

## Enterobius vermicularis induced infectious keratitis following penetrating keratoplasty

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A 28-year-old man with a prior history of penetrating keratoplasty in the left eye for total corneal melt presented with a 3-day history of a red, painful left eye. On examination, he was found to have graft infiltrates. Microscopic examination of wet mount preparation of corneal scrapings revealed the presence of embryonated eggs of *E. vermicularis*. Cellophane (scotch) tape preparation from perianal region also revealed embryonated eggs of *E. vermicularis* as well as live adult worms. Ocular and adnexal involvement by *E. vermicularis* is extremely rare. Here, we report the first case of infection of a corneal graft with *E. vermicularis*.

**Key words:** *Enterobius vermicularis*, keratitis, therapeutic penetrating keratoplasty

*Enterobius vermicularis*, commonly known as pinworm, is an intestinal nematode that commonly infests children from low socio-economic status. Ocular and adnexal involvement by *E. vermicularis* is extremely rare. In literature, there are only two case reports of the adult worm being isolated from the conjunctival sac.<sup>[1,2]</sup> We report the first case of infection of a corneal graft with *E. vermicularis*.

### Case Report

A 28-year-old male presented to Advanced Eye Centre, Post Graduate Institute of Medical Education and Research (PGIMER) with complaint of redness, pain and watering in left eye since 3 days. He did not give any history of ocular trauma. Systemic history was not significant. The patient had undergone left eye therapeutic penetrating keratoplasty 6 months back for total corneal melt. Cultures from corneal button did not reveal growth of any organism.

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On examination, the best corrected visual acuity was 20/20 in right eye and perception of light in left eye. Slit lamp examination of left eye revealed diffuse conjunctival and ciliary congestion, loose sutures inferiorly, graft oedema and yellowish-white graft infiltrates near the graft-host junction in the inferior half [Fig. 1]. Fluorescein staining demonstrated presence of a large epithelial defect measuring 11 mm × 7 mm. Digital intraocular pressure was normal. B scan ultrasonography showed a normal posterior segment. Anterior and posterior segment examination of the right eye was normal. Corneal scrapings were obtained and sent for Gram stain, KOH stain and bacterial and fungal cultures. Microscopic examination of the wet mount preparation of corneal scrapings showed the presence few embryonated eggs of *Enterobius vermicularis*. An occasional embryonated egg showed coiled larva within it [Fig. 2]. Bacterial and fungal cultures from corneal scrapings did not reveal growth of any organism. Early morning perianal cellulose (scotch) tape test was done and examined under the microscope. Microscopic examination of the cellulose (scotch) tape revealed the presence of embryonated eggs of *E. vermicularis* and live adult worms [Fig. 3]. Stool examination was negative for any parasitic ova or cysts.

In view of parasite induced corneal ulcer, our patient was treated with 400 mg oral albendazole which was repeated after 2 weeks. Moreover, patient was started on topical gatifloxacin 0.3% every hourly, atropine 1% TDS and carboxymethyl cellulose 0.5% QID. The patient responded well to treatment and the ulcer healed over the next 28 days leaving a vascularised opacified graft. Antibiotic drops were tapered and stopped.

At last visit (4 months after the presentation), the visual acuity in left eye was perception of light and there was no recurrence of infection in the graft at the end of 4 months.

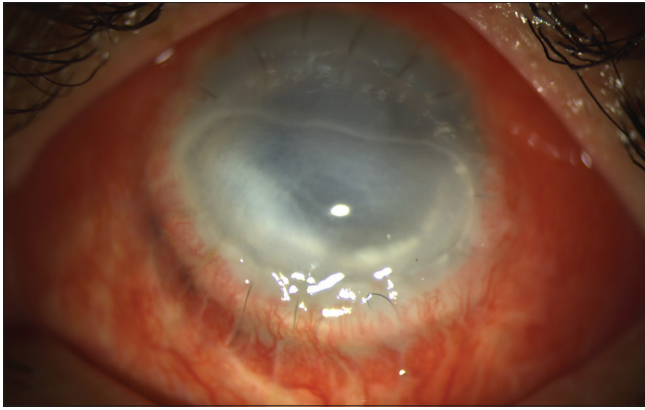
### Discussion

*E. vermicularis*, commonly known as pinworm, is an intestinal nematode. Children are most commonly infected by this nematode in areas of poor faecal sanitation. Transmission of *E. vermicularis* eggs occurs by the feco-oral route. This occurs when the eggs are directly inoculated from the fingers into the mouth. These eggs are infective for short period after being laid, making autoinfection the most common route of intestinal infection. Following ingestion, the embryonated eggs hatch in the small intestine and develop into adult worms. Adult worms reside in the rectum, cecum, appendix and colon. Mating between male and female adult worms occur in the

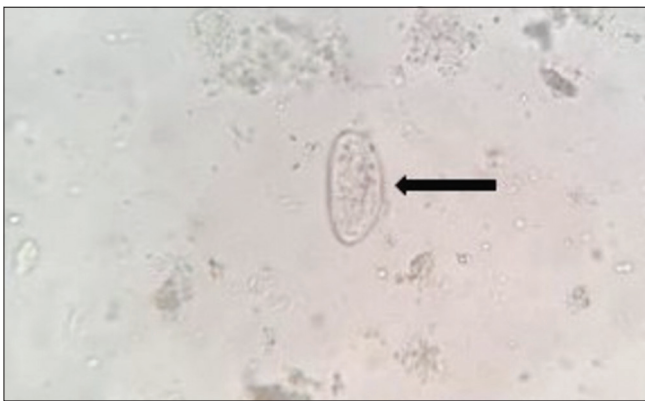
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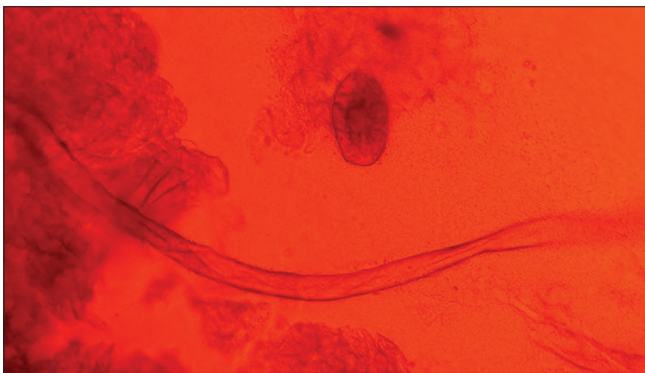
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**Figure 1:** Anterior segment photograph showing corneal ulcer at graft host junction. There is a large epithelial defect (measuring 11 mm × 7 mm) in the inferior half of the graft



**Figure 2:** Wet mount preparation from corneal scraping showing an embryonated egg of *E. vermicularis* (arrow)



**Figure 3:** Cellophane tape test showing adult *E. vermicularis* and an egg containing larva on microscopic examination

human intestine. The gravid female worm then migrates to the anus and lays partially embryonated eggs on the perianal area. It is the migration of the female worm to the perianal area that causes pruritus, which is the most common symptom of pinworm infestation.<sup>[3]</sup>

Extraintestinal presentation of *E. vermicularis* is very rare. *E. vermicularis* has been isolated from the female reproductive tract, urinary tract, biliary tract and liver.<sup>[4-6]</sup>

Ocular involvement by *E. vermicularis* is extremely rare. In literature, there are only two case reports of the adult worm being isolated from the conjunctival sac.<sup>[1,2]</sup> The first report from 1976 describes a case of 15-year-old Indian girl who gave history of worms crawling out of her eyes. She continued to expel worms for 21 days, with a total number of 42 worms identified.<sup>[1]</sup> Second case report is of a 15-year-old Caucasian girl in whom adult *E. vermicularis* was isolated from conjunctival sac as well as nose. In this report, a total of six worms were isolated from the patient's eye.<sup>[2]</sup> However, ours is the first report in which embryonated egg of *E. vermicularis* was isolated from corneal scrapings obtained from a graft infiltrate.

According to the CDC guidelines, the recommended treatment for pinworm infection is oral pyrantel pamoate (11 mg/kg of body weight). Alternatively, patients may be given a single dose of 100 mg mebendazole. A second dose may be given in cases where the infection persists typically the result of autoinoculation.<sup>[7]</sup>

Treatment of extraintestinal infection is not standardized. In our case, patient was treated with 400 mg oral albendazole which was repeated after 2 weeks.

In conclusion, we report here an extremely rare case of a corneal graft infected with *E. vermicularis* eggs. Although the mechanism by which eggs reached this location is not clear, it is most likely that the embryonated eggs were directly inoculated by the patient into his eye, from the perianal skin, through infected finger nails.

Cellophane swab or scotch tape swab method is used to collect the eggs from the perianal area. Stool examination may not be helpful because eggs are not always released in the faeces.

The highlight of our case report is the infection of a corneal graft with *E. vermicularis*. Ocular and adnexal involvement with *E. vermicularis* has been previously documented in two case reports from different countries.<sup>[1,2]</sup> But the infection of a corneal graft with *E. vermicularis* eggs is extremely rare and to our knowledge, is the first case report of its kind.

#### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

#### Conflicts of interest

There are no conflicts of interest.

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