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CASE REPORT

A Case of Secondary Choroidal Neovascularization in Inactive Choroidal Tuberculoma

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ABSTRAK

Tuberkulosis okular adalah jangkitan okular yang disebabkan oleh Mycobacterium tuberculosis (TB). Sebanyak 5-10% kes keradangan okular disebabkan oleh TB okular. Spektrum TB okular adalah berbeza-beza, menjejaskan mana-mana bahagian adnexa, lapisan dan struktur bola mata yang berlainan, kandungan orbit, saraf optik pada bahagian belakang orbit. Ia boleh dikaitkan dengan/atau tanpa manifestasi sistemik. Uveitis posterior adalah manifestasi tuberkulosis okular yang paling biasa. Perdarahan subretinal sekunder yang disebabkan oleh 'neovascularization' choroidal adalah komplikasi yang jarang berlaku dalam tuberkulosis ocular. Kami melaporkan satu kes yang jarang ditemui iaitu 'neovascularization' choroidal sekunder pada kanak-kanak lelaki berusia 9 tahun yang dijangkiti 'choroidal tuberculoma' pada kedua-dua mata disebabkan oleh tuberkulosis miliari. Dia dirawat dengan suntikan ranibizumab intravitreal dan suntikan plasminogen activator rekombinan intravitreal (r-TPA). Walaupun perdarahan subretinal pulih, namun penglihatan adalah terhad disebabkan oleh fovea atropik.

Kata kunci: choroidal neovascularization, okular, ranibizumab, tuberkuloma, tuberkulosis, uveitis

ABSTRACT

Ocular tuberculosis is an ocular infection caused by *Mycobacterium tuberculosis* (TB). About 5-10% of ocular inflammation cases are caused by ocular TB. Spectrum of ocular TB is diverse, affecting any part of the adnexa, different layers and

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structures of the globe, orbital contents, optic nerve to the orbital apex posteriorly. It can be associated with or without systemic manifestation. Posterior uveitis is the most common presentation of ocular tuberculosis. Subretinal haemorrhage secondary to choroidal neovascularization (CNV) is a rare complication in ocular tuberculosis. We report a rare case of secondary choroidal neovascularization in a 9-year-old boy with bilateral eye choroidal tuberculoma with underlying miliary tuberculosis. He was treated with intravitreal ranibizumab and intravitreal recombinant-tissue plasminogen activator (r-TPA) injection. The CNV resolved, however, vision was poor due to atrophic fovea.

Keywords: choroidal neovascularization, ocular, ranibizumab, tuberculosis, tuberculoma, uveitis

INTRODUCTION

Tuberculosis (TB) is one of the communicable diseases which causes significant high rates of morbidity and mortality worldwide. The influx of foreign-born workers has led to continuously rise number of new TB cases in Malaysia (Shahidatul-Adha et al. 2017). TB generally affects the lung as well as other organs. Ocular TB is one of the extra-pulmonary manifestations of TB.

Ocular TB can affect all the structures of the eye without any pathognomonic presentation. Ocular manifestations are caused by either active intraocular infection or as result of an immunological reaction in the eye without any direct infection. The most common manifestation is granulomatous uveitis with predominant lesions in the choroid. The high vascularity of choroidal tissue permits easy hematogenous spread of infection from a caseous primary focus elsewhere in the body. Secondary CNV is a known complication of ocular tuberculoma. However, there are less published research reports.

CASE REPORT

A 9-year-old boy with miliary TB presented for eye screening prior to anti-TB commencement. He had history of prolonged fever with significant loss of weight and appetite. However, he denied any respiratory symptoms. His grandmother and uncle had history of pulmonary TB. The investigations performed from pediatric department before being presented to us revealed high ESR (104 mm/hr) and a positive tuberculin skin test (17 mm x 17 mm). Chest X-ray showed diffused granular opacities at both lung fields. The sputum tests for acid fast bacillus (AFB) were negative.

On presentation to us, he had bilateral eye choroidal tuberculoma with good vision (Figure 1a and 1b). However the patient defaulted the eye clinic follow-up. He represented with poor vision of the right eye at four months of anti-TB treatment. His VA

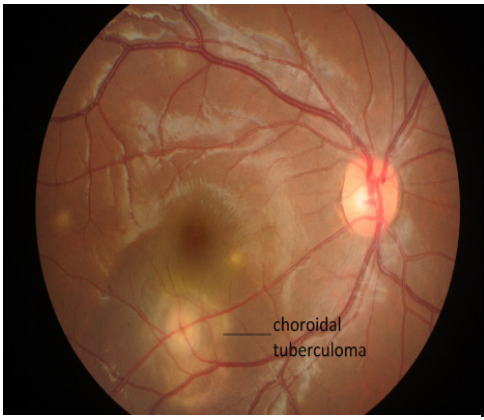

Figure 1a

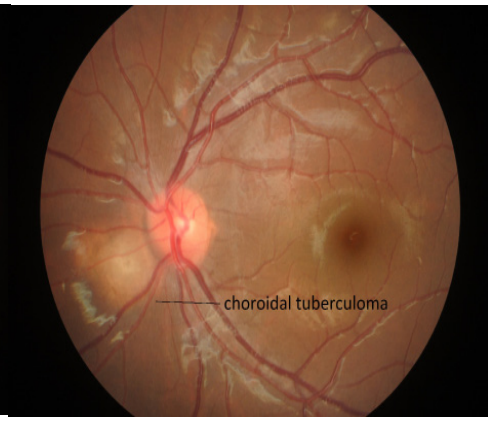

Figure 1b

Figure 1a and 1b: Figure 1a and 1b shows bilateral choroidal tuberculoma upon presentation

was 6/120. The fundus examination of the right eye showed choroidal scar at the inferior of the fovea with a rim of subretinal haemorrhage and fluid which measured about 1 disc-diameter size (Figure 2a). The left eye showed choroidal scar which was inferior to the optic disc. The optical coherence tomography (OCT) displayed evidence of subretinal fluid and hyper-reflectivity which corresponded with the blood observed (Figure 2b). Fundus flourescein angiogram (FFA) done showed a classic type of leakage.

Intravitreal Ranibizumab injection 0.5 mg in 0.05 mL was given to the right eye. Upon review after 1 week of treatment, we noticed that the size of subretinal haemorrhage had increased to about 4 disc-diameter size (Figure 3a). OCT showed increased subretinal and intraretinal fluid (Figure 3b). Subsequently the patient was given 0.05 ml (12.5 g) intravitreal recombinant-

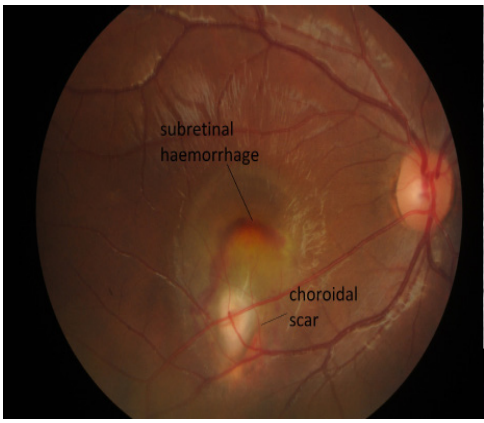

Figure 2a

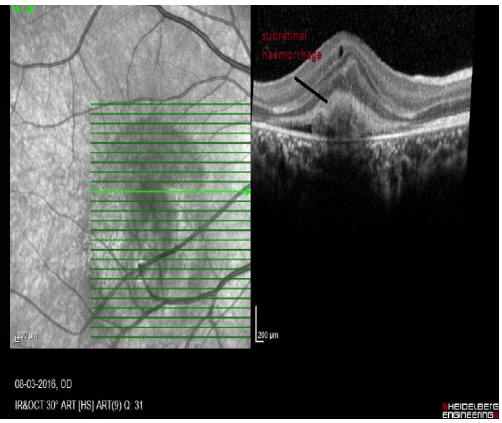

Figure 2b

Figure 2a and 2b: Figure 2a and 2b shows right eye choroidal scar with subretinal haemorrhage inferior to the fovea and corresponding OCT shows intraretinal and subretinal fluid

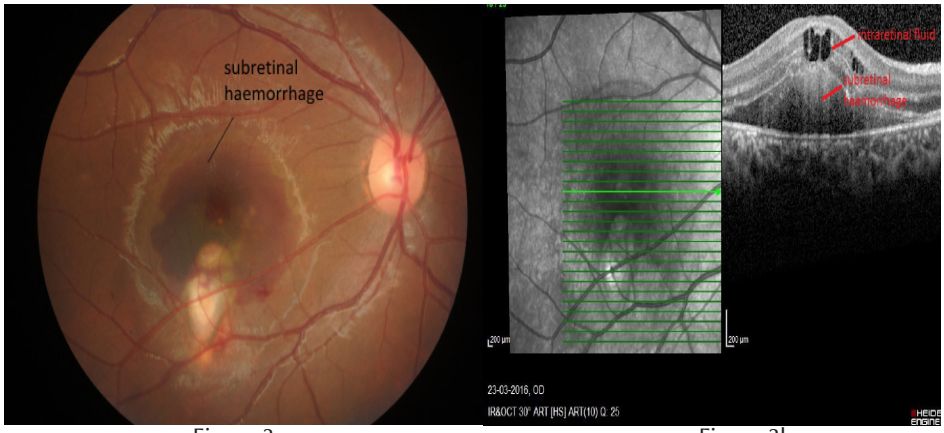

Figure 3a Figure 3b

Figure 3a and 3b: Figure 3a and 3b show right eye subretinal haemorrhage post intravitreal Ranibizumab with corresponding OCT which shows increasing intraretinal and subretinal fluid.

tissue plasminogen activator (r-TPA) injection. After a month, his right eye VA was Counting Finger (CF) and the fundus showed resolving subretinal blood and fluid (Figure 4). Repeated intravitreal Ranibizumab injection was also given. Currently the patient has completed 1 year duration of anti-TB treatment with 6-weeks course of systemic corticosteroid. His final right eye VA was CF with clinically atrophic fovea (Figure 5a). OCT showed thin fovea with disruption of outer retinal layers (Figure 5b).

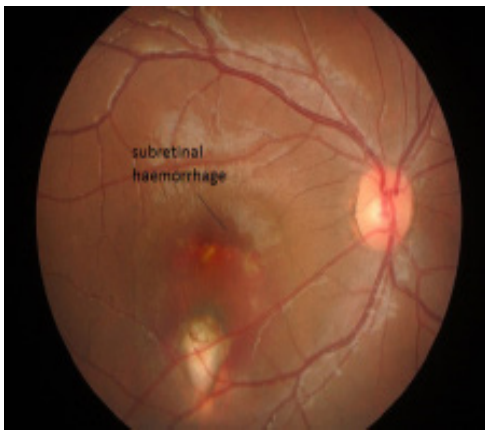

Figure 4: Figure 4 shows resolving right eye subretinal haemorrhage after the first dose intravitreal Ranibizumab

DISCUSSION

Ocular tuberculosis is an extra-pulmonary presentation of tuberculosis and may lead to blindness if not properly diagnosed and treated. It is a challenge to diagnose this disease as it mimics other variants of uveitis entities. It can be either primary or secondary as a result of the seeding effect by haematogenous spread from a distant site. It is also believed that a delayed hypersensitivity reaction to the Mycobacterium protein is another possible pathogenesis of the disease (Shahidatul-Adha et al. 2017). Choroidal lesion is the most common eye manifestation due to high vascular supply (Sharkachi 2015, Thayil et al. 2011). It can also be focal, multifocal or serpiginous choroiditis, solitary or multiple choroidal nodule, choroidal tuberculoma, neuroretinitis,

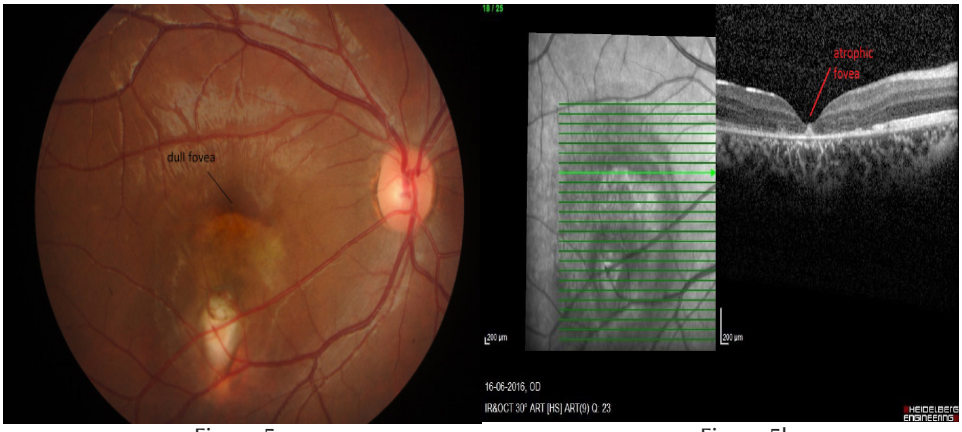

Figure 5a Figure 5b

Figure 5a and 5b: Figure 5a and 5b shows resolved subretinal haemorrhage and OCT shows atrophic fovea with disruption outer retinal layer.

subretinal abscess and etc. Choroidal tuberculoma is a less common intraocular TB manifestation described as a solitary yellowish or greyish white large lesion which generally located in the posterior pole.

Secondary CNV is a rare complication in inactive choroidal tuberculoma. In an animal study, the researchers found an area of tissue hypoxia within the choroidal tuberculoma and vascular endothelial growth factor (VEGF) expression in retinal pigment epithelial (RPE) as early as day 24 infection following ocular dissemination of Mycobacterium TB in guinea pigs (Thayil et al. 2011). CNV secondary to posterior segment inflammation may occur from the inflammation mediated angiogenesis itself, or due to a defect in Bruch's membrane-RPE complex secondary to degeneration following inflammation (Handwerger et al. 2001). On the other side, occlusive vasculitis leads to ischaemia in certain cases (Kok et al. 2006). This may explain the pathogenesis of such cases. Intravitreal anti-VEGF is used to inhibit the CNV (Thayil et al. 2011; Bansal et al. 2013). Local inhibition of VEGF decreases the permeability of blood retinal barrier and inhibits the angiogenesis. On the other hand, inhibition of VEGF leads to the depletion of granuloma vascularity, hence increases tissue destruction (Thayil et al. 2011).

A similar case of secondary choroidal neovascularization in choroidal tuberculoma which was successfully treated with a single dose of intravitreal bevacizumab was reported (Koushik et al. 2016). Bansal et al. found that intravitreal bevacizumab may be a useful adjunct in the management of a vascular choroidal granuloma (Bansal et al. 2013).

In view of extensive subretinal haemorrhage, we decided to use intravitreal rTPA. Low dose rTPA is known to be safe in cases of submacular haemorrhage secondary to age-related macular degeneration (Handwerger et al. 2001). A dose of 18 to 50 µg in

a concentration of 20-30 µg/0.1 ml is recommended (Handwerger et al. 2001).

Our patient received both the intravitreal anti-VEGF and r-TPA, but the outcome was unfavourable as the lesion had involved the fovea.

CONCLUSION

Secondary CNV is a known complication of ocular tuberculoma. Anti-vascular endothelial growth factor (anti-VEGF) is a treatment of secondary CNV. The use of intravitreal r-TPA may help to lyse the blood and hasten resolution.

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