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A neglected ocular tuberculosis without antitubercular therapy: A case report

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Case Report

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ABSTRACT

Ocular tuberculosis (TB) is one of the causes of uveitis, but there is often a skepticism and lack of acceptance regarding this diagnosis. We present a case of a-62-year-old female patient who complained of blurred vision, pain, and redness in her right eye. These symptoms had persisted for the past 16 months. The latest visual acuity in the right eye was 0.0167, and in the left eye was 0.63. Upon examination, keratic precipitates were found in the right eye, along with flare and cells +1/+1, pupil seclusion, a cloudy lens, and opacity in the posterior segment. The left eye was within normal limits. The patient was diagnosed with panuveitis of the right eye due to ocular TB and a complicated cataract. She had been referred by the local general hospital with complaints of blurred vision and was initially diagnosed with anterior uveitis due to ocular TB based on clinical presentation and positive Interferon-Gamma Release Assay (IGRA) test results. The patient was then referred back to the Internal Medicine Department of the local general hospital and the community health centre to start the anti-tuberculosis therapy (ATT). However, the patient refused treatment and, as a result, did not receive anti-tuberculosis drugs. Panuveitis TB, without adequate treatment, can lead to a poor prognosis.

INTRODUCTION

Mycobacterium tuberculosis is an obligate aerobic bacterium that grows quickly in acidic environments and is the causative agent of TB, an infectious disease that can spread by the air.[1] Tuberculosis poses a serious health issue, particularly in developing countries, and ocular TB represents an extrapulmonary form that can lead to vision loss and reduced quality of life.[2]

According to estimates from the World Health Organization (WHO), 25% of people worldwide are afflicted with latent TB, with 10% developing into active TB. Pulmonary TB accounts for around 80% of cases, while extrapulmonary TB accounts for approximately 20%, with half of those patients having normal-looking chest X-rays. Indonesia ranks second highest in the world in the number of TB cases, 11% of which are extrapulmonary TB cases.[3] Ocular TB is a rare form of extrapulmonary TB that can lead to vision loss and decreased quality of life. A severe case of TB-uveitis can cause significant visual morbidity. Reports indicate that almost one-third of individuals with TB-uveitis had visual acuity poorer than 3/60.

The global prevalence of ocular TB is estimated to be around 4.0% of all uveitis cases. Ocular TB is a major cause of infectious uveitis, ranging from 22.9% to 48.0% in Indonesia and India.[3] Ocular TB can affect nearly any part of the eye and can lead to vision-threatening complications such as glaucoma, cataracts, and cystoid macular edema without prompt and proper treatment. The diagnosis of ocular TB is often delayed, as its clinical manifestations are difficult to differentiate from those of other conditions.

The diagnosis of ocular TB remains problematic.[3] The challenging aspects of obtaining specimens, limited awareness of ocular TB among clinicians, limited diagnostic tools in certain regions, diverse patient histories, and varied signs and symptoms make confirming an ocular TB diagnosis difficult.[4,5] With adequate treatment,

TB can be cured. Conversely, if left untreated, this disease can have fatal consequences. It is difficult to identify and treat TB-uveitis accurately due to its varied clinical presentations and the absence of a dependable single gold-standard diagnostic test. The significance of conducting additional research to provide an original diagnostic method for TB-uveitis and to further develop targeted treatment plans based on the underlying inflammatory process unique to each patient cannot be overstated.[5] Adverse visual sequelae following TB-uveitis have been linked to chronic illness, posterior uveitis with choroiditis, and delayed diagnosis.9 Optic neuropathy, macular oedema, glaucoma, vitreous hemorrhage, cataract, and macular scarring are possible complications associated with visual impairment.[6]

Research demonstrates that a nine-month course of anti-tuberculosis therapy (ATT) can reduce the recurrence of TB-uveitis by 11 times. It's important to ensure adequate treatment, quality medication administration, continuous provision of medications, and monitoring of drug intake focused on the patient.[6] This case report aims to further discuss the diagnosis, management and enforcement of treatment for panuveitis TB in a patient without pulmonary TB symptoms who refused ATT.

CASE DESCRIPTION

A 62-year-old female patient presented to the ophthalmology clinic with complaints of blurred vision and redness in her right eye for the past 16 months, along with worsening vision. The complaint began with seeing floating hair-like shadows, which progressively worsened. She reported eye pain, tearing, and photophobia. The patient denied a history of TB but acknowledged contact with a TB patient, her private driver.

The patient has a history of persistent cough lasting for approximately one month a year ago but did not seek medical attention. Weight loss and night sweats were not reported. The patient denied a history of high blood pressure, diabetes, allergies, injectable drug use, or having tattoos. There were no complaints of cavities, ear pain, mouth sores, shortness of breath, joint pain, joint swelling, or bowel or bladder disturbances. The patient had previously sought treatment 16 months ago, referred from a Regional General Hospital with a diagnosis of anterior uveitis; her previous visual acuities were 0.4 for the right eye (RE) and 0.63 for left eye (LE). Physical examinations revealed the patient was alert and oriented, with a blood pressure of 100/70 mmHg, a regular pulse rate of 80 beats per minute, a respiration rate of 18 breaths per minute. The visual acuity of the RE was 0.0167, and the LE was 0.63. Examination of the anterior segment of the RE revealed mutton-fat keratic precipitates, flare, and cells +1/+1 in the anterior chamber, irregular pupil, synechia, Koeppe nodules, Busacca nodules on the iris, and a cloudy lens (Figure 1).

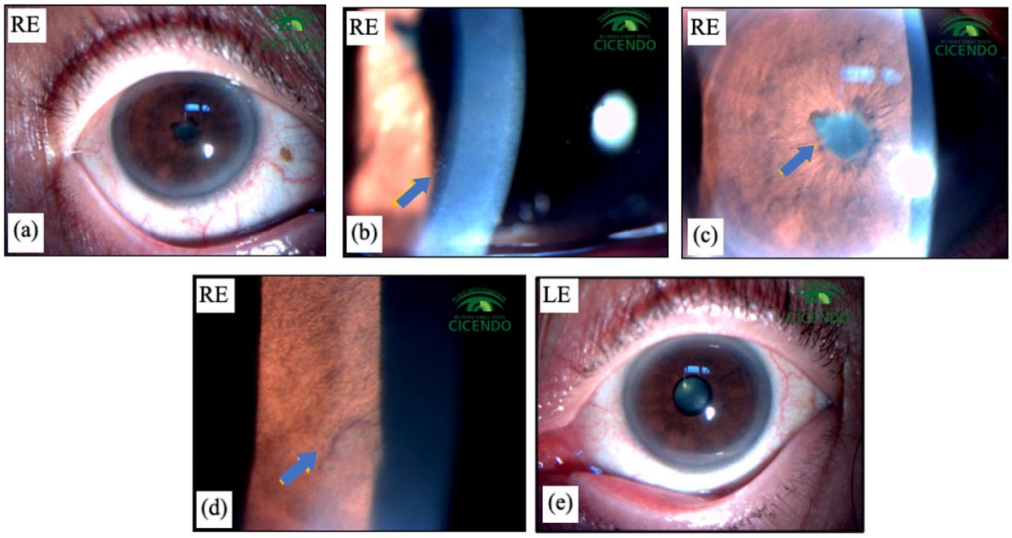

Figure 1. Examination of the anterior segment of the right eye shows ciliary injection (a); keratic precipitates (blue arrow) (b); Koeppe's nodules (blue arrow) (c); Bussaca nodules (blue arrow) (d); and examination of the anterior segment of the left eye is within normal limits (e). RE: Right Eye LE: Left Eye

Ultrasonography of the right eye showed inflammatory cells (Figure 2). The patient then underwent an Interferon-Gamma Release Assay (IGRA) on her own initiative, which resulted in a positive reading of > 10.00. The prognosis was poor because ocular TB can recur at any time. The patient is still advised to undergo regular check-ups to monitor the progression of the disease.

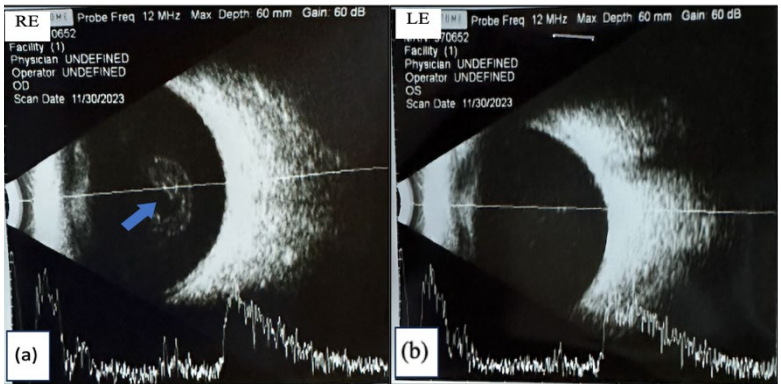

Figure 2. Examination of the right eye by ultrasonography (USG) revealed mild to moderate opacity of the vitreous with suspected inflammatory cells (a) shown in blue arrow; Examination of the left eye by USG was within normal limits (b). RE: Right Eye LE: Left Eye

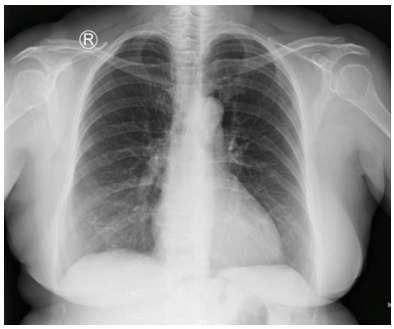

Figure 3. Chest X-ray examination within normal limits

During the visit 16 months ago, when seeking treatment at the hospital, the patient was diagnosed with anterior uveitis due to TB, based on clinical examinations and a positive IGRA result. The patient was provided with a referral to the Division of Internal Medicine and adviced to start ATT in her local area. However, the patient consulted a pulmonary specialist, who stated the absence of pulmonary TB. Consequently, the patient did not visit the community health center to obtain ATT. Instead, the patient did not seek treatment at the local hospital, as her child is a healthcare professional. The patient continued with the prescribed methylprednisolone, prednisolone acetate, and 1% cyclopentolate for the last 16 months.

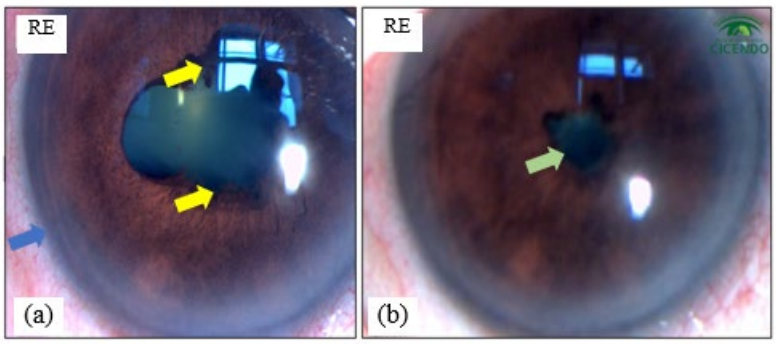

Figure 4. Comparative figures of the right eye from the previous 16 months examination with current examination. Examination of the right eye 16 months ago revealed ciliary injection (blue arrow) with synechia in the superior and inferior quadrants (yellow arrow) (a). Current examination of the right eye shows pupil sequela and lens opacity (green arrow) (b).

DISCUSSION

Ocular TB is a chronic disease by *Mycobacterium tuberculosis* infection in the eye, with diverse manifestations that can lead to blindness. The most common manifestations of ocular TB are choroiditis and uveitis, accounting for 10% of all uveitis cases.[7] In this case, a 62-year-old female patient had contact with a pulmonary TB patient. According to Abdisamadov, most ocular TB patients do not exhibit pulmonary TB signs, up to 60%, and have a normal chest X-ray result.[8] This aligns with the present case, where the patient had no signs or symptoms of pulmonary TB.

Primary systemic infection can result from recent exposure, while secondary infection is more frequently caused by the reactivation of a dormant illness. High-risk groups include patients who are immunocompromised due to HIV/AIDS (human immunodeficiency virus/ acquired immunodeficiency syndrome), chronic disease, medication, health care workers, and recent immigrants from endemic areas.

The manifestations of ocular TB can be caused by active infection or immunological reactions to the organism. Clinical presentations in the lacrimal gland can include dacryoadenitis or abscess. On the eyelids, TB can present as chronic blepharitis, nodules resembling chalazion, and cellulitis-like infiltrations. Conjunctival TB has clinical features such as conjunctivitis, subconjunctival nodules, polyps, tuberculoma, phlyctenulosis, and ulcers.[9,10]

The majority of reported ocular TB cases are classified as probable or possible.[2] A probable case is identified when there are one or more clinical signs of ocular TB, depiction of TB lesions in X-rays, and one of the following: a history of TB exposure within the last 24 months or positive immunological evidence (Mantoux test/IGRA/ polymerase chain reaction (PCR)). A possible case is considered when there are one or more clinical signs of ocular TB, the chest X-ray does not align with TB infection, and one of the following is present: a history of TB exposure within the last 24 months or positive immunological evidence (Mantoux test/IGRA/PCR). In this case report, the patient meets the criteria for a possible TB diagnosis because the chest X-ray is within normal limits, and the IGRA result is positive.[11]

In cases of suspected ocular TB, several questions should be asked to the patient, including main complaints, onset, whether it affects the right or left eye, duration, typical symptoms of pulmonary TB (chronic productive cough, low-grade fever, night sweats, weight loss), history of contact with TB patients, previous history of TB and TB treatment, history of infections, history of medication consumption, symptoms of blurred vision, floaters, and photophobia.[12]

The study conducted by Khabibullina found that the most commonly complained about symptoms by patients when they seek medical attention are blurred vision (76.4%) and red eyes (67.6%).[9] Another case report authored by Singh et al. stated that the most prevalent clinical manifestation in TB uveitis is blurred vision.[10] This aligns with the patient's initial complaint of blurred vision upon their first visit.

Uveitis TB is characterized by keratic precipitates, nodules on the edge of the iris (Koeppe nodules), and on the iris surface (Busacca nodules), as well as posterior synechiae.[11] Intermediate TB uveitis is characterized by vitreous cell appearance, snowball opacities, and a snowbank around the pars plana. Posterior TB uveitis primarily manifests in the choroid, resulting from high oxygen pressure in the choroid that enhances bacterial growth.[12] Invasion of tissues by bacteria leads to manifestations such as choroidal tubercles and tuberculomas.[13] The patient initially presented with clinical features of anterior uveitis, and the final condition showed clinical features of panuveitis.[13]

In patients with uveitis, it's important to conduct complementary examinations to establish the diagnosis and rule out differential diagnoses. Examinations should be performed according to the suspected etiology, including complete blood count, serology, antibody titers, radiology, HLA (Human Leukocyte Antigen) testing, and tuberculin testing.[14]

Research by Singh et al. showed that among 35 patients with blurry vision, a history of prolonged cough, and a positive IGRA, posterior synechiae, mutton-fat keratic precipitates, iris nodules, choroiditis, retinitis, and vasculitis were found.[10] This aligns with the current case, where findings included similar features such as cilary injection, keratic precipitates, posterior synechiae, Busacca and Koeppe nodules on the iris, and a cloudy lens.[15]

On her first visit 16 months ago, when the patient sought treatment at Cicendo Eye Hospital, she was advised to undergo a chest X-ray and IGRA.

The clinical condition and a positive IGRA result indicated a diagnosis of ocular TB. The IGRA has a sensitivity and specificity of up to 58% and 77% in diagnosing active pulmonary TB and 82% and 76% in diagnosing intraocular TB, respectively.8 According to one study in India, patients with uveitis without systemic TB symptoms who had positive IGRA results were found to be consistent with positive PCR results.[16]

The patient was recommended to undergo ATT treatment and was referred to the Internal Medicine Division and the local health centre. However, the patient sought treatment from a pulmonologist, who found no pulmonary TB infection. Consequently, the patient only used the last medication prescribed by regional hospital, including methylprednisolone, prednisolone acetate, and 1% cyclopentolate.[17]

The goal of uveitis treatment is to control inflammation to prevent vision loss and limit therapy side effects.[4] Initial uveitis therapy includes prednisolone acetate to alleviate inflammation. Cycloplegics are administered to relieve discomfort by relaxing the iris sphincter and ciliary muscle spasm, preventing posterior synechiae formation, and releasing synechiae.[5] Systemic corticosteroid administration remains controversial in patients with TB uveitis because some cases experience worsening and relapse.[7] Several studies report that corticosteroid administration yields favourable outcomes when given after or concurrently with ATT.[11] Administering steroids alone without ATT should be avoided as it can lead to the multiplication of bacilli, causing pan ophthalmitis or reactivation of systemic TB due to infection activation.[14]

Ocular tuberculosis can affect any part of the eye's structure and present with a wide range of clinical symptoms. It can be challenging to diagnose ocular tuberculosis (TB), and clinical aspects need to be evaluated in conjunction with laboratory results and in coordination with other subspecialists. The prognosis was poor because ocular TB can recur at any time, In the absence of treatment, the disease progresses in a waxing and waning manner, eventually leading to the breakdown of the blood-aqueous barrier, increased vitreous opacities, and cystoid macular edema. If the sclera is a part of the illness process, sclera necrosis and performance are probable. Anti-tuberculous therapy can be started, and the prognosis is good with complete resolution of choroidal lesions.[18]

Adherence to TB treatment can be challenging due to factors such as individual personality, education level, knowledge, lengthy treatment duration (9-12 months), combination therapy requirements, and drug side effects.[19] Some patients experience rapid symptom improvement, potentially downplaying the importance of prolonged treatment. This may contribute to patient refusal behaviour in undergoing ATT.[13] Studies state that 80% of patients show improvement after nine months of ATT.[20] Initiating and administering ATT quickly and accurately provides a better prognosis. Without treatment, ocular TB can lead to permanent structural changes in the eye, potentially resulting in vision loss or blindness. This explanation aligns with the patient's condition, where worsening complaints were found due to non-compliance with guideline-based treatment.

CONCLUSION

Panuveitis TB can be caused by *Mycobacterium tuberculosis*, and inadequate treatment can lead to a poor prognosis. This case emphasized the necessity of integrated screening policies or guidelines for extrapulmonary TB in Indonesia. By raising awareness and promoting collaborative efforts, healthcare systems can better address the diagnostic and therapeutic challenges posed by ocular TB, ultimately enhancing patient care, and reducing the burden of this disease.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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AUTHOR CONTRIBUTIONS

All authors contributed equally to this manuscript. All authors read and approved the final manuscript.

LIST OF ABBREVIATIONS

TB: Tuberculosis; IGRA: Interferon-Gamma Release Assay; ATT: anti-tuberculosis therapy; WHO: World Health Organization; TBU: Tuberculosis uveitis; RE: Right eye; LE: Left eye; USG: Ultrasonography; HIV/AIDS: human immunodeficiency virus/acquired immunodeficiency syndrome; PCR: Polymerase chain reaction; HLA: Human Leukocyte Antigen; PCR: polymerase chain reaction

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