Examination of patients with liver and gallbladder diseases

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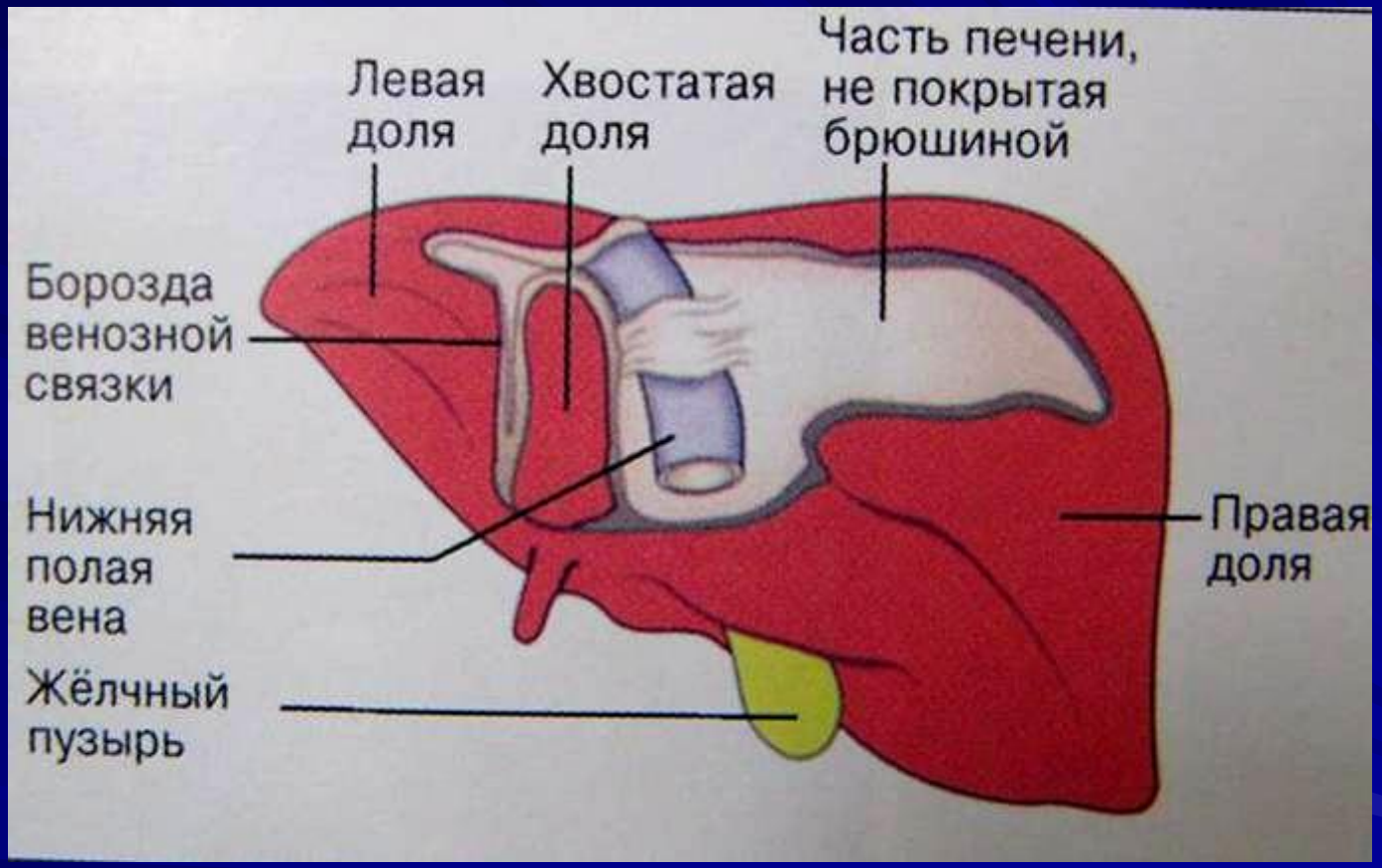
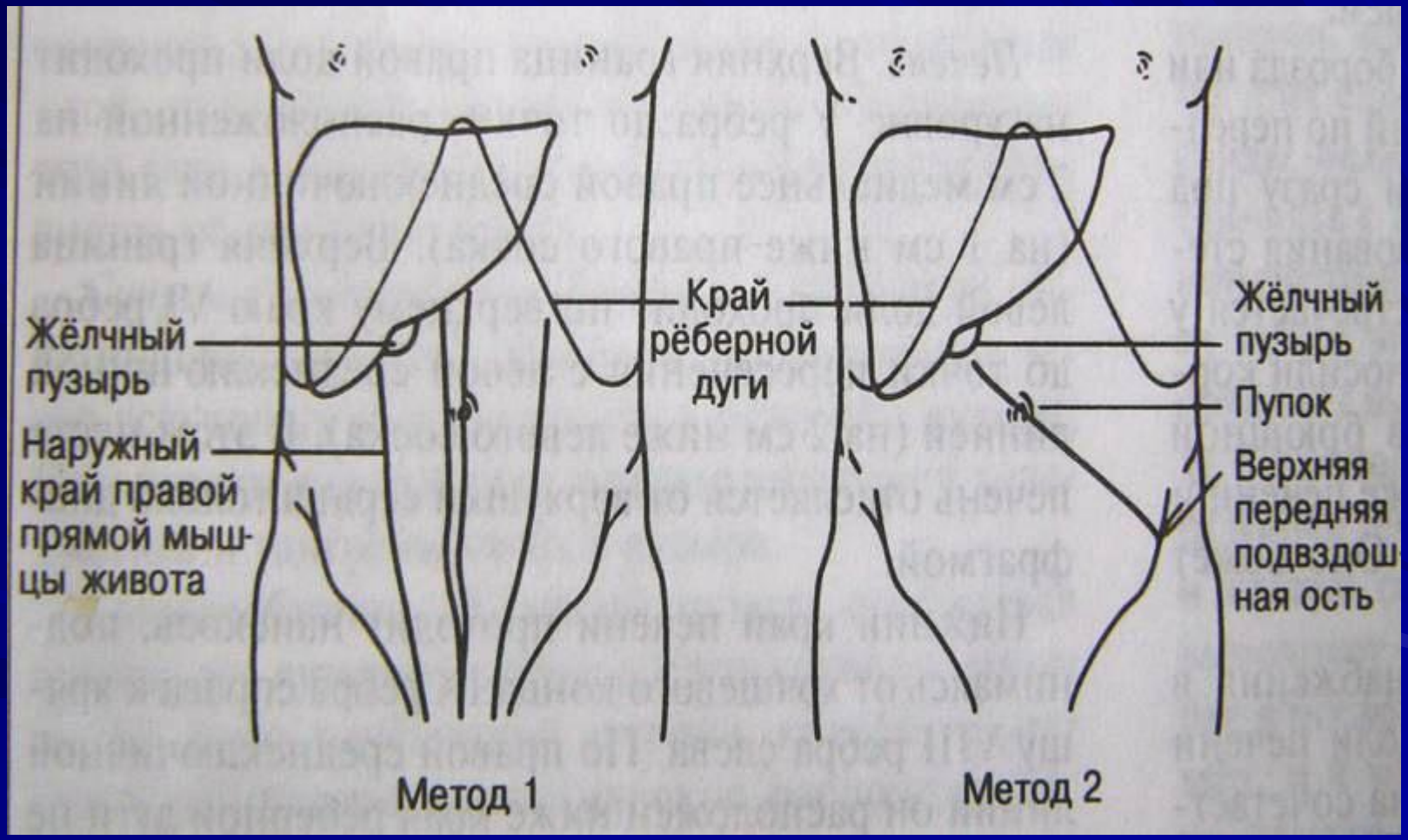
Anatomy of the liver

- liver is the biggest gland of the organism;
- Its average weight in an adult person is 1500 g


Левая доля
Хвостатая доля
Часть печени, не покрытая брюшиной
Борозда венозной связки
Нижняя полая вена
Жёлчный пузырь
Правая доля

Location – right hipocondrium and epigastric region



Functions of the liver:

1. **Formation of bile** 800-1000 ml in 24 hours;

2. **Metabolism of proteins** – synthesis of urea, fibrinogen and prothrombin, disamination of aminoacids;

Functions of the liver:

3. **Metabolism of carbohydrates** – large deposition of glycogen in the liver and processes of glycogenesis);

4. **Metabolism of lipids and phospholipids;**

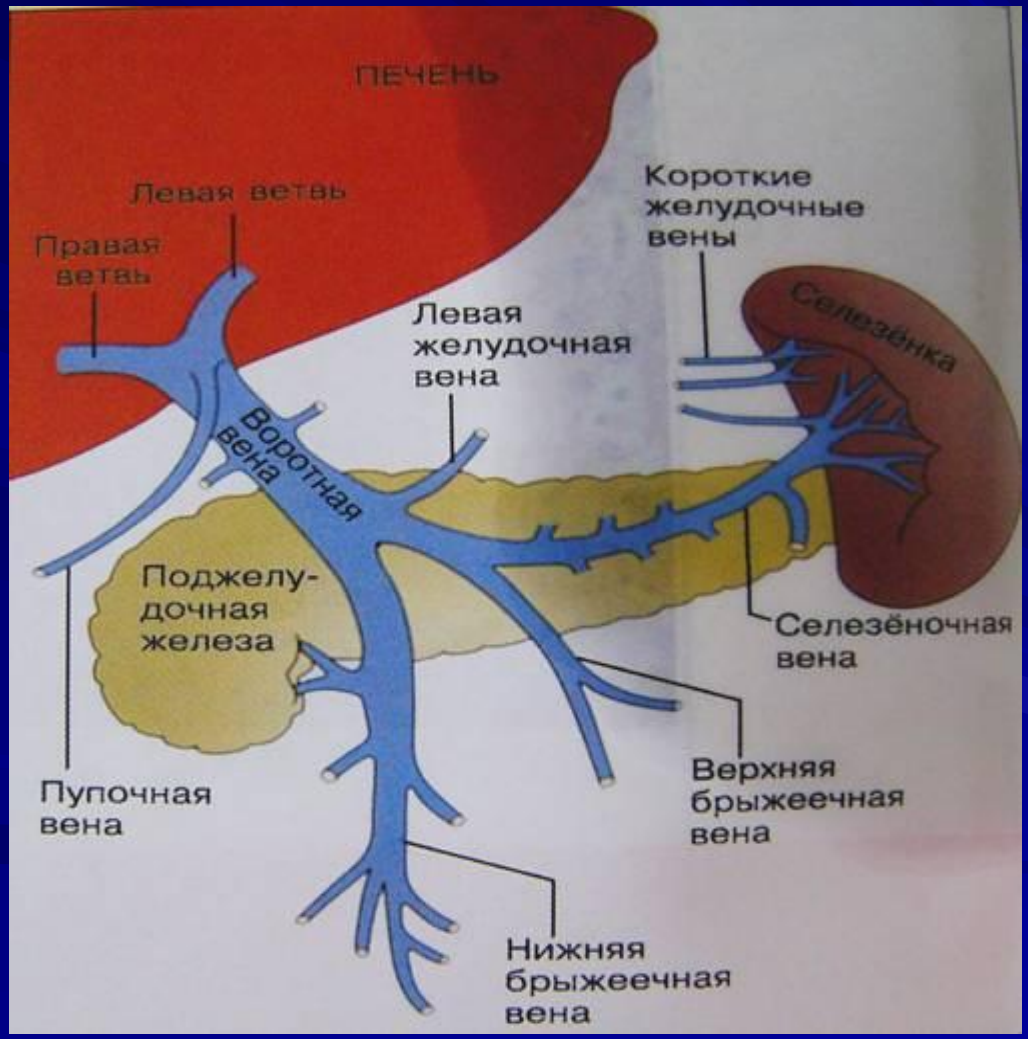
5. **Antitoxic function** - fixation, neutralisation and elimination of toxic substances;

6. **Hematopoietic function**;

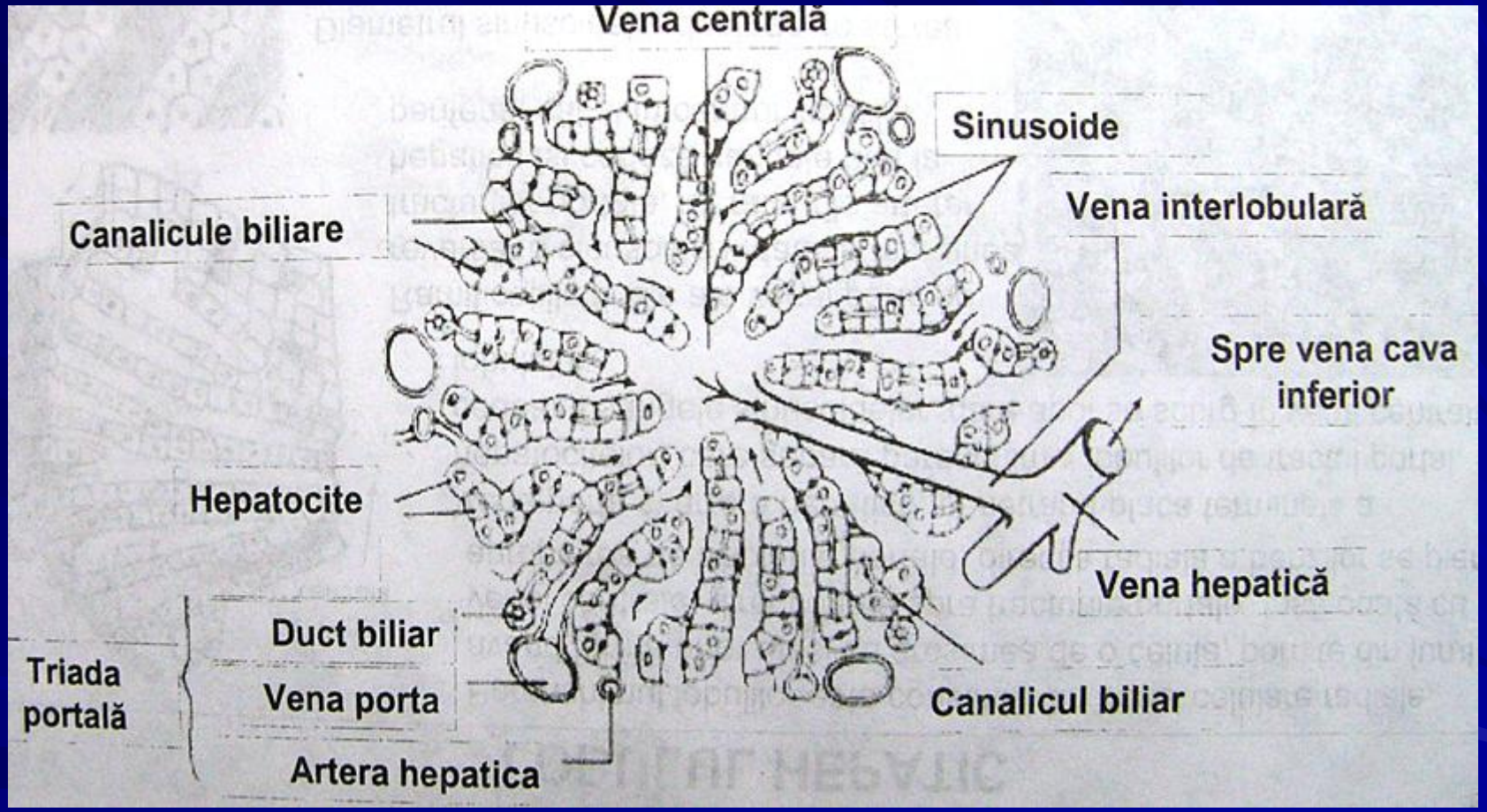
7. **Metabolism of microelements and vitamins**.

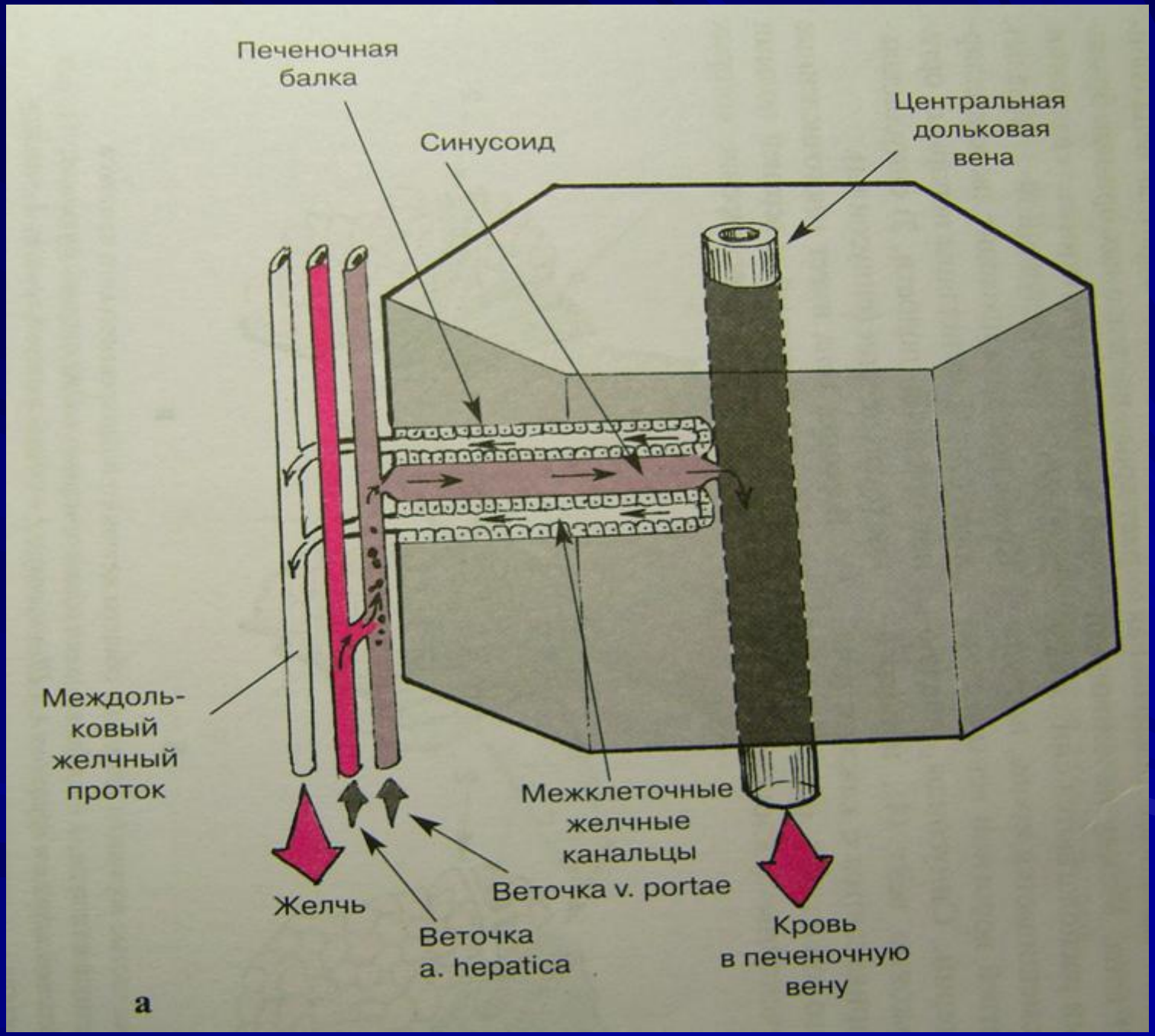
8. **Immune function**

The portal vein system , (situated behind the pancreas)



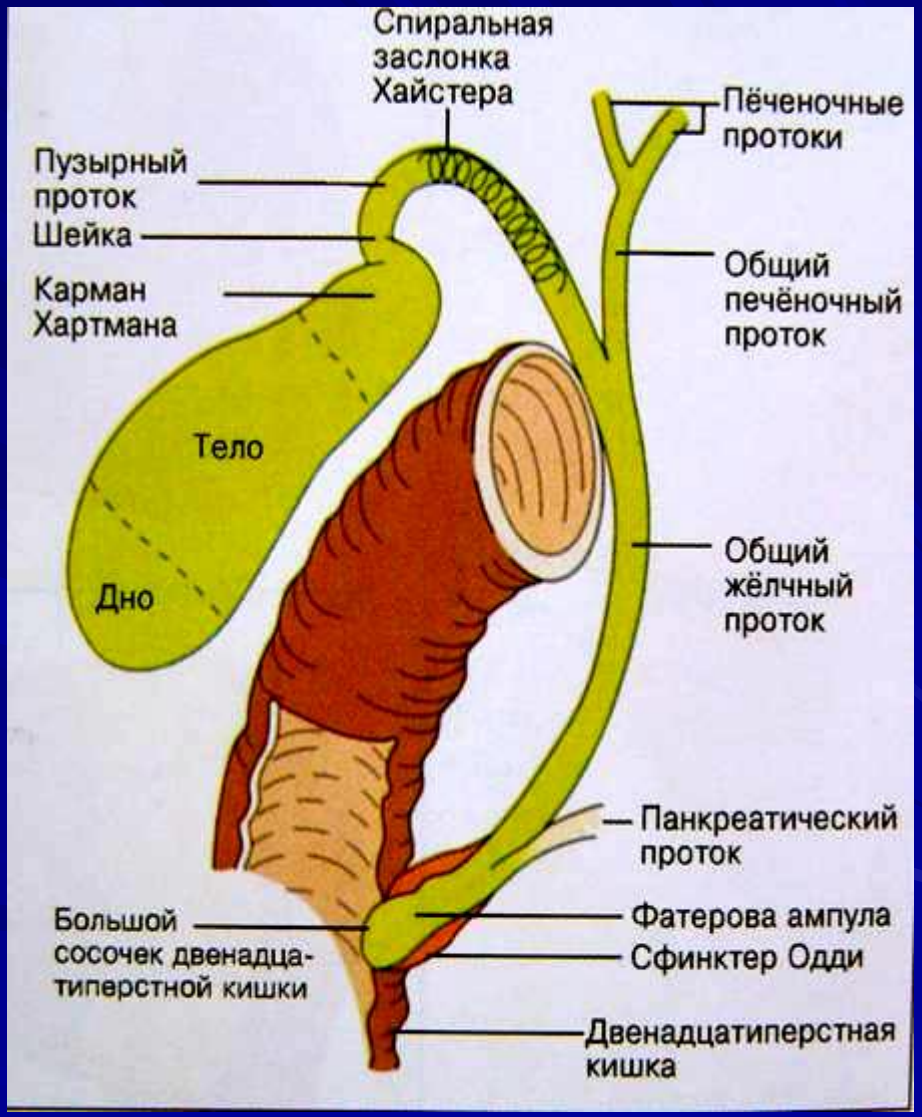
The hexagonal hepatic lobe




Печеночная балка
Синусоид
Центральная дольковая вена
Междольковый желчный проток
Межклеточные желчные канальцы
Веточка v. portae
Желчь
Веточка a. hepatica
Кровь в печеночную вену
а

Gall bladder

- Gall bladder represents a reservoir for accumulation of bile.
- It is situated on the visceral surface of the liver, in gall bladder fossa.



Gall bladder

The bottom of gall bladder is blank, stays out from the inferior margin of the liver at the level of the joint of VIII and IX right costal cartilages, which is the intersection of right abdominal rect muscle margin and right costal arch.

Complaints of patients with liver and gall bladder diseases

- pain in right hypochondriaa is one of the main complaints.

  the pain is permanent, pestering, caused by dilation or an inflammatory process in the Glison capsule in such diseases like congestion of the liver, hepatitis.

  in inflammation of peritoneum, covering the liver, the pain is very severe.

Pain in biliary colic

- spastic contractions of the gall bladder and bile ducts, frequently given by migration of stones.
- the pain is extremely severe, sometimes can lead to pain shock.

Pain in biliary colic

- The onset of the pain is usually acute.
- Frequently associated with vomiting and fever.
- the pain irradiates to the right shoulder, right scapula and interscapular region, to the place of insertion of m. sternocleidomastoideus.

Jaundice

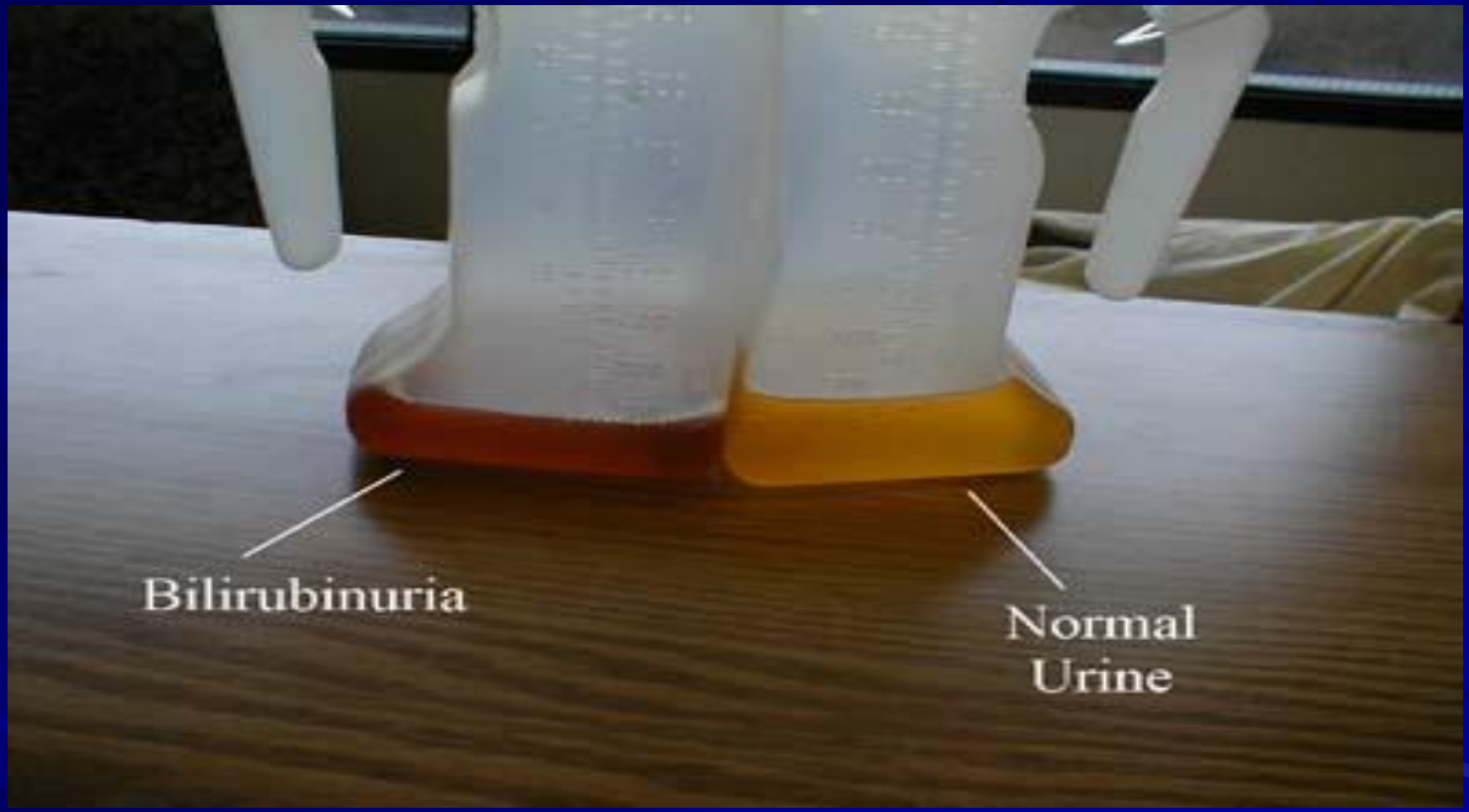
yellow coloration of sclera, skin, visible mucosa, as a result of excessive accumulation of bilirubin in blood and tissues.

Colour of the skin and urine in jaundice

- Light yellow in haemolytic jaundice,
- Red yellow in parenchymatous jaundice
- Green yellow in mechanical jaundice

Elimination of bilirubin with urine in mechanic and parenchymatous jaundice colours the urine in dark brown.


BARD
2000
1800
1600
1400
1200
1000
800
600
400
STEER
NEUTRAL
BRAKE


Bilirubinuria
Normal
Urine

Absence of stercobilin in faeces in mechanical jaundice leads to their complete discolouration.

Itching of the skin

Frequently found in mechanical jaundice due to accumulation in the blood of a big amount of bile acids

Dyspeptic complaints

- Loss of appetite,
- Nausea, eructation,
- Meteorism, diarrhoea or constipation,
- Bitter taste.

due to decreased secretion of bile and diminished disintoxication function.

Other complaints

- fatigue,
- reduced ability to work,
- weight loss.

These complaints depend on disturbance of vitamin and protein metabolism and antitoxic function of the liver.

Fever

Found in:

- Acute hepatitis,
- Inflammatory processes in bile ducts,
- Hepatic abscess (extremely high values, associated with chills)

Symptoms of haemorrhagic diathesis:

- epistaxis,
- gingivorrhagias,
- haemorrhages from oesophageal varicose veins

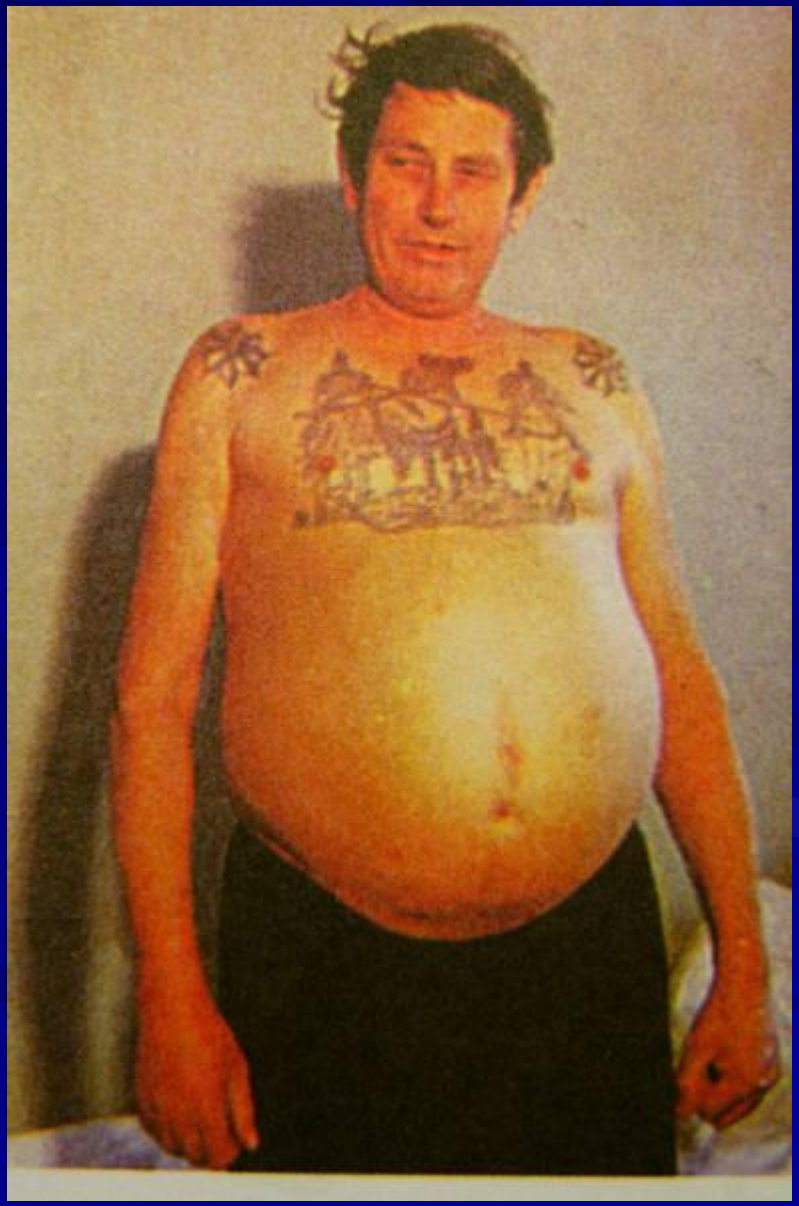
  consequence of decreased production of coagulation factors in the liver and portal hypertension.

  rupture of haemorrhoidal plexus anastomoses lead to profuse haemorrhages.

Increased pressure in the portal vein system occurs most often as a consequence of prolonged disturbance of circulation in hepatic parenchyma with further formation of conjunctive tissue (cirrhosis), compressing the interhepatic ramifications of portal vein.

Increased pressure (marked and long-term) in the portal vein system leads to exudation of liquid in abdominal cavity (ascitis) and the patient will complain on increased volume of abdomen.

Ascitis



Causes of oedema in hepatic diseases

- Mechanical compression of vena cava inferior in case of a big amount of liquid in abdominal cavity can lead to appearance of oedema on the lower extremities;
- Decreased amount of albumins in the blood (decreased oncotic pressure).

Central nervous system changes:

insomnia,
asthenia,
agitation,
deliria,
coma.

History

- History of the disease - for appreciating the onset and evolution of the disease;
- History of patient's life - for appreciating of the aetiology of the disease.

Moments to be observed:

- Long-term deficiency of protein and vitamin products in alimentation, as well as disturbances of their absorption in intestine in case of its lesion.
- Hygienic habits during alimentation (not washed fruits and vegetables or not proper drinking water supply), can favourise infection with type A hepatitis virus.

- Some toxic chemical substances (chloroform, carbon tetrachloride, phosphor, arsenium etc.) and toxins of vegetal origin (mushrooms) can also cause severe liver dysfunction.
- Alcoholism represents a major factor in production of chronic hepatopathies: chronic hepatitis, liver cirrhosis.

Former diseases:

1) viral hepatitis, evolving to chronic hepatitis (in several years) and finally to liver cirrhosis;
2) hepatobilliary diseases (colecistitis, billiary lithiasis);
3) infectious diseases, acute (dysentery, septicaemia) and chronic (tuberculosis , syphilis, brucellosis, malaria) which affect the liver;

4) cardiac diseases (particularly right heart failure, which due to long-term congestion in the liver, can determine appearance of liver cirrhosis);

5) metabolic diseases, such as diabetes mellitus can affect the liver.

6) Intake of some hepatotoxic medicines and administration of different parenteral treatments (transfusions, injections, vaccines, surgery) as a possibility of transmitting of type B , C virus hepatitis.

Heredocollateral anamnesis

Hereditary predisposition for some hepatic diseases, but mostly gall bladder diseases.

Status praesens of the patient

General inspection

- Patient's general condition could be from satisfactory to extremely severe.
- Consciousness – from clear to coma.
- Position of the patient - from active to passive in hepatic coma.
- In chronic hepatitis and liver cirrhosis on the face there could be varicosities and spiders at the level of the cheeks.

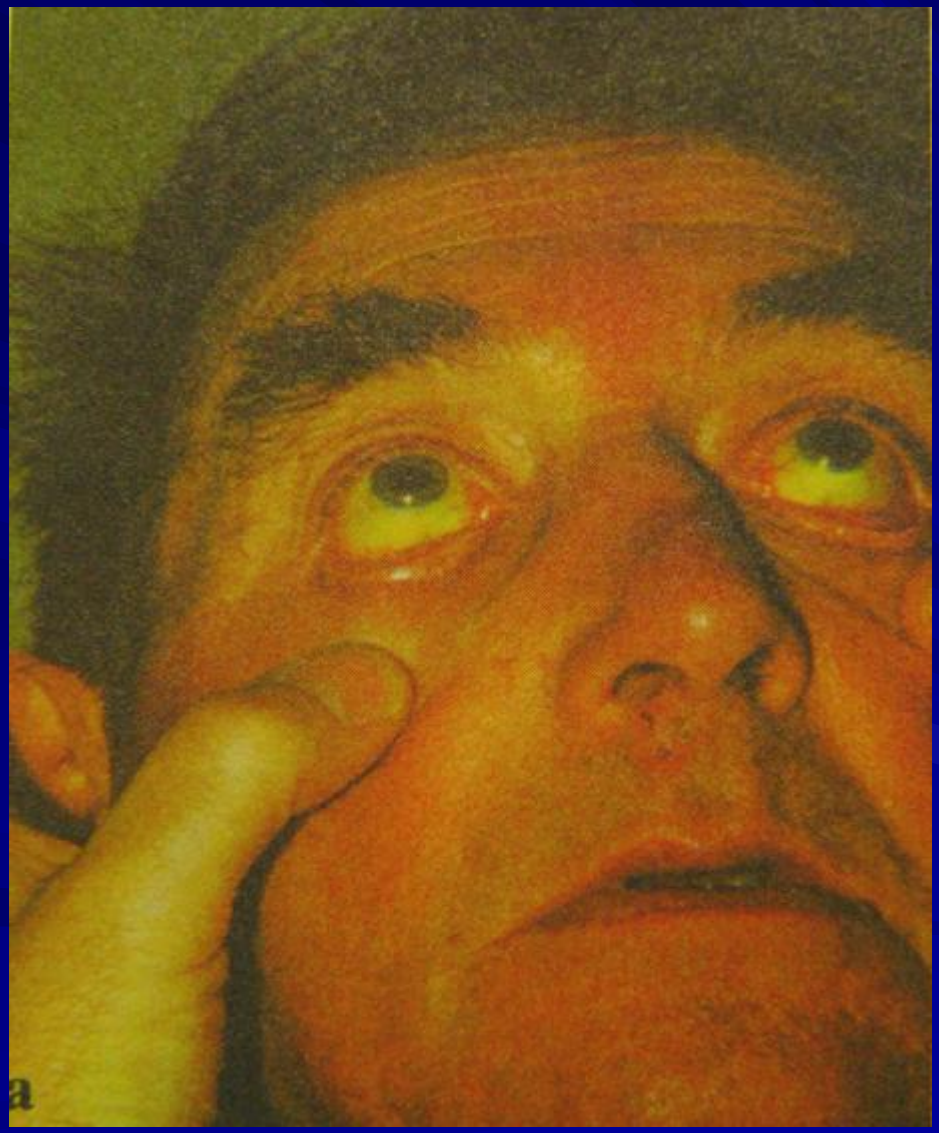
Skin and vizible mucosa:

a) pale skin (digestive haemorrhages due to rupture of oesophagial varices in cirrhosis);

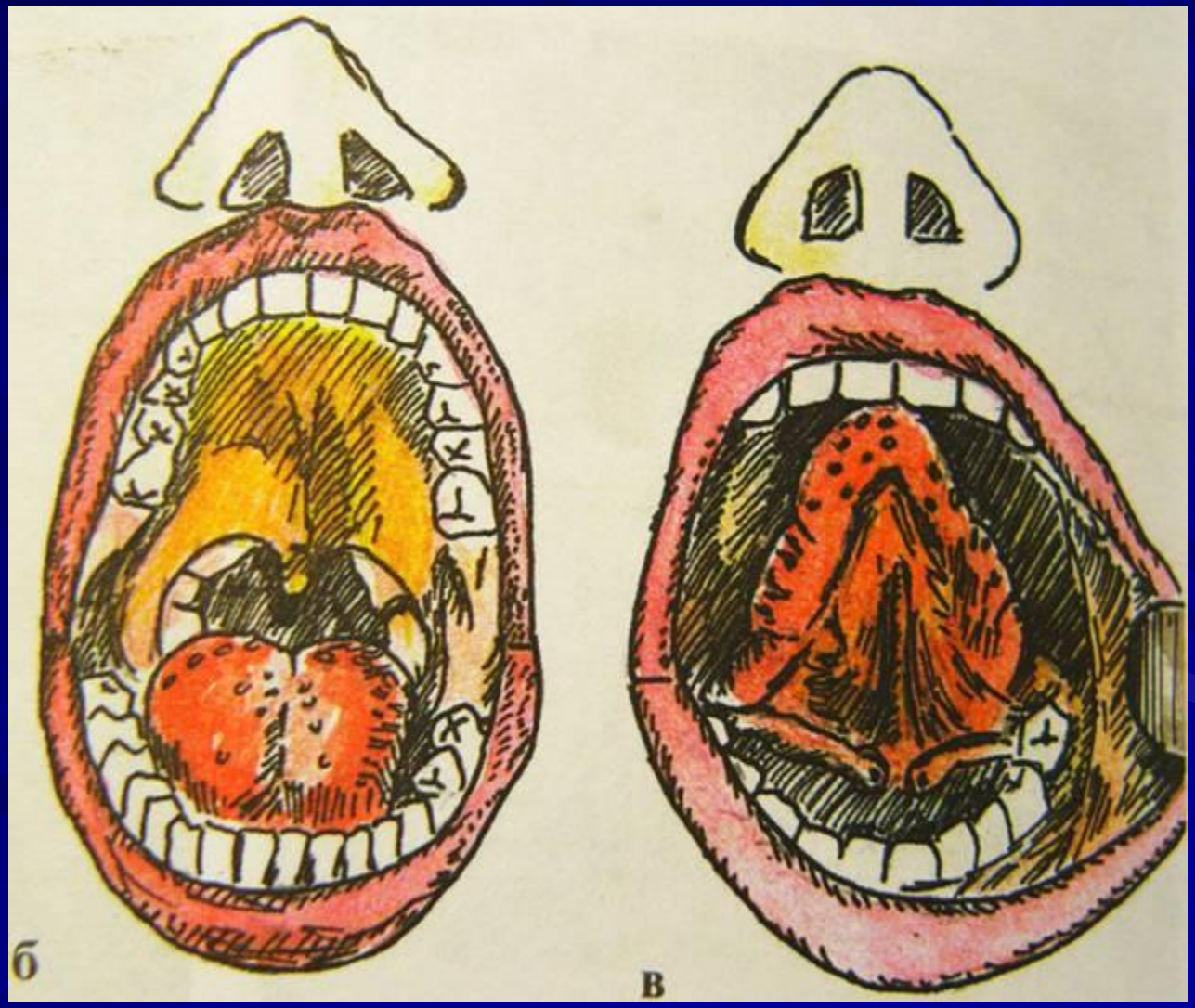
b) haemorrhagic petechiae;

c) subjaundice or jaundice with red or green shade;

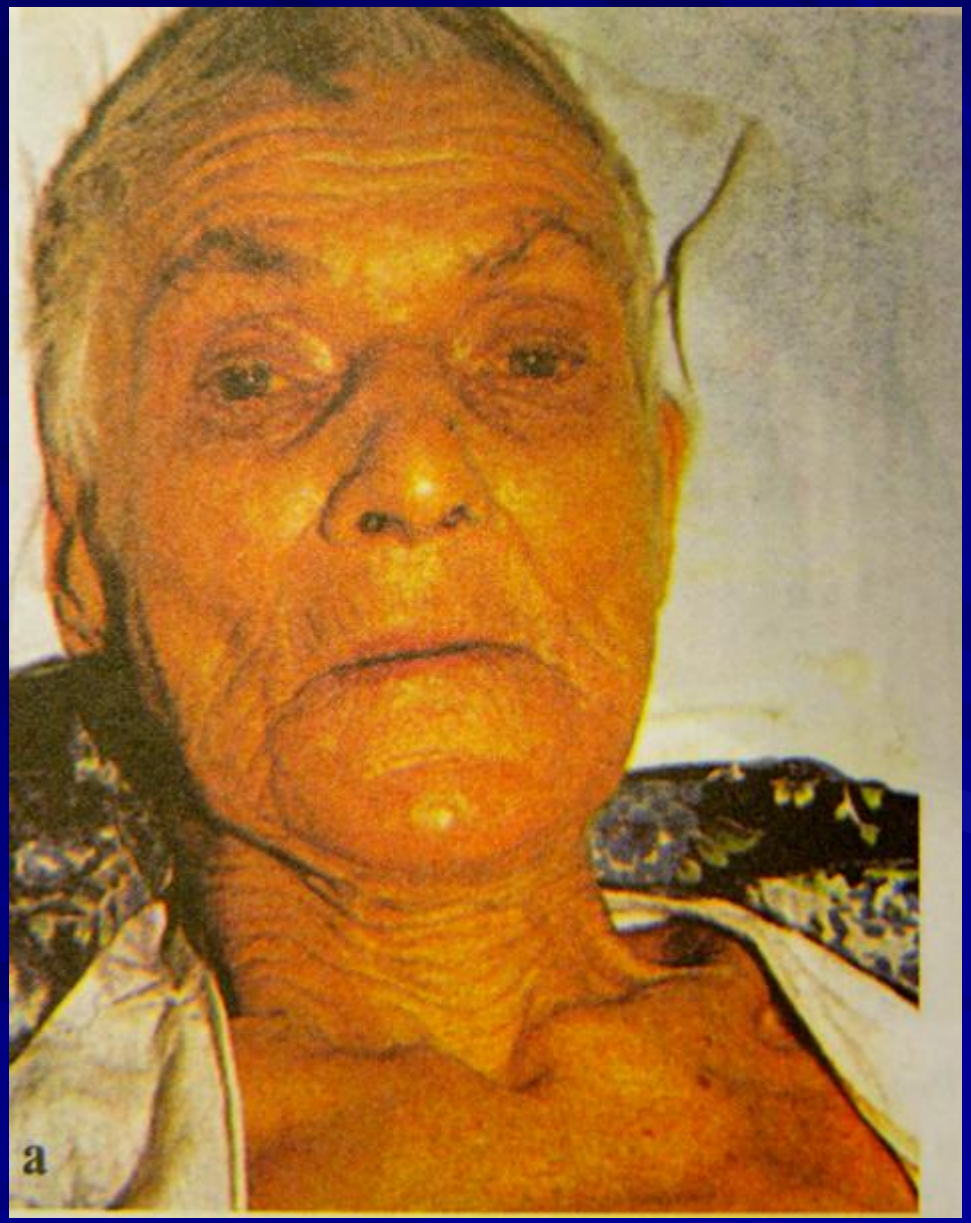
Jaundice of sclera



Jaundice of oral mucosa, under the tongue

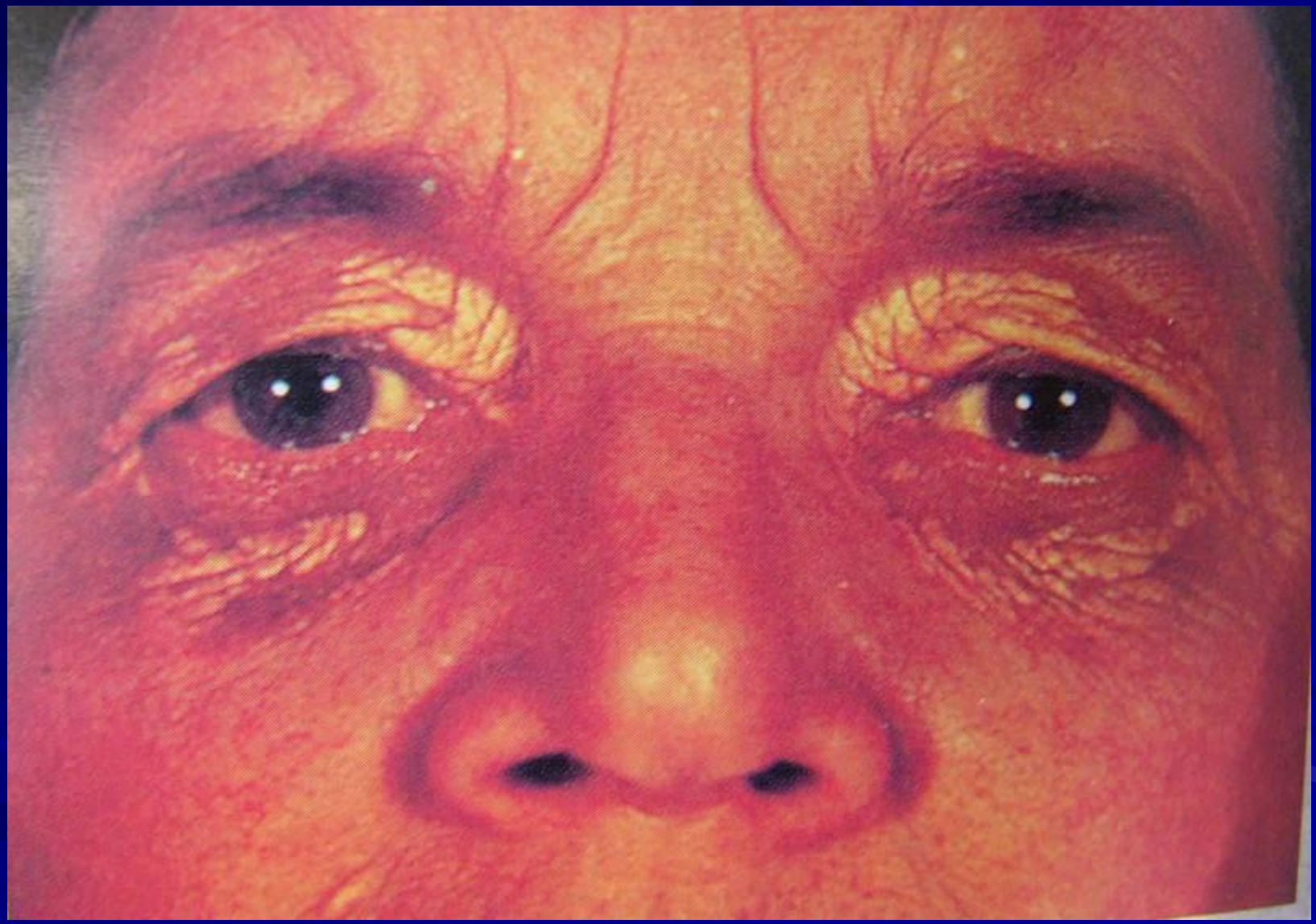


Mechanical jaundice



d) „Spiders", mostly seen on the neck, face, shoulders, arms.

e) if cholesterol metabolism is disturbed, one can find white to yellow depositions of it on the eyelids (xantelasma) or sometimes in other parts of the body (xantoma);



f) gynecomasty (increase of mammary glands) in men;

g) palmar and plantar erythema

h) diminishing of axillary and pubic pilousity (in women) and of pectoral pilousity (in men);

i) Peripheral oedema

- Other changes – thin and fragile hair; white and fragile nails with transversal and longitudinal striation.
- Subcutaneous fat tissue is decreased especially in liver cirrhosis, this could be noticed mostly on the face and extremities, being in contrast with big abdomen.
- Clubbing of the fingers in patients with chronic pathologies of the liver.

Inspection of oral cavity

- inflammation of oral mucosa and in the region of angles of mouth due to long-term disturbance of vitamin metabolism, especially from group B.

- tongue – purple.

Inspection of the abdomen

- in liver diseases, associated with portal hypertension, one can notice increased volume of abdomen (due to meteorism and accumulation of ascitic liquid);
- the skin above the abdomen is smooth, stretched, the umbilicus is prominent.

Liver cirrhosis – ascitis, gynecomasty, petechiae, caput Medusae, umbilical hernia

- Sometimes during inspection of the abdomen excessive abdominal volume is given by increased dimensions of some organ (ex. liver and spleen), or by umbilical hernia.

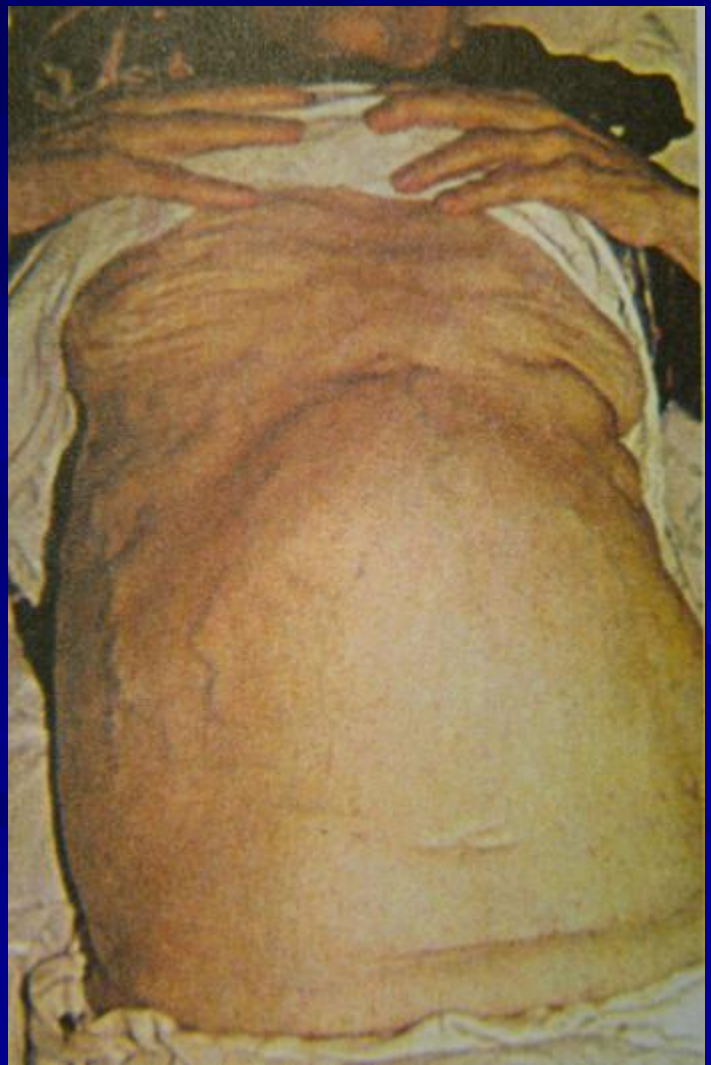
- in such cases the abdomen is asymmetric.

Cirrhosis

Jaundice

Umbilical hernia

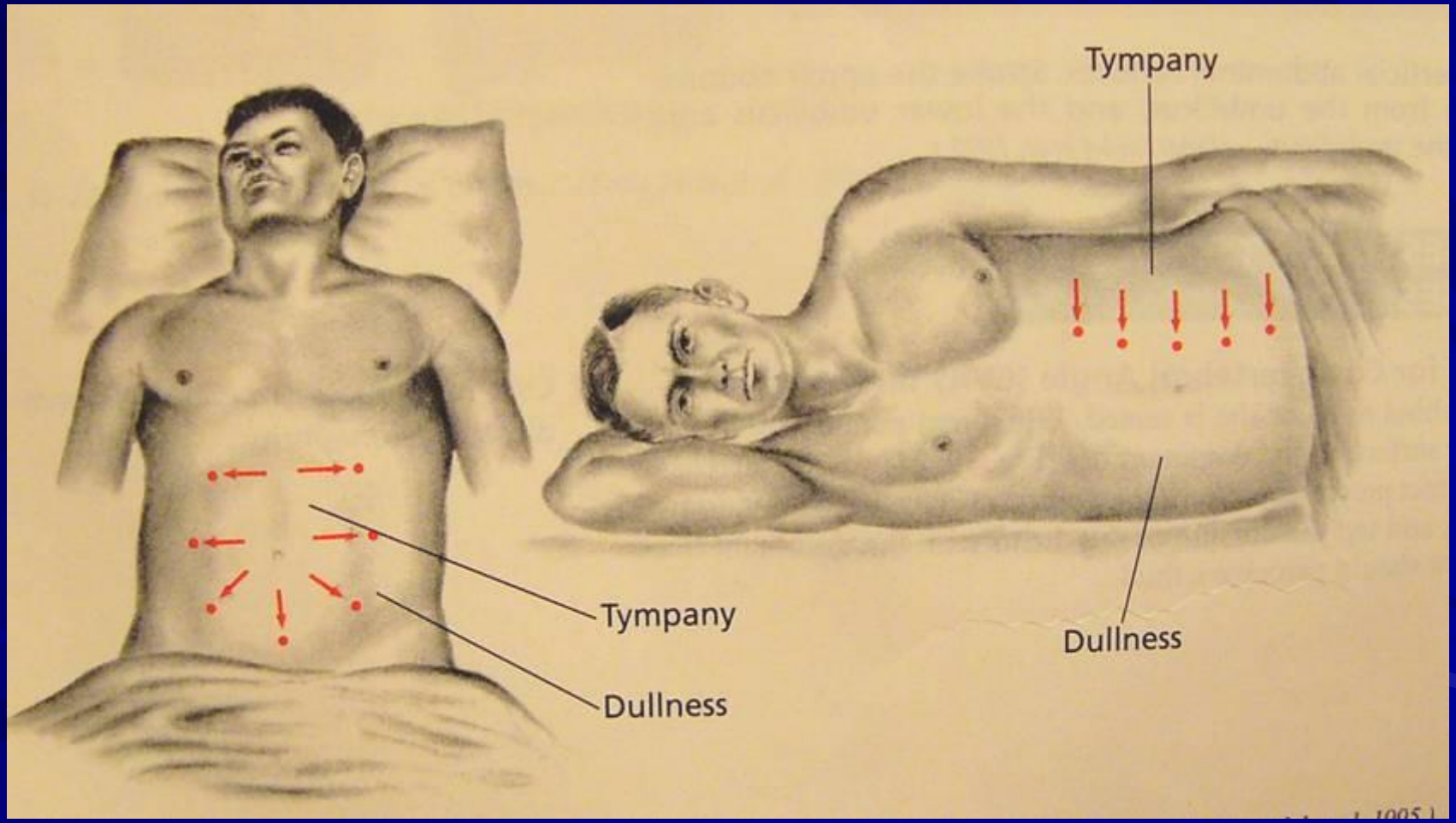
On the anterior wall of the abdomen there could be a pronounced venous net.



Percussion of the abdomen
for appreciating of liquid in abdominal cavity.

- With patient laying on his back apply a superficial percussion from umbilicus to lateral sectors of the abdomen. If there is liquid in abdominal cavity, it goes down.
- As a result, in the central part of the abdomen (in umbilical region) there is a tympanic sound, and in flanks there is dullness.

percussion of the abdomen



when moving the patient in lateral position the liquid is going down again, an in the upper part, above the opposite flank, the dull sound turns to tympanic.

- One can also percut the abdomen with the patient in standing position from up to down on the median line.

- If there is liquid, in the inferior part of the abdomen there is a dull sound by percution.

Huge amount of liquid can be appreciated by meaning of fluctuation method (wave sign).

- The left hand is put on the lateral surface, and the fingers of the right hand apply brief, knocking movement to the opposite abdominal wall.
- These shocks produce oscillations of liquid, which are transmitted to the opposite side and are felt by left hand like a wave symptom.

in order to be sure that the fluctuation is transmitted through the liquid, but not through abdominal wall, it is recommended to the assistant to place his hand on the medial anterior line in umbilical region (to block the transmission of the wave through abdominal wall).

percussion of the liver

the most simple method of appreciation of liver borders is Curlov's method.

Proceed as following:

I Moment

- Appreciating of the upper border of the liver on the right mediocclavicular line.

  The plessimeter is placed parallel to the upper border of the liver and percussion is made from up to down until the sound changes to subdull (this is point 1 - usually IV-V intercostal space).

II Moment

- Appreciating of the lower border of the liver on the right medioclavicular line.

The plessimeter is placed parallel to the lower border of the liver at the level of umbilicus and percussion is made from down to up until the sound changes to dull (this is point 2 - usually at the level of the lower margin of costal arch).

III Moment

Appreciating of the upper border of the liver on the medial anterior line.

This is impossible to do by percussion as here the liver is near the heart, which also gives a dull sound during percussion.

The border is determined conventionally, tracing a horizontal line from the point 1 to median anterior line. This is the upper border of the liver on the medial anterior line (point 3).

IV Moment

Appreciating of the lower border of the liver on the medial anterior line.

- percussion is done from down to up from the level of umbilicus or lower on the medial anterior line until the sound changes to dull. (this is point 4 - usually at the border of the upper and medium third of the distance between umbilicus and xyfoid process.

V Moment

- Appreciating of the lower border of the liver on the left costal arch.

  The plessimeter is placed perpendicular to the left costal arch at the level of IX rib and percussion is made right on the margin of the left costal arch to the point 3 until the sound changes to dull (this is point 5 – usually at the level of VII-VIII rib).

In a healthy adult there should be:

between point 1 and 2 - 9-11 cm.

between point 3 and 4 - 8-10 cm.

between point 3 and 5 - 7-9 cm.

gallbladder is not determined by percussion.

Palpation of the liver - goals

Appreciation of the characteristics of the lower margin of the liver:

- contour (smooth or irregular);
- consistence (hard or soft)
- shape (sharp or rounded)
- presence of pain
- the surface of the organ (smooth or irregular).

In big amount of liquid in abdominal cavity the margin of the liver cannot be appreciated by palpation.

In this case with the fingers of the right hand apply abrupt shocks on the abdominal wall (without taking the fingers off from the anterior wall of the abdomen), moving the hand from down to up.

When the fingers touch the margin of the liver, there is a feeling of a hard organ, which is moving from and to the fingers (the symptom of "floating ice").

In healthy people gallbladder is not determined by palpation.

During superficial palpation of the abdomen in billiary colic and in inflammatory process there could be tension of the abdominal muscles in the right hypochondria. Also sensitivity and pain could be revealed.

In the presence of pain it is necessary to determine the point of maximal pain.

In gall bladder disorders this point coincides with projection of gall bladder on the abdominal wall, which is at the level of intersection of the external margin of right rect abdominal muscle with right costal arch .

Auscultation of the liver

During examination of the liver auscultation is rarely applied

In local peritonitis sometimes there could be heard and even appreciate palpatory a noise of peritoneal friction under the right hypochondriac region.

Percussion of the spleen

- percussion can serve only as a method of orientation for appreciating splenomegaly.

  The spleen is situated under the cupola of left diaphragm in the depth of left hypochondria. The X rib divides it in two halves - anterior inferior pole and posterior superior pole; these could be determined by percussion on the X rib.

percussion is better to be performed with patient laying in right lateral position with slightly flexed legs.

I Moment

The plessimeter is placed at the margin of the left costal arch perpendicular to the X rib.

percussion is made from the margin of the left costal arch directly on the X rib until the sound changes from tympanic to dull.

II Moment

- The plessimeter is placed perpendicular to the X rib on the posterior axillary line
- Slight percussion is made on the X rib to the first point until the sound changes to dull.

  The segment between the first and the second point represents the longitudinal diameter of the spleen. Normally the longitudinal diameter is 6-8 cm

- For appreciation of transversal diameter of the spleen the longitudinal diameter is divided into 2
- percussion is made from the obtained point perpendicular X rib, first up, until the sound changes from clear to dull, and then down until the sound changes from clear to dull.

  The segment between these two points represents the transversal diameter of the spleen. Normally the transversal diameter is 4-6 cm.

Palpation of the spleen

- The goal of palpatory examination of the spleen is to appreciate the inferior margin and its location, consistence, shape and tenderness, the character of the spleen surface.
- The principle is identical with palpation liver.
- During palpation of the spleen the most comfortable position of the patient is- in right lateral decubitus with slightly flexed legs.

Auscultation

in very rare cases at the level of the spleen could be heard peritoneal friction (in infarction of the spleen, as a consequence of local inflammation of peritoneum).