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Significance of Polymerase Chain Reaction Analysis of Vitreous Humor in an Immunocompromised Patient with Necrotising Retinochoroiditis

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Introduction

Toxoplasmosis is one of the most common human parasitic infection worldwide. In most adults, it does not cause serious illness, but in immunocompromised individuals, it can cause more severe but also atypical manifestations. We present a patient who complained of progressive vision loss, with newly diagnosed HIV infection, in whom polymerase chain reaction (*PCR*) of the vitreous humor was a definitive tool to achieve diagnosis.

Case

A 36-year-old woman with newly diagnosed nephrotic syndrome presented with a 10-day history of blurry vision and bilateral progressive vision loss. Her only medicine was amlodipine for hypertension.

Social history

The patient, born in Nigeria, arrived in the United States two months prior to her admission. She was monogamous with her husband. She denied use of tobacco, alcohol or illicit drugs.

Physical exam

BP 131/74 mmHg, HR 99/min, RR 18/min, temperature 97.5 ° F. On ophthalmological exam, her visual acuity was 20/800 in both eyes. Intraocular pressure was normal (17-18 mmHg). Fundoscopic findings are seen in Fig 1A and 2A. She had bilateral pitting edema. The remainder of her physical exam was normal.

Laboratories

Hgb was 6.3 gr/dL, creatinine 13.5 mg/dL and normal electrolytes. Urinalysis showed proteinuria. **Serology for HIV was positive with a CD4 count of 17/µl and HIV viral load of 375,000 copies/ml.**
Head CT showed no evidence of hemorrhage or fluid collection. A lumbar puncture was performed and cerebrospinal fluid analysis was unremarkable. VDRL, *Cryptococcus spp* antigen, immunoglobulins against *Toxoplasma spp, Acid- Fast Bacilli (AFB)* smear and fungal and bacterial cultures of the CSF were all negative.
Serum PCR for herpes simplex virus 1 and 2 (HSV 1 and 2), varicella-zoster (VZV) and cytomegalovirus (CMV) were also negative.

Serology for cytomegalovirus IgG (CMV) was positive as well as IgG (but negative IgM) for toxoplasma.

Fig 1A. Funduscopy of the left eye: grade 4 disc edema (arrow) with intraretinal hemorrhages (arrowhead).
Fig 1B. Improvement of the disc edema (arrow) and intraretinal hemorrhage (arrowhead) after 4 weeks of treatment.

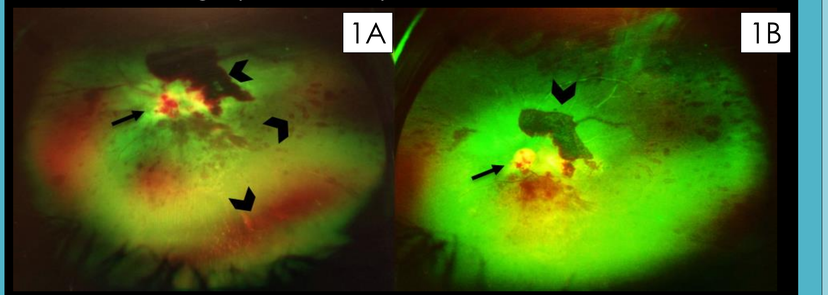


Fig 2A. Funduscopy of the right eye: pink papilla without edema, intraretinal hemorrhages (arrowhead) and sub-retinal whitening.
Fig 2B. Improvement of the intraretinal hemorrhage (arrowhead) after a 4-weeks course of intravenous and intravitreal antibiotics.

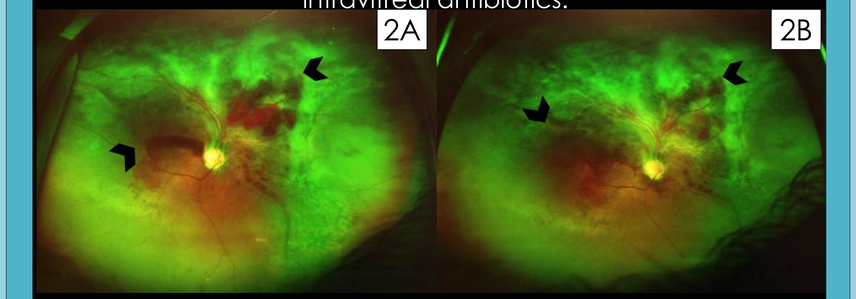
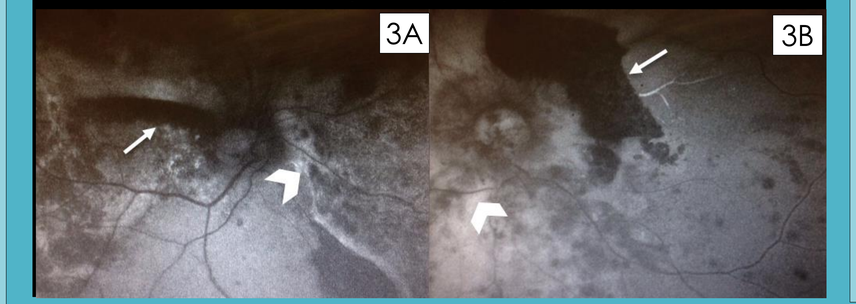


Fig 3. Fundus fluorescein angiography of the right **(A)** and left eye **(B):** old lesion with hypofluorescence (arrows). The hyperfluorescence at the margins corresponds to active lesions (arrowheads).



Clinical course

Given the concern for progression to irreversible blindness, the patient was started on empiric intravenous ganciclovir, trimethoprim-sulfamethoxazole, and prednisolone. Anterior chamber paracentesis of both eyes was performed. Vitreal fluid analysis returned positive for toxoplasma antigen in both eyes and *PCR* was negative for CMV and VZV in both eyes. **The diagnosis of toxoplasma retinochoroiditis was then confirmed by PCR.** Treatment for toxoplasma retinochoroiditis with oral trimethoprim-sulfamethoxazole, intravitreal clindamycin and prednisolone lasted for 6 weeks with clinical improvement at 4 weeks (Fig 1B and 2B). She started combination antiretroviral therapy

Discussion

The diagnosis of ocular toxoplasmosis in immunocompromised patients is often challenging, since atypical lesions are common and obtaining reliable results for immunodiagnostic assays is difficult. Therefore, the best clue to diagnosis is recognition of the clinical presentation in association with the detection of an infectious agent in ocular samples by **molecular biology techniques**, such as *T. gondii* antibody titers or amplification of *T. gondii* DNA.

The **confirmation of clinical diagnosis is higher for PCR of vitreous samples** (up to 50%) compared to serum or aqueous humor (between 18 and 46%). The higher yield of vitreal samples can be explained by the fact that, anatomically, the vitreous humor is closest to the necrotic lesions, leading to a better sampling of the parasitic DNA.

In this case, a positive PCR study for T. gondii, along with the clinical presentation led us to the correct diagnosis sparing potentially toxic therapies.

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The pictures of this case are contributions of the Department of Ophthalmology at the Lyndon B. Johnson General Hospital, in Houston, Texas.

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