

## CHARACTERISTICS OF HISTOLOGICAL CHANGES IN SEPTIC PODODERMATITIS

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**Аннотация.** Изучены гистологические изменения, происходящие в патологических очагах при септическом пододерматите продуктивных коров. Установлены светло-красные очаги некроза в эпидермисе копытцевой каймы, рексис и пикноз а в ядрах клеток зернистого, блестящего и ороговевающего плоского эпителия эпидермиса, слабое прилегание клеток интимы стенки кровеносного сосуда, дистрофические изменения в клетках эпидермиса копытцевого венчика, уменьшение количества округлых и удлиненных сосочков основы кожи, атрофия ретикулярной ткани, гиперплазия и гипертрофия сосочков подкожной ткани, в очаге воспаления разрыв и эрозия волокон ткани.

Также наблюдались полиморфно-ядерная инфильтрация ткани в очагах воспаления основы кожи копытцевой подошвы, мукоидное выпячивание и гиалиноз в волокнах сетчатого слоя соединительной ткани, очаги некроза и микроабсцессы, экссудативно-пролиферативный васкулит, паракератоз и дискератоз на фоне фибриноидных и склеротических изменений коллагеновых и эластических волокон.

**Resume.** The histological changes occurring in pathological foci with septic pododermatitis in productive cows were studied. Light red foci of necrosis were found in the epidermis of the claw border, rhexis and pyknosis a in the nuclei of the cells of the granular, shiny and keratinizing squamous epithelium of the epidermis, poor adherence of intimal cells to the wall of the blood vessel, dystrophic changes in the epidermal cells of the claw corolla, a decrease in the number of rounded and elongated papillae of the base skin, atrophy of reticular tissue, hyperplasia and hypertrophy of the papillae of the subcutaneous tissue, rupture and erosion of tissue fibers at the site of inflammation.

Also observed were polymorphonuclear tissue infiltration in foci of inflammation of the base of the skin of the sole of the hoof, mucoid protrusion and hyalinosis in the fibers of the reticular layer of connective tissue, foci of necrosis and microabscesses, exudative-proliferative vasculitis, parakeratosis and dyskeratosis against the background of fibrinoid and sclerotic changes in collagen and elastic fibers.

**Ключевые слова:** септический пододерматит, гистологические изменения, рексис, пикноз, некроз, атрофия, основа кожи, воспалительный очаг, инфильтрация, коллаген, гиперплазия, гипертрофия, гиалиноз, васкулит, паракетоз.

**Key words:** septic pododermatitis, histological changes, rhexis, pyknosis, necrosis, atrophy, skin base, inflammatory focus, infiltration, collagen, hyperplasia, hypertrophy, hyalinosis, vasculitis, paraketosis.

**Enter.** Today, the role of the livestock sector in providing quality food products to the population is incomparable. In order to grow enough milk and meat products, many highly productive breeds of cattle are brought from abroad and are being cared for. Adaptation of animals to new conditions, feeding technologies and peculiarities of storage conditions cause pathologies, especially of the distal part of the legs.

It is important that the development of optimal methods of early diagnosis, treatment and prevention of finger diseases is based on a deep analysis of pathologoanatomical and pathologistological changes in the pathological focus.

Purulent-necrotic lesions of the hoof in cows are very common and account for the highest percentage of all other foot diseases, according to researchers. These diseases are recorded in various animal species, but are most often seen in cattle. This pathology causes serious economic damage due to the high frequency and wide distribution of its manifestations both in our country and abroad. Damages include reduced productivity, loss of live weight, replacement of herd animals, and treatment costs [1].

At present, 18 diseases of cattle hooves are known, the most important of which are laminitis, pododermatitis, hoof palm ulcer, white line diseases, finger dermatitis, soft heel phlegmon, necrobacteriosis [6]. According to the authors, dairy cows often have 5-10 different finger pathologies at the same time.

The author suggests classification of diseases in the area of the fingers, taking into account injuries of the skin of the inter-hoof gap, soft and hard tissues of the hooves [7]. According to him, foot diseases can be caused by many etiological factors, all cases of lameness should be recorded for accurate diagnosis and identification, rational treatment methods, and the term "hoof rot" cannot be used as a nosological diagnosis.

It is noted that the main principles of any classification in animal husbandry are timely diagnosis, predicting the course of the disease, determining the rationality of treatment and prevention [2].

According to the researcher, when conducting complex clinical-experimental and scientific-production studies on dairy farms with different maintenance technologies, clinical, clinical-orthopedic, zoo-veterinary, sanitary-hygienic, morphometric, hematological, biochemical, biophysical, radiological, microbiological and pathological studies are carried out on each farm. it is necessary to conduct [5].

Disruption of microcirculation and regulatory mechanisms characteristic of purulent-necrotic processes is of great importance in the pathogenesis of diseases occurring in the area of the distal part of the legs, which leads to a decrease in the level of tissue respiration and accumulation of metabolic products in them. The accumulation of non-oxidized toxic substances reduces the production of energy materials and proteins, which is the cause of another destructive process in the pathological focus [3].

The skin base of the hoof (pododerm) or hoof dermis (corium unguulae, pododerma) acts as a connector between the horn substance capsule and the hoof bone. In histological section, hoof skin consists of three layers: papillary or leafy (stratum papillare, stratum lamellatum), vascular (stratum vasculosum) and periosteal layers (stratum periosteal) [4].

**Research object and methods.** Biological material was obtained from 10 forcibly slaughtered cows infected with septic pododermatitis in the livestock complex of Akdarya district belonging to the "Siyob-Shavkat-Orzu" cluster of the Samarkand region "Konigil Animal

Slaughter" LLC in the city of Samarkand. For histological and ultrastructural studies, pieces of 0.5 cm were taken from the hoof bone, hoof ring, hoof wall, hoof palm and soft heel skin-based tissues. The obtained sections were fixed in 10% formalin.

Pathohistological examinations were made in the "Pathomorphology" and "OPTA-TECh" laboratories of the "Animal anatomy, histology and pathological anatomy" department, and histosections were prepared from the samples taken from the hooves of cows and studied under the MB-200 microscope. After appropriate histological processing, 7- $\mu$ m-thick sections were stained with hematoxylin and eosin and Van Gieson methods to obtain a gross morphological picture.

Research results. Specific histological changes were noted in the microstructures of pathological foci in different parts of the hooves of purebred cows diagnosed with purulent pododermatitis.

The foci of necrosis in the epidermis of the hoof ridge are pale red, and rhexis (disintegration) and pyknosis (non-swelling, shrinkage), emigration of erythrocytes and leukocytes were detected in the nuclei of the cells of granular, shiny and horn-like flat epithelia of the epidermis. Deformation and reduction of suckers on the skin base (derma) of the hoof ridge, flattening of collagen and elastic fibers of the reticular layer around the inflammation, disintegration and erosion of tissue fibers, swelling and necrosis in the inflammatory site of the subcutaneous (hypoderm) layer were observed. Pathological granulation tissue is formed. Mucoïd edema of the mucous membrane of blood vessel walls indicates tissue oxygen deficiency. The intima cells of the blood vessel wall are weakly adherent, the accumulation of blood cells and the formation of microthrombi lead to the violation of blood microcirculation and hypodermic trophism.

Dystrophic changes in the cells of the epidermis of the hoof circle, necrosis of the mucous membrane of the epidermis, emigration of tumor and shaped elements of blood, karyorrhexis and karyopyknosis in the nuclei of cells of flat epithelia of the epidermis, undifferentiation of the walls of connective fibers and necrosis were found. The number of round and long papillae of the base of the skin has decreased and the reticular tissue has atrophied, blood vessels have expanded, blood cells have accumulated around it, and microthrombi have formed. Hoof circle subcutaneous tissue suckers are also subject to hyperplasia and hypertrophy (increased tissue size and quantity), tissue fibers are broken and eroded, swollen and necrotic in the focus of inflammation, the cells of the blood vessel wall are separated from each other, microthrombi in blood vessels cause circulatory disorders. .

It was found that rhexis and pyknosis in the nuclei of flat epithelial cells of the epidermis of the base of the hoof wall, connective fibers are not differentiated and necrosis occurs. The basement membrane and subepidermal reticulin tufts have marked soft tissue thickening due to edema and necrosis. The inner surface of the hoof wall, the papillary layer of the skin base, is dry and uneven, and such cases can be found even in areas without fibrin coating. The number of papillae of the base of the hoof skin is reduced and reduced, and in some places they are not visible at all, scars are formed in their place, mucous and fibrinoid edema, degeneration of collagen and elastic fibers, dyskeratosis (disruption of the freezing state of the cells of the epidermal layer) were detected. Exudative-proliferative vasculitis (inflammation of the vessel wall), parakeratosis, dyskeratosis, lymphocytic and mononuclear infiltration was detected against the background of fibrinoid and sclerotic changes.

The epidermis is not visible in the pathological focus of the hoof palm, the epidermis near the pathological focus and its surroundings is thickened acanthosis (uniform thickening of the layers of the epidermis), hyperkeratosis (excessive thickening of the horny layer of the epidermis), the basal layer is thinned or partially absent in some places, karyopyknosis (shrinkage of the nuclei) in the cells of the shiny layer ) and was found to be in a state of karyolysis (melting of the nucleus). Cells are significantly thinned, the nucleus is fragmented and in some places is not visible. In the inflammatory focus of the skin base of the hoof palm, there is tissue infiltration with a polymorphous nucleus, mucoid swelling and hyalinosis (hyaline dystrophy in the connective tissue), areas of necrosis and microabscesses, edema and disintegration zones in the fibers of the connective tissue of the reticular layer. As a result of mucoid swelling of the mucous membrane of the walls of blood vessels, intima cells are weakly attached to each other. Necrosis and lysis of the papillae of the skin base were observed, and the existing papillae were reduced in size, scars were formed in place of the lysed papillae, collagen and elastic fibers were fibrinoid and sclerotic changes against the background of exudative-proliferative vasculitis, parakeratosis (disruption of the freezing process) and dyskeratosis (epidermal layer violation of the state of freezing of cells) was determined.

The epidermis of the soft heel close to and around the pathological center is thinned and almost lysed in some places, the cells of the basal and shiny layers are sparse, the nucleus is fragmented and is not visible in some places (Fig. 1).

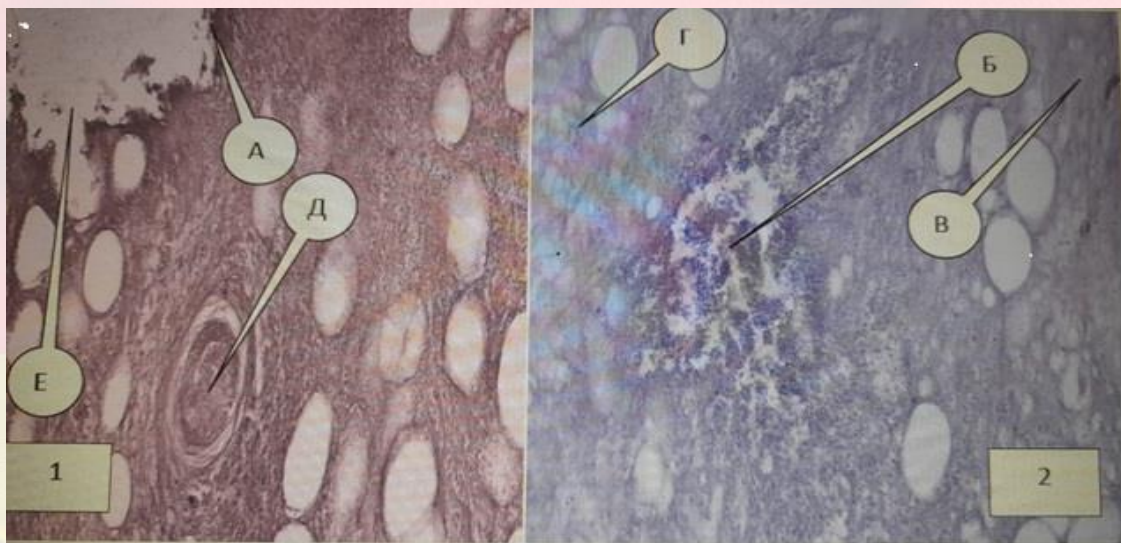


Figure 1. The epidermis of the soft heel is lysed (A), connective tissue cells are necrotic (B), parakeratosis, dyskeratosis (V), dystrophic changes in vascular endothelial cells, microtraumas (G), necrosis in collagen and elastic fibers, hyperplasia (D) (tissue volume increase), the area of fat vacuoles is sharply reduced and some of them have undergone necrosis (E). Hematoxylin-eosin. Ok. 10. Ob. 40. (1). Stained according to Van-Gieson (2).

In the areas near the pathological focus and around it, the number of long, rounded papillae on the basis of the skin has decreased and the connective tissue cells have undergone necrosis, soft tissue fibers are swollen and thickened, some tissues are broken, many bundles of elastic

fibers in the dermis have undergone necrosis and lysis, and the fibers are broken into fragments, parakeratosis, dyskeratosis was detected. Dystrophic changes, microtraumas and microhematomas were observed in vascular endothelial cells. It was noted that the connective tissue cells were broken and eroded, the area of fat vacuoles was sharply reduced and some of them were necrotic, and the hypodermis layer was thinned.

### **Summary**

- in purulent pododerma of cows, the foci of necrosis in the epidermis of the hooves are light red in color and rhexis and pyknosis in the nuclei of the cells of the granular, shiny and horn-like flat epithelia of the epidermis, deformation of the nipples on the basis of the skin and a decrease in their number, weak adhesion of the intima cells of the wall of blood vessels, dystrophic changes in the cells of the epidermis of the hooves, it is characterized by the fact that the number of round and long papillae of the base of the skin is reduced and the reticular tissue is atrophied, the papillae of the subcutaneous tissue are hyperplastic and hypertrophied, tissue fibers are broken and eroded at the site of inflammation;

-in purulent pododerma, tissue infiltration with a polymorphous nucleus in the inflammatory focus of the skin base of the hoof palm, mucoid swelling and hyalinosis in the fibers of the connective tissue of the reticular layer, the presence of necrosis and microabscesses, swelling and fragmentation zones, the formation of scars in the place of lysed teats, collagen and elastic fibers are fibrinoid and exudative-proliferative vasculitis, parakeratosis and dyskeratosis were detected against the background of sclerotic changes.

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