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FIBROMATOSIS OF THE ROE DEER (*Capreolus capreolus*)

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Summary: Of all the skin tumors, fibromas present very frequent skin neoplasms in different species of wild game of the family *Cervidae* caused by papillomaviruses. Viral etiology of skin neoplasms was proven in certain species of wild game from this family, and the most frequent diagnoses are: fibromas, ossifying fibromas, fibrosarcomas, multiple neurofibromatosis, fibropapillomas, and papillomas. In this article, a several case of roe deer multiple fibromas - fibromatosis from the province of Vojvodina is presented.
In this study, tumor samples of a roe deer were macroscopically and histologically examined ,whose autopsies was performed at the Department of Pathological Morphology of the Institute of Veterinary Medicine of Serbia. Tumor samples were fixed in 10% neutral formalin, and after standard procedures embedded in paraffin. Paraffin tissue thickness of 3-5 μm were colored by hematoxylin-eosin method (HE).
By macroscopic examination, it was determined 26 clearly limited neoplasms, gray-black in color, firm consistency, covered with skin without hair. Tumors were localized over the entire body, with the largest number of determined tumors in the head and extremities.Tumors were ranging in size from 1.5 to 12 cm. Larger tumors were covered with skin that was partially ulcerated, and in its central part, next to ulceration, necrosis was located. In cross section of these lesions solid tumor mass was showed, with no visible vascularization. By autopsies, apparent metastases were not found in internal organs or other signs of disease. On histopathological examination the stroma was determined, which consisted of a number of interlaced collagen fibers and fibroblasts with spindle-shaped, square and star-shapes of sails. The epidermis that covers the tumor mass, showed signs of acanthosis and hyperkeratosis..
The diagnozed tumor of the roe deer had the histological characteristics of a polimorphous fibroblasts, which is not the case with domestic animals. This finding can be considered as a characteristic of fibromas for animals of the family *Cervidae*.
Solitary fibroma or multiple fibroma (fibromatosis) does not present a significant cause of deer deaths, but they cause concern among hunters who are in direct contact with them. Although fibromas do not lead to spoilage of game meat, they are esthetically repellent and people are reluctant to consume meat of such game. This is the second case of fibromatosis in our experience, and we can conclude that it is necessary to conduct an extensive examination to obtain data about disiase in our hunting grounds in Serbia.

Key words: fibroma, roe deer, morphological changes

Introduction

From all skin tumors, fibromas present very frequent skin neoplasms in different species of wild game of the family *Cervidae* caused by papillomaviruses. The causative is a roe deer papillomavirus (CcPV1) belonging to the ruminant specific Delta-papillomavirus genus. In the body, the virus penetrates through damaged skin or by direct contact and by insects that feed on blood. After penetration it multiplies in the epithelial cells and connective tissue cells. According to the literature, there is no evidence that this is a zoonotic disease that can be transmitted from deer to humans. Viral etiology of these neoplasms is detectable only in certain species of this family, and most frequently are diagnosed: fibromas, osifikujući fibroma, fibrosarcoma, multiple neurofibromatosis, fibropapilomi and papillomas. Fibromas most frequently occur in animals under two years of age. However, there are also described the sporadic cases in older animals. According to some studies, there is a gender predisposition for the occurrence of this neoplasm, with a greater proven predisposition of males. Fibromas are described as solid, nodular, round skin lesions up to 1 cm in diameter. Their number can vary from 1 to 226, a size of 0.5 to 25 cm [1,2,5]. In our previously described case of deer fibromas, the tumor was established by measuring 12x7 cm. The tumors are usually dark brown to black, smooth or wrinkled surface. Large fibromas may be ulcerated and are often pedunculated. Connective tissue fibroma consists of star-, angular the spindle-shaped fibroblasts that produce collagen matrix fibers oriented perpendicularly relative to the epithelium, and randomly allocated in the tumor mass. The significance of this neoplasm animal health rests primarily on its mechanical effects, so if is close to the eye it can lead to blindness, and the localization around the mouth making it difficult or impossible the food intake and leads to consequential mortality. In the case of the fibroma of the larger presence in the extremities, it can lead

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to difficulties in movement of animals and they become easy prey for predators. Although there are descriptions of metastases in the internal organs as a result of dissemination of virus in the body, making metastases or local invasion are described [1,4].

Roe deer papillomavirus infection has been identified as an endemic disease in roe deer populations of the Carpathian basin in Central Europe (Hungary, Austria, Croatia). Papillomavirus infection have been reported in a number of cervid species, e.g. white-tailed deer, mule deer, European elk, reindeer, red deer and roe deer [5]. According to our knowledge, there were no official reports of incidence of fibromas in roe deer in Serbia, but this is the second case of fibroma in our experience. In this article, several cases of roe deer fibromatosis from Vojvodina is presented.

Material and Method

Tumor samples of roe deer from different part of skin and oral cavity, on which necropsy was performed at Department of Pathology of the Institute of Veterinary Medicine of Serbia, were examined. Samples of the tumors from different parts of the skin, macroscopic and histologically were examined. Samples were fixed in 10% buffered formalin, and after standard processing cast in paraffin. Paraffin sections 3-5 μm thick were coloured with hematoxylin and eosin (HE).

Results and Discussion

By macroscopic examination the 26 limited, solid, gray-black neoplasms were found, with loss of hairs on the skin over the tumor, spreaded to different parts of the body, with a predominant distribution in the head and extremities (Figure 1, Figure 2). Diameter of established lesion was 1.5 to 12 cm. In the case of larger tumors partially ulcerated skin was found. The overlaying partially ulcerated skin, was observed on the larger tumors. This finding is also found in literature, mostly in cases of larger and pedunculated fibromas [1]. Larger tumor fractions were presented with central ulcerations and necrosis. On cut section, a white firm mass, practically without any vasculature on cut surface, was rimmed by a skin (Figure 3). Tumors were well-circumscribed and unencapsulated without infiltrating borders, which is characteristic of benign tumors [6]. In addition, two tumor masses in oral cavity were observed (Figure 4). Although there are some cases in literature about metastatic potential of fibromas [4], necropsy performed on the roe deer revealed neither internal metastases nor serious underlying disease. On histopathological examination of fibromas from skin and oral cavity, interlacing bundles of collagen and spindle-shaped, angulated or stellate fibroblasts were seen (Figure 5). The polymorphism of fibroblasts was pronounced (Figure 6). Nuclei of fibroblasts were polymorphous, hypechromatic, without mitotic figures. Those characteristics are observed also by other authors [1, 3, 5]. In some sections taken from the periphery of the tumor fibroblasts were predominant in regard to stroma and that is histological characteristic of *fibroma molle*. In sections taken from the central parts of tumor stroma was emphasized and fit into the picture of *fibroma durum*. The covering epidermis showed moderate acanthosis and hyperkeratosis but otherwise of normal appearance. Data from literature has shown similar pathological conditions in epidermis [1].

Figure 1. Fibroma located in the face area of the head

Figure 2. Large Fibroma located in femoral region

Figure 3. Cut sections of the two fibromas on the hind leg

Figure 4. Fibroma present in oral cavity

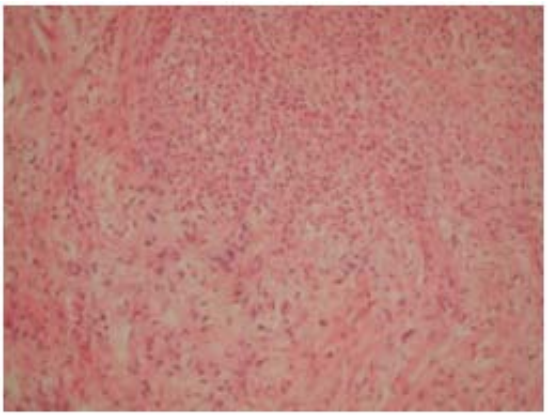

Figure 5. Fibroma from the head skin - Expressed fibroblast polymorphism. Fibroblast nuclei are hyper chromatic and polymorphic, and no mitoses are observed, HE, X200

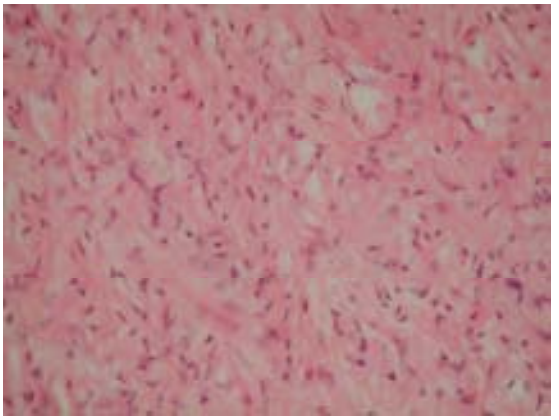

Figure 6. Fibroma from the leg - polymorphous fibroblasts and collagen fibers, HE, X400

Conclusion

The diagnozed tumor in the roe deer had the histological characteristics of a polimorphous fibroblast, which is not the case with domestic animals. This finding can be considered as a characteristic of fibromas in animals of the family *Cervidae*.

Solitary fibroma or multiple fibroma (fibromatosis) does not present a significant cause of deer deaths, but they cause concern among hunters who are in direct contact with them. Although fibromas do not lead to spoilage of game meat, they are esthetically repellent and people are reluctant to consume meat of such game. This is a second case of fibromatosis in our experience, and we can conclude that it is necessary to conduct an extensive examination of this disease to obtain data about incidence in our hunting grounds in Serbia.

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