

Subconjunctival Cysticercosis: Case Report and Review of Literature

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Abstract: *Cysticercosis is caused by the larval stage of Taenia solium. Ocular involvement of cysticercosis is known and often misdiagnosed clinically. Incidence of subconjunctival cysticercous cysts among the cystic lesions of conjunctiva is 8.89%. A 13 year old boy presented with swelling in the medial aspect of left eye since 1 month. He had solitary, painless lesion without any systemic involvement. On excision, histopathology revealed cysticercous cyst. Here we report this case for their rarity of the site and importance of routine histopathological examination for correct diagnosis of subconjunctival cysticercosis.*

Keywords: Subconjunctival Cysticercosis, Cysticercosis, Ocular Cysticercosis

1. Introduction

Cysticercosis cellulosa, the larval form of the pork tapeworm *Taenia solium*, is the causative organism of cysticercosis, in which humans are the intermediate hosts in the life cycle. It is contracted by ingestion of infective cysticerci in undercooked pork, ingestion of eggs of *Taenia solium* through contaminated water, food or vegetables and autoinfection by regurgitation of eggs from the small intestine or due to unclean and unhygienic personal habits. *Cysticercus cellulosa* may become encysted in various bodily tissues, *Cysticercus cellulosa* may be solitary or more often multiple, commonly numerous. Any organ or tissue may be involved, the most common being subcutaneous tissues and muscles. It may also affect the eyes, brain, and less often the heart, liver, lungs, abdominal cavity and spinal cord [2]. Ocular involvement occurs in 10-30% of the infected patients in endemic areas and may be extra ocular or intraocular [3]. Incidence of subconjunctival cysticercous cysts among the cystic lesions of conjunctiva is 8.89% [4]. Here we report a case of subconjunctival cysticercous diagnosed on routine histopathological examination.

2. Case Report

A 13 years old boy, pure vegetarian presented with a gradually increasing swelling in the medial aspect of left eye since one month. He had solitary pea size painless lesion associated with foreign body sensation in the eye i.e watering of the eye & discomfort on closing the eyelids, without any systemic involvement. Patient past medical history was non-contributory. Clinical examination revealed an oval subconjunctival swelling, 1cm x 0.8cm near the medial aspect of left eye with overlying congested conjunctiva (Figure 1 and 2). The B-scan USG of left eye & orbit showed a complete thick-walled subconjunctival cyst, 10mm x 7.0mm x 6mm on the anteromedial aspect, with an eccentric high reflective opacity suggesting a scolex and low reflective mobile opacities filling the cyst cavity. No abnormality was detected in the right eye & on systemic examination. Results of complete blood count and stool examination were normal in our case. USG abdomen &

pelvis and CT-scan brain was also normal. A differential diagnosis of (a)Hydatid cyst (b)Neurocysticercosis was given. Excisional biopsy of the swelling was done and intact cyst was removed and sends to us for histopathological examination. On gross (Figure3) histopathological examination, The specimen consisted of single globular grey white cyst with smooth transparent cyst wall and a pearly white dot corresponding to the scolex, cystic structure filled with colour-less fluid. Cut surface drained clear fluid. A single grey white nodule measuring 0.2mm seen on cut surface. Microscopic examination showed polypoidal lesion lined by conjunctival epithelium, subconjunctival zone showed loose areolar tissue with mixed inflammatory cells infiltrates comprising of lymphocytes, plasma cells, neutrophils and eosinophils, with parasite having outer cuticle layer, middle loose areolar tissue like zone and inner cuticle layer with few hooklets in the cavity (Figure 4, 5, 6). Evidence of foreign body giant cell reaction was seen. Based on these findings, a diagnosis of subconjunctival cysticercosis was made.



Figure 1: An oval subconjunctival swelling near medial aspect of left eye.

Volume 5 Issue 8, August 2016

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Figure 2: Intra-operative Cyst

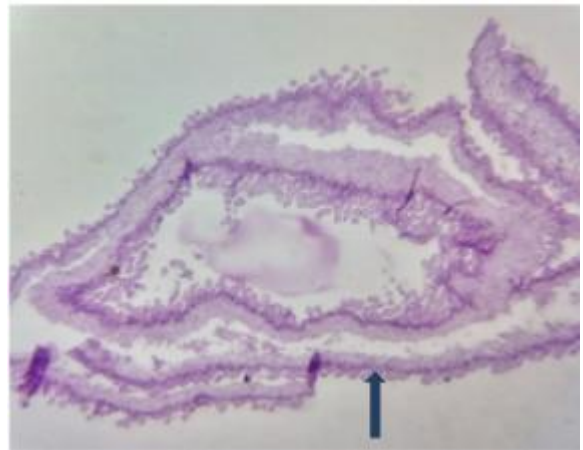


Figure 5: Membrane of cyst showing the outer layer covered with microvilli (ARROW) (H&E 40X)



Figure 3: Gross appearance of the cyst with a transparent cyst wall and a pearly white dot corresponding to the scolex

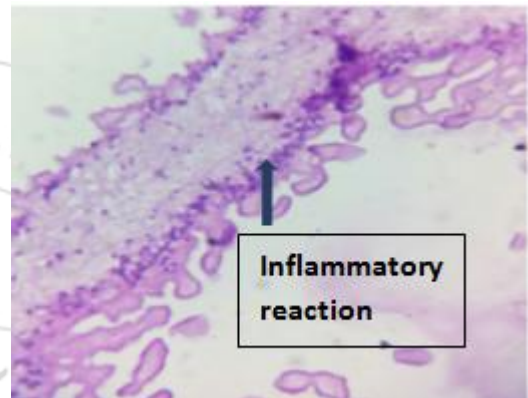


Figure 6: Integument with surrounding inflammatory cells (H&E, 100X)

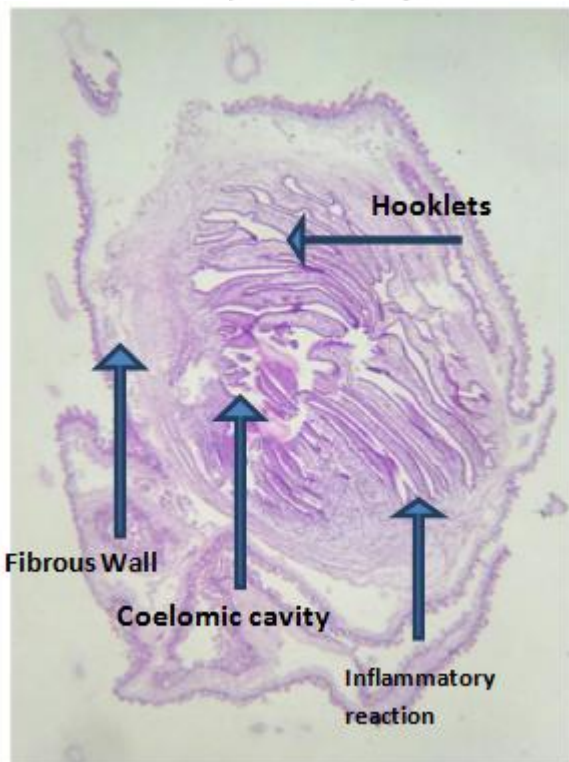


Figure 4: Histopathological picture cyst with cysticercus larva having invaginated scolex and hooklets with an outer integument with surrounding inflammatory cells (H&E 40X)

3. Discussion

Cysticercosis is a parasitic infestation caused by *Taenia solium*. The mode of transmission is faeco-oral. It has been estimated that 50 million people are infected by *T. solium* in the world, of which 350 thousand live in Latin America^[9] especially in those countries that do not have an adequate health infrastructure and proper health education program.^[10] The main risk factors associated with the CC are the presence of peoples infected by *T. solium* in the community with inadequate primary health care system, without proper health education and personal and food hygiene and without a sustainable supply of safe and clean water and where free-range pigs are able to ingest contaminated human feces and the use of infected feces as an agricultural fertilizer.

The embryos (oncospheres) developed after hatching penetrate the intestinal wall and disseminate to different tissues by hematogenous route. These oncospheres develop into cysticerci in different organs and tissues^[11]. The sites of predilection are brain, subcutaneous tissue, eye, skeletal muscle, heart muscle, liver, lungs and peritoneum. Ocular dissemination of *Cysticercus cellulosae* is well known with several reports in medical literature. Ocular Cysticercosis is endemic in sub-Saharan Africa, India, East Asia, México and Latin America^[2].

Some authors consider that intraocular cysticercosis is predominant in the Western countries, whereas extraocular

is more common in the Indian population attributed to geographic and environmental factors.^[11, 13] However, other affirms that intraocular involvement is more common in India compared with Western countries.^[12] And involvement of conjunctiva is most commonly reported in India^[14], whereas involvement of posterior segment of the eye is most commonly seen in Western countries.^[15] Compared with conjunctival region but it also can be seen in India.^[16] In the eye, common sites of involvement are the vitreous cavity, sub-retinal space & subconjunctival tissue.

Ocular manifestations of cysticercosis vary from asymptomatic to painful blind eye and may be associated with neurological symptoms such as headache, fits, diplopia, and restriction of the ocular movements, nystagmus and papilloedema. Approximately 4% involve the eyelid or orbit, 20% involve the subconjunctival space, 8% involve the anterior segment, and 68% involve the posterior segment^[5]. In our case, patient presented with subconjunctival swelling. In the conjunctiva, Cysticercosis usually presents as a cyst. According to Nath et al, incidence of subconjunctival cysticercous cysts among the cystic lesions of conjunctiva was 8.89%^[4].

The conjunctiva is a connection between the eyelids, sclera and cornea. It is the mucous membrane that lines the posterior surface of the eyelids (palpebral conjunctiva) and the anterior aspect of the globe (bulbar conjunctiva). The host inflammatory response to cysticerci located into the conjunctival depends on the parasite's ability to evade host immunity; therefore, inflammation is restricted to degenerating cysts whose ability to evade host defenses is faltering. Lack of inflammation occurs with both healthy cysticerci (vesicular stage) and those that have involuted (inactive disease). Upon involution, cysts undergo granulomatous change and exhibit calcification^[17]. It almost never happens in the conjunctiva region. Subconjunctival cysticercosis usually presents as a painful, yellowish, nodular subconjunctival mass with surrounding conjunctival congestion or may even present as an eyelid nodule or even as subconjunctival abscess from orbital myocysticercosis^[22].

Patients presenting lacrimal canalicular obstruction have been reported as well^[18]. The most common outcome is the spontaneous extrusion of the *T. solium* cysticercus^[19], sometimes they got extruded from the orbit or from subconjunctival space but almost always associated with clinical improvement^[19]. Anterior subconjunctival cysts may be treated with excision biopsy. As the cyst is usually adherent to the adjacent muscle, excision may be difficult. Care must be taken to keep the extra ocular muscle intact during dissection because an excessive intra operative dissection of the sub conjunctival cyst may damage the extra ocular muscle fibers, leading to postoperative diplopia and strabismus.^[20, 21]

There is no specific sex and age predilection, although orbital cysticercosis is more common in younger age group. Either eye may be affected but bilateral involvement is rare. In our case, left eye was involved. There were no such signs in our case. An excisional biopsy gives definitive diagnosis.

Once the infection is diagnosed, systemic involvement especially CNS involvement must be ruled out by laboratory tests and radiologic imaging studies. CT scan & MRI are useful to demonstrate the location, number & size of the cysts^[6]. Serological tests like ELISA (enzyme-linked immunosorbent assay) or EITB (enzyme-linked immunoelectro transfer blot) are useful to detect antibodies to *Taenia solium* in serum, cerebrospinal fluid & saliva. However in individuals living in an endemic area, antibodies may be present because of an exposure and not an established infection^[7, 8].

4. Conclusion

This case reveal the importance of routine histological examination, emphasizing the need to consider diagnosis of subconjunctival cysticercosis in patients living in endemic areas presenting with solitary, nodular ocular lesion & the necessity to adopt appropriate measures to ensure food sanitation and personal hygiene in controlling this disease.

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