Peptic ulcer complication

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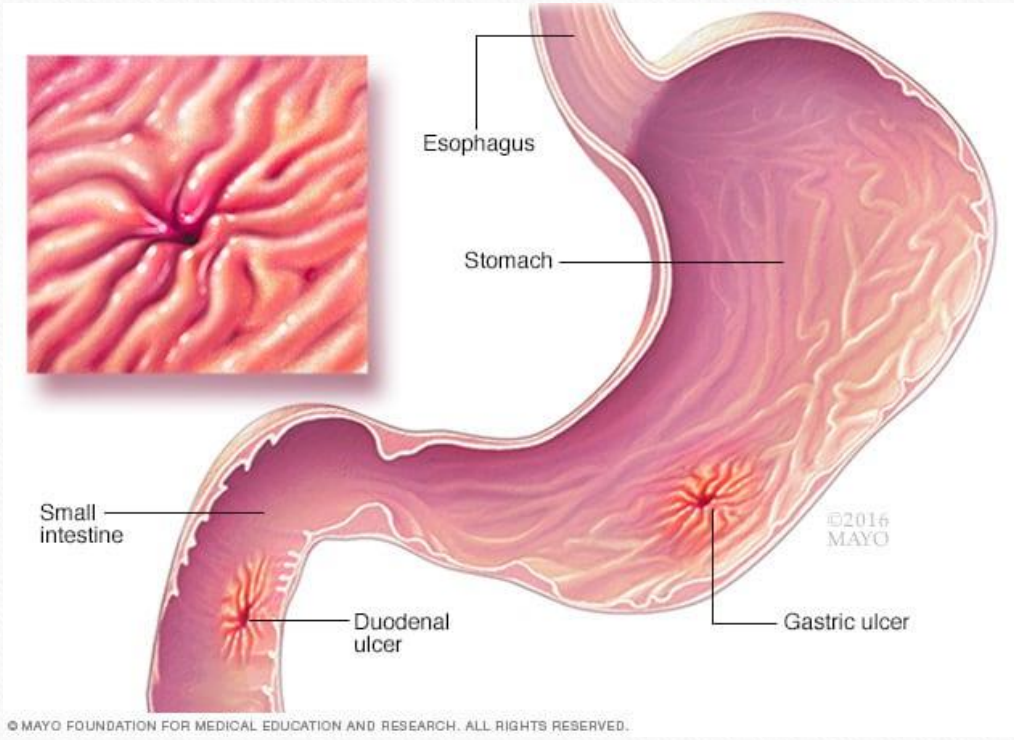
Peptic Ulcer

Done By : Mohammad Al-fuhaily

Peptic ulcer disease (PUD) is a chronic condition that causes ulcers, or open sores, to develop in the lining of the stomach or duodenum (the first part of the small intestine).

PUD is caused by an imbalance between the acid and protective factors that line the digestive tract. Acid can erode the lining of the stomach and duodenum, making them more likely to ulcers.

Protective factors, such as mucus and bicarbonate, help to protect the lining of the digestive tract from acid.



EPIDEMIOLOGY

- Incidence — The risk of complications in patients with chronic PUD is 2 to 3 percent per year.

- There has been a consistent decrease in the incidence of bleeding and perforation and hospitalization rates due to complications of PUD, presumably reflecting the fall in Helicobacter pylori prevalence .

- As an example, in the United States there has been a 30 to 40 percent fall in hospitalizations for PUD complications between 1993 and 2006

- In the United States, bleeding is the most common complication of PUD (73 percent), followed by perforation (9 percent), and obstruction (3 percent).

- Mortality — In patients with bleeding peptic ulcer, the majority of deaths are related to multi-organ failure or cardiopulmonary causes rather than to bleeding itself . Not surprisingly, in patients with gastrointestinal bleeding requiring endoscopic therapy, hypovolemic shock, multiple co-morbidities, and rebleeding in the hospital were predictive of mortality.

- In patients undergoing surgery for perforated PUD, the long-term mortality is high, with one in three patients dying in the follow-up period. Older age, co-morbid illnesses, and post-operative complications were predictors of mortality .

- Gastric outlet obstruction is the least frequent complication of PUD in developed countries. Most cases are associated with duodenal or pyloric channel ulceration.

Risk factors for ulcer complications :

1. **H. pylori infection :**

H. pylori are Gram negative spiral-shaped bacillus, found in the mucous layer of those with duodenal ulcers (90%) or gastric ulcers (70%) , type of bacteria that can live in the stomach lining.

It is thought to be the most common cause of peptic ulcer disease (PUD) , H. pylori attacks the lining that protects your stomach. The bacteria makes an enzyme called urease. This enzyme makes your stomach acids less acidic (neutralizes them). This weakens your stomach's lining

H. pylori can also cause other health problems, such as:

Gastritis (inflammation of the stomach lining)
Stomach cancer
Duodenal cancer

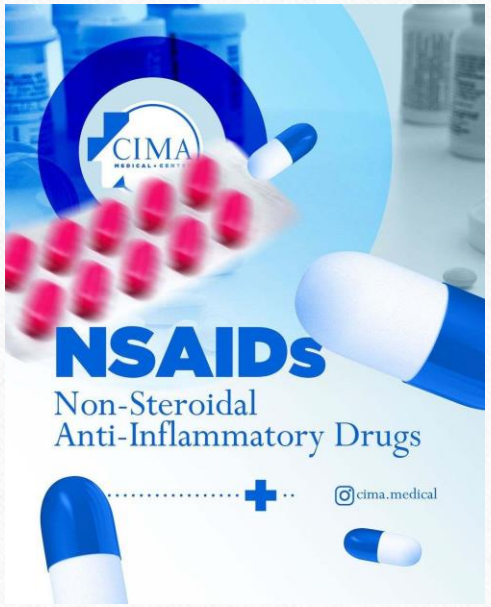
2. NSAID use

- Nonsteroidal anti-inflammatory drugs (NSAIDs) are a class of medications that are used to treat pain and inflammation. NSAIDs work by blocking the production of prostaglandins, which are chemicals that play a role in pain and inflammation.

- The risk was higher in patients taking high-dose NSAIDs compared with those taking medium- or low-dose NSAIDs (dose dependent).

- Some common NSAIDs include:

1. Aspirin
2. Ibuprofen
3. Naproxen



3- Concurrent H. pylori infection

The combination of H. pylori infection and NSAID use increases the risk of bleeding peptic ulcers more than either risk factor alone.
This is supported by the fact that the odds ratio for bleeding peptic ulcers was 6.1 in patients who had both H. pylori infection and used NSAIDs, compared to 1.8 and 4.9 in patients with only one of the two risk factors.

4- Other risk factors:

advanced age (>65 years) and chronic debilitating disorders, especially cardiovascular disease , previous gastric bypass surgery , physiological stress ; such as severe burns or head trauma

Ulcer characteristics:

is a round or oval sore that develops in the lining of the stomach or duodenum.
The ulcer is typically less than 1 cm in diameter and has a sharp edge.
The base of the ulcer is often covered in a yellow or white material called fibrin.

- **PUD ulcers can be classified into two types:**

- **Type I ulcers:** These ulcers develop in the pyloric antrum, which is the lower part of the stomach.
- **Type II ulcers:** These ulcers develop in the duodenum, which is the first part of the small intestine.

- **The most common symptoms of PUD include:**

  - Abdominal pain, especially in the upper abdomen
  - Burning sensation in the stomach
  - Indigestion
  - Nausea and vomiting
  - Loss of appetite
  - Unexplained weight loss

- **PUD is typically treated with a combination of medications and lifestyle changes.**

- Medications used to treat PUD include:

  - **Proton pump inhibitors (PPIs):** PPIs reduce stomach acid production.
  - **H2 blockers:** H2 blockers also reduce stomach acid production.
  - **Antibiotics:** Antibiotics are used to treat H. pylori infection.

- Lifestyle changes that can help to manage PUD include:

  - **Quitting smoking:** Smoking can damage the lining of the digestive tract and make ulcers more likely to develop.
  - **Limiting alcohol consumption:** Alcohol can irritate the lining of the digestive tract and make ulcers more likely to develop.
  - **Managing stress:** Stress can increase the production of acid in the stomach, which can make ulcers more likely to develop.

- **PUD can be diagnosed with a variety of tests, including:**

  - **Upper endoscopy:**

  - **Blood tests:**

Blood tests can be used to check for H. pylori infection.

  - **Stool tests:**

Stool tests can also be used to check for H. pylori infection.

The common complications of peptic ulcer are :

1. bleeding
2. perforation
3. Obstruction

Bleeding

By safaa al rawashdhe

Introduction

- *The most frequent cause of upper GI bleeding (60% of all case)*
- *Most common complication of pu (10-15%)*
- *More common with posterior duodenal ulcer .*
- *High incidence to peptic ulcer bleeding notice in patient above 6 decade*

Percentage of patients require surgery? ≈10%

Percentage of patients spontaneously stop bleeding? ≈80% to 85%

What are the risk factors ?

Any factor leading to acute exacerbations and inflammation of the ulcer

- NSAID
- Helicobacter pylori infection
- Smoking
- alcohol
- nervousness and streses

How the bleeding occur ?

Bleeding can occur when an ulcer erodes into a underlying blood vessel

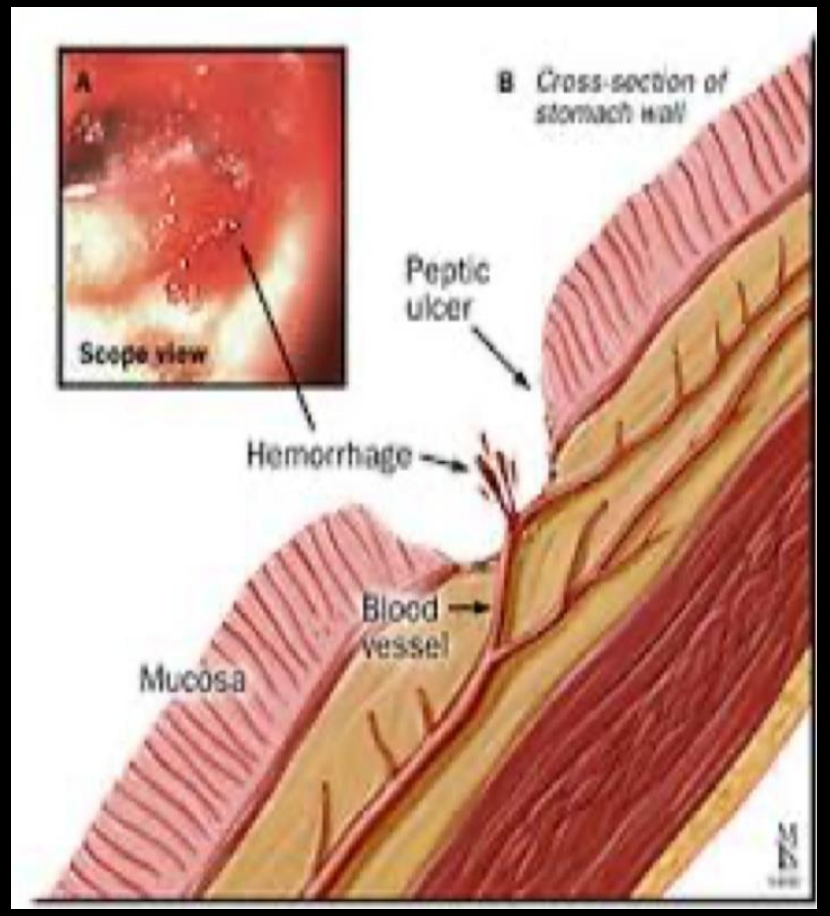
Ulcer

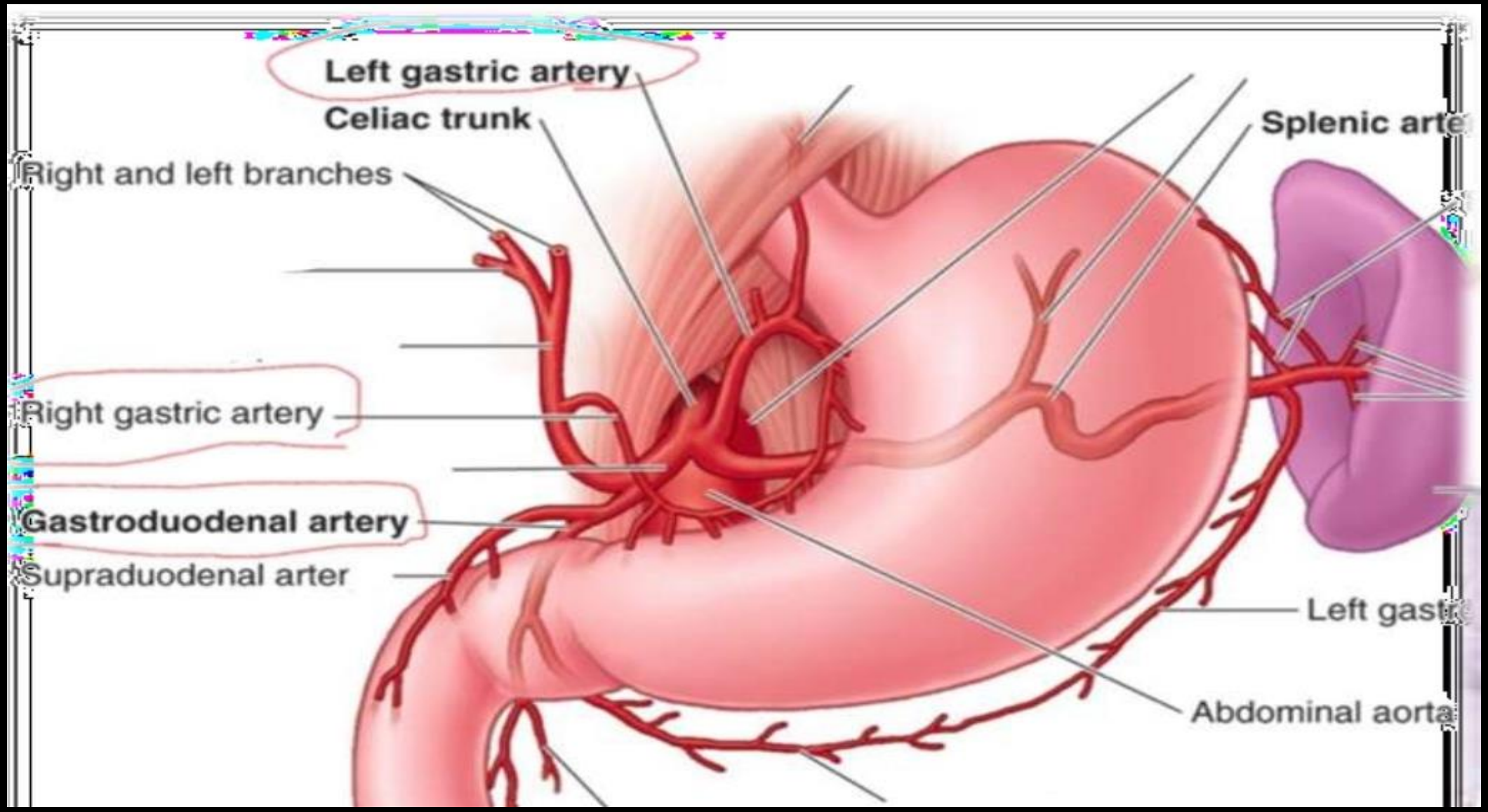
↓

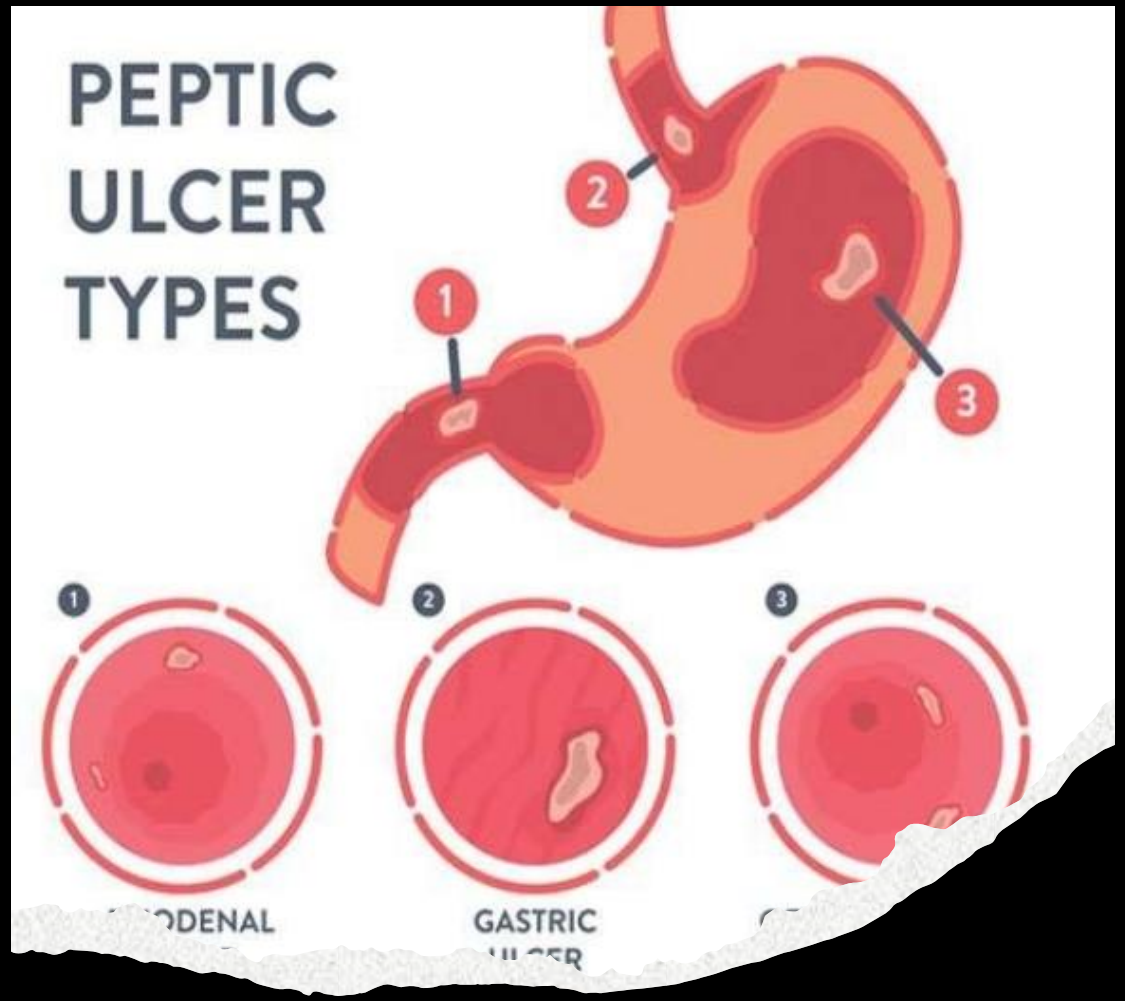
Erosion more mucosa , sub mucosa

↓

bleeding




Left gastric artery
Celiac trunk
Splenic arte
Right and left branches
Right gastric artery
Gastroduodenal artery
Supraduodenal arter
Left gastr
Abdominal aorta



Site of bleeding ..

Duodenum

- Bleeding from duodenal ulcer is four times more common than gastric.
- Found in the posterior aspect due to proximity to GDA

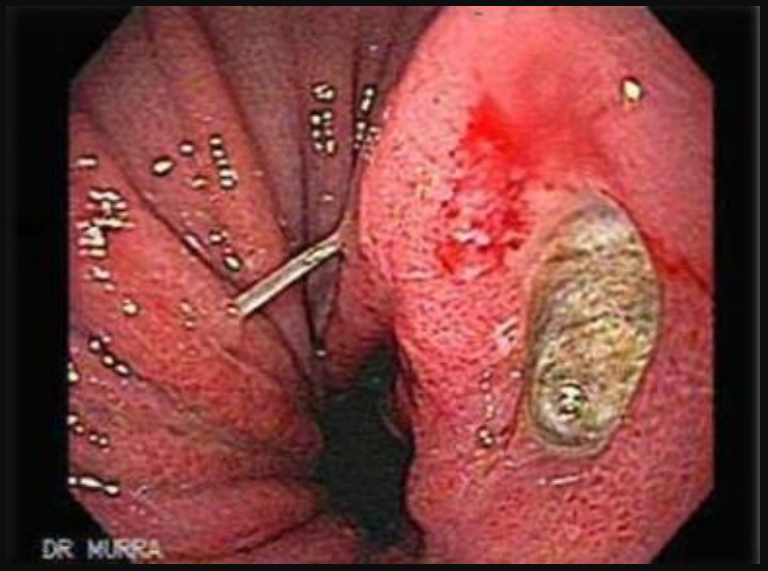
#Anteriorly placed ulcers tend to perforate

#posterior duodenal ulcers tend to bleed the GDA

《Kissing ulcer :A pair of ulcers on opposite sides of a tubular structure (anterior, posterior)》

GASTRIC ULCER BLEEDING

- Most common sites are the lesser curvature of stomach
- Large chronic ulcers may erode posteriorly into the pancreas and, on other occasions, into major vessels such as the splenic artery.

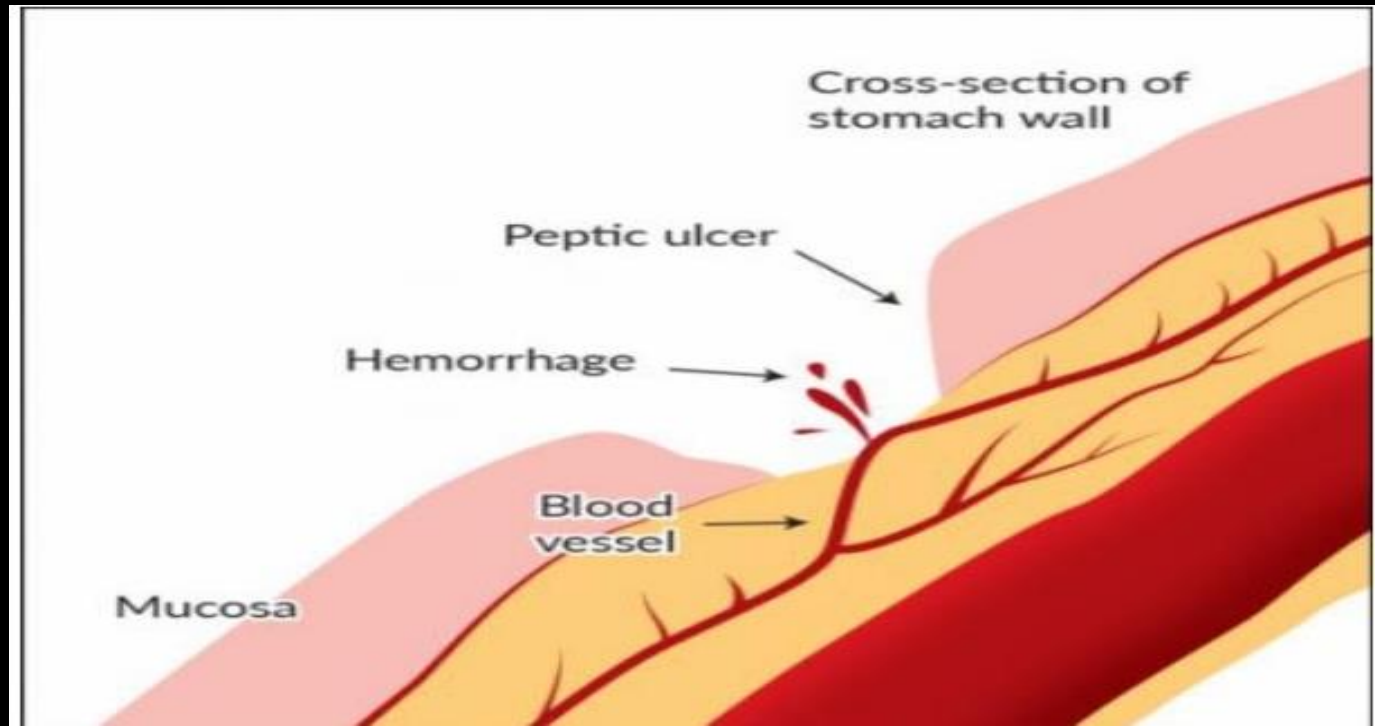


- ***Bleeding may be:***

: ***1. Mild: Due to erosion of the friable granulation tissue in the floor of the ulcer.***

2. Moderate: Due to erosion of a small vessel in the floor of the ulcer.

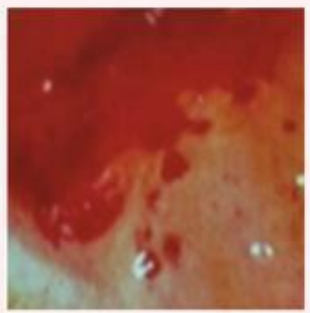
3. Severe: Due to erosion of a large extra-gastric vessel (gastroduodenal or splenic).



Forrest Classification

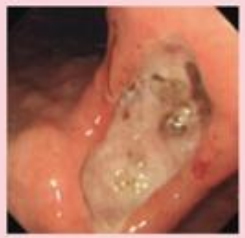
Acute Hemorrhage

1a
Active Spurting
Rebleeding Risk:
60 to 100%

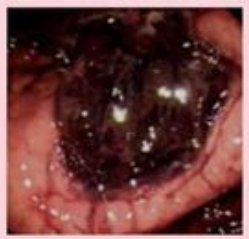


1b
Active Oozing
Rebleeding Risk:
50%

Signs of Recent Hemorrhage



IIa
Non-Bleeding Visible Vessel
Rebleeding Risk:
40 to 50%



IIb
Adherent Clot
Rebleeding Risk:
20 to 30%

IIc
Flat Spot in Ulcer Base
Rebleeding Risk:
7 to 10%

Lesions without Active Bleeding

III
Clean-Based Ulcer
Rebleeding Risk:
3 to 5%

@enrrikke

Images from Alzoubaidi, et al, 2018

- First described in 1974 by J.A. Forrest et al. in The Lancet
- Standardized classification system for endoscopists to describe peptic ulcers
- Helps prognosticate and risk stratify patients based on stigmata of recent hemorrhage and decide on discharge versus close inpatient monitoring

PRESENTATION OF A PATIENT WITH BLEEDING PUD :

The ulcer can either bleed slowly and chronically which makes it go unnoticed , as the symptoms will be similar to that of anemia :

1.Pallor of skin and mucous membranes 3. Shortness of breath 3. Fatigue

- Or the bleeding occurs heavily and profusely that cause : 1.Melena 2. Hematemesis 3. Hematochezia " if massive" 4. Hypotension / shock

FIRST PRESENTATION

Acute bleeding (heavy)	Chronic bleeding (slow)
Hematemesis"vomiting blood" , melena	Coffee ground vomiting
Hypotension / shock	Anemia "iron D"

Hematochezia

usually represents a lower GI source of bleeding . #When hematochezia is presenting symptom of UGIB it is associated with hemodynamic instability and dropping hemoglobin.

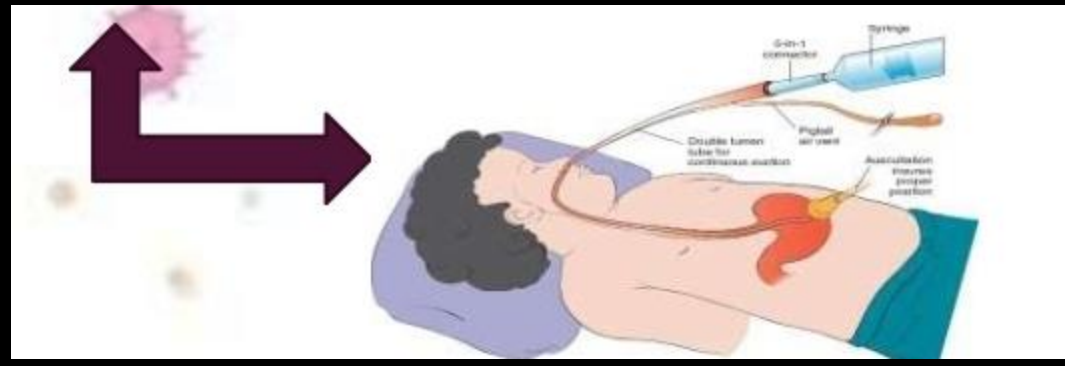
 # How to differentiate between upper and lower GI bleeding ?

Upper GI bleeding	Lower GI bleeding
Hematemesis / melena(black ,tarry stool)	Hematochezia(fresh blood in feces)

 # Hematemesis indicates an UGIB.

- **<u>Melena</u> indicates the blood has been in GI tract for at <u>*least 14 hours*</u>.**

#Bloody nasogastric aspirate: indicates an upper gastrointestinal source of bleeding



D.D.: Other causes of haematemesis (ugib).

Table 1. Causes of Upper Gastrointestinal Bleeding

Diagnosis	*Distinguishing features*	*Frequency (%)*
Peptic ulcer bleeding	History of aspirin or nonsteroidal anti-inflammatory drug use associated with abdominal pain, food consumption reduces pain, nocturnal symptoms, history of peptic ulcer bleeding or *Helicobacter pylori* infection	62
Gastritis and duodenitis	Same as peptic ulcer bleeding	8
Esophageal varices	History of cirrhosis and portal hypertension	6
Mallory-Weiss tear	History of repeated retching or vomiting	4
Gastrointestinal malignancy	History of weight loss, smoking, or alcohol consumption; more common in Asians	2
Arteriovenous malformations	Painless bleeding in older patients (older than 70 years), history of iron deficiency anemia	10
Esophagitis or esophageal ulcer	Heartburn, indigestion, or dysphagia	
Dieulafoy ulcer	Painless bleeding, more common in men	
No identifiable source	—	8

Information from reference 3.

* **Complications:**
Hypovolaemic shock

Lab investigations

#THE DIAGNOSTIC TEST OF CHOICE WITH UGI BLEEDING? -EDG %95> diagnosis rate

#Emergency endoscopy: to visualize the bleeding ulcer and to exclude other causes of haematemesis specially oesophageal varices

HB% & Haematocrite estimation: Decrease in any haemorrhage after few hours when haemodilution occur and progressively decrease in any continuous hemorrhage type and cross matching , chemistry , pt/ptt, LFT

Resuscitation ..

**for any significant gastrointestinal bleed ,usually when >30% of blood volume has been lost*

1*)Assessment of hemodynamic instability*

2)2 wide bore venous cannula are inserted one for installing fluid and one for drawing blood for CBC

, coagulation profile and blood cross matching .

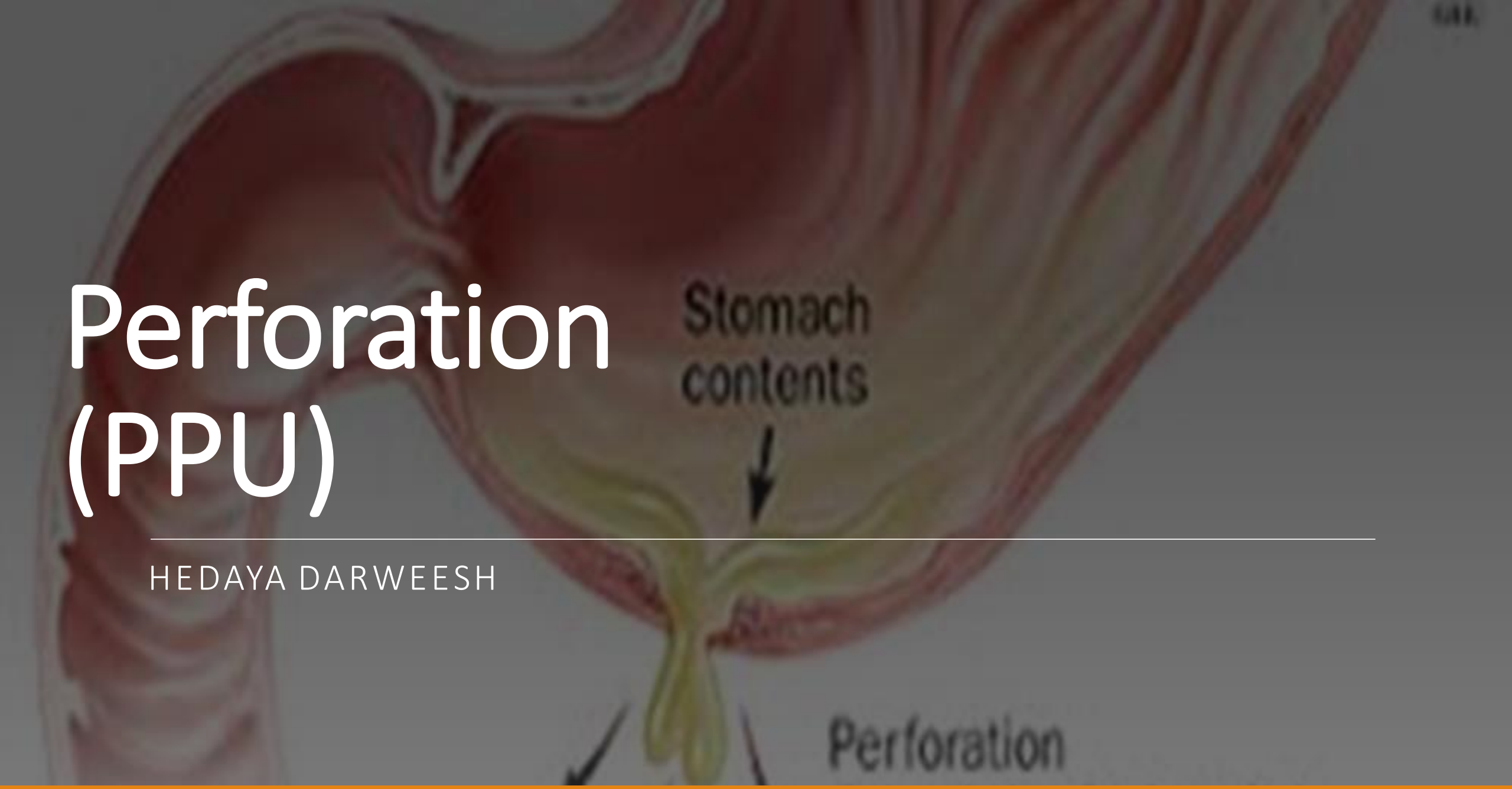
3) Central venous catheter.

4) Bladder catheterization for monitoring of urine output.

5) Insertion of nasogastric tube

Perforation (PPU)

HEDAYA DARWEESH



Epidemiology

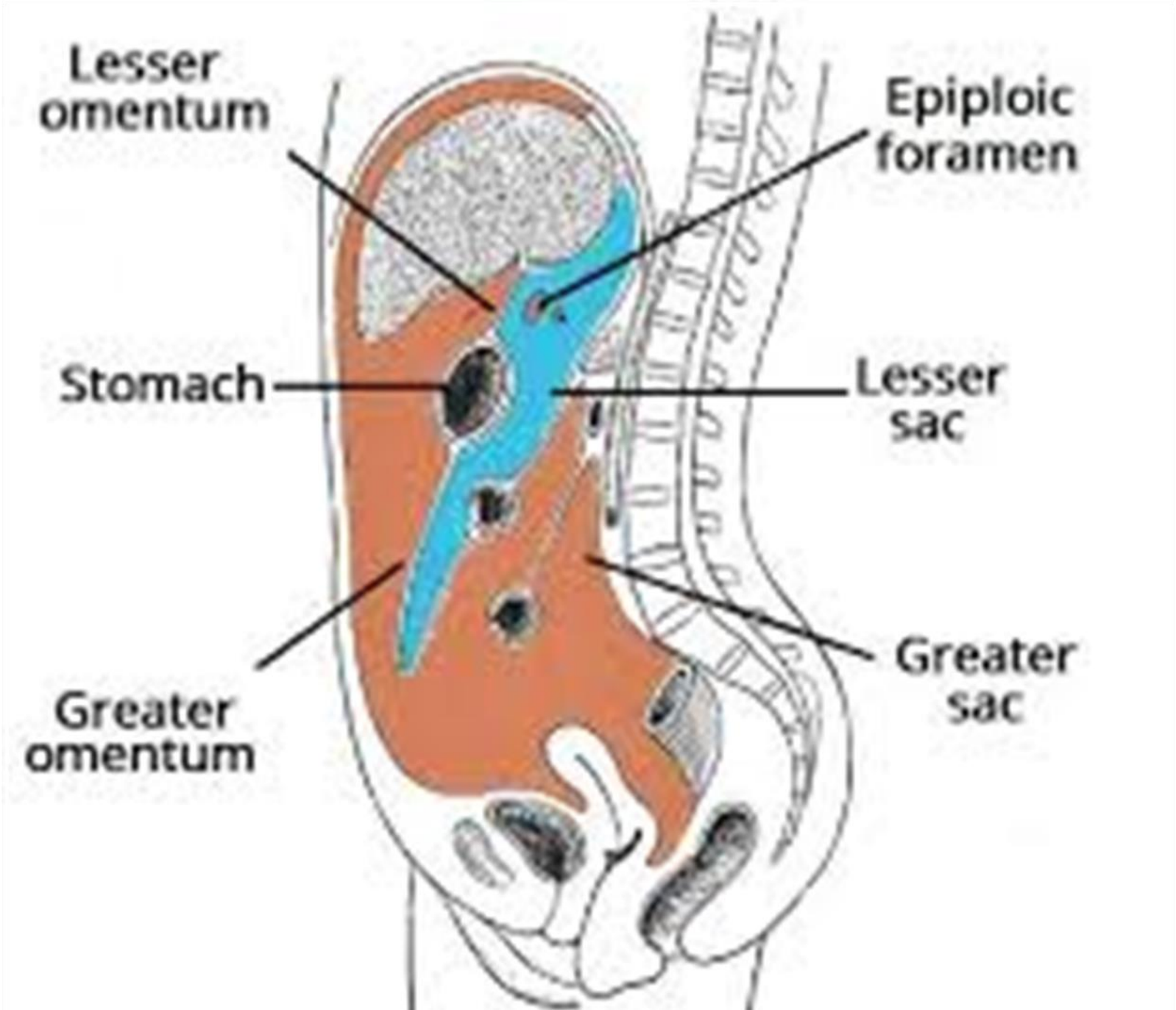
- Perforation is the second most common complication of peptic ulcer, but it represent the most frequent indication for emergency surgery for PUD .
- Despite the widespread use of gastric antisecretory agents and eradication therapy, the incidence of PPU has changed little.
- Previously, most patients were middle aged, with a ratio of 2:1 of male: female . With time there has been a steady increase in the age of the patients suffering this complication and an increase in the numbers of females, such that perforations now occur most commonly in elderly female patients .
- PPU carries a mortality ranging from 1.3% to 20% .
- A diurnal peak of ulcer perforations has been observed with more perforations occurring in the morning .

Aetiology or risk factor

- it is unclear why some patient perforate and others do not .
- when the base of ulcer be friable it will be more easy to perforated like in exacerbation like in infection or inflammation (H.Pylori) or NSAID or alcohol or in stress .
- increased acid-production like in fasting or in Patients with acid-hypersecretion, including those with a gastrinoma (Zollinger-Ellison syndrome) are at risk for perforation .
- they found that a third of patients with PPU have a previous history of or current known peptic ulcer at time of diagnosis .
- Ulcer perforation is noted to occur after bariatric surgery, after crack-cocaine or amphetamine use, and after chemotherapy with angiogenesis inhibitors such as bevacizumab .

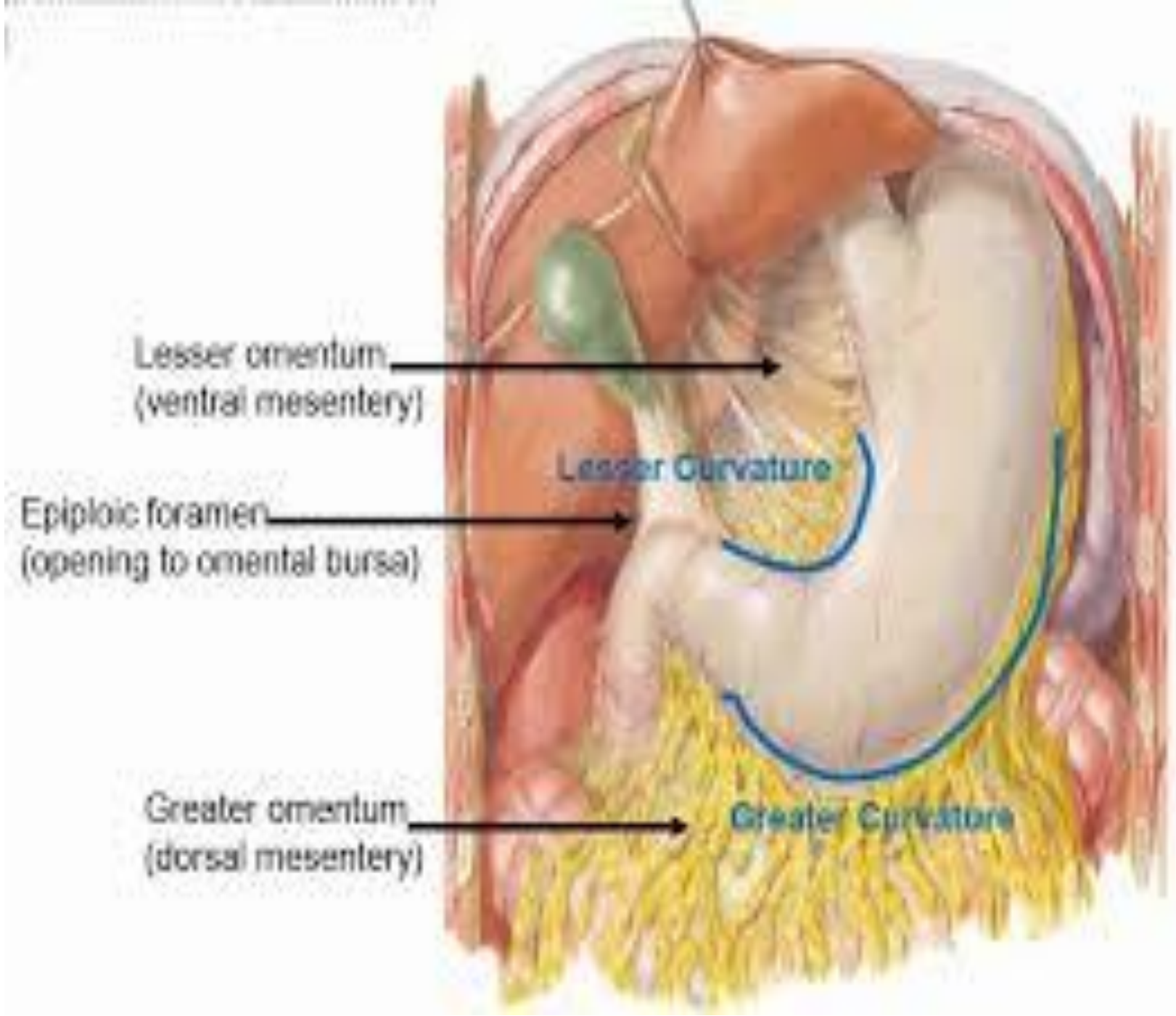
Where may perforation occur ?

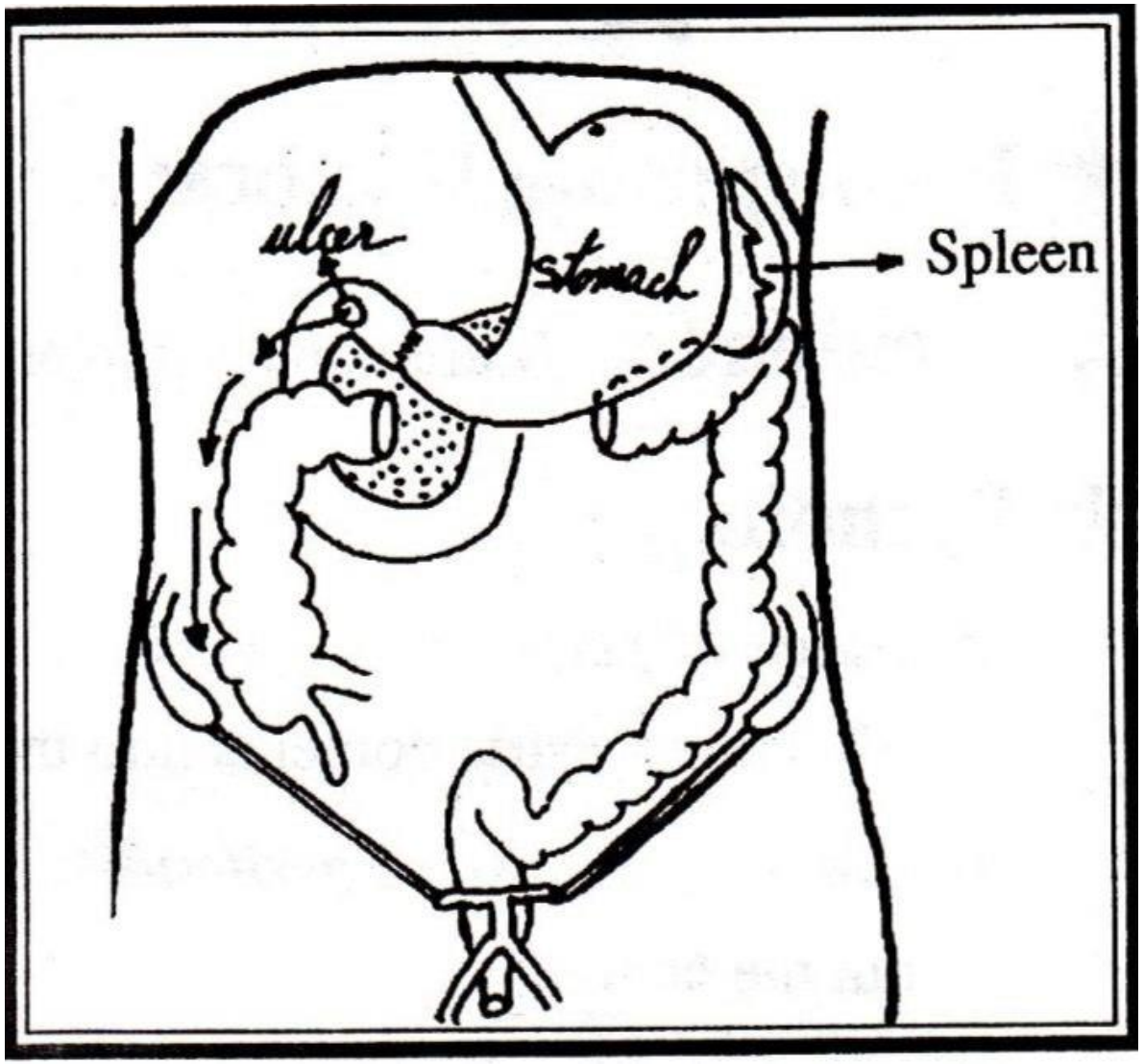
- More common is perforation of anterior duodenal ulcer into the greater sac of the peritoneal cavity.
- ▪ Rarely perforation of posterior gastric ulcer into the lesser sac .



Acute PPU

it is at three stages :




ulcer
stomach
Spleen

Stage 1 (contents are sterile)

Sudden rupture ⟶ Content in peritoneal cavity ⟶ Chemical peritonitis

- Symptoms (usually short and the patient not seen in it)(contents are sterile)

Sudden severe epigastric pain which become generalized .

- signs

general :

pallor, sweating, subnormal temperature, rapid weak pulse .

local :

guarding, epigastric tenderness .

Decreased liver dullness (air under the diaphragm).

Shifting dullness (fluid in the peritoneal cavity).

Decreased intestinal sounds (paralytic ileus occurs late).

Stage 2 : stage of illusion

Reaction of peritoneum → **Production of large amount of alkaline fluid and bringing antibodies**

- symptoms

Pain decreases .

- signs

general :

The patient has more tachycardia .

local :

Like the previous stage with increased shifting dullness .

Stage 3: stage of septic peritonitis .

Bacteria (normal flora) infection → Pus formation → Septic peritonitis

- symptoms

  Pain increases with fever, anorexia, headache, malaise, repeated vomiting and distension .

- signs

  general :

  Fever, toxemia, more tachycardia, deterioration of the general condition of the patient .

  local :

  Generalized rigidity, tenderness, progressive abdominal distention .

Complication of PPU

- septic shock (mention) with rising pulse rate and high fever
- paralytic ileus (mention) with sever abdominal distension & dead silent abdomen.
- hypovolemic shock .
- neurogenic shock .

Notes

- **The clinical picture may be less clear in the obese, the immunocompromized, patients with a reduced level of consciousness, in the elderly and in children.**
- **In another patient, the leak from the ulcer may not be massive . They may present only with pain in the epigastrium and right iliac fossa as the fluid may track down the right paracolic gutter .**

Subacute PPU

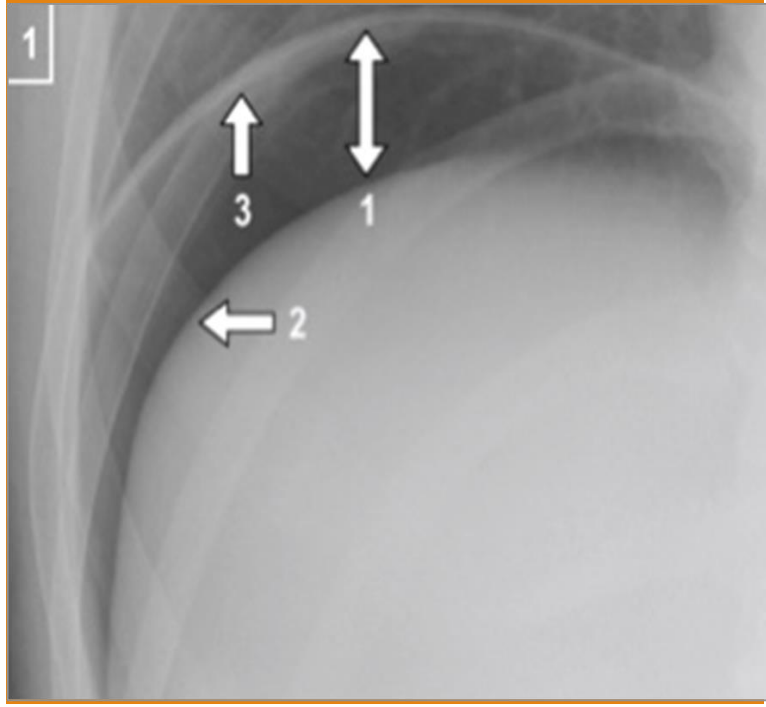
- this is a small perforation allowing only a minimal amount of contents to enter the peritoneal cavity and is rapidly sealed .
- it give the same early signs as perforated PU but much reduced .
- if diagnosed correctly it can be treated conservatively .

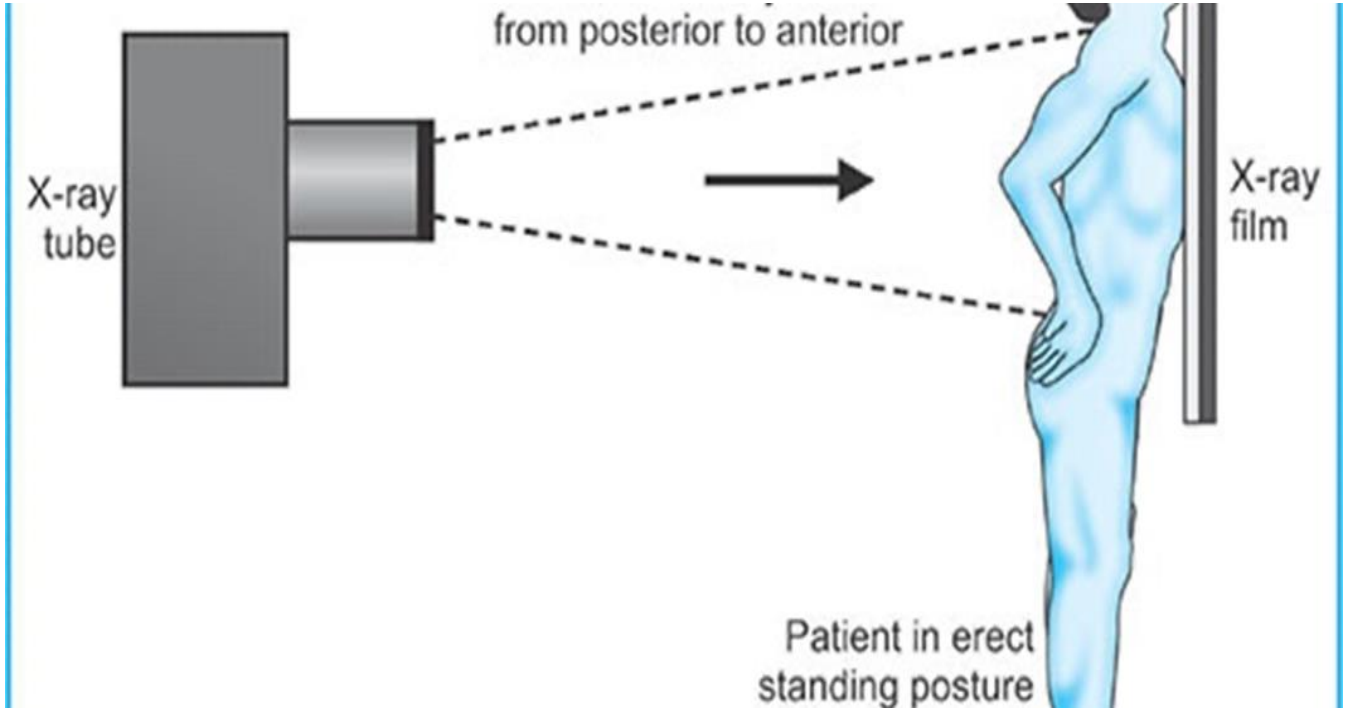
Perforation vs penetration

- is similar pathologically to perforation ,except that the ulcer crater burrows through the entire wall of the intestine ,and instead of leaking digestive content into the peritoneal cavity , the crater bores into an adjacent organ .
- Gastric ulcer most commonly penetrate into the left lobe of liver , while duodenal ulcer penetrate posteriorly into the adjacent pancrease , sometimes lead to pancreatitis .
- Rarely gastric ulcer may penetrate into the colon , resulting in gastrocolic fistula .

Investigation
1) erect chest x-ray

- The erect chest x-ray is the most important initial plain film commonly performed in patients with acute upper abdominal pain suspected of perforation .
- The patient needs to be erect for 5 minutes before a chest radiograph is taken. It does not matter if the radiograph is AP or PA. If there is a perforated peptic ulcer, air will rise and collect beneath one or both hemidiaphragms .
- This technique is about 80% sensitive for perforation .





2. Oral contrast enhanced CT scan

Patients without air under diaphragm at admission on plain chest radiograph, should be evaluated further by computed tomography (CT) scanning with oral contrast, as it has a diagnostic accuracy as high as 98%.

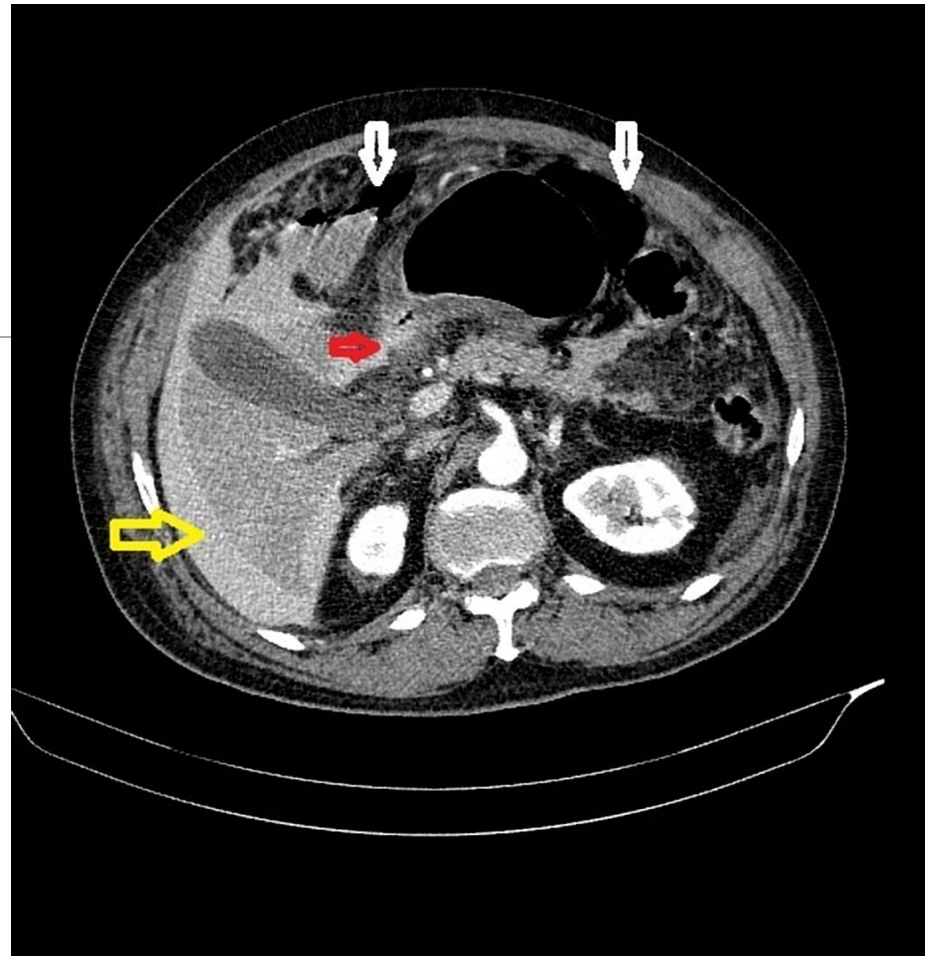
Rarely a CT scan is performed even when an erect chest X-ray reveals free air under diaphragm.

CT scan is performed in supine position and free air is usually seen anteriorly just below the anterior abdominal wall.

Oral Diatrizoate (Gastrografin), a contrast agent used for diagnosis of PPU.

Oral contrast free leak into the peritoneal cavity makes diagnosis of PPU certain. Absence of a leak does not exclude PPU as the perforation may have sealed off spontaneously.

Barium study is contraindicated in gastrointestinal perforation and should be avoided as a tool to diagnose PPU.

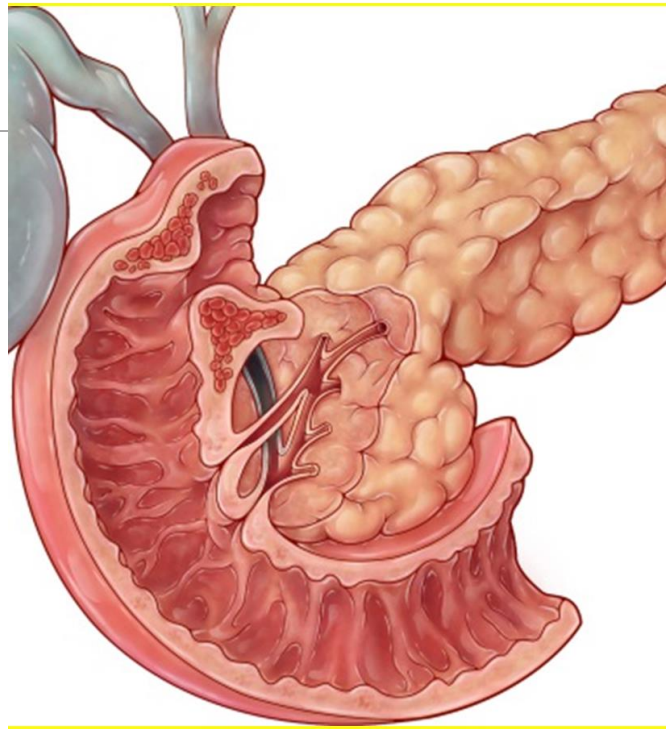


1- White short arrows point to free intra-peritoneal air.
2-Yellow arrow points to dense ascites (peri-hepatic free fluid) due to extravasated contrast material.
3-The red arrow points the site of perforation

3. Serum amylase

- Laboratory tests are performed in PPU not to establish diagnosis but to rule out differential diagnosis and also to understand the insult to various organ systems. They are non-specific.

- Serum amylase at index presentation to emergency unit or after a normal chest X-ray. Raised serum amylase may be associated with PPU and it's usually raised less than four times its normal level. (also high in acute pancreatitis)

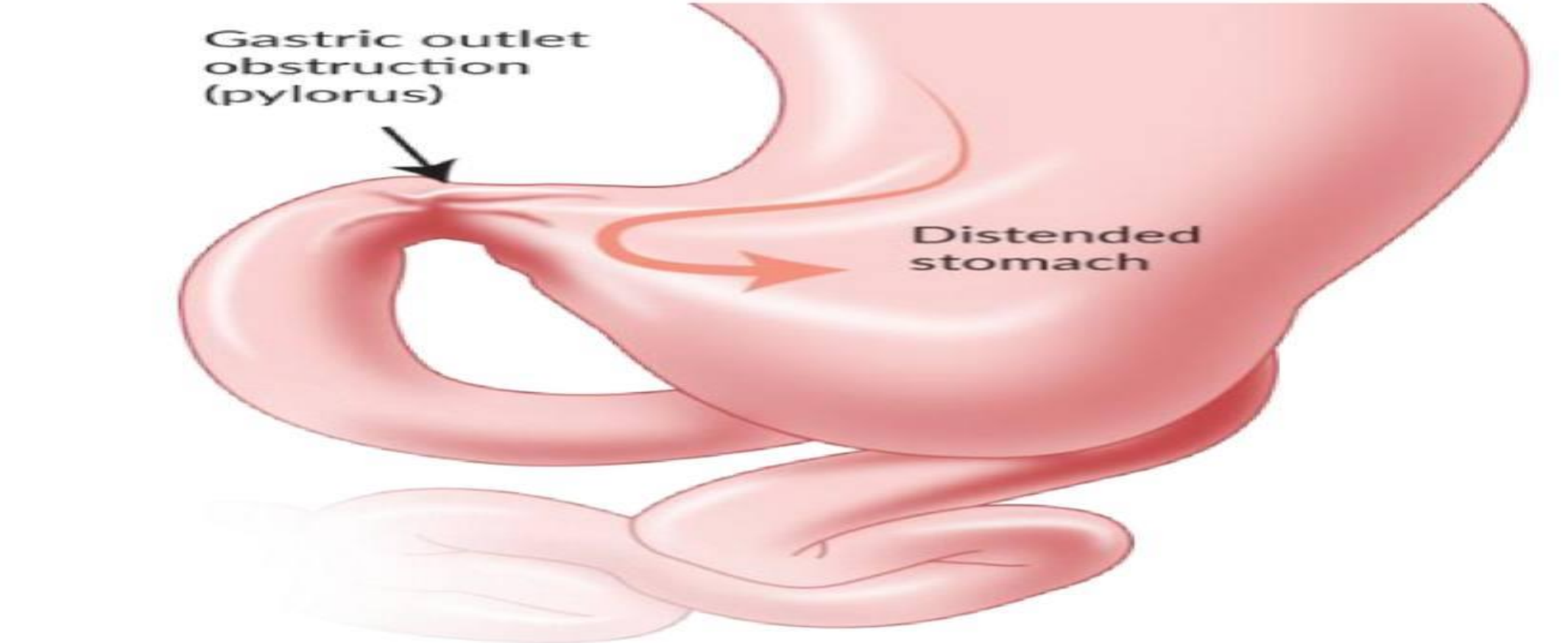


Why serum amylase is high in PPU ?

1. Pancreatic juice full of pancreatic enzymes (amylase).
2. Moves to Gastrointestinal lumen (duodenum) via ampulla of Vater.
3. Faces a perforated peptic ulcer.
4. Outpouring of amylase- rich fluid into peritoneal cavity through PPU.
5. Absorption of fluids and solutes from the peritoneal cavity by peritoneal lymphatics or uptake by the peritoneal capillaries (transcapillary absorption).
6. Ending up with quantities of amylase in circulation sufficient to produce a rise in serum concentration (hyper-amylasemia)

Other laboratory tests

- WBCs count and C-reactive protein may be done as part of the investigation in PPU, raised as a result of inflammation or infection.
- Electrolyte imbalances included hyponatremia in 21%, hypokalemia in 19% and elevated serum creatinine in 18% patients.
- Elevated creatinine, urea and metabolic acidosis reflects systemic inflammatory response syndrome (SIRS) and prerenal injury.
- Serum gastrin levels are indicated in patients with history of recurrent ulcers or recalcitrant PUD and can help establish diagnosis of Zollinger Ellison syndrome.



GASTRIC OUTLET OBSTRUCTION

Done by:Farah
AL-khraishah

Gastric Outlet Obstruction:

Medical condition resulting from mechanical obstruction of gastric emptying.

The two common causes of gastric outlet obstruction are gastric cancer,and pyloric stenosis secondary to peptic ulceration.

However, in recent years, the most common cause of gastric outlet obstruction has been gastric cancer.

So endoscopic biopsy is needed to determine the cause

How peptic ulcer causes GOO!!

Both acute and chronic peptic ulcer disease can lead to GOO.

The principal sites of involvement in cases of obstruction are the pyloric channel and the duodenal bulb.

Acute peptic ulcers can cause obstruction via inflammation-induced edema and tissue deformation.

By contrast, chronic peptic ulcer disease leads to scarring and tissue remodeling as part of the healing process.

However, obstruction is the *least* common complication of peptic ulcer disease, occurring in approximately 2 percent of cases

Clinical Picture:

- long history of PUD
- Anorexia , Nausea
- ***Vomiting***

is most important prominent feature

*projectile

*contains undigested food

*devoid of any bile

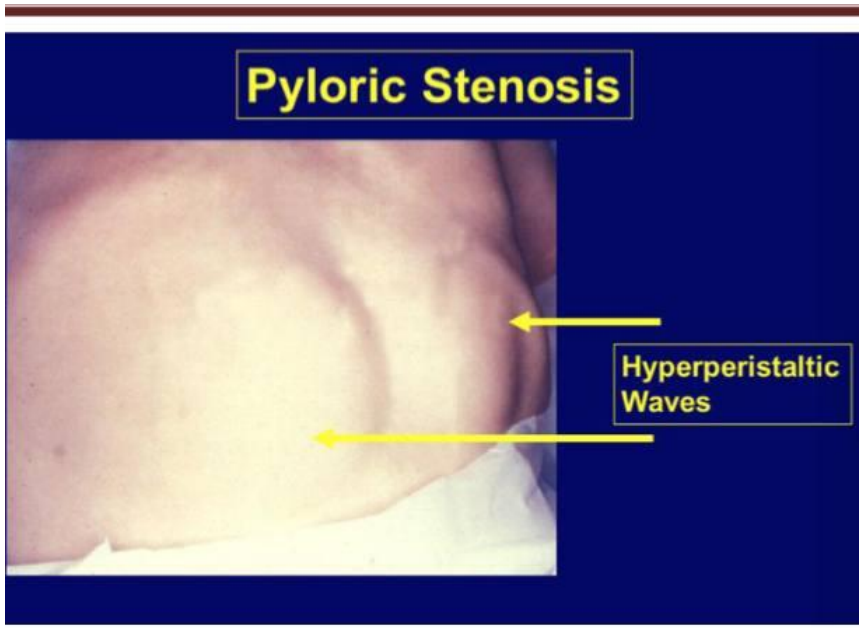
- Epigastric pain and fullness
- Weight loss and dehydration
- Electrolyte disturbances

Examination

gure 1 The transverse right upper quadrant incision provide

Epigastric fullness.

Succussion splash



Hyperperistaltic waves

LR

on examination

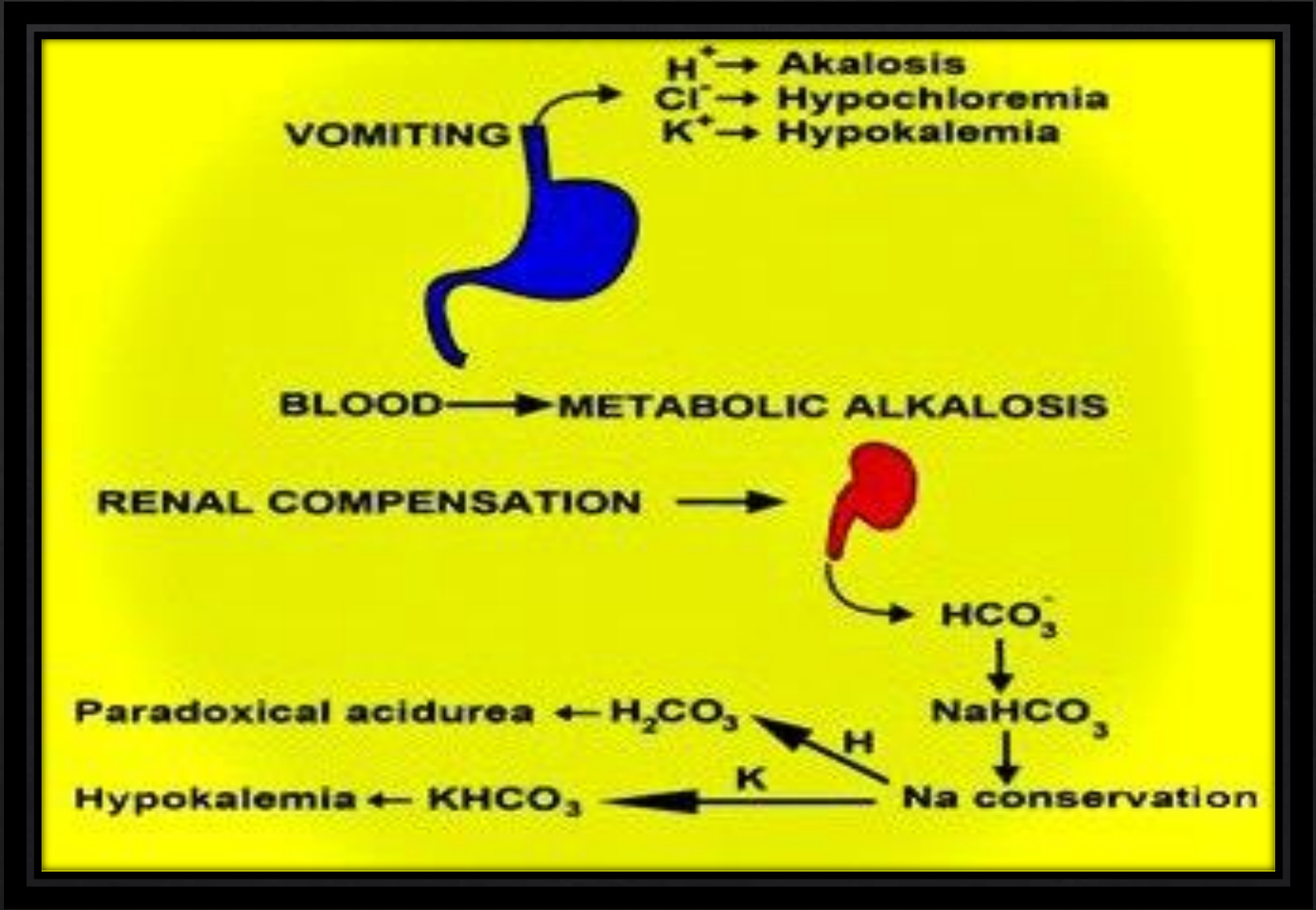
1. Distended abdomen and a succussion splash may be audible on shaking the patient's abdomen.

Positive succussion splash is done with 4 hours empty stomach, by placing a stethoscope over the epigastric region and shaking the patient adequately.

2. A dilated stomach may be appreciated as a tympanic mass in the epigastric area and or left upper quadrant.

3. Visible gastric peristalsis (VGP) may be elicited by asking the patient to drink a cup of water.

Metabolic effects



Paradoxical Aciduria

Gastric outlet obstruction characterized mainly by **vomiting** so there will be **hypochloremic hypokalemic metabolic alkalosis**

and **kidney tries to compensate** for this by excreting bicarb in the urine.

But with more volume depletion and sodium loss there will be aldosterone mediated sodium retention accompained by potassium excretion to maintain electroneutrality of the urine

but with **excessive hypokalemia** kidney starts to excerte hydrogen ions **instesd of potassium**

so paradoxically the urine will be acidic .

Electrolyte Changes In Pyloric Stenosis

metabolic alkalosis

Hypochloremia

Hyponatremia

Hypokalemia

low circulating ionized calcium. (alkalosis)

Hypomagnesemia

paradoxical aciduria

causes of (goo)

Benign :

Peptic ulcer disease

Hypertrophic pyloric stenosis

Gastric polyps

caustic ingestion

Pancreatic pseudocyst

crohn's disease

Bouveret syndrome

Malignant :

Adenocarcinoma

Lymphoma

Gastrointestinal stromal tumors

Investigations

1. Endoscopy : (most important investigation):

The stomach should be emptied using a wide-bore gastric tube. A large **nasogastric tube** may not be sufficiently large to deal with the contents of the stomach, and it may be necessary to pass an **orogastric tube** and **lavage the stomach** until it is completely emptied.

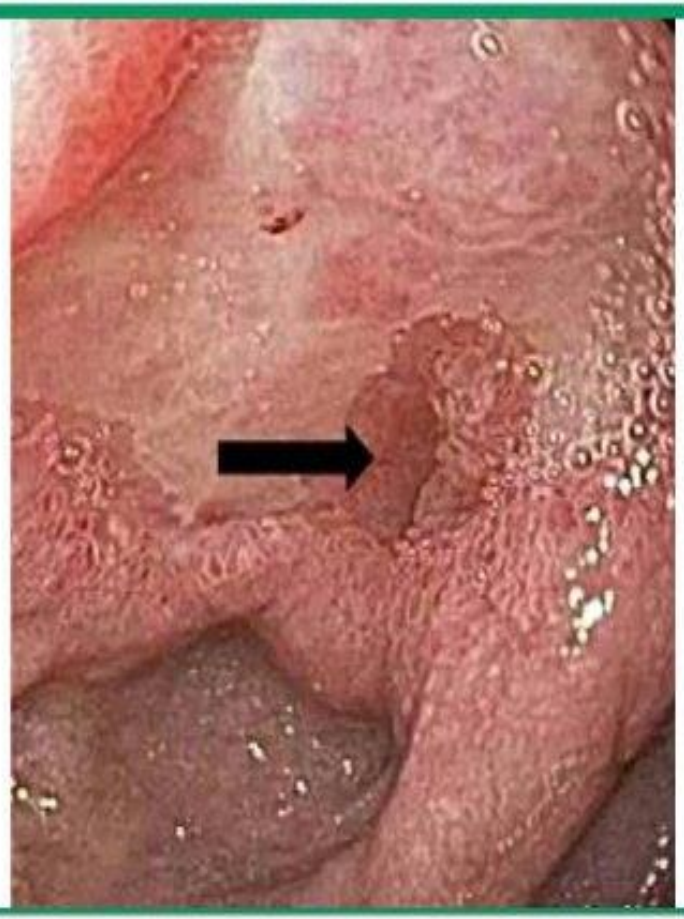
- **It shows** stenosed inactive pyloric ring .

- **Identifies** the level of obstruction

- Failure of the tip of the endoscope to pass to the duodenum .

- **Detect the cause & take biopsy to exclude malignancy** .

Gastric outlet obstruction due to peptic ulcer disease



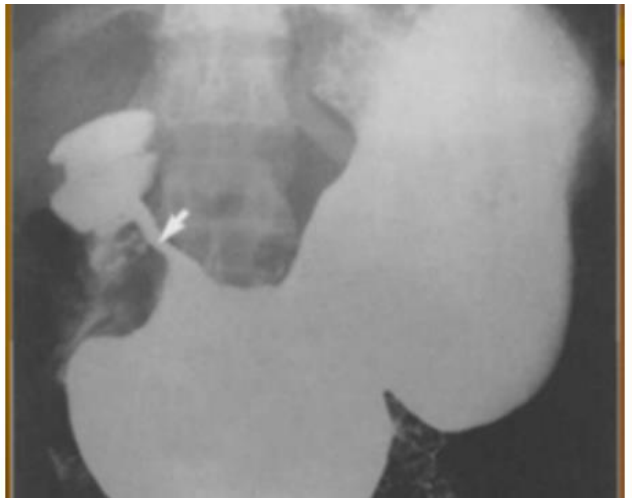
Endoscopic view of the pre-pylorus in a patient with acute on chronic peptic ulcer disease and associated gastric outlet obstruction. The black arrow indicates the narrowed pylorus.

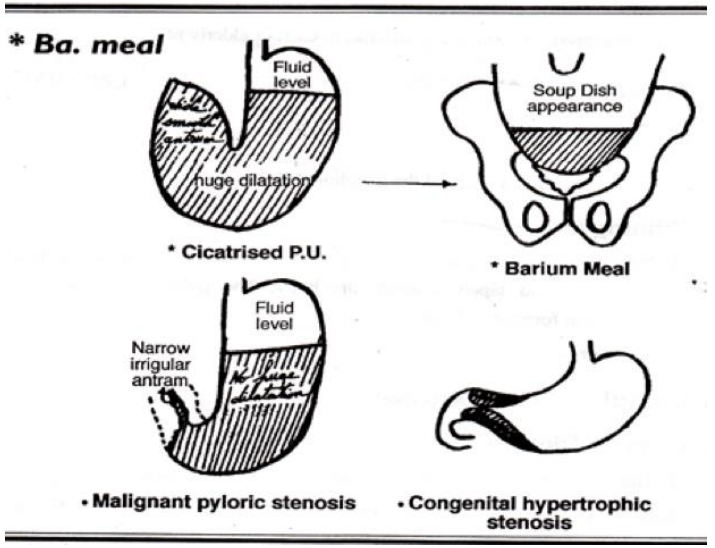
Investigation

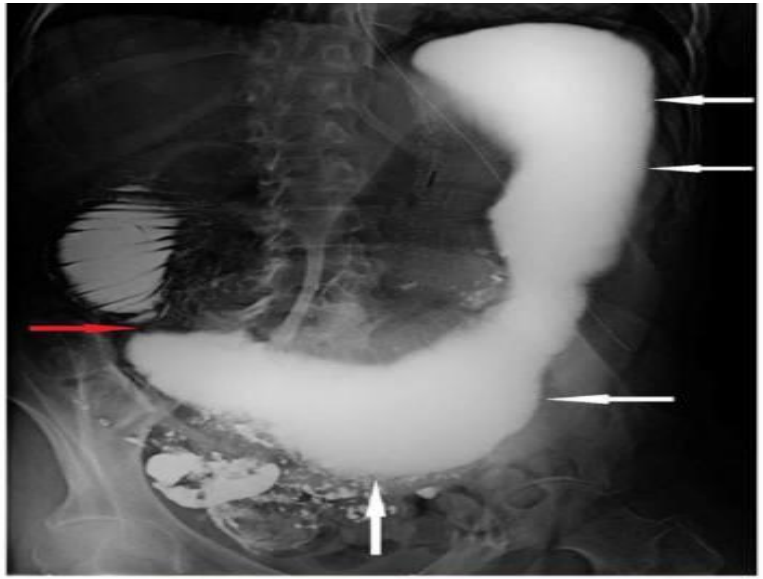
2- Barium meal:

After **6 hours** of fasting barium is administered **orally** then **x ray** is taken in supine position at intervals **of 20-30 min**

-Hugely dilated stomach (<u>may</u> <u>reach the pelvis</u>) with wide smooth antrum ,and the point of obstruction is visualized by string sign (D.D. from carcinoma in which there is narrow irregular pylorus with mild proximal dilatation).



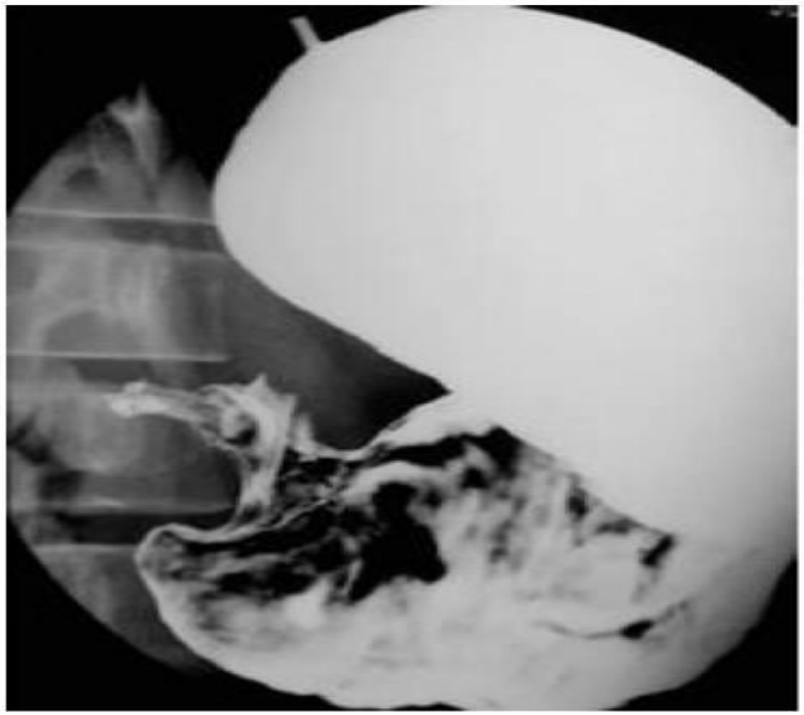




Benign Gastric Outlet Obstruction

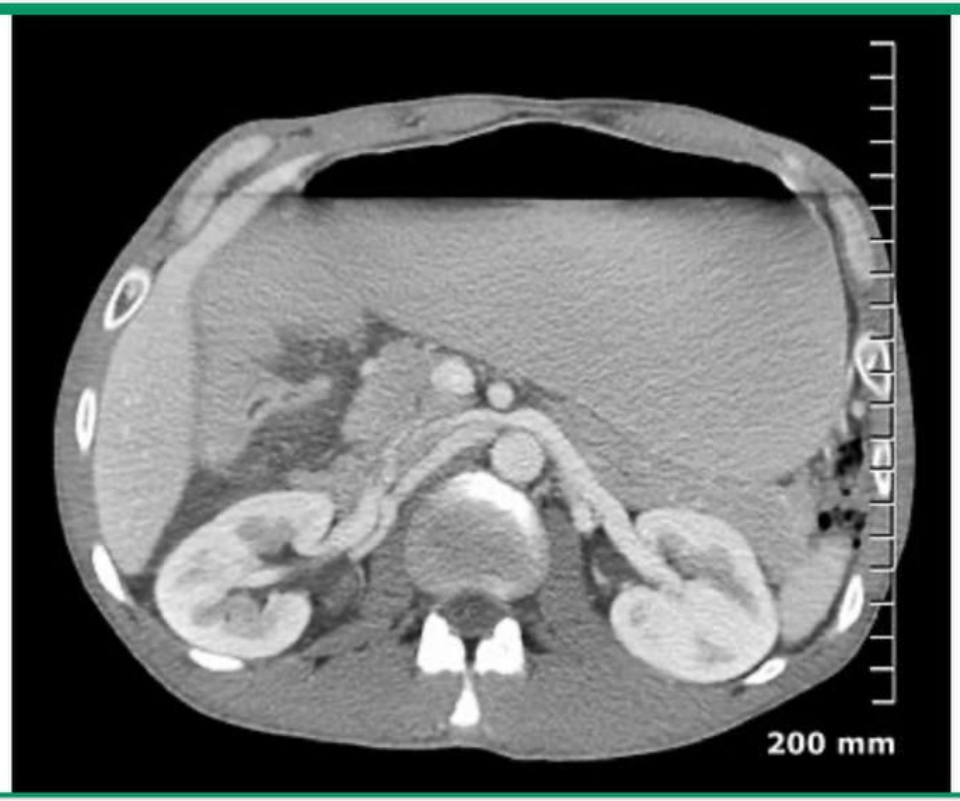
Malignant Gastric Outlet Obstruction

(Malignancy in pyloric region)



CT

CT of the abdomen in a patient with gastric outlet obstruction



Abdominal CT in a patient with gastric outlet obstruction due to peptic ulcer disease showing a distended and fluid filled stomach.

Other Investigations

* a complete blood count (CBC) : hemoglobin and hematocrit to rule out the possibility of anemia.

* electrolyte panel

* Liver function tests : may be helpful, particularly when a malignant etiology is suspected.

* A test for H pylori : is helpful when the diagnosis of peptic ulcer disease (PUD) is suspected.

* Kidney function test (KFT) ; prerenal failure .

* sodium chloride load test

Management

Managememt should involve correcting the metabolic abnormality and dealing with the mechanical problem :

Conservative management :

1- Nasogastric suction by **NG tube .**
2- Acid suppression by **PPI .**
3- Fluid replacement ((the patient should be rehydrated with **IV isotonic saline** with **potassium supplementation**. (Replacing the sodium chloride and water allows the kidney to correct the acid–base abnormality) .

4- Correct the electrolyte abnormalities

5-Eradication therapy of H.pylori

Interventional Treatment:

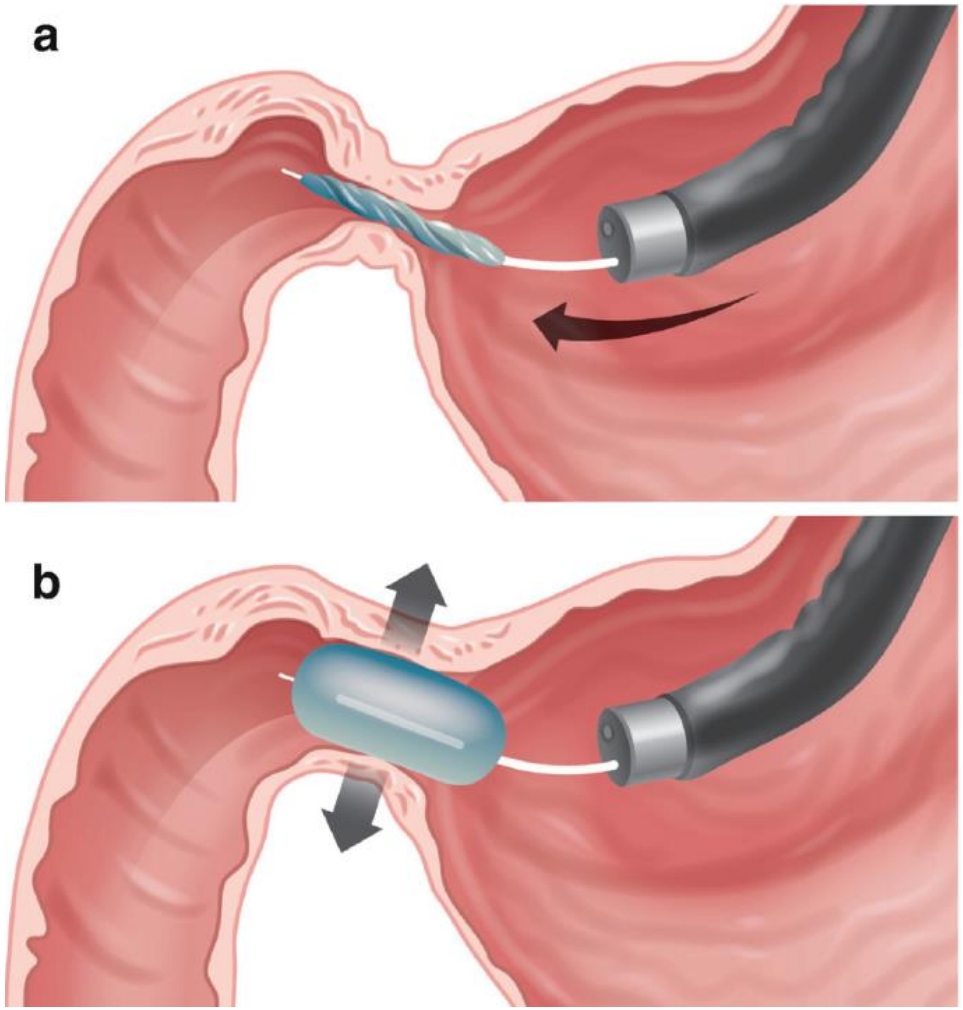
* Endoscopic balloon dilatation

Multiple dilatations are required

Durable response seen in 70-80% of cases

Immediate improvement of symptoms

Perforation risk 3-7%



Management

Abd-Elrhman Samara

General management

Supportive measures — Supportive measures include fluid resuscitation based on the hemodynamic status, correction of associated electrolyte abnormalities, and blood transfusions in selected patients with gastrointestinal bleeding. Patients should be kept fasting in anticipation of endoscopic or surgical intervention.
Early surgical consultation allows for preoperative preparation should urgent surgical intervention become necessary.

Acid suppressive therapy is a type of medication that reduces the amount of acid produced by the stomach. It is commonly used to treat peptic ulcer disease (PUD), which is a condition in which open sores (ulcers) form on the lining of the stomach and/or the upper part of the small intestine (duodenum).

The two main types of acid suppressive therapy are proton pump inhibitors (PPIs) and H2 blockers.

- PPIs are the most effective type of acid suppressive therapy. They work by blocking the production of acid in the stomach.

with an intravenous (IV) proton pump inhibitor (PPI; eg, esomeprazole 80 mg bolus). Typically, endoscopy is performed on these patients within 12 hours. However, if endoscopy is delayed, a second dose of an IV PPI should be given 12 hours later (eg, esomeprazole 40 mg). For patients who may have stopped bleeding (eg, patients who are hemodynamically stable with melena), we give an IV PPI every 12 hours (eg, esomeprazole 40 mg). Subsequent dosing will then depend on presence of high-risk stigmata of recent hemorrhage on endoscopic evaluation

In patients with other peptic-ulcer-related complications (gastric outlet obstruction, penetration, perforation), high-dose twice-daily PPI treatment is reasonable to enhance healing (eg, oral omeprazole 40 mg twice daily), but dosing should generally be reduced to once daily after four weeks [26-28].

The duration of treatment is based on the ulcer location and underlying etiology.

- H2 blockers are less effective than PPIs, but they are often used as first-line treatment for mild PUD. They work by reducing the amount of acid produced by the stomach. Commonly used H2 blockers include ranitidine (Zantac) and famotidine (Pepcid).

Acid suppressive therapy is generally safe and well-tolerated. However, some people may experience side effects such as headache, diarrhea, constipation, and abdominal pain. In rare cases, PPIs can cause more serious side effects such as low magnesium levels, bone fractures, and pneumonia.

Discontinue NSAIDs — If aspirin or non-aspirin nonsteroidal anti-inflammatory drugs (NSAIDs) can be discontinued, even complicated ulcers readily heal and uncommonly recur.

If non-aspirin NSAIDs must be continued, the incidence of recurrent PUD can be decreased by switching to a COX-2 inhibitor with concomitant therapy with a PPI or misoprostol (for rare patients who are unable to take PPIs or have contraindications to PPI use).

Likewise, when continued low-dose aspirin is justified, concomitant cotherapy with a PPI is indicated. Strategies for secondary prevention of gastroduodenal toxicity due to NSAIDs are discussed in detail elsewhere.

Evaluation for H. pylori — Patients should be evaluated for H. pylori.

There are a number of ways to evaluate H. pylori infection as the cause of peptic ulcers. These include:

• Blood test: A blood test can detect the presence of H. pylori antibodies in the blood.

• Stool test: A stool test can detect the presence of H. pylori antigens in the stool.

• Breath test: A breath test can detect the presence of H. pylori bacteria in the stomach.

• Endoscopy: Endoscopy is a procedure in which a thin, flexible tube with a camera is inserted through the mouth or rectum to examine the stomach and duodenum. Endoscopy can also be used to take biopsies of tissue from the stomach or duodenum for testing for H. pylori.

Eradication of H. pylori dramatically reduces recurrent ulcers and complications. H. pylori testing (eg, biopsy urease test, urea breath test) in the setting of ulcer bleeding or PPI use may result in false-negative results, so repeat testing is required for patients whose initial tests are negative. A urea breath test for H. pylori performed as soon as the patient has resumed oral feedings is a reasonably sensitive predictor of H. pylori infection.

We typically defer treatment of H. pylori with oral antibiotics until patients are tolerating oral feedings. Interrupted treatment may encourage resistance and should be avoided.

Management of specific complications

- Bleeding : The management of upper GI bleeding depends on the severity of the bleeding. If the bleeding is mild, it may stop on its own or with supportive measures, such as intravenous fluids and blood transfusions. If the bleeding is more severe, endoscopic or surgical intervention may be necessary.

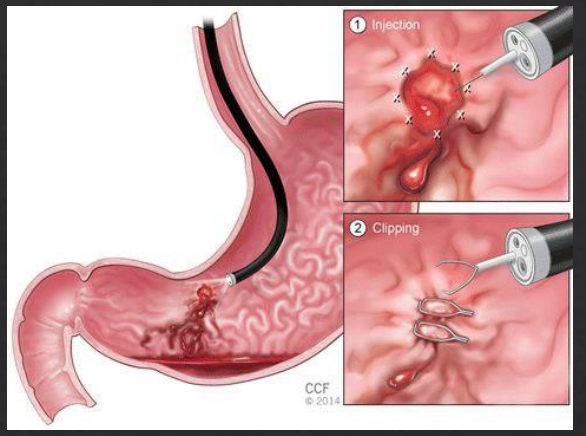
- Upper endoscopy is the best initial diagnostic and therapeutic procedure in the management of bleeding peptic ulcers. Surgery and transcatheter arteriography/intervention are generally reserved for patients with failed therapeutic endoscopy.

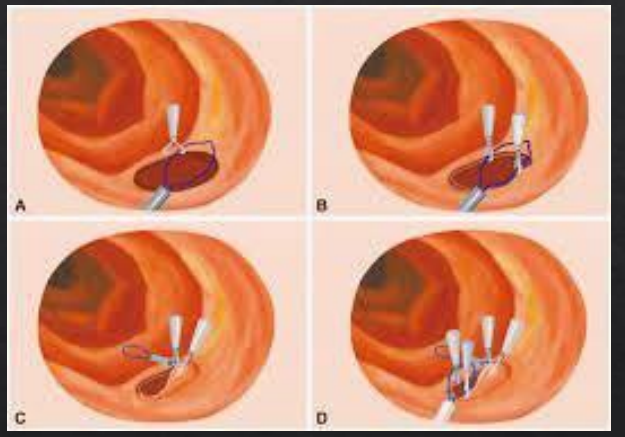
There are a number of techniques that can be performed during an EGD to control bleeding from an ulcer. The gastroenterologist might inject medications, use a catheter to cauterize the ulcer (burn a bleeding vessel shut) or place a small clip to clamp off a bleeding vessel.

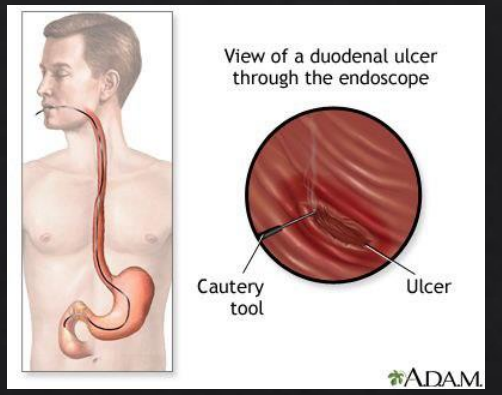
Endoscopic adrenaline injection: Adrenaline injection into bleeding gastric ulcer is used for vasoconstriction and provides temporary haemostasis. It improves visualisation of the affected area prior to a definitive treatment. Definitive treatment may be: resection, thermal coagulation, clipping, suturing or injection of a sclerosant.

Endoscopic clipping: is a minimally invasive procedure that uses metal clips to seal off bleeding blood vessels in the gastrointestinal tract (close two mucosal surfaces without the need for surgery and suturing).

Endoscopic cauterization: is a minimally invasive procedure that uses heat to seal off bleeding blood vessels in the gastrointestinal tract. The risks of endoscopic cauterization are generally low, but they can include: Pain, Bleeding, Infection, Perforation of the gastrointestinal tract, Damage to nearby organs.





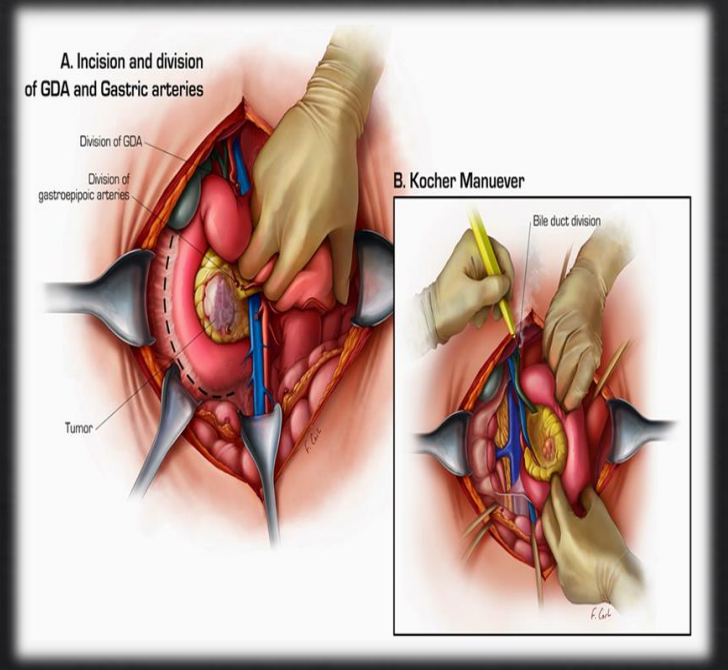


- Surgery : The most common site of bleeding from a peptic ulcer is the duodenum.

It is essential that the duodenum is fully mobilized.

This should be done before the duodenum is opened as it makes the ulcer much more accessible and also allows the surgeon's hand to be placed behind the gastroduodenal artery, which is commonly the source of major bleeding.

So first we do Kocher maneuver
(the dissection of the lateral peritoneal attachments of the duodenum to allow inspection of the duodenum, pancreas, and other retroperitoneal structures over to the great vessels)



- THEN , Following mobilization, the duodenum, and usually the pylorus, is opened **longitudinally**

- if the vessel within the ulcer is bleeding , this should be controlled using well-placed sutures on a small round bodied needle that under-run the vessel. The placing of more and more inaccurately positioned sutures is counterproductive. Following under-running, it is often possible to close the mucosa over the ulcer

- Bleeding from the GDA is controlled with a three-point U stitch technique. This consists of a superior suture, inferior suture, and a horizontal suture creating a "U" stitch for the transverse pancreatic artery.

- then closed with interrupted sutures in a transverse direction to avoid narrowing

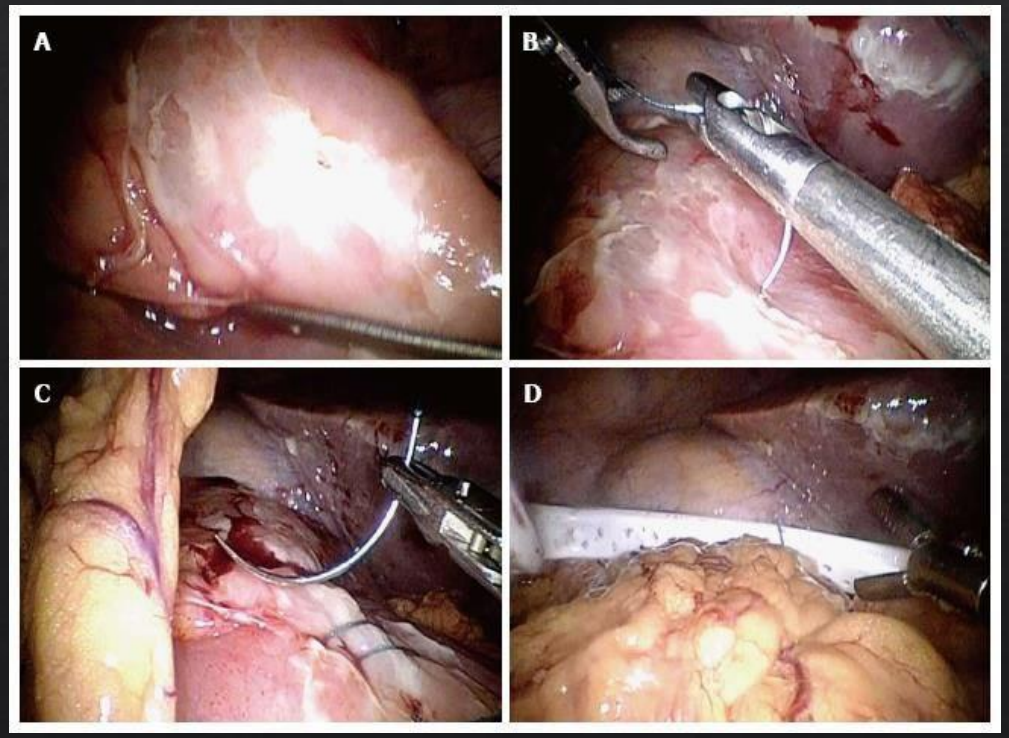
- Perforation – Many ulcer-related perforations of the stomach and duodenum require surgical repair (open or laparoscopic). However, nonoperative management may be used is selective patients. The management of gastric and duodenal perforations and surgical repair of PUD are discussed in detail separately.

Perforation is a serious complication of PUD that requires immediate medical attention. Treatment typically involves surgery to repair the hole in the stomach or duodenum.

Surgery: Surgery is typically required to repair the perforation and prevent further complications Surgical treatment options for peptic ulcer perforation include:

1) Laparotomy: This is a traditional open surgery that involves making a large incision in the abdomen to access the perforation.

1) Laparoscopic surgery: This is a minimally invasive surgery that involves making small incisions in the abdomen and using a camera and surgical instruments to repair the perforation.



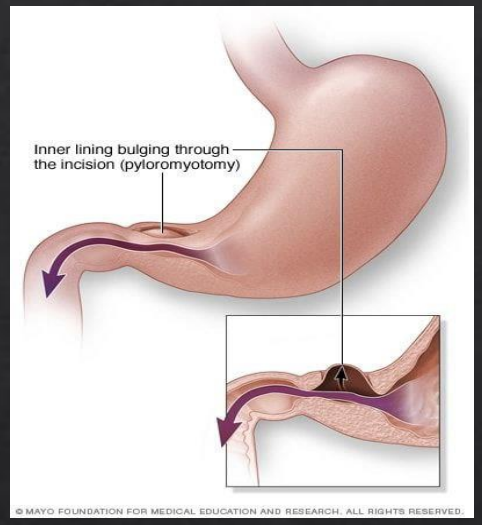
- **Gastric outlet obstruction:** it can be caused by a variety of factors, including PUD, scarring, and tumors.

The management of gastric outlet obstruction depends on the underlying cause. If the obstruction is caused by PUD, it may be treated with medication, such as a PPI or H2 blocker. If the obstruction is caused by scarring or a tumor, surgery may be necessary.

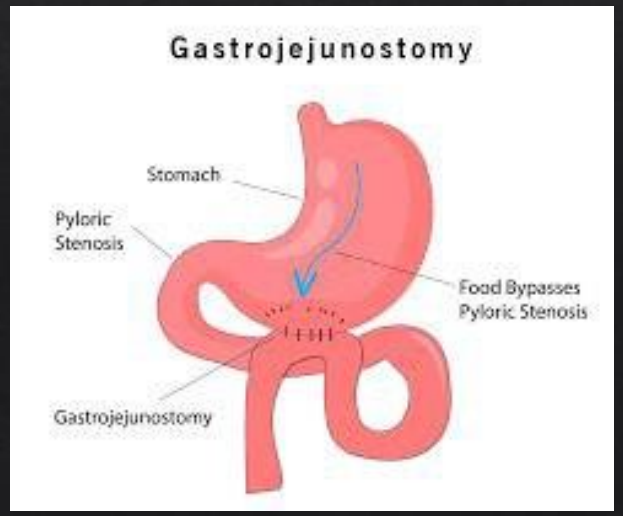
Surgery

Surgical treatment options for GOO caused by peptic ulcer include:

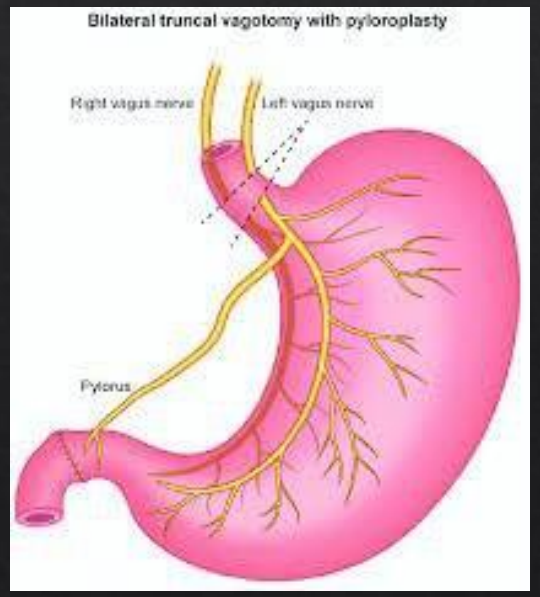
1) Pyloromyotomy: This procedure involves cutting the muscle at the pylorus to widen the opening and relieve the obstruction.



2) Gastrojejunostomy: This procedure involves creating a new opening between the stomach and the jejunum, bypassing the duodenum.



3) Vagotomy: This procedure involves cutting the vagus nerve, which reduces the amount of acid produced by the stomach.

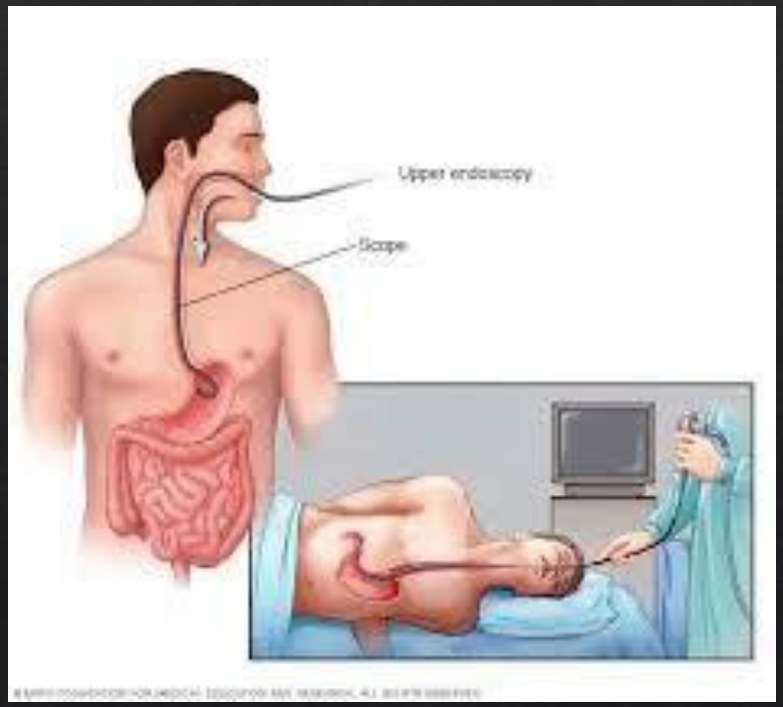


SUBSEQUENT MANAGEMENT

Upper endoscopy

An upper endoscopy is a procedure in which a thin, flexible tube with a camera on the end is inserted through the mouth and into the stomach and duodenum.

- Most patients with PUD who have a complication should have upper endoscopy to rule out cancer
- If you have PUD and a complication, upper endoscopy can help your doctor rule out cancer.
- If your ulcer is not healing, upper endoscopy can be repeated after 8 to 12 weeks to check on its progress.



Upper endoscopy is the most accurate way to diagnose PUD. It allows the doctor to see the ulcers directly and to take tissue samples for biopsy. Biopsies can be used to rule out other causes of ulcers, such as cancer.

Upper endoscopy can also be used to treat PUD. During the procedure, the doctor can use a variety of instruments to stop bleeding from ulcers, inject medications into ulcers to promote healing, or remove ulcers altogether.

Upper endoscopy is a safe and effective procedure for the diagnosis and treatment of PUD. It is also a relatively quick and easy procedure, with most patients able to go home the same day.

The risks of upper endoscopy are very low. However, there is a small risk of bleeding, perforation of the digestive tract, and infection.

Thank you