

Hookworm infection: An unusual presentation

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ABSTRACT

Hookworm infections are widely distributed in the tropics and subtropics, with around 1.3 billion infected globally. Common manifestations of *Ancylostoma duodenale* and *Necator americanus* infections include symptoms due to larval penetration, pneumonitis, or the intestinal phase of infection. We report an unusual case of total hyphema with secondary glaucoma in the right eye of a 70-year-old male patient, caused by an adult hookworm in the anterior chamber. The extracted worm was identified to be of *Ancylostoma* species. The patient was treated with topical steroids, cycloplegics, and oral albendazole. Pain, corneal oedema and secondary glaucoma subsided and his vision improved.

Key words: *Ancylostoma* sp., anterior chamber eye infection, hookworm infections

INTRODUCTION

Hookworm infections are generally found in warm, moist areas and are prevalent throughout the tropics and subtropics. Several factors such as infection in the general population, defaecation into the soil, conducive environmental conditions and human contact with infective larvae in the soil influence its prevalence.^[1] Though *A. duodenale* and *N. americanus* are generally confined to different geographic areas, both species are seen in South India.^[2]

Infection in humans is acquired by active skin penetration of filariform larvae from the soil. Clinical symptoms due to hookworm infection vary. Pruritis may occur due to penetration of larvae, pneumonitis due to migrating larvae and diarrhoea, weakness and pallor depending on the worm load in the intestine. In chronic infections, iron deficiency anaemia is the main symptom. Hookworms are notorious for causing blood loss either by direct ingestion of blood or by continued loss from the original attachment sites, possibly due to an anticoagulant secreted by the worm.

Diagnosis of hookworm infection is usually made by detection of characteristic eggs in the stool. Larval forms may be seen in stool samples if kept unpreserved for more than 24 h after collection.^[2] Adult worms are generally

detected on endoscopy, as they remain firmly attached to the small intestine.

The case reported is a rather unusual one, of hyphema caused by an adult hookworm in the anterior chamber of the right eye.

CASE REPORT

A 70-year-old male, a farmer who handled manure, presented with history of sudden onset of blurring of vision in the right eye followed by pain and redness of 10 days duration. He was referred from a local hospital as a case of hyphema for evaluation. There was no history of any constitutional symptoms, trauma, ocular surgery or any drug intake. The patient was not hypertensive or diabetic and there was no history of any bleeding disorder. There was no previous history of sudden loss of vision in the affected eye. Ocular examination revealed conjunctival and circumcorneal congestions in the right eye. Cornea was hazy, being oedematous and there was total hyphema [Figure 1].

His visual acuity was only light perception in the right eye and

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20/70 in the left eye. There was no fundus view in the right eye. Examination of the left eye showed an immature senile cataract. Intraocular pressure was 54 mmHg in the right eye and 17.3 mmHg in the left eye with Shiotz tonometer, (Riester, Germany).

General examination including blood pressure was normal, as also cardiovascular, respiratory, gastrointestinal and nervous system examinations. Investigations such as haemoglobin, random blood sugar and total leucocyte count were within normal limits.

With a presumptive diagnosis of total hyphaema with secondary glaucoma, an emergency anterior chamber wash was planned, to relieve the raised intraocular pressure and to prevent blood staining of cornea. Under microscope, before putting the incision, a wriggling movement was detected in the anterior chamber. Paracentesis was done to clear the hyphaema. A worm was evident with one end attached to the inferior angle [Figure 2].

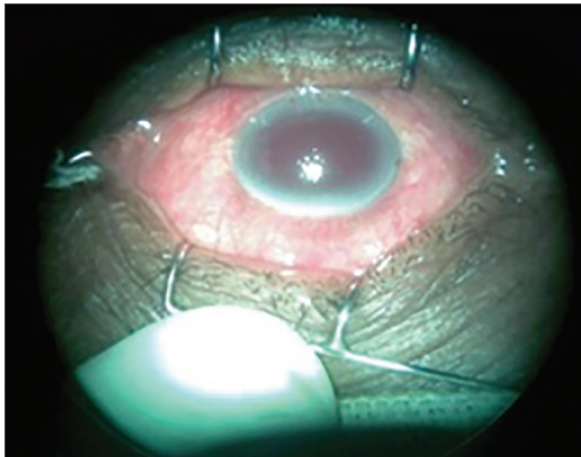


Figure 1: Total hyphaema with conjunctival and circumcorneal congestions

The live worm was extracted. It was motile, small, cylindrical, greyish white (12 mm × 0.5 mm) with light brown tint at one end. On microscopy of the entire worm, a rounded anterior end and tapering posterior end were seen.

Oral aperture was seen directed towards the dorsal surface and buccal capsule was evident. Buccal capsule with two hook-like ventral teeth and a triangular plate on the dorsal surface was seen [Figure 3]. The posterior end was tapering with a spine [Figure 4].

Extracted worm was identified to be of *Ancylostoma* species (female) being 12 mm in size; the anterior end was bent in the same direction as the body curvature, with presence of buccal capsule, claw-like ventral teeth, triangular dorsal lancet, and a pointed posterior spine.^[3] It was confirmed from the Department of Microbiology, Jawaharlal Institute of Postgraduate Medical Education & Research (JIPMER) as belonging to the *Ancylostoma* species. Further identification was not possible. Stool examination revealed no evidence of parasitic infestation. There was no history of any creeping eruption either.

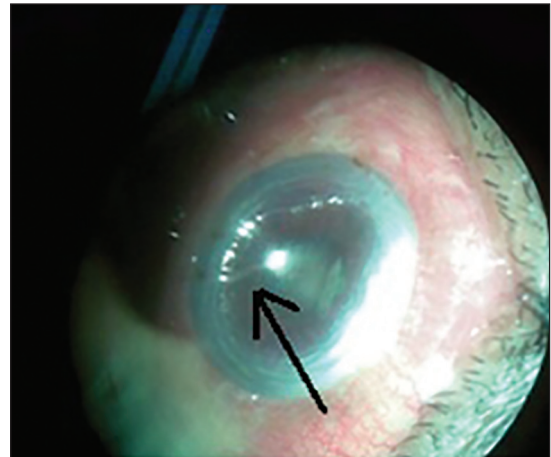


Figure 2: Worm with one end attached to the inferior angle

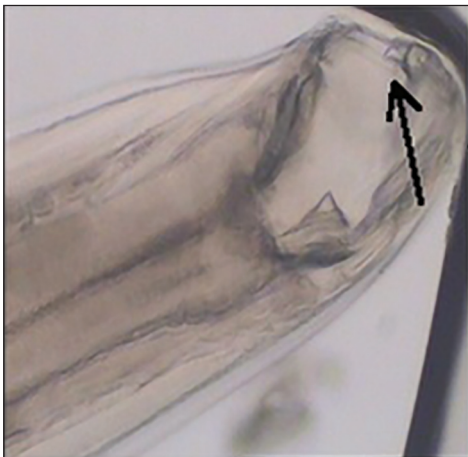


Figure 3: Anterior end — buccal capsule with hook-like ventral teeth and triangular plate on the dorsal surface



Figure 4: Posterior end of the hookworm showing spine

In the postoperative period, the hyphema cleared. The patient was treated with topical steroids, cycloplegics and oral albendazole. Pain, corneal oedema and secondary glaucoma subsided and his vision improved.

DISCUSSION

Various ocular manifestations such as lid swellings, uveitis, retinitis and diffuse unilateral subacute neuroretinitis (DUSN) can occur with parasitic invasions of the eye and ocular adenexa with or without systemic manifestations.^[4-6] Persistent corneal oedema secondary to presumed dead adult filarial worm in the anterior chamber has also been reported.^[7] The worms that have been reported to be found in the anterior chamber were *Wuchereria bancrofti*, *Brugia*, *Sparganum*, *Paragonimus westermani*, *Schistosoma*, *Angiostrongyloidea*, *Gnathostomiasis*, *Onchocerca volvulus* and *Loa loa*.^[5,6] This is an unusual case of total hyphema with secondary glaucoma caused by an adult hookworm in the anterior chamber. Dirofilaria is common in Kerala, India and most of these have been reported in and around the eyes but not from the anterior chamber.^[8]

People who have direct contact with the soil that contains human faeces in areas where hookworm infections are common are at high risk. In the present case, the route of entry of the worm into the anterior chamber is not clear. It is likely that infective larvae gained direct access into the eye *via* a contaminated source or by touching the eye with contaminated fingers after handling biomanure, the patient being a farmer. Considering the life cycle of the hookworm, there is no obvious reason to account for the presence of the adult hookworm in the anterior chamber. Adult hookworms are generally seen in the small intestine, firmly attached to the intestinal mucosa by means of well-developed mouth parts. Adult *Ancylostoma duodenale* has been rarely detected in other sites such as the colon being associated with colitis.^[9] Morphological features of the adult worms help in differentiating the two common species. The adult male worms of *Ancylostoma duodenale* are generally 8-11 mm in length and in females 10-13 mm; the adult worms of *N. americanus* are slightly smaller. The prominent buccal capsule in *A. duodenale* bears two pairs of hook-like teeth, whereas *N. americanus* has smaller buccal capsule with semilunar cutting plates. Zoonotic *A. caninum* has three pairs of teeth.^[10] However, in this case as

only one pair of ventral teeth and pointed posterior spine were evident, the worm could only be identified as female *Ancylostoma* sp.

This case is reported to highlight an unusual clinical presentation of an adult hookworm infection, in the anterior chamber of the eye, which to the best of our knowledge has not been reported.

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Conflicts of interest

There are no conflicts of interest.

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