Retinal vasculitis in *Toxocara canis* neuroretinitis

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Abstract

**Background:** The purpose of this case report is to describe clinical and angiographic findings of retinal vasculitis in acute *Toxocara canis* neuroretinitis associated with systemic infection.

**Findings:** A 16-year-old male presented with a 1 week history of left eye pain, floaters, and decreased visual acuity. Ocular examination was consistent with neuroretinitis and retinal vasculitis. Fluorescein angiography demonstrated leakage of fluorescein from the optic nerve and the retinal veins. Clinical and laboratory evaluation were consistent with systemic *Toxocara canis* infection.

**Conclusions:** Ocular *T. canis* may present with retinal vasculitis in young patients in the setting of acute systemic infection.

**Keywords:** Toxocara canis, Neuroretinitis, Vasculitis, Fluorescein angiography

Case report

A 16-year-old male presented with a 1 week history of left eye pain, floaters, and decreased visual acuity. His review of symptoms was significant for headache, sore throat, and cough occurring 1 week prior to his visual symptoms. He did not have any known history of animal exposure and denied any recent direct contact with dogs. Visual acuity was 20/20 in the right eye and 4/200 in the left eye. The ophthalmic examination of the right eye was entirely normal. A relative afferent pupillary defect was present in the left eye. Anterior segment examination showed mild conjunctival hyperemia, fine keratic precipitates across the corneal endothelial surface, 3+ cells and flare in the anterior chamber, and 2+ anterior vitreous cells. Fundus examination showed mild posterior vitreous debris (Figure 1a). The optic nerve was swollen with overlying exudates and surrounding subretinal fluid. Macula was thickened with underlying subretinal fluid extending from the optic nerve. There were multiple, track-like chorioretinal scars around the nasal portion of the retina, near the optic disk, and extending into the periphery (Figure 1a). Retinal veins showed mild phlebitis with areas of cotton wool spot-like exudates along the temporal vascular arcades. Fluorescein angiography of the left eye showed leakage of fluorescein from the optic nerve and the retinal veins (Figure 1b, c). Optical coherence tomography (OCT) of the left eye showed subretinal and intraretinal fluid (Figure 1d). The patient was started on topical steroid and cycloplegic...
treatment, and laboratory work-up including PPD with control, CBC, angiotensin converting enzyme, FTA-ABS, c-ANCA, HLA-B5, HLA-B27, Bartonella panel, *T. canis* ELISA, and toxoplasmosis IgG and IgM was initiated. A chest X-ray was ordered. One week later, visual acuity measured 20/200 on the left with improving anterior chamber inflammation. Funduscopic examination showed decreased subretinal fluid, development of a macular star, and resolving perivenular and peripapillary exudates (Figure 2a). The laboratory work-up returned positive for...
*T. canis* ELISA and elevated eosinophil count at 8.2%. The rest of the laboratory work-up and chest X-ray were within normal limits. The patient’s positive *T. canis* ELISA, eosinophilia, and systemic symptoms strongly indicated the diagnosis of systemic *T. canis* infection, and after consultation with the infectious disease service, he was treated with albendazole and oral prednisone. Two weeks later, the visual acuity remained at 20/200, and fundus examination showed improving macular star, optic nerve edema, and retinal exudates. Visual acuity improved to 20/80 17 months after his initial presentation (Figure 2b).

**Discussion**

Ocular manifestations of *T. canis* vary greatly and may include disciform macular detachment, multifocal granulomas, retinal tracks, peripheral retinal detachment, papillitis, peripheral retinal mass, pars plana mass, vitritis, endophthalmitis, and cataract. However, to our knowledge, retinal vasculitis has not been previously described in patients with ocular *Toxocariasis*. Our patient presented with clinical and angiographic findings of retinal vasculitis in the setting of *T. canis* neuroretinitis and evidence of concurrent systemic *T. canis* infection. His examination was significant for sheathing of the retinal veins and cotton wool spot-like exudates. Fluorescein angiography demonstrated dye leakage from retinal vessels with a venous predominance, consistent with the clinical findings.

Vasculitis is a well-documented finding in many organs in patients affected by systemic *T. canis* infection [5]. In addition, retinal vasculitis is one of the common findings in animal models of ocular *T. canis* infection [4]. Most patients with ocular *T. canis* are not seen in the acute phase of systemic infection. This may partly explain why retinal vasculitis is an uncommon finding in human ocular infections with *T. canis* and has not been reported previously. In our patient, the presence of constitutional symptoms, positive *T. canis* ELISA, and increased eosinophil count on blood analysis indicated concurrent systemic and ocular *T. canis* infection.

**Conclusion**

Although uncommon, *T. canis* infection needs to be considered in the differential diagnosis of neuroretinitis and retinal vasculitis in young patients. Evaluation for constitutional symptoms of *T. canis* infection as well as laboratory work-up including *T. canis* ELISA and complete blood count may assist with diagnosis. Treatment with anthelmintic agents and systemic steroids may hasten recovery of ocular symptoms and funduscopic findings, though permanent posterior segment changes are common secondary to infective and inflammatory factors. Visual outcome may be limited due to irreversible retinal damage despite the initiation of anthelmintics and anti-inflammatory agents.

**Consent**

Informed consent was obtained from the mother of patient on his behalf for publication of this report and any accompanying images.

**Competing interests**

The authors declare that they have no competing interests.

**Authors’ contributions**

CB and SE conceived of the study, participated in its design and coordination, and helped to draft the manuscript. All authors read and approved the final manuscript.

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**References**

1. Stewart JM, Cubillan LD, Cunningham ET Jr (2005) Prevalence, clinical features, and causes of vision loss among patients with ocular toxocariasis. Retina 25:1005–1013
2. Taylor MR (2001) The epidemiology of ocular toxocariasis. J Helminthol 75:109–118
3. Shields JA (1984) Ocular toxocariasis. A review. Surv Ophthalmol 28:361–381
4. Fenoy S, Ollero MD, Guillen JL, del Aguila C (2001) Animal models in ocular toxocariasis. J Helminthol 75:119–124
5. Rubinsky-Elefant G, Hirata CE, Yamamoto JH, Ferreira MU (2010) Human toxocariasis: diagnosis, worldwide seroprevalences and clinical expression of the systemic and ocular forms. Ann Trop Med Parasitol 104:3–23

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