

CASE REPORT

Unilateral mixed adenoma of the third eyelid lacrimal gland in a boxer dog

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Abstract

A female boxer dog was presented with a mass expanding the left third eyelid. Histopathology revealed a mass composed of pleomorphic cells arranged in tubuloacinar structures, a fibrovascular myxoid stroma, and intermixed trabeculae of woven bone. The mass was diagnosed as a mixed adenoma of the third eyelid lacrimal gland.

KEYWORDS

adenoma, dog, gland, lacrimal, mixed, nictitans

1 | INTRODUCTION

The primary lacrimal gland and third eyelid lacrimal gland (TELG) of dogs are compound tubuloalveolar, serous glands that produce the aqueous portion of the precocular tear film. Neoplasms affecting the TELG are rarely reported in dogs. Adenocarcinomas are most commonly reported, with adenomas, squamous cell carcinomas, myoepitheliomas, complex tumors, and plasmacytomas also reported.¹⁻⁶

Other tubuloalveolar serous glands in dogs include the salivary glands, apocrine sweat glands, and mammary glands. Mammary gland neoplasms in dogs are common, and both complex and mixed tumors of the mammary gland are well described.^{7,8} Complex neoplasms of glandular tissues possess both epithelial and myoepithelial cell populations. Mixed glandular neoplasms have epithelial and myoepithelial cell populations but also possess mesenchymal stromal elements including cartilage and bone. Mixed TELG tumors are reported in the veterinary literature^{9,10}; however, the histologic features have not been described. To the authors' knowledge, this report represents the first histologic description of a mixed tumor of the lacrimal gland of the third eyelid in a dog.

2 | CASE REPORT

2.1 | Clinical history

A 13-year-old female boxer dog was presented for euthanasia for progressive degenerative orthopedic disease. On presentation, there was a mass expanding the left third eyelid. Also noted were bilaterally symmetric 0.5×0.5 cm hazy crystalline opacities in the dorsotemporal anterior cornea and mild lenticular sclerosis. The owner reported that the third eyelid lesion had been present without progression or regression for an indeterminate number of years. A fundic examination was not performed. No peripheral lymph node enlargement was appreciated, regionally or distantly. The remainder of the physical examination revealed decreased range of motion in the coxofemoral joints bilaterally, medial buttress associated with the right stifle, and moderate to marked atrophy of the muscles of the pelvic limbs consistent with degenerative joint disease. The patient was anesthetized with a tiletamine-zolazepam combination (Telazol®, Zoetis,) and subsequently euthanized with intravenous pentobarbital sodium/phenytoin sodium solution (Euthasol®,

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Virbac,). Permission was granted for excision and histopathology of the third eyelid mass; complete necropsy was offered but declined. The third eyelid was excised post-mortem and stored in 10% buffered neutral formalin.

2.2 | Gross pathology

On gross examination, the palpebral and bulbar third eyelid were expanded by a well circumscribed, firm-to-hard, domed, 2.2×1.6×1.1 cm mass. On cut surface, the mass was mottled tan-white and red-brown and multilobulated with central, opaque white-tan areas (mineralization) (Figure 1). The tissue was decalcified prior to routine histologic processing, and 5 µm sections were stained with hematoxylin and eosin (H&E). Histopathology was performed by a board-certified veterinary anatomic pathologist (KN).

2.3 | Histopathology

Histologically, the mass was partially encapsulated, arising from, expanding, and compressing the TELG (Figure 2). The neoplasm was composed of pleomorphic epithelial

cells arranged predominantly in small islands and variably sized tubuloacinar structures. Neoplastic cells were cuboidal to spindle-shaped with variably distinct cell borders,



FIGURE 2 Gland of the third eyelid is expanded and replaced by lobules of neoplastic cells with trabeculae of bone. HE following decalcification. Subgross

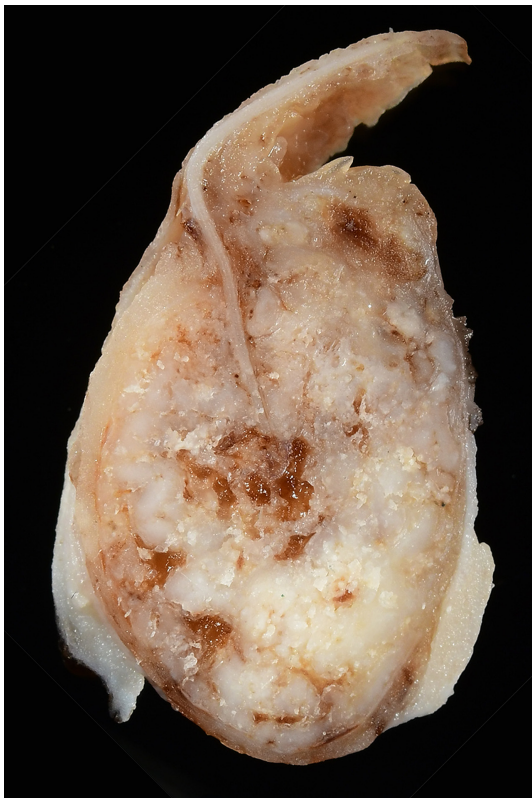


FIGURE 1 Gland of the third eyelid and associated cartilage, bisected. The cut surface shows the third eyelid gland expanded by a tan-to-brown, firm-to-hard mass

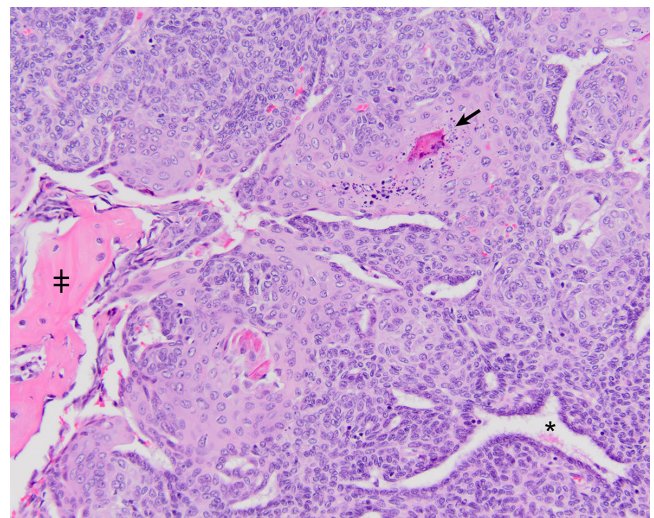


FIGURE 3 Mixed adenoma of the third eyelid lacrimal gland. Glandular structures (*) are lined by low cuboidal cells. There are more solid areas of squamous differentiation with keratohyaline granules and central keratinization (arrow). There are trabeculae of woven bone (†). HE following decalcification. 200x magnification

scant to moderate eosinophilic to amphophilic cytoplasm, round to oval nuclei with stippled chromatin, and single, variably prominent nucleoli. There were 6 mitoses per ten high power fields (400x). There were scattered foci of squamous differentiation with keratohyaline granules and foci of keratinization (Figure 3). Neoplastic cells were supported by a variably dense fibrovascular myxoid stroma with multifocal trabeculae of woven bone lined by osteoblasts. Multifocally, there were regions of necrosis and hemorrhage with acicular clefts. Large numbers of lymphocytes were present within the substantia propria of the conjunctiva. Based on the low mitotic count, the presence of woven bone, and the lack of invasion, the tumor was diagnosed as a mixed adenoma of the TELG.

3 | DISCUSSION

The mixed lacrimal adenoma reported here has histopathologic features similar to those reported in mixed tumors of other tissues, namely salivary, apocrine, and mammary glands. The characteristic stromal elements (cartilage, bone, etc.) are well described in canine mammary tumors, and mixed tumors are the most frequently reported mammary tumors in intact female dogs.^{7,8,11} The histogenesis of the bone in mixed mammary neoplasms is not fully understood, but available evidence suggests that myoepithelial cells are requisite for chondroid and osseous metaplasia.^{12–17} This is likely the case for other mixed tumors as well, including those arising from the TELG.

The majority of primary tumors of the TELG in dogs are reported to be adenocarcinomas with benign adenomas being much less common.^{1,6} Although histologically malignant, metastasis following TELG adenocarcinoma excision in the dog is low with a recent retrospective of 108 cases reporting a 9.3% rate of suspected or confirmed metastasis among the 54 cases for which follow-up information was available.⁶ The retrospective study reported no significant difference in median survival times between dogs diagnosed with TELG adenocarcinoma and those with other tumor types, but metastasis within the adenocarcinoma group was significantly associated with decreased survival time.⁶ These data emphasize the importance of a thorough systemic clinical evaluation prior to surgical excision of the third eyelid. However, even histologically malignant tumors of the TELG—when completely excised, and in the absence of metastases—are unlikely to significantly impact long-term survival.

The majority of canine mixed mammary tumors are benign mixed mammary tumors or carcinomas arising in mixed mammary tumors; however, the less common

carcinosarcomas also possess a mixture of epithelial and mesenchymal stromal elements.^{18,19} Dogs with carcinomas arising in mixed tumors are reported to have lower histologic grades as well as improved survival times relative to other mammary carcinoma subtypes and carcinosarcomas.^{18,19} Salivary gland neoplasms in domestic species are rare, and both pleomorphic adenomas (benign mixed tumors) and malignant mixed tumors of the salivary gland are reported.^{20,21} Clinical outcome data for these salivary tumors are primarily limited to single case reports.^{22–25} Mixed adenomas and carcinomas of apocrine sweat glands in dogs are similarly uncommon with clinical outcome data limited to single case reports.^{26–30}

Given the nature of this case, no follow-up information is available, and a necropsy was declined so neither regional nor distant metastasis can be ruled out. However, because the microscopic features are consistent with the diagnosis of a mixed benign adenoma, the mass was likely an incidental finding unrelated to the presenting clinical signs or cause of euthanasia. Because TELG tumors are uncommon to rare in dogs, data pertaining to biological behavior are minimal. The even lower incidence of mixed tumors of the TELG underscores the need for more information that might provide insight into the biological behavior of these tumors. For third eyelid masses that are firm-to-hard, a mixed TELG tumor should be considered as a differential diagnosis.

AUTHOR CONTRIBUTIONS

Dr. McKeever provided the Introduction and Case Report sections and contributed to the Discussion section of the manuscript. Dr. Newkirk provided histopathology of the lesion and contributed to the Discussion section of the manuscript.

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None.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

CONSENT

Informed written consent for from the patient's owner has been signed and collected in accordance with the journal's patient consent policy.

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