Ocular Neoplasia
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Squamous Cell Carcinoma
Squamous cell carcinoma is the most common form of ocular neoplasia. It is often locally invasive and occasionally associated with metastasis.1 Unfortunately despite treatment, recurrence is common.2,3 The most common ocular locations are the nictitans (third eyelid), eyelid, and limbus.4,5 Horses with no to light pigmentation or increased ultraviolet light exposure are predisposed to SCC.6,7,8 Some lightly pigmented breeds such as Drafts, Appaloosas, and Haflingers also have an increased risk for squamous cell carcinoma.1,3,9

Ocular squamous cell carcinoma can be associated with ocular discharge and blepharospasm. Recurrence and local invasion of the periocular soft tissue, bony orbit, sinuses, and lymph nodes are issues reported in the literature.1,9,10 Lesions located on the eyelids and nictitans are more likely to be associated with metastasis than lesions on the limbus and cornea.4,11,12 It has been suggested that this is due to the presence of lymphatics and their ability to spread neoplastic cells.13

In horses, the nictitans does not seem to play a crucial role in tear film production and has been removed without the consequence of reducing the aqueous portion of the tear film as seen in the canine.14,15 A case series looking at extraocular lymphoma showed that surgical excision was associated with a better outcome than cases in which excision was not performed.11 It has been suggested that treatment of ocular squamous cell carcinoma is most successful when surgical excision is combined with adjunctive therapy.2,5,14,15

In cases of ocular squamous cell carcinoma, radiation therapy combined with surgery reduced the rate of recurrence (13.3%) when compared with surgery alone (40%).16 Mitomycin C was used as a sole treatment for SCC of the third eyelid and resulted in resolution in 6/6 horses.16 Additional adjunctive therapies reported in the literature include: cryotherapy, radiation, immunotherapy, photodynamic therapy, and chemotherapy.1,3,15 Recurrence of neoplasia significantly reduces survival so it is very important that appropriate treatment be performed as early as possible.3,11,17

Photodynamic therapy for eyelid squamous cell carcinoma has been reported in the literature with success. This technique requires a photosensitizing agent, light source, and oxygen.18 It is theorized that the photodynamic agent localizes in the tumor due to the drug’s affinity for tumor associated macrophages and it tends to stay in the tumor due to a lack of lymphatics. Tumor cells become necrotic and are phagocytized and carried to the lymph nodes. At the lymph nodes the T-cells generate immune memory cells that aid in prevention of recurrence.19,20 With this procedure major reconstruction of the eyelid can be avoided, however, general anesthesia is required and the photosensitizing agent is expensive. The photosensitizing agent that is currently in use is called Visudyne (verteporfin). When used in 10 horses there was no recurrence over an average follow up time of 25 months. The control population treated with surgical excision and cryotherapy had recurrence in 11/14 cases during the same period.21

Delayed removal of ocular squamous cell carcinoma can allow bone or lymph node involvement that can result in recurrence or growth of new tumor. The recurrence rate of third eyelid SCC varies in the literature from 0-40%.3,5,14,17,22 In a study by
Schnoke et al. the recurrence rate for lymphosarcoma of the third eyelid was 57% following treatment. Spread into the nearby bone or lymph nodes is a greater concern when dealing with eyelid or third eyelid squamous cell carcinoma. There are no current reports of spread of limbal squamous cell carcinoma into these tissues, however, this location can progress and cover the bulbar conjunctiva and cornea and necessitate eye removal.

**Sarcoid**
Sarcoid is the second most common equine ocular tumor. It is categorized as a benign tumor of fibrous tissue and has a high rate of recurrence. Association with bovine papillomavirus has been suggested. There are six recognized forms of sarcoids: occult, verrucose, nodular, fibroblastic, mixed, and malignant. Diagnosis is based on characteristic appearance and biopsy results. Treatment should be started soon after the biopsy is performed because trauma to the tumor can result in conversion to an aggressive form.

Treatment options include surgical excision, cryotherapy, chemotherapy, brachytherapy, topical antivirals, topical herbal preparations, and an autologous vaccine. In the periorbital area complete surgical excision can be very difficult without devastating consequences for the globe. In one study surgical excision alone resulted in recurrence in 82% of horses. Use of an autologous sarcoid vaccine with success was recently reported. It describes using liquid nitrogen to freeze pieces of sarcoid prior to implantation in the neck. In this study there was decrease in size of the sarcoids in 94% of cases and clinical regression in 69% of cases.

**Lymphoma/Lymphosarcoma**
Lymphoma is considered the leading cause of neoplasia related death in the horse. Periocular lymphosarcoma is often considered an initial sign of multisystemic disease. Periocular locations affected by lymphoma include the conjunctiva, third eyelid, eyelid, limbus, orbit, and intraocular tissues. In a review of 79 horses with lymphosarcoma, 21 horses had ocular involvement. Twenty of the horses died or were euthanized within 6 months of the diagnosis. The most common lesions were infiltration of the palpebral conjunctiva and eyelids. Diagnosis was confirmed by biopsy or necropsy in all cases. The ocular lesions were commonly noticed by owners prior to lymph node enlargement.

Surgical resection of the lesion resulted in an improved outcome. Poor prognostic indicators were diffuse lesions (versus nodular) or cutaneous involvement.

**Hemangioma/Hemangiosarcoma**
Hemangiosarcoma is a malignant neoplasm of vascular endothelial origin. Ocular and periorbital locations reported in the literature include the third eyelid, limbus, eyelid, conjunctiva, and orbit. The most common location for this tumor appears to be the third eyelid (4/8 cases reported). In general a diagnosis of ocular/periocular hemangiosarcoma is a poor prognostic indicator with 6/8 horses reported in the literature being euthanized due to their disease. This is in contrast to the reports in the small animal literature where euthanasia due to disease was not reported. In one surviving horse, serous ocular
discharge was noted during a routine appointment. On further investigation a small third eyelid mass was seen and the third eyelid was excised with no signs of recurrence at 2 years follow-up. The second surviving horse had an exenteration performed. Anecdotally the author feels like with complete surgical excision, treatment of these lesions can be successful.

References