HISTOLOGICAL STRUCTURE OF THE PROSTATE GLAND IN EXPERIMENTAL ANIMALS

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Abstract: The article studies the anatomical and histological features of the prostate gland in one of the experimental animals - a dog. The parenchyma of the gland is well developed and consists of connective and muscle tissue on the outside, which penetrates into the gland and forms intercellular barriers. The stroma consists of oval and round cavities. The epithelium of the inner lining of the cavities is homogeneous and cylindrical, while the tubules are covered to a greater extent with cubic epithelial cells.

Keywords: dog, prostate gland, hematoxylin-eosin, Van-Gieson, elastic fibers, stroma, argyrophilic fibers, nerve fibers.

ГИСТОЛОГИЧЕСКАЯ СТРУКТУРА ПРЕДСТАТЕЛЬНОЙ ЖЕЛЕЗЫ У ЭКСПЕРИМЕНТАЛЬНЫХ ЖИВОТНЫХ

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Аннотация: В статье изучены анатомические и гистологические особенности предстательной железы у одного из экспериментальных животных — собаки. Паренхима железы хорошо развита и снаружи состоит из соединительной и мышечной ткани, которая проникает внутрь железы и образует межклеточные барьеры. Строма состоит из овальных и круглых полостей. Эпителий внутренней выстилки полостей однородный и цилиндрический, тогда как канальцы покрыты в большей степени кубическими эпителиальными клетками.

Ключевые слова: собака, предстательная железа, гематоксилин-эозин, Ван-Гизон, эластические волокна, строма, аргирофильные волокна, нервные волокна.

Introduction. In recent years, scientific literature and defended research papers have lacked information regarding the histological structure and morphology of the canine prostate gland [3,8]. No studies specifically examining the intramural nervous system of the prostate have been identified. However, some researchers have investigated intramural nervous structures in digestive organs [1,7]. Studies have explored the vegetative nerve fibers of venous blood vessels in the walls of the stomach and esophagus under normal conditions and in liver cirrhosis [2,6]. Nevertheless, no data were found in the literature on the anatomical-histological structure and morphology of intramural vegetative ganglia of the prostate gland in experimental animals, such as dogs [4,5].

Research Objective: To study the anatomical-histological structure of the prostate gland in healthy adult dogs.

Materials and Methods: The study was conducted on prostate glands obtained from eight healthy adult dogs, one of the experimental animals. The materials were fixed in 12% neutral formalin. To examine the general histological structure, tissues were stained with Hematoxylin-Eosin. Elastic fibers were identified using the Van Gieson method. Argyrophilic fibers were stained using the Donskoy method. To study the nervous system, histological sections were prepared using a freezing microtome and impregnated using the Bielschowsky-Gross, Rasskazova, and Campos methods.

Research Results The canine prostate gland is well-developed, with clearly defined lobules that are relatively large and possess an alveolar structure. The terminal secretory portions and excretory ducts are wide but not uniformly structured. They are lined internally with cylindrical epithelium, which in some areas forms papillary growths. In some secretory cavities, amorphous secretion with visible granularity is observed. The stroma consists of connective and smooth

muscle tissues, with a small number of thin elastic fibers located in the capsule, around glandular elements, and near blood vessels. The interlobular connective tissue is well-developed, extending thin layers into the lobules, surrounding the terminal secretory portions and ducts. Numerous blood vessels and large nerve nodes are present around the capsule. Argyrophilic fibers are well-developed, with internal and external argyrophilic membranes composed of thin and thick fibers. A large and small reticular network of argyrophilic fibers is visible in the stroma. Intramural nerve fibers are present in significant quantities, particularly in the organ's periphery. These are represented by nerve bundles, nodes, and individual nerve fibers of varying thickness, sometimes varicose, tortuous, or straight. In some areas, they branch out, forming bush-like receptors that terminate in stromal or epithelial cells. The lobules vary in size, each containing numerous distinct terminal portions and ducts with smooth or tortuous lumens. The epithelium covering the terminal portions is typically multilayered cylindrical. Cell nuclei are well-stained, located basally, and have round or elongated oval shapes. Some duct walls and terminal secretory portions are lined with low cuboidal epithelium. The number of smooth muscles increases toward the gland's periphery, where striated muscles are also developed. Numerous blood vessels of varying calibers are present in the stroma, especially in the organ's outer regions. The external and internal argyrophilic membranes are well-developed, consisting of thin and thick, slightly tortuous fibers. Numerous nerve elements are primarily represented by nerve fibers and ganglia. Ganglion cells vary in size, with distinct round and oval nuclei. Small nodes composed of small multipolar nerve cells are observed in the central parts of the gland. Some nerve bundles and individual fibers are adjacent to glandular elements. Many nerve fibers penetrate the stroma, forming extensive receptor fields in some areas and reaching the epithelium of terminal portions and ducts. Numerous nerve endings, such as polyvalent receptors, dendritic receptors, and vascular receptors, are present. Genital corpuscle and bulb-type encapsulated receptors are widely distributed in the stroma, particularly along the periphery.

Conclusion: Our study allows the following conclusions. In dogs, in addition to a clearly defined lobular structure, there is well-developed stroma and parenchyma. The parenchyma contains very small terminal secretory portions and ducts. Alongside a distinct lobular structure, large terminal secretory portions and ducts covered with tall cylindrical epithelium forming papillary growths were identified. The canine prostate gland contains a significant number of nerve elements. These are numerous and diverse, represented by nerve trunks, branches, and various free and encapsulated receptors.

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