



Canaliculostomy as a treatment for obstructed nasolacrimal duct in 7 horses

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Obstruction of the nasolacrimal duct (NLD) of the horse is usually caused by debris that can be cleared by lavage, but a duct can be permanently obstructed because of atresia or if it is disrupted by injury. The nasolacrimal system is composed of lacrimal glands and a ductal system that drains lacrimal secretions into the nasal vestibule. Lacrimal secretions enter the dorsal and ventral lacrimal punctae, travel through the dorsal and ventral canaliculi, which converge at the lacrimal sac, and then travel through the NLD to the duct's terminus in the nasal vestibule.

One or both NLDs can be occluded anywhere along their length. Surgical techniques to restore passage of lacrimal secretions often fail because the site of obstruction is inaccessible for creating a new stoma. This study describes canaliculostomy to treat horses for obstruction of the NLD.

Seven horses were presented for treatment for chronic epiphora caused by obstruction of one or both NLDs. The cause of obstruction was disruption of the duct from trauma (4 horses) or atresia of a portion of the NLD (3 horses). Four horses had unilateral obstruction, and 3 had bilateral obstruction. Catheterization and lavage of the NLD through a lacrimal punctum and the nasolacrimal orifice was attempted unsuccessfully in all horses. The horses were medicated with acepromazine (5 horses), flunixin meglumine (7 horses), benzylpenicillin sodium (5 horses) and enrofloxacin (1 horse). One horse received no antimicrobial treatment before or after surgery.

Six horses were sedated with a bolus of detomidine HCl (IV) and butorphanol tartrate (IV), and for 5 horses, sedation was maintained by constant-rate infusion of a mixture of detomidine and butorphanol in isotonic saline solution. The cornea of the affected eye was desensitized by topical application of local anesthetic solution. The medial aspect of the eyelids of 5 horses was desensitized by anaesthetizing the supraorbital and infratrochlear nerves. For one horse, the only regional anesthesia administered was the auriculopalpebral nerve block. One horse was sedated with xylazine (IV) and anaesthetized with ketamine (IV) and diazepam (IV). Anesthesia was maintained with isoflurane and oxygen administered through an endotracheal tube.

The ventral lacrimal punctum and canaliculus were expanded with catheters of increasing diameter until a 14-ga, Jamshedi needle could be introduced into the canaliculus. The needle was advanced into the lacrimal sac, and the sac and bone surrounding it were penetrated by the needle causing the needle to enter the sinuses. Two-mm or 2.7-mm diameter tubing was inserted into the needle and advanced into the sinus. The needle was removed from the canaliculus leaving a portion of the tubing within the sinuses.

A 14-ga, hubless needle was inserted through the mucocutaneous junction of the eyelid 3 mm lateral to the ventral lacrimal punctum and directed ventrally until its point emerged through skin rostral to the lower eyelid. The end of the tubing was inserted into the lumen of the needle, and the needle and tubing were pulled through the eyelid. The tubing was transected leaving 2-cm of tubing exposed.

Because the catheter backed out of the canaliculus of the first and third horses, an additional step was performed in the repeated surgery of the third horse and subsequent four horses to ensure that the catheter remained in situ. The sinuses were exposed through a trephine hole created in the frontal bone, and the end of the tubing within the sinuses was exteriorized. The hubless needle was inserted at the cutaneous incision created to expose the frontal bone and advanced subcutaneously until its point emerged rostromedial to the incision. The end of the tubing was inserted into the lumen of the needle, and the needle and tubing were pulled through the skin. The tubing was transected leaving 2-cm of tubing exposed. The incision created to expose bone for trephination was closed, and the ends of the tubing were anchored to the skin. All horses were administered phenylbutazone for 7 days, and 6 horses were administered procaine penicillin for 3 days. An antimicrobial ointment was applied 2 or 3 times daily to the cornea of the affected eye(s) of 6 horses for 2 weeks. Staples or sutures were removed at 2 weeks, and tubing was removed at 5 to 6 weeks.

Canaliculostomy performed with the horse sedated was tolerated well by all horses. Follow-up information collected at 6 months to 11 years after surgery indicated that for 5 horses, epiphora had resolved completely, and for 2 horses, epiphora had markedly reduced.

When lavage of an obstructed NLD fails to restore patency to the duct, diverting lacrimal secretions into the sinuses by canaliculostomy should be considered. Canaliculostomy can be performed with the horse sedated. To resolve the complication of the tubing backing out of the sinuses and canaliculus, a trephine hole can be created into the sinuses to provide a means of anchoring the tubing.