ORBITAL CYSTICERCOSIS

Case Report

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ABSTRACT

A 47-year-old male presented to the Ophthalmology department at Ndola Teaching Hospital with a discharging wound extending from the lower eyelid on the lateral aspect of the right eye and a melted cornea. He had a history of having undergone a surgical procedure for a conjunctival growth, 6 months prior to presentation. He was a known retroviral disease patient with poor compliance to antiretroviral medication. He also history of tuberculosis. Orbital cysticercosis was diagnosed following clinical examination and investigations and anti-helminthic therapy was instituted.

INTRODUCTION

Cysticercosis is a parasitic infection that is caused by the larvae of Taenia Solium, which is a pork tapeworm [1]. The infection is acquired through ingestion of contaminated food and water transmitted through the faecal--oral route [1]. Neurocysticercosis is a central nervous system variant of the infection, responsible for causing seizures worldwide [1]. The infection is postulated to cause twice as many epilepsy occurrences compared to developed countries.

In the United States and other areas with large immigrant populations, there has been wide spread recognition of neurocysticercosis as a common infection, not just in developing countries [2]. The highest prevalence rates have been documented in South and Central America, Africa and Asia particularly in areas of poor sanitation and low socioeconomic status [3]. In Africa, it has been noted that Taenia Solium is transmitted around most of the continent but not in the strictly Muslim areas of North and sub-Saharan Africa where pork is not consumed [4]. As in Asia, concomitant localization of subcutaneous lesions with intracerebral infection is common in Africa. A different picture is seen however in the United States where intracerebral infection rarely occurs together with subcutaneous lesions [5].

One of the challenges in Africa and inmost endemic areas is the lack of awareness within communities as well as lack of adequate reports and study findings on cysticercosis [6]. This can be attributed to the lack of advanced diagnostic facilities and technology that would allow prompt screening and identification of infected individuals [7]. Few countries however, such as South Africa, Zimbabwe, Madagascar and other countries in Central, East and West Africa have been able to produce scientific reports although data still remains limited [7]. Consent for the case report publication was obtained from the patient.

In Zambia, the full countrywide extent, of the impact of cysticercosis in terms of prevalence, endemic areas as well as socioeconomic effect is not fully appreciated. Several studies however, have been carried out in Eastern province, tackling aspects such as prevalence of cysticercosis in bovine as well as human hosts as well as effectiveness of control measures for the prevention of spread of infection. Human cysticercosis prevalence has been reported to range from 6-13% based on circulating antigen detection whereas bovine cysticercosis prevalence was reported to range from 8.2-64.2%, in Eastern province [8].

CASE SCENARIO

A 47 year old male from Ndola city on the Copperbelt province of Zambia presented to the eye department at Ndola Teaching Hospital complaining of a painful right eye with a discharging wound for one week. These symptoms were said to have begun after he fell in the bathroom, whilst taking a bath. There was also a history of having had a growth on the white part of the eye (conjunctiva) excised from the same eye, one year prior. A sample was taken for histopathology but the results were not followed up. Five months after excision, another growth was noticed in the same eye, which he opted to have removed with a blade at home, by a relative. A few days later, he started experiencing the pain and discharge and presented to the eye department a week later. There was also history of having been on antiretroviral therapy (ARVS) for the past seven years for Human Immunodeficiency Virus (HIV), with poor compliance to medication. Anti-tuberculosis medication had been completed 7 months prior to presentation.

On general examination, the patient was ill looking and irritable but had normal vital signs (blood pressure, pulse, temperature, respiratory rate), with palpable cervical lymph nodes. Ocular examination revealed visual acuity (VA) of perception of light (LP) for the right eye and 6/6 for the left eye. Intraocular pressure (IOP) could not be taken in the right eye, but was 14.3mmHg in the left eye. The right eye had ecchymosis on the eyelids with a laceration extending from the lower eyelid to lateral canthus and past the margin. There was also a foul smelling, purulent, blood stained discharge covering the anterior aspect of the eye. The cornea was melted and the rest of the anterior segment structures could not be appreciated. Extraocular motility was not well appreciated due to the patient’s demeanour. The left eye had normal anterior and posterior segment findings.

Differential diagnoses included right lid laceration with corneal ulcer, osteomyelitis, orbital cellulitis and squamous cell carcinoma of conjunctiva and eyelid. Full blood count, differential count, renal and liver function test results were all within normal ranges. The CD4 count was 65cells/ul. The skull x-ray showed a homogenous opacity in the right later-
al orbital region. Computed Tomography scan (CT scan) of the head showed small, numerous hypodense opacities scattered throughout the brain parenchyma, including the right orbital region; features consistent with cerebral, subarachnoid and right orbital cysticercosis.

The patient was initiated on albendazole 400mg, orally, once a day for 3 days, praziquantel 2,600mg orally, once a day for 15 days with daily wound cleaning with povidone iodine three times a day. A week later, the patient was referred to the HIV/AIDS specialists for further assessment, counselling and drug therapy re-assessment, and was recommenced on antiretroviral therapy (Tenofovir/Lamivudine/Efavirenz).

By the third review, the patient’s laceration had healed and the discharge was no longer present. The patient however still had a melted cornea and a VA of LP in the right eye. A B-scan performed on the fourth visit indicated the absence of cysts in the posterior segment and orbit.

Figure 1: patient’s right eye with laceration wound, absence of lower lid lashes and chemosis.

Figure 2: Right eye with melted cornea.

Figure 3: skull x-ray; Anterior-Posterior view showing homogenous opacification in the orbit-right eye.

Figure 4: CT-Scan of the head with numerous well circumscribed hypodense lesions in the brain.
Cysticercosis is a condition caused by the tapeworm species Taenia Solium (mainly, Taenia Saginata and Taenia Asiatica [9]). It is commonly associated with a low socio-economic status, in areas with free-roaming pigs and low hygiene standards. Despite the condition being generally known to be caused by infected pork, it has been noted that cysticercosis is caused by re-infection, that is, ingestion of cysts passed out through stool. The infection obtained through direct ingestion of infected, undercooked pork, water, fruit and vegetables is referred to as taeniasis. In the past, neurocysticercosis (NCC) was referred to as a neglected disease together with echinococcosis but is now recognised as a major neglected tropical disease in the world[10]. This can be attributed to the increase in cases being diagnosed in tropical regions but without sufficient and accurate data on prevalence rates and the full extent of the infection [11]. Perhaps the absence of sensitization and lack of knowledge within communities on the existence of the disease can also be considered as a contributing factor to why some cases are missed. With the prevalence of HIV/AIDSs, cysticercosis is now a frequent opportunistic infection, responsible for focal brain lesions in patients with HIV [12].

The patient presented with symptoms at the age of 47. However, most literature states that individuals often present in the first and second decade of life. In a study carried out in India to determine the clinical manifestations, diagnosis, management and outcome of orbital cysticercosis, the median age at presentation was found to be 13 years [13]. NCC commonly affects the brain parenchyma but can also be found in the ventricles, meninges, spinal cord, eye and subarachnoid spaces. Occurrence of these cysts in other sites has been associated with racemose cysts, which predispose to an even more complicated disease process [4].

In the case of our patient, the cysts occurred in the brain parenchyma and the orbit. The main symptom was presence of a painful discharging wound on the right lower eyelid, associated with poor vision. Studies have however shown that most patients with NCC present with seizures and NCC is considered to be the most common cause of adult-onset epilepsy in the United States [11]. A study carried out in 1993 involving extrapolation of the population at risk and adjusting for disease other than seizures indicated that 400,000 people had symptomatic NCC in Lower Middle-Income Countries (LMICs) [14]. This was deduced by estimating mainly the active epilepsy, by subtracting epilepsy rates in non-endemic regions from rates in endemic regions in Peru [14]. This information may not be applicable to all LMICs however, as differences do exist in terms of individual country population and endemicity. Recent studies have however, through determination of active epilepsy rates from 0.6% to 1.8%, indicated that between 450, 000 and 1.35 million people in LMICs suffer epilepsy due to NCC [14, 15, 16]. The seizures are due to calcified granulomas which may develop sporadic episodes of oedema, and in later stages, cause inflammatory responses [17].

Orbital cysticercosis occurs in approximately 4% of individuals with ocular cysticercosis. Despite occurring in the vitreous, subretinal space and subconjunctiva, the orbit is occasionally the site for cyst lodgement [18]. Ocular manifestations of NCC usually worsen as the larvae increase in size and may lead to blindness in 3 to 5 years. The parasites release toxins which cause severe inflammatory reaction and eventually lead to destruction of the ocular structures [19]. This was noted in our patient, who presented with a wound on the lower eyelid as well as corneal melting that is corneal ulceration and stromal dissolution. The presence of a profuse purulent discharge clinically indicated superimposed bacterial infection although pus swab examination did not identify any growths on the media. The presence of the discharge can also be attributed to immunosuppression as a result of HIV/AIDS co-infection which pre-disposed the patient to other infections. Investigations carried out included imaging studies such as computed tomography (CT), skull x-ray and ultrasonography (ocular B-Scan). The patient’s CT confirmed the presence of cysts in the brain parenchyma as well as the right orbit-a feature pathognomic with NCC. No cysts were noted in the anterior segment, and the B-scan did not pick any cysts in the posterior segment. Imaging studies such as high-resolution sonography, CT and magnetic resonance (MRI) have been noted to be most beneficial for identifying and diagnosing cysticercosis [19]. Serological tests such as Enzyme-linked immuno-transfer blot (EITB) and enzyme linked immunosorbent assay (ELISA) to detect antibodies and co-agglutination were not carried out as resources were unavailable. Recent diagnostic advancements have seen the development of assays that are able to detect parasite antigens in serum and cerebral spinal fluid and can also be used to detect active infections. These assays however, are best used in combination with imaging.

In terms of treatment, larvicidal drugs such as albendazole and praziquantel are often used to kill the larvae[13]. According to WHO, there are currently no standard treatment guidelines for the management of NCC. Proposals have however been made. It has been noted, that the efficacy of albendazole and praziquantel is sub-optimal, with cure rates of 40 to 50% when the recommended dose is used [2]. Therefore, there is need for more effective alternatives. The patient received albendazole (400mg, once a day for three days) and praziquantel (2,600mg once a day for 15 days). Orbital cysts can be treated conservatively with a 4-week regimen of oral albendazole at 15 mg per kilogram per day [20]. The larvicidal drugs may cause an inflammatory response, occurring 2-5days after initiation of therapy and are therefore often combined with a corticosteroid to prevent this from occurring [21]. Rational use of corticosteroids has also been linked to a significant reduction in the occurrence of seizures, though studies are still underway [22]. The patient however, did not receive any steroids in view of the low CD4 count (64 cells/mm3), as a way of preventing further immunosuppression. In a study carried out in Latin America in 2006, in which 3 HIV positive individuals were treated for NCC, it was recommend ed that the CD4 count be considered in the diagnosis and treatment of NCC in individuals with HIV/AIDSs. It was further recommended that a CD4 count of greater than 200, with a definite or probable chance of NCC occurring, should warrant the patient being considered for treatment of NCC [2].

Surgical removal of orbital cysts has not been well documented but has been noted to be very successful for subconjunctival cysts. It is recommended that serial B-Scan, CT and MRI be carried out in order to monitor the resolution of the cysts.
Use of ventricular endoscopy to remove accessible ventricular cysts also results in reduced seizures and decreased morbidity [17]. Despite the treatment interventions instituted as well as the significant clinical improvement noted on consequent review appointments, the patient’s vision remained perception of light in the right eye due to the already existing melted cornea.

**CONCLUSION**

This case highlights the possibility of the occurrence of orbital cysticercosis in the Zambian population. It can present in an unusual form, with a wound on the lower eyelid as well as a melted cornea. The history could be for a longer duration like in this case, with a history of having had a conjunctival growth of one year prior to the presentation. Signs, symptoms and presentation of orbital cysticercosis are often non-specific and therefore require the clinician to have a high index of suspicion, backed by thorough assessment in order to be able to diagnose it.
**LIST OF REFERENCES**