Case #2

1. **Gangrene of the lower extremity.** An example of necrosis of black colour. Black coloured areas of mortification are seen on the foot. The extremity is enlarged, swelled, with exfoliation of the skin (moist gangrene).

   **Causes:** disturbance of blood supply, getting of the anaerobic infection, operation of thermic factors (burns, frostbites).

2. **Gangrene of the small intestine.** The area of the intestine is black and has clear-cut borders. **Causes:** disturbance of blood supply (thrombosis of mesenteric arteries).

   **Outcomes:** destruction of the wall with the development of peritonitis.

3. **Myocardial infarction.** Black coloured area of the heart with the rupture of the wall is seen. This is an example of ischemic necrosis which occurs under the necrosis or the spasm of coronary artery.

   **Outcomes:** an extensive transmural infarction takes place, it leads to the miomalation and death.

4. **Hemorrhagic pulmanory infarction.** The lung is dark-red. In the cut the red thrombuses are seen in the lumen of the pulmonary artery. These thrombuses became the cause of pulmanary infarction. The organ is enlarged, dense.

   **Outcomes:** the development of the respirative incompetence, the perifocal pneumonia; formation and development of the tumorous process in the area of the cicatrice.

5. **Necroses of the bowel wall.** The atrophy of the mucous membrane is seen, the bowel wall has focal black changes - the areas of necrosis, which are developed in the result of the disturbance of the blood supply.

   **Outcomes:** perforations with the development of peritonitis.

6. **Red infarction of the intestine.** It is developed in the result of the thrombosis of mesenteric arteries. Red infarction arises in the intestine in connection with the peculiarities of blood supply, namely the numerous anastomosises between the branches of mesenteric arteries. The dark-red painted bowel wall is seen, the intestine itself is deformed.

   **Outcomes:** red infarction results to the development of gangrene, perforation of the bowel wall and peritonitis.

7. **Concentric hypertrophy of myocardium.** The represented cut of the left heart ventricle wall is thickened (2 cm). The lumen of the heart ventricle cavity is narrowed. Concentric hypertrophy is a display of compensative hypertrophy, which develops under the hypertension in the systemic circulation, heart defects (aorta valve). The acting of the cardiac muscle is intensified, the fibres grow thick.

   **Outcomes:** without abolition of the cause decompensation of the heart or eccentric hypertrophy is developed.

5. **Transmural myocardial Infarction.** There can be seen: the area of the left heart ventricle wall is painted dark-red colour, the damage of cardiac muscle spreads through the whole thickness of the wall.

   **Causes:** disturbance of blood supply in the result of the thrombosis or the spasm of coronary artery.
Outcomes: finishes mainly with miomalation (rupture of the wall of the heart). It may be the expansion of the connective tissue, the disturbance of rhythm with heart block.

9. Myocardial infarction with the by-wall thrombuses. There can be seen: the colouring of the wall of the left heart ventricle to dark, that spreads on the middle and inner layer of the heart wall. On the surface of the endocardium the deposition of thrombus masses. Causes: the disturbance of the endocardium causes there is deposition of tissue thrombokinase, which activizes and sets going the mechanism of thrombus formation. Outcomes: by-wall thrombuses may be the source of thromboembolism in the systemic circulation.

10. White infarction with hemorrhagic areola in liver. In the cut there are: the areas of grey colour, which are dissociated from the sound tissue by the dark areola. Causes: thrombosis of the branches of liver artery. Outcomes: formation of cicatrice (expansion of the connective tissue).

11. Secondary contracted kidney. The kidney has dence consistency, tuberous, with numerous hollows and protuberances. The connective tissue replaces damaged mortificated parenchyma. The protuberances are the areas of hypertrophy of preserved parenchymal structures of the kidney. Causes: after the illnesses of kidney: glomerulonephritis and pyelonephritis. Outcomes: decrease of the function, development of insufficiency.

12. Hydronephrosis. The kidney is enlarged with isolated bladders. The surface is tuberous at the expanse of the hypertrophy of preserved parenchymal structures and the atrophy of the surrounding areas. The pelvis of the kidney is extended. Under hydronephrosis one can observe the atrophy of the parenchyma because of the pressure of urine, which is accumulated in the lumen of the pelvis in consequence of the obstruction of the exit by the stone. Outcomes: the function is decreased, inflammation is developed.

13. Hypertrophy of the myocardium of the left heart ventricle. The enlargement of the wall of the left heart ventricle and hypertrophy of the papilla muscle. The enlargement of the cavity of the left heart ventricle. There is a myogenic hypertrophy that is the enlargement of the muscle and the extending of the cavity. Such hypertrophy develops at primary stages of decompensation of the heart. It is connected with the factor that the muscle can’t bear enlarged loading and the heart cavity enlarges. Dystrophic changes develop in cardiomyocytes. The muscle of the heart is infirm and extended. Outcomes: cardiac insufficiency.

14. Bullous emphysema of the lung. There is a big bladder in the upper part of the lung. Cause: appears in the result of the excessive accumulation of the air in the tissue of the lung. It is observed under the small bronchus being obstructed by mucus. The atrophy of interalveolar membranes and there rupture is observed. Because of the air pressure local atrophy takes place.

15. Internal hydrocephalus. The enlarged lateral ventricles of the cerebral hemisphere are seen in consequence of the accumulation of liquor, it results in the atrophy of the parenchyma of the cerebrum.
Causes: complicated liquor circulation, which appears under inflammations (meningitis, encephalitis) or congenital structure of its openings. Local atrophy from pressure takes place. Outcomes: the function is decreased.

16. Fungous kidney. The kidney is tuberous on the surface, there are remains of the features of embryonal development. It is seen in the cut that the parenchyma is represented as fungus with numerous small cavities. The regular structure of the kidney is absent. The border between cortical and medulla substances isn’t seen. Causes: disturbance of prenatal development of kidney absence of the connection between the tubules and the glomerules. In the result primary urine is accumulated in the glomerules, the urine presses them and causes atrophy. This is an example of local prenatal atrophy from pressure. Outcomes: renal insufficiency.

18. Hypertrophy of the spleen. (Splenomegaly). The spleen is enlarged in 3-4 times, dark-cherrish colour, dense. These changes appears under the diseases of blood: anemia, leucosis, hemoblastosis. The enlargement of spleen is a result of compensatory hypertrophyc changes. Outcomes: the function is increased, it becomes an organ of sanguification, sometimes it may be a rupture at the insignificant injury.

19. Pancreonecrosis. The areas of grey colour in the parenchyma of the organ are seen, it’s a focality of fatty necroses or fatty degeneration of the pancreas. Causes: acute destructive pancreatitises, which are accompanied by the excretions of the excessive quantity of ferments. The example of direct necrosis takes place. Outcomes: the areas of necrosis are substituted by the connective tissue, the function is decreased, acquired diabetes mellitus is observed.

20, 23. Atrophy of the spleen. It can be seen that the spleen is decreased, the capsule and the parenchyma are contracted. Causes: deterioration of blood supply, age-related changes. The parenchyma is atrophied and substituted by the connective tissue, the function is decreased.

21. Hypertrophic vegetation of the mucous membranes of the intestine with the formation of polyps. The polyps can be seen on the mucous membrane. Causes: chronic irritation of the mucous membrane by different factors. Outcomes: dangerous by there possibility of the degeneration into malignant tumor - adenocarcinoma. Under the diagnosis of this process it is necessary to the carry out an operation.

22. The bones of the scull with the features of atrophy. The bones are thinned and shine through. Causes: accumulation of fluid in the scull cavity (hydrocephalus). This is an example of atrophy because of presure.

24. Gastric ulcer with the features of substitution. This is an example of reparative deficient regeneration. One can see the defect of the mucous and submucous membrane and of the muscular layer, which reaches the neighbouring organ - pancreas. Deficient regeneration is explained by the following: in consequence of the disturbance of muscular and external layers regeneration can’t take place completely because these structures can’t regenerate - muscular fibres don’t regenerate.
Outcomes: expansion of connective tissue.

25. **Multiple infarctions of the spleen.** The areas of altered colour are seen. They are grey and dark-red. The infarctions of the spleen appear under formation of thrombuses in the small branches of the artery of the spleen. There is vascular necrosis. **Outcomes:** expansion of connective tissue, sclerosis.

26. **Subendocardial myocardial infarction.** The cut of the left ventricle is seen in which the inner wall has altered dark-brown colouring. This is an area of necrotic disturbance on the result of the blood supply stopping. **Outcomes:** 1) parietal thrombuses in the heart cavity, thromboembolism in the systemic circulation. 2) development of cardiosclerosis, cardiac insufficiency. This is an example of vascular necrosis.

27. **Gangrene of the foot and intestine.** The alteration of colouring of the foot and of the intestine (black colour) is seen. **Causes:** disturbance of blood supply of these tissues. Stopping of blood supply in consequence of the formation of thrombuses in the arteries. The cause of black colouring of tissues: under necrosis the tissues, contacting with external air, the formation of sulfid of ferrum is observed. **Outcomes:** under the gangrene of the intestine peritonitis is developed. Under the gangrene a foot-intoxication with toxic disturbance of parenchymatous organs (parenchymal distrophy and their insufficiency).

28. **Cysts in liver.** Numerous cysts are seen under the capsule of the liver. This is an example of atrophy because of pressure. There is a thinning and an atrophy of parenchyma under the obstruction of bile ductulas.

29. **Hydrocephalus.** Cerebral hemispheres are represented, they are enlarged in size, the parenchyma of the cerebrum is sharply thinned and looks like the wall of capsule. This is an example of local atrophy from liquor pressure, which is accumulated in lateral ventricles under the disturbance of its drawing off.

30. **Hydronephrosis.** Kidney as a bladder with numerous cameras. Parenchyma is atrophied and is represented as a wall of the capsule. **Causes:** disturbance of drawing of urine. Such alterations appear under urolithiasis. It’s a local atrophy from pressure. **Outcomes:** function is disturbed, insufficiency.

38, 7. **Tonogenous hypertrophy (concentrated hypertrophy of the heart).** **Causes:** hypertonic disease, aorta valve defects; develops as an example of compensatorious hypertrophy. Myocardium is hypertrophied at the expanse of hyperplasia of intracellular organoids. Stromal component is hypertrophied. **Outcomes:** transition to the eccentric hypertrophy and development of cardiac insufficiency.

40. **Necrotic nephrosis.** The pale cortical layer and plethoric medulary layer are seen. **Causes:** under intoxication of the organism, traumatic shocks and shocks of other origin. There is an example of direct and indirect necrosis in origin. The direct one develops in the
epithelium of small channels (excretion of toxin). Indirect - in the glomus in consequence of the ischemia of cortical substance - a pale cortical layer.

**Outcomes:** acute renal failure, death.