Eyelid Squamous Cell Carcinoma in a Dog

Chang-hyun Song1§, Sae-kwang Ku2§, Hwan-soo Jang3, Eun-young Kye, Sung-ho Yun, Kwang-ho Jang and Young-sam Kwon*

Department of Veterinary Surgery, College of Veterinary Medicine, Kyungpook National University, Daegu 702-701, Korea; 1Departments of Neurology, Emory University School of Medicine, Atlanta 30322, GA, USA; 2Department of Anatomy and Histology, College of Oriental Medicine, Daegu Haany University, Daegu, Korea 712-715, Korea; 3 Plus Animal Hospital, Daegu 702-856, Korea; *Corresponding author: kwon@knu.ac.kr

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ABSTRACT
A 10-year-old, female, Yorkshire Terrier was presented with a left lower eyelid mass. No other abnormality was detected on affected eye in a general eye examination. The mass was surgically removed and histologically diagnosed as a squamous cell carcinoma. The advancement flap used in this case may be an appropriate therapeutic choice for eyelid squamous cell carcinoma in dogs.

INTRODUCTION
Squamous cell carcinoma (SCC) is a neoplastic condition of squamous epithelial cells and usually superficial (Withrow and Vail, 2007; Dreyfus et al., 2011). In general, ocular SCCs affecting any structure of the eye globe and adnexa are less frequent in dogs (Karasawa et al., 2008; Montiani-Ferrira et al., 2008; Pigatto et al., 2010). Most of these tumors are benign and rarely metastasize to distant organs (Withrow and Vail, 2007). Ocular SCC may appear as a focially thickened, roughened, ulcerated or usually pink to red lesion in older animals. Certain tumors can be treated by simple excision and can be properly managed in general practice (Willis and Wilkie, 2001; Conceicao et al., 2010).

The case report presented here describes the clinical and pathological features of a lower eyelid in an Yorkshire terrier. Advancement flap (H-plasty) was performed to further characterize this uncommon neoplastic disorder of the eyelid.

Case History and handling: A 10-year-old, female, Yorkshire Terrier weighing 4 kg was presented to the Kyungpook Veterinary Medical Teaching Hospital with a left lower eyelid mass. This mass incidentally detected 3 months ago and seemed to be growing fast recently. She also had a mass on the right nape of her neck measured approximately 0.5 cm. She was generally in good physical condition. Ophthalmic examination and hematologic test appeared normal except the mass of eyelid. Results of biochemical panel showed mild hypokalemia (3.3 mEq/L; reference range 3.5–5.6 mEq/L). There was no evidence of pulmonary metastasis on thoracic radiography.

On the day of surgery, she was premedicated with atropine (0.04 mg/kg, SC, Dai Han Pharm, Seoul, Korea), induced with propofol (0.7 ml/kg, IV, Dong Kook Pharm, Seoul, Korea) and maintained with isoflurane (Choongwae Pharm, Seoul, Korea). 0.9% normal saline (Choongwae Pharm, Seoul, Korea) was infused intraoperatively at a rate of 5 ml/kg/hr. The excision of the lower eyelid mass was performed by reconstruction of the eyelid margin using an advancement flap. The mass was measured about 0.7 × 0.7 × 0.5-cm when removed. Secondly, lumpectomy of the right nape of her neck was performed after complete removal of the lower eyelid mass. Recovering from surgery, oxygen was supplied. She allowed to be discharged when completely recovered. Postoperatively, she treated at a local veterinary clinic with topical antibiotics and nonsteroidal anti-inflammatory drugs (NSAIDs). The lesions resolved remarkably within 2 weeks after the surgery. During a follow-up through the phone for 6 months, she completely recovered and any recurrence or complication was not observed. The excised both masses were fixed in 10% neutral buffered formalin and stained with hematoxylin and eosin (H&E) for histopathologic evaluation.

RESULTS
Macroscopically, the lesion presents as an elongated nodular mass located in left inferior palpebral site with well circumference by connective tissues, red tined color

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in outside (Fig. 1a & b). In addition, the lesion located in
the right nape presents as yellow tined cyst in outside
firmly attached to the skin (Fig. 1c & d).

Microscopically, the mass in inferior palpebral site
consisted of proliferated tumor cells formed keratin
pearls, one of classic histopathological signs indicated
squamous cell carcinoma. Although mitotic figures were
rarely seen, polymorphic cells, melanocytes, atypical
cells, and various stages of differentiated cells with
inflammatory cell infiltrations were frequently seen (Fig.
2). Therefore, it was diagnosed as squamous cell
carcinoma. In addition, the mass in the right nape
consisted of proliferated various stages of sebaceous gland
cells without mitotic features and neovascularization
(Data not shown). It may be considered as with the typical
steatocystoma, a benign sebaceous gland tumor.

DISCUSSION

Tumors of the eye, orbit, or adnexa can interfere with
an animal’s vision, make them uncomfortable, and can be
potentially life-threatening condition. The more common
ocular tumors in small animals include sebaceous or
meibomian gland adenomas and epitheliomas, papillomas,
and melanoma. Most of these tumors are histologically
benign. Even if the eyelid tumors are histologically
malignant in dogs, the tumors rarely metastasize
(Withrow and Vail, 2007).

Ocular squamous cell carcinoma (SCC), one of the
uncommon tumors in dogs, comprises up to two thirds of
feline eyelid and third-eyelid tumors and has a
predilection for the lower eyelid and medial canthus of
white cats (Willis and Wilkie, 2001; Withrow and Vail,
2007). Ocular SCC in cattle and horse usually affects the
ocular adnexa and conjunctiva, but also involves the
eyelids, limbus, and cornea. In other species, predisposing
site has not been noted (Dugan et al., 1991; Meuten, 2002;
Dreyfus et al., 2011). In approximate order of frequency,
this tumor has been reported in the horse, sheep, dog and
cat (Moulton, 1978). Both in cats and dogs, this tumor is
believed to be caused by increased exposure to solar
radiation, lack of adnexal pigmentation, possibly chronic
ocular surface irritation (microtrauma), viral agents, high
e expression of cyclooxynagenase-1 (COX-1) and COX-2,
and hormonal, genetic and immunologic factors
(Montiani-Ferrira et al., 2008; Pigatto et al., 2010;
Takiyama et al., 2010). There is no breed or sex
predilection in any species (Moulton, 1978). Ocular SCC
involving the cornea or bulbar conjunctiva may invade the
eye and may spread to regional lymph nodes and
metastasize distantly late in the course of the disease, but
this metastases occur rarely. SCC of the eyelid, third
eyelid, or ocular surface may appear as a focally
thickened, roughened, ulcerated or usually pink to red
lesion in older animals (Willis and Wilkie, 2001). In our
case, the tumor of eyelid also showed typical appearance
about the thickened red lesion.

The clinical signs of ocular SCC may include
epiphora, conjunctival vascular injection, mucopurulent
ocular discharge, protrusion of the third eyelid,
junctival/corneal roughening or ulcerarion, and
corneal neovascularization or pigmentation, in addition to
a mass lesion (Withrow and Vail, 2007).

In general, small eyelid and ocular surface tumors are
best diagnosed by excisional biopsy. Certain tumors can
be amenable to simple excision and can be properly
managed in general practice (Conceicao et al., 2010; Takiyama et al., 2010). Furthermore, orbital ultrasound, skull radiographs, computed tomography (CT), magnetic resonance imaging (MR), regional lymph node cytology, and thoracic radiographs are occasionally required to localize or clinically stage potentially malignant tumors such as SCC. Treatment of squamous cell carcinoma often combines surgery with local radiation therapy or chemotherapy (Karasawa et al., 2008). In the case of early SCC, cryosurgery may permit to be used (Withrow and Vail, 2007). In the current case, the dog with lower eyelid squamous cell carcinoma was successfully treated with a lumpectomy using an advancement flap (H-plasty).

Ocular SCCs in general are uncommon diseases in dogs and misdiagnosis may delay treatment and increase morbidity (Willis and Wilkie, 2001). Therefore we believe that the clinical and histological features of the present case may contribute to understanding of the prevention, causes and the future establishment of effective treatments. To the authors’ knowledge, this is the first case report of squamous cell carcinoma of the eyelid in a dog.

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