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Clinical Techniques in
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Equine Eyelid Disease

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The most common eyelid disorders of horses include traumatic insults, anatomic malalignment problems, inflammatory lesions, and neoplasms. These eyelid conditions are discussed in this article with particular attention paid to practical diagnostic and therapeutic options. Surgical treatment for eyelid lacerations, entropion, ectropion, and temporary tarsorrhaphies are described. Causes and treatments for blepharitis and neoplastic diseases, especially sarcoids, are included.

KEYWORDS **eyelid, laceration, entropion, blepharitis, habronemiasis, sarcoid**

The equine eyelid consists of four major layers: the outermost typical haired skin, muscle, tarsal plate and stroma, and the innermost palpebral conjunctiva. The dorsal and ventral folds of skin of each lid are continuous with the facial skin. Underlying subcutaneous tissue is irregular and devoid of fat and blends with the striated orbicularis oculi muscle deep to it. The tarsal plate is an area of dense connective tissue which lends rigidity to the eyelid margins. A number of glandular structures within the tarsus and at the eyelid margin, including the meibomian glands and the glands of Zeis and Moll, contribute to the preocular tear film or function to lubricate the edges of the lids. Stiff tactile vibrissae are present along the base of the lower eyelid and at the base of the upper eyelid medially. The free edges of the dorsal and ventral lids meet to form the palpebral fissure which should fit close to the globe except at the medial canthus, where the lacrimal caruncle protrudes. The eyelids function to protect and exclude light from the eyes, spread the tear film over and remove foreign material from the anterior surface of the globe, contribute to the production of the tear film, and facilitate its drainage through the nasolacrimal apparatus. Evaluation of the eyelids should include examination of the cutaneous, marginal, and conjunctival surfaces of both the upper and lower lids of the patient.

Before any sort of sedation, regional nerve blocks, or topical anesthesia, it is important to perform a preliminary examination of the eyelids of the equine patient, paying particular attention to eyelid function, conformation, and neurologic reflexes. Acquiring a detailed history of duration, changes in appearance, previous therapies, and responses is also crucial as these can guide your diagnostic and treatment plans, as well as your prognosis. The lids should hug the globe snuggly while being freely mobile, and should be capable of performing a complete blink action covering the entire cornea. The shape, position, and condition of the eyelid margins, the relative size of the palpebral fissure compared with the globe, the symmetry of the two eyes, and the effectiveness and frequency of the blink response are important to assess.[1] The position of the eyelids may be assessed by considering the angle of the cilia (eyelashes) in relation to the globe. The eyelashes are normally positioned almost perpendicular to the corneal surface. Cilia which are directed even subtly downward may indicate lid disease or deformity or that the patient is experiencing ocular pain or discomfort.

The neurologic reflexes of the eyelids to evaluate include the menace response, which tests the visual response to a stimulus and the eyelids' ability to respond with movement (cranial nerves 2 and 7), and the palpebral and corneal reflexes (cranial nerves 5 and 7). If the menace response is negative, the next step is to assess the palpebral reflex by touching the eyelids or their tactile vibrissae. The afferent pathway of the palpebral reflex provides sensory information that elicits the blink motor response. In other words, this reflex helps assess whether the eyelids are capable of movement or blinking in response to the visual or sensory stimulus.[1] The corneal reflex evaluates the sensitivity of the cornea rather than that of the eyelid skin and is performed by slightly touching the cornea with a wisp of cotton. A positive response is a blink.

Trauma

Traumatic Eyelid Lacerations

The horse often exhibits quick movements of the head in response to fear or play situations, with trauma to the eyelids often a sequela. Any sort of eyelid trauma necessitates a full ophthalmic examination because of the potential for additional damage to the globe or orbit. Corneal ulcerations,

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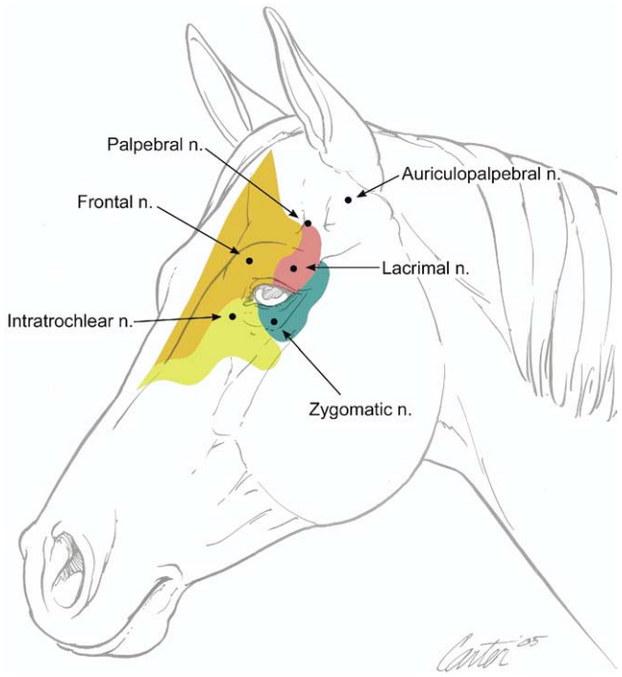

Figure 1 Sensory innervation of the eyelids of the horse. These regions will be temporarily desensitized by blocking the specific nerves as described in the text. A block between the auriculopalpebral and palpebral nerves will facilitate examination and repair procedures by temporarily limiting motor function of the lids.

globe perforation, uveitis, periorbital fractures, and orbital cellulitis or abscessation can accompany eyelid trauma. Lacerations of the eyelids should be repaired promptly to prevent lid deformities, infections, and exposure-induced damage to the cornea.[2] Depending on the extent of the lid injury, surgery to repair an eyelid laceration may be performed with sedation and local anesthesia alone, or for severe lesions with the animal under general anesthesia.[2,3] Akinesia and anesthesia of the eyelids can be achieved by injecting 2% lidocaine regionally to affect either motor or sensory innervation of the eyelids (Fig. 1). An auriculopalpebral motor nerve block will limit the movement of the lids (specifically the function of the orbicularis oculi muscle), and is performed by injecting 1 to 2 mL 1% lidocaine through a 25-gauge, 5/8-inch needle where the auriculopalpebral branch of the facial nerve is palpable as it crosses over the dorsal aspect of the zygomatic arch.[1,4,5] There are several different sensory blocks that may be employed depending on the location of the eyelid lesion to be addressed. The central two-thirds of the upper eyelid is innervated by the frontal or supraorbital nerve, and is blocked by injecting 2 mL of 2% lidocaine into the supraorbital foramen. This foramen can be identified as a small depression in the supraorbital process of the frontal bone, medial to its most narrow aspect.[1,4,5] The lateral upper eyelid and lateral canthus are innervated by the lacrimal nerve, and can be blocked with a line block along the lateral third of the dorsal orbital rim.[1,4,5] A block of the zygomatic nerve will anesthetize the lateral lower lid and is achieved with a line block along the ventrolateral orbital rim.[1,4,5] The medial canthal region is innervated by the infratrochlear nerve and is desensitized by injecting anesthetic through the bony notch on the dorsal rim of the orbit near the medial canthus.[1,4,5]

Eyelid Laceration Repair

It is wise to consider culturing a traumatic eyelid wound of any long-standing duration before cleaning and suturing the defect. Thorough flushing of the affected area with saline and a dilute povidine/iodine (2%) solution followed by minimal debridement of any wound margins or lid pedicles should be performed. The eyelids have a rich vascular supply and generally do not require removal of tissue of questionable viability. Even desiccated, avulsed eyelids are capable of recanalization by blood vessels following a repair.[2] For this reason and because of the concern for exposure keratitis, it is imperative that eyelid tissue tags and pedicles not be amputated, and instead replaced to as normal an anatomical position as possible (Fig. 2).

1. It is crucial to accurately appose the lid margin, and this should be the first step taken in the repair.[2] A figure-eight suture is placed on the eyelid margin that allows for knot placement away from the globe (Fig. 3).
2. The remainder of the defect is closed in two layers: a deep layer in the palpebral conjunctiva with 4-0 to 6-0

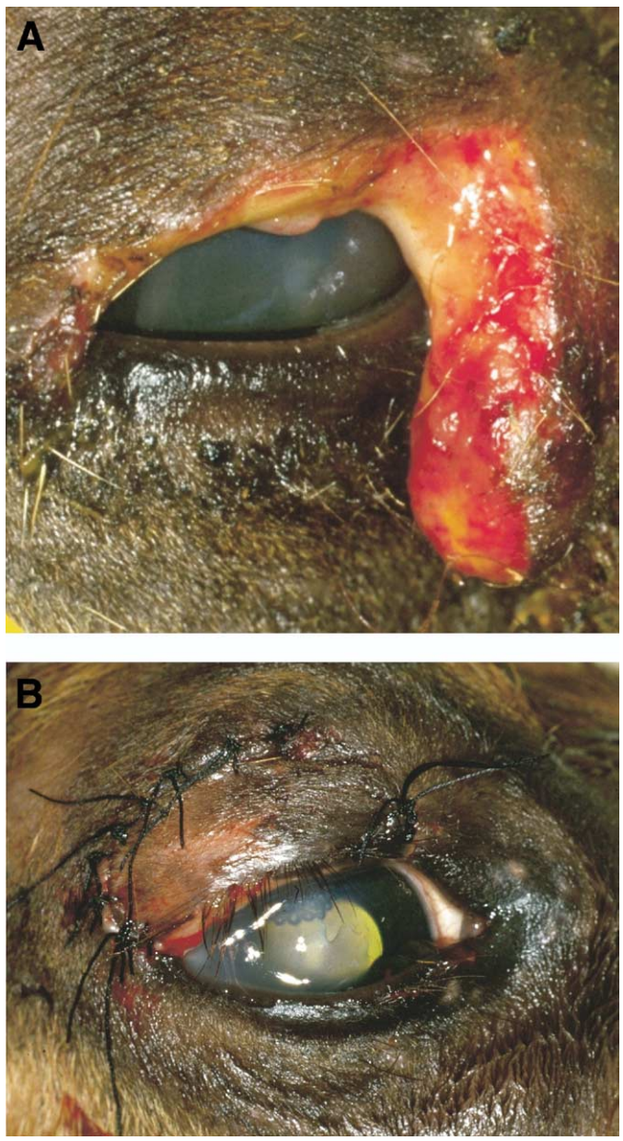

Figure 2 Upper eyelid laceration before repair (A) and after (B).