The main syndromes in liver diseases: portal hypertension, jaundice, liver insufficiency

The liver

- liver is the biggest gland of the organism;
- Its average weight in an adult person is 1200-1500 g
- liver is covered with a conjunctive capsule – Glisson capsule, which is prolonged to the interior of parenchyma.

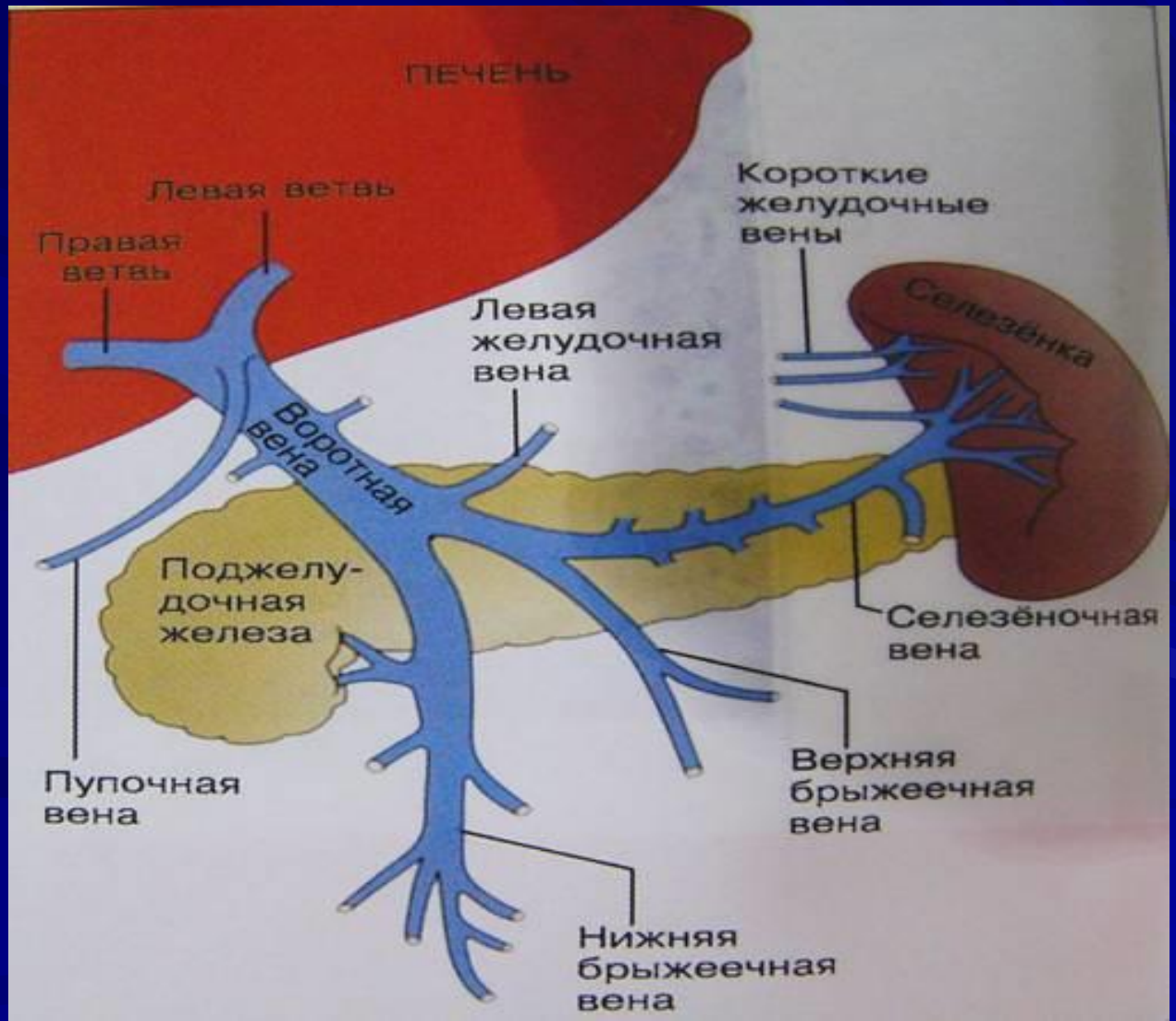
Vascularisation of the liver

The afferent hepatic circulation is provided by:

- System of hepatic artery
- Portal vein – formed behind the head of the pancreas by converging of three veins:

1. Superior mesenteric vein
2. Inferior mesenteric vein
3. Spleen vein

The portal vein system , (situated behind the pancreas)



- After the confluence of the above three veins it also receives blood from left and right gastric vein, prepyloric vein and pancreatic veins.

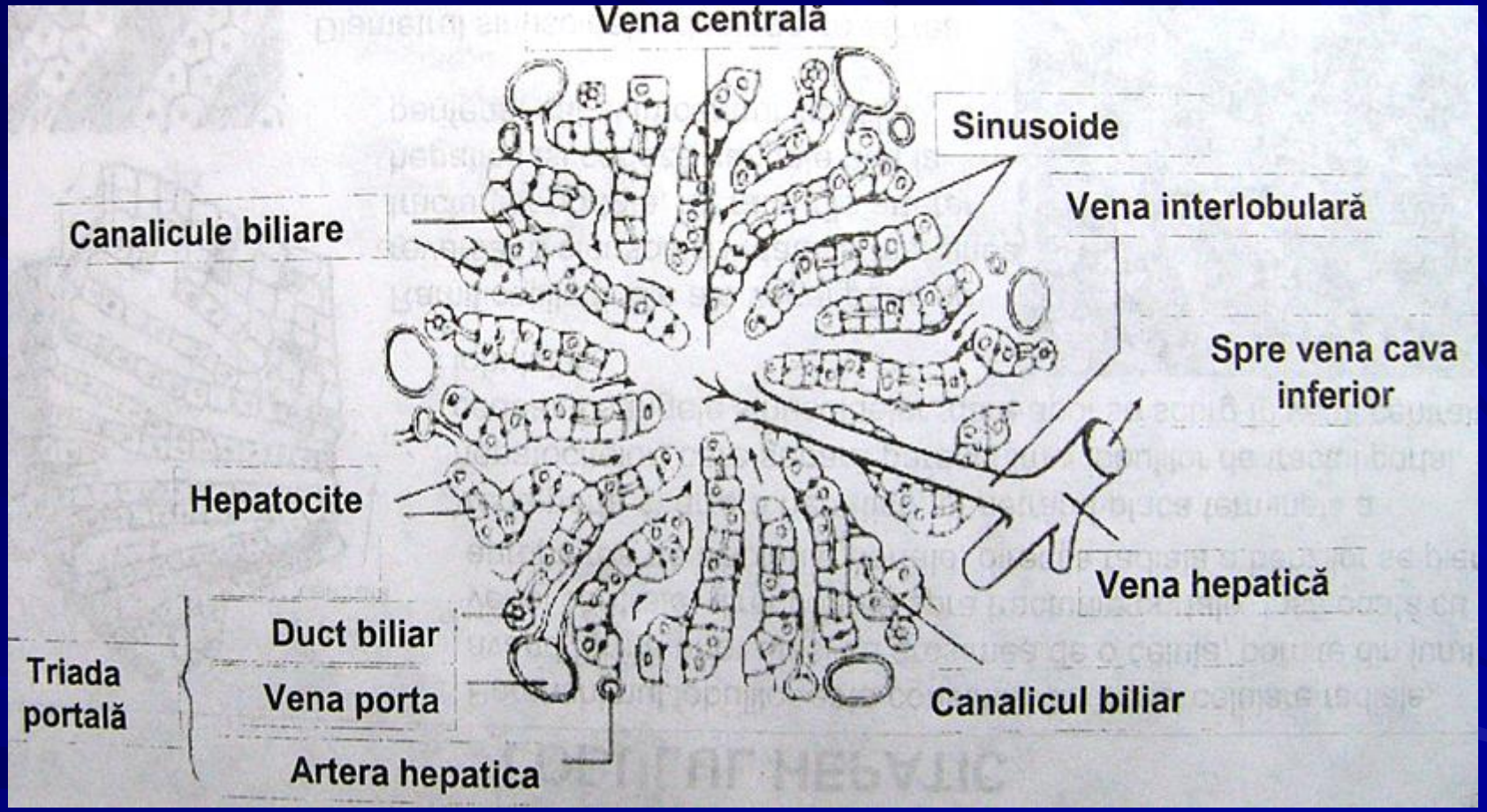
- The efferent hepatic circulation is provided by the system of suprahepatic veins.

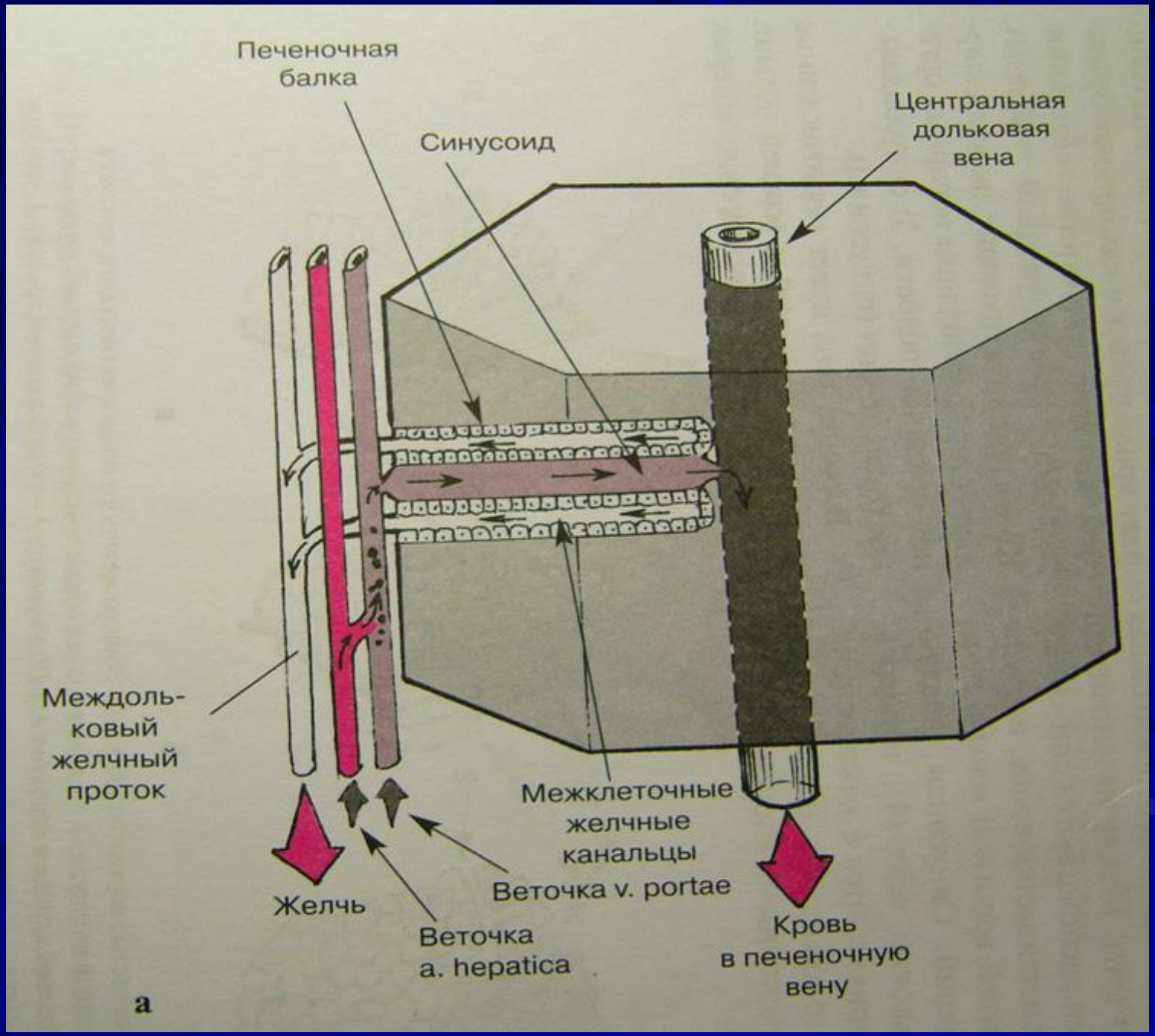
Structure of hepatic lobe

- At histological examination the hepatic lobe has a hexagonal shape, central vein in its centre.

- In the corners there are portal tracts, containing ramifications of portal vein, hepatic artery, billiary duct, lymphatic vessels, nervous fibres.

The hexagonal hepatic lobe

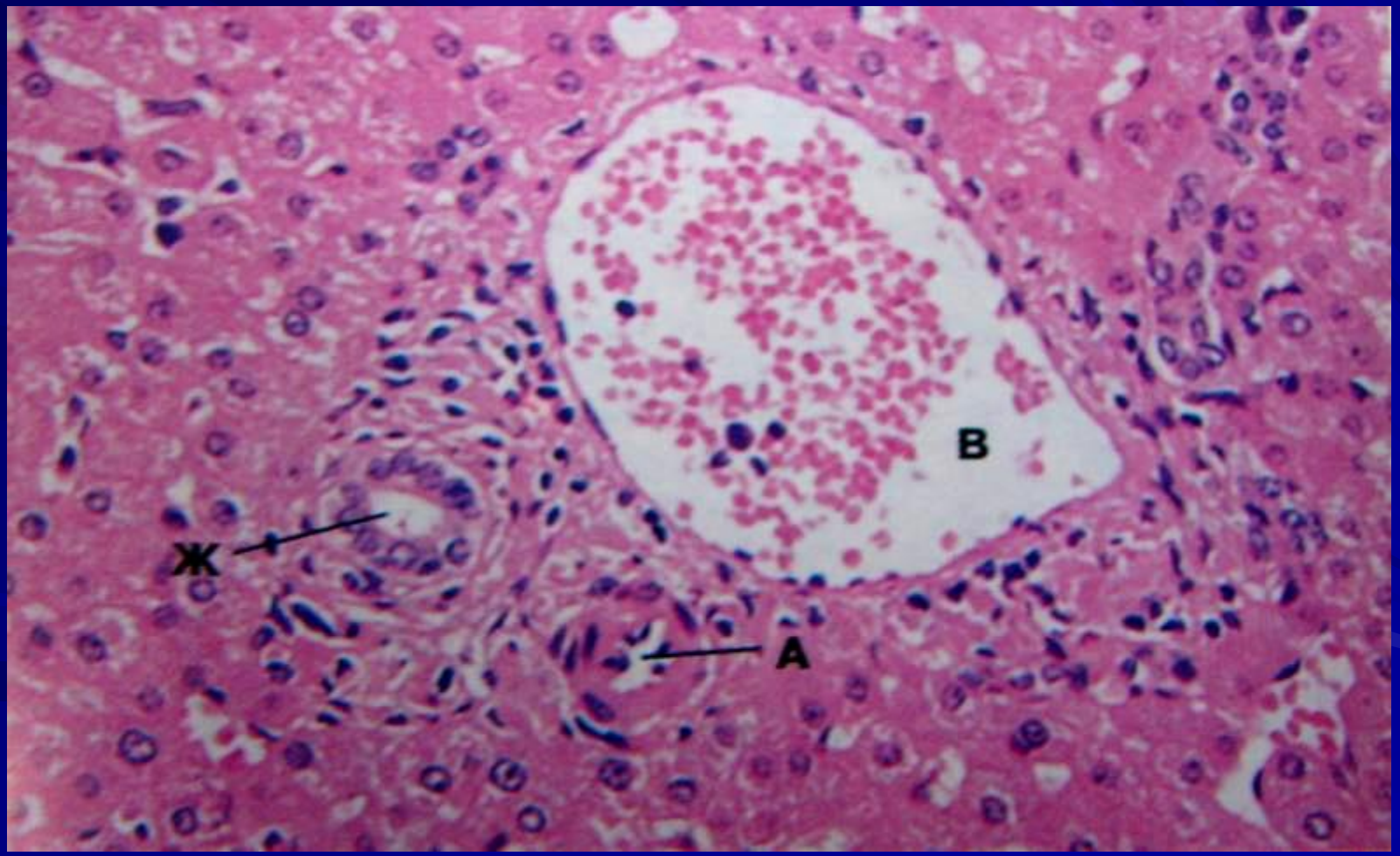



Печеночная балка
Синусоид
Центральная дольковая вена
Междольковый желчный проток
Межклеточные желчные канальцы
Веточка v. portae
Желчь
Веточка a. hepatica
Кровь в печеночную вену
а

The portal tract

- the portal tract represents a layer of conjunctive tissue surrounding the branches of portal vein, hepatic artery, billiary duct
- This layer of conjunctive tissue is continued to external capsule of the liver, realizing a truly „limiting plate".

Normal portal tract:
A-a.hep; B-v.hep; J- billiary duct.



Main functions of the liver

I. Metabolic function

1. **Metabolism of proteins** – synthesis of albumins.
2. **Metabolism of lipids** – synthesis of fatty acids, triglycerides, cholesterol, phospholipids, lipoproteins, and their degradation.

3. Metabolism of bilirubin:

- formation of bilirubin
- conjugation of bilirubin
- excretion of bilirubin

4. **Metabolism of carbohydrates**- oxidation of glucose, **processes of glycogenesis**, formation of glucuronic acid.
5. **Metabolism of** biologically active substances, biological amines, microelements.
6. **Metabolism of vitamins**.

7. participation in acido-basic balance.
8. participation in regulation of enzyme activity in blood serum (secretory enzymes - cholinesterase; indicatory enzymes - ALAT, ASAT; excretory enzymes γ-glutamintranspeptidase and others).

II. Barrier function (protection, detoxication)

III. Participation in immunopoiesis and immune regulation

IV. Participation in formation of coagulation factors

Hepatitis
Liver cirrhosis

Chronic hepatitis

- Definition – it is a liver disease of divers aetiology, associating clinical, biological and histological characteristics of inflammation and cytolysis of hepatic cells, with a duration more than 6 months, but without transforming into liver cirrhosis.

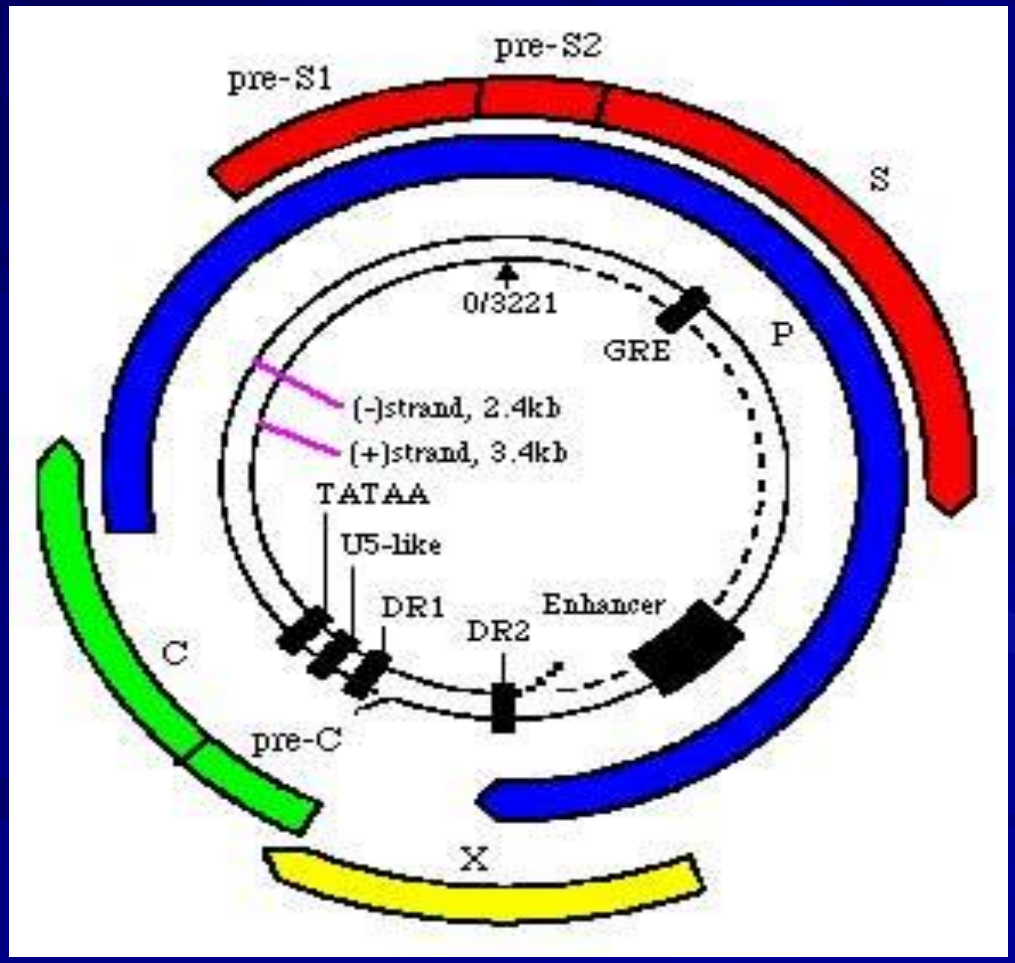
Aetiology of chronic hepatitis

1. viral factors (viruses of hepatitis B, C, D)
2. autoimmune factors
3. Drugs and professional chemical noxas
4. Non-defined

Pathogenesis of hepatitis

- HBV has an external layer with AgHBs (surface), which could be of three forms (small, medium, large).
- The three forms of AgHBs have three different corresponding antigenic proteins: protein S,
  protein pre-S1
  protein pre-S2.

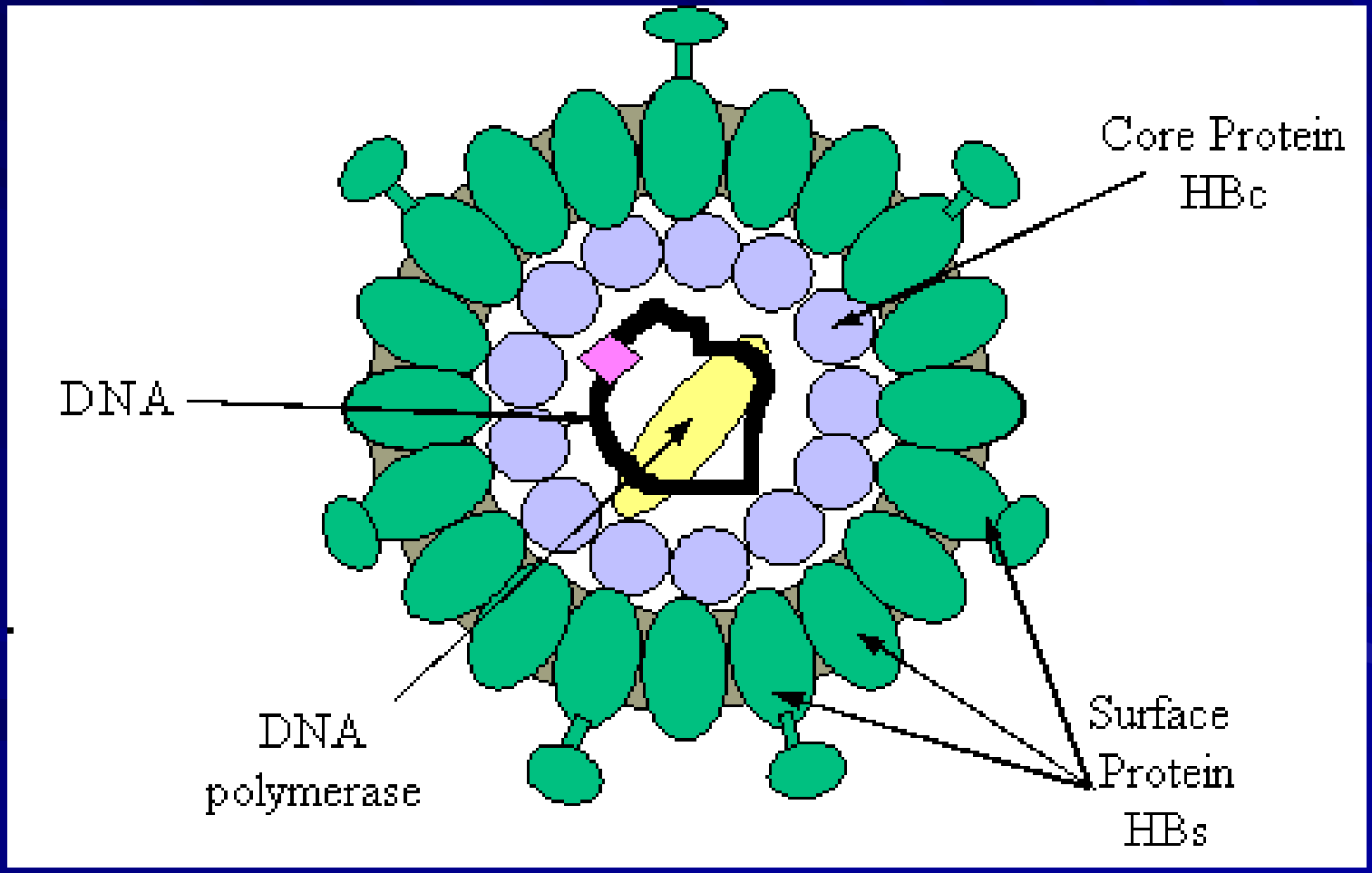
protein S, protein pre-S1 and protein pre-S2.



- protein Pre-S1 has an important role in fixation of virus on the hepatocyte,
- protein pre-S2 is involved in fixation of polymerizated immune albumin, the last contributes to the antigenic recognition of HBV also to the fixation of virus on the hepatocyte.

- Under the external cover of HBV there is a layer, covering a core, which contains AgHBc (core) and AgHBe (a peptide, included in the core).
- AgHBs is a constant marker of HBV infection (acute, chronicized, carrier); it disappears from serum in 1-3 months.

AgHBs, AgHBc (core), DNA , DNA polymerase.



- antibodies anti-AgHBs appear in serum in 1-2 months from disappearance of AgHBs ("immunological window"), indicating recovery.
- antibodies (IgM anti AgHBc) are the single marker of recent acute infection with HBV in the period of "immunological window".

- antibodies anti HBc appear early, together with AgHBs, as a marker of infection with HBV.
- Antibodies (IgG anti AgHBc) are markers of chronic infection.
- Ag HBe appears concomitant with AgHBs, being a marker of active replication.
- Persistence of AgHBe in serum over 6-7 weeks indicates an evolution to chronicisation.

- antibodies anti-AgHBe appear in serum after disappearance of AgHBe, indicating cessation of contagiousness and a favourable evolution.

- Pathogenetically, it is supposed that hepatitis B virus is not cytopathic (has no direct action on hepatocyte), and that morphological changes in the liver are due to immune injury of infected hepatocytes, which expose the antigens of hepatitis B virus on their surface.

- After penetration into the cell the virus starts multiplication, and the antigens of hepatitis B virus are exposed on the surface hepatocyte membrane.

- The infected cells are recognized by cytotoxic lymphocytes, becoming the target of a cellulary mediated immune response.

There are several types of cellulary mediated immune response:

1. **Normal immune response** – cytotoxic T lymphocytes together with T helper lymphocytes determine superficial Ag and produce the attack with necrosis of hepatocytes and inactivation of the virus inside them.

2. Excessive immune response:

- Conditions the fulminant form of acute hepatitis with high degree of lethality due to extended necrosis of hepatocytes.

3. Deficient immune response:

- Appears when the target antigen is not recognized by the immune system.
- The immunologic deficit is manifested by:

1. Incapacity of the immune system to produce antibodies, i.e. the defence is absent.
2. in case of insufficient production of antibodies, the defence of the organism is only partial.

- the hepatic replication of HBV is made at the level of cytoplasma and nucleus of hepatocyte.

Markers of the replication phase:

in hepatocytes: AgHBc is present

antigens present in blood:

- AgHBs
- AgHBe
- ADN-VHB
- DNA polymerase

antibodies present in blood :

- IgG -anti HBc (chronic infection)
- IgM- anti HBc (acute infection)

Markers of the integration phase:

in blood:

- AgHBs
- antibodies HBV:
  - Anti HBc
  - Anti HBe
  - Anti HBs
  - ADN-VHB.

HDV (hepatitis D)

- a small virus, having a circular catenae of RNA and behaving as a viral parasite of HBV.
- HDV infects the organism either concomitant with HBV (co-infection), or through superimposing to a pre-existent infection with HBV (super-infection).
- AgHD appears early in the serum, and disappears fast.

HDV (hepatitis D)

- Antibodies anti –HDV appear relatively early.
- Their persistence indicates an evolution to chronicisation.

Chronic viral hepatitis C

Hepatocytar lesions are due to the following two mechanisms:

- Direct mechanism
- Indirect mechanism – mediated by cytotoxic T lymphocytes .

- antibodies anti HCV appear late, on an average of 16 weeks after the onset.

- Persistence of antibodies anti –HCV for months, with low and undulant values of transaminases denotes a chronic infection.

For autoimmune chronic hepatitis there are two presumed etiological factors : endogen and exogen.

- endogen factor: activation of B-cells with elimination of antibodies against antigens of hepatocyte membrane with cytolysis due to a genetic defect of T- suppressor lymphocytes.

Exogen factors:

- Viral infections, some drugs – modify immunoreactivity of the body which has a genetic predisposition, favourizing the appearance of autoimmunity.

- in chronic medicamentous hepatitis there is a direct toxic effect of the drug or of some metabolite of it on the hepatocytes.

Morphology of chronic hepatitis

- **Persistent chronic hepatitis**: no hepatocytar necrosis. There is an inflammatory infiltrate (with mononuclears) in portal spaces.

- **Lobular chronic hepatitis**: moderate intralobular necrotic lesions with moderate fibrosis .

- **Active chronic hepatitis**: with following types of hepatocellular necrosis: focal; necrosis in moth hole; necrosis in bridges (confluence of several foci, with formation of bridges).

- **Septal chronic hepatitis**: formation of non-inflammatory interlobular fibrotic septa.

Classification (WHO 1994) of chronic hepatitis

<u>According to the aetiology:</u>

1. Viral chronic hepatitis
2. Autoimmune chronic hepatitis
3. Chronic hepatitis given by drugs and professional chemical noxas
4. Chronic hepatitis of unknown aetiology

According to the degree of activity:

1. minimal (ALAT, ASAT increased 3 times of normal value)
2. moderate (ALAT, ASAT increased 5 times of normal value)
3. severe (ALAT, ASAT increased 8 times of normal value)

According to the morphological stage :

1. persistent chronic hepatitis
2. lobular chronic hepatitis
3. active chronic hepatitis
4. septal chronic hepatitis

Depending on the phase of viral infection:

- phase of virus replication
- phase of virus integration

Clinical picture of chronic hepatitis consists of following syndromes:

1. Astheno-vegetative syndrome

- Marked fatigue
- Disturbances of sleep
- Weight loss

2. Dyspeptic syndrome

- Diminished appetite
- Nausea
- Meteorism after meals
- Bitter taste in the morning
- Constipation alternating with diarrhoea

3. Algic syndrome

- Dull pain under right costal arch, appearing after meals, physical effort or psychoemotional stress.

4. Haemorrhagipar syndrome:

- Gingivorrhagias
- Epistaxis
- Purpuric rash

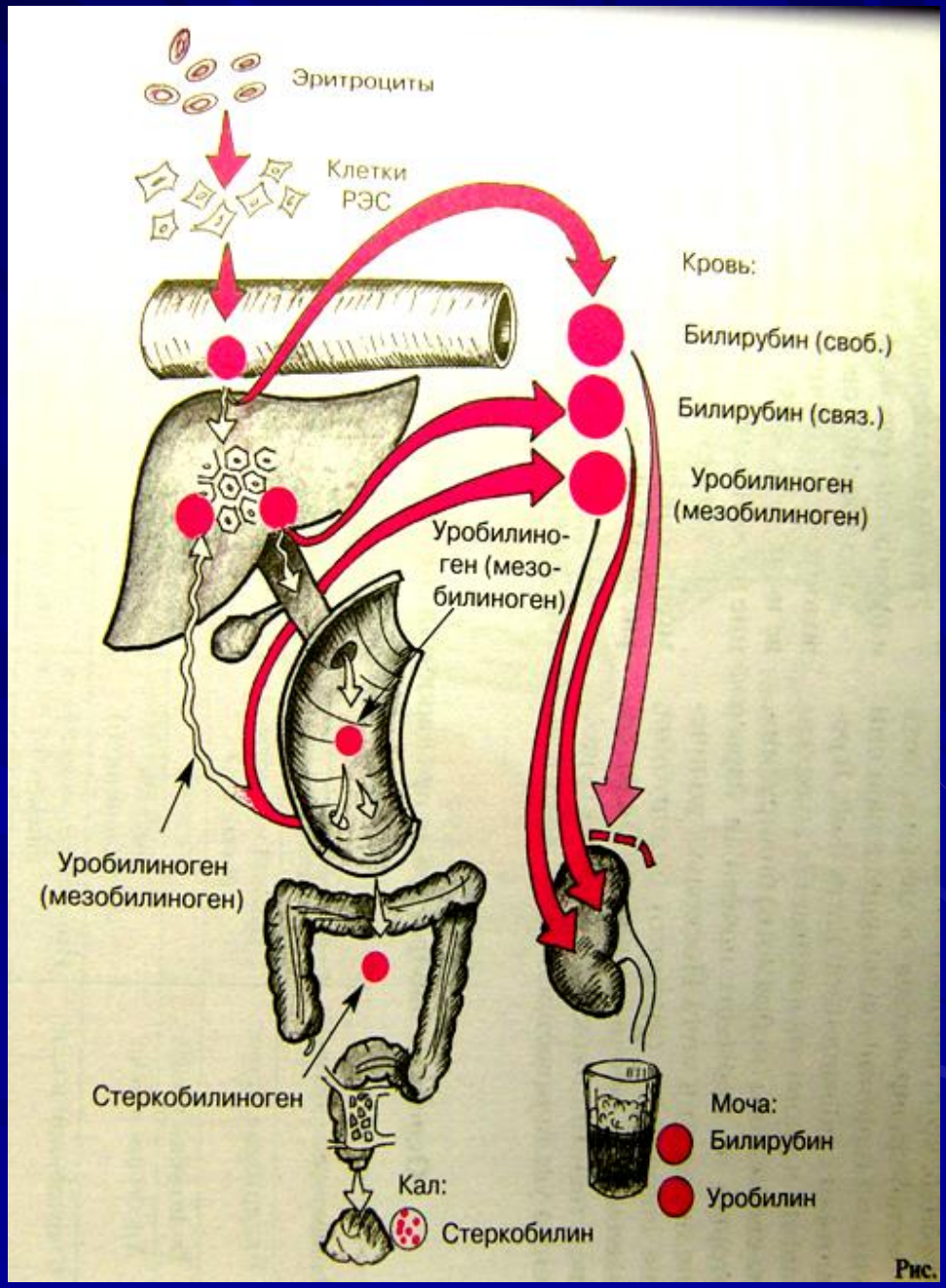
5. Syndrome of jaundice:

Classification of jaundice according to the mechanism of appearance :

Jaundice

	Hemolitic	Mecanic	Hepatocelular or parenchimatos
Produced by	Massive destruction of red blood cells with hyperproduction of free bilirubin	Obstruction coledoc	hepatocellular lesions with alteration of the hepatic lobe structures
causes	haemolytic anaemia (hereditary, acquired)	- choledocolithiasis - cancer of head of pancreas	- Chronic hepatitis - liver cirrhosis

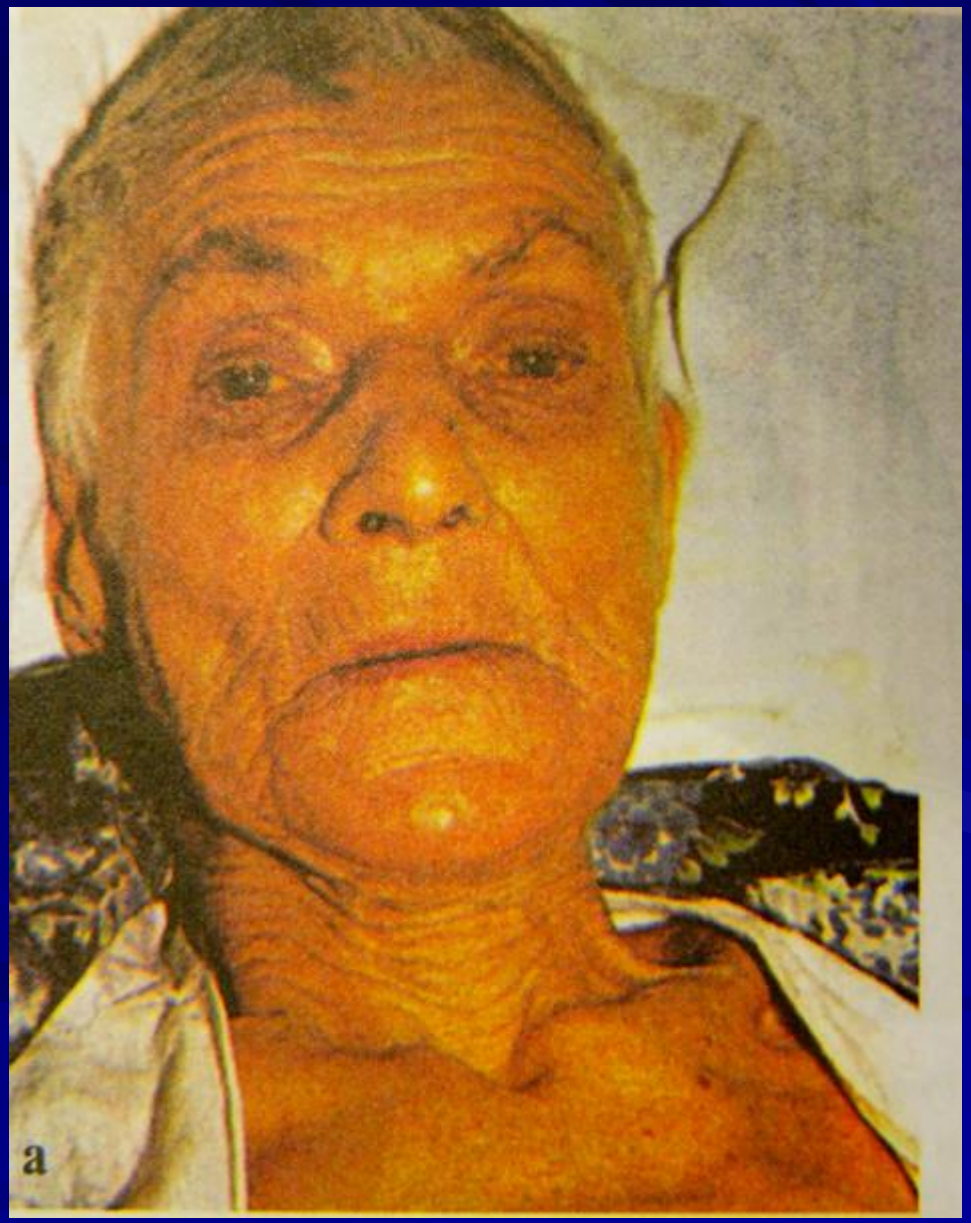
Parenchimatous jaundice



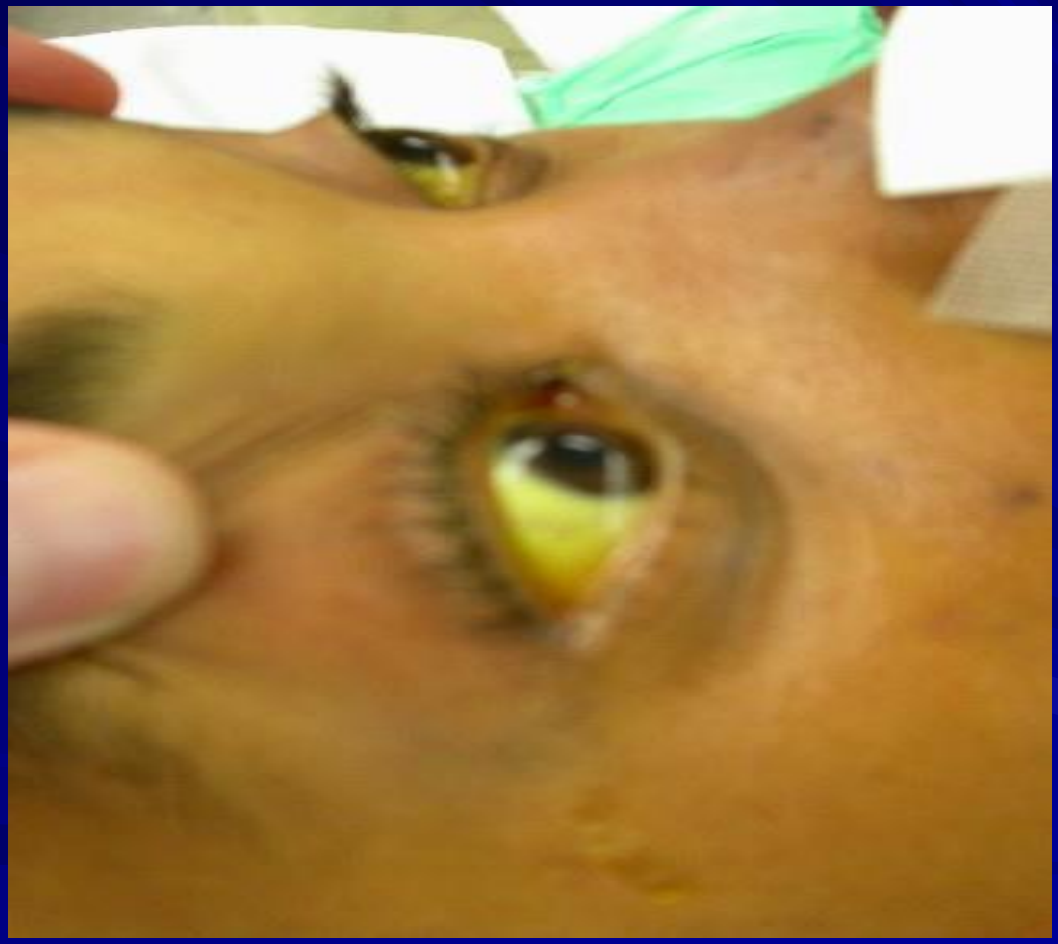
Clinical picture

	Haemolytical	Mecha-nical	Hepatocelular or parenchimatos
Coloration of skin and visible mucosa	Lemon yellow	Green yellow	Red yellow
Blood indirect/ direct bilirubin level	Indirect increased	Direct increased	indirect and direct increased

Mechanical jaundice



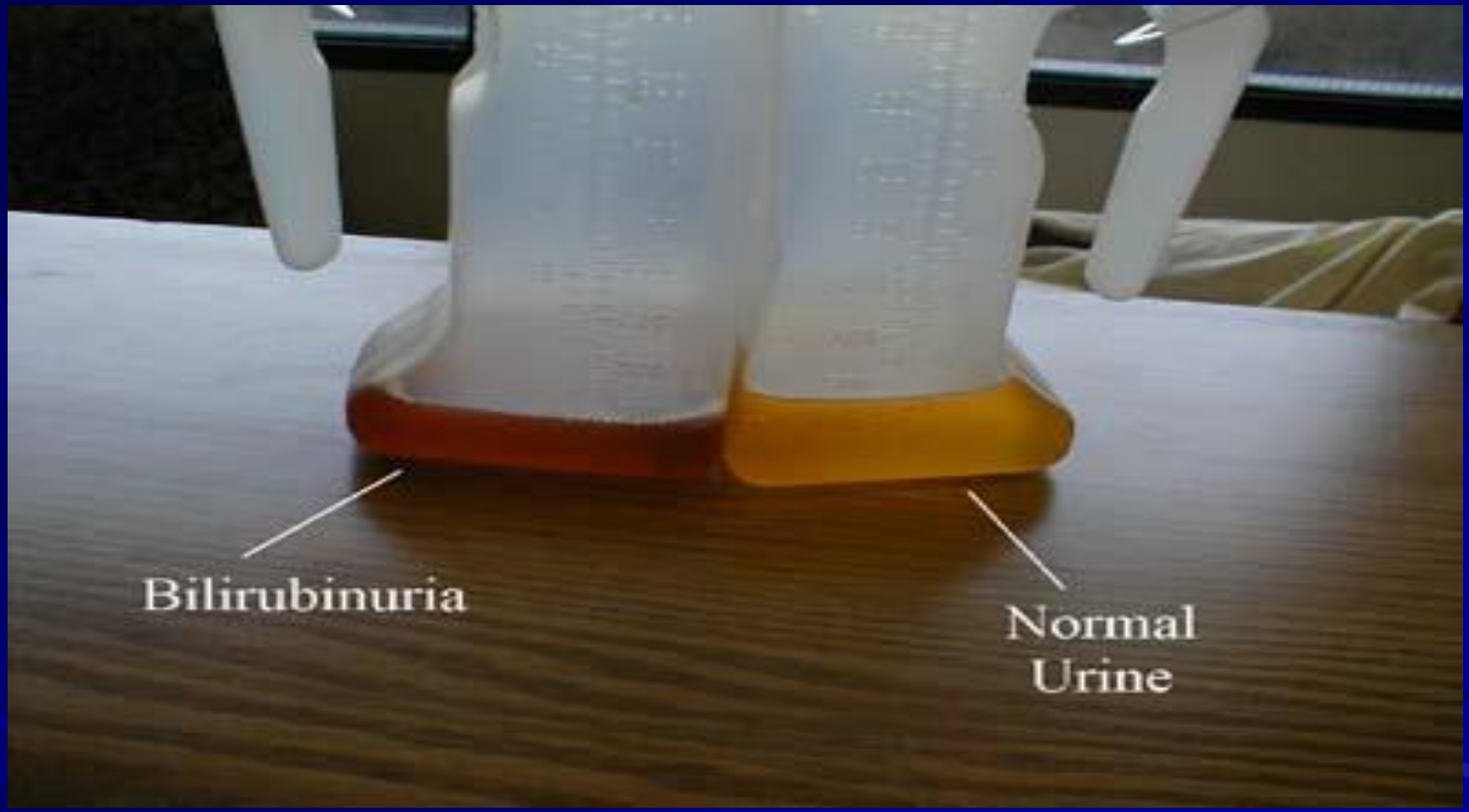
Jaundice of sclera



Parenchimatous jaundice

	Haemolytical	Mecha-nical	Hepatocellular or parenchimatos
Urine	Reddish	As „dark beer"	Hypercolorated
Faeces	Faecal stercobilin	Discolorated	Yellowish


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


Bilirubinuria
Normal
Urine

	Haemolitical	Mechanical	Hepatocellular or parenchymatous
spleen	Increased	---	Often increased
liver	Normal	At the beginning is normal	Increased
itching	---	Accentuated	---

There is an injury of hepatic cell, with a disturbance of the three stages of bilirubin metabolism at the level of the liver:

- formation of bilirubin
- conjugation of bilirubin
- excretion of bilirubin

Excretion of bilirubin is a critical moment in metabolism of bilirubin, and the most affected stage. This will lead to increase of conjugated and less – of indirect bilirubin in plasma.

6. Hepatosplenomegalic syndrome

Increased volume of the liver and spleen (in 15% of cases in chronic viral hepatitis C and autoimmune hepatitis)

7. Mesenchymal-inflammatory-autoimmune syndrome (more frequent in chronic viral hepatitis C and autoimmune hepatitis)

- fever
- arthralgia
- lymphadenopathy
- vasculitis

Physical examination in chronic hepatitis

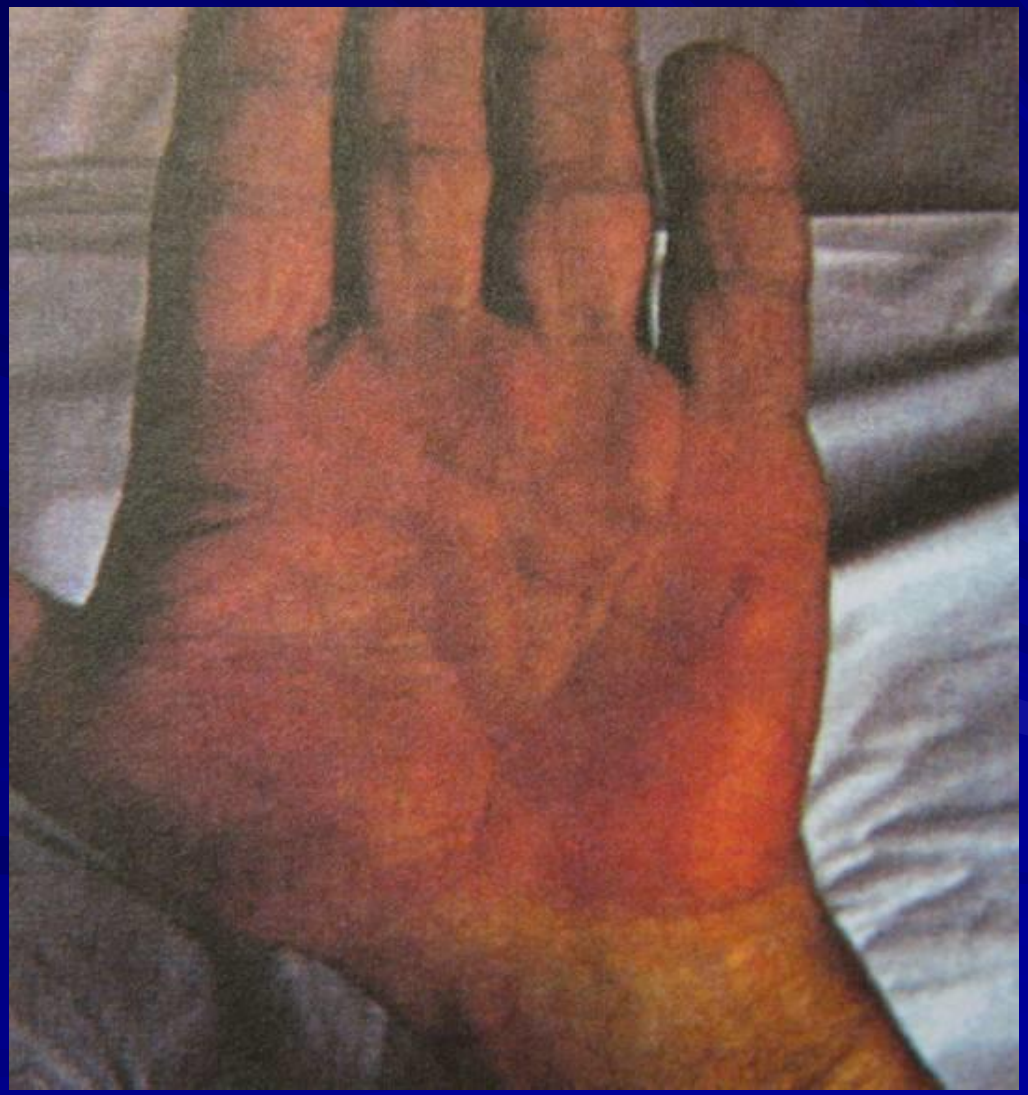
1. **General inspection:**

   in acute stage there will be jaundice of the skin, visible mucosa and sclera

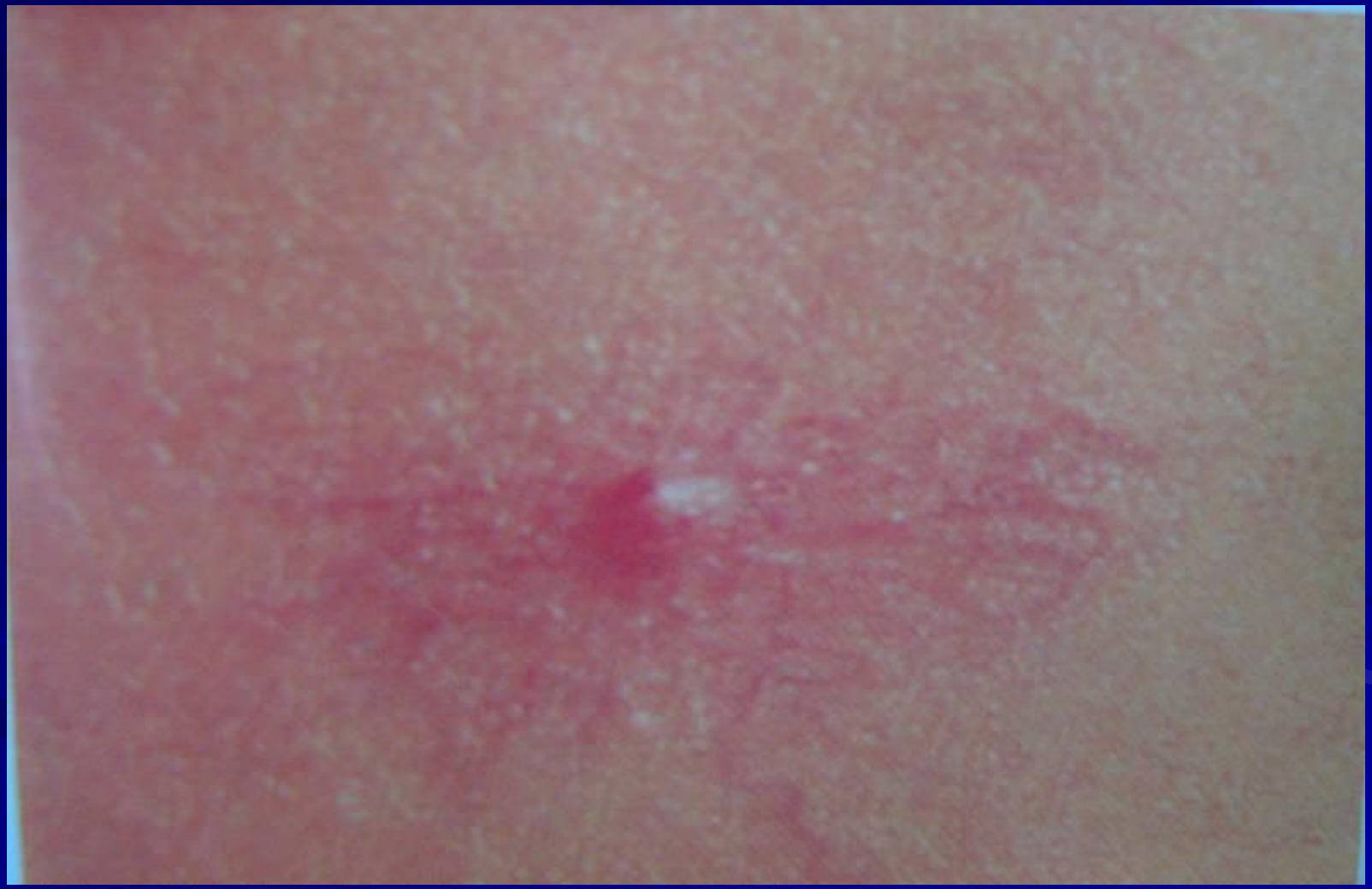
On the skin (face, neck, anterior part of the thorax):

- single spider angiomas (disturbance of hormonal status with increased oestrogen level in the blood and dilation of capillaries)
- more frequent in chronic viral hepatitis C and autoimmune hepatitis
- palmar and plantar erythema (hepatic palms)
- gynecomasty (increase of mammary glands) in men

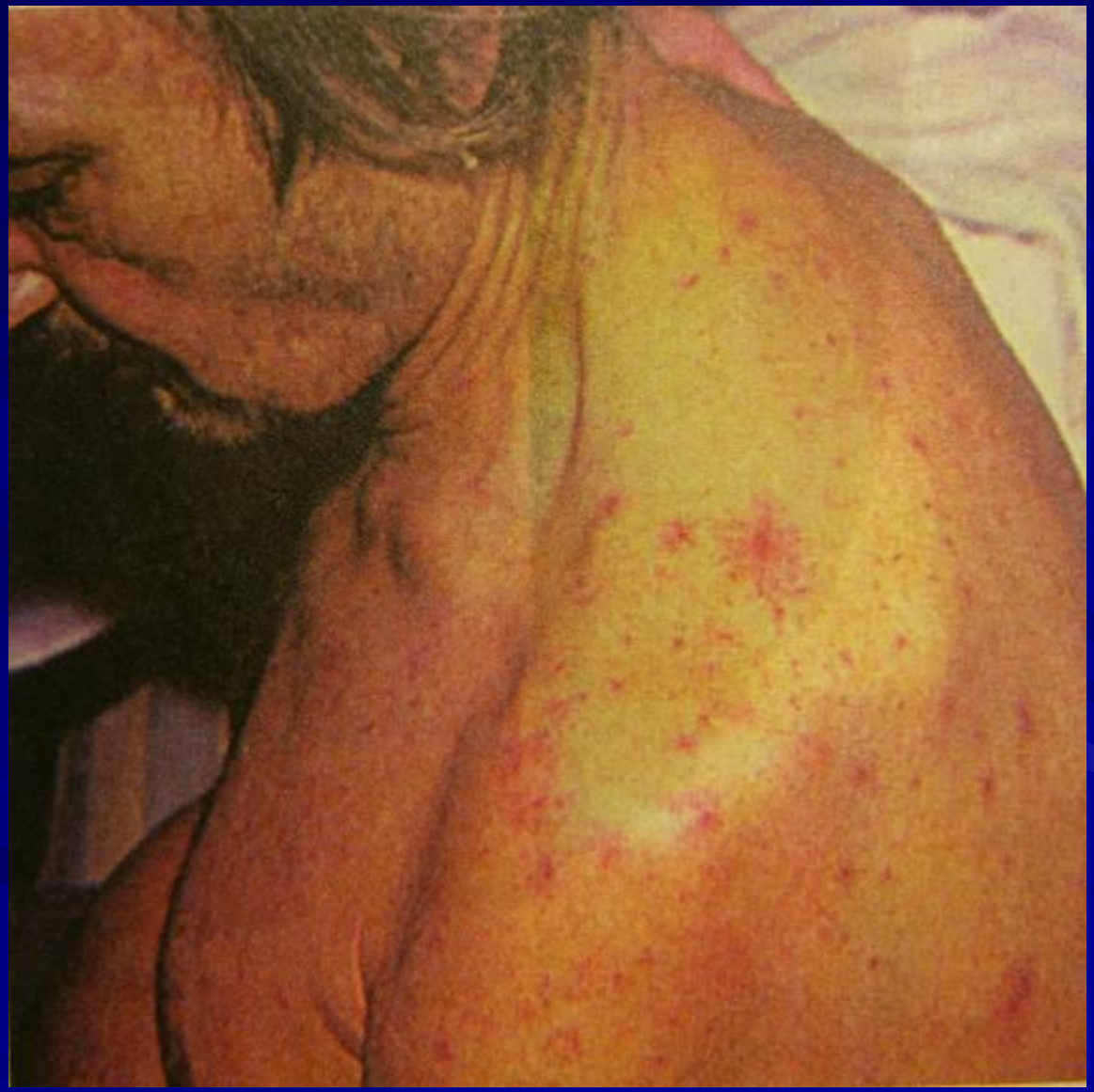
Cirrhosis (hepatic failure) – hepatic palms



Spider angioma



Cirrhosis – Spider angiomas



2. Local inspection:

- palpation: moderate increased volume of the liver, moderate pain, the surface is smooth, consistence slightly increased, the margin is sharp.

- Spleenomegaly: in 15% of cases.

The main laboratory syndromes in chronic hepatitis

1. Cytolytic syndrome: increased level of transaminase (ALAT, ASAT, lactate dehydrogenase (4,5), monophosphataldolase, arginase, glucozo-6-fosfatase).
2. Cholestatic syndrome: increased level of bilirubin, alkaline phosphatase, 5-nucleotidase, γ-glutamiltranspeptidase, cholesterol, β-lipoproteides, triglycerides, phospholipids.

3. Immuno-inflammatory syndrome : increased level of non-segmented leucocytes, lymphocytes, sedimentation rate, γ-globulins, IgA, IgM, IgG, autoantibodies; decreased level of complement C3.

4. Syndrome of hepatocellular failure: decreased level of total protein, prothrombin, albumin, coagulation factors, fibrinogen

- For chronic viral hepatitis - markers of hepatic viruses

- ultrasound examination - dimensions of the liver, ecostructure (homogeneous or non-homogeneous).

Examination with isotopes

(or scintigraphy with technetium - 99), which is selectively fixed in the cells of reticulohistiocytar system.

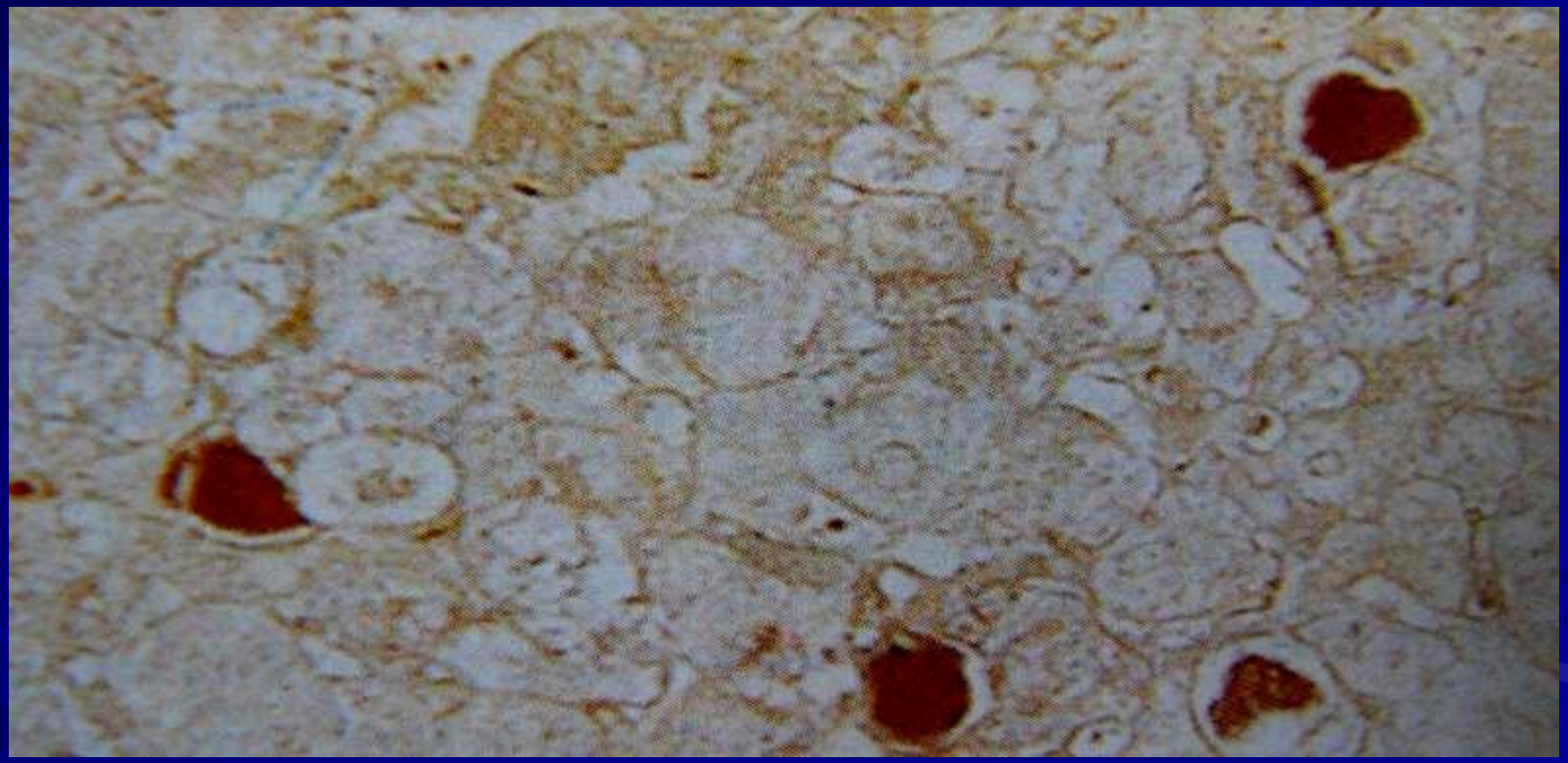
in chronic hepatitis there is a diffuse reduction of isotope capture by hepatic cells.

Biopsy of the liver

appreciation of morphological type of chronic hepatitis.

Contraindications for biopsy of the liver: haemophilia, low prothrombin index, thrombocytopenia, anaemia, hydatic cist, congestion in the liver.

hepatocytes with Hbs Ag (coloration with orsein)



CT

for appreciation of dimensions of the liver, dilation of portal vein, splenic vein, dimensions of the spleen.

Liver cirrhosis

Liver cirrhosis

Definition – an advanced, irreversible stage of various chronic hepatic lesions, in evolution of which occurs an active inflammation of the liver, morphologically characterized by:

- Variable degree of destruction of hepatocytar mass due to extensive necrosis
- Formation of connective tissue
- Presence of nodules of regeneration
- Disorganisation of hepatic architectonic
- Alteration of vascularisation leading to portal hypertension and hepatic failure.

Aetiology and name of liver cirrhosis

Aetiology	Name
1. Hepatic viruses B (D), C, G	postnecrotic cirrhosis
2. Alcohol	portal, Laennec cirrhosis
3. Metabolic - Fe - Cu	Haemocromatosis Wilson disease

Aetiology	Name
4. Cholestasis - intrahepatic - extrahepatic	primary billiary cirrhosis secondary billiary cirrhosis
5. Vascular - obstruction of hepatic veins - right heart failure with congestion in the liver	venoocclusive disease cardiac cirrhosis
6. autoimmune hepatitis	autoimmune cirrhosis

Aetiology	Name
7. Drugs: - Methotrexat - Amiodarone - Isoniazid - a methyldopa	medicamentous cirrhosis
8. Denutrition	nutritional cirrhosis
9. unknown causes	cryptogenic cirrhosis

Pathogenesis of liver cirrhosis:

- As a consequence of action on the liver of etiological factors, appear foci of inflammation and hepatocellular necrosis, where along with regeneration of hepatocytes (regeneration of hepatic cells is concentric, around non-affected cells, leading to formation of pseudolobules) there is an extensive development of connective tissue.

Pathogenesis of liver cirrhosis(2)

- the connective tissue compresses blood vessels, disturbing microcirculation and leading to hypoxemia and repeated necrosis.
- hepatocellular necrosis and development of connective tissue leads to atrophy of hepatic parenchyma, portal hypertension, development of porto-caval anastomoses, splenomegaly and ascitis.

Classification of liver cirrhosis

adopted at the congress of gastroenterologists in Kavana in 1956, completed in Acapulco (Mexico 1974) and accepted by World Health Organisation in 1978, and actually used.

Classification

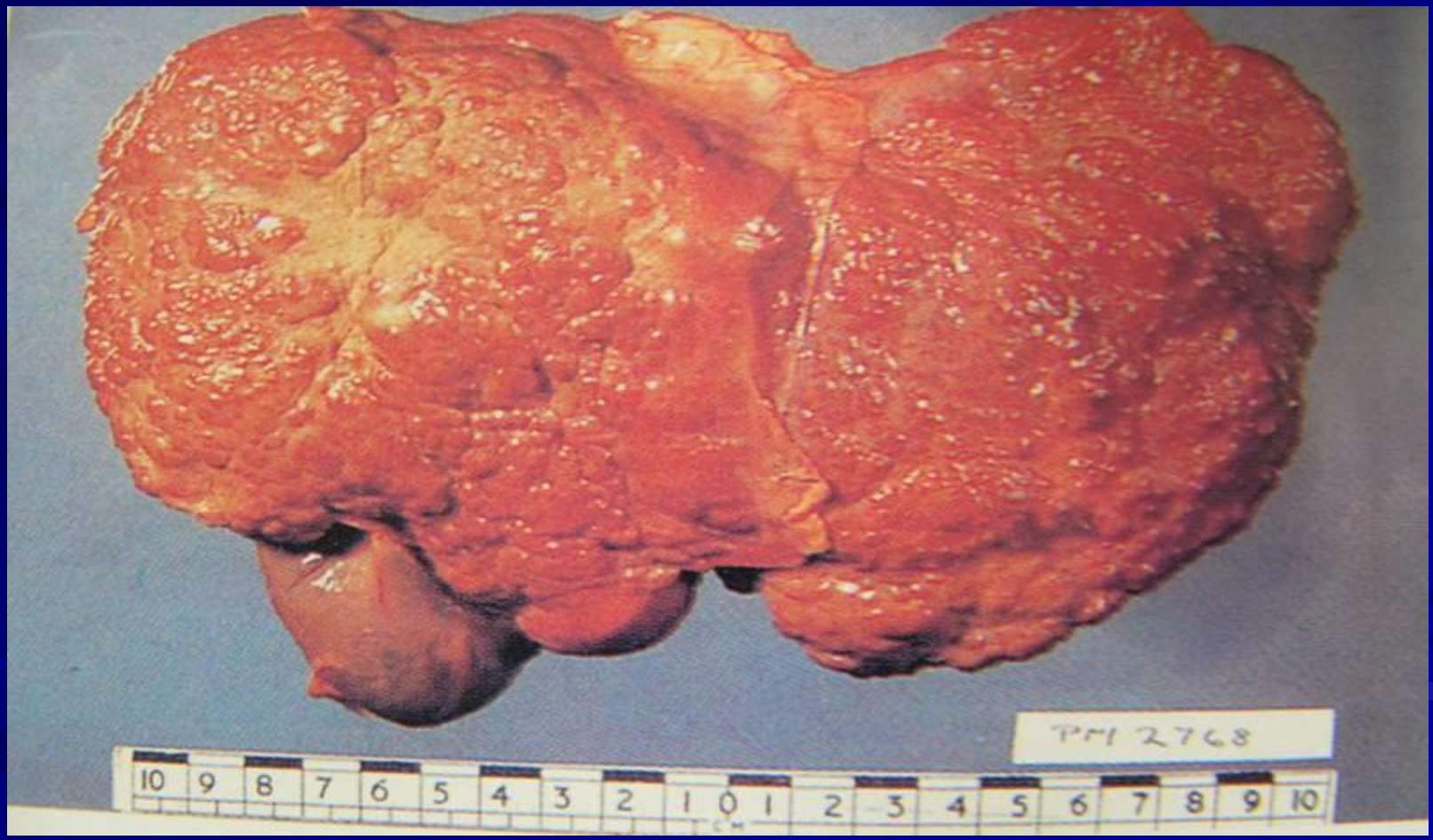
1. According to etiological factor.
2. Semeiological classification:

- Hypertrophic cirrhosis (more frequent in alcoholic and autoimmune aetiology)
- Atrophic cirrhosis (especially in viral aetiology)

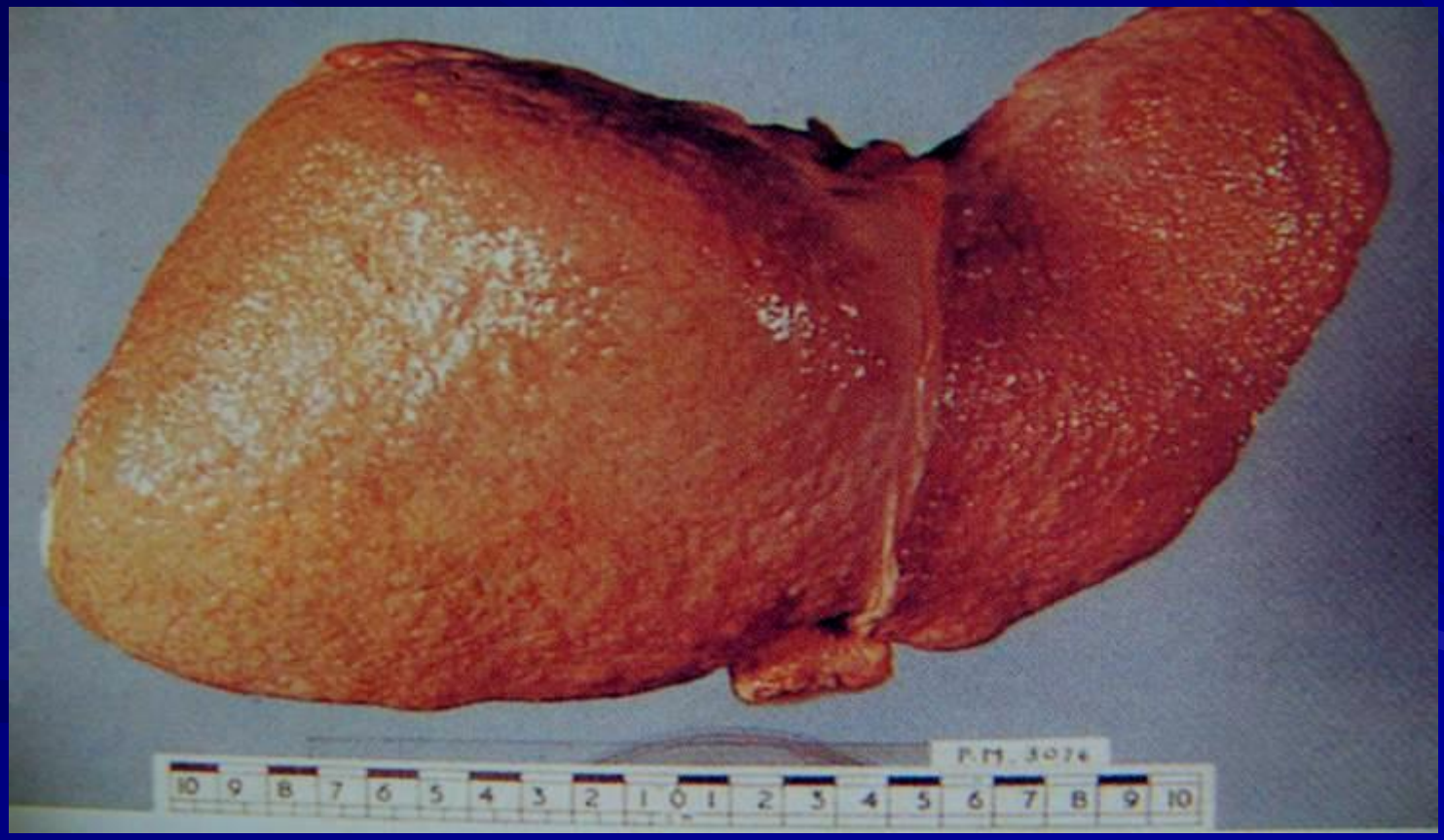
3. According to morphology and dimensions of the nodes (more or less than 3 mm), cirrhosis are divided in:

- micronodular cirrhosis
- macronodular cirrhosis
- mix cirrhosis

Macronodular cirrhosis



Micronodular cirrhosis



4. According to pathogenetic principle:

- portal cirrhosis (alcoholic, metabolic)
- postnecrotic cirrhosis (viral, autoimmune)
- billiary cirrhosis (primary or secondary)

5. According to **clinico-functional picture** (*clinical and laboratory*):

- Phase of cirrhosis - active
  - inactive
- presence of portal hypertension
- presence of hypersplenism (active spleen with destruction of red blood cells, leucocytes, platelets)
- functional status of the liver
  - compensated
  - subcompensated
  - decompensated

Specific syndromes for liver cirrhosis:

1) asthenovegetative syndrome- asthenia, anorexia, fatigue, weight loss.

2) dyspeptic syndrome – decreased appetite, nausea, vomiting, meteorism after meals, eructation, constipation, alternating with diarrhoea.

3.) algic syndrome – dull pain in right hypochondria, appearing after meals, physical or psychoemotional effort.

4.) jaundice syndrome

5.) hepatosplenomegalic syndrome.

6) syndrome of hipersplenism – increased activity of spleen (anaemia, leucopoenia, thrombocytopenia).

7) haemorrhagic syndrome – cause: eruption of oesophageal varices with signs of superior digestive haemorrhage (vomiting with coffee ground, melena).

8) syndrome of portal hypertension

9) ascitic syndrome

10) syndrome of hepatic failure with hepatic encephalopathy and coma.

Syndrome of portal hypertension

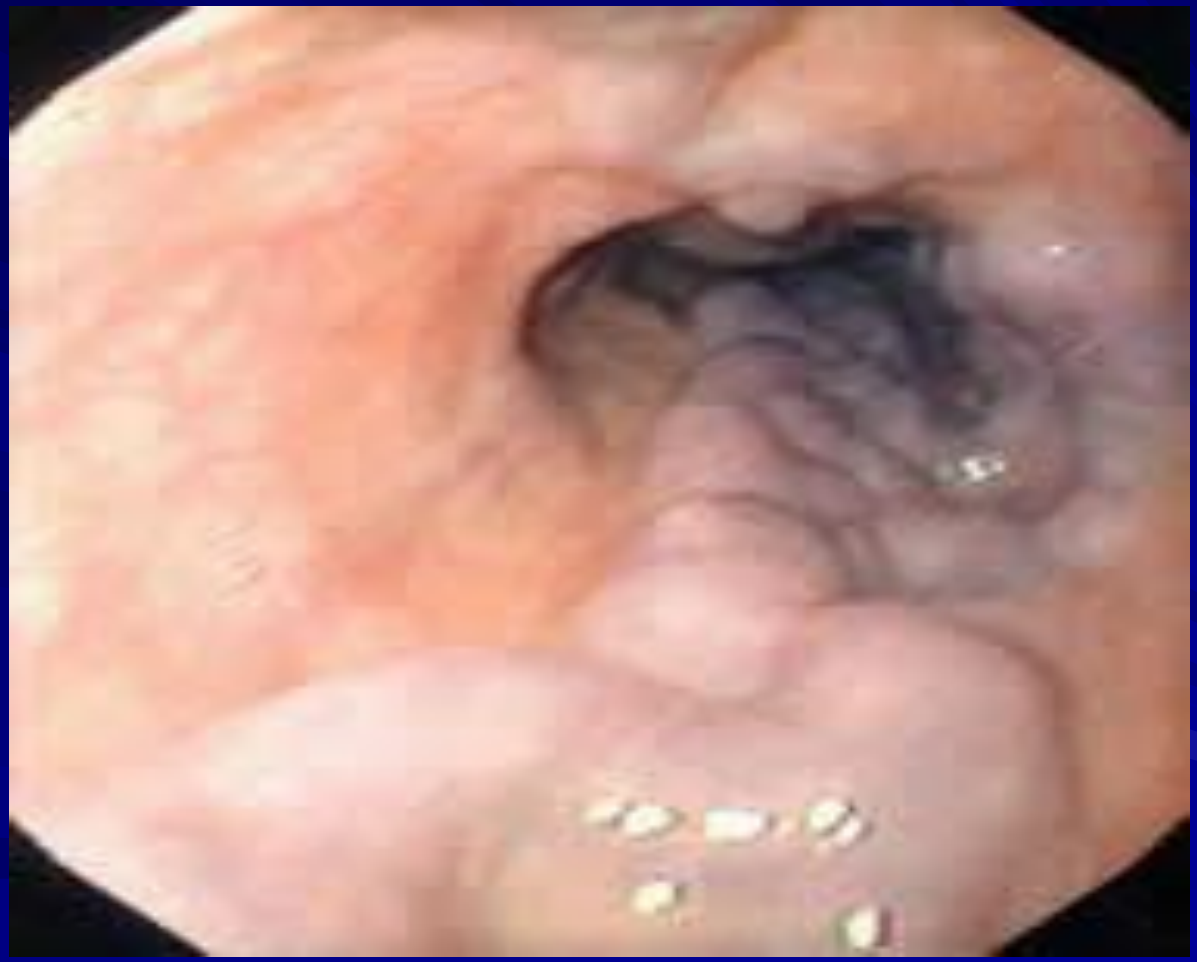
A totality of signs, symptoms and paraclinical changes, as a result of increased pressure in portal vein more than 14 mmHg

(Normal values 5-10 mmHg)

Anastomoses between portal and caval circulation:

1. Anastomosis between branches of left gastric vein and v. azygos (with further dilation of oesophageal and stomach veins and development of haemorrhages)
2. Overfilling of paraumbilical veins which unifies portal vein and v. cava inferior and superior leads to dilation of the abdominal wall veins
3. Anastomosis between superior haemorrhoidal vein and medial and inferior haemorrhoidal veins form internal haemorrhoids

Oesophageal varices



Clinically the patient could present:

- Dyspeptic disorders due to congestion in capillaries of digestive mucosa with anorexia, feeling of fullness in epigastria, sometimes eructation, meteorism, often - diarrhoea.

- There could appear a so-called exudative enteropathy with loss of proteins and weight loss (due to congestion in capillaries of digestive tract with absorption disturbances).

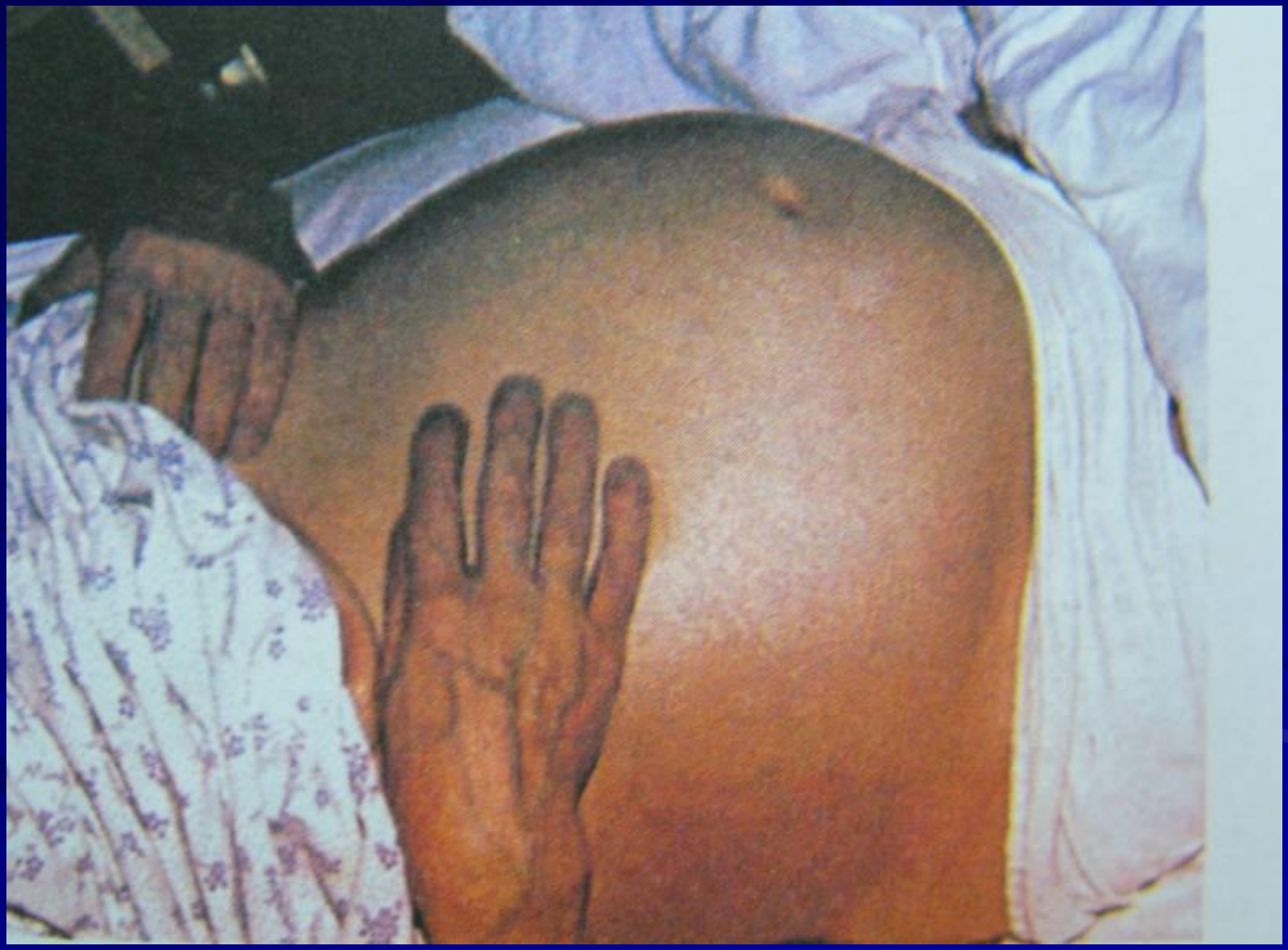
Physical examination in portal hypertension

- Spleenomegalia
- Ascitis
- Collateral abdominal circulation could be of following types:
  - periumbilical and in epigastria
  - in the flanks
  - in „caput medusae" due to dilation of umbilical and periombilical veins

Ascitic syndrome

- A totality of clinical signs, symptoms and paraclinical changes as a result of presence of liquid in peritoneal cavity.

Ascitis in liver cirrhosis



Causes of ascitic sindrom in liver cirrhosis:

1. Decreased intravascular colloido-osmotic pressure (due to synthesis of less albumin);
2. Decreased volume of circulating blood in renal territory and triggering of renin-angiotensin-aldosteron mechanisms (with diminishing of inactivation of aldosteron in hepatocytes).

Clinical picture

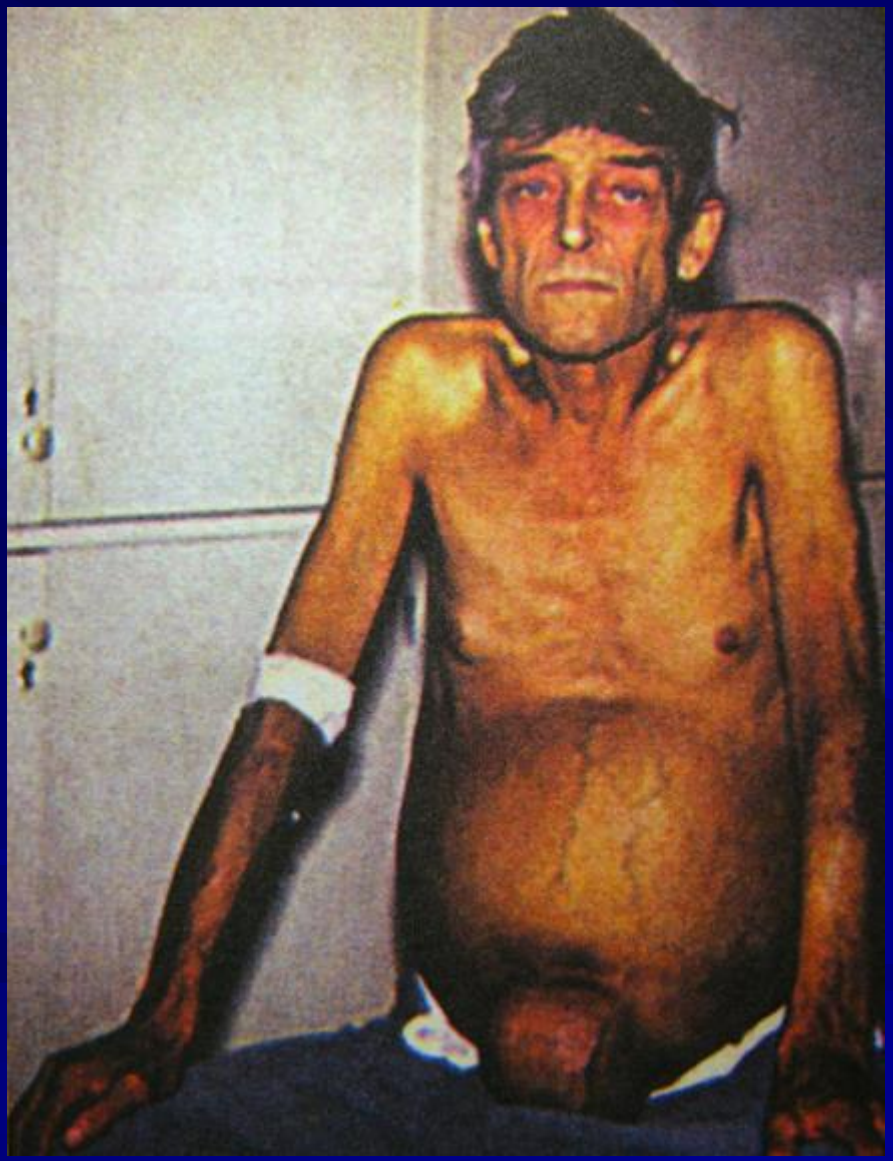
Complaints:

- feeling of fullness
- intraabdominal heaviness
- dyspnoea (reduced mobility of diaphragm)

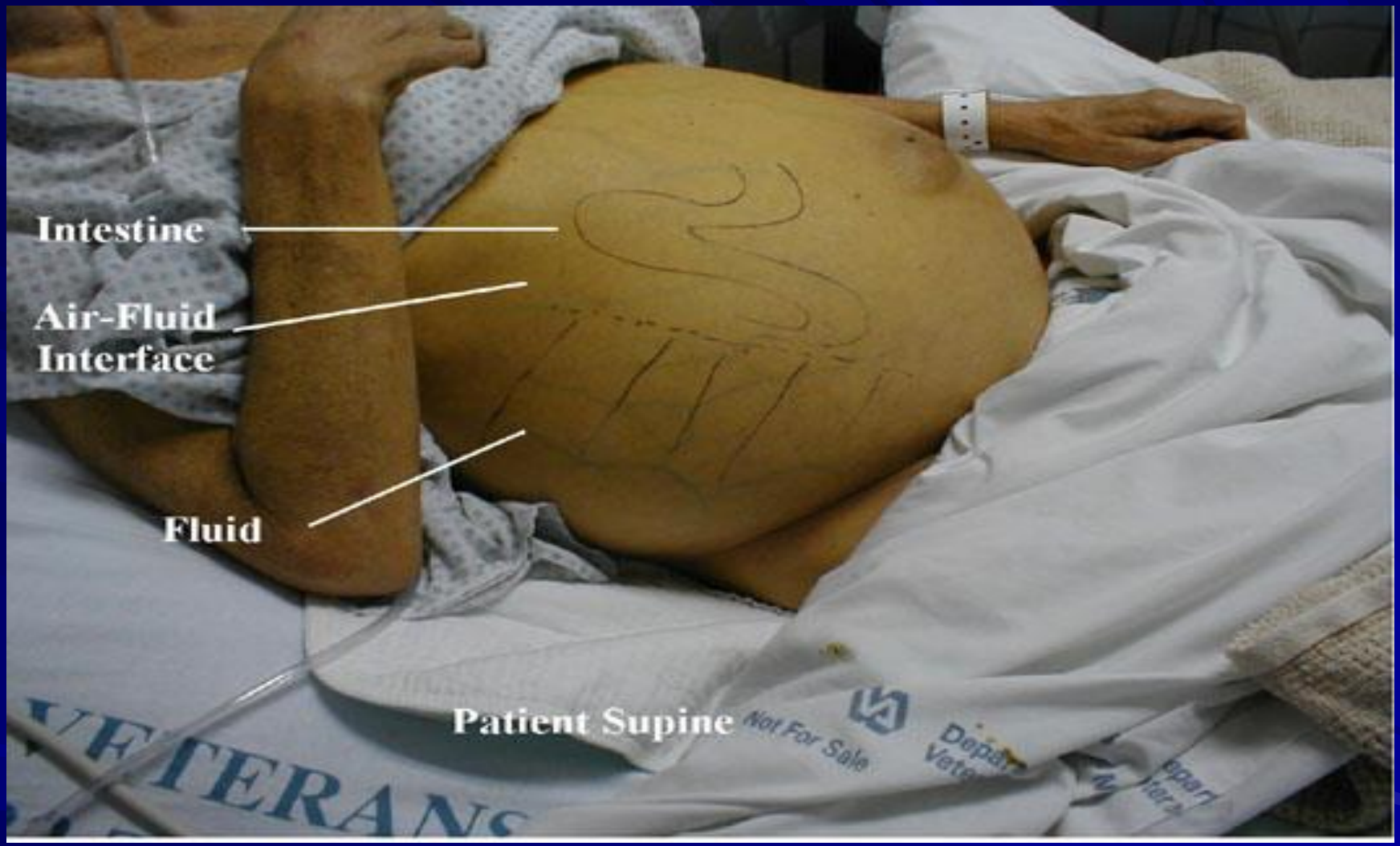
Inspection

- increased volume of abdomen, having an appearance of a „frog" in horizontal position and a „wallet" in vertical position.
- Due to distension of abdominal wall the skin looks stretched, glossy and smooth.
- in big ascitis (over 4-5 l) the umbilicus could be prominent. There could also be an umbilical hernia.

Liver cirrhosis



- ascitis, gynecomasty, petechiae
- caput Medusae,
- umbilical hernia


Intestine
Air-Fluid Interface
Fluid
Patient Supine
VETERANS
Not For Sale

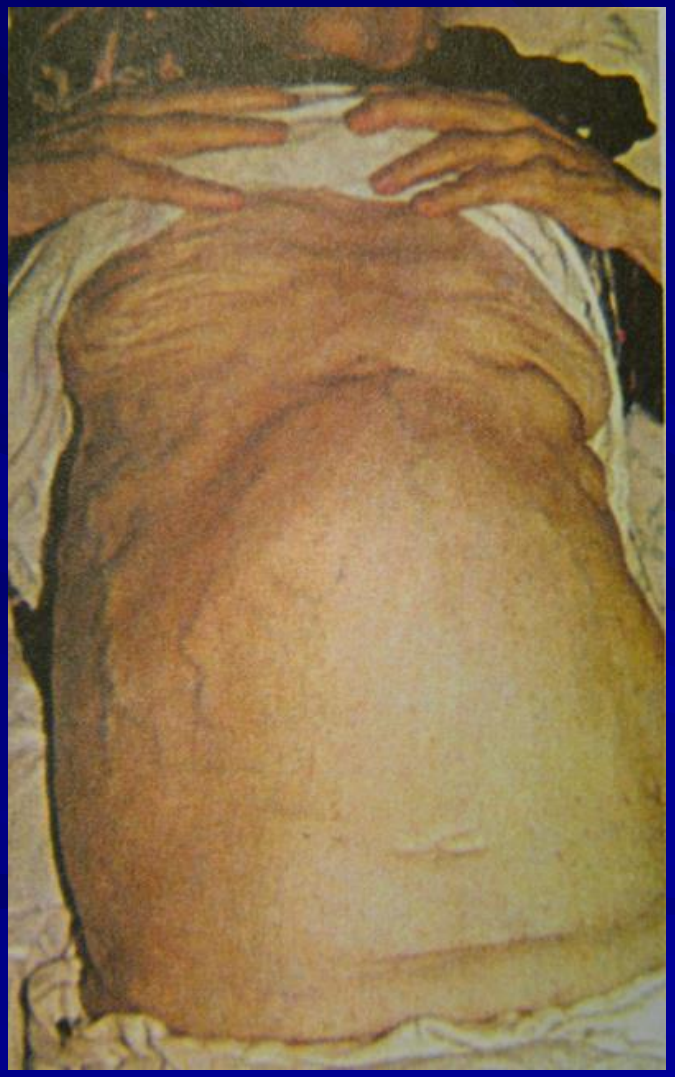

Air-Fluid
Interface
Shifted Upward
to Point Closer
to Umbilicus
Patient on Right Side

Inspection (2)

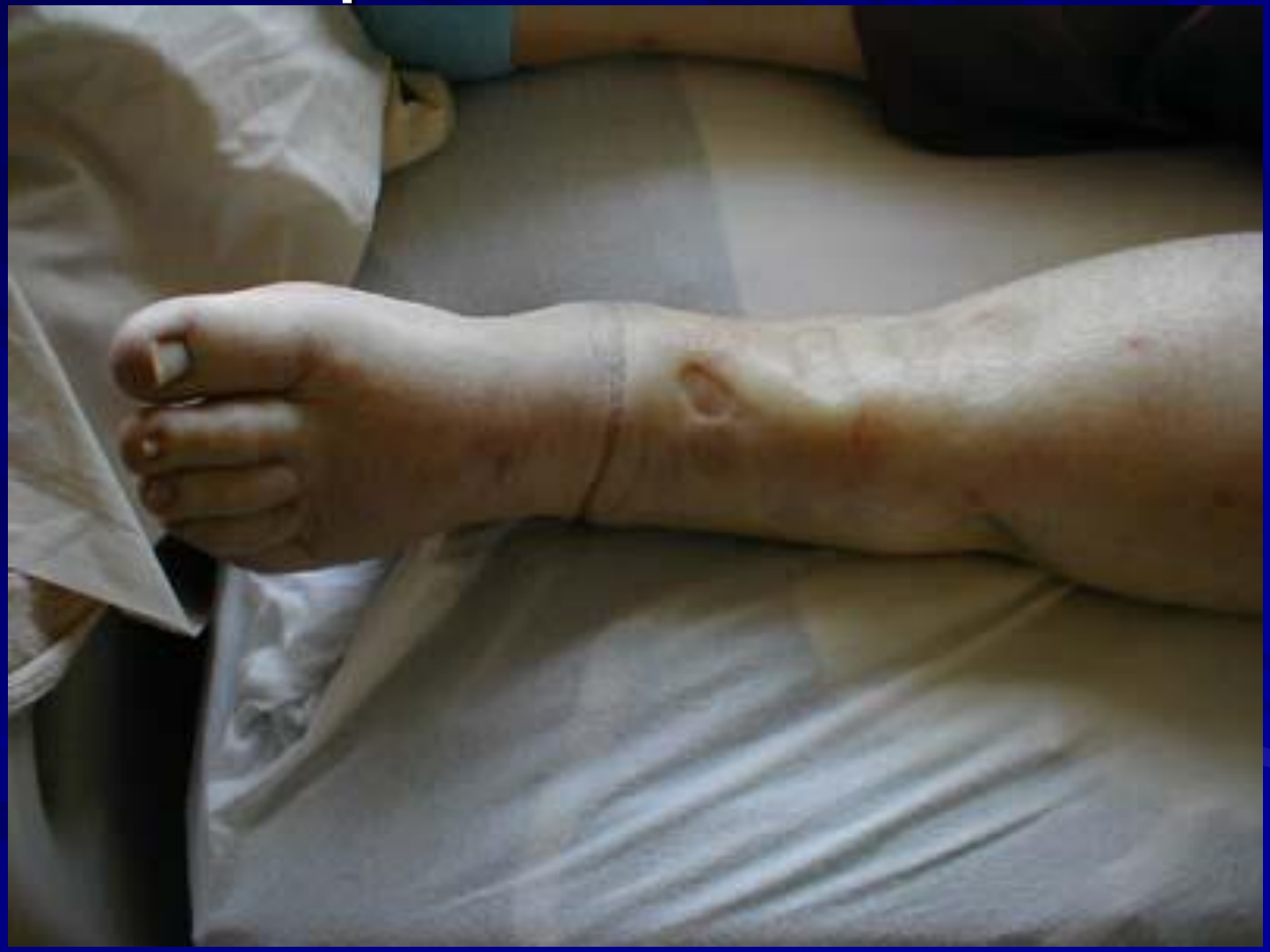
- visible venous circulation on abdominal flanks, in hypogastria and subumbilical region.

- in big ascitis there could be compression of inferior vena cava, leading to formation of oedema on the legs.

Liver cirrhosis – ascitis, caput Medusae,



Peripheral oedema



Palpation

- When the amount of liquid is medium (1 l - 5 l) the sign of "floating ice" is present by palpation – abrupt and intermittent compression at the level of the liver. One can feel the liver as an object floating in liquid.

Percussion

- Made in horizontal position (from umbilicus to the flanks for appreciation of a dull sound) and vertical position on median line from umbilicus down (for appreciation of a dull sound).
- The wave sign – transmitting of vibrations produced during abdominal percussion through ascitic liquid

Syndrome of hepatic failure with development of hepatic encephalopathy and coma.

- It is a neuropsychic syndrome, characterized by disturbances of consciousness and behaviour.
- The main pathogenetic element of installing of hepatic encephalopathy is intoxication with some substances of nitrogenous catabolism in intestine, and namely with ammonia, aromatized aminoacids (phenylalanine, tyrosine, tryptophan), fatty acids with short chain (butyric, valeric).

- these toxic products from the intestine are going through collaterals straight to the blood circulation.
- these patients have *Foetor hepaticus* – a dominant symptom, consisting in presence of a specific smell from the oral cavity (mould, rotten fruits).

  The smell is determined by presence in the expired air of mercaptans generated in the colon, by aromatized aminoacids containing sulphur (methionine).

Stages of hepatic encephalopathy

- *I Stage:* Attention and concentration are diminished, the patient is anxious or depressed, slight somnolence. There is disturbance of handwriting.
- *II Stage*: somnolence during the daytime, excitement during the night. Sometimes - aggressiveness, disorientation in time. Large amplitude tremor of hands. Disturbance of speech.

- *III Stage* (precoma) excitement, disorientation in space (involuntary urination and defecation), tremor of hands.

- *IV Stage*: Coma – the patient doesn't respond to any stimuli (verbal, physical), dilated pupils.

Specific clinical features of portal liver cirrhosis

- Appear as a consequence of abusive consumption of alcohol, predominantly in men, morphologically is micronodular.

Characteristic syndromes: astheno-vegetative, very marked dyspeptic, non-significant algic and jaundice, significant and rapidly evolving syndrome of portal hypertension.

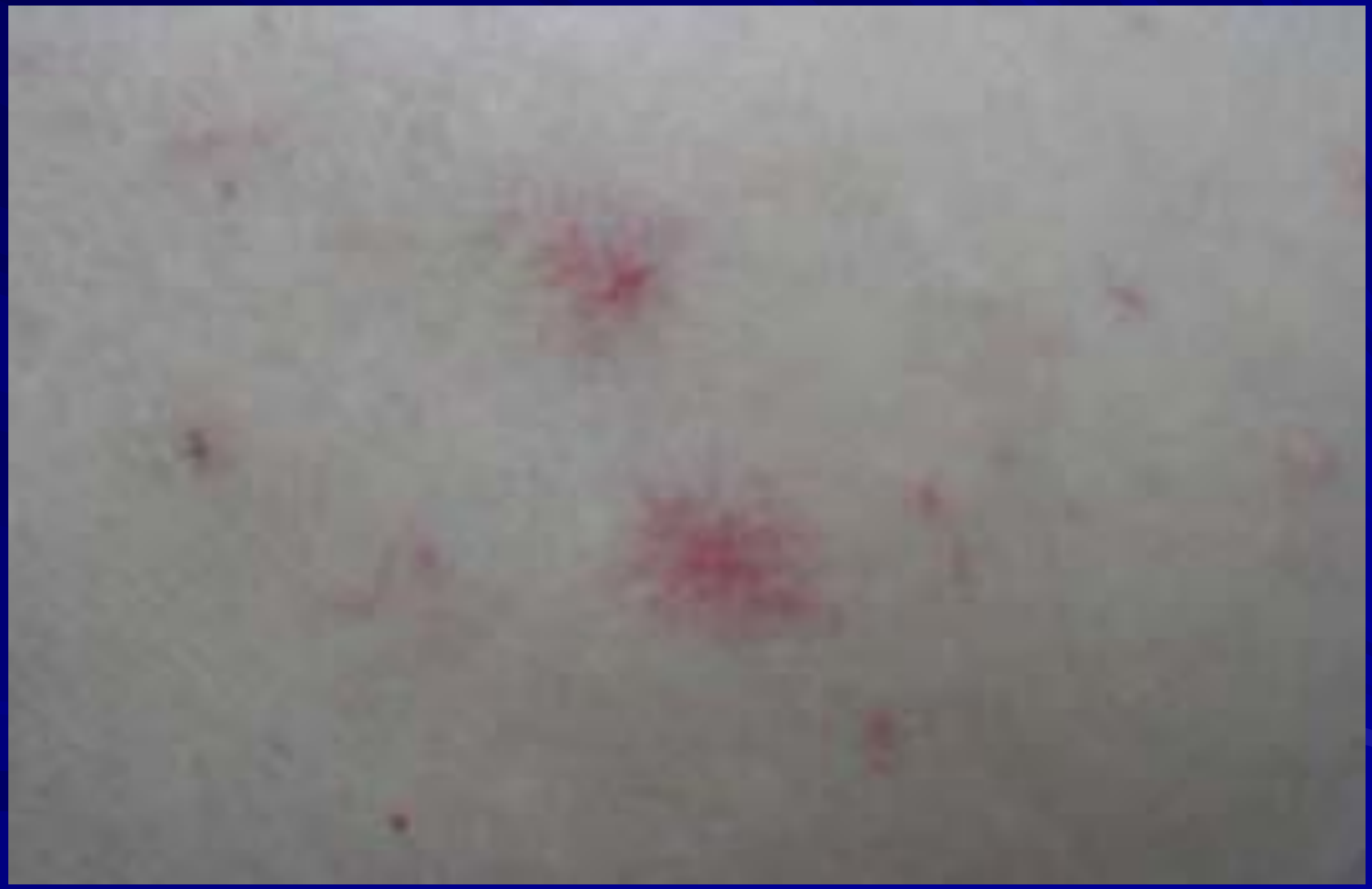
Specific clinical features of portal liver cirrhosis (2)

- Significant haemorrhagic syndrome.
- Hepatomegalia in the phase of compensation and small liver in the phase of decompensation.

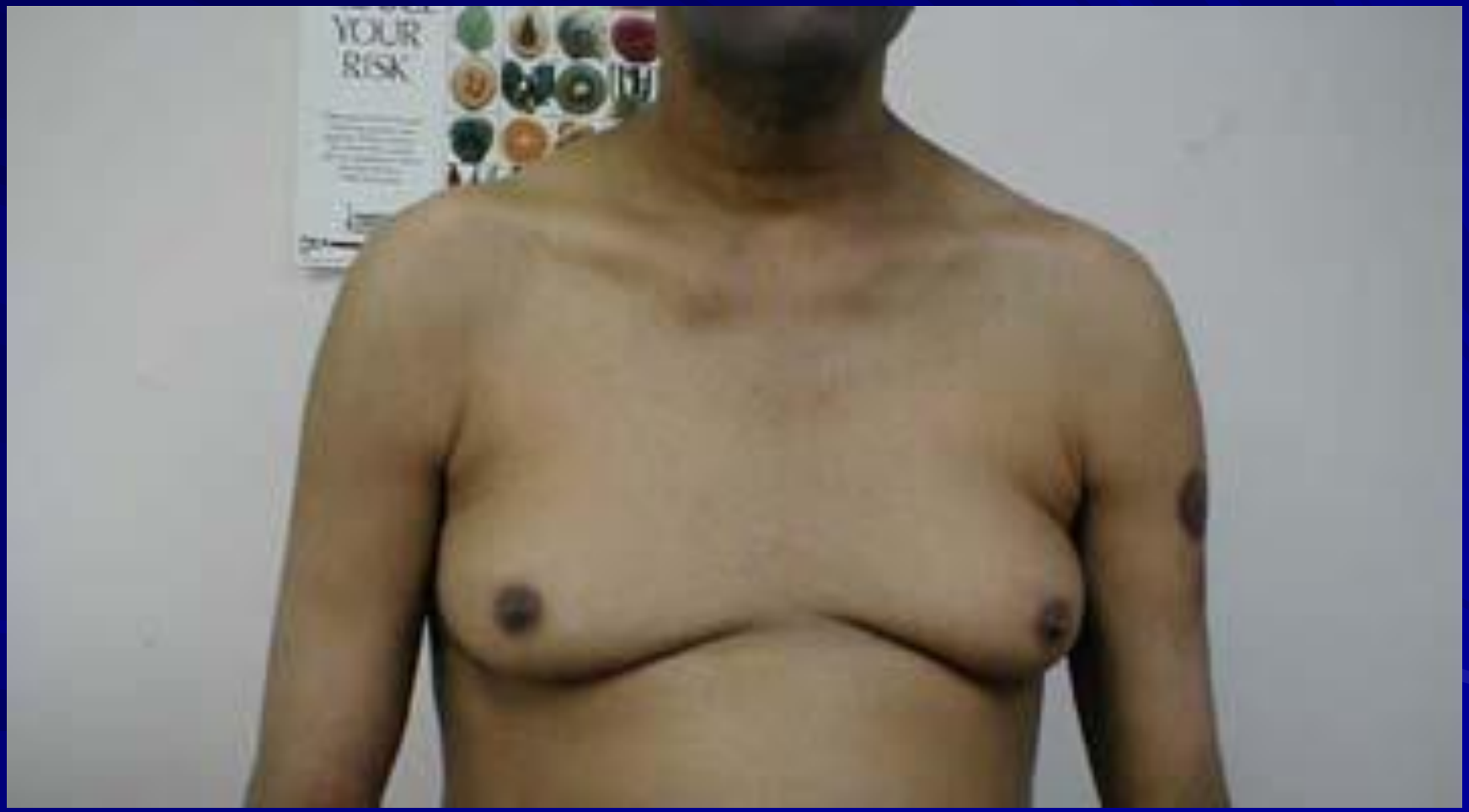
Physical examination

- Sub-jaundice of sclera and skin,
- facial erithrosis with varicosities on the cheeks,
- Spider angiomas on the face and thorax,
- tremor of upper extremities,
- Hyperhydrosis of palms,
- Ginecomasty in men,
- Hypopilosity.

Spider angiomas



Gynecomasty (increase of mammary glands) in men;



Physical examination

- Muscular atrophy, especially in the extremities.
- Purple lips and tongue.
- Increased volume of the abdomen due to ascitis.
- Due to distension of abdominal wall the skin looks like stretched, the umbilicus is prominent.
- Visible venous circulation on abdominal flanks, in hypogastria and subumbilical region.

Physical examination

For these patients there is characteristic polyorganic involvement:

- gastric and duodenal ulcer ,
- pancreatitis,
- alcoholic dystrophy of myocardium,
- alcoholic polyneuritis,
- Arterial hypertension.

Specific clinical features of postnecrotic liver cirrhosis

- The evolution can be rapidly progressive or slowly progressive.
- More often is a consequence of acute viral hepatitis.
- Morphologically is more frequent macronodular.
- During acutisation clinically is manifested with jaundice, asthenovegetative and dyspeptic syndrome, fever.

- Hepatomegalia is moderate and splenomegalia is marked with manifestations of hypersplenism.

- in the terminal period there are manifestations of portal hypertension.

Specific clinical features of billiary liver cirrhosis

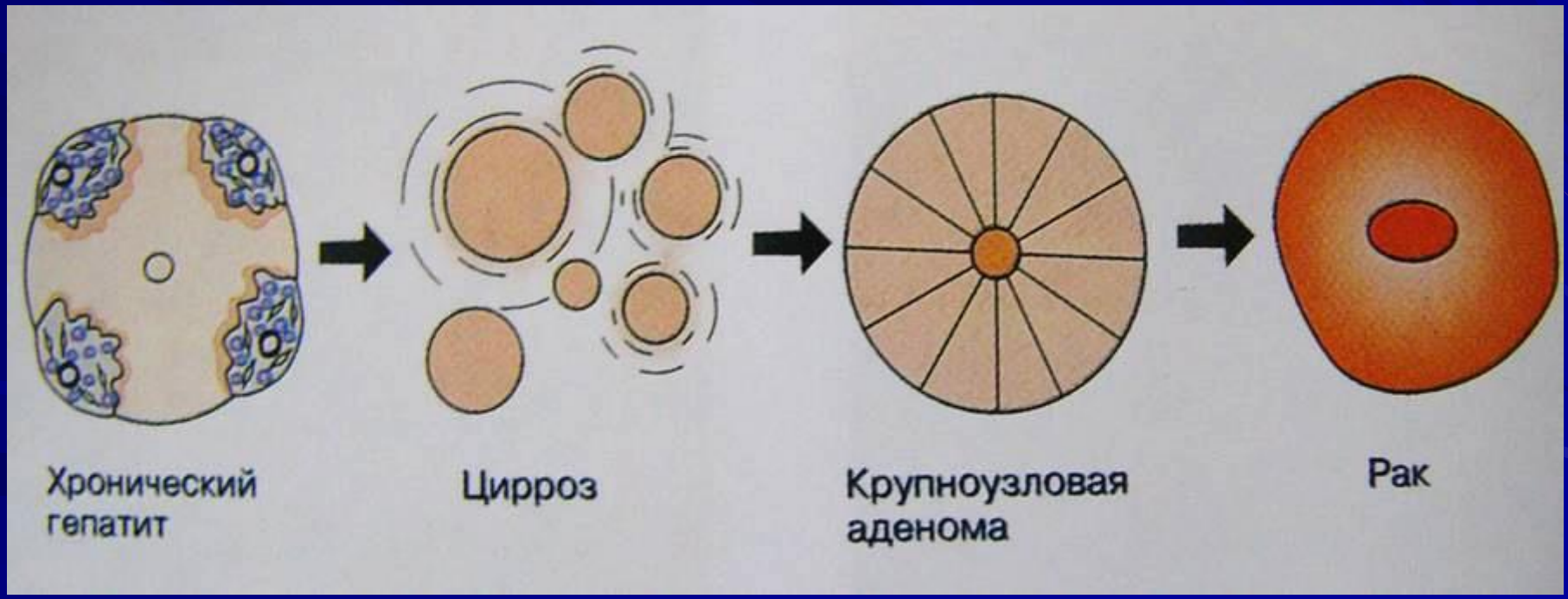
- Primary (primitive) billiary liver cirrhosis is characterized by chronic destructive non-supurative cholangitis (inflammation of intrahepatic billiary ducts) with manifestations of cholestasis. More frequently found in women of 40-60 years old.

- secondary billiary liver cirrhosis appears in patients with obstruction of extrahepatic billiary ducts by stones, tumors, strictures.
- Clinically is manifested by skin itching, jaundice, xantelasma on eyelids and xantoma.
- Moderate hepatomegalia. Manifestations of portal hypertension appear late

Complications of liver cirrhosis

- superior digestive haemorrhage .
- hepatic encephalopathy.
- spontaneous bacterial peritonitis.
- renal complications.
- hepatic cancer

Stages of hepatic carcinoma, from chronic hepatitis through cirrhosis



Spontaneous bacterial peritonitis

- the ascitic liquid becomes infected as a result of oedema of intestinal loops (due to lymphostasis) with penetration of intestinal saprofit flora into abdominal cavity, where it becomes pathogenic.
- Patients present fever, abdominal pain. Ascitis is refractary to treatment.
- Paracentesis could find over 250 leucocytes / mm^3 in ascitic liquid.

Renal complications

retention of liquid through following mechanisms: reduction of oncotic pressure (decreased synthesis of albumin) leads to reduction of circulating volume and decrease of renal flow with activation of renin-angiotensin-aldosteron system and increased reabsorption of sodium.

Hepatorenal syndrome:

1. progressive oliguria
2. Hypernatriemia
3. azotemia

Paraclinical examination in portal liver cirrhosis

- characteristic - moderate hyperbilirubinaemia (both conjugated and non-conjugated).
- Transaminase: ASAT is increased more than ALAT.
- In decompensation hepatocellular failure: decrease of prothrombin, fibrinogen, cholesterol, albumin.

Paraclinical examination in billiary liver cirrhosis

characteristic - manifestations of cholestasis with increased alcaline phosphatase, cholesterol, billiary acids, hyperbilirubinemia due to direct fraction.

Paraclinical examination in postnecrotic liver cirrhosis

characteristic - hyperbilirubinaemia (both conjugated and non-conjugated), increased transaminase, decreased albumins, prothrombin and fibrinogen, presence in blood of markers of viral hepatitis B and C.

Instrumental examination

1. Abdominal ultrasound examination with Doppler testing:

- dimensions of the liver, ecostructure hepatic parenchyma (homogeneous or non- homogeneous, ecodense, granular looks)
- dimensions of the spleen, portal and lienal vein (increased)
- Increased pressure in portal vein
- Presence of ascitis, thrombosis of portal vein

2. Scintigraphy of the liver:

- colloidal sulphur is fixed by reticulo-endothelial system and offers information about dimensions of the liver, homogeneity of capture, dimensions of the spleen.

- cirrhotic liver captures the isotope non-homogeneously. The spleen captures the isotope intensively.

CT

- Appreciates more exactly the dimensions, shape and density of the liver, signs of portal hypertension (spleenomegalia, increased diameter of portal vein and splenic vein).

Superior digestive endoscopy:

- Evidentiates oesophageal, gastric or duodenal varices.
- Appreciates their extension, degree, colour, signs of haemorrhagic risk (violet-grey coloration, with red points denotes the highest , risk for haemorrhage).

Oesophageal varices

Fig. CD.39 Oesophageal varices

Radiological examination with barium sulphate:

the oesophageal varices are seen worse than during endoscopy.

Exploratory paracentesis:

is the most direct method for confirmation of presence of ascitis, for biochemical and cytological examination of ascitic liquid.

Examination of ascitic liquid reveals:

- transudat
- density < 1015
- albumins < 25 g/l, negative Rivalt reaction
- bacteriologically the liquid is sterile

Punction-biopsy of the liver:

is the "golden" standard for confirmation of the diagnosis of liver cirrhosis.

Offers information about morphological type and the severity of cirrhosis.

Contraindications for punction biopsy of the liver:

- prothrombin index less than 60V
- thrombocytopenia less than 50.000
- infected ascitis

Laparoscopy:

Used in case of absence of clinical signs of portal hypertension and when non-invasive methods do not allow an exact diagnostication.

Both in macronodular cirrhosis and in micronodular or mix cirrhosis, the macroscopic looks is characteristic.

During laparoscopy this could be seen visually and also some fragments could be taken for diagnostic biopsy. Also the dimensions and looks of the spleen could be appreciated.