

Angiostrongylus cantonensis in anterior chamber

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Live worm in anterior chamber is a rare finding. We hereby report a case of ocular *Angiostrongylus cantonensis*, which, to the best of our knowledge, is the third case report from India. A 70-year-old female presented with the complaints of watering and foreign body sensations in right eye since 2 months. On examination, a translucent worm of approximately 15 mm length was found freely moving in anterior chamber. Patient underwent surgical removal of live worm, which was identified as *A. cantonensis*. Educating people regarding importance of hygiene is important for prevention of worm infestation.

Key words: *Angiostrongylus cantonensis* (rat lungworm), anterior chamber, intraocular parasite

Presence of *Angiostrongylus cantonensis* in eye is a rare finding. So far only two cases have been reported from India.^[1] In the genus *Angiostrongylus*, a total of 21 species have been identified including two species that can cause diseases in humans, namely, *A. cantonensis* and *Angiostrongylus costaricensis*.^[2] Ocular involvement has been reported in 1.1% cases of angiostrongyliasis.^[3] Humans are accidental hosts who do not transmit infection to others.^[4] Rats serve as the definitive host of *A. cantonensis*, whereas humans become infected by ingesting third-stage larvae in raw intermediate hosts, such as snails, prawns, fish, frogs or monitor lizards.^[4] Infection can rarely be acquired by the consumption of vegetables contaminated with larvae.^[5] No data are available regarding risk of transmission of angiostrongyliasis from definitive host. The larvae are transported via the blood to the central nervous system, where they are the most common cause of eosinophilic meningitis, a serious condition that can lead to death or permanent brain and nerve damage.^[6] Not much is known about why it targets the brain in humans, but a chemical-induced chemotaxis has been implicated recently. Acetylcholine has been previously reported to enhance motility of this worm via nicotinic acetylcholine receptors.^[7] Experimental assays in animal model are needed to validate a chemical-induced

chemotaxis by use of anticholinergic drugs to prevent cerebral infection following infections by *A. cantonensis*.^[8]

Angiostrongyliasis caused by infection with *A. cantonensis* is primarily characterized by eosinophilic meningitis, meningoencephalitis or myelitis.^[9] 42 cases have been reported till now^[1] including the cases reviewed by Diao *et al.*^[10] There are a few sporadic reports of ocular angiostrongyliasis from Asia. Two cases have been reported from India.^[1] Ocular involvement includes optic neuritis, blepharospasm, uveitis, macular oedema, retinal oedema, necrotic retinitis, panophthalmitis, papilloedema and optic nerve compression.

Case Report

A 70-year-old female presented with complaints of watering, redness and foreign body sensation in right eye since 2 months. She had no complaints in her left eye. She used to walk bare foot, takes bath and washes utensils from the same well, consumes nonvegetarian diet, does not wash vegetables before cooking and goes open ground for sanitation. There was no history of any ocular interventions in past. She had no systemic illness.

On examination, her best corrected visual acuity was 20/200 in right eye and 20/120 in left eye. Right eye showed mild conjunctival congestion and corneal haze. On slit lamp evaluation, a translucent worm of ~15 mm length was found freely moving in anterior chamber without any attachment to iris [Fig. 1]. There were no cells or flare in anterior chamber. Both pupils were reacting briskly to light. Both the eyes had nuclear sclerosis grade II. Undilated fundus examination of both eyes did not reveal any patch of chorioretinitis or any migratory tracts with optic discs being normal. Extra ocular movements were normal. There were no abnormalities in the surrounding adnexa. Systemic examination did not reveal any migratory subcutaneous swelling, nodules or abscess.

Her B-scan of both eyes was normal. The haemogram including eosinophil count, liver profile, renal profile and chest x-ray were normal. Routine stool and urine examination did not reveal any eggs/worm/larva. Thick smear for microfilaria came out to be negative.

Patient underwent surgical removal of live worm under topical anaesthesia. A paracentesis at 9 o'clock meridian was made followed by intracameral injection of lignocaine 2% (0.1 mL) to anaesthetise the worm. Hydropropyl methyl cellulose (HPMC) injected to prevent damage to adjacent structures, to maintain the space and to protect the endothelium. The worm got embedded in the viscoelastic substance, which minimized the risk of damage to iris and cornea. The worm was removed [Fig. 2]. The viscoelastic washed out of anterior

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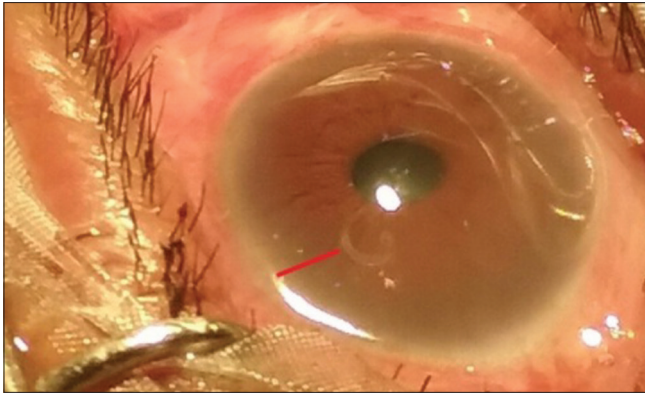


Figure 1: Red arrow shows live worm in anterior chamber under operating microscope

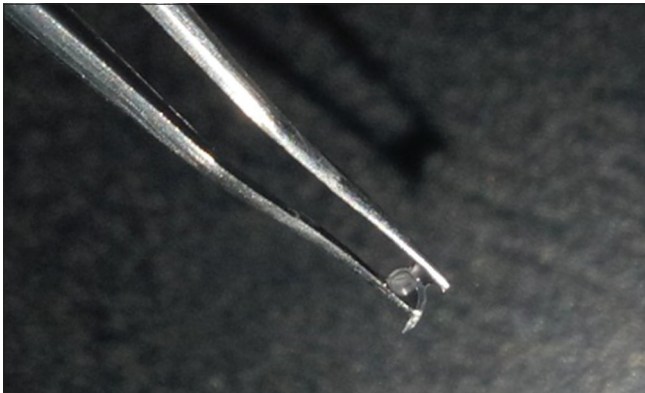


Figure 2: Retrieved live worm



Figure 3: Under microscope: *Angiostrongylus cantonensis* of 2.0 cm length and 70–80 μ m width. Anterior end was rounded. Mouth opened directly to oesophagus. Posterior end was blunt ($\times 30$)

chamber; balanced salt solution was injected to reform anterior chamber.

The worm was examined by microbiologist and was confirmed to be *A. cantonensis* [Fig. 3]. Naked eye examination of worm showed a thin, convoluted translucent worm. Microscopically, the anterior end was rounded and it measured 30–40 μ m in breadth. There was no buccal capsule and the mouth opened directly into a muscular oesophagus. Body was long and thin with a breadth of 70–80 μ m. A long, tubular intestine could be seen, which were wound together in a spiral pattern. The posterior end was blunt with a width of 40 microns. The worm was covered with a smooth cuticle without any kinks or knobs. Complete length of worm was 2.0 cm with a breadth of 70–80 μ m. All these findings suggested that the worm was *A. cantonensis*.

Postoperatively, patient was prescribed eye drops moxifloxacin 0.5% and dexamethasone 1% four times a day for 15 days. In addition, atropine sulphate 1% eye drops were prescribed four times a day for 7 days.

At 1 week, patient was symptomatically better, her corneal haze disappeared and the best corrected vision in right eye improved to 20/120. In both eyes, dilated fundus examination did not reveal any patch of chorioretinitis or any migratory tracts and optic disc were normal. Patient was counselled about maintenance and importance of personal hygiene. She was advised for cataract surgery but she did not report back.

Discussion

Ocular angiostrongyliasis is a rare finding. The first reported case from India was a 12-year-old boy who was initially treated for secondary glaucoma and 2 weeks post-therapy, worm was found in anterior chamber with subretinal tracks associated with eosinophilia.^[11] Other case reported from India was a 40-year-old female who had eosinophilic meningitis following which worm was found in posterior chamber associated with eosinophilia.^[12] Our case had no systemic manifestations, anterior chamber was quiet and there was no eosinophilia. The surgical retrieval of live worms under topical anaesthesia has been reported.^[3,11,12] Use of intracameral lignocaine 0.1 mL followed by injection of HPMC enables the surgeon to grasp and remove the worm from anterior chamber easily. In four cases with retinal involvement reported from Thailand, laser ablation with or without oral steroids was successfully performed.^[13] No role of LASER in anterior segment involvement due to angiostrongyliasis has been reported so far. Antihelminthic, such as albendazole, is not recommended before removal of worm because dead parasites may cause serious intraocular inflammation.^[13]

So far, only 42 cases have been reported in the literature, most of them are reported from Thailand.^[1] Almost all the cases had unhygienic handling of food and water. The details of these cases are summarised in the Table 1.

Our patient used to walk barefoot and going open ground for sanitation, which may be additional factor contributing to infestation of worm, but an associative relationship has not been reported. Educating the public about the dangers of eating raw or undercooked food is essential for the prevention and control of this food borne zoonotic disease. Patient counselling is a must in such scenario to prevent further recurrence.

Table 1: Overview of reported cases of *Angiostrongylus cantonensis*⁽¹⁾

Country/number of cases	Site of worm (AC:PC)	Number of cases with meningitis (%)	Number of cases with eosinophilia (%)	Treatment
India/2	1:1	1 (50)	2 (100)	Sx
Thailand/19	4:15	5 (26.31)	2 (10.52), NA 7 (36.84)	Sx, Laser, oral steroids, IVMP, oral albendazole
Srilanka/5	3:2	1 (20)	1 (20), NA 3 (60)	Sx
China/4	2:2	1 (25)	IR, NA 1 (25)	Sx in one rest IR
Taiwan/2	0:2	2 (100)	1 (50), NA 1 (50)	IVMP, oral mebendazole
Japan/2	0:2	1 (50)	2 (100)	Sx, oral steroids
Vietnam/2	1, IR	0, IR	1 (50), IR	Sx, IR
Indonesia/1	1:0	0	0	Paracentesis
Papua New Guinea/1	0:1	0	1 (100)	Topical steroids+topical antibiotic
Malaysia/1	0:1	0	1 (100)	Sx
South Africa/1	1:0	0	1 (100)	Needle aspiration
Nepal/1	0:1	0	IR	Sx
Jamaica/1	1:0	0	0	Sx

NA: Not available, Sx: Surgical, IVMP: Intravenous methylprednisolone, IR: Incomplete reporting, AC: Anterior chamber, PC: Posterior chamber

Conclusion

Early intervention in an eye with a worm in the anterior chamber can save eyes from becoming blind and also prevents systemic complications.

Declaration of patient consent

We certify that we have obtained all appropriate consent from patient. Patient has given consent for her images and other clinical information to be reported in the journal. The patient understands that her name 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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Conflicts of interest

There are no conflicts of interest.

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