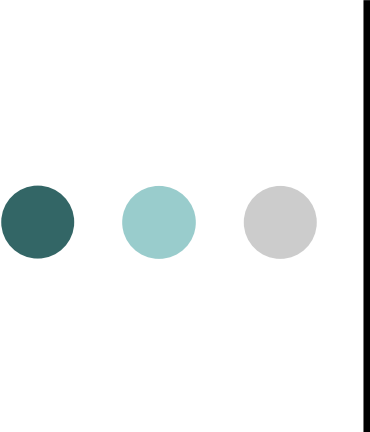


CM w Bydgoszczy UMK w Toruniu

Włodzimierz Gniłka



# **Gastrointestinal bleeding and life threatening conditions in surgery**



# Gastrointestinal hemorrhage

- **Upper GI hemorrhage** – *proximal to the Treitz ligament (accounts for more than 80% of acute bleeding)*
- **Lower intestinal hemorrhage** – *distal to the Treitz ligament*



# Gastrointestinal hemorrhage

- **Acute bleeding**

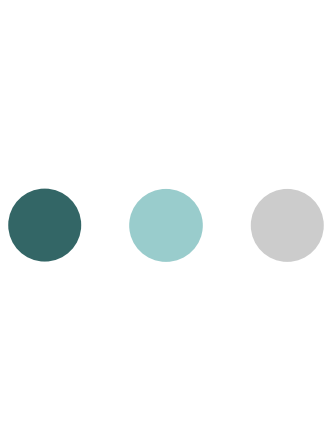
*blood loss exceeds 500 ml*

- **Chronic bleeding**

*blood loss 50 ml/day*

- **Occult bleeding**

*is not apparent to the patient until presentation with symptoms related to the anemia.*



Upper Gastrointestinal hemorrhage



## Upper Gastrointestinal hemorrhage

Acute gastrointestinal hemorrhage may range from trivial to massive and can originate from virtually any region of the gastrointestinal tract, including the pancreas, liver and biliary tree.



## Upper Gastrointestinal hemorrhage

Most patients with an acute hemorrhage stop bleeding spontaneously. However, in almost 15% of cases, major bleeding persists, requiring emergent resuscitation, evaluation and treatment. Improvement of the management of these patients, primarily by early endoscopy and directed therapy, has significantly reduced the length of hospitalization. Despite this, the mortality rate remains greater than 5% and is significantly higher in those patients initially hospitalized for other reasons.



## Acute Gastrointestinal hemorrhage

- In patients with GI bleeding, several fundamental principles of initial evaluation and management must be followed.



# Acute Gastrointestinal hemorrhage

## Initial assesment and resuscitation

Assess airway, breathing, and circulation (ABCs)

Assess magnitude of bleeding

Initiate appropriate monitoring

Laboratory evaluation



## History and exam

Identify risk factors

Previous surgery

Medications



## Localize bleeding

Nasogastric tube aspirate

Endoscopy

Other studies as needed



## Initiate therapy

Pharmacologic, Endoscopic

Angiographic

Surgical





# Upper Gastrointestinal hemorrhage

- 80-85% - stop bleeding spontaneously
- 15-20% - endoscopic treatment
- 15% - endoscopically treated requires surgery



70% urgency procedure



30% planned procedure



# Upper Gastrointestinal hemorrhage

## Symptoms:

- Coffee-ground vomit refers to the vomiting of black material which is assumed to be blood; it implies that bleeding has ceased or has been relatively modest.
- Melaena: black tarry stools, usually due to acute UGIB but occasionally bleeding from the small bowel or right side of the colon.
- Haematemesis: bright red haematemesis usually implies active haemorrhage. Patients presenting with haematemesis have a higher mortality than those presenting with melaena alone.
- Haematochezia: passage of fresh or altered blood per rectum, usually due to colonic bleeding but occasionally due to profuse upper gastrointestinal or small bowel bleeding.
- Abdominal pain, epigastric pain
- Weakness
- Loss of blood: shock, syncope, presyncope



# Acute Upper Gastrointestinal hemorrhage

## Aetiology

- Peptic ulcer
- Oesophagitis
- Gastritis/erosions
- Erosive duodenitis
- Varices
- Portal hypertensive gastropathy
- Malignancy
- Mallory-Weiss tear
- Vascular malformation

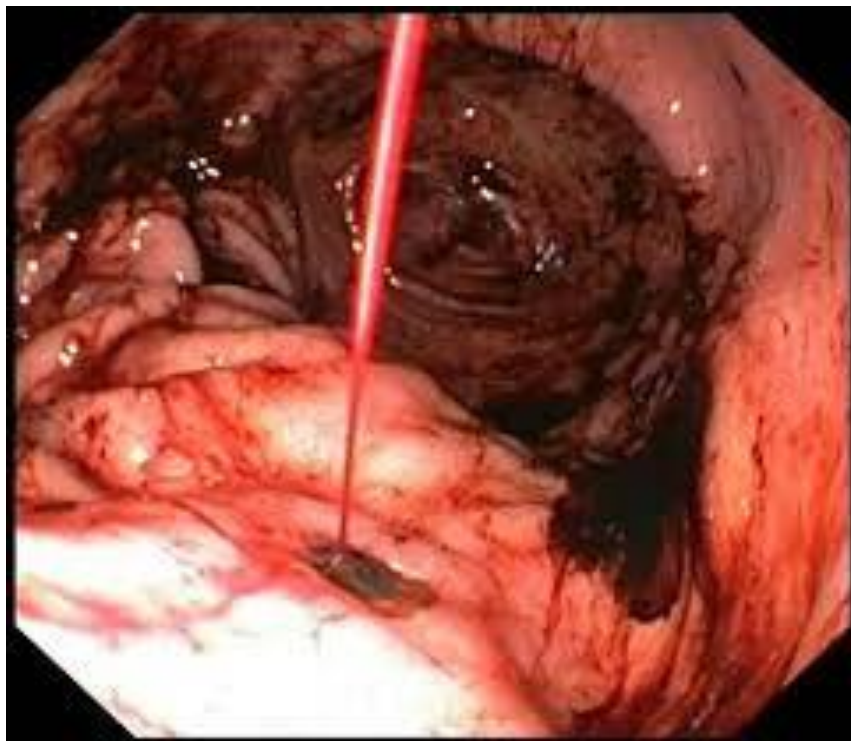


# Acute Upper Gastrointestinal hemorrhage

## ○ PUD

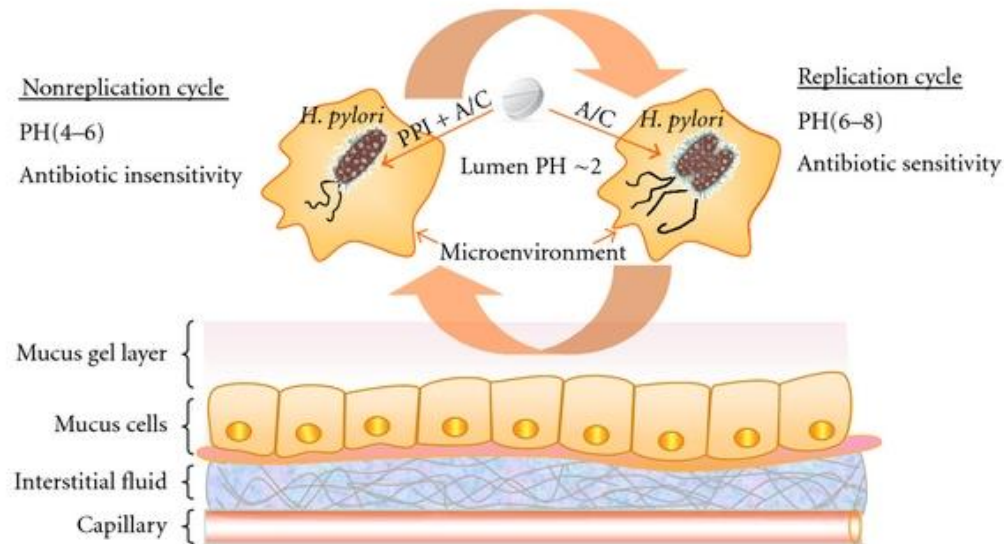
- peptic ulcer disease still represent the most frequent cause of upper GI hemorrhage accounting for about 40 % of all cases. About 10 to 15% of patients with peptic ulcer disease develop bleeding.
- bleeding develops as a consequence of acid-peptic erosion of the mucosal surface. Although chronic blood loss is common with any ulcer, significant bleeding typically results when there is involvement of an artery, either of the submucosa or, with penetration of the ulcer, an even larger vessel.
- although duodenal ulcers are more common than gastric ulcer, gastric ulcers bleed more commonly; as a result, in most series the relative proportions are nearly equal. The most significant hemorrhage occurs when duodenal or gastric ulcers penetrate into branches of the gastroduodenal artery or left gastric artery, respectively.

# Acute Upper Gastrointestinal hemorrhage



# Acute Upper Gastrointestinal hemorrhage

- The incidence of uncomplicated peptic ulcer has declined dramatically. This recent change has been attributed to better medical therapy, including proton pump inhibitors (PPI's) and regimens for eradication of *Helicobacter pylori*.



The need for operation for perforated peptic ulcer disease has declined as well,

surgical intervention for bleeding peptic ulcer disease has remained relatively stable



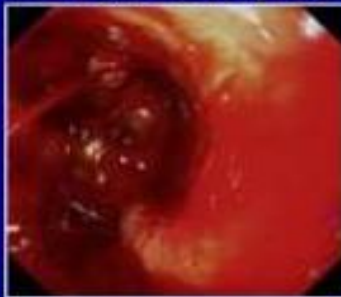
# Acute Upper Gastrointestinal hemorrhage

- Endoscopic therapy is instituted if bleeding is active or, when bleeding has already stopped, if there is a significant risk for rebleeding.
- The ability to predict the risk for rebleeding permits prophylactic therapy, closer monitoring and earlier detection of hemorrhage in a high-risk patients.
- The forest classification was developed in an attempt to assess the risk based are on endoscopic findings, and to stratify the patients into low, intermediate and high-risk groups.

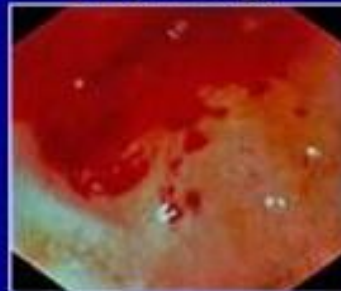
# Acute Upper Gastrointestinal hemorrhage

## Forrest's classification for PU bleeding

**I-a (arterial jet )**



**I-b (oozing)**



**II-a (visible vessel)**



**II-b (adherent clot)**



**II-c (black spot)**



**III (clean base)**







## Acute Upper Gastrointestinal hemorrhage

### PUD Medical management

- PPI
- Eradication H. pylori

### PUD Endoscopic Management:

- epinephrine injection
- heater probes and coagulation
- application of hemoclips

## Acute Upper Gastrointestinal hemorrhage

### ○ Rebleeding - Second attempt





## Acute Upper Gastrointestinal hemorrhage

- Surgical management
  - 10% of patients with bleeding still require surgical intervention



## Acute Upper Gastrointestinal hemorrhage

- Indications for surgery in gastrointestinal hemorrhage:
  - Hemodynamic instability despite vigorous resuscitation (>6 units transfusion)
  - Failure of endoscopic techniques to arrest hemorrhage
  - Recurrent hemorrhage after initial stabilization (with up to two attempts at obtaining endoscopic hemostasis)
  - Shock associated with recurrent hemorrhage
  - Continued slow bleeding with a transfusion requirement exceeding 3 units/day



## Acute Upper Gastrointestinal hemorrhage

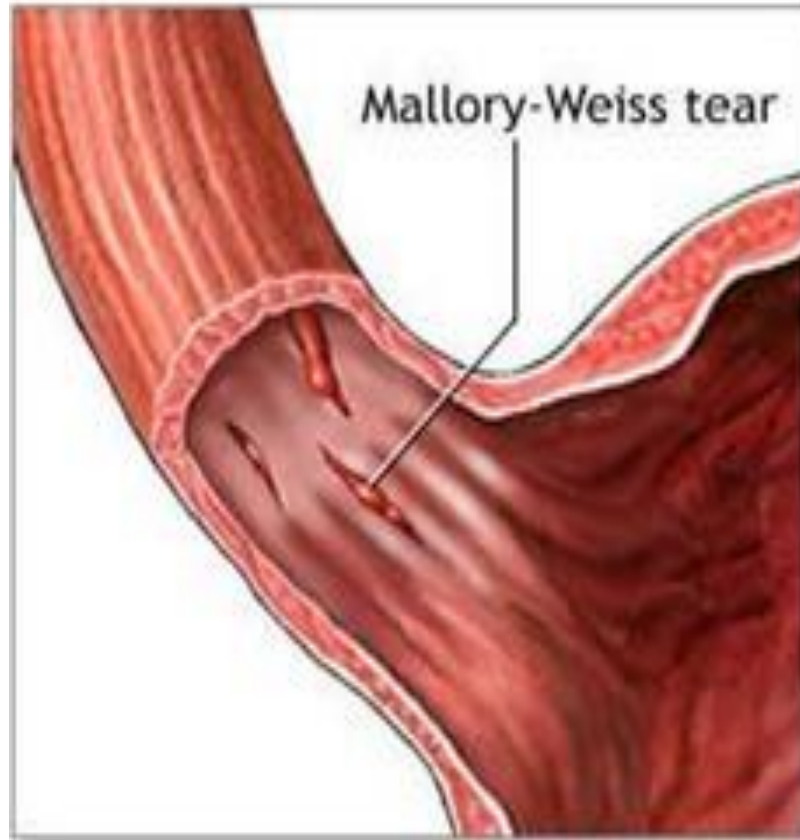
- In Mallory-Weiss syndrome lacerations are longitudinal tears in the esophagus at the esophagogastric junction, attributed to episodes of excessive vomiting in the setting of toxic gastritis, with failure of lower esophageal sphincter relaxation.

# Acute Upper Gastrointestinal hemorrhage



Mallory-Weiss syndrome

# Acute Upper Gastrointestinal hemorrhage





# Acute Upper Gastrointestinal hemorrhage

- Rare causes include:
- Dieulafoy's lesion (a vascular malformation of the proximal stomach).
- Angiodysplasia.
- Haemobilia (bleeding from the gallbladder or biliary tree).
- Pancreatic pseudocyst and pseudo-aneurysm.
- Aortoenteric fistula.
- Bleeding diathesis.
- Ehlers-Danlos syndrome.
- Pseudoxanthoma elasticum.
- Gastric antral vascular ectasia.
- Osler-Weber-Rendu syndrome.



## Upper Gastrointestinal hemorrhage

Dieulafoy's Lesion are vascular malformations found primarily along the lesser curve of stomach within 6 cm of the gastroesophageal junction.



## Acute Upper Gastrointestinal hemorrhage

- Gastric antral Vascular ectasia also known as „water melon stomach”





## Acute Upper Gastrointestinal hemorrhage

- Malignancy:
- Malignancies of the upper GI tract are usually associated with chronic anemia or hemoccult-positive stool, rather than episodes of significant hemorrhage



## Acute Upper Gastrointestinal hemorrhage

- Aortoenteric fistula – Primary aortoduodenal fistulas are rare lesions developing up to 1% of aortic graft cases. They typically develop in the setting of a previous abdominal aneurysm repair.
- Hemorrhage in this situation is often massive and fatal unless immediate surgical intervention is undertaken.

# Acute Upper Gastrointestinal hemorrhage

## Hospital admission

**Consider for admission and early endoscopy (and calculation of full Rockall score) if:**

- aged  $\geq 60$  years  
(all patients who are aged  $>70$  years should be admitted); or
- witnessed haematemesis or haematochezia  
(suspected continued bleeding); or
- haemodynamic disturbance  
(systolic blood pressure  $<100$  mm Hg, pulse  $\geq 100$  beats per minute); or
- liver disease or known varices.





## Acute Upper Gastrointestinal hemorrhage

### **Resuscitation and initial management**

Shocked patients should receive prompt volume replacement. It has been demonstrated that early and aggressive resuscitation reduces mortality in UGIB

- Correct fluid losses (place two wide-bore cannulae and also send bloods at the same time). Either colloid or crystalloid solutions may be used to achieve volume restoration prior to administering blood products; red cell transfusion should be considered after loss of 30% of the circulating volume.
- Transfuse patients with massive bleeding with blood, platelets and clotting factors in line with local protocols for managing massive bleeding. Major haemorrhage protocols should be in place.
- Decisions on blood transfusion should be based on the full clinical picture; over-transfusion may be as damaging as under-transfusion.
- Platelet transfusions should not be offered to patients who are not actively bleeding and are haemodynamically stable.
- Platelet transfusions should be offered to patients who are actively bleeding and have a platelet count of less than  $50 \times 10^9/\text{litre}$ .
- Fresh frozen plasma should be used for patients who have either a fibrinogen level of less than 1 g/litre, or a prothrombin time (INR) or activated partial thromboplastin time greater than 1.5 times normal.
- Prothrombin complex concentrate should be used for patients who are taking warfarin and actively bleeding.
- Recombinant factor VIIa should not be used except when all other methods have failed.
- Proton pump inhibitors (PPIs) should not be used prior to diagnosis by endoscopy in patients presenting with acute UGIB.



# Rockall Numerical Risk Scoring System

## assessment of bleeding risk

- Age
  - Score 0: Age less than 60 years
  - Score 1: Age 60 to 79 years
  - Score 2: Age 80 years or older
- Shock symptoms
  - Score 0: Shock absent, normal Heart Rate and Blood Pressure
  - Score 1: Heart Rate 100 or higher
  - Score 2: Systolic Blood Pressure <100 mmHg (and Heart Rate 100 or higher)
- Comorbidity
  - Score 0: None
  - Score 2: CHF, CAD or other major comorbidity
  - Score 3: Renal Failure, liver failure or metastatic cancer
- Endoscopic diagnosis
  - Score 0: No lesion and no stigmata of recent Hemorrhage (or Mallory-Weiss tear)
  - Score 1: All other Upper Gastrointestinal Bleeding causes (except upper gastrointestinal cancer)
  - Score 2: Upper gastrointestinal tract cancer
- Stigmata of recent Gastrointestinal Bleeding
  - Score 0: No stigmata or dark spot only
  - Score 3: Blood in upper GI tract, adherent clot, visible vessel, or actively bleeding or spurting vessel



# Upper Gastrointestinal hemorrhage

- **Interpretation: Total cumulative score**
- Score 0 to 2
  - Rebleeding rate: 3.5 to 5.3%
  - Mortality: 0 to 0.2%
- Score 3
  - Rebleeding rate: 11.2%
  - Mortality: 2.9%
- Score 4
  - Rebleeding rate: 14.1%
  - Mortality: 5.3%
- Score 5
  - Rebleeding rate: 24.1%
  - Mortality: 10.8%
- Score 6
  - Rebleeding rate: 32.9%
  - Mortality: 17.3%
- Score 7
  - Rebleeding rate: 43.8%
  - Mortality: 27%
- Score 8 or higher
  - Rebleeding rate: 41.8%
  - Mortality: 41.1%





# Upper Gastrointestinal hemorrhage

- Endoscopy is now the method of choice for controlling active peptic-ulcer related UGIB.

Endoscopic therapy should only be delivered to actively bleeding lesions, non-bleeding visible vessels and, when technically possible, to ulcers with an adherent blood clot. Black or red spots or a clean ulcer base with oozing do not merit endoscopic intervention since these lesions have an excellent prognosis without intervention.<sup>1</sup>

Adrenaline (epinephrine) should not be used as monotherapy for the endoscopic treatment of non-variceal UGIB. For the endoscopic treatment of non-variceal UGIB, one of the following should be used:

- A mechanical method (eg clips) with or without adrenaline (epinephrine).
- Thermal coagulation with adrenaline (epinephrine).
- Fibrin or thrombin with adrenaline (epinephrine).
- Interventional radiology should be offered to unstable patients who re-bleed after endoscopic treatment. Refer urgently for surgery if interventional radiology is not immediately available.



# Upper Gastrointestinal hemorrhage

## Monitoring of ill patient

- *puls*
- *Arterial pressure*
- *OCŻ*
- *diuresis - 50 ml/h*



## Upper Gastrointestinal hemorrhage

IPP 80 mg-bolus;

followed by continuous intravenous infusion

8mg/h/24h/3 days;



# Upper Gastrointestinal hemorrhage

Monitoring:

Allgöwer rate =

puls / systolic blood pressure

= 0,5 healthy

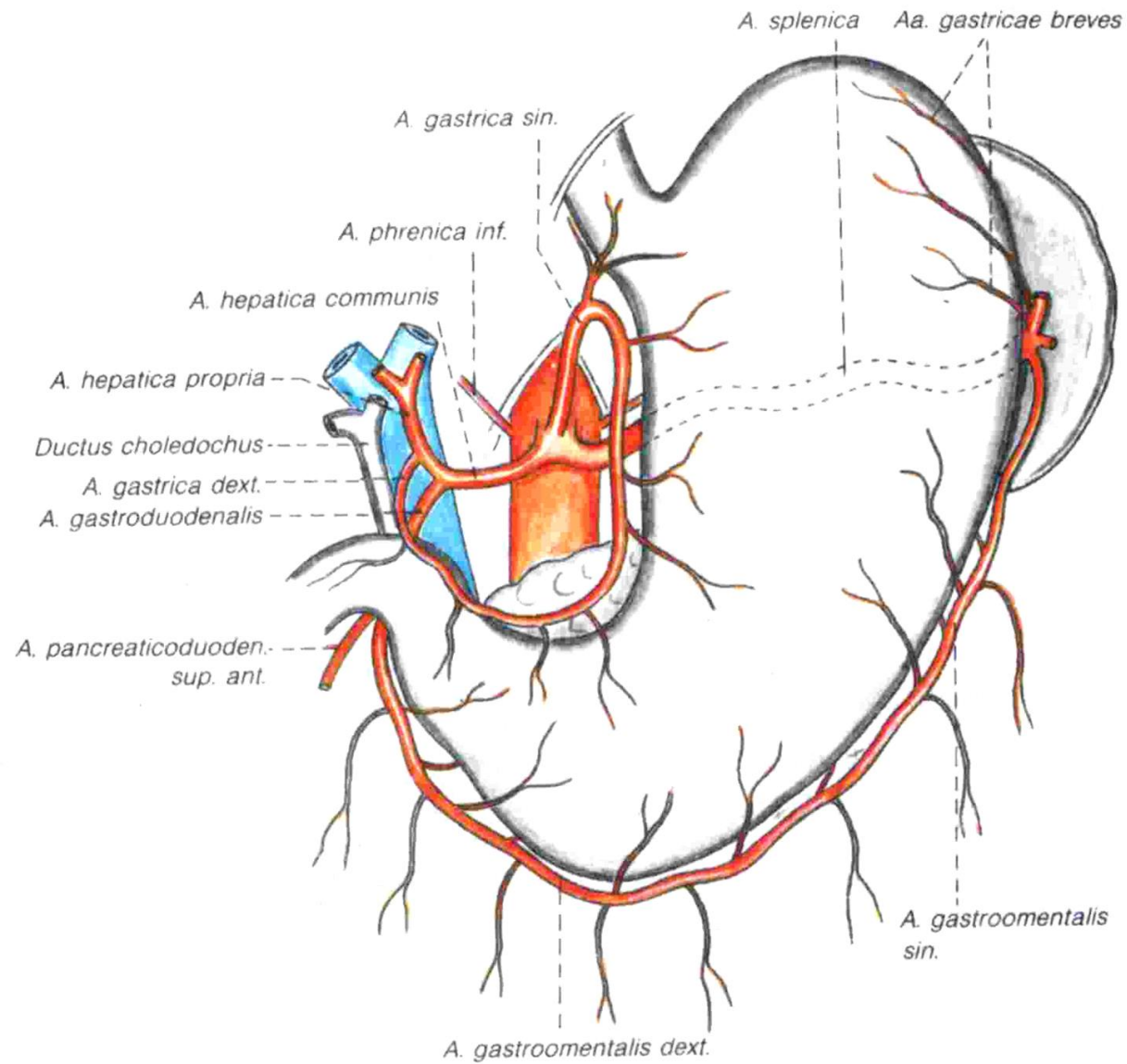
= 1,0 potentially shock

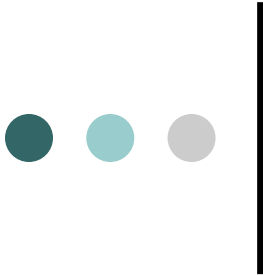
> 1,5 shoc



# Upper Gastrointestinal hemorrhage

Surgery







## Duodenal ulcer

- ***Exposure of the bleeding site, longitudinal duodenotomy or duodenal pyloromyotomy is performed, typically suture ligation suffices.***
- ***Pyloroplasty combined with truncal vagotomy is the most frequently used operation***





# Gastric ulcer

- ***Hemigastrectomy with anastomosis BI or BII, vagotomy***

***Exposure of the bleeding site, gastrotomy is performed***

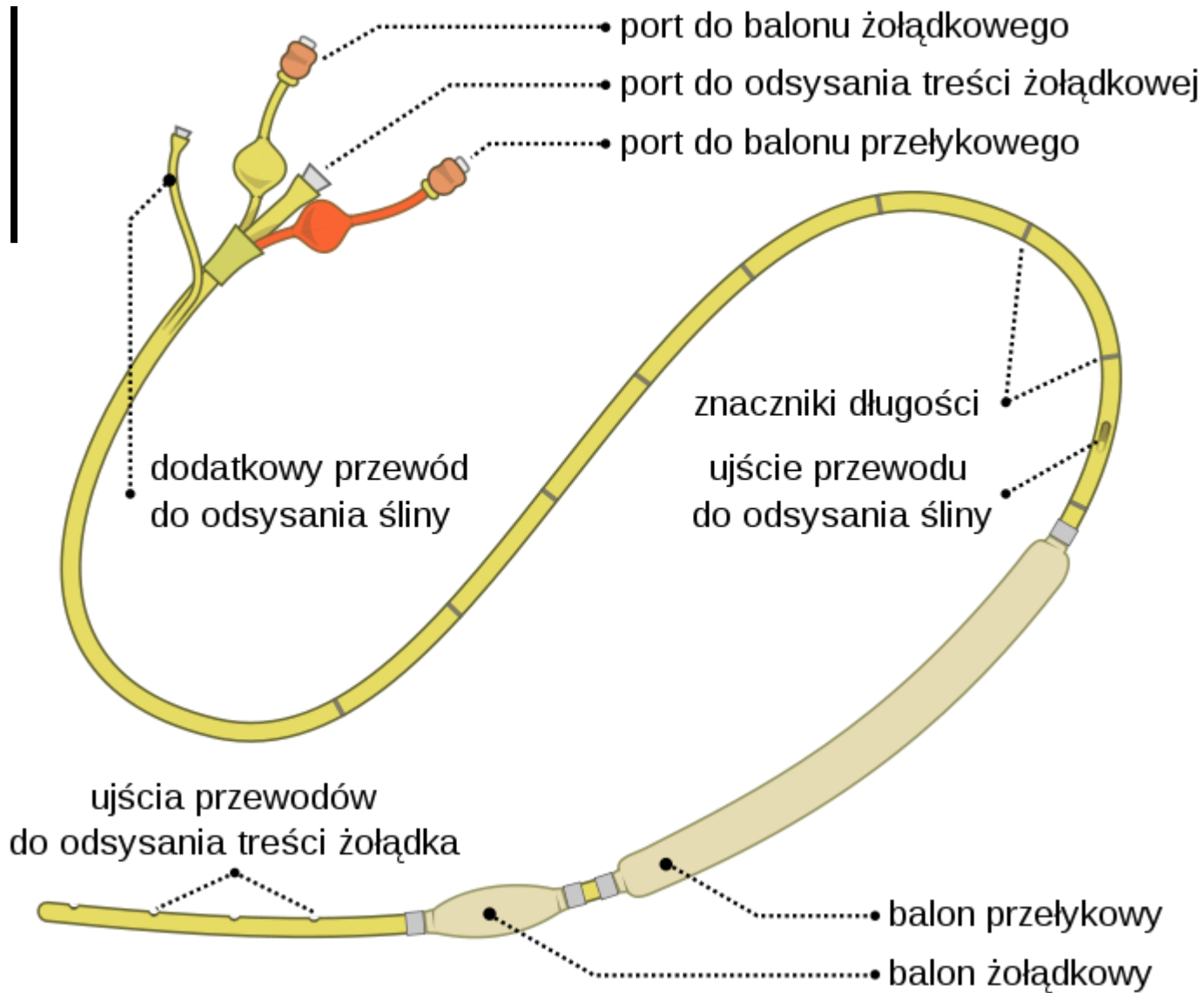
- ***typically suture ligation is associated with 30% rebleeding***

***Gastric ulcer resection***

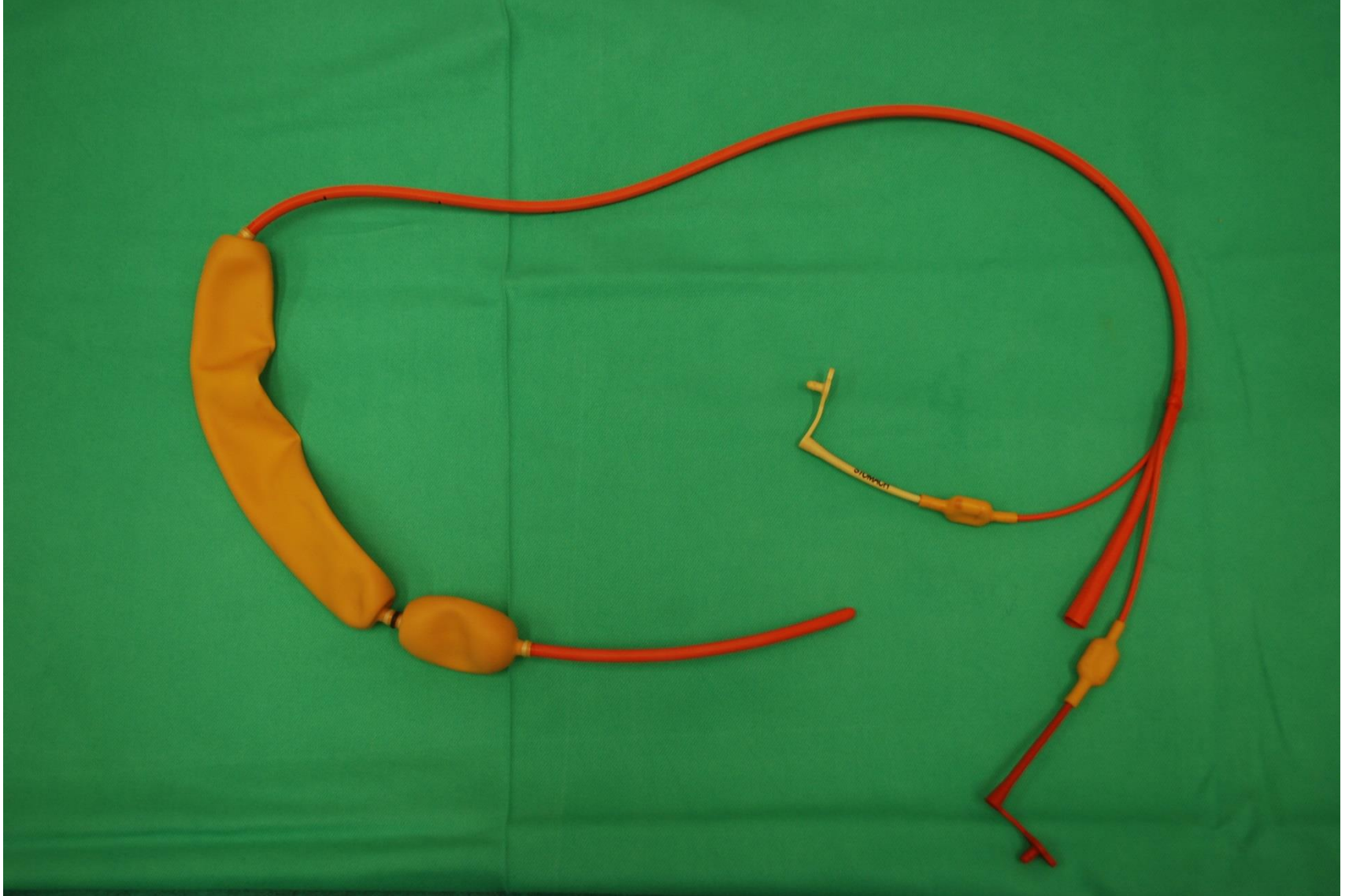


## Upper Gastrointestinal hemorrhage

- **Management of variceal bleeding<sup>l</sup>**
- Terlipressin should be offered to patients with suspected variceal bleeding at presentation. Treatment should be stopped after definitive haemostasis has been achieved, or after five days, unless there is another indication for its use.
- Prophylactic antibiotic therapy should be offered at presentation to patients with suspected or confirmed variceal bleeding.
- Balloon tamponade should be considered as a temporary salvage treatment for uncontrolled variceal haemorrhage.



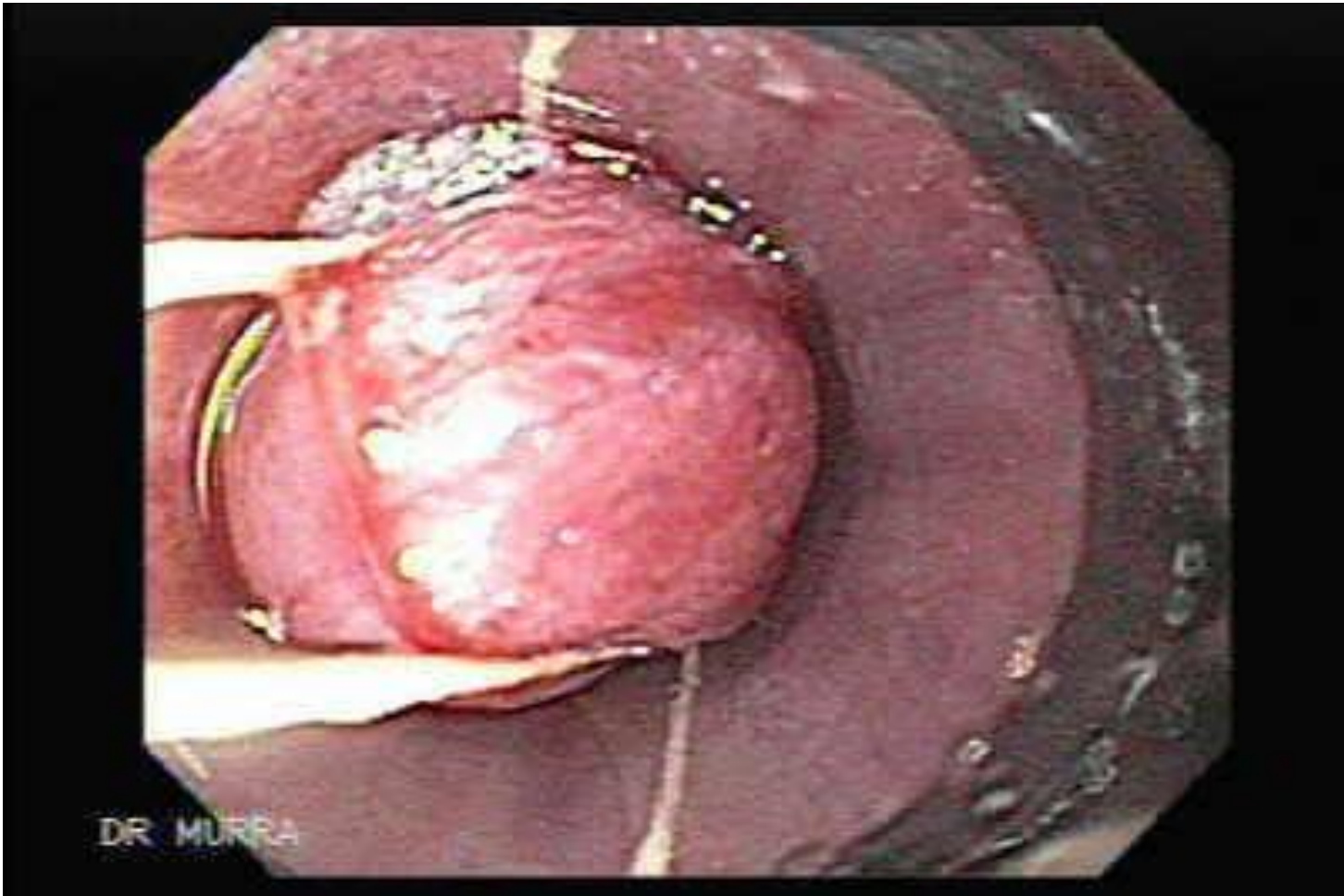
Sonda Sengstakena-Blakemorea





# Upper Gastrointestinal hemorrhage

- Oesophageal varices:
  - Band ligation should be used for patients with UGIB from oesophageal varices.
  - NICE recommends that there is sufficient evidence to show that stent insertion is effective for selected patients with oesophageal varices in whom other methods of treatment have failed to control bleeding.
  - Transjugular intrahepatic portosystemic shunts (TIPS) should be considered if bleeding from oesophageal varices is not controlled by band ligation.
- Gastric varices:
  - Endoscopic injection of N-butyl-2-cyanoacrylate should be offered to patients with UGIB from gastric varices.
  - TIPS should be offered if bleeding from gastric varices is not controlled by endoscopic injection of N-butyl-2-cyanoacrylate.





## Upper Gastrointestinal hemorrhage

### **Sengstaken-Blakemore probe (1950)**

- Introducing into the lumen of the gastrointestinal tract
  - Gastric balloon filling: 200 ml liquid / air
  - Oesophageal balloon filling: air 30-50 mmHg
  - Traction 250 g
- 
- Surgery: Tanner's procedure, Sugiura procedure



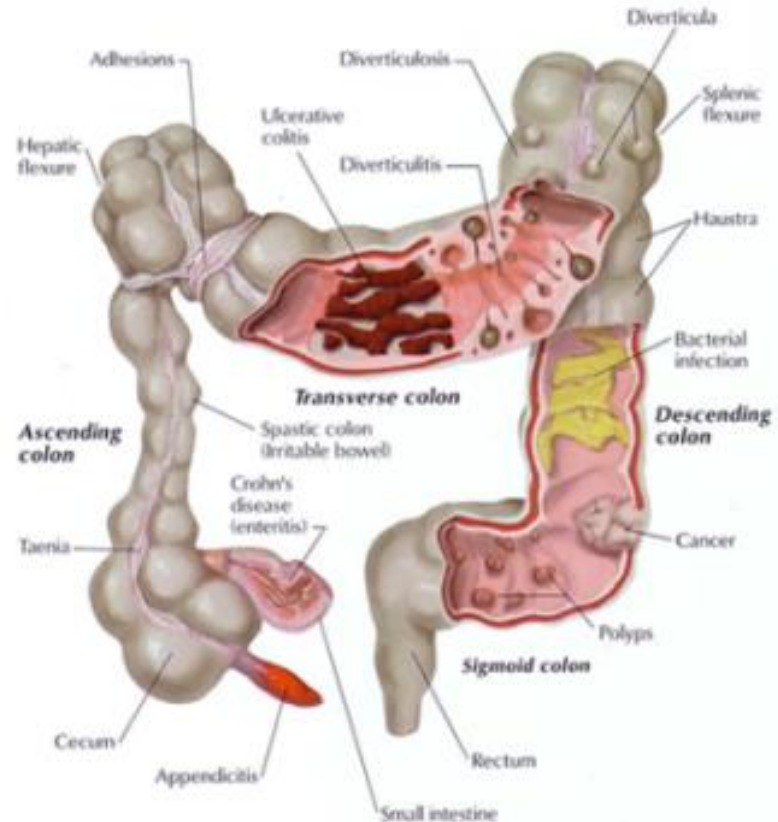
**Lower intestinal hemorrhage**





# Lower intestinal hemorrhage

**Lower intestinal hemorrhage –**  
*distal to the Treitz ligament*





## Lower intestinal hemorrhage

- **Stool mixed with blood**
  - degree is higher, more high is source of bleeding.
- **Blood on the surface of the stool**
  - bleeding from the final part of the gastrointestinal tract
- **laboratory blood tests**
  - weakness, shortness of breath*



## Lower intestinal hemorrhage

- Medical history
- Clinical examination + „per rectum”
- Diagnostic
- Treatment



# Lower intestinal hemorrhage

## Adults to 25 years

- Ulcerative colitis
- Crohn's disease
- Colon polyps
- Hemorrhoidal disease



## Lower intestinal hemorrhage

### Adults to 60 years

- Diverticular disease
- Ulcerative colitis
- Crohn's disease
- Colon polyps
- Hemorrhoids



# Lower intestinal hemorrhage

## Adults above 60 years

- Angiodysplasia
- Diverticular disease
- Colon cancer
- Colon polyps
- Hemorrhoids

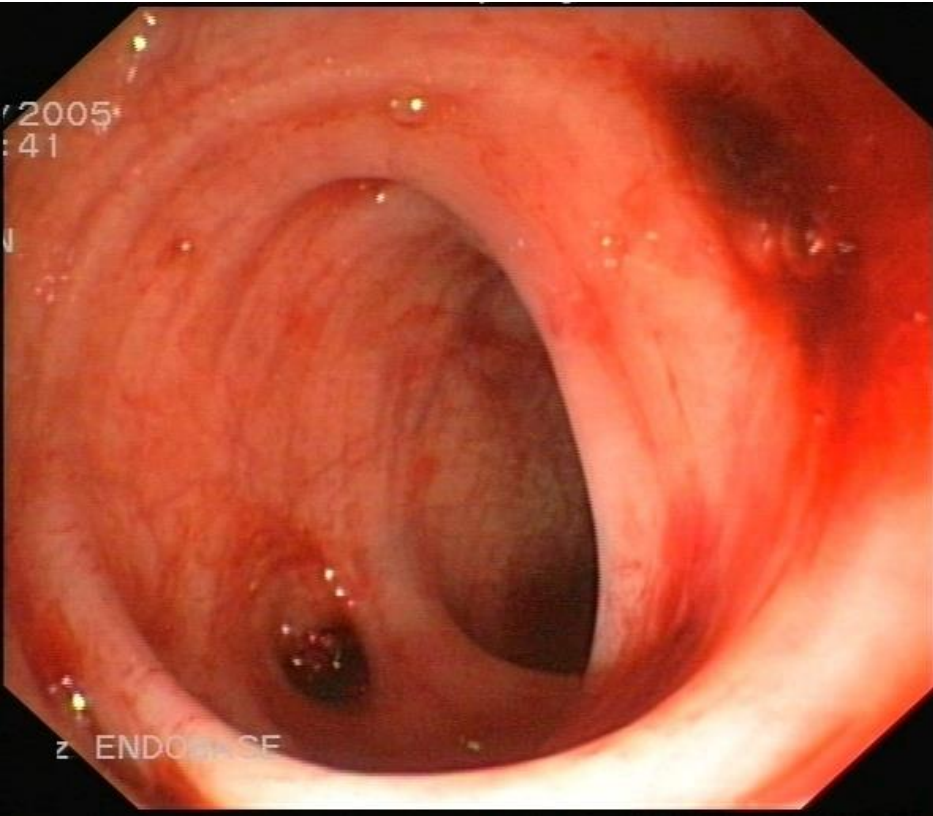


# Lower intestinal hemorrhage

## Diagnostic

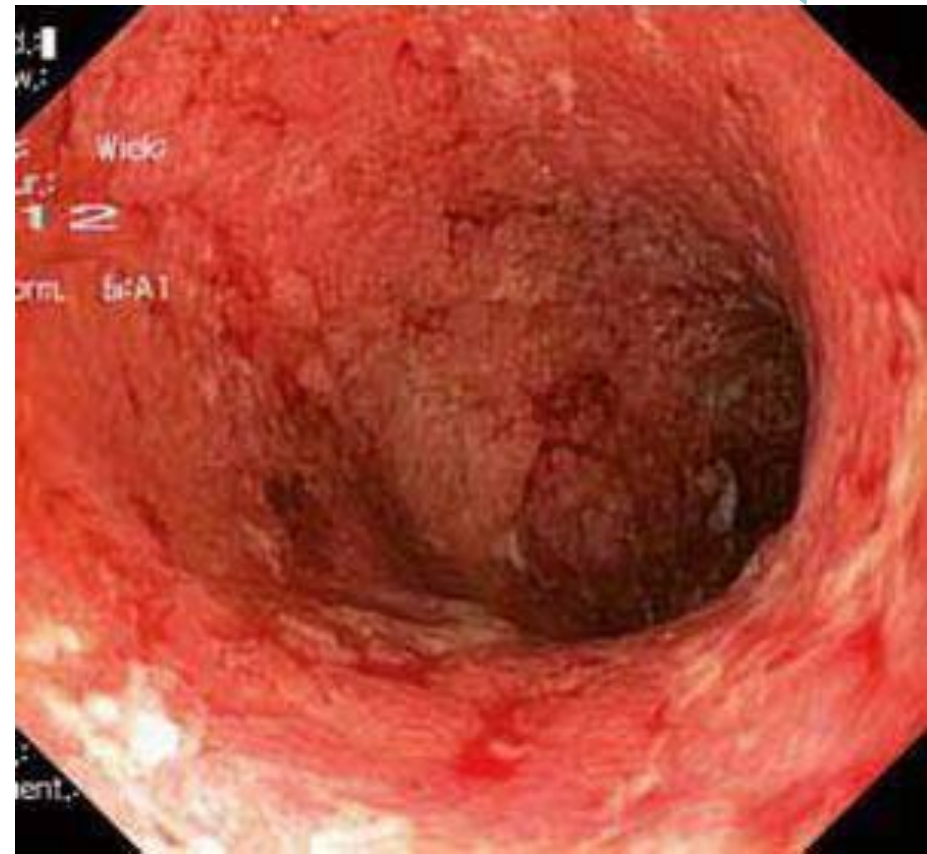
- Clinical exam + „**per rectum**”
- Endoscopy (recto, colonoscopy)
- Abdominal US
- Abdomen CT, virtual colonoscopy
- Contrast of the colon
- Scyntygraphy

## Lower intestinal hemorrhage

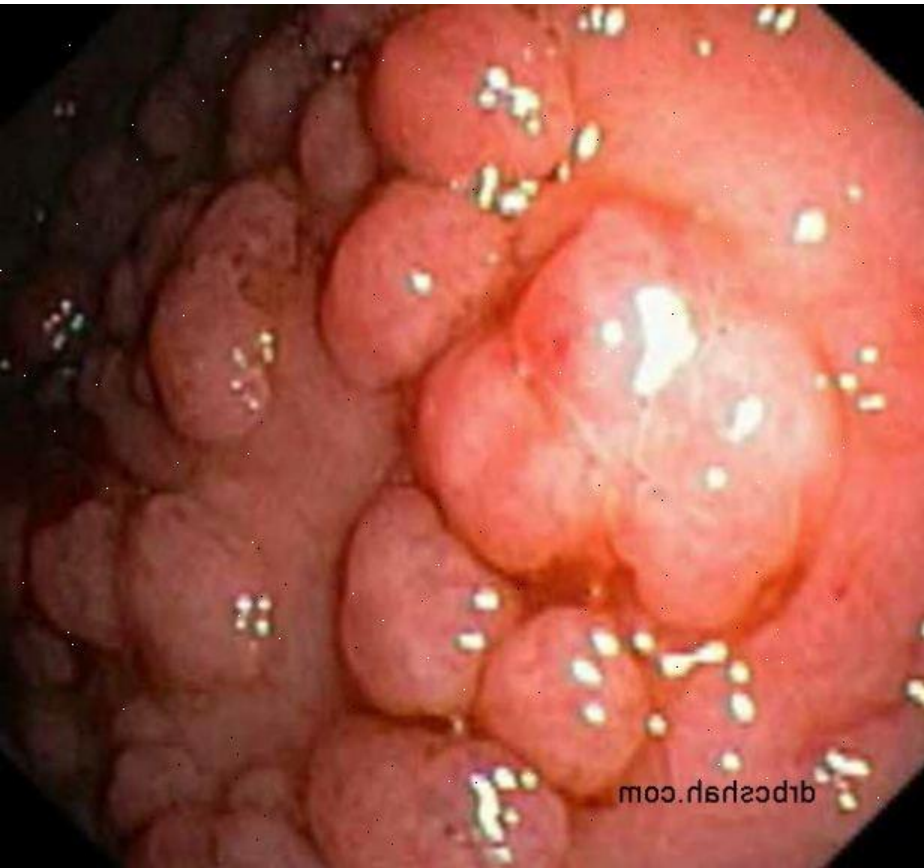


Bleeding from diverticula

Crohn disease







*Colon polyps*



## Lower intestinal hemorrhage



*Colon cancer*

*Colon cancer*



## Lower intestinal hemorrhage



*Hemorrhoids bleeding*







## **Lower intestinal hemorrhage**

Hemorrhage treatment is to locate it's source and removing it (np. hemorrhoidectomy, gastrectomy, polypectomy itd.); or / and conservative treatment with taking into account comorbidities.