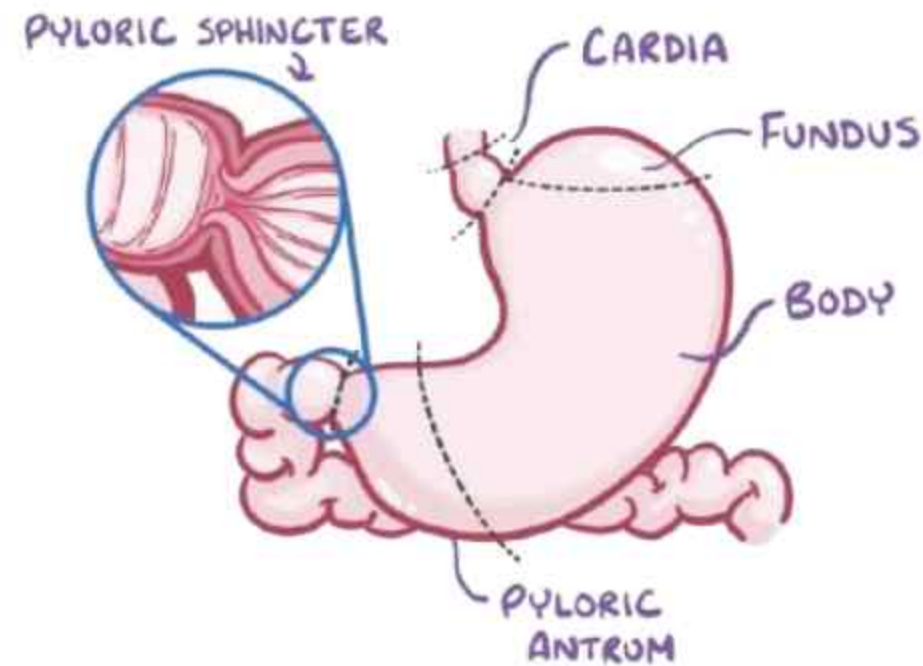


PEPTIC ULCERS

SEMINAR



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Peptic ulcer: Definition and Types

Peptic ulcer: a defect in the gastric or duodenal mucosa with a diameter of at least 0.5 cm and a depth that penetrates through the muscularis mucosae

★ In this lecture we will discuss about Gastric ulcer, duodenal ulcer, complications and postgastrectomy complications and symptoms

Let's start..

Gastric ulcer

:Pathphysiology



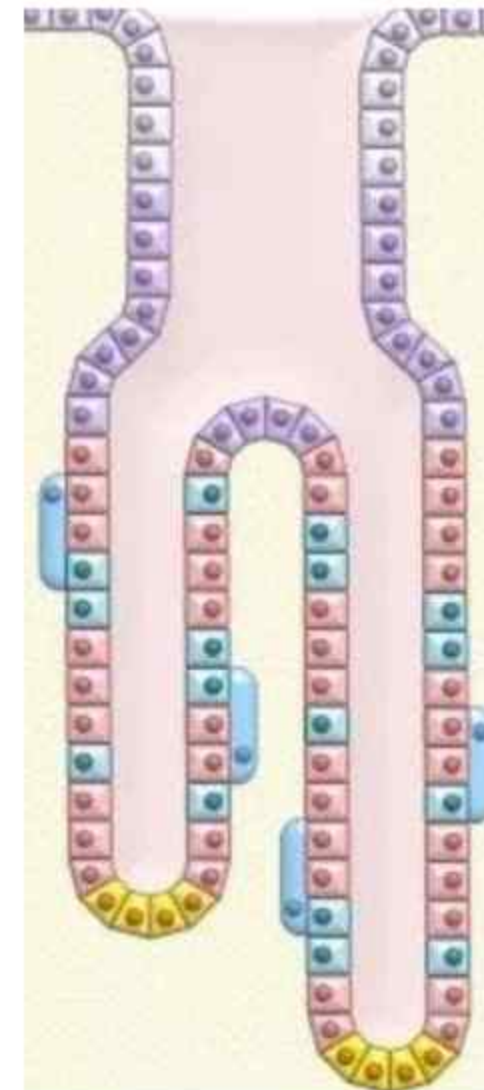
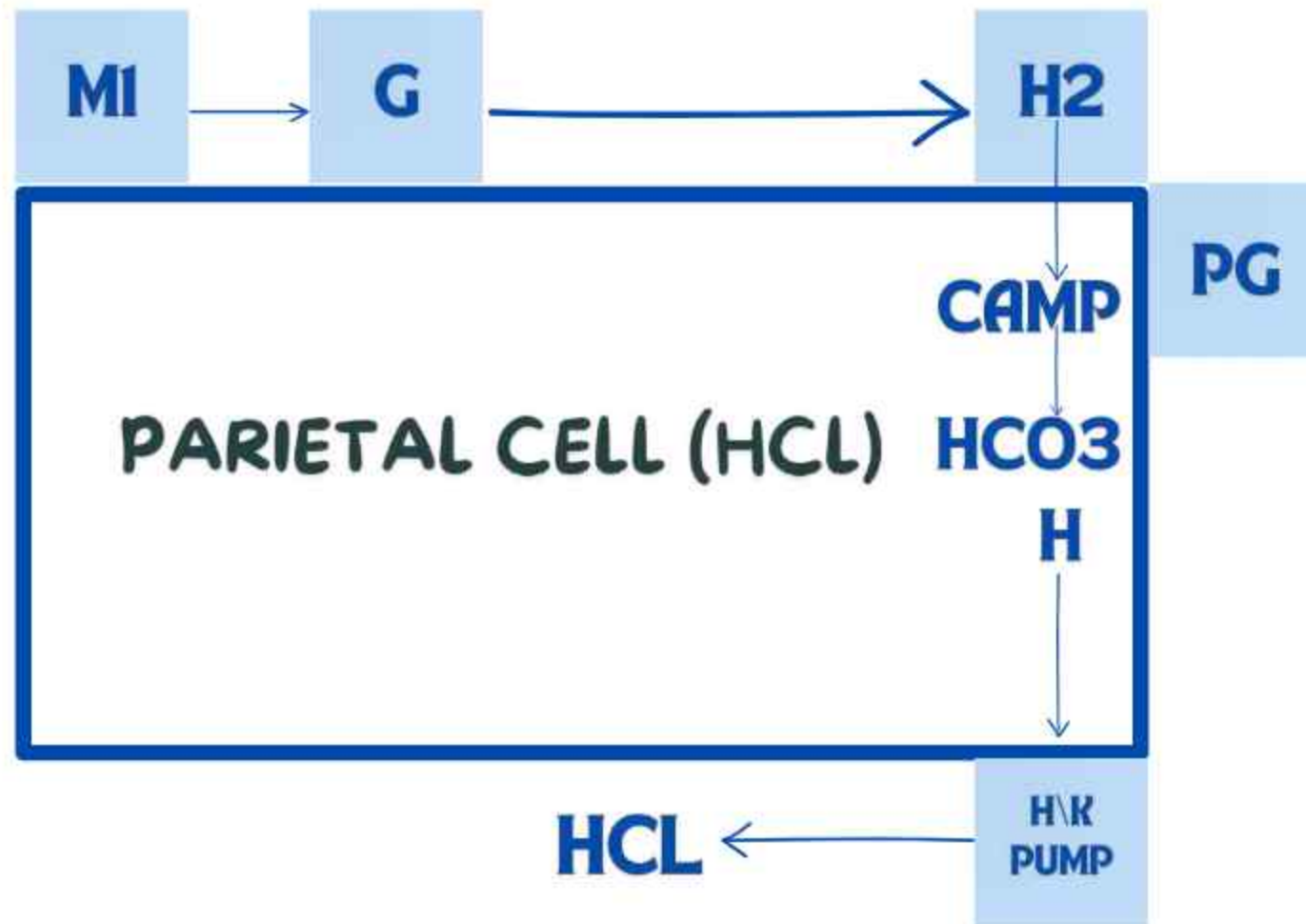
DEFENDERS

- 1- MUCOUS
- 2- BICARBONATE
- 3- GOOD BLOOD FLOW

VS

STRIKERS

- 1- **H. PYLORI**
- 2- NSAIDS
- 3- PEPSIN
- 4- **HCL**



Cell Types	Substance Secreted
Goblet cells	Mucus (protects stomach lining)
Parietal cells	Gastric acid (e.g. hydrochloric acid)
Chief cells	Pepsinogen (protease precursor)
D cells	Somatostatin (inhibits acid secretion)
G cells	Gastrin (stimulates acid secretion)

Gastric ulcer: Diagnosis and treatment

Diagnosis:

① DIFFUSE
EPIGASTRIC PAIN



② WORSEN
WITH FOOD



③ ENDOSCOPY
REVEAL
ULCER(1-2CM)



Treatment:

PHARMACOLOGICAL

1-NEUTRALIZING HCL

2-ANTI HCL
SECRETION

3-MIBLOCKER

4-H₂ BLOCKER

5-PPI(PROTON PUMP
INHIBITOR)

6-H.PYLORI
ANTIBIOTICS

7-SURGERY(LAST
INTERVENTION)

Non PHARMACOLOGICAL

1-AVOID TRIPLE 'S'
(SPICE-STRESS-
SMOKE)

2-AVOID NSAIDS

3-AVOID FRIED FOOD



Gastric ulcer: Healing and surgery

- ★ Many gastric ulcers will heal, **An unhealed ulcer has a 5-10 % chance of being malignant**
- ★ Most **satisfactory** treatment>>> Billroth I partial gastrectomy
- ★ Most **commonly** performed operation treatment>> subtotal gastrectomy
- ★ There is no clear association between gastric ulceration and acid secretion, but it has been suggested that enhancing gastric drainage (by pyloroplasty) will promote healing.
- ★ **SURGERY (GASTRIC ANTRUM IS MOST SUSCEPTIBLE)**

BILLORITH I

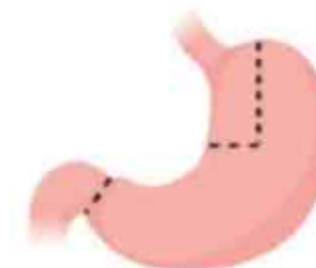


Billroth I

1. PARTIAL GASTRECTOMY
2. ANASTOMOSING WITH DUODENOM

SUBTOTAL GASTRECTOMY

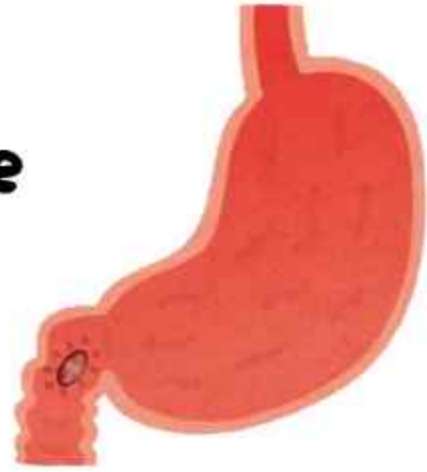
Subtotal



- 5 Removing the part of your stomach with cancer, nearby lymph nodes, and possibly parts of other organs near the tumor

Duodenal ULCER: Definition

★ peptic ulcer of the duodenal **mucosa**, usually located on the anterior or posterior wall of the duodenal bulb



★ natural tendency to heal- and to recur- in a cyclical fashion

★ **Eradication of *Helicobacter pylori* is the main medical treatment.**



★ Rate of acid secretion is a function of the:

- 1 Number of parietal cells
- 2 Magnitude of vagal stimulation of parietal cells (**cephalic phase**)
- 3 Gastrin stimulation of parietal cells (**humoral phase**)



Note

The feature common to all methods of treatment that prolong the healing phase is **reduction to the amount of acid secreted by the stomach**

Duodenal ulcer: Causes and comparison



There are 2 main causes:

① Chronic NSAIDs use 

② Helicobacter pylori infection 

Gastric ulcer

1

less common

2

Sever symptoms after meals

3

Mostly related with malignancy

VS

Duodenal ulcer

1

More common

2

Improve symptoms after meals

3

Mostly benign

Duodenal ulcer: Interventions

Treatment

- ★ Pharmacologic agents can accelerate the healing process by **reducing** vagus-mediated acid secretion (anticholinergics), or by **buffering** the acid entering the duodenum (antacids)

Surgery

- ★ Surgical procedures have the potential to permanently cure duodenal ulcers by virtually **abolishing gastric acid secretion**

★ The various standard operations incorporate per-mutations of vagal section (**cephalic phase**), excision of the gastric antrum (**humoral phase**), and excision of part of the body of the stomach (**parietal cells**)

Type of surgical intervention

Partial gastrectomy

vagotomy:vagal section

Billroth 1

Billroth 2

Polya gastrectomy

TRUNKAL VAGOTOMY

SELECTIVE VAGOTOMY

HIGHLY SELECTIVE VAGOTOMY



Billroth I



Billroth II

Duodenal ulcer:

Partial gastrectomy

The **antrum** which produces **gastrin** and about half of the acid-secreting portion of the stomach is removed. Continuity is restored by **gastrojejunal anastomosis**, which has the **advantage** that the residual stomach is bathed in **alkaline** juice. the **disadvantage** that **atrophic gastritis** which follows can lead to **malignancy**.

Surgical Interventions



vagotomy:vagal section

the vagus is **motor** to the gut and its adnexae as a whole so that certain **disadvantages** must follow. There may be:

- (i) Changes in gastro-intestinal motility
- (ii) Impaired emptying of the gallbladder



Duodenal ulcer:

PARTIAL GASTRECTOMY

- ★ The stimulation of gastrin secretion can be reduced by procedures which by-pass the antrum (**gastroenterostomy**) or which accelerate gastric emptying (**pyloroplasty**)
- ★ It has been found that resection of the **distal three-quarters** of the stomach removes **enough parietal cells**– and hence enough acid secretion–to cure most duodenal ulcers
- ★ When gastric resection is the sole surgical maneuver, either a gastrojejunal (**polya**) or a gastroduodenal (**Billroth**) an **astomosis** can be used to complete the operation
- ★ From the nutritional point of view the patient with a **Billroth anastomosis** has a better digestive life than the patient with a polya anastomosis.

Duodenal ulcer: vagotomy

1 TRUNKAL VAGOTOMY

- Is preformed by dividing both vagal trunks at the esophageal hiatus.
- It is very effective in curing DU provided denervation of the stomach is complete.
- However, it results in the pylorus failing to open and therefor in gastric stasis. Consequently, the pyloric ring must be destroyed (**pyloroplasty**) or bypassed (**gastroenterostomy**).
- These necessary secondary procedures also expose the patient to the risks of post gastric surgery sequelae and though the operation is safer than partial gastrectomy, it is often associated with approximately the same incidence of satisfactory results.

2 SELECTIVE VAGOTOMY

Only the vagal fibers to the stomach are divided; those supplying the **pancreas**, **biliary tree** and **small bowel** are spared.

- However vagal denervation of the stomach renders it atonic and excessively slow to empty . This undesirable consequence must be avoided either by dividing the pyloric circular muscle fibers (**pyloroplasty**) or by providing an additional exit from the stomach (**gastroenterostomy**).

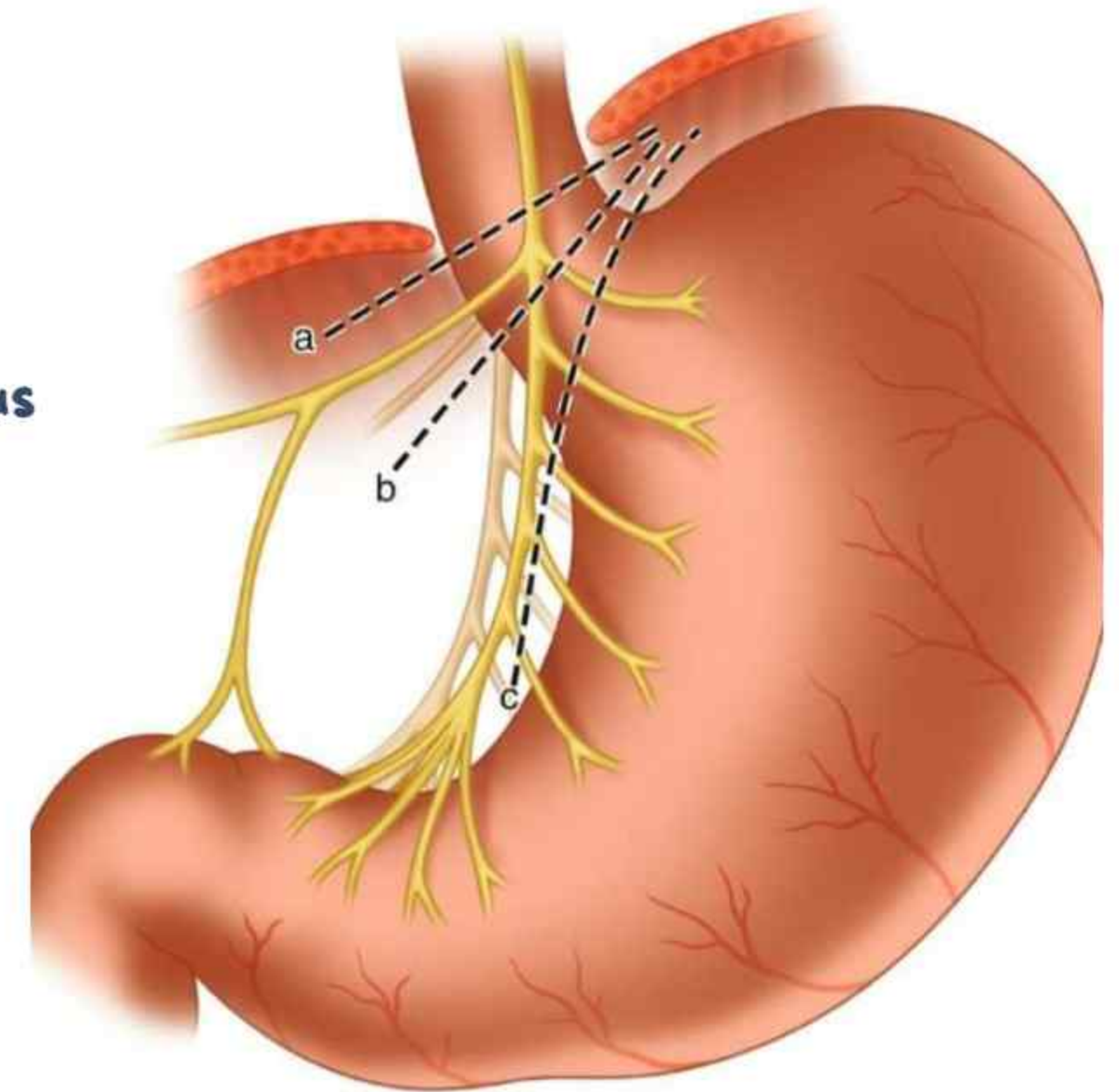
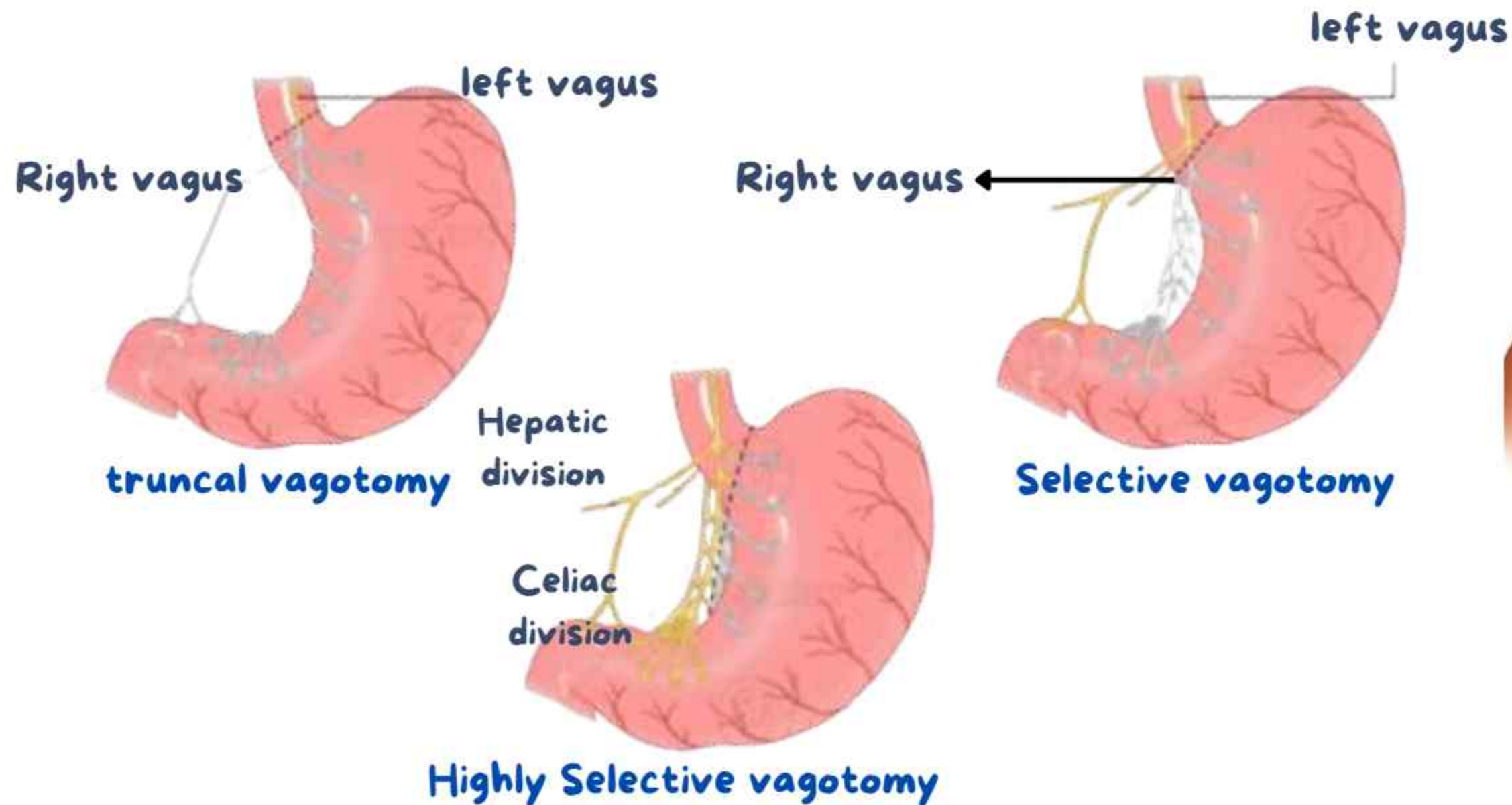


The **nerve of Latarjet** or the **posterior nerve of the lesser curvature** is a branch of the anterior vagal trunk which supplies the pylorus. It is cut in selective vagotomy and preserved in highly selective vagotomy. It functions by increasing peristalsis and relaxing the sphincter, thus draining the contents of the stomach into the first part of duodenum. **If damage occurs to this nerve, it can cause "Retention syndrome".**

3 HIGHLY SELECTIVE

- In this operation only the nerves to the parietal cell mass are sectioned. The **vagal fibers which supply the pylorus are also spared** so the stomach empties normally eliminating the need for supplementary pyloroplasty, gastroenterostomy, or gastric resection.
- This is done by mobilizing the lesser curvature from the antrum to the esophagus and dividing all blood vessels and nerves. **The pyloric innervation is left intact so that pyloroplasty or gastrojejunostomy are unnecessary .**
- This seems the best procedure with a low rate of recurrence (less than 5%) and an equally low rate of unsatisfactory results from post gastric surgery disturbances.

Explanation



- A - Truncal vagotomy
- B - Selective vagotomy
- C - Highly selective vagotomy

★ LIFE-THREATENING COMPLICATIONS

Exsanguinating Haemorrhage

Perforation

Stenosis from scarring

★ These complications make operation **mandatory**.

★ Perforation is usually dealt with by **simple oversewing of the ulcer**.

★ in case of hemorrhage and stenosis, removal of the immediate threat to life is **combined with one of the procedures described above** that will remove the risk of further ulceration.



SPECIFIC COMPLICATIONS OF SURGERY FOR PEPTIC ULCER

① Early

Failure of stomach
or stomach remnant
to empty

• **Occurs** after any procedure. It was formerly common after vagotomy and drainage.

• **Causes** are: Prolonged paralysis of stomach (doubtful), Edema at a stoma, Fluid and electrolyte disorder, especially hypokalaemia

• **Management** is conservative with NG suction, fluid, electrolyte and nutritional replacement.

Intestinal
obstruction

• **Causes** are: A. Adhesive.

B. As a consequence:

1. Twisting of the loop of a gastrojejunostomy after polya gastrectomy.
2. Herniation of loops through a mesenteric defect.
3. Retrograde intussusception of the efferent loop of a gastrojejunostomy (rare).

• **Prophylaxis:** avoid causes – such as mesenteric cul-de-sacs or holes

• **Treatment:** operative

Fistula

Can occur after any operation, which involves a suture line.

Most usual sites are:

1. After polya gastrectomy (Duodenal stump, pancreas from trying to dissect out a difficult ulcer).
2. Occasionally at a Pyloroplasty.

Acute
pancreatitis

May follow any procedure. Its **etiology is unknown**, but some cases are traumatic

peptic ulcers:

Complications

Anastomotic and recurrent ulceration

② Late

Gastrojejunocolic fistulae.

•Causes:

- Inadequate resection of parietal cell mass.
- Isolated antrum left after polya gastrectomy.
- Zollinger – Ellison syndrome.
- Incomplete vagotomy
- persistent suture in the anastomosis. More usually this is merely a suture exposed as a consequence of ulceration from another cause

•Prophylaxis:

adequate primary treatment.

- Management** is related to cause and requires investigation to ascertain the level of acid secretion or the completeness of vagotomy.

Recurrence after vagotomy is best managed by polya gastrectomy

- Occurs** when a recurrent ulcer after gastrojejunal anastomosis penetrates into the colon. It should arouse the suspicion of **Zollinger-Ellison syndrome**.

- C/p**: Severe diarrhea occurs due to enteritis caused by colonic contents passing directly into the small bowel and acidosis, dehydration, potassium loss, anemia and cachexia will result in death if the fistula is not interrupted surgically.

Treatment:

1. **Good risk patient**. Excision of the gastric, jejunal and colonic components and the construction of a higher gastrectomy.

2. **Poor risk patient**. A staged procedure:

- (a) Stage 1: Proximal colostomy which, diverts the fecal stream from the fistula and thus stops the enteritis.
- (b) Stage 2: Excision of fistula and its visceral components and the construction of a higher gastrectomy and colonic anastomosis.
- (c) Stage 3: Closure of colostomy

Post Gastric surgery syndroms and symptoms

POST-GASTRIC SURGERY SYMPTOMS AND SYNDROMES LATE EFFECTS OF ABLATION OR BYPASS OF THE PYLORUS

★ Case scenario:

A patient is post-op from a gastric resection for treatment of peptic ulcer disease. One hour after eating meals, the patient exhibits diaphoresis, tachycardia, and hypotension. In addition, the patient reports feeling abdominal cramps, weakness, and nausea, diarrhea

Which options below can be incorporated in the patient's plan of care to help alleviate the patient's signs and symptoms? Select all that apply:

Post Gastric surgery syndroms and symptoms

I-Dumping syndrome:

- ★ The stomach is a reservoir and the pylorus 'meters' food rendered isoosmotic with plasma into the small bowel for further digestion and absorption.
- ★ **Consequently**, ablation of gastric areas plus, as is always the case, loss or bypass of the pylorus allows the entry of hyperosmolal, large volume loads into the jejunum



Two things follow:

1. The bulk stimulates peristalsis and results in pain, rapid transit and thus occasionally diarrhea.
 2. The hyperosmolality draws fluid into the gut lumen which aggravates the bulk problem and may also reduce blood volume so creating vasomotor instability-the patient feels faint and tremulous after a meal
- ★ These features constitute the 'dumping syndrome' which is aptly named because it does result from dumping a large volume of hypertonic liquid into the jejunum

Post Gastric surgery syndroms and symptoms

1-Dumping syndrome:

★ Occurs when food, especially sugar, moves too quickly from the stomach to the duodenum. This condition is also called rapid gastric emptying. It is mostly associated with conditions following gastric or esophageal surgery, though it can also arise secondary to diabetes or to the use of certain medications; it is caused by an absent or insufficiently functioning pyloric sphincter.

★ Dumping syndrome has **two forms**, based on when symptoms occur:

Early dumping syndrome

occurs 10 to 30 minutes after a meal.

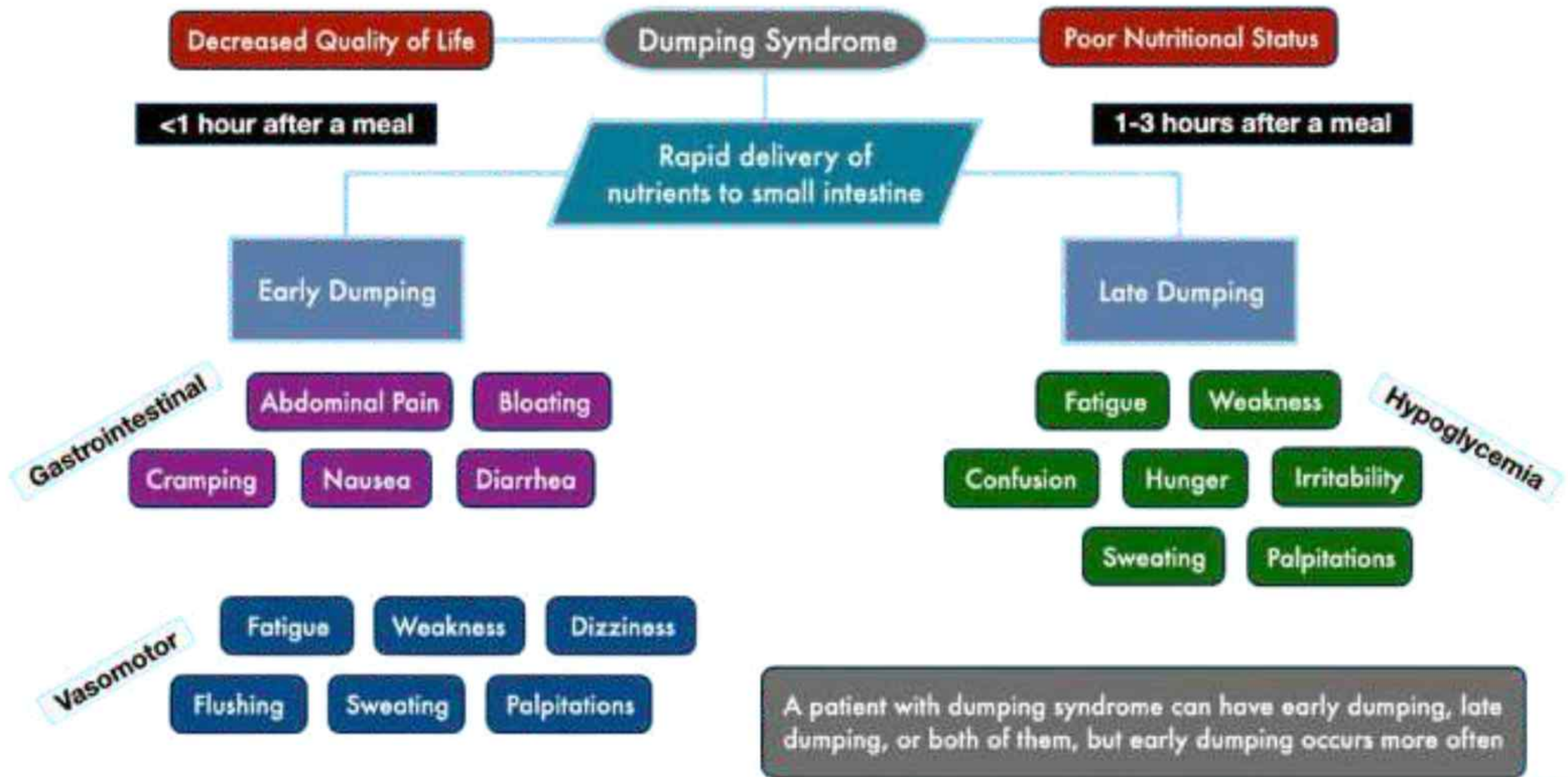
It results from rapid movement of fluid into the intestine following a sudden addition of a large amount of food from the stomach. The small intestine expands rapidly due to the presence of hypertonic/hyperosmolar contents from the stomach, especially sweet foods. This causes symptoms due to the shift of fluid into the intestinal lumen, with plasma volume contraction and acute intestinal distention. Osmotic diarrhea, distension of the small bowel leading to crampy abdominal pain, and reduced blood volume can result.

Late dumping syndrome

occurs 2 to 3 hours after a meal.

— It results from excessive movement of sugar into the intestine, which raises the body's blood glucose level and causes the pancreas to increase its release of the insulin. The increased release of insulin causes a rapid drop in blood glucose levels, a condition known as alimentary hypoglycemia.

Post Gastric surgery syndroms and symptoms



Post Gastric surgery syndromes and symptoms

1-Dumping syndrome:



Diagnosis:

primarily done on the basis of symptoms

- ★ The following tests may also help confirm dumping syndrome and exclude other conditions with similar symptoms

1-A modified oral glucose tolerance test:

checks how well insulin works with tissues to absorb glucose

A health care provider often confirms dumping syndrome in people with:

1. Low blood sugar between 120 and 180 minutes after drinking the solution
2. An increase in hematocrit > 3% at 30 minutes
3. A rise in pulse rate > 10 beats per minute after 30 minutes

2-A gastric emptying scintigraphy test:

involves eating a bland meal that contains a small amount of radioactive material

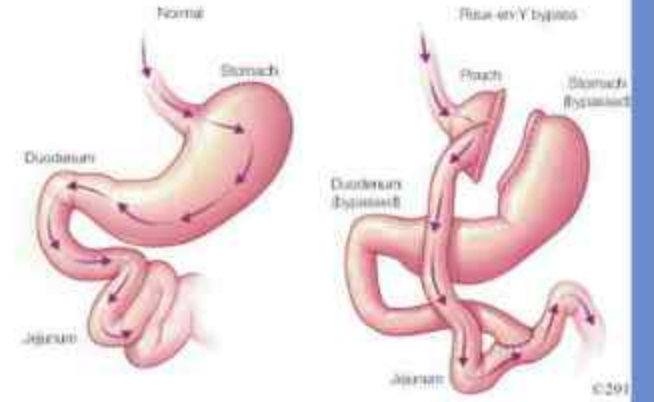
,An external camera scans the abdomen to locate the radioactive material

The radiologist measures the rate of gastric emptying at 1, 2, 3, and 4 hours after the meal.

The test can help confirm a diagnosis of dumping syndrome.

3-An Upper GI endoscopy.

4-An upper GI series examines the small intestine



▼ Risk factors:

- ★ Surgery that alters your stomach can increase your risk of dumping syndrome. These surgeries are most commonly performed to treat obesity, but are also part of treatment for stomach cancer, esophageal cancer and other conditions.

These surgeries include:

1-Bariatric surgery

especially gastric bypass surgery (Roux-en-Y operation) or sleeve gastrectomy - which is performed to treat morbid obesity.

2-Gastrectomy

in which a portion or all of your stomach is removed.

3-Esophagectomy

in which all or part of the tube between the mouth and the stomach is removed.

4-Fundoplication

a procedure used to treat gastroesophageal reflux disease (GERD) and hiatal hernia

5-Vagotomy

a type of surgery to treat stomach ulcers.

6-Pyloroplasty

which is done to widen the valve to the stomach (pylorus), allowing food to pass through.

7-Gastric bypass surgery

Post Gastric surgery syndroms and symptoms

1-Dumping syndrome: Treatment

A-Lifestyle changing:



- 1-eating smaller meals. Ex: eating 5-6 meals throughout the day
- 2-Delaying liquid intake until at least 30 mins after meal.
- 3-Increasing intake of proteins, fibers and complex carbohydrates.
(Because their digestion takes long time that's what we want)
- 4-Avoiding simple sugars like table sugar.
(because they have high osmotic effect)
- 5-Increasing the thickness of the food.
(By adding pectin or guar gum plant extracts to increase the consistency of food)
- 6-Lying down after eating . (because it slows emptying of the stomach)
- 7-chewing thoroughly.

Finally **our goal** is to limit the amount of volume that's entering the stomach

B-Medicines:



Octreotide

(Causes slowing of gastric emptying + decrease insulin release).

Side effects:

nausea, pain at the site of injection, changes in blood sugar levels

Acarbose

(It helps mainly in late dumping syndrome).

C-Surgical:



By reversing the previous surgery or corrective surgery like (reconstruction of the pyloric sphincter).
But in most cases surgery correction is not successful.

★ Complications

like: dehydration, malnutrition, weight loss.

Post Gastric surgery syndroms and symptoms

2-Anemia:



There are some causes of anemia after **partial gastrectomy**:



A-megaloblastic anemia(macrocytic)
(Perinicious anemia)

Caused by loss of releasing the intrinsic factor from the resected portion which is important for vitB12 absorbtion from the terminal ileum

It is rare+ treated by IV vitB12



B-Iron deficiency anemia(microcytic)

Stomach plays imp role in absorbtion of iron by coverting iron into absorbable state Fe^{+3} to Fe^{+2} (ferrous to ferric) so we will lose this process consequently deudenum and jejunum won't absorbe iron properly.

Treated by iron supplements

Both can be caused by malnutrition

Post Gastric surgery syndroms and symptoms



3-Weight loss and its complications:

- ★ Especially after partial gastrectomy when patients can't eat sufficiently. (**early satiety**)
- ★ Loss of ghrelin hormone releasing from stomach which is responsible of feeling hungry. (**Hunger hormone**)
- ★ Malnutrition, dumping syndrome, and there is increased risk of nutrition associated diseases ex:TB

Weight loss maximally occurs by 12 months and many patients regain weight afterwards

4-Bilious vomiting:

- ★ Any **operation** which, destroys or bypasses the pylorus allows bile to reach the stomach.
- ★ It is **diagnosed** by endoscopy and treated by BACLOFEN (it causes decrease relaxation of the LES)
- ★ If bile reached stomach:
 - 1) **Atrophic gastritis** (due to chronic inflammation finally remodeling and scarring occurs)
 - 2) **Bilious vomiting** (It is more likely after **polya** gastrectomy where characteristically a patient eats a meal and some to 10-20 mins later vomits bile only)
- ★ **c/p:** Patient come with epigastric pain, nause, green yellowish vomiting.

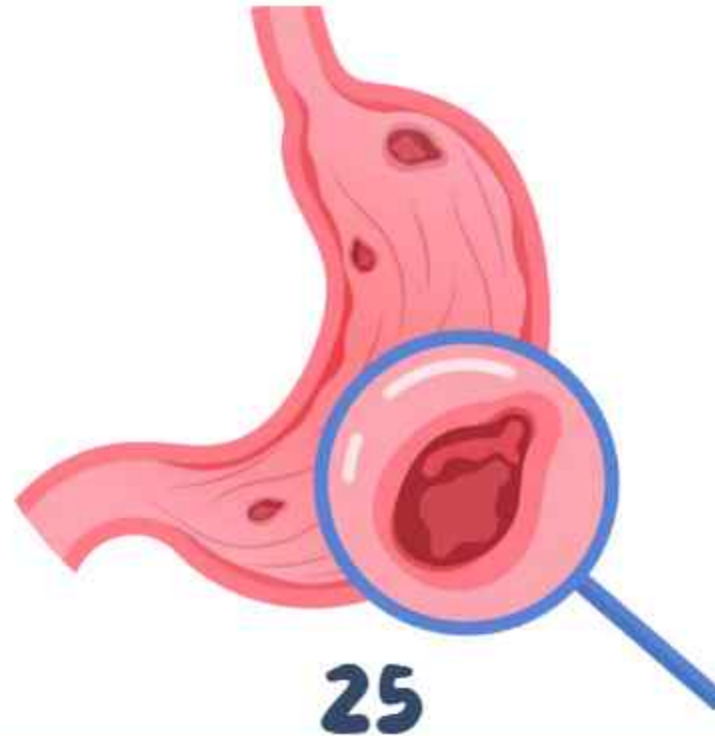


Post Gastric surgery syndroms and symptoms

5-Diarrhea:

- ★ Apart from the dumping syndrome, all vagotomies **except** highly selective ones seem to cause diarrhea
- ★ Matters are made worse if **cholecystectomy** has been done or is subsequently done

Quiz time!
click on ulcer to start



The background features a white central area with decorative elements in the corners. The top-left corner has overlapping blue and red triangular shapes. The top-right corner has a cluster of purple dots of varying sizes. The bottom-left corner has a cluster of red dots of varying sizes. The bottom-right corner has overlapping red and blue triangular shapes.

THANK
YOU