# MORPHOPATHOLOGICAL STUDY OF MYXOMATOSIS IN RABBITS

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***Abstract: Morphopathological study of myxomatosis in rabbits***
*Myxomatosis in rabbits develops in two main forms: edematous and nodular. Edematous form is characterized by inflammation of the eyelid and conjunctiva. The head of a rabbit suffering from myxomatosis is like a lion's head. Nodular form grows on the head, ears, eyelids, representing some growths that can merge with other parties giving ugly rabbit form.*

***Key words:*** *myxomatosis, myxoma, edematous, form, nodular*

## INTRODUCTION

Myxomatosis description was made for the first time by Sarelli in 1896, which signaled the disease in wild rabbits in Uruguay [1]. Later it was recorded in Brazil, Mexico and USA. It seems that in Australia and Europe the disease remained unknown in the first half of the twentieth century, although there are opinions according to which it should be reported in these countries, but not expand. Then the disease spread to many countries in the world [2, 3, 5]. It was shown that myxomatosis is a disease caused by a virus that attacks only rabbits, both the domestic and wild rabbit population. There are several strains of the virus that manifest themselves in a different way. Most often the disease is transmitted by the bite of mosquitoes, fleas, lice or ticks and in many cases is fatal. This disease can also be transmitted through direct contact between rabbits or by air. In some cases, transmission is carried out indirectly through food or bedding vessel, their master can transmit the virus from infected to the healthy rabbit. Animal exhibitions are just another important source of infection, there is a possibility that a carrier rabbit pass on the virus [2, 3].

The evolution of the disease progression can be slow in case of very well cared rabbits and sometimes there are chances of healing them by intensive care. However, myxomatosis can be a very serious and long-term disease and, most often, it is recommended euthanasia of the sick animal [4, 7].

Republic of Moldova is like those European countries in which myxomatosis has caused a great damage. Currently it is trying to control the spread of myxomatosis by vaccinating rabbits flock. However, the disease often occurs in individual sectors, causing great damage to peasants. In our country myxomatosis was poorly studied in terms of pathology and therefore we proposed morphopathological study of this disease.

## MATERIAL AND METHODS

The morphological study of myxomatosis in rabbits was conducted on pathological material obtained from 5 corpses of rabbits aged from 4 to 6 months belonging to Soldanesti town residents. The autopsy was performed in the necropsy room of veterinary clinic in the town.

After macroscopic examination of internal organs, modified visceral portions of which were cut for histopathological research. Initially organ portions were washed for a day under running tap water to remove the substrate fixer.

Subsequently, the concentration and dehydration of the portions of the tissue pieces were passed through alcoholic solutions with concentrations from 60 ° to 100 °, for each 24 hours. This was followed by the passage of pathological material through the portions of the alcohol-chloroform for 12 hours, then the pieces of organs were embedded in paraffin liquid.

After pouring pathological material in paraffin blocks, the latter were installed in sliding microtome. As a result of sectioning the paraffin block histopathological pieces with a thickness of 8-10 microns were obtained which were stained with hematoxylin-eosin.

**RESULTS AND DISCUSSION**

Macroscopically, we determined that myxoma tumor appears as a single, circular or lobular, which can reach considerable size in deep soft tissues. The tumor is not encapsulated or only partially encapsulated, enclosed in the surrounding tissues or infiltrative and often relapsing after surgical removal. Tumor mass has a soft consistency, and the translucent section presents a swollen aspect, sometimes with cystic and hemorrhagic areas, our data are consistent with the results observed by Marlier D. and colleagues in experimental infection [4].

By our observations, myxomatosis quickly disseminate, mortality hovering at a level of 95-100%. According to the literature, the animals passed through the disease become immune, being carrying and eliminating the virus [3]. After an incubation period of 4-5 days, the disease begins with fever, rhinitis and serous conjunctivitis, which then becomes mucopurulent, followed by swelling of the eyelids, scalp (especially the nose), then appear myxomas of the ears, eyelids, nose, genitals and limbs.

Myxomatosis in rabbits develops in two forms: edematous and nodular. Of the five dead bodies of myxomatosis rabbits, two showed changes of edematous form and three – of the nodular form. Edematous form is characterized by inflammation of the eyelids and conjunctivitis. As a result, the eyelids become mate, ocular secretions appear, develops serous rhinitis. On the surface of the head, in the region of the anus, the external reproductive organs there are present masses of gelatinous edema as 3-5 cm size formations. Sick animals are diverging, and the temperature of their bodies rises to 41.4 ° C. Rabbits, usually refuse feed, and as a result, decrease in the weight. Visible mucous membranes are cyanotic, breathing becomes more difficult. Head sick rabbit myxomatosis is that „a lion head". Malignant disease is manifest and lasts 4-10 days, sometimes five weeks, ending with the death of animals.

If in the beginning of the disease fever and anorexia install, then further progression of the disease may take the form of nodular usual form. Nodular form develops on the head, ears, eyelids, constituting some growths that can merge with other parties giving ugly rabbit form. After about 2 weeks of nodules formation foci of necrosis appear which in case of a benign evolution, usually heal.

Nodular form can be acute, subacute, or benign. The disease begins with the appearance conjunctival secretions, initially serous then mucopurulent. Secretions are followed by subcutaneous connective tissue edema in the head, especially the muzzle and

myxomatous pseudotumor formation. In the next phase of tumor nodules can be generalized by their spreading to limbs, scrotum, lungs and thorax and as a result, the animal is weak and often presents serious respiratory disorders.

In the acute form the animal death occurs in most cases in 2-10 days. In subacute form myxomas are less numerous, sick animals weaken significantly and present respiratory abnormalities. Duration of the disease is 2-4 weeks. In the fatal case the skin covering the myxoma forms crusts and then fall off with the pseudotumoral tissue [2].

Benign forms are found in more resistant animals from a genetic point of view or in those descending from immune mothers. In these animals the disease is characterized by easy development with unchanged general condition, with few pseudotumors, located mostly on the head, which are necrotized and then quickly blistered. The disease, in most cases, ends with a complete healing of the animal.

Edematous form, as well as nodular forms, begins with conjunctivitis and mucopurulent discharge, then blepharitis and dyspnea can add, sometimes hidden papules on the ears. The female rabbits abortion or infertility may occur. In all cases of disease bacterial complications are quite common. The overlapping of secondary infections, particularly Pasteurella, is characterized by fibrinous pneumonia lesions. At necropsy of rabbit corpse there are few characteristic lesions. It highlights splenomegaly, swollen lymph nodes, subcutaneous connective tissue, especially at the level of pseudotumors, is edematous.

Pseudotumors are of different sizes, with characteristic appearance, non-adherent to the underlying subcutaneous tissue, smooth surface on section, yellowish, gelatinous, with intensely vascularized peripheral area. Lymph nodes, lungs, gonads and other internal organs are congested. In the histopathological study it was determined that mesenchimatous pseudotumors consist of mucoid connective tissue, similar to that of Warton gelatin from umbilical cord, no cases in adult tissues.

Myxoma is made of rare cells, stellate or spindle-shaped, with extra long, thin, apparently anastomosed, spread in a basic substance, which is amorphous, mucoid, rich in mucopolysaccharides, in particular in hyaluronic acid, metachromatic to toluidine blue staining. Cells have cytoplasm in a moderate amount, clear, with fine vacuoles and nuclei that are relatively large, round or oblong, with a well defined chromatin network. The fundamental substance mucoid can highlight reticulin fibers and collagen. The blood vessels are rare. In some areas of tumor and perivascular areas tumor cells may be more numerous and round, without processes.

Microscopically, we determined baloon degeneration of the spinous layer of skin epithelium, hyperacantosis and in the cytoplasm of epithelial cells we found inclusions or Splendore's bodies. In the dermis and hypodermis histopathological investigation revealed hyperplasia and swelling of endothelial of capillaries with lumen obliteration, with fibrinoid degeneration and thrombosis of capillaries, a fact noted by P. Marcato and colleagues [3]. Simultaneously pericytes proliferate takes place that are located like bulb onions.

We noticed a serous exudation and bleeding with excess of eosinophils in dermohypodermic foci like in the research of J. Patterson-Kane [6]. Collagen fibers are fluidified and present cells are big with cytoplasmic extensions and bulky looking brindle cores. In myxomatous cells Splendore bodies can be identified.

In the lymph nodes hyperplasia of reticular cells with epithelial transformation and giant polynucleic cells (polykariocytosis), regression of lymphoid tissue (kariorexis and atrophy), proliferation of hyperbasofile immature cells, hyperplasia of capillary endothelium, bleeding and necropurulent microfoci are found.

Our observations are consistent with literature data, according to which certain histopathological changes should be applied for differential diagnosis of myxomatosis with pastereulosis, staphylococcal disease, spirochetosis, oral papillomatosis, Shope papilloma and rabbits infectious rhinitis [7]. Like in our study, they indicate systemic nature, rabbits polyorganic damage of the rabbits with dystrophic changes and bleeding in vital organs - the myocardium, liver, kidney, brain, involving small caliber vessels of panvasculitis type. Therefore, we have not only histopathological confirmation of systemic inflammatory response syndrome, but also morphological substrate of multiple organ failure syndrome, which explains the high mortlality described by several authors in myxomatosis [1, 4, 5, 7] .

## CONCLUSIONS

1. Myxomatosis is a viral very serious infectious disease of rabbits, especially those domestic and some species of the wild ones, mainly characterized by mucosal swelling and the presence of pseudotumors called myxomas. Nodular form of myxomas grows mainly on scalp and genitals. Edematous form is characterized by blepharoconjunctivitis with dead eyelid, eye discharge and rhinitis.
2. Histopathological lesions of myxomatosis in rabbits include: mesenchimatous pseudotumors consisting of mucoid connective tissue, similar to umbilical cord; tumor cells with moderate cytoplasm and fine vacuoles, with the relatively large round or oblong nucleum; dermohypodermic foci with serous exsudation, bleeding, fluidifying of collagen fibers; hyperplasia of reticular cells, giant polynucleic cells, bleeding and necroopurulent microfoci in the lymph nodes.

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