

MORPHOLOGICAL CHANGES IN LYMPH NODES VESSELS OF THE SMALL INTESTINE OF DOGS WITH OBSTRUCTED LYMPH DRAINAGE

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Abstract: One of the main ways of nutrient absorption in the small intestine is, as is known, its interorgan lymphatic system, from which lymph is diverted to the extracorporeal milk vessels. The extra organ milk vessels of the human small intestine, located in the mesentery, are formed from the diverting lymphatic vessels of the submucosa and the diverting lymphatic vessels of the serosa. They follow from the mesenteric edge of the small intestine to the main lymph nodes of the mesentery root together with or separately from the blood vessels, terminating in numerous mesenteric lymph nodes.

Key words: dog, small intestine, extra organ lymph nodes, lymph vessels, abdominal cavity, lactic vessels, mesenteric node.

МОРФОЛОГИЧЕСКИЕ ИЗМЕНЕНИЯ ЛИМФАТИЧЕСКИХ СОСУДОВ ТОНКОЙ КИШКИ СОБАК ПРИ ЗАТРУДНЕННОМ ЛИМФООТТОКЕ

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Резюме: В статье изучены морфологии млечных сосудов тонкой кишки собаки при застое лимфы, вызванном перевязкой на разных уровнях

лимфатических сосудов, транспортирующих млечную жидкость в вены, поскольку в доступной нам литературе этот вопрос недостаточно освещен. А также состояния вне органных лимфатических сосудов тонкой кишки на собаках.

Ключевые слова: собака, тонкая кишка, внеорганные лимфатические узлы, лимфатические сосуды, брюшная полость, млечные сосуды, брыжеечный узел.

Introduction. One of the primary pathways for nutrient absorption in the small intestine is its intraorgan lymphatic system, from which lymph is drained into extraorgan chylous vessels [1,3]. The extraorgan chylous vessels of the human small intestine, located in the mesentery, are formed from the efferent lymphatic vessels of the submucosal layer and the serous membrane [2,4,5]. These vessels extend from the mesenteric border of the small intestine to the main lymphatic nodes at the root of the mesentery, either alongside blood vessels or independently, interrupted by numerous mesenteric lymphatic nodes.

Research Objective. The purpose of this study is to investigate the morphology of the chylous vessels of the dog's small intestine under conditions of lymph stasis induced by ligation of lymphatic vessels at various levels.

Materials and Methods. The study involved 23 animals (dogs), including 3 controls. Four series of experiments were conducted on experimental animals to induce impaired lymph outflow.

In the first series, the thoracic lymphatic duct was ligated near its entry into the left venous angle in 5 dogs.

In the second series, the intestinal trunk was ligated at the origin of the cranial mesenteric artery in 5 dogs.

In the third series, 5 dogs underwent two operations: first, the thoracic lymphatic duct was ligated in the neck, followed by ligation of the efferent lymphatic vessels of the cranial mesenteric node 4, 5, 7, 10, or 15 days later.

In the fourth series, the afferent lymphatic vessels of the cranial mesenteric node were ligated at their entry into the node in 5 dogs. Experimental animals were euthanized 1, 3, 5, 7, 10, or 15 days post-operation.

Results. The study revealed that in 5 dogs of the first series and 5 dogs of the third series, dilated chylous vessels (1.5–2 times larger) were clearly visible in the wall of the small intestine and its mesentery 2–7 days post-operation. The number of these vessels significantly increased in both the jejunum and ileum compared to the norm, likely due to the expansion of reserve lymphatic vessels. A network of lymphatic vessels in the serous membrane was clearly visible along the length of the small intestine, with loops of varying shapes oriented nearly perpendicular to the intestine's long axis. Collecting lymphatic vessels formed from this network, merging in pairs and crossing the intestine transversely, reached its mesenteric border and entered the mesentery, where they anastomosed with each other and with efferent lymphatic vessels.

First Series Results: 8–15 days post-operation, the condition of the extraorgan lymphatic vessels of the small intestine and its mesentery in other dogs of this series was similar to that described above. However, the diameter of the lymphatic vessels slightly decreased, and areas of the mesentery free of vessels showed varying degrees of opacity due to connective tissue proliferation. In all dogs of this series, the lymphatic vessels of the cranial mesenteric node were sequentially studied in the direction of lymph flow toward the vein. The efferent lymphatic vessels of the cranial mesenteric node were numerous. Five dogs were euthanized, while in another 5, well-filled efferent lymphatic vessels of the cranial mesenteric node were ligated and left for further study.

Second Series Results: In 3 dogs, incomplete ligation of the intestinal trunks was performed due to undetected additional intestinal trunks. Consequently, no visible morphological changes were observed in the lymphatic vessels of the small intestine wall or its mesentery 7, 10, or 15 days post-operation. In a dog euthanized 5 days post-operation, injection of Gerota's mass into the lymphatic vessels of the

small intestine wall showed incomplete filling of the mesenteric lymphatic vessels. The efferent lymphatic vessels of the cranial mesenteric node formed a bundle directed cranially, either entering the cisterna chyli directly or passing through the pancreaticoduodenal node. The intestinal trunks were obliterated from the cranial mesenteric node to the ligation site.

Third Series Results: This series aimed to further investigate the condition of the extraorgan lymphatic vessels of the small intestine in 5 dogs from the first series, where the thoracic lymphatic duct was initially ligated, followed by ligation of the efferent lymphatic vessels of the cranial mesenteric node 4, 5, 10, or 15 days later. Five to seven days post-operation, severe engorgement of the lymphatic vessels in both the small intestine wall and its mesentery was observed, along with vessel deformation, tortuosity, increased vessel count, and some thickening and hardening of the intestinal wall. Collecting lymphatic vessels of the serous membrane were primarily formed at the free edge of the intestine, crossing it as dense white cords into which lymphatic vessels from the intestinal wall drained. Near the obliterated intestinal trunks, numerous small and large efferent lymphatic vessels of the cranial mesenteric node were found, some significantly dilated, forming a plexus on the posterior abdominal wall that partially compensated for lymph outflow. Some efferent lymphatic vessels, filled with blue mass, extended cranially and either entered the cisterna chyli directly or were interrupted in the pancreaticoduodenal nodes. Others extended caudally toward the aortic or lumbar lymphatic nodes behind the inferior vena cava.

Fourth Series Results: In 5 dogs, the afferent lymphatic vessels of the cranial mesenteric node were ligated at their entry into the right and left halves of the node. Three to five days post-ligation, severe stasis of chylous fluid was observed in these vessels. Dilated arcades of lymphatic vessels at the mesenteric border connected the lymphatic vessels of adjacent neurovascular bundles in the

mesentery. By day 7 post-operation, expansions resembling chylous “lakes,” connective tissue proliferation, and mesenteric opacity were observed along the lymphatic vessels. Due to wall thickening and reduced lumen, the lymphatic vessels felt dense and were tortuous. The small intestine wall in these animals Kierkegaard animals was edematous and hardened.

Conclusion. Simultaneous ligation of large and small efferent lymphatic vessels of the cranial mesenteric node significantly affects the extraorgan lymphatic vessels of the small intestine, resulting in increased number and diameter of efferent lymphatic vessels, thickening and hardening of the lymphatic vessel walls and the intestinal wall, enlargement and hardening of the cranial mesenteric node, and, in some cases, small hemorrhages and ulcerations of the intestinal mucosa. These changes in the extraorgan lymphatic vessels of the small intestine and its mesentery may occur due to lymphatic vessel and node obstruction by malignant tumor cells or other pathological processes.

REFERENCES| ЧОККИ | IQTIBOSLAR:

1. Abdullaeva, D. R., Ismati, A. O., & Mamataliev, A. R. (2023). Features of the histological structure of extrahepatic bile ducts in rats. *Golden brain*, 1(10), 485-492 (in Russ).
2. Mamataliev, A., & Oripov, F. (2021). Histological structure of the intramural nervous apparatus of the common bile duct and gallbladder in a rabbit, in norm and after gallbladder removal. *Journal of Biomedicine and Practice*, 1(3/2), 117-125(in Russ).
3. Mamataliev, A. R., Tukhtanazarova, Sh. I., Zokhidova, S. Kh., Omonov, A. T., & Rakhmonov, Sh. Sh. Anatomical and topographic structure and active contraction of the walls of the portal vein of laboratory animals. *Academic research in modern science*, (2024). 3(30), 163-168(in Russ).
4. Satybaldiyeva, G., Minzhanova, G., Zubova, O., Toshbekov, B., Rasulovich, M. A., Sapaev, B., ... & Khudaynazarovna, T. I. Behavioral adaptations of Arctic fox,

Vulpes lagopus in response to climate change. Caspian Journal of Environmental Sciences, (2024); 22(5): 1011-1019.

5. Mamataliev, A. R. (2024). Nervous apparatus of extrahepatic bile ducts in rabbit after experimental cholecystectomy. International journal of recently scientific researcher's theory, 2(4), 161-165(in Russ).