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First case of Human Ocular Thelaziasis from India caused by Thelazia californiensis: A case report.

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Abstract: *This is a case report of human ocular thelaziasis caused by Thelazia californiensis that was found wiggling in the anterior chamber of the eye. A 40-year-old Hindu male reported to the Department of ophthalmology, with complaint of floaters in left eye from six months. On detailed ocular examination a creamy white worm was seen wiggling in the anterior chamber of his left eye. The parasite was surgically removed from the patient's eye in one piece and was later identified as adult female Thelazia californiensis by the Indian veterinary research Institute, Uttar Pradesh, India based on the morphological characteristics. According to the available data, this is the first human case of Thelazia californiensis from India as Thelazia californiensis occurs solely in Western united states of America.*

Keyword: *Anterior chamber, California eye worm, Eye worm, Human Thelaziasis, Human Ocular Thelaziasis, India, Thelazia californiensis.*

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I. Introduction

Thelaziasis is an Arthropod-born disease caused by spirurian nematodes from the genus Thelazia (commonly called "eyeworms") that parasitize the orbital cavity and related structures such as conjunctival sac, nasolacrimal ducts, lacrimal duct, nictitating membrane in birds and mammals like dogs, cattle, horses, cats, rabbits, pigs, deer, foxes, camels, rodents, monkeys as well as humans where they feed on ocular secretions (tears) of the host [1] [2].The Thelaziasis is transmitted by secretophagous nonbiting diptera or tear-feeding flies usually flies, including drosophilid flies in the genus, amioto and muscid flies in the genera, musca and fannia[3] [4] [5] [6]. From among the 16 species of Thelazia found worldwide only two species T. callipaeda (commonly called "Oriental eye worm") and Thelazia californiensis (commonly called "California eye worm") infect humans [7] [8][9]. Thelazia californiensis is solely found in Western North America. Whereas, Thelazia callipaeda responsible for majority of cases, occurs in India, China, Russia, Thailand, Japan and Korea, Southern Italy and Northern Europe.Human Thelaziasis is a rare disease. Stucky in 1917 reported first case of human thelaziasis from Beijing, China [10]. In India, cases of Human Thelaziasis were first reported by Friedmann in 1948 [10] [11]. Man is an accidental host for Thelazia. The natural vector/s and life cycle of this parasitic worm is poorly understood but experimental trial on animals have been carried out [2]. The gravid female lays embryonated (ensheathed eggs) or first stage larvae "L1" into lacrimal secretions of the host [2]. These larvae get transmitted to the intermediate host or tear-feeding flieswhich feed on infected host's lacrimal secretions containing these infective "L1" larvae [2]. The 'larvae' hatch or exsheath in the digestive tract of fly and penetrate the gut wall and migrate to different body parts, depending on the species where they develop in capsules into infective "L3" larval stage [2]. These L3 stage larvae break out of the capsules and migrate to the fly's mouthparts from where it is transmitted to a new host.In the new host L3 larvae may live for over one year and mature to adults in the orbital cavity and related tissues [2].A very few human ocular thelaziasis cases have been rarely reported in India [1]. According to available data, this is the first human case of Thelazia californiensis in India [1].

Case report:

A Hindu 40-year-old male reported in January, to the Department of ophthalmology, Haryana with complaint of floaters in the left eye from six months. Patient is an employee in a private company. He hails from a non-hilly urban area and owns a cow in his house. Patient had no prior ocular or medical history. General physical examination of the patient did not unveil any abnormality. Ocular examination of the patient revealed a visual acuity of 6/6 in right and 6/12 in the left eye without glasses. Intraocular pressure as measured with applanation tonometry was 19 mm of Hg in the right eye and 18 mm of Hg in his left eye. Slit lamp examination of the cornea and conjunctiva of both eyes was normal. The anterior chamber examination of the left eye revealed a creamy white motile worm, which was not adherent to any intraocular structures (Fig.1).

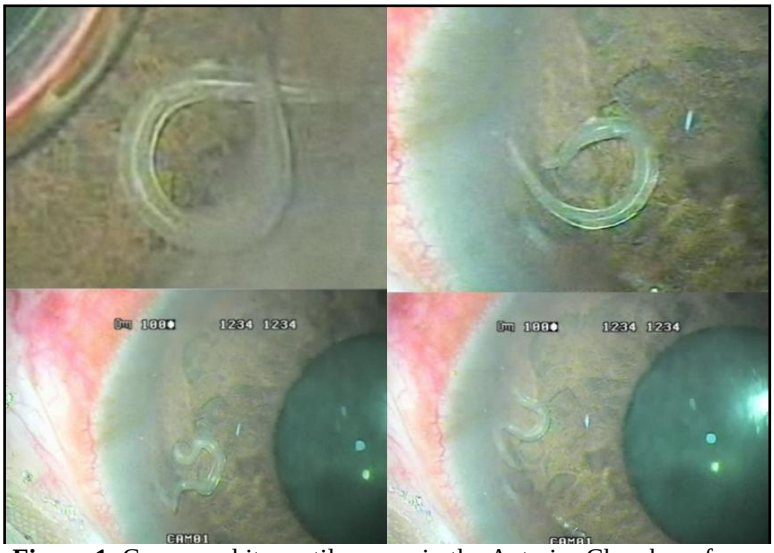

Figure 1: Creamy white motile worm in the Anterior Chamber of eye**.**

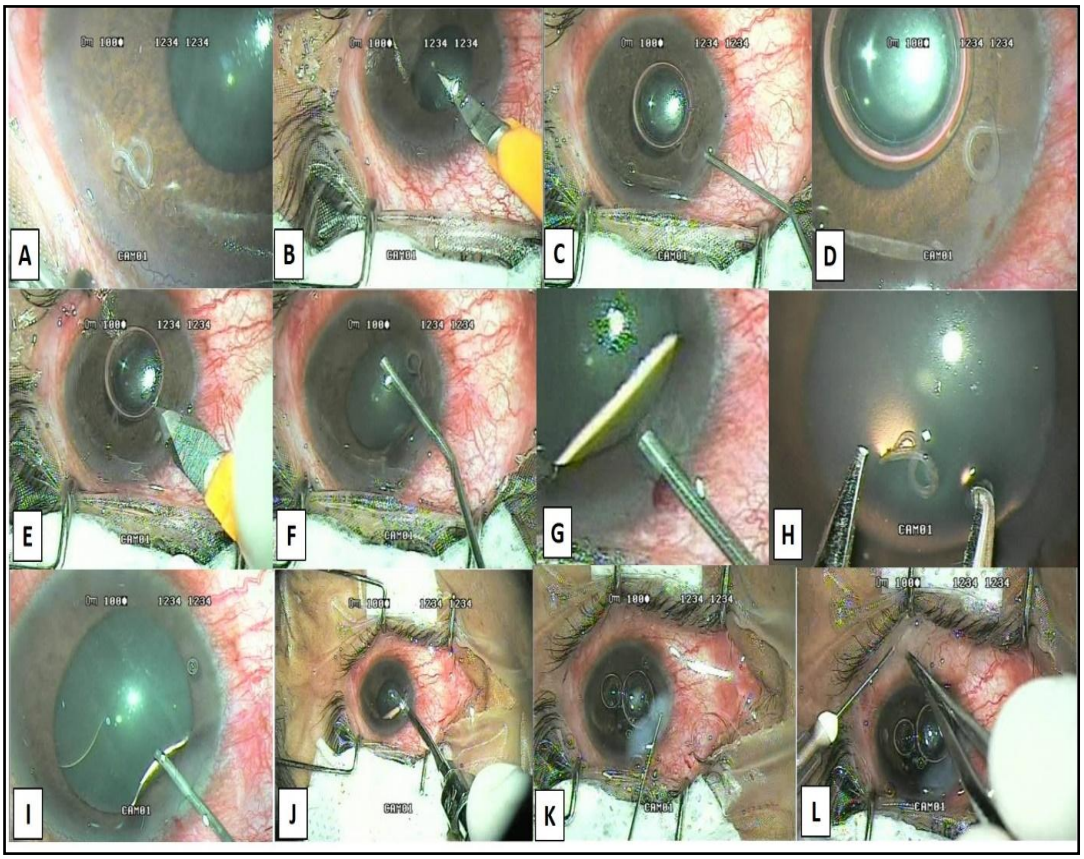

Figure 2: Surgical steps in sequential order

The worm coiled and stopped wiggling on direct exposure to bright light from the slit lamp (Fig.2-A). When the slit lamp was dimmed, the worm uncoiled and started wiggling again. No flare or cells were observed in the anterior chamber of both eyes. The pupils were central circular and symmetrical, as well as pupillary reactions were normal and brisk in both eyes. Patient was bilaterally phakic with clear lens and vitreous. On dilated fundus examination of both eyes, no abnormality was observed. The patient all routine laboratory investigations, including total leucocyte count, differentiated leucocyte count and peripheral smears were within normal range. Patient was explained about his condition and was posted for surgery after taking an informed consent. Prior to surgery antibiotic eyedrops were instilled two hourly in the eye to be operated and use of mydriatic eye drops were strictly avoided. The constricted pupil protects the lens from trauma during any

intraocular manipulation. Left eye of the patient was anaesthetized using peribulbar block (local anesthesia). The anterior chamber of the left eye was entered via a clear corneal stab incision using 15-degree straight blade (Fig.2-B). Intracameral preservative-free 1% lidocaine hydrochloride was injected (Fig.2-C) which led to chemo paralysis (loss of motility) of the parasite as well as mydriasis (intracameral meiotic agent could have been used to counteract mydriasis) (Fig.2-D). The corneal stab incision was further enlarged using 2.8 keratome(Fig.2-E). Viscoelastic agent was injected anterior to the paralyzed nematode (Fig.2-F), resulting in the expulsion of the worm from the anterior chamber in a one-piece (Fig.2-G). The worm was placed on viscoelastic agent covered corneal surface for measurement with calipers (Fig.2-H). It was later transferred to a sterile container containing normal saline, which was sent to microbiology lab for further evaluation. The Viscoelastic agent present in anterior chamber was expelled out by injecting normal saline filled in 10 cc syringe fitted with hydro-dissection cannula (Fig.2-I). The residual viscoelastic agent was removed using manual irrigation and aspiration (Fig.2-J). Corneal wound hydration was done (Fig.2-K), and surgery was completed with subconjunctival injection of gentamicin and dexamethasone (Fig.2-L). The postoperative period was uneventful and the complaint of floaters in left eye did not reoccur. The worm was sent to Indian veterinary research Institute, Izatnagar, Bareilly, Uttar Pradesh for evaluation and was identified based on morphological characteristics as nematode adult female specimen of Thelazia californiensis.

II. Discussion

Thelazia callipaeda is responsible for most of the cases of Human Ocular Thelaziasis in Asia, whereas Thelazia californiensis is less common and solely found in western united states of America [12]. These parasites can be intraocular or extraocular [13]. Our patient had intraocular Thelaziasis caused by Thelazia californiensis. He owned a cow in his home. Studies suggest a link between human ocular thelaziasis in Asia to poor socio-economic status, improper personal hygiene (e.g. wiping face with towels contaminated with cow dung), rural setting, keeping livestock or parasitized animals such as dog, cat, pig, sheep in the same environment [14] [15] [16]. The elderly and children between three to six years of age amount to 61% of human thelaziasis [16]. The natural cycle of vector activity of ocular Thelaziasis has seasonal distribution, during July-August. As our patient had complaint of floaters in left eye since 6 months. So, the transmission of disease probably happened around July of previous year. Clinical presentation of human ocular thelaziasis may range in severity from asymptomatic state or subclinical to clinical disease. The most common clinical presentations are foreign body sensation, excessive lacrimation, mild conjunctival irritation, ocular pain, less often photophobia, floaters, follicular hypertrophy, corneal opacity, and ectropion [2] [12]. Other findings, include Corneal ulcer, conjunctivitis and keratitis [2]. The secondary bacterial infections can often worsen these symptoms. The repeated migration of worms across conjunctiva can lead to scarification and consequent fibrous opacification of conjunctiva and cornea [12]. The adult worms can be often found in the conjunctival sac where they appear as white, threadlike, coiled masses. Rarely, it can be found in anterior chamber as creamy white motile worm. Microscopic examination of tears shows the presence of embryonated Eggs and larvae. The extraction of the worm from eye is the definitive treatment resulting in immediate alleviation of symptoms. Some reports suggest use of irrigation with 2-3% boric acid or Lugol's iodine for removal of worms from lacrimal duct [12]. Topical treatment with cocaine or thiabendazole have also been reported to kill the worms in human cases[12][13]. Levamisole and ivermectin have shown to cure similar infestations in Asia and Europe. There is no vaccine for thelaziasis [12]. Majority of species of belonging to genus Thelazia are transmitted by tear-feeding flies. So, the sanitary practices which decreases the population of flies will also reduce thelaziasis spread. In India studies show high infestation rate amongst dogs so Public health and prevention strategies are important.

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