

## Case Report



# Habronemiasis (Equine Summer Sore) in an 8-year-old Arab Horse

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### ABSTRACT

**Introduction:** Habronemiasis, equine summer sore, is caused by *habronema* larvae, commonly in tropical and subtropical climates. House flies, face flies, and stable flies transmit the pathogenic nematode larvae. Cutaneous habronemiasis is the most common form of habronemiasis in horses. Cutaneous habronemiasis is associated with the deposition of larvae in areas where they cannot complete their life cycle. Deposition of larvae is related to local hypersensitivity. *Habronema* larvae could cause preocular infectious resulting in conjunctivitis, blepharitis, or dermatitis.

**Case report:** An eight-year-old male Arabian horse was referred to the Large Animal Medicine Unit, Veterinary Clinical hospital, Shiraz University, Shiraz, Iran, with a history of wounds on the preocular region and hind limbs. The right eye's ocular examination revealed abundant mucopurulent discharge, blepharospasm, and chemosis. The granulomatous tumor had a diameter of 1.8 cm and was evident on the palpebral conjunctiva of the medial canthus. The skin lesion was identified as habronemiasis based on the history, clinical symptoms. Treatment includes prednisolone tab with reducing dosage for 30 days, an oral dose of Ivermectin, topical oxytetracycline ointment for five days, chloramphenicol and triamcinolone eye drop for three days. The diagnosis was confirmed due to the positive reaction of the lesions to treatment protocol.

**Conclusion:** Ocular habronemiasis is the common form of habronemiasis. Depositing of dead larva causes a hypersensitivity reaction. Treatments include corticosteroid to reduce inflammation-association tissue proliferation, antibiotic ointment for prevention of second bacterial infection, an antihistamine for the prevention of histamine-mediated pruritic and allergic conditions, and oral anthelmintic for the killing of adult form in the stomach. The current study authors suggest fly control is essential in preventing habronemiasis.

## 1. Introduction

Habronemiasis, or equine summer sore, is caused by *habronema* larvae, commonly in tropical and subtropical climates. *Habronema* larvae could cause preocular infectious resulting in conjunctivitis, blepharitis, or dermatitis<sup>1</sup>. *Habronema microstoma* (*H. microstoma*), *Habronema muscae*, and *Draschia megastoma* are three worms known to cause habronemiasis. *Habronema*'s adult stage is usually asymptomatic and lives in the equine stomach. Adult female nematodes produce eggs in horse stomachs, and eggs are passed with feces. Then the eggs in the horse feces are ingested by the maggots of various flies. Mature flies deposit the infective L3 larvae on the horse

mucus membrane<sup>2</sup>. Flies mostly deposit their eggs on moist skin area which is attractive to them, like the preocular area. If the horse consumes the parasite's larvae, the adult parasite will complete its life cycle in the horse's stomach. A local hypersensitivity reaction occurs on the cutaneous or mucus membrane if the larvae remain on the cutaneous<sup>3</sup>.

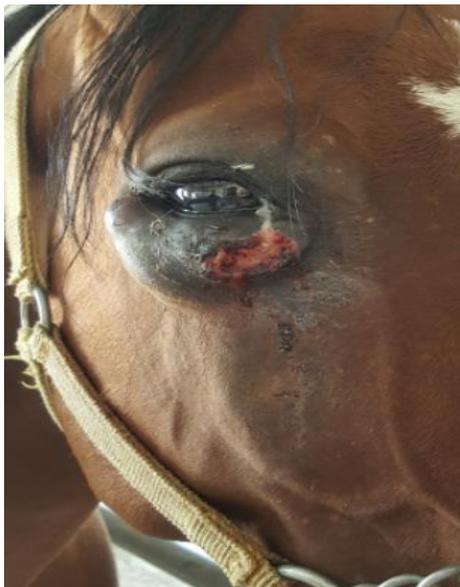
When flies are most active, the spring and summer seasons are also the seasons with the highest incidence of habronemiasis. The medial canthus of the eye is the most common location for finding preocular lesions caused by habronemiasis. These lesions have an inflammatory and

granulomatous appearance. These granules are composed of necrotic, caseous, or calcified material that is found surrounding either the dead remnants of the larvae or the larvae themselves<sup>4</sup>. A clinical presentation might be used to make a diagnosis. Sulfur-like granules are also pathognomonic. Histopathologic examination may be used to confirm the diagnosis. In several cases, the histology material showed evidence of an eosinophilic granulomatous inflammation associated with worms. In addition, a polymerase chain reaction (PCR) assay for molecular diagnosis of the two species of *Habronema* (*H. microstoma* and *H. muscae*) has been developed. It was determined with a specificity of one hundred percent and a sensitivity of ninety-seven percent that *habronema* DNA was present in the feces of horses. In addition, a PCR test was developed to diagnose stomach form of *habronema*. Validation of a PCR method has been completed to identify *habronema* species in skin samples from individuals with cutaneous infection<sup>5</sup>.

On cytology, eosinophils are abundant in smears from conjunctival scrapings. The conventional treatment for habronemiasis consists of anthelmintic medicine, removal or surgical debulking, and anti-inflammatory drugs. During the winter, lesions may spontaneously recover<sup>6</sup>. The current article describes a case of habronemiasis and its successful management.

## 2. Case report

An eight-year-old male Arabian horse with a history of wounds on the preocular area (Figure 1) and hind limbs (Figure 3) was referred to the Large Animal Medicine Unit, Veterinary Clinical Hospital, Shiraz University, Shiraz, Iran. An extensive amount of mucopurulent discharge, blepharospasm, and chemosis were seen during the ocular examination of the right eye. The granulomatous growth



**Figure 1.** Habronemiasis preocular lesion resulting in conjunctivitis, blepharitis in an eight-year-old male Arabian horse



**Figure 2.** Improvement of the Habronemiasis preocular lesion in an eight-year-old male Arabian horse 30 days after treatment

was discernible on the palpebral conjunctiva of the medial canthus and had a diameter of 1.8 centimeters. The mucous membrane was pink, and the rectal temperature was 37.5 degrees Celsius, all of which were seen during the clinical examination of the horse. During the clinical and ophthalmic evaluations, no further abnormalities were discovered. The research horse was dewormed with Albendazole (orally once at a dosing rate of 10 mg/kg)<sup>5</sup> 6 months before of clinical signs of habronemiasis. The skin lesion was identified as habronemiasis based on the history and clinical symptoms. After therapy, the lesions were completely cured (30 days, Figure 2 and 4). Treatment includes prednisolone (2 mg/kg) tab with reducing dosage for 30 days. A single dosage of Ivermectin (200 µg/kg, Zoetis, Netherlands) was given orally, and an antibiotic ointment containing 0.5% oxytetracycline (Pfizer, Netherlands) was administered topically every six hours for five days to prevent secondary bacterial infection. Triamcinolone eye drop (corticosteroid, 0.1%, Netherlands) inhibits inflammation-related tissue growth. To avoid histamine-mediated pruritic and allergic symptoms, chlorphenamine eye drops (antihistamine, 0.4 to 0.5 mg/kg BW/day for three days) were used<sup>6,7</sup>.



**Figure 3.** Habronemiasis hind limb lesion in an eight-year-old male Arabian horse



**Figure 4.** Improvement of the Habronemiasis hind limb lesion in an eight-year-old male Arabian horse 30 days after treatment

### 3. Discussion

Habronemiasis is a complex parasitic disease of horses, donkeys, mules, zebras, and dogs that commonly occurs in tropical and subtropical areas. The disease caused by three nematodes includes *H. microstoma*, *H. muscae*, and *Draschia megastoma*. House flies, face flies, and stable flies transmit the pathogenic nematode larvae<sup>1</sup>. Cutaneous habronemiasis is the most common form of habronemiasis in horses. Cutaneous habronemiasis is associated with the deposition of larvae in areas where they cannot complete their life cycle. Deposition of larvae is related to local hypersensitivity<sup>3</sup>. Squamous cell carcinoma, foreign body granulomas, and phycomycosis are the differential diagnosis for ocular habronemiasis. Tests, including histology or PCR, could confirm the diagnosis. Many different options have been indicated for habronemiasis treatment. Treatment options should focus on eliminating the infection, reducing inflammation, and decreasing the size of the lesion<sup>8</sup>.

There is debate over the usefulness of anthelmintic medications because the deposition of dead larvae on the skin brings on a hypersensitive reaction. It is possible for the administration of ivermectin to occasionally worsen pruritus symptoms<sup>7</sup>. Although anthelmintic medications significantly prevent habronemia by eliminating the adult stages of the parasite in the stomach, the disease can still occur. If there are fewer parasite eggs, then there are fewer flies that are infected with the condition. The use of moxidectin therapy<sup>6</sup> has shown evidence of this effect. Based on the findings of several studies, local anthelmintic treatment with solutions of ivermectin, ecythiophate, and trichlorfon may be beneficial in treating lesions. On the other hand, there is no evidence to suggest that it can be utilized to treat the lesion itself<sup>6-8</sup>.

Infection prevention is a critical component of *habronemia* care. Controlling flies is critical because they act as intermediate hosts, especially throughout the spring and summer. The removal of their nesting habitat will reduce the quantity of flies. As a result, adequate cleaning and manure management, frequent paddock cleaning,

and waste stability are critical in fly control. Certain equipment items, such as fly nets and blankets, can protect certain areas, and face masks might be helpful in the treatment of (peri)ocular habronemia. Stabling horses during peak fly hours is one management method, but fly repellents may also be useful in some situations<sup>9</sup>.

### 4. Conclusion

Habronemiasis is a complex parasitic disease commonly found in horses, primarily in tropical and subtropical regions. The most prevalent form of habronemiasis is ocular habronemiasis. When the larvae die, their deposition causes a hypersensitivity reaction. A diagnosis can be made based on clinical presentation, and the presence of sulfur-like granules is a characteristic sign. Histopathologic examination can be used to confirm the diagnosis, often revealing eosinophilic granulomatous inflammation along with nematodes. Treatment options include the use of corticosteroids to reduce inflammation-related tissue proliferation, antibiotic ointment to prevent secondary bacterial infections, antihistamines to prevent histamine-mediated itching and allergic reactions, and oral anthelmintics to eliminate adult parasites in the stomach.

### Declarations

#### Competing interest

No conflict of interest.

#### Authors' Contribution

Ali Hajimohammadi diagnosed the case. Golara Ostovari, Diba Forouzanpour, Hossein Dehghani, and Mehrdad Mashhadi conducted the treatment. Diba Forouzanpour, Hossein Dehghani writes the manuscript. Ali Hajimohammadi supervised and revised the manuscript. The whole manuscript was read and approved by the authors.

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#### Ethical considerations

The authors have checked plagiarism, publication consent, misconduct, data fabrication or falsification, double publication or submission, and redundancy.

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