

**MINISTRY OF HEALTHCARE OF UKRAINE
HSEEU "Ukrainian Medical Stomatological Academy"**

"Approved"
at the meeting of internal
medicine №1 department
Head of Department
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Protocol № 1 from 29.08.2016

**GUIDELINES
FOR STUDENTS
INDEPENDENT WORK
IN THE PRACTICAL CLASSES PREPARING**

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| <i>Academic discipline</i> | Internal medicine |
| <i>Module</i> | Emergency conditions in clinic of Internal Medicine |
| <i>Content module</i> | Emergency conditions in clinic of Internal Medicine |
| <i>Study subject</i> | Curation of the patient with melena and hematemesis |
| <i>Course</i> | VI |
| <i>Faculty</i> | of foreign students training |

1. Relevance of the topic: Gastrointestinal bleeding (GIB) presents as either overt or occult bleeding. Overt GIB is manifested by hematemesis, vomitus of red blood or “coffee-grounds” material; melena, black, tarry, foul-smelling stool; and/or hematochezia, passage of bright red or maroon blood from the rectum. Occult GIB may be identified in the absence of overt bleeding when patients present with symptoms of blood loss or anemia such as lightheadedness, syncope, angina, or dyspnea; or when routine diagnostic evaluation reveals iron deficiency anemia or a positive fecal occult blood test. GIB is also categorized by the site of bleeding as upper GIB, lower GIB, or obscure GIB if the source is unclear. GIB accounts for ~150 hospitalizations per 100,000 population annually in the United States, with upper GIB ~1.5–2 times more common than lower GIB.

2. The main goal: To be able to choose and put into practice the approach to the patient with melena and hematemesis, to put diagnosis and to determine tactics of treatment, emergency care and prophylaxis.

Specific goals:

- To select the information indicating the cause of melena and hematemesis;
- To create a scheme of diagnostic search;
- To identify the other signs of diseases that runs with melena and hematemesis (general examination, palpation, percussion, auscultation);
- To analyze and interpret the changes in the results of the laboratory and instrumental methods of investigation, depending on the course of the disease;
- To formulate and justify a preliminary diagnosis according to modern classifications;
- To conduct differential diagnostics of diseases with the melena and hematemesis;
- To develop a strategy of treatment depending on the disease and the existing complications;
- To provide medical care;
- To provide emergency care;
- To assess the patient's prognosis and to propose a plan of preventive actions;
- To apply deontological communication skills with patients.

3. Basic knowledge, abilities, skills (interdisciplinary integration)

| Discipline | To know | To be able to |
|------------------|---|--|
| Anatomy | The structure of the gastrointestinal tract, blood supply, innervation | |
| Histology | The structure of the esophagus, stomach, intestines, liver, gallbladder, pancreas in health and disease | To interpret results of endoscopy, USI and biopsy |
| Regional anatomy | Interposition of the gastrointestinal organs | |
| Physiology | Indicators of gastrointestinal tract function, its value | To determine the function of gastrointestinal organs |
| Morbid anatomy | Changes in the structure of gastrointestinal tract organs in pathology | |
| Radiology | Radiological changes at pathology of | Analyze the radiological picture of the |

| | | |
|----------------------|--|--|
| | gastrointestinal organs | chest cavity and abdominal cavity |
| Propaedeutic therapy | Diseases with abdominal pain as leading symptom | Perform an objective examination of the patient, analyze the clinical and laboratory results |
| Pharmacology | The mechanism of action, indications and contraindications for hemostatic preparations, H ₂ -blockers, IPP, β_2 -blockers | Prescribe the drugs of these groups |

4. Do the tasks for independent work during preparation for classes.

4.1. The list of key terms, parameters, characteristics:

| Term | Definition |
|------------------------|---|
| GI bleeding | is all forms of bleeding in the gastrointestinal tract, from the mouth to the rectum. |
| Mallory-Weiss syndrome | refers to bleeding from a laceration in the mucosa at the junction of the stomach and esophagus. This is usually caused by severe vomiting. |
| Esophageal varices | are extremely dilated sub-mucosal veins in the lower third of the esophagus. |
| Melena | refers to the black "tarry" feces that are associated with gastrointestinal bleeding. |
| Hematemesis | is the vomiting of blood. |
| Hematochezia | is the passage of fresh blood through the anus, usually in or with stools (contrast with melena). |

4.2. Theoretical questions for the lesson:

1. Give the definitions of melena and hematemesis, name and define diseases which are characterized by these complications.
2. Specify the risk factors for diseases of stomach, gallbladder, pancreas, intestines which can be complicated by GIB.
3. The pathophysiological mechanisms of melena and hematemesis in different pathologies.
4. Diagnostic criteria of diseases which can be complicated by melena and hematemesis.
5. Modern classifications of ulcer disease, gastritis, cholecystitis, pancreatitis, intestinal diseases.
7. Specify the principles and features of ulcer disease, gastritis, cholecystitis, pancreatitis, intestinal diseases pharmacotherapy according to modern recommendations.
8. What lifestyle modifications should be recommended for patients with melena and hematemesis according to the reason?

Topic Content

GASTROINTESTINAL BLEEDING

Upper GIB (UGIB) ~1.5–2 times more common than lower GIB (LGIB). The incidence of GIB has decreased in recent decades, primarily due to a reduction in UGIB, and the mortality has also decreased to <5%. Patients today rarely die from exsanguination, but rather die due to decompensation of other underlying illnesses.

GIB presents as either overt or occult bleeding. Overt GIB is manifested by hematemesis, vomitus of red blood or “coffee-grounds” material; melena, black, tarry, foul-smelling stool; and/or hematochezia, passage of bright red or maroon blood from the rectum. Occult GIB may be identified in the absence of overt bleeding when patients present with symptoms of blood loss or anemia such as lightheadedness, syncope, angina, or dyspnea; or when routine diagnostic evaluation reveals iron deficiency anemia or a positive fecal occult blood test. GIB is also categorized by the site of bleeding as UGIB, LGIB, or obscure GIB if the source is unclear.

Peptic ulcers are the most common cause of UGIB, accounting for ~50% of cases. Mallory-Weiss tears account for ~5–10% of cases. The proportion of patients bleeding from varices varies widely from ~5–40%, depending on the population. Hemorrhagic or erosive gastropathy (e.g., due to nonsteroidal anti-inflammatory drugs [NSAIDs] or alcohol) and erosive esophagitis often cause mild UGIB, but major bleeding is rare.

Characteristics of an ulcer at endoscopy provide important prognostic information. One-third of patients with active bleeding or a nonbleeding visible vessel have further bleeding that requires urgent surgery if they are treated conservatively. These patients benefit from endoscopic therapy with bipolar electrocoagulation, heater probe, injection therapy (e.g., absolute alcohol, 1:10,000 epinephrine), and/or clips with reductions in bleeding, hospital stay, mortality, and costs. In contrast, patients with clean-based ulcers have rates of recurrent bleeding approaching zero. If stable with no other reason for hospitalization, such patients may be discharged home after endoscopy. Patients without clean-based ulcers usually remain in the hospital for 3 days because most episodes of recurrent bleeding occur within 3 days. Randomized controlled trials document that high-dose, constant infusion proton pump inhibitor (PPI) (80-mg bolus and 8-mg/h infusion), designed to sustain intragastric pH >6 and enhance clot stability, decreases further bleeding and mortality in patients with high-risk ulcers (active bleeding, nonbleeding visible vessel, adherent clot) when given after endoscopic therapy. Patients with lower-risk findings (flat pigmented spot or clean base) do not require endoscopic therapy and receive standard doses of oral PPI.

Prevention of recurrent bleeding focuses on the three main factors in ulcer pathogenesis, *Helicobacter pylori*, NSAIDs, and acid. If a bleeding ulcer develops in a patient taking NSAIDs, the NSAIDs should be discontinued. If NSAIDs must be given, a cyclooxygenase 2 (COX-2) selective inhibitor (coxib) plus a PPI should be used.

Patients with established cardiovascular disease who develop bleeding ulcers while taking low-dose aspirin should restart aspirin as soon as possible after their bleeding episode (1–7 days). Patients with bleeding ulcers unrelated to *H. pylori* or NSAIDs should remain on PPI therapy indefinitely.

The classic history for Mallory-Weiss tears is vomiting, retching, or coughing preceding hematemesis, especially in an alcoholic patient. Bleeding from these tears, which are usually on the gastric side of the gastroesophageal junction, stops spontaneously in 80–90% of patients and recurs in only 0–10%. Endoscopic therapy is indicated for actively bleeding Mallory-Weiss tears. Angiographic therapy with embolization and operative therapy with oversewing of the tear are rarely required.

Patients with variceal hemorrhage have poorer outcomes than patients with other sources of UGIB. Urgent endoscopy within 12 h is recommended in cirrhotics with UGIB, and if esophageal varices are present, endoscopic ligation is performed and vasoactive medication (e.g., octreotide 50 µg bolus and 50 µg/h infusion) is given for 2–5 days. Combination endoscopic and medical therapy appears to be superior to either therapy alone in decreasing rebleeding. In patients with advanced liver disease (e.g., Child-Pugh class C with score 10–13), a transjugular intrahepatic portosystemic shunt (TIPS) should be strongly considered within the first 1–2 days of hospitalization because randomized trials show significant decreases in rebleeding and mortality compared with standard endoscopic and medical therapy. Over the long term, treatment with nonselective beta blockers plus endoscopic ligation is recommended because the combination of endoscopic and medical therapy is more effective than either alone in reduction of recurrent esophageal variceal bleeding. In patients who have persistent or recurrent bleeding despite endoscopic and medical therapy, TIPS is recommended. Decompressive surgery (e.g., distal splenorenal shunt) may be considered instead of TIPS in patients with well-compensated cirrhosis. Portal hypertension is also responsible for bleeding from gastric varices, varices in the small and large intestine, and portal hypertensive gastropathy and enterocolopathy. Bleeding gastric varices due to cirrhosis are treated with endoscopic injection of tissue adhesive (e.g., n-butyl cyanoacrylate), if available; if not, TIPS is performed.

Hemorrhagic and erosive gastropathy, often labeled gastritis, refers to endoscopically visualized subepithelial hemorrhages and erosions. These are mucosal lesions and do not cause major bleeding due to the absence of arteries and veins in the mucosa. Erosions develop in various clinical settings, the most important of which are NSAID use, alcohol intake, and stress. Stress-related gastric mucosal injury occurs only in extremely sick patients, such as those who have experienced serious trauma, major surgery burns covering more than one-third of the body surface area, major intracranial disease, or severe medical illness (i.e., ventilator dependence, coagulopathy). Severe bleeding should not develop unless ulceration occurs. The mortality rate in these patients is quite high because of their serious underlying illnesses. The incidence of bleeding from stress-related gastric mucosal injury has decreased dramatically in recent years, most likely due to better care of critically ill patients. Pharmacologic prophylaxis for bleeding may be considered in the high-risk patients mentioned above. Metaanalyses of randomized trials indicate that PPIs are more effective than H₂ receptor antagonists in reduction of overt and clinically important UGIB without differences in mortality or nosocomial pneumonia.

Other less frequent causes of UGIB include erosive duodenitis, neoplasms, aortoenteric fistulas, vascular lesions (including hereditary hemorrhagic telangiectasias (Osler-Weber-Rendu) and gastric antral vascular ectasia (“watermelon stomach”)), Dieulafoy’s lesion (in which an aberrant vessel in the mucosa bleeds from a pinpoint mucosal defect), prolapse gastropathy (prolapse of proximal stomach into esophagus with retching, especially in alcoholics), and hemobilia or hemosuccus pancreaticus (bleeding from the bile duct or pancreatic duct).

Small-intestinal sources of bleeding (bleeding from sites beyond the reach of the standard upper endoscope) are often difficult to diagnose and are responsible for the majority of cases of obscure GIB. Fortunately, small-intestinal bleeding is uncommon. The most common causes in adults are vascular ectasias, tumors (e.g., GI stromal tumor, carcinoid, adenocarcinoma, lymphoma, metastases), and NSAID-induced erosions and ulcers. Other less common causes in adults include Crohn’s disease, infection, ischemia, vasculitis, small-bowel varices, diverticula, Meckel’s diverticulum, duplication cysts, and intussusception.

Meckel's diverticulum is the most common cause of significant LGIB in children, decreasing in frequency as a cause of bleeding with age. In adults <40–50 years, small-bowel tumors often account for obscure GIB; in patients >50–60 years, vascular ectasias and NSAID induced lesions are more commonly responsible.

Vascular ectasias should be treated with endoscopic therapy if possible. Although estrogen/progesterone compounds have been used for vascular ectasias, a large double-blind trial found no benefit in prevention of recurrent bleeding. Octreotide is also used. A randomized trial reported significant benefit of thalidomide and awaits further confirmation. Other isolated lesions, such as tumors, are generally treated with surgical resection.

Hemorrhoids are probably the most common cause of LGIB; anal fissures also cause minor bleeding and pain. If these local anal processes, which rarely require hospitalization, are excluded, the most common causes of LGIB in adults are diverticula, vascular ectasias (especially in the proximal colon of patients >70 years), neoplasms (primarily adenocarcinoma), colitis (ischemic, infectious, idiopathic inflammatory bowel disease), and postpolypectomy bleeding. Less common causes include NSAID-induced ulcers or colitis, radiation proctopathy, solitary rectal ulcer syndrome, trauma, varices (most commonly rectal), lymphoid nodular hyperplasia, vasculitis, and aortocolic fistulas.

The most common colonic causes of significant GIB are inflammatory bowel disease and juvenile polyps. Diverticular bleeding is abrupt in onset, usually painless, sometimes massive, and often from the right colon; chronic or occult bleeding is not characteristic. Case series suggest endoscopic therapy may decrease recurrent bleeding in the uncommon case when colonoscopy identifies the specific bleeding diverticulum. When diverticular bleeding is found at angiography, transcatheter arterial embolization by superselective technique stops bleeding in a majority of patients. If bleeding persists or recurs, segmental surgical resection is indicated. Bleeding from right colonic vascular ectasias in the elderly may be overt or occult; it tends to be chronic and only occasionally is hemodynamically significant. Endoscopic hemostatic therapy may be useful in the treatment of vascular ectasias, as well as discrete bleeding ulcers and postpolypectomy bleeding. Surgical therapy is generally required for major, persistent, or recurrent bleeding from the wide variety of colonic sources of GIB that cannot be treated medically, angiographically, or endoscopically.

Approach to the patient. Measurement of the heart rate and blood pressure is the best way to initially assess a patient with GIB. Clinically significant bleeding leads to postural changes in heart rate or blood pressure, tachycardia, and, finally, recumbent hypotension.

In contrast, the hemoglobin does not fall immediately with acute GIB, due to proportionate reductions in plasma and red cell volumes (i.e., “people bleed whole blood”). Thus, hemoglobin may be normal or only minimally decreased at the initial presentation of a severe bleeding episode. As extravascular fluid enters the vascular space to restore volume, the hemoglobin falls, but this process may take up to 72 h. Transfusion is recommended when the hemoglobin drops below 7 g/dL, based on a large randomized trial showing this restrictive transfusion strategy decreases rebleeding and death in acute UGIB compared with a transfusion threshold of 9 g/dL. Patients with slow, chronic GIB may have very low hemoglobin values despite normal blood pressure and heart rate. With the development of iron-deficiency anemia, the mean corpuscular volume will be low and red blood cell distribution width will increase.

Hematemesis indicates an upper GI source of bleeding (above the ligament of Treitz). Melena indicates blood has been present in the GI tract for at least 14 h, and as long as 3–5 days. The more proximal the bleeding site, the more likely melena will occur.

Hematochezia usually represents a lower GI source of bleeding, although an upper GI lesion may bleed so briskly that blood transits the bowel before melena develops. When hematochezia is the presenting symptom of UGIB, it is associated with hemodynamic instability and dropping hemoglobin. Bleeding lesions of the small bowel may present as melena or hematochezia. Other clues to UGIB include hyperactive bowel sounds and an elevated blood urea nitrogen (due to volume depletion and blood proteins absorbed in the small intestine). A nonbloody nasogastric aspirate may be seen in up to ~18% of patients with UGIB, usually from a duodenal source. Even a bilestained appearance does not exclude a bleeding postpyloric lesion because reports of bile in the aspirate are incorrect in ~50% of cases. Testing of aspirates that are not grossly bloody for occult blood is not useful.

At presentation, patients are generally stratified as higher or lower risk for further bleeding and death. Baseline characteristics predictive of rebleeding and death include hemodynamic compromise (tachycardia or hypotension), increasing age, and comorbidities. PPI infusion may be considered at presentation: it decreases high risk ulcer stigmata (e.g., active bleeding) and need for endoscopic therapy but does not improve clinical outcomes such as further bleeding, surgery, or death. Cirrhotic patients presenting with UGIB should be placed on antibiotics (e.g., quinolone, ceftriaxone) and started on a vasoactive medication (octreotide, terlipressin, somatostatin, vapreotide) upon presentation, even before endoscopy. Antibiotics decrease bacterial infections, rebleeding, and mortality in this population, and vasoactive medications appear to improve control of bleeding in the first 12 h after presentation.

Upper endoscopy should be performed within 24 h in most patients with UGIB. Patients at higher risk (e.g., hemodynamic instability, cirrhosis) may benefit from more urgent endoscopy within 12 h. Early endoscopy is also beneficial in low-risk patients for management decisions. Patients with major bleeding and high risk endoscopic findings (e.g., varices, ulcers with active bleeding or a visible vessel) benefit from endoscopic hemostatic therapy, whereas patients with low-risk lesions (e.g., clean-based ulcers, nonbleeding Mallory-Weiss tears, erosive or hemorrhagic gastropathy) who have stable vital signs and hemoglobin and no other medical problems can be discharged home.

Patients with hematochezia and hemodynamic instability should have upper endoscopy to rule out an upper GI source before evaluation of the lower GI tract. Colonoscopy after an oral lavage solution is the procedure of choice in most patients admitted with LGIB unless bleeding is too massive, in which case angiography is recommended. Sigmoidoscopy is used primarily in patients <40 years old with minor bleeding. In patients with no source identified on colonoscopy, imaging studies may be employed. 99mTc-labeled red cell scan allows repeated imaging for up to 24 h and may identify the general location of bleeding. However, radionuclide scans should be interpreted with caution because results, especially from later images, are highly variable. Multidetector computed tomography (CT) “angiography” is an increasingly used technique that is likely superior to nuclear scintigraphy. In active LGIB, angiography can detect the site of bleeding (extravasation of contrast into the gut) and permits treatment with embolization. Even after bleeding has stopped, angiography may identify lesions with abnormal vasculature, such as vascular ectasias or tumors.

Obscure GIB is defined as persistent or recurrent bleeding for which no source has been identified by routine endoscopic and contrast x-ray studies; it may be overt (melena, hematochezia) or occult (iron-deficiency anemia). Current guidelines suggest angiography as the initial test for massive obscure bleeding, and video capsule endoscopy, which allows examination of the entire small intestine, for all others. Push enteroscopy, usually performed

with a pediatric colonoscope, to inspect the entire duodenum and proximal jejunum also may be considered as an initial evaluation. However, in contrast to enteroscopy, lack of control of the capsule prevents its manipulation and full visualization of the intestine; in addition, tissue cannot be sampled and therapy cannot be applied. If capsule endoscopy is positive, management is dictated by the finding. If capsule endoscopy is negative, current recommendations suggest patients may either be observed or, if their clinical course mandates (e.g., recurrent bleeding, need for transfusions or hospitalization), undergo further testing. "Deep" enteroscopy (e.g., doubleballoon, single-balloon, and spiral enteroscopy) is commonly the next test undertaken in patients with clinically important obscure GIB because it allows the endoscopist to examine, obtain specimens from, and provide therapy to much or all of the small intestine. CT and magnetic resonance enterography also are used to examine the small intestine. Other imaging techniques sometimes used in evaluation of obscure GIB include 99mTc-labeled red blood cell scintigraphy, multidetector CT "angiography," angiography, and 99mTc-pertechnetate scintigraphy for Meckel's diverticulum (especially in young patients). If all tests are unrevealing, intraoperative endoscopy is indicated in patients with severe recurrent or persistent bleeding requiring repeated transfusions.

Fecal occult blood testing is recommended for colorectal cancer screening and may be used beginning at age 50 in average-risk adults and beginning at age 40 in adults with a first-degree relative with colorectal neoplasm at ≥ 60 years or two second-degree relatives with colorectal cancer. A positive test necessitates colonoscopy. If evaluation of the colon is negative, further workup is not recommended unless iron-deficiency anemia or GI symptoms are present.

Materials for self-control:

1. During the doctor's round, a 56-year-old male patient with decompensated cirrhosis complains of dizziness, palpitations, moving black specks seen before the eyes, general weakness. The patient is pale, Ps- 110/min, AP- 90/50 mm Hg. What complication is most likely to have occurred in the patient?

- A. Hepatocellular insufficiency
- B. Bleeding from esophageal varices
- C. Hepatic encephalopathy
- D. Acute coronary syndrome
- E. Paroxysmal tachycardia

2. A man, 46 years old, complains of vomiting with bright red blood. In the anamnesis: micronodular hepatic cirrhosis of viral etiology for 5 years. During last half year increasing abdominal size due to ascites was observed. What preparation is it necessary to begin with?

- A. Mesaton 1% - 2 ml intramuscular
- B. Cordiamin - 2 ml intramuscular
- C. Intravenous vasopressin - 20 units
- D. Prednizolon - 20 mg intravenous
- E. Swallowing of ice pieces

3. A patient, who has been suffering from liver cirrhosis for 5 years, complains of fatigue, skin pallor, cold sweats, thirst, vomiting with a dark red blood. What is the most probable reason of this type of hemorrhage?

- A. Portal hypertension.

- B. Thrombosis of hepatic veins
- C. Malignization
- D. Heart failure
- E. Pulmonary embolism

4. A patient has been suffering from viral hepatitis B during last 4 years. He reports an alcohol abuse for many years. He complains of heartburn and burning pain behind the breastbone, which was disturbing for last 2 months. There was a vomiting with fresh dark blood in the morning after meal and lifting weight. At examination – the skin is pale and wet, heartbeat rate - 92/min, AP 90/60 mm. Scleras are icteric, abdomen is enlarged due to ascites, hepatosplenomegalia. List the most probable reasons for the hemorrhage:

- A. Malory-Weiss syndrome
- B. Achalasia of the esophagus
- C. Rupture of esophageal varices
- D. Bud-Chiari syndrome
- E. Duodenal ulcer

5. A 41 years old patient was admitted to the intensive care unit with haemorrhagic shock due to gastric bleeding. He has a history of hepatitis B during the last 5 years. The source of bleeding are esophageal veins. What is the most effective method for control of the bleeding?

- A. Hemostatic therapy
- B. Intravenous administration of pituitrin
- C. Introduction of obturator nasogastric tube
- D. Operation
- E. Administration of plasma

6. A 51-year-old female patient complains of frequent defecation and liquid blood-streaked stools with mucus admixtures, diffuse pain in the inferolateral abdomen, 6 kg weight loss over the previous month. Objectively: body temperature - 37, 4°C, malnutrition, skin is pale and dry. Abdomen is soft, sigmoid is painful and spasmodic, makes a rumbling sound. Liver is dense, painful, extends 3 cm below the costal margin. What is the most likely diagnosis?

- A. Non-specific ulcerative colitis
- B. Bacillary dysentery
- C. Sprue
- D. Intestinal enzymopathy
- E. Helminthic invasion

7. A 54 years old male patient complains about permanent dull pain in the mesogastral region, weight loss, dark blood admixtures in the feces, constipations. He put off 10 kg within a year. In blood: erythrocytes: $3,5 \cdot 10^{12}/l$, Hb- 87 g/l, leukocytes - $12,6 \cdot 10^9/l$, stab neutrophil shift, ESR- 43 mm/h. What is the most probable diagnosis?

- A. Chronic pancreatitis
- B. Gastric ulcer
- C. Chronic colitis
- D. Cancer of transverse colon
- E. Stomach cancer

8. A 33 y. o. male patient was got to hospital. The patient is pale, after an attempt to stand up he complains of strong dizziness. There was coffee-like vomiting approximately an hour ago. BP- 90/60 mm Hg., pulse- 120 b/min. From anamnesis: the patient has been suffering from ulcer of stomach, which didn't disturb him for 4 years. An ulcer was visualized at gastrofibroscopy. Your diagnosis:

- A. Ulcer of stomach, complicated with bleeding
- B. Ulcer of duodenum, complicated with bleeding
- C. Erosive gastritis
- D. Acute pleurisy
- E. Acute myocardial infarction, abdominal form

9. Man, 52 years old, is suffering from erosive gastritis, progressive general weakness, dizziness. Objectively: pale and dry skin and mucous, angular stomatitis. Pulse is 104/min. AP is 130/70. Tones of heart are quiet, a systolic noise above the apex and on the basis of heart is heard. Liver and spleen are not palpated. There is hypochromic anemia in blood. What pathogenic factor can be major in the development of anemia in this case?

- A. Blood loss
- B. Vitamin B12 deficiency
- C. Intoxication
- D. Hemolysis of erythrocytes
- E. Folic acid deficiency

10. A 45-year-old man was delivered to a hospital with complaints on vomiting with streaks of blood, loss of weight. On esophagofiberscopy a cauliflower-shaped mucosal growth was detected in the abdominal esophagus. The mucosa there bleeds on contact. What preliminary diagnosis can be made?

- A. Barrett esophagus
- B. Esophageal tumor
- C. Abdominal esophagitis
- D. Esophageal diverticulum
- E. Esophageal achalasia

The answers for the tests:

1-B, 2-C, 3-A, 4-A, 5-C, 6-A, 7-D, 8-A, 9-A, 10-B.

Recommended literature:

1. **Goldman's Cecil medicine / [edited by] Lee Goldman, Andrew I. Schafer. – 24th ed. USA 2012, Elsevier p. 2569**
2. Harrison's Principles of Internal Medicine / D.Kasper, A.Fauci, S.Hauser, D. Longo.-19 ed. – N.Y.: McGraw-Hill Professional, 2015. - Vol. 1, Vol.2. - 3000 p.
3. Maastricht V/Florence Consensus Report on Managing Helicobacter pylori Infection <http://www.jwatch.org/na42519/2016/10/20/maastricht-v-florence-consensus-report-managing>
4. Textbook of Clinical Gastroenterology and Hepatology (2nd Revised edition)/Edited by C. J. Hawkey, Jaime Bosch, Joel E. Richter, Guadalupe Garcia-Tsao, Francis K.L. Chan. – Chicester : John Wiley and Sons Ltd, 2012. – 1272 p.

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