

# GANGRENA OF LIMB. MODERN VIEW ON AN OLD PROBLEM

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## **Abstract.**

Processes taking place inside the body - such as arterial sclerosis, which can cause a heart attack, or the formation of blood clots - lead to impaired blood circulation and are internal causes of gangrene. If microbes take part in the development of gangrene, then this is a septic or putrefactive disease. When microbes do not participate in this process, the disease is aseptic. In recent years, ischemic limb disease, which is pathogenetically associated with diseases such as atherosclerosis and diabetes, has become increasingly important.

*Keywords: gangrene, necrosis, atherosclerosis, diabetes mellitus, macroangiopathy, microangiopathy.*

# OYOQ-QO'LLARNING GANGRENASI. ESKI MUAMMONING ZAMONAVIY KO'RINISHI

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## **Annotatsiya.**

Tanada sodir bo'ladigan jarayonlar – masalan, yurak xurujiga olib kelishi mumkin bo'lgan arterial skleroz yoki qon pıhtılarının shakllanishi – qon aylanishining buzilishiga olib keladi va gangrenaning ichki sabablarini anglatadi. Agar mikroblar gangrenaning rivojlanishida ishtirok etsa, bu septik yoki chirigan kasallikdir. Mikroblar bu jarayonda ishtirok etmasa, kasallik aseptikdir. So'nggi yillarda ateroskleroz va diabet kabi kasalliklar bilan patogenetik jihatdan bog'liq bo'lgan oyoq-qo'llarning distal qismi ishemik kasalligi tobora muhim ahamiyat kasb etmoqda.

*Kalit so'zlar: gangrena, nekroz, ateroskleroz, qandli diabet, makroangiopatiyalar, mikroangiopatiyalar.*

# ГАНГРЕНА КОНЕЧНОСТЕЙ. СОВРЕМЕННЫЙ ВЗГЛЯД НА СТАРУЮ ПРОБЛЕМУ

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## **Аннотация.**

Процессы, происходящие внутри организма, – такие как артериальный склероз, который может стать причиной инфаркта, или образование тромбов, – приводят к нарушению кровообращения и относятся к внутренним причинам гангрены. Если в развитии

гангрены принимают участие микробы, то это септическое или гнилостное заболевание. Когда в этом процессе микробы участия не принимают, то заболевание асептическое. Последние годы все большее значение приобретает ишемическая болезнь конечностей, которая патогенетически связана с такими болезнями как атеросклероз и сахарный диабет.

*Ключевые слова: гангрена, некроз, атеросклероз, сахарный диабет, макроангиопатии, микроангиопатии.*

**Relevance.** Gangrene is necrosis of tissues that come into contact with the external environment. Gangrene can be caused by internal or external factors. Severe bruises with vascular ruptures and damage to nerve endings, exposure to high or low temperatures, radiation damage, the influence of chemicals - all these factors relate to external causes of gangrene. According to WHO, the concept of "Diabetic Foot Syndrome" (DFS) is defined as an independent complication of diabetes. This is a complex of anatomical and functional changes in the foot associated with diabetic neuropathy, micro- and/or macroangiopathy, against the background of which severe purulent-necrotic processes develop. Based on this WHO definition, the International Diabetic Foot Agreement defines this syndrome as follows: Infection, ulceration and/or destruction of deep tissues associated with neurological impairment and decreased main blood flow in the arteries of the lower extremities of varying severity. Diabetes mellitus is a powerful factor stimulating the development of atherosclerosis. In patients with diabetic foot syndrome, occlusion of the main arteries of the lower extremities by lipid-fibrous plaques in the femoral and popliteal arteries occurs in 57–59% of cases, in the posterior tibial artery in 45%, in the middle and distal parts of the leg and on the foot in 14–20% cases. Atherosclerosis develops somewhat less frequently in intermuscular arteries and collaterals. The pathogenesis of macroangiopathy is multifactorial. Hyperinsulinemia is one of the factors in the development of atherosclerosis. The main factors leading to foot damage in diabetes are micro- and macroangiopathies, peripheral diabetic neuropathy (DN), foot deformation with the formation of high-pressure zones and infection of damaged tissues. Ischemia, neuropathy and an infectious agent are the classic etiological triad of purulent-destructive complications of DFS. The atherosclerotic process in diabetes occurs at a younger age and 2-5 times more often than in the general population, and is characterized by rapid progression, multisegmental and diffuse type of damage to the distal arteries of the lower extremities. Diabetic neuropathy is detected in 30-35% of patients with diabetes, is characterized by diffuse or focal damage to peripheral and/or

autonomic nerve fibers and is manifested by a complex of clinical syndromes, severe forms of which occur in more than 10% of patients.

Classification of diabetic foot syndrome by the International Working Group on Diabetic Foot in 2000:

- neuropathic (in 60–75% of cases);
- ischemic (in 5–10% of cases);
- neuroischemic (in 20–30% of cases).

Classification of diabetic neuropathy by localization stage 0 – absence of neuropathy;

- stage 1 – asymptomatic neuropathy;
- stage 2 – symptomatic neuropathy;
- stage 3 – severe (complicated) neuropathy.

The Fontaine-Leriche-Pokrovsky classification is based on distinguishing several stages in the development of chronic arterial insufficiency or arterial circulatory failure of the lower extremities.

stage:I asymptomatic atherosclerotic artery disease, detected only by instrumental examination;

stage:II arterial insufficiency that occurs during functional stress (intermittent claudication);

stage:III arterial insufficiency at rest (resting ischemia);

Stage IV: trophic disorders, tissue necrosis.

The development of gangrene in patients occurs in two ways: slow over several years, which is associated with critical ischemia. The second path is lightning, which is based on thrombosis or embolism of the arteries. In recent years, a sharp increase in the incidence of diabetes mellitus has been observed in Uzbekistan. This is mainly due to the increase in patients suffering from type 2 diabetes in age groups over 40 years old, is usually associated with obesity and is characterized by a slow progression. Considering the above, we can consider VTS one of the pressing problems at the present stage.

**The purpose of the work.** Of the total amount of biopsy and surgical material, gangrene was 0.2%. All material was divided into three groups. Patients with diabetes mellitus accounted for 59%, gangrene associated with atherosclerosis and obliterating endarteritis 17%, gangrene due to exposure to physical factors 24%.

Analysis of gangrene of exogenous origin revealed that women accounted for 53%. By age from 20-40 years - 20%, from 40-60 years - 30% and from 60-80 years 50%. Men in this group made up 47%. By age from 20-80 years the

number of cases was equal to 33.3%. The cause of the development of gangrene was frostbite, bruises, and advanced fractures. A morphological study revealed tissue necrosis with secondary purulent inflammation of the phlegmonous type. In the study of gangrene associated with circulatory disorders, men predominated: 77%, aged 40-80 years, 50% each. Women made up 23% aged 60-80 years. A morphological study, along with tissue necrosis and secondary purulent inflammation in the vessels, revealed atherosclerotic plaques at the stage of atheromatosis, ulceration and calcification. The lumen of the vessel was blocked by a thrombus. Clinical changes were characterized by the acute stage of ischemia. The disease proceeded slowly with a gradual increase in symptoms of damage to the extremities.

When analyzing 47 cases of patients with diabetes mellitus, the following data were obtained. The patients were admitted urgently with diabetic foot syndrome. 100% of patients had type 2 diabetes mellitus. The age of the patients ranged from 45 to 82 years, 58% were men, 42% were women. In 85% of patients, the pathological process in the foot occurred as a type of critical ischemia. The first manifestations appeared several years ago and were characterized by decreased skin sensitivity or absence of pulse in the arteries of the foot, deformation of the foot, and severe hyperkeratosis.

Patients noted pain while walking in the hips or calves, which caused them to stop while walking. Night pain in fingers or feet. Feet are cold to the touch. The patients could not lie down for a long time and constantly hung their sore leg down, which led to temporary pain relief. Almost all patients showed manifestations of changes in peripheral nerves in the form of the formation of trophic ulcers with secondary inflammation, which is associated with the addition of diabetic neuropathy (neuropathic form) of DDS in combination with ischemic one.

During a morphological study of the surgical material from this group, the pathological process was localized mainly in the area of the toes. The latter were black in color with areas of skin ulceration exposing bone tissue. The overlying tissues are edematous with single or multiple trophic ulcers. Microscopic examination revealed necrosis of all tissues with focal or diffuse leukocyte infiltration. Skin with deep ulcerative defects. The bone tissue was represented by homogeneous, structureless masses.

In 15% of patients the process developed very quickly. Patients complained of severe, sharp pain in the limb, loss of sensation and active movements. On examination, the limb was bluish, cold to the touch, and

vascular pulsation was poorly defined. The process was widespread, involving the lower leg and higher. During a morphological study of the surgical material, the pathological process involved not only the fingers and foot, but spread higher. The skin had a bluish-purple color with black areas and was swollen. Microscopic examination of tissues was dominated by destructive processes in the form of necrosis with loss of tissue structure. The vessels were full of blood and blood clots were detected in the lumen of the arteries. The inflammatory process in tissues was determined in individual cases. One of the most dangerous complications of dry gangrene is the development of wet gangrene. In our studies, it was detected in 10%. 50% of the total number of this complication were patients with diabetes mellitus, 38% patients with gangrene of exogenous origin and 12% gangrene with circulatory disorders. The process grew quickly and required prompt amputation of the limb. Thus, the study allowed us to draw a conclusion. Gangrene of various causes is still an important problem in surgery today. If the past decades were dominated by gangrene of exogenous origin, now ischemic limb disease is far from its effective solution. A special place is occupied by diabetic foot syndrome. In patients, it develops in two directions: as a type of critical ischemia with a neuropathic component. The second way is associated with arterial thrombosis. These points must be taken into account when treating patients with diabetes mellitus to prevent the dangerous complication of gangrene of the extremities, which can lead to death of patients.

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