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Modified Needle Aspiration Technique for Extracting Live Eye Worm in a Thoroughbred Horse

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Abstract: A 2 years old female Thoroughbred horse was presented with an ocular disorder. In initial eye examination, the left eye was diagnosed with severe uveitis including hypopyon. Additionally, a live parasite about 3 cm in length was clearly seen wriggling in the left eye. A modified needle aspiration technique was performed to extract the live eye worm from the anterior chamber of the eye. The patient was recovered without any post-operative complications within 1 month. This modified needle aspiration technique could be an effective procedure for eliminating eye worms in horses.

Key words: Eye worm, needle aspiration technique, extraction, horse, post-operative

INTRODUCTION

There are various parasites that cause ocular disorders with or without other systemic conditions (Kumar *et al*., 2004). Eye worms in horses appear to be either *Thelazia nematodes* or *Setaria* species. No matter what species are the causative agent, eye infections may occur when the adult worm meanders into the intraocular structures, thus it was called eye worm (Barua *et al*., 2005). The eye worm exists in the immature and mature stages in the anterior chamber of the eye and it will be exposed to the external environment (Soraya, 2011). The lashing movement of the worm may cause trauma and inflammation of the intraocular structures leading to severe uveitis, cataracts and retinal detachment (Deepak *et al*., 2011). Operative removal of a live motile worm has been performed using various techniques including a superior-temporal limbal stab incision (Barua *et al*., 2005), en bloc elimination with intraocular forceps (Chen *et al*., 2010) and paracentesis in the superiotemporal quadrant of the eye. In this study, a modified needle aspiration technique was described for extracting a live eye worm from the anterior chamber of the eye in a horse.

MATERIALS AND METHODS

A 2 years old female Thoroughbred horse was presented with an ocular disorder. While the right eye was normal, the left eye was confirmed with severe corneal edema and eyelid swelling that completely covered the orbit (Fig. 1). The horse had a white, opaque cornea and

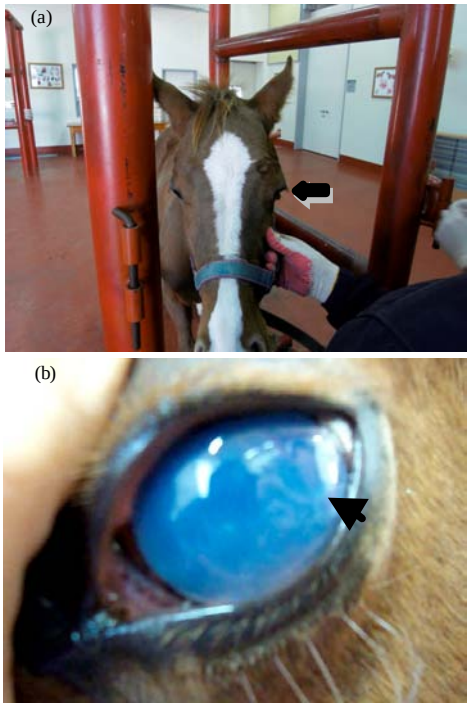

Fig. 1: a) Lesion in left eye of a Thoroughbred horse and b) the arrow indicates an eye worm in the anterior chamber of the left eye

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Fig. 2: a) Induction of local anesthesia targeting the auriculopalpebral nerve and b) supraorbital nerve prior to eye examination for definitive diagnosis

severe miosis. Before further diagnostic examination using an ophthalmoscope, local anesthesia was induced with lidocaine HCl (Huons, Korea) to block the auriculopalpebral nerve and supraorbital nerve (Fig. 2). The anterior chamber of the left eye was found to be filled with various types of abnormal contents leading to uveitis including hypopyon. Additionally, a live parasite about 3 cm in length was clearly seen wriggling in the left eye. Systemic examination including a complete blood count and blood chemistry did not reveal any abnormalities.

To eliminate the eye worm within the left eye, general anesthesia was performed with an intravenous injection of detomidine hydrochloride (0.02 mg kg^{-1}) ketamine hyodrochloride (2.2 mg kg^{-1}) and xylazine hydrochloride (1.1 mg kg^{-1}). After the left eye was prepared aseptically (Fig. 3) the upper and lower eyelids were carefully kept open with an eye speculum so as not to injure other eye structures such as conjunctiva, cornea, eyelids and iris. A small puncture was made in the sclera with a 21G needle attached to a syringe that was continually inserted through the conjunctiva into the anterior chamber (Fig. 4). The end of the needle was carefully oriented toward the eye worm and the parasite was aspirated into the syringe

Fig. 3: Preparation for needle aspiration to remove the eye worm. Arrow indicates the eye worm in the anterior chamber

Fig. 4: A small puncture was made in the sclera with a needle that was continually inserted through the limbus into the anterior chamber

along with the aqueous humor. This operation was performed very carefully to avoid damaging any other structures within the eye. After the operation, oxytetracycline and polymycine B sulfate (terramycin ophthalmic ointment, Pfizer, Indonesia) was applied.

RESULTS AND DISCUSSION

For 4 days after the operation, Balanced Salt Solution (BSS) was irrigated within the eye and flunixine meglumine (SP Intervet, France) and atropine sulfate (Jeil, Korea)were injected into the subconjuctiva (Fig. 5). Tobramycine (tobrex eye drops, SA Alcon-Couvreur, Belgium) were also applied 3 times per day. On days 5-7 after the operation, BSS was irrigated within the eye. Flunixine meglumine and gentamicine sulfate (Daesung, Korea) were systemically administered. The 8 days after the operation, BSS was also used to irrigate the eye and tobramycine (tobrex eye drops, SA Alcon-Couvreur, Belgium) was applied 3 times per day.

Fig. 5: Subconjuctival injection of flunixine meglumine and atropine sulfate for post-operative management

Prognosis after the operation to eliminate the eye worm was good. In particular, corneal edema and hypopyon was dramatically reduced 5 days after the operation (Fig. 6). Over time, intraocular inflammation was gradually relieved and pupillary light reflex was showed positive.

Eye worm infections is known to be the causes significant economic losses to the equine industry in parts of Europe, Asia and Africa where about a dozen species of *Thelazia nematodes* and Setaria worms inhabit the eyes of horses (Weinmann *et al*., 1974). Various clinical signs are associated with eye worm infection including excessive tearing, photophobia, epiphora, keratitis, conjunctivitis, corneal opacity, extensive endophthalmitis, occasional severe dysfunction and even blindness of the affected eyes (Weinmann *et al*., 1974; Fitzsimmons, 1963; Lyons *et al*., 1975). Occasionally, the anterior chamber is invaded. Therefore, surgical approaches for removing eye worms are important for relieving the symptoms of infection. There have been several studies of eliminating eye worms in the anterior chamber of the eye (Barua *et al*., 2005; Kumar *et al*., 2004; Osuntokun and Olurin, 1975; Stewart, 1940) and the area for proper needle positioning to remove the parasite by aspiration has been generally accessed vertically through the top of the affected eyeball. However, this approach was likely to inflict enough damage to the eyeball to induce blindness. Therefore in this study, researchers made a small puncture at the 12 o'clock position through the conjunctiva to access the anterior chamber region where the eye worm resided with a needle. In attempting to do so, the parasite was washed out of the anterior chamber with BSS. In this study, researchers inserted the needle obliquely with a different position. Recovery from the procedure was rapid in comparison to that reported in other studies (Barua *et al*., 2005; Kumar *et al*., 2004).

Fig. 6: a) Comparison of the pre-operation condition and b) post-operative results 5 days after surgical treatment

Therefore, the modified needle aspiration technique performed could be utilized by equine practitioners to improve eye worm elimination.

CONCLUSION

In this study, a modified needle aspiration technique was performed to extract the live eye worm from the anterior chamber of the eye. This modified needle aspiration technique could be an effective procedure for eliminating eye worms in horses.

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