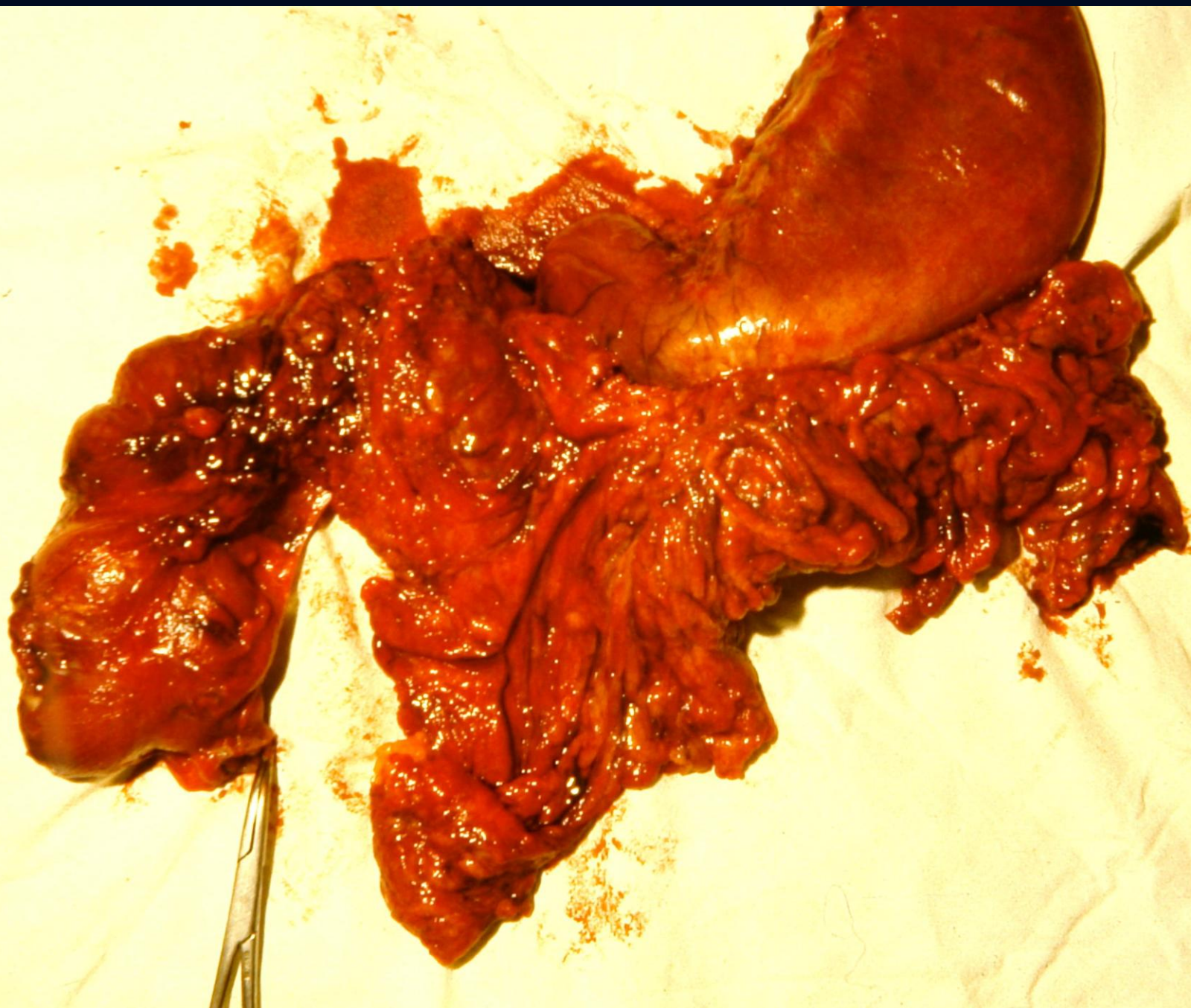


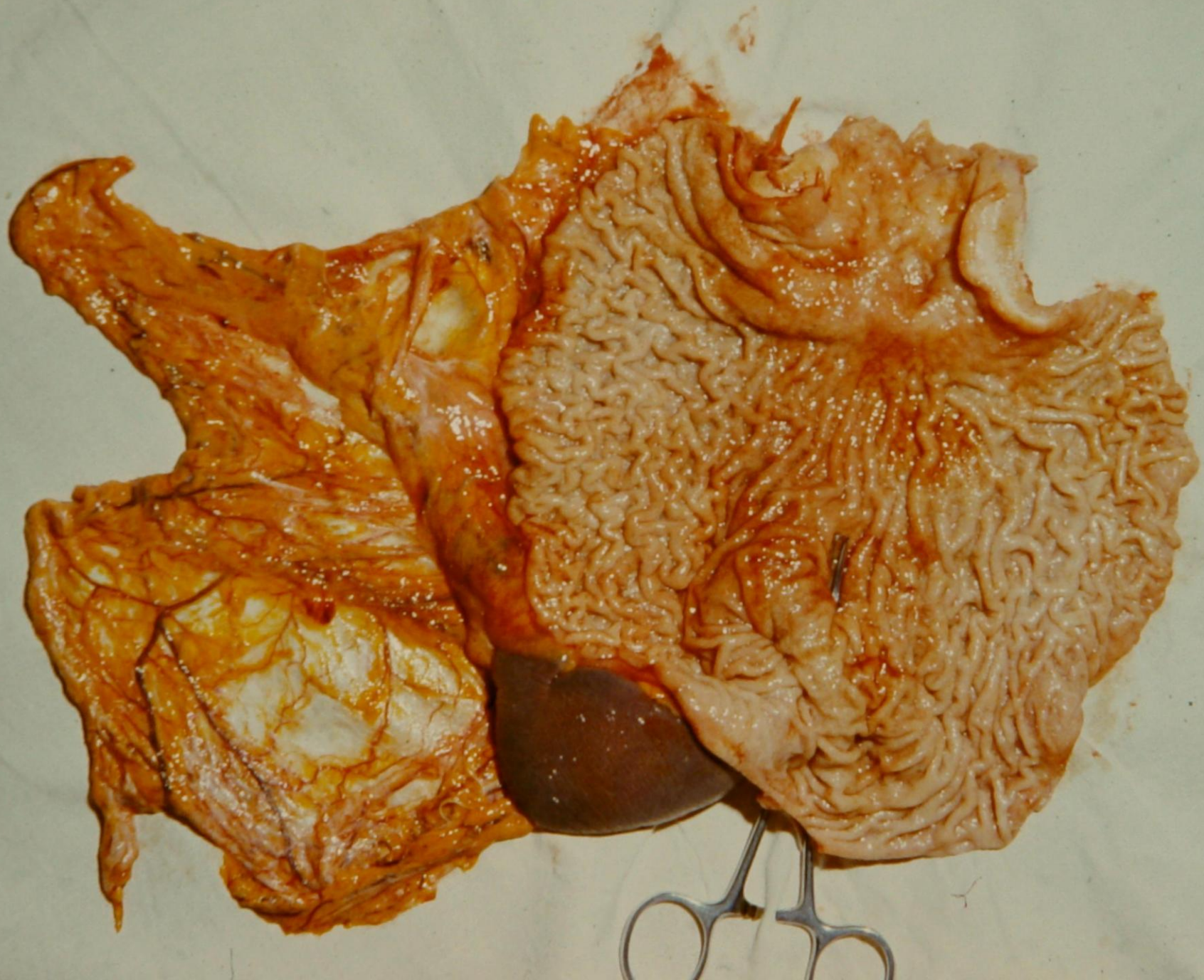


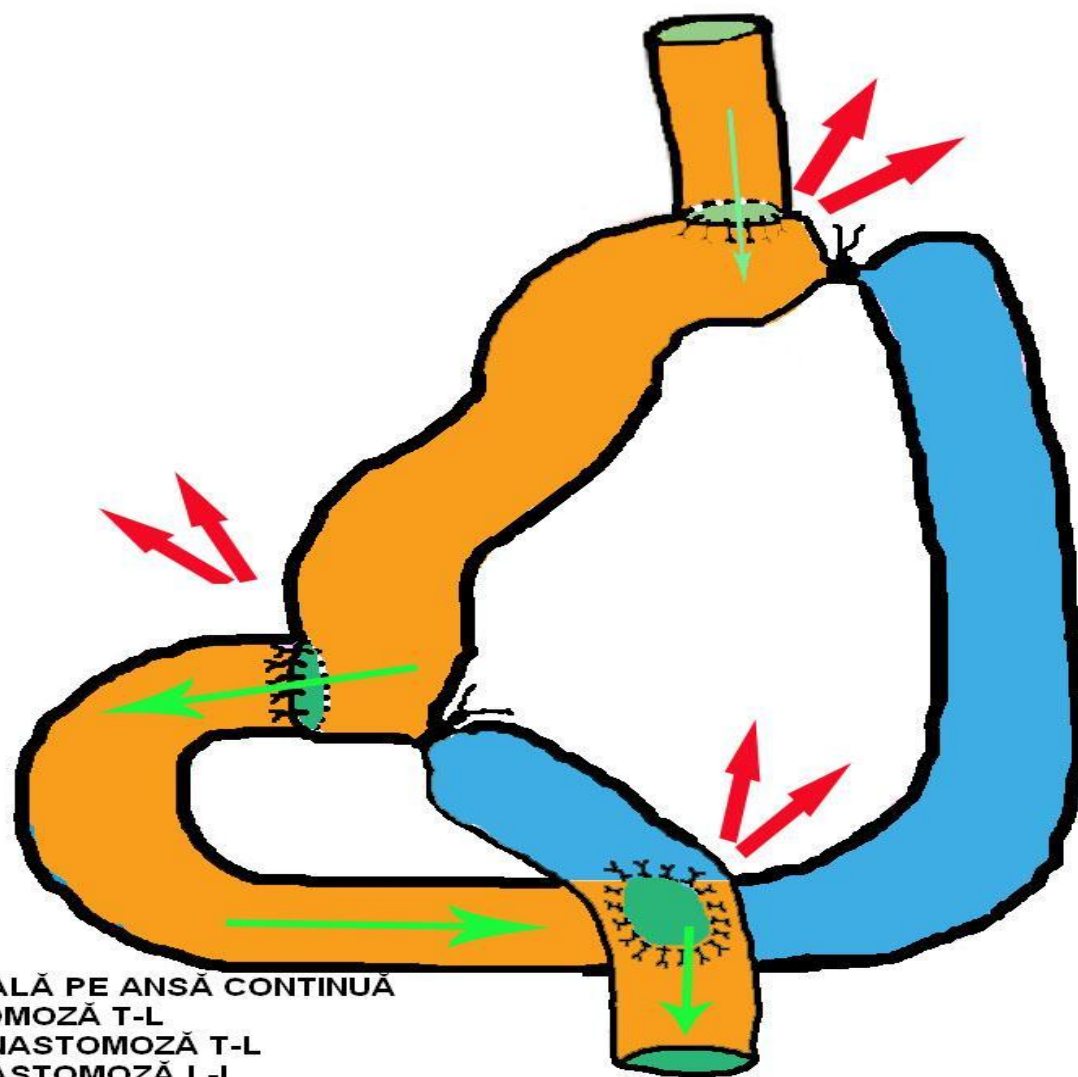




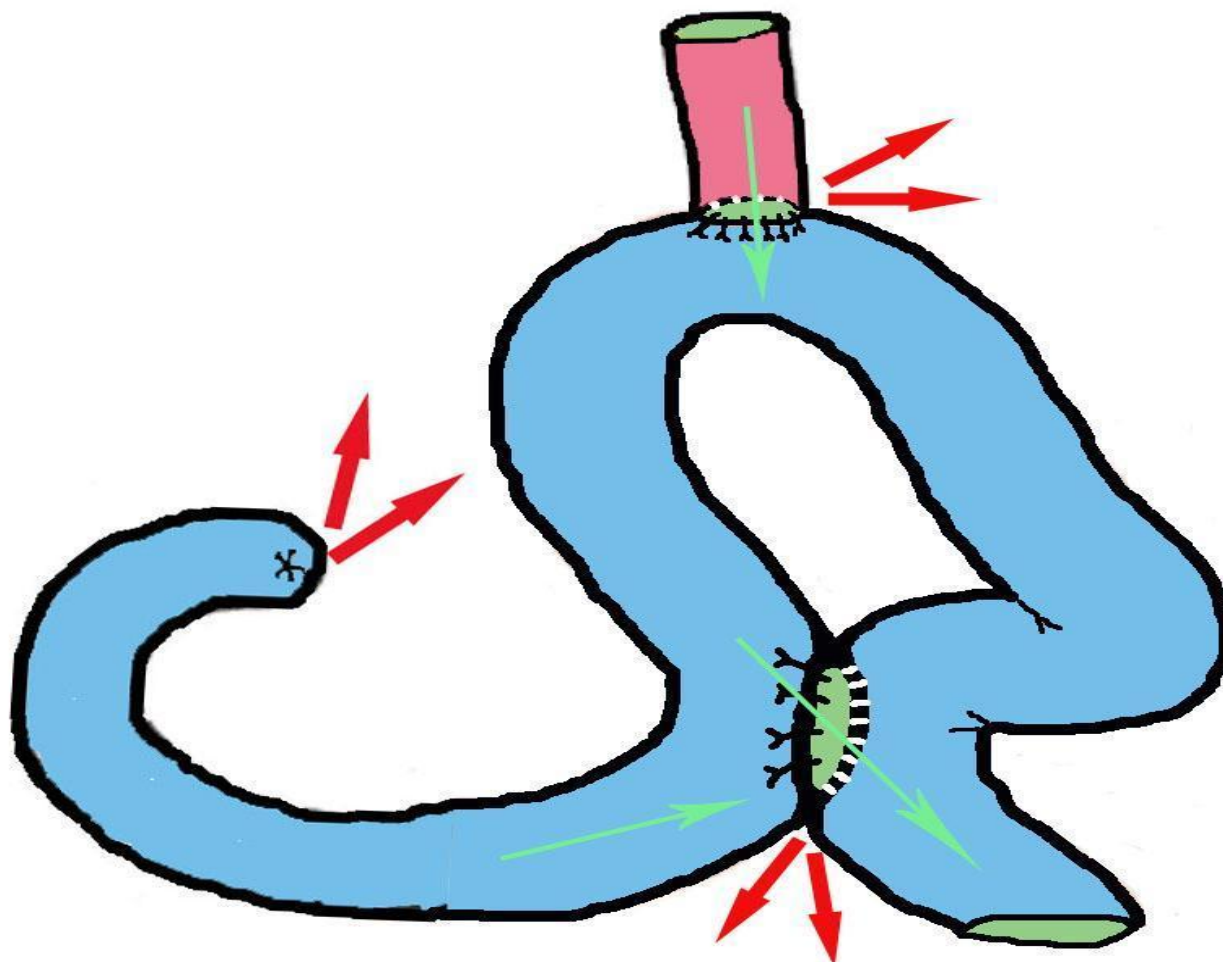








GASTRECTOMIE TOTALĂ PE ANSĂ CONTINUĂ
-ESO-JEJUNOANASTOMOZĂ T-L
-DUODENO-JEJUNOANASTOMOZĂ T-L
-ENTERO-ENTEROANASTOMOZĂ L-L



GASTRECTOMIE TOTALĂ GRAHAM

**ESO-JEJUNOANASTOMOZĂ T-L SI
ENTERO-ANASTOMOZĂ L-L**

STOMACH, DUODENUM
CARCINOMA of the STOMACH
Treatment

Palliative surgery

- ☐ Surgical resection or by pass for symptoms due to obstruction (dysphagia, vomiting, obstructive pain)
- ☐ Resection for bleeding

Methods of non operative palliation

- ☐ Laser therapy
- ☐ Intubation for dysphagia
- ☐ Intestinal laser therapy for bleeding gastric cancers

Radiotherapy

- ☐ Gastric ADK is Rx-resistant
- ☐ Palliative radiotherapy for malignant dysphagia

STOMACH, DUODENUM

CARCINOMA of the STOMACH

Treatment

Chemotherapy

❑ Systemic:

- GIST unresponsive to chemotherapy,
- Mitomycin C, doxorubicin, 5-fluorouracil and the nitrosoureas-tumor shrinkage

❑ Regional:

- local instillation of cytotoxics
- Hyperthermic peritoneal perfusion with cytotoxic agents
- Local arterial infusion of cytotoxics