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Original Scientific Paper

SIMULTANEOUS PRESENCE OF MELANOMA AND ADENOMA IN THE PERIANAL GLANDS OF DOGS

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Abstract: Melanomas are malignant tumors originating from pigment cells, while adenomas are benign tumors that develop from glandular tissue. This study investigates the histopathological characteristics of simultaneously occurring melanomas and adenomas in the perianal glands of older dogs.
Over a ten-year period, four cases were recorded in dogs aged between 8 and 12 years, in which histopathological examination confirmed the simultaneous presence of melanomas and adenomas in the perianal gland. In all cases, the tumors were detected during routine clinical examinations due to visible changes in the perianal region.
The presence of both tumor types in the same organ represents a rare and complex pathology that requires careful diagnosis. These findings highlight the need for detailed investigation into the pathogenesis of this rare tumor combination, as well as the development of new therapeutic approaches. The study also emphasizes the importance of early recognition and timely treatment, as well as the need for further research to better understand the clinical and pathological characteristics of these tumors in older dogs.
Keywords: adenoma, melanoma, dog, perianal gland

INTRODUCTION

Melanoma is a neoplasm arising from the uncontrolled proliferation of melanocytes, the cells responsible for melanin production. Although cutaneous melanoma is the most common form, this tumor can also develop on mucous membranes, in the eye, and in the meninges. While all subtypes originate from melanocytes and share a common embryonic origin and function, their etiopathogenesis and biological behavior differ significantly, including their patterns of metastasis (Van der Weyden et al., 2020).
In dogs, melanoma can be either benign or malignant. Benign melanomas most frequently occur on the head, trunk, and extremities (Smith et al., 2002). Malignant forms are far more common, representing approximately 70% of cases, with 62%

located in the oral cavity, 27% in the skin, 6% on the digits, and 4% sublingually (Gillard et al., 2014; Polton et al., 2024). According to Dobson (2013), dogs with darker pigmentation, such as Schnauzers and Scottish Terriers, have a higher predisposition to developing cutaneous melanoma.

An adenoma is a benign neoplasm of epithelial-glandular origin. Although benign, adenomas are considered precancerous lesions that may progress to adenocarcinomas (Bennett et al., 2002; Valenčáková-Agyagosová et al., 2019). Perianal adenomas are among the most common neoplasms in the perianal region of dogs and arise from the sebaceous and sweat glands in this area, as well as on the prepuce, at the base of the tail, and in the inguinal region (Valenčáková-Agyagosová et al., 2019).

Perianal glands play an important role in territorial marking and physiological processes associated with the anus, but they are also susceptible to various pathological changes. Adenomas are the most common, while malignant neoplasms such as melanoma are less frequent. The simultaneous presence of melanoma and adenoma in perianal glands is extremely rare and has only recently become a subject of scientific interest.

Older dogs are particularly susceptible, making perianal lesions common in this population. Perianal adenoma represents one of the most frequent benign neoplasms in older male dogs (Brodzki et al., 2023), whereas melanoma is associated with a poor prognosis due to its aggressive nature (Nishiya et al., 2016; Van der Weyden et al., 2020; Polton et al., 2024). Although the mechanisms leading to their concurrent occurrence are not fully understood, a potential pathophysiological connection is possible, but studies confirming this are lacking.

Accordingly, the importance of histopathological examination is paramount, as it is the only diagnostic method that allows precise determination of the nature of neoplasms and informs appropriate therapeutic decisions. This study aims to highlight the clinical relevance of the simultaneous occurrence of melanoma and adenoma and to encourage further research on this rare but significant pathological phenomenon.

MATERIALS AND METHODS

The study included dogs examined and treated in veterinary clinics in the city of Novi Sad between years 2014 and 2024. All dogs were aged between 8 and 12 years and exhibited clinical signs indicative of perianal gland pathology. The patients included in the study were: two Staffordshire Bull Terriers (one male, 8 years old, and one female, 11 years old), one Golden Retriever (male, 12 years old), and one Retriever (male, 10 years old).

A comprehensive clinical examination was performed for each dog, during which clinical signs such as swelling and pain in the perianal region, discomfort during defecation, and visible changes around the anus were recorded. Behavioral changes, including frequent licking and rubbing of the anus, were also noted as indicators of perianal gland pathology.

Ultrasonography was employed to assess the size and location of the neoplasms, as well as to identify potential metastases or other abnormalities in the perianal region.

The ultrasound examination also assisted in evaluating the internal structure of the neoplasms and in delineating their margins prior to surgical excision.

All dogs underwent radical surgical interventions in which the perianal gland neoplasms were completely excised. The size of the lesions prior to surgical excision ranged from 3.0 × 3.5 cm to 8.1 × 5.2 cm, indicating that the neoplasms were relatively large before surgery. Surgical excision aimed for complete removal of the tumors to reduce the risk of recurrence and metastasis.

Following surgical excision, tissue samples were submitted for histopathological examination. The affected perianal gland tissue was fixed in 10% formalin, dehydrated through a graded series of alcohols, and finally embedded in paraffin. Paraffin blocks were sectioned on a microtome at a thickness of 3 µm and stained with hematoxylin and eosin (H&E). The prepared histological slides were then subjected to detailed microscopic examination to determine tumor type, invasiveness, and degree of differentiation.

Descriptive statistics were used for data analysis. Data on breed, age, sex, clinical signs, lesion size prior to surgery, tumor type, and treatment outcomes were analyzed and presented in tabular form.

RESULTS

Based on the analysis of four histopathological perianal gland specimens from dogs, the presence of both melanoma and adenoma was confirmed within the same visual field (Figure 1).

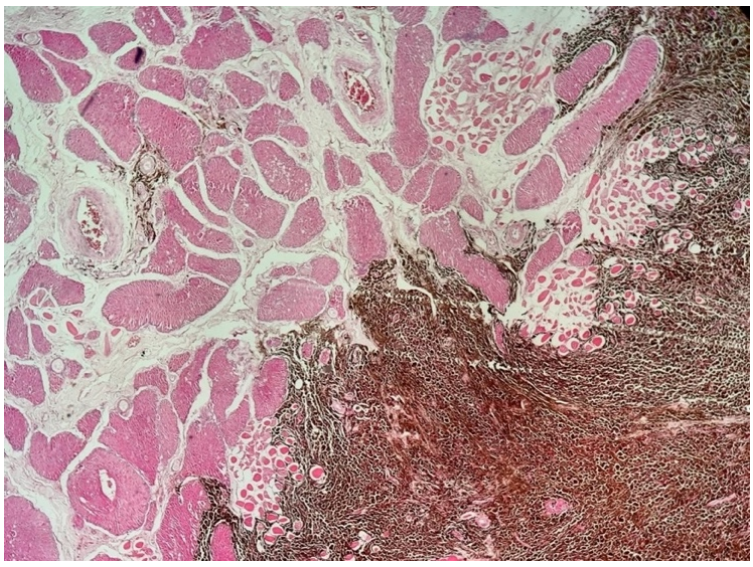

Figure 1. Histopathological finding showing the simultaneous presence of melanoma (lower right corner) and adenoma (upper left corner) in the perianal gland of a dog (H&E, 40×).

Histological examination revealed two distinct cell populations, as shown in Figure 2. The first cell population was characterized by well-organized lobular structures

composed of polygonal cells with moderately eosinophilic and vacuolated cytoplasm. These cells formed solid nests and trabeculae surrounded by fibrovascular septa. The nuclei were round, with finely granular chromatin and small nucleoli. Mitotic activity was low, and no signs of invasion into surrounding tissue were observed. Morphologically, this finding corresponded to an adenoma of the perianal gland.
The second cell population consisted of pleomorphic cells with abundant eosinophilic to amphophilic cytoplasm containing intracytoplasmic melanin granules (brown to black). These cells formed nests and trabeculae with invasive characteristics. The nuclei were large, hyperchromatic, and irregular. Frequent mitoses, including abnormal forms, were observed. Invasion into the glandular tissue of the perianal gland was also evident. Morphologically, these features corresponded to a malignant melanoma.

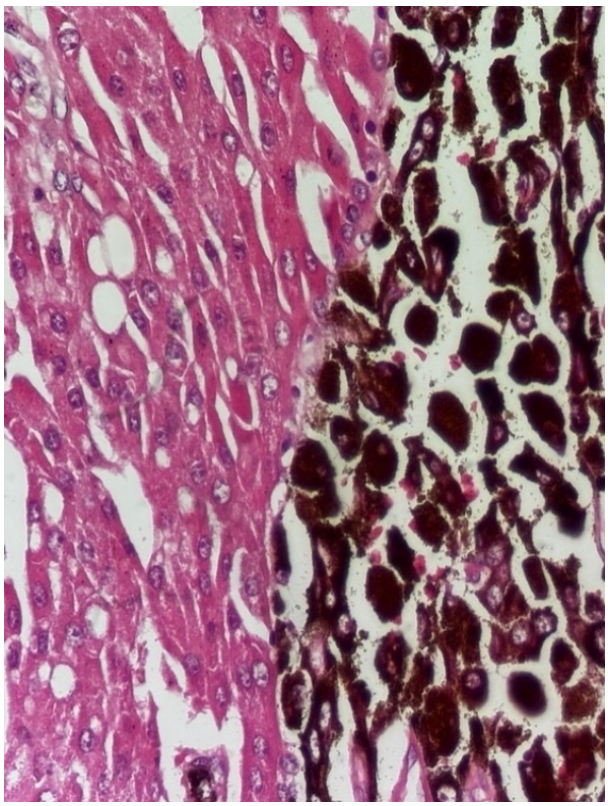

Figure 2. Histopathological finding of adenoma (left) and melanoma (right) in the perianal glands of a dog (H&E, 100×).

All dogs included in this study exhibited clinical signs indicative of perianal gland changes. The most common symptoms were swelling and pain in the perianal region, which were observed in all four dogs. Table 1 presents the clinical signs observed in the examined dogs.

Table 1. Clinical signs observed in the dogs

Symptom	Number of dogs	Percentage (%)
Pain in the perianal region	4	100%
Swelling of the perianal glands	4	100%
Defecation problems	2	50%
Licking of the anal region	3	75%

Prior to surgical excision, the size of the lesions in the perianal region ranged from 3.0 × 3.5 cm to 8.1 × 5.2 cm. The size and shape of the lesions were similar in all patients, with no significant variations. Data on lesion size (Table 2) indicate that all lesions were of comparable size before surgery. This suggests that the tumors were relatively large and could have caused the observed clinical symptoms.

Table 2. Lesion size prior to surgical excision

Breed	Sex	Lesion size (cm)
Staffordshire Bull Terrier	Male	3.9x4.6
Staffordshire Bull Terrier	Female	3.0x3.5
Golden Retriever	Male	8.1x5.2
Retriever	Male	5.8x6.1

Radical surgical interventions were performed in all four cases with the aim of complete tumor removal. Based on the histopathological examination of the surgical specimens, the resection margins were evaluated as clean in all four cases, with no tumor cells present at the edges of the specimens.

The dogs were observed postoperatively for a minimum period of six months. Observation included clinical examination and inspection of the surgical site, with particular attention to possible local recurrence or signs of systemic disease spread. In three dogs, no local changes or metastatic lesions were observed, and they achieved complete and lasting recovery. In one dog, local recurrence was noted six months after surgery, while no metastatic changes were detected during the observation period (Table 3).

Table 3. Overview of surgical treatments and outcomes

Type of surgical treatment	Numner of dogs
Radical tumor excision	4
No recurrence	3
With recurrence	1

DISCUSSION

The results of this study indicate the simultaneous presence of melanoma and adenoma in the perianal glands of older dogs, which is a rare but significant pathological finding that can have serious health implications for these animals. Considering that this study included only four dogs, the generalizability and broad applicability of these results are limited. However, the obtained data may be useful for understanding the clinical course and management of such cases.

Jakab and Balka (2012) reported the first case of simultaneous malignant cutaneous melanoma and sarcoma in dogs. In this decade-long study, four cases of simultaneous melanoma and adenoma in the perianal glands of dogs were documented. The histopathological findings of adenoma and melanoma in this study are consistent with the observations of Valenčáková-Agyagosová et al. (2019) regarding adenomas, and with Bolon et al. (1990), Spangler and Kass (2006), and Scott et al. (2017) regarding melanomas.

Clarke and Rissi (2018) diagnosed a rare form of malignant melanoma in an 8-year-old female American Staffordshire Terrier and a male Golden Retriever, while Scott et al. (2017) reported malignant melanomas in the perianal region of a 14-year-old Labrador Retriever and a 12-year-old Golden Retriever. These findings correspond with the present study, in which the age of the dogs ranged from 8 to 12 years. Furthermore, in this study, one of the breeds was a Golden Retriever, which presented with simultaneous melanoma and adenoma in the perianal gland. The occurrence of adenoma in the perianal gland of a Labrador Retriever in study obtained by Das et al. (2014) aligns with the findings in the Labrador Retriever in this study.

Regarding clinical signs, all dogs in this study exhibited pain and swelling in the perianal glands, which are common symptoms associated with various perianal gland disorders, including adenoma and melanoma. According to Bolon et al. (1990), clinical signs such as pain and swelling of the perianal glands are the most frequent indicators in dogs with perianal gland disease, consistent with the findings of this study. These clinical signs highlight the crucial role of clinical examination in the early detection of such pathologies.

Studies by Valenčáková-Agyagosová et al. (2019), Brodzki et al. (2023), and Saharan et al. (2024) indicate that perianal gland disorders are common in older dogs, with a predominant focus on adenomas. In the present study, the simultaneous presence of melanoma and adenoma was observed, representing a rare but serious occurrence that requires early and precise diagnosis to prevent complications such as metastasis or recurrence.

The tumor sizes prior to surgical excision in this study ranged from 3.0 × 3.5 cm to 8.1 × 5.2 cm. These findings are consistent with other studies, such as Scott et al. (2017), who reported that the size of perianal gland tumors in dogs typically ranges from 5 to 10 cm in diameter. Tumor size plays an important role in determining prognosis and surgical approach, as larger tumors often require more radical procedures and are associated with a higher risk of recurrence.

However, some studies, such as Ahn et al. (2019), emphasize that larger tumor diameters are associated with increased invasiveness and metastatic potential, which is also relevant in melanoma management. Unlike adenomas, which are generally less aggressive, melanomas have a higher tendency to metastasize and are more aggressive. This is confirmed by the histopathological findings in this study, where two dogs had invasive forms of melanoma.

The results of this study show that 75% of the dogs had successful postoperative recovery without recurrence, while one dog experienced tumor recurrence. This success rate is consistent with findings from other authors studying surgical treatment of perianal glands in dogs. According to Tozon et al. (2005) and Das et al. (2014), most dogs with perianal gland adenomas recover successfully after radical surgical intervention, but recurrences are more frequent in cases of melanoma (Fonseca-Alves et al., 2021). The findings of this study support this observation, as one dog with simultaneous melanoma and adenoma experienced recurrence six months after surgery. Radical tumor excision in perianal glands has a high success rate according to Hernandez et al. (2018), although recurrences are more common in dogs with malignant conditions such as melanoma (Fonseca-Alves et al., 2021). This underscores the importance of postoperative monitoring and early detection of any signs of disease recurrence, which is also confirmed in this study.

The results of this study indicate that 75% of the dogs achieved complete recovery, while 25% experienced recurrence. This aligns with findings from Singer and Mutch (2006) and Simons et al. (2016), who studied long-term outcomes of perianal tumor treatment in dogs. According to Tozon et al. (2005), the prognosis for dogs with perianal gland adenomas is generally favorable, whereas in dogs with melanoma, prognosis depends on the degree of invasiveness and presence of metastasis (Kim et al., 2005; Smedley et al., 2011).

These findings highlight the importance of early detection, appropriate surgical intervention, and careful postoperative monitoring in cases of simultaneous melanoma and adenoma in the perianal glands of dogs.

CONCLUSION

This study revealed a rare and clinically significant simultaneous occurrence of melanoma and adenoma in the perianal glands of older dogs. Although melanoma and adenoma often occur independently, in these cases they were present concurrently, which may influence diagnostic and therapeutic approaches. Histopathological confirmation of this simultaneous occurrence indicates that these tumors may have had distinct biological characteristics, yet together they affected the clinical course. Therefore, it is important for veterinarians to be aware of the possibility of this simultaneous presence to ensure accurate diagnosis and timely treatment. Furthermore, this study highlights the need for further research to better understand the mechanisms underlying this pathology.

Conflict of interest statement: The authors declare that there is no conflict of interest.

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