Choroidal tuberculoma: malignancy or infection

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ABSTRACT

Choroidal tuberculoma is a rare form of ocular tuberculosis that poses a diagnostic dilemma when there is no systemic manifestation. We describe a case of a 37-year-old lady who presented with decreased vision and superior visual field defect in her right eye for a duration of 2 weeks. The right eye visual field defect was described as a superior altitudinal field defect. Her visual acuity in the right eye was 20/30. Right fundus examination revealed an elevated hypopigmented subretinal mass measuring 7-disc diameter at the inferotemporal arcade with the presence of surrounding subretinal fluid and pigmentary changes. B-scan showed choroidal excavation with low internal reflectivity. Based on a positive QuantiFERON-TB immunoassay and clinical correlation, a diagnosis of presumed ocular tuberculosis was made. She responded to a 9-month course of anti-TB treatment, and the lesion gradually decreased in size. This case highlights the importance of QuantiFERON-TB immunoassay in aiding the diagnosis of presumed ocular tuberculosis without any systemic manifestations of tuberculosis.

RESUMO

O tuberculoma de coroide é uma forma rara de tuberculose ocular que representa um dilema diagnóstico quando não há manifestação sistêmica. Descrevemos o caso de uma senhora de 37 anos que apresentou diminuição da visão e defeito no campo visual superior no olho direito por um período de 2 semanas. O defeito no campo visual do olho direito foi descrito como um defeito no campo altitudinal superior. Sua acuidade visual em olho direito era de 20/30. O exame de fundo de olho direito revelou uma massa sub-retiniana hipopigmentada elevada medindo 7 discos de diâmetro na arcada inferotemporal com a presença de líquido sub-retiniano circundante e alterações pigmentares. O B-scan mostrou escavação coroidal com baixa refletividade interna. Com base num imunoensaio QuantiFERON-TB positivo e na correlação clínica, foi feito um diagnóstico de presumível tuberculose ocular. Ela respondeu a um tratamento anti-TB de 9 meses e a lesão diminuiu gradualmente de tamanho. Este caso destaca a importância do imunoensaio QuantiFERON-TB no auxílio ao diagnóstico de presumível tuberculose ocular sem quaisquer manifestações sistêmicas de tuberculose.

INTRODUCTION

Ocular tuberculosis (TB) comprises 1% of total TB cases. Choroidal tuberculoma as an initial presentation of ocular TB is a rare occurrence that poses both diagnostic and therapeutic challenges to the ophthalmologist, especially when occurring without any other systemic involvement.[1] The confirmatory diagnosis requires the identification of *Mycobacterium tuberculosis* (M. tb) from the tissue sample. In clinical practice, these samples are usually difficult to acquire, and the biopsy of tissue might be difficult to justify.[2] The diagnosis of presumed ocular TB can be established based on clinical grounds, positive QuantiFERON-TB Gold (QFT), and ruling out other common causes of uveitis. In the absence of a confirmatory diagnostic test, a QFT may help to diagnose ocular TB.[3] We aimed to report a case of an immunocompetent patient with unilateral isolated choroidal tuberculoma in which findings from the systemic examination were negative for systemic TB.

Case report

A 37-year-old lady presented with a 2-week history of decreased vision and superior visual field defect in the right eye. The right eye visual field defect was described as a superior altitudinal field defect. There were no flashes of light or floaters. She had no TB symptoms such as chronic cough and hemoptysis, and no constitutional symptoms such as loss of appetite or weight loss were reported. There was no family history of malignancy. She had not been exposed to TB patients and had received the Bacille Calmette-Guérin vaccine (BCG). Her ocular history was significant for myopia.

Her best corrected visual acuity was 20/30 in the right eye and 20/20 in the left eye. Right eye examination showed the anterior segment examination was normal with no evidence of inflammatory cells reaction. Right fundoscopy revealed the presence of a large yellow subretinal mass measuring 7-disc diameter at the inferotemporal arcade with surrounding hyperpigmentation (Figure 1A). The retinal vessels appeared normal with no evidence of vasculitis, hemorrhage, or cotton wool spots. The optic disc was pink and not hyperemic. There was no significant vitreous inflammatory reaction. Her left eye examination was unremarkable. Optical coherence tomography (OCT) of the right eye showed the presence of dome-shaped elevation of subretinal mass with subretinal fluid (Figure 1B). B-scan of the right eye showed choroidal excavation of the subretinal mass with low internal reflectivity.

Fluorescein angiography (FA) of the right eye demonstrated diffuse hyperfluorescent in the early phase (Figure 1C) and pooling of dye in the late phase over the subretinal mass (Figure 1D). There was no dual circulation. Indocyanine green angiography (ICGA) of right eye showed an area of hypocyanascent of subretinal mass corresponding to the choroidal mass (Figure 1E). There was an absence of polyps or vascular leakage.

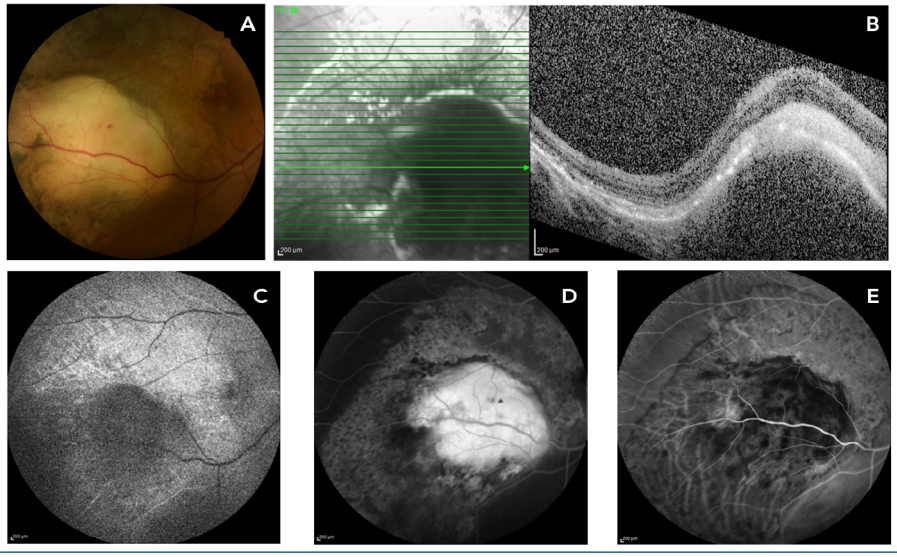

Figure 1. (A) Fundus photo of the right eye showed yellowish subretinal mass at inferotemporal arcade, approximately 7-disc diameter with surrounding hyperpigmentation. (B) Optical coherence tomography showed dome shaped elevation of subretinal lesion mass with subretinal fluid. (C) Early phase of fluorescein angiography showed area of diffuse hyperfluorescent. (D) Late phase of fluorescein angiography showed pooling of dye of the subretinal mass. (E) Indocyanine green angiography showed an area of hypocyanescent of the mass and absence of polyps.

The differential diagnosis included choroidal malignancy (primary tumor or secondary metastasis), as well as inflammatory or infectious origin. Full systemic examination was normal with no hepatosplenomegaly or lymphadenopathy. Respiratory system examination was unremarkable with no pulmonary mass or consolidation on chest x-ray imaging. Her full blood count was normal and tumor markers were negative. The Erythrocyte sedimentation rate (ESR) was significant at 57 mm/H (normal < 23 mm/H). C-reactive protein was 5.6 mg/L (normal < 5 mg/L). A purified protein derivative (PPD) skin test was positive (induration of 19 mm; standard <15 mm). The QFT was positive.

Patient was diagnosed with presumed ocular TB in the right eye and was referred to the Internal Medicine Department for further systemic assessment and treatment. There was no pulmonary or systemic involvement of TB detected. Sputum acid fast bacilli was negative.

Finally, the diagnosis of isolated choroidal tuberculoma was made based on the clinical findings, endemicity of TB, which is endemic in Malaysia, and supported by positive PPD and QFT tests. She was planned for anti-TB therapy for 9 months with daily doses of oral isoniazid, rifampicin, pyrazinamide, and ethambutol. After completion of the intensive phase of anti-TB for aa duration of 2 months, there was a significant shrinkage of the choroidal tuberculoma (Figure 2A). She continued with maintenance dose of anti-TB therapy up to 9 months which consists of isoniazid and rifampicin. The choroidal tuberculoma subsequently continued to reduce in size and flattened with an adjacent area of chorioretinal scarring (Figure 2B) upon completion of the anti-TB drugs. Her final visual acuity of the right eye has improved to 20/20.

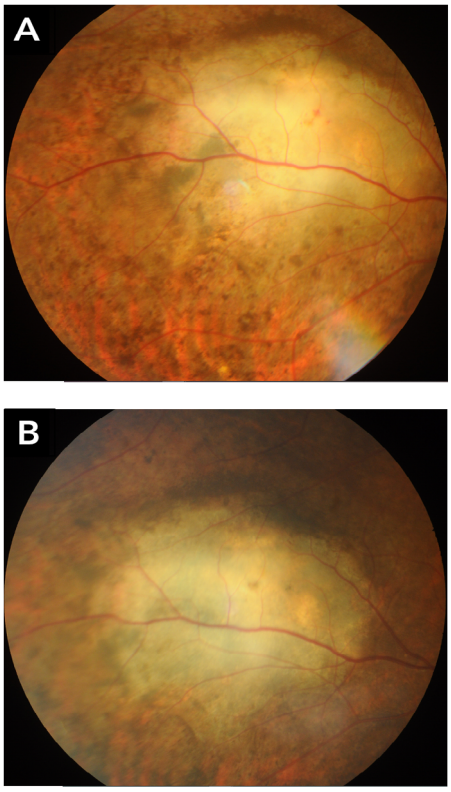

Figure 2. (A) Fundus photo of right eye showed decreased in the size of choroidal tuberculoma after 2 months of anti-tuberculosis. (B) Choroidal tuberculoma subsequently continued to reduce in size and flattened with an adjacent area of chorioretinal scarring at 9 months upon completion of anti-tuberculosis treatment.

DISCUSSION

This case report illustrated a case of choroidal tuberculoma as the first presenting sign of TB, which is an infection caused by the organism M. tb. It can affect the pulmonary and extrapulmonary TB, including the eye.[4]

The incidence of M. tb. remains a public health concern in Southeast Asia (183 per 100,000 people).[5] The route of transmission of M. tb. is via inhalation and contact. Ocular TB affects about 1% of patients with pulmonary TB and 20% of those with extrapulmonary TB.[6] It can occur without a systemic TB infection and affect any part of the eye.[7] Our patient had no systemic manifestation of TB.

Posterior uveitis is the most common presentation of ocular TB, which can affect both immunocompetent and immunocompromised patients. Due to the extensive vascular network, the choroid is the most commonly affected site due to the spread of M. tb. via the hematogenous route.[8] Typical presentations of ocular TB include choroiditis, tuberculoma, and subretinal abscess. The rapid multiplication of bacilli within the choroidal tuberculoma may cause tissue destruction via liquefactive necrosis and form subretinal abscess.[1]

The gold standard for the diagnosis of ocular TB requires microbiological confirmation. There are many diagnostic techniques used to diagnose active pulmonary or extrapulmonary TB, such as tissue culture and biopsy. However, due to the difficulty in obtaining the tissue, it has limited utility in diagnosing ocular TB. The advent of polymerase chain reaction (PCR) and improved culture technique has increased the yield in diagnosing ocular TB.[6] The biopsy of tissue might be difficult to justify, as it carries certain complications such as retinal detachment, vitreous hemorrhage, and endophthalmitis while obtaining the samples.[2] A study conducted in Asia has shown that the yield was only 66%. The complications

were similar to the previous study.[9] The challenge that we faced in our patient was she had no clinical manifestations of either pulmonary or extrapulmonary TB and thus no sample was taken for microbiological confirmation of M. tb.

Our patient had a positive PPD and QFT test, which guided us to the diagnosis of presumed ocular TB. A positive PPD may suggest prior exposure rather than active TB infection. It is sensitive but not specific in diagnosing TB. The cutoff point is 15 mm for an individual with history of prior BCG vaccination.[10] For our patient, QFT test was performed in view of high suspicions of TB (endemic in Malaysia). The QFT is an interferon-gamma release assay (IGRA), which is not affected by BCG vaccination and has higher specificity than PPD.[11]

Other differential diagnosis like choroidal melanoma or choroidal metastasis had been ruled out. Her FFA findings did not show any evidence of dual circulation suggestive of choroidal malignancy. B scan revealed low internal reflectivity that can distinguish choroidal tubercle from malignancy.[7] Her tumor markers were within normal limits which guided us to the diagnosis of choroidal tuberculoma.

She started on anti-TB therapy for 9 months duration. During the initiation phase, she started on four drugs namely isoniazid, pyrazinamide, rifampicin, and ethambutol. There was a remarkable improvement after the intensive phase of treatment as shown in Figure 2A, which further confirmed the diagnosis of choroidal tuberculoma. Treatment was then followed by using isoniazid and rifampicin for a total duration of 9 months. The recommended treatment duration is 6 to 12 months.[12] The treatment was continued up to 9-month duration after reviewing her clinical condition and the size of the lesion. A study conducted by Hamade et al. has shown that treatment of ocular TB may be given with anti-TB alone without corticosteroid. The use of corticosteroid without anti-TB coverage may result in flaring up of latent TB.[13]

Our patient is responding to anti-TB treatment, evidenced by the shrinkage of choroidal tuberculoma and recovery of vision to 20/20. Our case had a similar finding to Young et al.'. in which the choroidal tuberculoma dramatically resolved with anti-TB alone.[13] To the best of our knowledge, there are only a few cases of choroidal tuberculoma occurring without evidence of systemic involvement.[14-16] In countries where TB is endemic, a high index of suspicious is warranted in cases suspected of ocular TB. QFT is an important diagnostic tool for identifying ocular TB in situations where there is a diagnostic dilemma.

In conclusion, choroidal tuberculoma is a rare disease which can occur in healthy individuals. High index of suspicious is required to diagnose and treat this condition. The role of QFT in diagnosing TB has proven to be beneficial and it allows for the early initiation of treatment in order to preserve vision.

AUTHORS' CONTRIBUTION

Daniel Sen Kai Phang contributed to the conception and design of the writing and critical review of the manuscript's content. Ariffin Nurulhuda and Abd Aziz Hayati contributed to the interpretation of data and writing of the manuscript's content. Embong Zunaina contributed to the writing and critical review of the manuscript's content. All authors approved the final version of the manuscript and are responsible for all aspects of the manuscript, including ensuring its accuracy and integrity.

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