Case Report

Toxoplasma Retinitis: A Picture-Perfect Presentation

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Abstract

Toxoplasma Retinitis: A picture-perfect presentation where SD-OCT serves as a crucial supplemental imaging tool for both diagnosing and monitoring patients with ocular toxoplasmosis.

Keywords: Ocular toxoplasmosis, Spectral domain optical coherence tomography, Chorioretinitis.

Introduction

Toxoplasma gondii is an obligate, single-cell protozoan parasite that resides within host cells is responsible for ocular toxoplasmosis, an infection that primarily affects the retina and choroid. This condition ranks as the foremost cause of posterior uveitis globally and is a frequent contributor to vision impairment due to intraocular infections. *T. gondii* is highly prevalent in nature, with an estimated one billion people worldwide being infected by this parasite.

Risk factors for *T. gondii* infection include exposure to environments where the infectious organism is prevalent, particularly those frequented by cats. Additionally, individuals face an elevated risk of infection if they consume raw or undercooked meat containing Toxoplasma oocysts. Pregnant women infected with the parasite face a heightened risk of transmitting the infection to their unborn child, resulting in severe fatal complications, including retinal infections, congenital deformities, and mortality.

Ocular Toxoplasmosis

Toxoplasma infection leads to necrotizing chorioretinitis. This chorioretinal area with indistinct margins, accompanied by a focal vitreous infiltrate, is often described as "a headlight in the fog". Additionally, localized lobular perivasculitis can occur around the arterioles in the vicinity of the active lesion, known as Kyrieleis plaques.[1] However, atypical lesions may present as extensive areas of retinal necrosis or retinochoroiditis without adjacent preexisting pigmented retinal scars, and they can affect both eyes. These unusual lesions are more commonly seen in elderly individuals and individuals with underlying immunodeficiency caused by various factors.[2] Unconventional clinical presentations can be unfamiliar to healthcare providers, leading to delays in both diagnosis and treatment.

Visual impairment can result from a macular lesion, as seen in Fig. 1, whereas lesions in the peripheral retina often cause vision loss due to severe vitreous inflammation. Although less common, optic nerve involvement can lead to significant visual field defects and loss of color vision.[3] Ocular toxoplasmosis may also give rise to additional manifestations, including retinal neovascularisation, retinal detachment and optic neuritis.

The polymerase chain reaction (PCR) method can be valuable in confirming the diagnosis, especially in immunocompromised individuals who exhibit extensive, atypical retinitis foci. On the other hand, assessing local antibody production may be a more suitable approach for accurately diagnosing immunocompetent individuals with smaller retinitis foci.[4]

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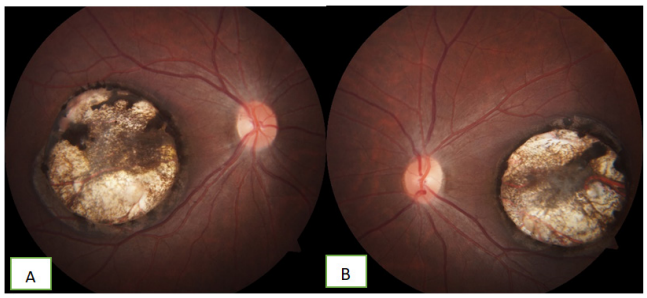

Figure 1: Fundus Photo showing toxoplasma lesion over macula (A) Right Eye (B) Left Eye

Spectral Domain Optical Coherence Tomography in Ocular Toxoplasmosis

Spectral-domain optical coherence tomography (SD-OCT) has become a widely accepted technique for visualizing the posterior eye's structural details, offering an impressive resolution. SD-OCT imaging revealed that toxoplasma retinochoroidal lesions and scars exhibit a complex nature. In the acute phase, they are characterized by thickening and disorganization of the retinal reflective layers across their whole thickness and the underlying choroid.[5] A thickened hyperreflective retina, accompanied by choroidal thickening and hyperreflectivity, hyperreflective dots in the vitreous,

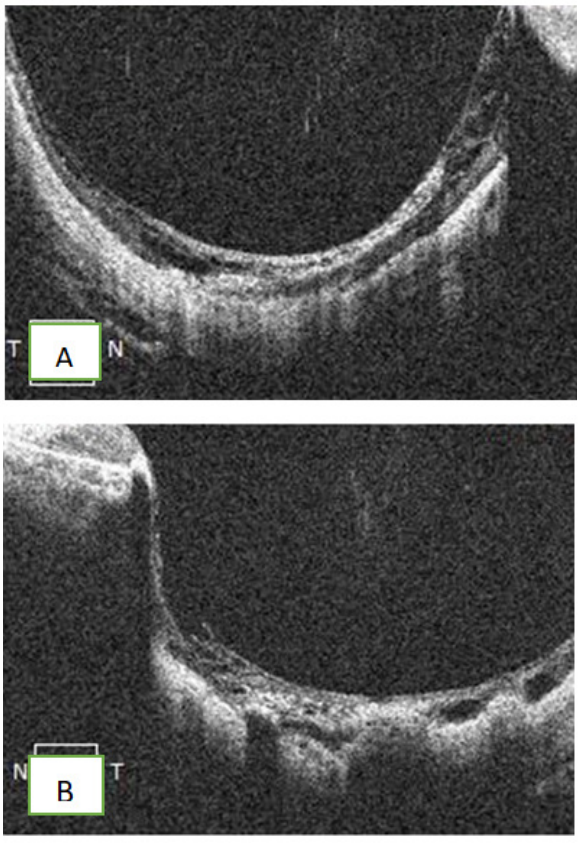

Figure 2: SD-OCT showing toxoplasma lesion over macula (A) Right Eye (B) Left Eye

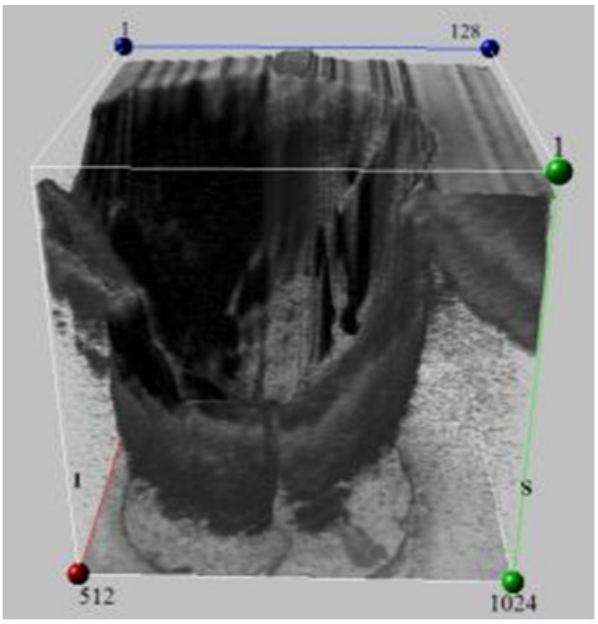

Figure 3: SD-OCT- 3D Visualisation of a macular cube (Right Eye)

and thickening of the posterior hyaloid are also seen (Figs 2 and 3). Adjacent to the lesion, there was frequently observed disorganization of retinal layers and interrupting of the ellipsoid zone (EZ). As time progressed, the retina underwent thinning and diminished hyperreflectivity, but it did not revert to a normal appearance. Additionally, there was thickening of the retinal pigment epithelium coupled with choroidal hyperreflectivity, or alternatively, epithelial atrophy with choroidal hyperreflectivity.[6]

As scar formation progresses, varying degrees of thinning become apparent, often accompanied by irregularities in the outer retinal layers.[7]

SD-OCT reveals discernible changes at the macula, with lesions characterized by hyperreflective dots at the vitreoretinal interface, full-thickness retinal hyperreflectivity, and choroidal thickening beneath the submacular region.[8,9]

Crater like defects over macula pathognomic of loss of larger areas associated with toxoplasmosis.

Conclusion

SD-OCT serves as a crucial supplemental imaging tool for both diagnosing and monitoring patients with ocular toxoplasmosis.

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