Gastric and duodenal diseases

Surgery Team
MED 433

MED 433
طب ٤٣٣

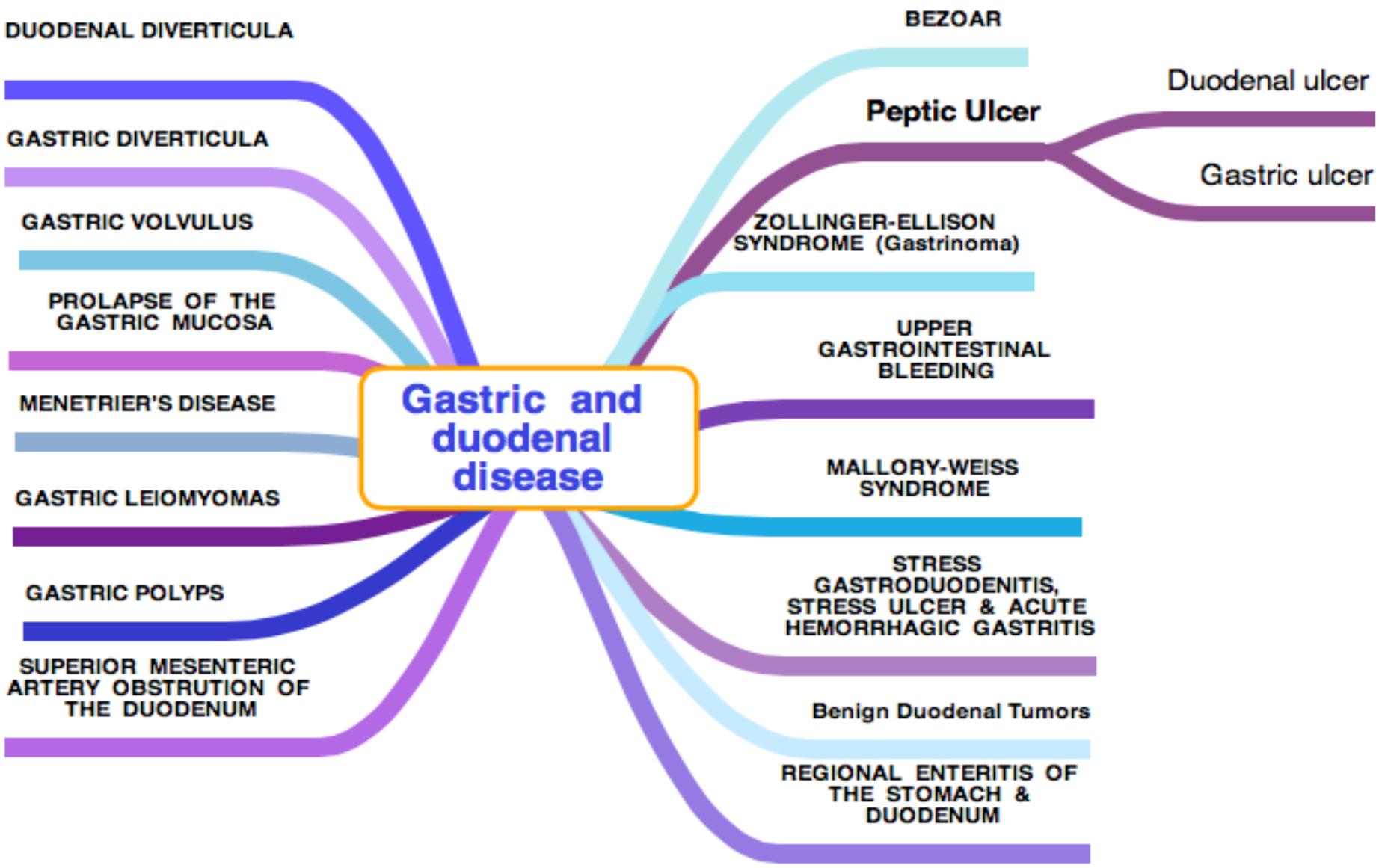
Objectives :

- ✓ Anatomy, physiology of stomach and duodenum
- ✓ Peptic ulcer diseases, and it's complications requiring surgical intervention
- ✓ Gastric neoplasia
- ✓ Miscellaneous disorders of stomach: Menetrier's disease, Gastritis, Dieulafoy's lesion, Gastric volvulus, Bezoars
- ✓ Miscellaneous disorders of duodenum: Duodenal obstruction, Duodenal diverticula, Duodenal trauma

Sources : Slides, Raslan's Notebook, Principles & Practice of Surgery by: O. James Garden

Color Index : Slides & Raslan's | Textbook | Doctor's Notes | Extra Explanation

Mind Map


Gastric and duodenal disease
DUODENAL DIVERTICULA
GASTRIC DIVERTICULA
GASTRIC VOLVULUS
PROLAPSE OF THE GASTRIC MUCOSA
MENETRIER'S DISEASE
GASTRIC LEIOMYOMAS
GASTRIC POLYPS
SUPERIOR MESENTERIC ARTERY OBSTRUTION OF THE DUODENUM
BEZOAR
Peptic Ulcer
Duodenal ulcer
Gastric ulcer
ZOLLINGER-ELLISON SYNDROME (Gastrinoma)
UPPER GASTROINTESTINAL BLEEDING
MALLORY-WEISS SYNDROME
STRESS GASTRODUODENITIS, STRESS ULCER & ACUTE HEMORRHAGIC GASTRITIS
Benign Duodenal Tumors
REGIONAL ENTERITIS OF THE STOMACH & DUODENUM

Introduction :

The duodenum is divided into 4 parts, which are closely applied to the head of the pancreas.

The 1st part of the duodenum is :

*5 cm in length. *most common site of peptic ulceration. *begins at the pylorus. *Runs upward and backward on the transoyloric plane at the level of the 1st lumbar vertebra.

The relations of this part are as follows:

#Anteriorly : the quadrate lobe of the liver and the gallbladder .

#Posteriorly : the lesser sac (first inch only), the gastroduodenal artery, the bile duct and portal vein, IVC.

#Superiorly : the entrance into the lesser sac (the epiploic foramen)

#Inferiorly : the head of the pancreas.

Superior mesenteric artery syndrome : the obstruction of the 3rd part of the duodenum by the superior mesenteric artery.

1st: Peptic Ulcer :

Most common cause of abdominal pain related to the stomach and duodenum.

Sites:

Esophagus → Stomach → Duodenum → Jejunum* → Ileum**

*following a gastrojejunostomy.
**in relation to ectopic gastric mucosa in Meckel's diverticulum.

Men are affected three times as often as women.

Duodenal ulcers are ten times more common than gastric ulcers in young patients.

In the older age groups the frequency is about equal.

Clinical presentation :

Pain → Bleeding → Perforation → Obstruction

*You have to rule out MI and aortic aneurysm rapture(AAR) (fatal conditions)
*Measure the femoral and radial pulse if there is delay = AAR

Duodenal Ulcer :

95%occure in the duodenal bulb(2cm), the 1st part of the duodenum

They may be acute (ulcers with a history of less than 3 months with no evidence of fibrosis) or chronic.

Common in young and middle-aged males.

Normal or increased acid secretion.

90% caused by Helicobacter pylori (GNCB aerophilic)

Gram negative , coccobacilli , microaerophilic bacterium

Clinical features :

*well localized epigastric pain (mid-day, noon and night)
*pain when hungry, relieved by food.

Diagnosis

1.EGD (esophagogastro-Duodenoscopy)	**2.Gastric analysis: Basal (after sleep) Vs maximal (after eat) (isn't use nowadays)**
3.Gastrin serum levels : severe or refractory. Done if zollinger-ellison S. is suspected or treatment was not effective.	**4.Contrast meal: used when either endoscopy is contraindicated or ulcer complication has occurred.**

If you suspect duodenal ulcer for at least 6 weeks (must treat the PT before the doing all the tests)

Treatment

Medical treatment (80% in 6 weeks)	**Surgical treatment (limited to PT with complication or to block hormonal stimulation)**
1.H2 antagonist (zantac) control acid secretion. 2.Proton pump inhibitors (omeprazol) 3.Antibiotics (Amoxicillin) : For H pylori eradication.	**1.Vagotomy. 2.Antrectomy and vagotomy. 3.Subtotal gastrectomy.**

Gastric Ulcer :

95% along lesser curve (incisura angularis) in the distal half of the stomach.

Gastric ulcers generally run a chronic course .

Types

- In incisura angularis & normal acid
- Prepyloric and DU & high acid (MOST COMMON)
- In the antrum duo to NSAID

Common in 40-60 year old males (gastric ulcer is more prevalent with older age)

Gastric ulcer may develop into malignancy much more often than Duodenal ulcers.

Clinical features

- Epigastric pain
  - At the gastroesophageal junction (GEJ)
- The pain occurs during eating and relieved by vomiting (PT my lose weight)

Diagnosis

1.EGD with biopsy (biopsy is important to exclude malignancy)

2.Contrast swelling (Filling defect)

Treatment

Medical treatment	Surgical treatment
Not common. To eradicate H. pylori.	Usually done to make sure that the ulcer does not develop into cancer.

Complications of surgery for peptic ulcer :

1. Early Complications (leakage, bleeding, retention)
2. Late Complications :
   1. Recurrent ulcer (marginal ulcer, stomal ulcer ,anastomotic ulcer)
   2. Gastrojejunocolic and gastrocolic fistula.
   3. Dumping syndrome

A condition where the ingested food bypasses the stomach too rapidly and enters the small intestine largely undigested. It happens when the upper end of the small intestine, the duodenum expands too quickly due to the presence of hyperosmolar food from the stomach.

Clinical features :
*Tachycardia.
*flushing.
*sweating.
*colicky pain.
*hypoglycemia and may lead to fainting (more in late dumping)

- There is no pylorus due to surgery, so the food will go to the small bowel directly due to eating food with osmotic potential.
- Patient will suffer from fainting and sweating.
- Early dumping.
- Late dumping is caused by hypoglycemia.
- Late dumping occurs 1-3 hours after a meal. The pathogenesis is thought to be related to the early development of hyperinsulinemic (reactive) hypoglycemia.
- Advice the patient to eat less sugar or give him acarbose.

   4. Alkaline gastritis

Complications of surgery for peptic ulcer : (Con..)

- 5.Anemia
  - Iron deficiency.
  - Vit.B12 deficiency (pernicious anemia).
- 6.Postvagotomy diarrhea
- 7.Chronic gastroparesis.
- 8.Pyloric obstruction\ stenosis.

Complications of Peptic ulcers :

1.Pyloric obstruction :

Dull epigastric pain & projectile vomiting of large volumes of undigested food matter.

Could be due to stricture formation.

Medical treatment (must make sure PT is taking their medication even if the pain stops).

Surgical treatment :
1.Remove and anastomose .
2.Bypass.

2.Perforation : Sudden, Severe, diffused (not epigastric) Steroid-related abdominal pain

*Occurs in acute ulcers (duodenal mostly)
*on the anterior wall of the duodenum (duodenal ulcers)

*high risk ; female, old age, gastric ulcer.
*acute onset of severe unremitting epigastric pain.

*anterior ulcers cause perforation while posterior ulcer cause bleeding.

*Diagnosis ; X-ray will demonstrate free air under the diaphragm (which means air in the peritoneum indicating that there is perforation of the viscus) (85%) and fill 400 cc of air by the nasogastric tube (NGT) never do gastroscopy)

Bleeding site in Duodenal ulcers :

When bleeding (upper GI, presents with vomiting blood) is seen we suspect the ulcer is to be in the posterior wall of the 1st part of the duodenum. Perforation occurs in the anterior wall ulcer, bleeding more commonly occurs in the posterior ulcer mainly due to the gastroduodenal artery that lies behind the 1st part of the duodenum .

*Treatment : NGT, ABS, Surgery.

Dr. case :
Patient with peptic ulcer in medication, suddenly has Severe, diffused abdominal pain after he take voltaren for joint pain. What is most likely diagnosis ?
Perforation ulcer

2nd : Zollinger-ellison syndrome (gastrinoma)

Peptic ulcer disease (often severe) in 95%
- Gastric hypersecretion + very high no. of ulcers (multiple ulcer) + gastroma
- **Elevated serum gastrin**

Gastroma: Single one is usually malignant, Multiple is benign (MEN 1)

Diagnosis:	o Gastrin levels more than 500 pg/ml o CT Scan, somatostatin scan o Portal vein blood sample
Presentation:	Diarrhea (steatorrhea due to the inactivation of the pancreatic lipase) and severe persistent epigastric pain
Treatment:	1. Medical treatment: Acid control (massive dose of PPI) 2. Surgical treatment: Distal hemi-gastrectomy and ulcer excision

3rd : Stress gastroduodenitis, stress ulcer & acute hemorrhaegic gastritis:

- **Stress ulcer:** Ulcer due to shock or sepsis
- **Curling's ulcer:** Ulcer due to burns
- **Cushing's ulcer:** Ulcer due to the presence of a CNS tumor or injury (more to perforate, high acid production)
- **Acute Hemorrhagic Gastritis**

4th : Upper gastrointestinal bleeding

Presentation	Hematemesis, Melena, Hematochezia (fresh blood in stool) [Occurs very rarely]	
Management	1. Resuscitation 2. Detection and endoscopic treatment (If the cause is an ulcer we can either a. put a clip on it b. burn it (cauterization) (never do to varices) c. coteries (use a rubber band) d. injection of a sclerosing agent to form a clot and stop the bleeding 3. Surgical management	
Causes	Common causes	Uncommon causes 5%
	Peptic ulcer 45%, Duodenal ulcer 25% Gastric ulcer 20%, Esophageal varices 20%, Gastritis 20%, Mallory-Weiss syndrome 10%	Gastric carcinoma, Esophagitis Pancreatitis, Hemobilia Duodenal diverticulum

Mallory-weiss syndrome

Usually caused by severe retching, coughing, or forceful vomiting , UGIB cases
most common site: 1-4cm longitudinal tear in gastric mucosa at esophageal-gastric junction

diagnosis	EGD is done to confirm diagnosis

90% of bleeding stops spontaneously:
- By cold gastric wash (To induce vasospasm to stop the bleeding)
-If it doesn't stop, we perform EGD
-If the tear is small, we can burn it(cautery).If not, it will need surgical intervention.

	5th: Gastric polyps	6th : Gastric leiomyomas	7th: Menetrier's disease	8th: Prolapse of the gastric mucosa
presentation	Incidental finding or anemia	Incidental finding, 90% asymptomatic, less than 1% present with massive bleeding	Presents with hypoproteinemia Diarrhea, edema and weight loss	Incidental finding, Vomiting and abdominal pain
	Type of Gastric polyps: 1. Hyperplastic : treat with Omeprazole 2. Adenomatous (Premalignant) – most serious 3. Inflammatory: Affects distal part of the stomach 4. hamartoma	Benign smooth muscle tumor Common submucosal growth	- Giant hypertrophy of the gastric rugae (thick rugae) - Mucosal hypertrophy may lead to abnormally large secretion of protein-rich mucus and Acid	Occasionally accompanies small gastric ulcer
Diagnosis	EGD to R/O malignancy (by endoscopy remove the polyp. If the polyp is adenomatous, do further investigation)	- EGD and CT scan: bulging mass in the mucosa on endoscopy - Never take biopsy (the capsule will break)		X-Ray: Antral folds into duodenum (Double ring on X-ray) [not well defined]
Management	You have to resect the adenomatous type due to its malignant potential	Surgical wide excision	- Atropine (to reduce the secretion) - Omeprazole - H. Pylori eradication - Gastrectomy If the patient still has symptoms (rarely)	Antrectomy with Billroth 1

9th: Gastric volvulus (important)

Benign disease, but lethal (can lead to death)

Types:

1. Organoaxial volvulus	2. Mesenterioaxial volvulus
• Its longitudinal axis • More common • Associated with HH (hiatal hernia)	• Transverse axis • Line drawn from the mid lesser curvature to the mid greater • curvature - Associated with vomiting (obstruction)

Presentation: Severe abdominal (epigastric) pain and Brochardt's triad

Brochardt's Triad (important)

- Vomiting followed by retching and then inability to vomit
- Epigastric distention
- Inability to pass a nasogastric tube

Diagnosis: Confirmed by a Ground Glass appearance on X-Ray

Management : If diagnosed, we should immediately take him to the OR

10th: Gastric diverticula :

- Uncommon
- Asymptomatic (Incidental finding) or percent with Weight loss, diarrhea
- It causes anemia
- Diagnosis: EGD, x-ray
- Treatment: Surgery

11th: Duodenal diverticula

- Affects 20% of the population, Rare before 40 years of age
- Asymptomatic – incidental finding
- 90% in the medial aspect of the duodenum (2nd part of the duodenum is the most common site in the GI tract)
- Most are solitary and 2.5 cm peri-ampullary of vater, It can cause obstruction, bleeding and inflammation
- If it's asymptomatic, we leave it. If there is superficial cancer, we excise it.

12th: Bezoar :

- Retained concretions of indigestible foreign material in the stomach **(foreign Body in the stomach)**
- Types:
  1. Trichobezoars: formed from hair
  2. Phytobezoars: indigestible plant material
- Presentation: obstruction
- Diagnosis: EGD, x-ray
- Treatment: surgical removal

13th: Regional enteritis of the stomach & duodenum :

- Food poisoning
- Presentation: pain and diarrhea
- Clinical diagnosis
- Observation of the patient

14th: superior mesenteric artery obstruction of the duodenum:

- Obstruction of the third portion of the duodenum leads to compression of the superior mesenteric artery (SMA) and Aorta
- Appears after rapid weight loss following injury
- Distance between two vessels is 10-20 mm
- Proximal bowel obstruction symptoms and signs (Vomiting)
- Diagnosis: CT Scan
- Treatment: Bypass surgery

Fat is the only thing that lies between the duodenum and the SMA.
So when a person is cachexic and chronically ill, the fat will diminish and this will bring the duodenum and SMA closer to each other, leading to the obstruction.

15th: benign duodenal tumors

- Brunner's gland adenomas
- Carcinoid tumors
- Heterotopic gastric mucosa
- Villous adenomas

Three emergencies that need immediate intervention: **(important)**
1. Gastric volvulus
2. Superior mesenteric artery syndrome
3. Mesenteric thrombosis - E.g. history of Atrial
fibrillation; will cause embolization - Severe pain, do CT

Summary

Clinical comparison of Gastric ulcer and Duodenal ulcer

Gastric Ulcer	Duodenal Ulcer
• Occur in the stomach	• Occur in the duodenum
• Epigastric pain 1-2 hours after eating	• Epigastric pain 2-5 hours after eating
• Can cause hematemesis or melena	• Can cause melena or hematochezia
• Heartburn, chest discomfort and early satiety are commonly seen	• Heartburn, chest discomfort are less common but may be seen
• Can cause gastric carcinoma (mostly in the elderly)	• Pain may awaken patient during the night

MCQs

1.Features of dumping syndrome include all of the following except:

a. Tachycardia
b. Sweating
c. Constipation
d. Diarrhea
e. Palpitations

2. Which one of the following statement is true about mallory-weiss syndrome:

a. It is caused by H. pylori organism infection
b. It is a 1-4 cm longitudinal tear in gastric mucosa at EGJ
c. It causes 80% of upper GI bleeding
d. 5%of the bleeding stops spontaneously

3. The most frequent cause of UGI bleeding is:

A. Esophageal varices
B. Peptic ulcer disease
C. Angiomata
D. Mallory Weiss tear
E. Gastritis

4. A 73 year old man presents with several episodes of hematemesis. Examination shows signs of orthostatic hypotension and melena. What is the first priority in caring for this patient?

A. Nasogastric tube placement and gastric lavage.
B. Resuscitation with adequate IV access and appropriate fluid and blood product fusion.
C. Intravenous infusion of H2-receptor antagonists to stop the bleeding.
D. Urgent upper panendoscopy.
E. Urgent surgical consultation

5. Which is the most common complication of Peptic ulcer disease?

a. Perforation
b. Gastric outlet obstruction
c. Penetration
d. Haemorrhage
e. All are uncommon occurring in less than 5% of patients

6. Commonest site of peptic ulcer is:

A. 1st part of Duodenum
B. 2nd part of duodenum
C. Distal 1/3 of stomach
D. Pylorus of the stomach

Ans: 1:C, 2:B, 3:B, 4:B, 5:D 6:A

Thank You..

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