

Case Series of Ocular Cysticercosis in School Going Children from Foothills of North Himalayan Region of India

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Abstract

Introduction: Ocular cysticercosis is a parasitic infection caused by larvae of *Taenia solium*. Occurring in 10-30% of the infected patients in endemic areas and may be extraocular or intraocular. It is one of the neglected tropical diseases. It may cause significant visual loss if not treated in time. Here we report three cases of ophthalmic cysticercosis in school going children, all of whom were vegetarian by diet. Each case was unique representing different clinical features and treatment requirements. *Case Series: Case 1:* A five year old school going female presented with painless nodular swelling in her left eye for 3months. On examination, she had a sub conjunctival nodule measuring 7mm x 6mm, about 3mm nasal to the limbus. Her radiological findings revealed a well-defined cystic lesion with well-defined eccentric hyperintensity suggestive of extraocular cysticercosis. Patient underwent surgical excision of the cyst, histopathological examination of which showed features of cysticercosis cellulosae. *Case 2:* A fourteen-year-old male presented with nodular painless swelling in the lateral aspect of the left eye since 8 years. Ocular examination revealed swelling measuring 13mm x 11mm about 6mm temporal to limbus. Clinical and radiological findings were suggestive of sub conjunctival cysticercosis. Patient was taken for surgical excision of the cyst. Histopathological examination revealed cyst of *Taenia solium* confirming the diagnosis of extraocular cysticercosis left eye infiltrating lateral rectus muscle. *Case 3:* An eleven-year-old girl, vegetarian by diet presented with complaints of blurred vision and floaters in right eye for 3 weeks. On retinal examination, a single translucent vitreous cyst was found which on ultrasound scans had features suggestive of intravitreal cysticercosis. Patient was taken up for pars plana vitrectomy for the removal of the cyst, which was removed piecemeal. *Conclusion:* Ocular cysticercosis, a neglected parasitic disease is now-a-days emerging as a common disease in the tropics. The diagnosis is mainly based on clinical features and radiology. Consciousness about importance of early diagnosis, appropriate surgical management and medical management with appropriate anthelmintic drugs should be increased among clinicians with community and personal hygiene measures for prevention of its spread.

Keywords: Ocular Cysticercosis; School-Going Children; Eye Disease.

Introduction

Ocular cysticercosis is a parasitic infection caused by larvae of *Taenia solium* (cysticercus cellulosae). This may be acquired by eating undercooked pork (containing larvae) or via ingestion of contaminated water, food and vegetables (containing eggs) or via autoinfection due to unclean personal hygiene [1]. It is one of the neglected tropical diseases prevalent in developing countries like India where both intraocular (subretinal, intravitreal or in the anterior chamber) and extraocular (sub conjunctival or orbital) cysticercosis is observed with almost equal frequency [1,2,3,4]. It may cause significant visual loss if not treated in time, especially if the cyst is located intraocular or if an extraocular cyst compresses on the optic nerve [5,6]. Ocular cysticercosis is usually not the site of primary lesion by this parasite, it is acquired accidentally or rarely via dissemination or autoinfection of taenia eggs. Here we report three cases of ophthalmic cysticercosis in school going children, all of whom were vegetarian by diet, from this institute, which caters to patients from foothills of Himalayas lying in Northern India. This region has lot of parasitic infections due to poor hygienic condition, lack of proper sanitation, open defecation and lack of education of proper hand hygiene. School going children are more prone and exposed to these unhygienic food-eating habits. However, few case reports have been there From other parts of India, data from this region of India is not available and actual burden of the disease may still be hidden from the tip of iceberg.

Case Report

Case 1

A five years old school going female child, resident of Nazibabad, Uttarakhand vegetarian by dietary habits, presented with a nodular swelling in her left eye following finger nail trauma 3 months prior to the presentation. The swelling was painless, progressively increasing in size, associated with redness and was being treated outside as conjunctivitis. There were no associated complaints of decrease in vision or double vision, floaters or pain or limitation of ocular movements. There were no neurological signs and symptoms. There was a history of being treated with antitubercular medicines in the past for tubercular lymphadenopathy. On ocular examination her best corrected visual acuity was 6/6 both eyes with a nodular swelling on the bulbar conjunctiva of the left eye measuring 7mm x 6mm, about 3mm nasal to limbus with adherence to the underlying structures. Anterior segment examination on slit lamp biomicroscopy was unremarkable. Although superficial and deep conjunctival and sclera congestion was present, but the conjunctiva overlying the swelling was freely mobile. There was no limitation of ocular motility. Examination of the posterior segment of the eye did not reveal any abnormality. B scan ultrasonography of the mass revealed a well-defined cystic lesion with well-defined eccentric hyperintense mural nodule involving the extraocular adnexal tissue. Computerized tomography showed small well-defined lesion with



Cyst seen in left eye

B scan

CT Scan

MRI



Stool Cyst??

Excision of Cyst

Cyst

Histopathology H & E of Cyst

Follow up at two weeks

Case 1: Figure

central hyper intensity 5mm x 3 mm in size in both coronal and axial sections involving extraocular tissue on the medial side of the left orbit. Magnetic Resonance imaging showed a cystic lesion with hyperintensity on medial side of the left orbit in T1 weighted images. However, computerized tomography and magnetic resonance imaging of the brain did not reveal any abnormality. Her stool examinations revealed Some cysts, but they were not pathognomic for taenia solium cysts and her ELISA for anti cysticercal antibodies was equivocal. Hence, a preoperative diagnosis of sub conjunctival cyst was made. The patient was taken up for excision of nodular cystic lesion of the left eye under general anaesthesia. Per -operatively it was found that the cyst was infiltrating into the fibers of medial rectus muscle, although ultrasonography did not reveal any such findings. Histopathological examination of the excised specimen showed features of cysticercosis cellulosae with eosinophilia and granulomatous inflammatory reaction in the surrounding tissue, confirming the diagnosis of extraocular cysticercosis of the eye with involvement of extraocular muscle. Post operatively the patient was given a single dose of Albendazole 15 m/kg body weight for deworming. On review, patient's ocular examination was normal and stool examination did not reveal any ova or cyst.

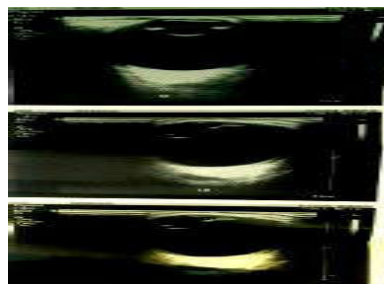
the lateral aspect of the left eye since 8 years, which had shown a recent increase in size since last 3 months associated with redness. This was not associated with diminution of vision, diplopia, drooping of lids or protrusion of eyeball. There was no discharge or watering and no evidence of floaters. There was no history of any other systemic illness. Patient was vegetarian in food habits. General physical examination was normal. Ocular examination revealed a nodular swelling measuring 13mm x 11mm about 6mm temporal to limbus with overlying freely mobile conjunctival tissues, but adherence to the underlying structures. Superficial conjunctival and deep scleral congestion was present. Rest of the anterior segment and posterior segment revealed no abnormality. On laboratory investigations ELISA for taenia solium was positive (1.32U) (positive > 1.1 U). Stool findings were negative for any ova or cyst. Ultrasonography B Scan revealed a well-defined extra ocular cystic lesion involving extraocular tissues of the left eye. Was seen. On Computerized Tomography of the orbit, a cystic lesion was seen with peripheral enhancement in the lateral aspect of the left orbit, but computerized tomography of brain did not reveal any evidence of neurocysticercosis. Surgical excision of the cyst was done under general anaesthesia and the cyst was send for histopathological examination which revealed cyst of taenia solium and confirmed the diagnosis of extraocular cysticercosis left eye infiltrating lateral rectus muscle. Oral albendazole was given postoperatively and patient was cosmetically normal and disease free on follow up.

Case 2

A fourteen-year-old male resident of Bijnour, Uttarakhand presented to the outpatient Ophthalmology department of AIIMS Rishikesh with chief complaints of a nodular painless swelling in



Cyst in eye



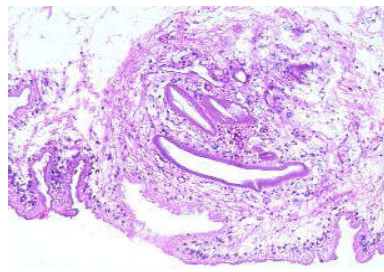
B Scan-USG



CT Scan



Excised Cyst



Hisopatholgy H& E



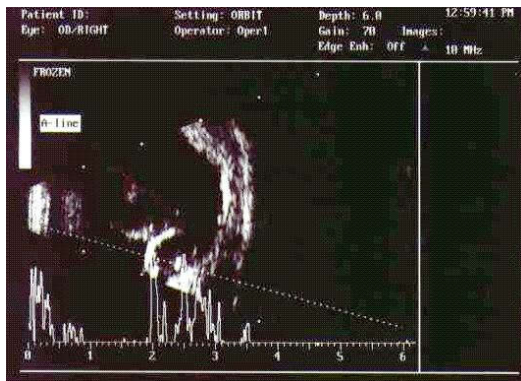
Follow up at 6 weeks

Case 2:

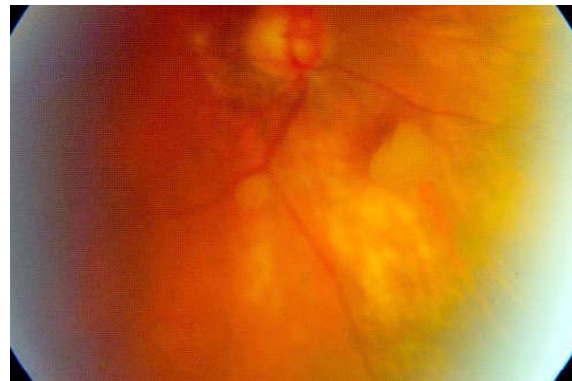
Case 3

An eleven-year-old girl, vegetarian by diet presented to the eye OPD with complaints of blurred vision and floaters in right eye for 3 weeks. She had best corrected visual acuity of 6/24 Right eye and 6/6 left eye. Slit Lamp biomicroscopy of the anterior segment was unremarkable bilaterally. However vitreous examination revealed +1 cells with a floating material in the vitreous cavity. On examination with a fundus viewing lens, a single translucent vitreous cyst was found in the mid vitreous cavity which

showed undulating movements within the cyst with light. No other sub retinal cysts were seen. Ultrasound A scan revealed two reflective echo spikes and B scan showed an ovoid echo density in the mid vitreous. Blood eosinophilia was noted but stool parasitology examination and ELISA revealed no evidence of cysticercosis. MRI of the brain did not show any evidence of neurocysticercosis. Patient was referred to the vitreoretinal team for pars plana vitrectomy for the removal of the cyst under the cover of systemic steroids. On review post operative examinations patient had a good visual recovery of 6/9.



Case 3: USG scan



Intravitreal cyst on Fundus photograph.

Discussion

Cysticercosis affects an estimated 50 million people worldwide. Ocular cysticercosis is endemic in tropical areas, such as sub-Saharan Africa, India, East Asia, Mexico and Latin America. The reported incidence of ocular involvement varies from 10 to 30% in endemic areas [7]. In India, 78% of the cases with ocular cysticercosis have been reported from states of Andhra Pradesh and Pondicherry (now Puducherry) [8,9]. There is no specific sex predilection. People of any age may be affected, although orbital cysticercosis is more commonly reported in younger age groups. In our case series school going children between 5-15 years of age were diagnosed with ophthalmic cysticercosis. So probably an accidental inoculation may be the cause of such cases. Ocular cysticercosis can involve any part of the eye: approximately 4% involve the eyelid or orbit, 20% involve the subconjunctival space, 8% involve the anterior segment, and 68% involve the posterior segment (subretinal and intravitreal). In Western countries, the most common site of involvement in ocular cysticercosis is subretinal [10].

In India, both intraocular cysticercosis and extraocular cysticercosis are seen with almost equal

frequency. Ocular and adnexal cysticercosis represents 13% to 46% of systemic disease. In our series the two cases were myocysticercosis with sub conjunctival presentation and one in vitreous cavity. The presentation of ocular cysticercosis varies based on cyst location, from asymptomatic to vision loss or disturbance and a moving sensation in the eye. Redness, photophobia, and pain may occur. Ocular manifestations may be devastating as the cysticercus enlarges and it may lead to blindness if left untreated [11]. Within the vitreous cavity, the cyst may be free-floating [12,13] and may produce vitritis as was seen in our case 3. Apart from vitritis [14] cysticercosis may also lead to retinal and vitreous hemorrhages, proliferative vitreoretinopathy, retinal detachment, disc edema, cyclitic membrane formation, and phthisis. Cysticerci in the anterior chamber, although uncommon may produce iridocyclitis and secondary glaucoma [15]. Conjunctival involvement is usually in the form of a painless or painful yellowish, nodular subconjunctival mass with surrounding conjunctival congestion.

Extraocular myocysticercosis usually presents as recurrent pain, redness, proptosis, ocular motility restriction, diplopia and ptosis [16,17]. One or more extraocular muscles may be simultaneously involved, although a propensity for involvement of the superior

muscle complex and the lateral rectus muscles has been reported [18]. 2 of our patients, although they were cases of myocysticercosis, did not have any diplopia, pain or motility restriction. Also optic nerve compression by an orbital cyst may cause decreased vision and disc edema [19].

In these cases, the presentation was as painless subconjunctival nodules with conjunctival congestion. Although they were myocysticercosis involving medial rectus muscle in one case and lateral rectus muscle in other but presented as subconjunctival nodules due to spontaneous extrusion of cyst from extraocular muscle into the subconjunctival space because of the constant motility of the larvae.

The diagnosis of cysticercosis is based on clinical, serologic, histological and radiological findings. Positive test results from a serum enzyme-linked immunosorbent assay (ELISA) for anticysticercal antibodies help confirm the diagnosis; however, negative test results do not exclude cysticercosis. In fact, only 50% of ocular cysticercosis cases test positive on ELISA, whereas 80% of neurocysticercosis cases test positive [20]. Thus, imaging studies are most helpful in establishing the diagnosis of ocular cysticercosis as was in our case series. High resolution Ultrasonography (USG), computed tomography (CT) and Magnetic Resonance Imaging (MRI) help in detection of the orbital cyst. Though stool examination for the adult worm may be performed in cases of suspected myocysticercosis infections, it is not essential that all patients with myocysticercosis will have the adult worm in their intestines except in those cases, which are acquired by auto-infection. This explains why the stool examination did not show the presence of worms or cyst in our cases.

Surgical removal by pars plana vitrectomy is mandatory in individuals with intraocular cysts. Medical therapy, other than the use of corticosteroids, is not part of treatment. In individuals with uveitis, perioperative corticosteroid administration is recommended. Cysts deep within the orbit are best treated conservatively with a 4-week regimen of oral albendazole (15 mg/kg/d) in conjunction with oral steroids (1.5 mg/kg/d) in a tapering dose over a 1-month period.

The treatment of anterior chamber cysticercosis is essentially surgical. Anterior subconjunctival cysts may be treated with excision biopsy [21] As the cyst is usually adherent to the adjacent muscle, excision may be difficult. Care must be taken to keep the extraocular muscle intact during dissection as was in both of our cases of myocysticercosis.

Conclusion

Ocular cysticercosis, a neglected parasitic disease is now- a-days emerging as a common disease in the tropics. There is a scarcity in sero diagnostics to aid its laboratory diagnosis. The diagnosis is mainly based on clinical features and radiology. Management of both intraocular and extraocular forms continues to pose a serious challenge to the clinicians. Emphasis should be on appropriate sanitation and improvement of personal hygiene to control faeco-oral transmission of the disease. Raw and improperly cooked food should be avoided in endemic areas to reduce the morbidity and ocular blindness due to this preventable disease.

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Conflict of Interest: NIL

Key Messages

Ocular cysticercosis, a neglected parasitic disease is now- a-days emerging as a common disease in the tropics. There is a scarcity in sero diagnostics to aid its laboratory diagnosis. The diagnosis is mainly based on clinical features and radiology. Management of both intraocular and extraocular forms continues to pose a serious challenge to the clinicians. Emphasis should be on appropriate sanitation and improvement of personal hygiene to control faeco-oral transmission of the disease. Raw and improperly cooked food should be avoided in endemic areas to reduce the morbidity and ocular blindness due to this preventable disease.

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