Case Report

Orbital Myocysticercosis in Abakaliki: A Case Report

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Abstract

Cysticercosis describes human soft tissue infestation with the larval form of the pig tapeworm *Taenia solium*. It may affect the brain parenchyma, orbital or intraocular tissues, striated muscle, viscera, subcutaneous tissue, or skin. Clinical presentation depends on the location. We report a case of an 8-year-old boy presenting with painful proptosis and inferior globe displacement from myocysticercosis of the left superior rectus muscle. The radiological findings of a thick cyst capsule appearing as a well-defined hyperdense ring with a central hypodense core and a hyperdense focus within the core representing the scolex were classical of the disease. The patient responded well to oral antihelminthic and steroid therapy with no residual deficits. Cysticercosis is endemic in developing countries. The increased awareness of the different disease presentations will result in a high index of suspicion which is needed for early diagnosis and institution of appropriate treatment.

Keywords: Albendazole, cysticercosis, orbit, taenia solium

Introduction

The adult tapeworms *Taenia solium* from pigs, *Taenia saginata* from cattle, and *Taenia asiatica* may infest the intestines of humans. The larval form of *T. solium* is cysticercosis cellulosae and is the most common cause of helminthic infestation of the human tissues. It may affect the skin, the muscles, the central nervous system (CNS), and the ocular tissues.[1] *T. solium* is the most important cause of food-borne infestations in humans and is of significant public health importance.[2] Cysticercosis may occur in individuals who do not eat pork.[3]

Ophthalmic involvement in cysticercosis may be intraocular or extraocular. The cyst may be found in the subretinal space, in the vitreous cavity, or the anterior chamber in intraocular disease.[3-6] Extraocular disease may involve the subconjunctival space, the superior rectus/levator palpebrae superioris complex,[7] other extraocular muscles,[8,9] and the optic nerve.[10-12] Its presence in the lacrimal sac has also been reported.[13] The frequency of ocular affectation varies from study to study,[3,4,6-9,14] with a tendency toward the increased diagnosis of intraocular disease with advances in vitreoretinal skills and technology.[3] Subconjunctival cysticercosis was previously reported as the most common type (44–86%), but more recent publications favor myocysticercosis at 79.2%.[13] Ocular involvement may result in vision loss, severe inflammation, or mass effect such as proptosis and dystopia as seen in this case.

Case Report

An 8-year-old boy presented at the Eye Clinic of the Federal Teaching Hospital, Abakaliki, Ebonyi State, with the complaints of progressive swelling of the upper part of the left eye of 3 months duration. He had also noticed protrusion of that eye and drooping of the left eyelid with mild pain occurring 2 months after the onset of swelling. There was no history of the consumption of poorly cooked pork or contact pigs and no evidence of gastrointestinal involvement. There was no history of seizures. Examination revealed moderate mechanical ptosis with nonaxial proptosis of 6 mm with inferior dystopia of 5 mm [Figure 1]. There was also marked conjunctival congestion with restriction of upgaze. There were no focal neurological deficits. Visual acuity was 6/6 in the right eye and 6/9 in the left eye. Fundus findings

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Figure 1: Appearance at presentation

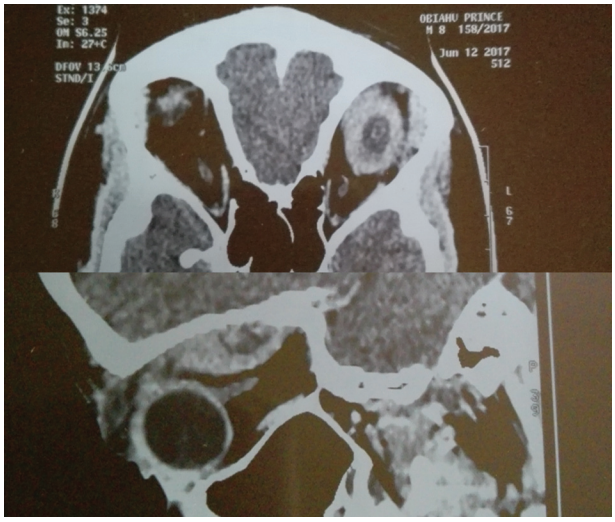

Figure 2: Characteristic appearance of cysticercosis on computed tomography scan

were essentially normal in both eyes. There were no swellings in any other parts of the body. Computerized tomography of the orbit showed a cystic mass on the superior orbit displacing the globe outwards and downwards. The cyst capsule was a thick, well-defined hyperdense ring with a central hypodense core and a hyperdense focus within the core representing the scolex [Figure 2]. The brain parenchyma and ventricular system appeared essentially normal. Full blood count was normal except for marked eosinophilia. A diagnosis of cysticercosis involving the superior rectus muscle was made and he was given albendazole 15 mg/kg/day for 1 month and tabs prednisolone 1 mg/kg/day for 1 month. At 1 month, marked reduction in the proptosis, dystopia, and inflammation were noted, with a residual 3 mm of proptosis. Medications were therefore continued for another 4 weeks. Albendazole was stopped at the end of the second month and steroids tapered over the next 4 weeks. Residual proptosis and ptosis all regressed with steroid therapy with both eyes appearing symmetrical [Figure 3]. The patient suffered a transient fluid retention on oral steroids which resolved on the termination of the medication. He has remained asymptomatic for another 6 months of follow-up.

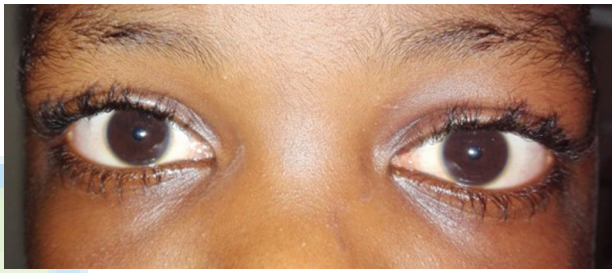

Figure 3: Appearance at completion of treatment

Discussion

T. solium is a zoonotic cestode which has a complex two host life cycles. Humans are the only definitive hosts, harboring the adult tapeworm in the gut without significant symptoms.[15] The adult tapeworm infestation is acquired by eating raw or undercooked pork meat containing cysticerci or poorly washed foods and vegetables. The pig acquires the parasite as the intermediate host by the ingestion of infected human droppings. These ingested eggs are absorbed and disseminated hematogenously to the pork muscles. When ingested as poorly cooked pork by humans, the definitive host, the cysticerci adhere to and lodge in the intestine where they develop into the adult tapeworm, *T. solium*. These can reside asymptomatically in the intestine for several years. They intermittently shed millions of viable eggs in their proglottids into the intestines and feces to cause both human and porcine recontamination via feco-oral transmission, fecal contamination of foods, and poorly washed vegetables, following the use of human or pig droppings as manure.[16] These eggs are absorbed in the intestines and transmitted hematogenously to the CNS,[17] the muscles,[18] or the ocular tissues.[15] CNS involvement accounts for 70% of the epilepsy in developing countries, making cysticercosis the most common preventable cause of epilepsy in the world.[19] The presence of the cyst in the tissue stimulates intense inflammatory reaction with local tissue destruction as well as a mass effect.[1]

About 50 million people worldwide are estimated to have cysticercosis infection.[20] Many infections are subclinical and there are few data on prevalence; therefore, estimates are likely to be low. Prevalences vary from place to place with neurocysticercosis occurring in almost half of the people infected in endemic areas. Serodiagnostic tests such as Enzyme linked immunosorbent assay (ELISA) for anticysticercal antibodies or cysticercal antigens may assist diagnosis but are not specific.[15,21] Onah and Chiejina reported the prevalence of taeniasis in Nsukka at 8.6%[22] while Biu and Hena reported a 4.2% prevalence of the disease in Maiduguri.[23] Both intestinal infestation and

soft tissue cysticercosis occur globally. This parasitic infection is found in the areas of poor sanitation in Africa, Latin America, and Asia where grazing pigs have access to human feces. Taeniasis/cysticercosis has been reported by the World Health Organization as one of the 17 neglected tropical diseases requiring further research and control.[17,24] The disease is common in children and young adults, but there is no sex predilection.[15] Edia-Asuke *et al*. report a seroprevalence for *T. solium* of 14.3% in a cross-sectional study in Kaduna. The poor methods of pork preparation and epilepsy were strongly associated with seropositivity.[25] Ocular involvement may be intraocular or extraocular (adnexal). Intraocular cysticercosis may present as a chronic uveitis, retinal detachment, or free-floating intracameral cystin the anterior chamber, the vitreous or subretinal space.[3-6,26] Wender *et al*. report a prevalence of 0.001% of intraocular cysticercosis in their uveitis service, 63.6% subretinal, and 36.4% intravitreal affectation.[4] Adnexal involvement includes the extraocular muscles, subconjunctival tissue, the intraconal and extraconal spaces, or the eyelids and have been reported many times.[7,27-30]

Diagnosis is based on the clinical presentation of a mass effect as well as the classical radiological findings of thick cyst capsule appearing as a well-defined hyperdense ring with a central hypodense core and a hyperdense focus within the core representing the scolex. Naik *et al*. put forward 3 classical ultrasonographic presentations of cysticercosis as a typical cyst with a scolex within which may be surrounded abscess; the same, surrounded by oedema; or an irregular cyst without a scolex.[31] Honavar and Sekhar describe the modality as "practical, precise, and cost effective" for primary evaluation and treatment monitoring in the cases of orbital cysticercosis.[32] Ultrasonography offers the advantage of affordability and cost effectiveness; it is readily available in many ophthalmology practices and is easy to perform. The drawback of this modality, however, is the inability to assess the involvement of the brain parenchyma to rule out neurocysticercosis. Computed tomography or magnetic resonance imaging, on the other hand, though more expensive, offers opportunity to both evaluate the orbit and the brain parenchyma.

Eosinophil count is often elevated. Excision biopsy and histopathology may result in the identification of parts of the scolex in the biopsy sample such as hooklets scolex, tegument, and so on.[33,34]

The treatment of cysticercosis has evolved over the years with albendazole emerging as a safe and effective treatment modality for the disease.[12,35,36] Praziquantel was previously the mainstay of treatment but has been largely replaced by albendazole as a safer modality. Combination therapy with albendazole and praziquantel is recommended for neurocysticercosis, because together they offer increased synergy in parasite death.[36] Intense inflammation is stimulated by the dead parasite which may worsen seizures in neurocysticercosis and soft tissue edema in other sites. The treatment therefore comprises an antihelminthic, combined with steroid therapy and a histamine 1 receptor antagonist for gastric mucosal protection.[12,37]

Rath *et al*. report residual functional deficits including ptosis, proptosis, motility restriction, diplopia, and strabismus in 21% of the patients after treatment had been completed.[12] They opined that early diagnosis and treatment may reduce the risk of persistent functional deficits at the end of appropriate therapy.[12] Murthy and Samant reported only residual muscle restriction in his series.[8]

Conclusion

Cysticercosis is endemic in developing countries. Clinical presentation varies with the site of affectation. An increased awareness of the different disease presentations will result in a high index of suspicion which is needed for early diagnosis and institution of appropriate treatment.

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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Conflicts of interest

There are no conflicts of interest.

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