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Ocular Gnathostomosis – a Case Report

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ABSTRACT

Ocular infestation by live Gnathostoma spinigerum is a rare occurrence in humans. Most of the published reports are from South-East Asia. We report a rare case of ocular gnathostomosis of right eye of a 45-year-old male hailing from Tirunelveli, Tamil Nadu. Slit lamp examination revealed a live, actively motile worm in the superior palpebral conjunctiva, which was successfully removed. Its identity was confirmed by microscopy.

KEYWORDS : Gnathostoma spinigerum, Ocular Gnathostomosis, superior palpebral conjunctiva

Introduction

Gnathostomosis is a food-borne parasitic zoonosis caused by several species of the genus Gnathostoma (Nematoda) particularly Gnathostoma spinigerum. Dogs, cats and wild mammals are known to serve as definitive hosts, but humans can be accidental or parataenic hosts. [1] In humans, the nematode larvae typically cause intermittent subcutaneous migratory swellings, but less commonly involve the internal organs.[2] A total of 12 Gnathostoma species have been reported with the most important species causing human infection being G. spinigerum.[3]

Gnathostomosis is transmitted by the ingestion of raw, insufficiently cooked definitive hosts such as fresh water fish, poultry, or frogs. Humans are not one of the definitive hosts of the parasite and do not allow the parasite to complete its life cycle. Human infections are acquired by the ingestion of raw, insufficiently cooked infected intermediate hosts containing the advanced third-stage larvae. If the ingested third stage larvae migrate from the gastric wall then they are prevented from maturing into adult worms, leaving the life cycle incomplete. So eggs are may not found in diagnostic tests. This also means the number of worms present in humans is a reflection of the number of third stage larvae ingested.

In man, the larvae can migrate to various internal organs, including the eye and subcutaneous tissue but can never become mature. Man is an incidental host and represents the dead end for the parasite. Systemic effects include migratory cutaneous swelling, hypereosinophilic syndrome, fatal eosinophilic encephalomyelitis, gastrointestinal mass and pleurisy.[4] Various ocular lesions include lid oedema, orbital cellulitis, anterior uveitis[5] with or without hypopyon, secondary glaucoma, multiple iris holes, sub retinal space, and retinal detachment with multiple holes. Herewith we report such a case from a male belonging to Tirunelveli District, Tamil Nadu, India. In this patient a live worm was found to be present in the superior palpebral conjunctiva of the right eye. The case is reported because of its rarity and clinical importance.

Case History

A 45 years old male came to Ophthalmology Outpatient Department of our medical college hospital with complaints of gritty sensation and watering with redness in right eye for two days. He had no complaints in the left eye. When he was asked specifically he told something was moving inside his right eye. On examination, there was marked eyelid oedema, conjunctival congestion and chemosis. While trying to evert the swollen upper eyelid the worm was seen under high magnification of Slit lamp, a mobile worm was seen along the folds of the superior palpebral conjunctiva whose movement was recorded in video. Using a non-toothed forceps, the worm was gently removed under topical anaesthesia at the slit lamp and collected in vial containing normal saline. The visual acuity was 6/6 in both eyes. Fundus examination was normal with no signs of previous chorioretinitis. The optic disc was normal. Extra ocular movements were found to be normal. On the next day, a whitish nodule of 4 mm was identified in the superior palpebral conjunctiva [Fig. 1]. Systemic examination did not reveal any migratory subcutaneous swelling, nodule, or abscess.

All routine investigations including haemogram, chest x-ray came out to be normal except eosinophilia (35 %). Liver and renal profile was normal. Routine stool and urine examination did not reveal any eggs / worm / larva.

Under topical anaesthesia the extracted live, actively motile worm was sent to the Microbiology Department for identification. Macroscopically, the worm was a short and white, cylindrical structure measuring 2 mm in length [Fig. 2]. Light microscopy showed that the anterior end revealed the head bulb that possessed four circumferential rows of hooklets and the entire body was covered with fine cuticular spines. Two of the three lips could be clearly seen in the head bulb. The posterior end was rounded. Two pairs of salivary glands and the oesophagus were distinctively seen. The above findings suggested its identity to be one of a L3 larva of Gnathostoma spinigerum.[2] The worm was sent to Department of Veterinary Parasitology, Veterinary College and Research Institute, Tirunelveli for further confirmation, resulted as L3 larva of Gnathostoma spinigerum [Fig. 3].

After surgical removal the patient was treated with oral Albendazole 400 mg. He was given topical steroids and antibiotics after the procedure and asked to review after 2 days and the patient however was normal at follow up.

Discussion

Gnathostomosis is a food-borne zoonosis caused by the late-third stage larvae of *Gnathostoma* spp. It has a complex life cycle involving at least two intermediate hosts first intermediate host is water crustacean, copepod, *Cyclops*, and the second intermediate host is freshwater fish with humans being accidental hosts in which the larvae cannot reach sexual maturity. The main risks for acquisition are consumption of raw or undercooked freshwater fish and geographical exposure. *Gnathostoma* infection results in initial nonspecific symptoms, followed by cutaneous and/or visceral larva migrans, with the latter carrying high morbidity and mortality rates if there is central nervous system involvement.

Intraocular infection by live *Gnathostoma spinigerum* is a rare occurrence. The worm was first described in 1836 by Richard Owen in a

stomach nodule of a tiger.[6] The first human infection was described by Levinsen in 1890 in a breast abscess of a woman living in Siam.[7] The first human case of intraocular Gnathostomosis was reported in Thailand.[8] Several cases of ocular Gnathostomosis have been reported thereafter from various parts of the world.[9] *Gnathostoma* has also been reported to be extracted from the cervix, the abdominal skin and also been coughed out from the pharynx.

Man can be infested by eating the raw or undercooked meat of such intermediate or paratenic hosts. Third stage larvae cannot mature in humans, but they may remain alive up to 10 years. In humans, they may migrate to various organs, including the eye. The mode of entry of *Gnathostoma* larva into the eye is not clearly known.

The infection in our patient may have been acquired by eating infected fish or drinking contaminated municipal water with infected *Cyclops*. Prevention depends on avoidance of raw or inadequate cooking of food like fresh water fish, snails, pork etc. Proper sewage disposal and treatment of drinking water or boiling of water may prevent the spread in the community. Therapeutic success depends on early and complete surgical removal, which could be lifesaving, Albendazole has been recommended as an adjunct to surgical removal to treat the ocular involvement [10].

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Fig. 1 A nodule in the superior palpebral conjunctiva



Fig. 2 Light microscopic view of larva of Gnathostoma extracted from the eye (x100)

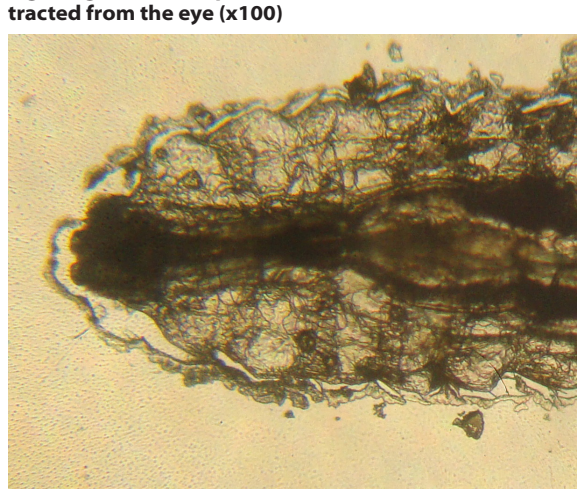


Fig. 3 Anterior end of the Ganthostoma larva revealing the head bulb and four circumferential rows of hooklets along with fine cuticular spines (x400)

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