Case Report

Congenital ocular toxoplasmosis diagnosed in adolescence: A case highlighting diagnostic gaps

Abstract

This case report describes a 15-year-old male who presented to the clinic for the first time with long standing unexplained reduced vision of the right eye. Through a comprehensive ophthalmic evaluation, direct ophthalmoscopy revealed a well-demarcated chorioretinal lesion in the macular region of the right eye and in the peripheral retina of the left eye. The case illustrates the diagnostic challenges of identifying ocular toxoplasmosis when external signs are minimal or absent and emphasizes the critical role of a thorough ophthalmic evaluation in detecting underlying chorioretinal pathology. Early recognition of such lesions is essential to appropriate management, prevention of further vision loss, and timely referral for specialized care.

Keywords: ocular toxoplasmosis, congenital toxoplasmosis, chorioretinal scars, serological testing

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Abbreviations: OCT, optical coherence tomography; OCTA, optical coherence tomography angiography; OT, ocular toxoplasmosis

Introduction

Ocular toxoplasmosis is a non-curable infectious disease mainly caused by the parasite Toxoplasma gondii and is probably the most common cause of posterior segment infection in many countries. Cats are definitive host and it is usually acquired by eating undercooked meat or by contact with cat feces.[1]

Ocular toxoplasmosis (OT) is the most common cause of infectious posterior uveitis worldwide and remains a significant cause of preventable visual impairment. A recent meta-analysis estimated its global prevalence at 2% in the general population, with the highest rates reported in the Americas at 6%. Among patients with uveitis, OT accounts for approximately 9% of cases, with even greater proportions observed in lower-middle-income countries. Prevalence is markedly higher in posterior uveitis (33%), compared with 7% in panuveitis, underscoring its strong predilection for the posterior segment.[2]

Congenital toxoplasmosis, caused by transplacental transmission of *Toxoplasma gondii* after maternal infection, can result in a range of clinical outcomes and affects approximately 0.1–0.3 per 1,000 live births. The risk of fetal infection increases with gestational age, from <15% at 13 weeks to >70% at 36 weeks; however, infections acquired later in pregnancy are often asymptomatic at birth.

Chorioretinal scars were the most frequent ocular manifestation in congenital toxoplasmosis, predominantly in the peripheral retina (58% of treated vs. 82% of historical controls). Macular involvement was observed in 54% of treated patients (41% bilateral) and 76% of historical controls (23% bilateral). Visual acuity in eyes with macular lesions ranged from 20/20 to 20/400, with 29% of treated children followed from birth experiencing bilateral visual impairment (best-eye visual acuity <20/40). Recurrences occurred in 13% of treated patients (7/54) and 44% of untreated historical patients (8/18), and new lesions developed in previously unaffected or adjacent retinal areas. Active lesions generally became quiescent within 10–14 days of therapy.[3]

Serological testing for toxoplasmosis involves measuring antibodies that the immune system produces in response to *Toxoplasma gondii* infection. The most common antibodies tested are IgG which indicates prior exposure or infection and typically persists for life and IgM that suggests recent or active infection, but the result must be interpreted with caution, as IgM can persist long after the acute phase.

A prospective observational study by Krishnankutty et al.,[4] evaluated 35 patients with ocular toxoplasmosis for serum **IgG and IgM antibodies** using ELISA and compared them to 24 patients with non-toxoplasmic uveitis. Thirteen patients had typical retinochoroidal lesions with adjacent scars, while 22 exhibited atypical features, including retinitis patches without adjacent scars (31.8%), intermediate uveitis (27.3%), papillitis (22.7%), and retinal vasculitis or dense vitritis (9.1% each). Mean IgG levels were significantly higher in both typical (85.3 ± 82.9 IU/ml) and atypical cases (47.5 ± 66.2 IU/ml) compared to controls (6.6 ± 3.4 IU/ml, $p < 0.001$). These findings indicate that atypical presentations are common and that elevated IgG levels support the diagnosis of ocular toxoplasmosis, emphasizing the value of serological testing alongside clinical evaluation.

Optical coherence tomography (OCT) is a vital noninvasive tool in ocular toxoplasmosis, demonstrating increased retinal thickness, hyperreflectivity, and disorganization in active retinochoroiditis, as well as thinning and structural disruption in inactive lesions. OCT also detects associated complications such as macular edema and vitreomacular traction. Optical coherence tomography angiography (OCTA) complements OCT by visualizing retinal and choroidal microvascular changes, including regions of reduced flow in acute disease and vascular abnormalities during follow-up. These imaging modalities enhance the clinical diagnosis, staging, and monitoring of ocular toxoplasmosis without invasive dye studies (Figure 1).

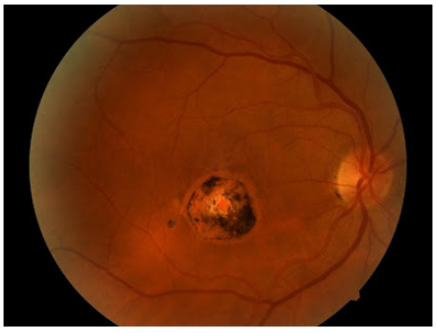

Figure 1 Chorioretinal scar on the macula of the right eye.[5]

Case report

A fifteen-year-old male presented himself to the optical clinic for comprehensive eye examination last January 16, 2020 with a chief complaint of blurring of vision at far of the right eye.

Patient is generally healthy, no medical condition has been reported. Full term at birth. No medication taken in the present.

On external gross examination, no significant finding has been observed from the patient's eye. While on ophthalmoscopy, "brown patches" or "scar-like" was observed on the macular are of the right eye and pheriperal retina of the left eye.

On ocular preliminary assessment, his uncorrected visual acuity of the right eye is limited to Counting Fingers at 2 feet, while his left eye had an unaided visual acuity of 20/50.

Both subjective and objective testing reveals that the patient has a corneal astigmatism. His subjective refraction is Plano = - 2.00 X 180 on his right eye while +0.25 = -2.75x 15 on his left eye was recorded. Unfortunately, the right eye's visual acuity didn't improve even with best lenses on and even if pinhole visual acuity has been performed.

Patient was referred to ophthalmologist (retina specialist) for the management of underlying retinal disease that might be affecting the patient's vision of the right eye.

Patient came back after a week with fundus photo and medical certificate from the retina specialist with his clinical diagnosis of congenital ocular toxoplasmosis of both eyes. The "brown patches or scar like" structure noticeable on his first visit was actually chorioretinal scars affecting areas of the macula (right eye) and peripheral retinal of the left eye.

Serological testing (IgG and IgM) was done to confirm the diagnosis. Patient tested positive to IgG testing.

Additional history was provided by the patient's mother, who noted that their household had multiple domestic cats during her pregnancy. As cats are the definitive hosts of *Toxoplasma gondii*, this exposure may explain how the patient acquired the infection.

Combining serology with clinical findings and imaging

In practice, clinicians diagnose *ocular toxoplasmosis* by integrating:

a) Characteristic ophthalmoscopic findings (e.g., focal necrotizing retinochoroiditis, chorioretinal scars).

b) Serological results — usually IgG positivity; IgM supports recent activity if present.

c) Imaging such as Optical Coherence Tomography (OCT) — OCT can reveal structural changes (e.g., retinal layer disruptions, vitreoretinal inflammation) consistent with *Toxo* lesions.

In this clinical case, ophthalmoscopic findings (chorioretinal scars) with positive IgG result concluded that patient has inactive ocular toxoplasmosis. No anti-parasitic treatment is required, and management will focus on regular monitoring every 6 mons to 12 mons to detect any reactivation or complications.

In contrast, if the patient has active ocular toxoplasmosis, management includes prompt anti-parasitic therapy, typically a combination of pyrimethamine, sulfadiazine, and folinic acid, to target replicating *Toxoplasma gondii*. Corticosteroids may be added to reduce intraocular inflammation, but only after anti-parasitic therapy has been initiated to avoid exacerbating the infection. Patients require frequent ophthalmologic monitoring to assess lesion regression, detect complications such as macular involvement or retinal detachment, and evaluate visual acuity. Early and aggressive treatment is critical to minimize retinal damage and preserve long-term vision.

Though clinical use of OCT can improve prognosis and provide a comprehensive assessment of the retina, access remains limited in many regions of the Philippines, particularly in rural or under-resourced areas. High costs, scarcity of advanced ophthalmic equipment, and a limited number of trained personnel limits widespread use. As a result, timely diagnosis, monitoring of disease progression, and early detection of complications in conditions like ocular toxoplasmosis can be delayed. Improving equitable access to OCT—through public hospital funding, and training initiatives—could enhance early detection, guide treatment decisions, and ultimately improve visual outcomes for Filipino patients.[6–11]

Conclusion

This case of congenital ocular toxoplasmosis diagnosed in adolescence underscores the diagnostic gaps in early detection of congenital infections in the Philippines. Limited access to routine neonatal screening, serologic testing, and advanced ophthalmic imaging contributes to delayed recognition, allowing lesions to persist undetected until visual symptoms manifest. The case highlights the need for enhanced awareness among healthcare providers, integration of early ophthalmologic screening in high-risk infants, and improved accessibility to diagnostic tools such as serology and OCT. Strengthening these measures can facilitate earlier diagnosis, timely intervention, and better visual outcomes for Filipino patients with congenital ocular toxoplasmosis.

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Conflict of interests

The author declares that there are no conflicts of interest.

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