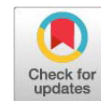


Case Report



Surgical Management of Eye Worm in a Horse: A Case Report

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Abstract | A six-year-old mare was brought to the Upazila Veterinary Hospital, Narail District, Bangladesh, with primary complaints of severe lacrimation, corneal opacity, and the sensation of a moving object inside the right eyeball for seven days. Upon ophthalmic examination, a watery thread-like worm moving in swirling motion in the aqueous humour of the anterior chamber of the eye was evident. Surgery was performed to remove the eye worm from the horse. A gradual reduction in lacrimation and corneal opacity was noted, with the return of vision within 30 days. The vision was evaluated by assessing the animal's reaction to visual stimuli and the pupillary light reflex. Additionally, no shrinkage of the eyeball was noted. Morphologically, the collected worm was identified as *Setaria* sp. Therefore, this case was diagnosed as ocular setariosis.

Keywords | Equine ocular setariosis, Eyeworm, Surgical management, Horse, Narail, Bangladesh

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INTRODUCTION

Equine setariosis is a common ocular parasitic disease that impairs vision in equines, mainly resulting from an ectopic infestation of *Setaria digitata*, *S. equina*, and *S. marshalli* (Buchoo *et al.*, 2005). *Setaria* is a nematode in the order Spirurida and the family Setariidae. Adult worms freely inhabit the abdominal cavity of the definitive host, the horse and donkey. These parasites also show migratory behaviour into various organs such as the heart, lungs, spleen, kidney, uterus, oviduct, ovary, urinary bladder, and occasionally they can get into the central nervous system or the eyes in a deviant host, particularly in horses, sheep, and goat (Perumal *et al.*, 2016). The main form of migration in infected horses is ocular migration (Radwan *et al.*, 2016). In the Indian subcontinent, setariosis is most common in the summer and fall when mosquito vectors,

primarily *Anopheles peditaneniatus* and *Culex nilgircus*, are most prevalent (Kumar *et al.*, 2011). Adult female worms shed microfilariae in the abdominal cavity of their hosts circulate in the blood, causing "microfilariosis" in cattle and buffaloes (Lumain *et al.*, 2021). When mosquitoes feed on the blood of infected hosts, they become infected with microfilariae. The infected mosquitoes transmit these infective larvae to other susceptible hosts during the blood meal around the eyes, and the deposited infective larvae migrate into the anterior chamber of the eye (Rafee and Amarpal, 2016). The infected animal with ocular setariosis shows symptoms of constant lacrimation, photophobia, corneal opacity, conjunctivitis, retinal detachment, and reduced performance, which may even lead to blindness if the treatment is delayed (Verma *et al.*, 2019). Although involvement of the eye is often unilateral, bilateral occurrences have sometimes been documented too (Shin

et al., 2002). The most effective treatment for ocular setariosis is the surgical removal of the parasite (Tuntivanich *et al.*, 2011). Hence, the objective of this report was the successful surgical removal of the *Setaria* sp. from the eye of the mare.

CASE HISTORY AND CLINICAL OBSERVATION

A six-year-old mare weighing 250 kg was referred to the Upazila Veterinary Hospital, Narail District, Bangladesh, with continuous ocular discharge, photophobia, poor vision, and corneal opacity. The owner reported that the mare used to rub the right eye against the surrounding wall with no previous deworming history for a year. The temperature, pulse, and respiration rates of the mare were normal, but there was a gradual decrease in appetite. Clinical observation of the eye revealed a watery, thread-like worm of about 2 cm in length moving in a swirling motion in aqueous humour (Figure 1A). The *Setaria* sp. was identified based on morphological characteristics, including the ventral projection, dorsal projection, and lateral lips at the anterior end (Figure 1D), and a smooth knob at the posterior end (Figure 1E). Therefore, the condition was diagnosed as ocular setariosis due to the detection of *Setaria* sp. inside the anterior chamber of the eye of the mare. The mare was handled following the ethics and guidelines of the Upazila Veterinary Hospital.

TREATMENT AND DISCUSSION

At first, the mare was properly restrained, and then the supraorbital and auriculopalpebral nerves were blocked by administering 2% Lignocaine hydrochloride @ 10 ml, (G-Lidocaine®, Gonoshasthaya, Bangladesh) to the standing horse. After trimming the eyelashes of the affected eye, an antiseptic solution was applied around the eye, and the eyelid was retracted. The worm was expelled using a clear corneal stab with a scalpel with blade no. 11 at the 6 O'clock position. Then, the worm was flushed out along with the outflow of the aqueous humour (Figure 1B). After washing the collected sample with normal saline, the detailed morphological characteristics were examined under a light microscope, using lactophenol (Figure 1D and E). Following surgery, systemic antibiotic, Ceftriaxone @ 10mg/kg bwt (Triject Vet®, SK+F, Bangladesh), NSAID, Flunixin meglumine @ 1.1 mg/kg bwt (Meglunix Vet®, Popular, Bangladesh), and antihistamine, Promethazine hydrochloride @ 1 mg/kg bwt (Dellergen Vet®, Renata, Bangladesh), were administered intramuscularly (IM) for five days. Moreover, eye drop, a combination of Ciprofloxacin and dexamethasone (Civodex®, Popular, Bangladesh) was applied intraocularly 3-4 drops thrice a day till recovery. Additionally, Fenbendazole @ 5 mg/kg bwt (Fenazol®, Acme, Bangladesh) was administered for deworming after 7 days of surgery. Gradually, the corneal

opacity disappeared, and the vision was restored within 30 days of surgery (Figure 1C). The vision restoration was assessed by animal's reaction to the visual stimuli and the pupillary light reflex (PLR).

Adult worms of *Setaria* sp. are typically found in the peritoneal cavity of cattle and buffaloes. Heterotrophic parasitism of adult *Setaria* sp. worms from the peritoneum to the aqueous humor of affected animals causes injury to the cornea, leading to corneal opacity. Similar adverse effects of ocular setariosis in equines have been documented by Gangwar *et al.* (2008). Delayed treatment of ocular setariosis may lead to blindness (Buchoo *et al.*, 2005). Despite both medical (Muhammad and Saqib, 2007) and surgical intervention (Buchoo *et al.*, 2005) having been preferred for equine ocular setariosis. However, the best treatment is surgical removal of the eyeworm from the horse (Patil *et al.*, 2016; Tuntivanich *et al.*, 2011). Surgical intervention has a higher potential for rapid and effective treatment, which can be performed under general anesthesia or regional nerve blocks with or without sedation (Patil *et al.*, 2012). Medical treatment has been less effective due to the slow absorption of dead parasites and the resultant antigenicity, leading to uveitis (Lavach, 1990). It took at least 15 days for the worm in the eye to die off following the administration of ivermectin (Muhammad and Saqib, 2007). Several case reports are available on different surgical techniques for worm removal, either by aspiration or incision. In this study, we have successfully performed corneal incision techniques using a corneal stab with a scalpel with blade no. 11 at the 6 o'clock position, which differs from a few of the previous studies (Kalpravidh *et al.*, 1992), in which a stab incision was done at the 10-2 O'clock position of the eyeball.

CONCLUSION

Equine ocular setariosis is a condition that impairs vision in horses. Prompt diagnosis and treatment are key to a favourable outcome. Corneal incision technique using a corneal stab with a scalpel with blade no. 11 at the 6 O'clock position was proven to be an effective intervention for the removal of eyeworm from the mare. The removed worm was diagnosed as *Setaria* sp. Gradually, the corneal opacity disappeared following the surgery, and the vision was restored within 30 days of surgery.

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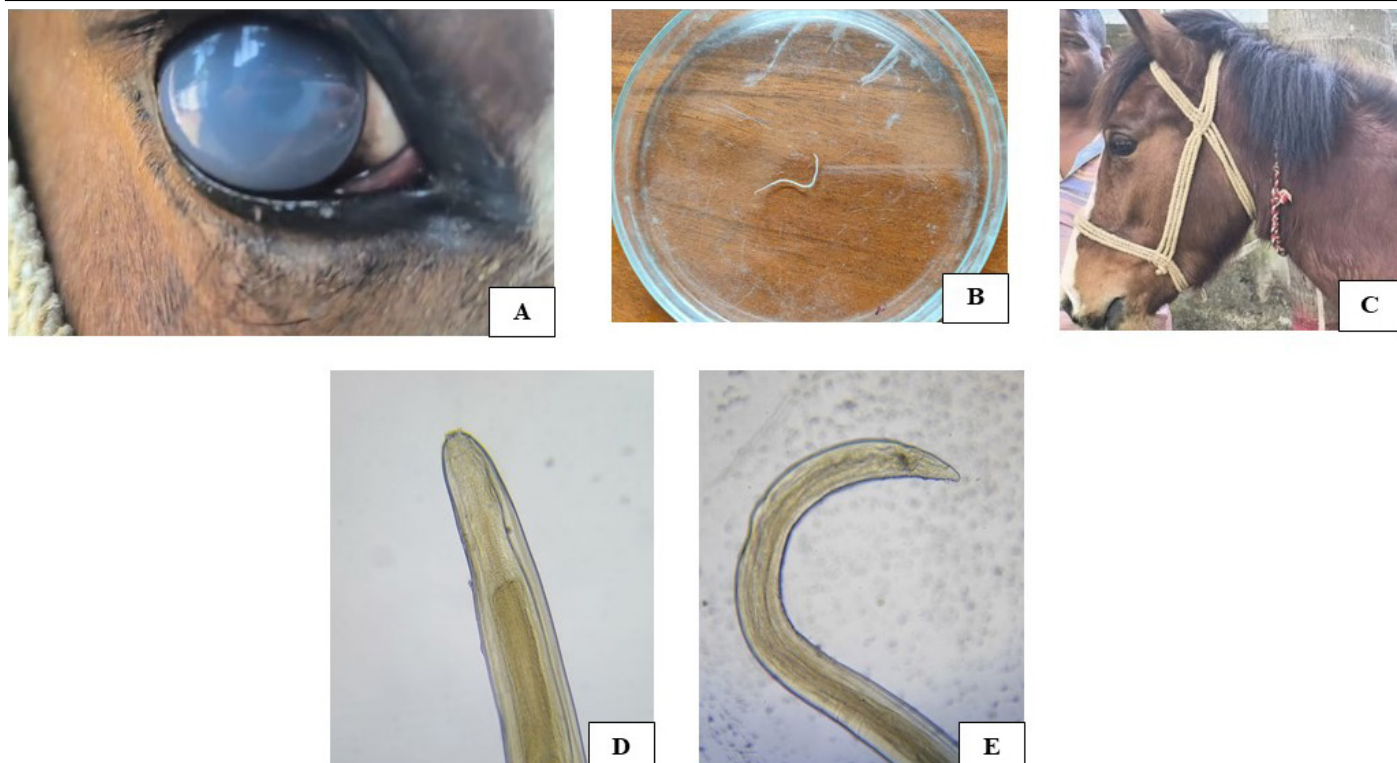


Figure 1: A: Infected eyeball of a horse, B: Removed *Setaria* sp., C: Recoverd eyeball after surgery, D and E: Observed morphology of *Setaria* sp., under microscope.

NOVELTY STATEMENT

This study highlighted the surgical removal of setariosis from the eyeball of a horse.

AUTHOR'S CONTRIBUTION

Al Wasef performed surgery, wrote the manuscript, and edited the manuscript. Md. Torikul Islam performed surgery and treated the mare. Vijay Kumar Sah and Nitol Chandra Das wrote the manuscript. Uday Kumar Mohanta supervised, reviewed the manuscript.

All authors checked and confirmed the last edition of the submitted manuscript.

GENERATIVE AI AND AI-ASSISTED TECHNOLOGY STATEMENT

The authors declare that no generative AI or AI-assisted technologies were used in the preparation of this manuscript.

CONFLICT OF INTEREST

The authors have declared no conflict of interest.

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