

Ocular Toxoplasmosis presenting with right eye sensory esotropia and bilateral facial nerve palsy in a pediatric age group patient: A case report

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Abstract

Toxoplasmosis is a worldwide zoonosis caused by an intracellular protozoan parasite, *Toxoplasma gondii*. We report here a 6 year old pediatric patient who was diagnosed with toxoplasmosis 2 years back with right eye squint and bilateral facial nerve palsy. A 6-year-old male child presented for routine follow up after 1 year with a 2 year history of squint in right eye along with diminution of vision both for near and distance. He was diagnosed with toxoplasmosis 2 years back. Serology for toxoplasma was positive for IgG. Poor prognosis results from macular involvement and regular follow-up is necessary as reactivation may lead to vitritis with further diminution of vision.

Keywords: Toxoplasmosis; bilateral seventh nerve palsy; sensory esotropia; case report

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I. INTRODUCTION

Toxoplasmosis is a zoonosis caused by *Toxoplasma gondii*, an intracellular protozoan parasite. The infection can be congenital or acquired with the main transmission routes includes contaminated food and water and vertical transmission.¹ Toxoplasma encephalitis manifests as headache, fever, hemiparesis, ataxia, cranial nerve palsy and seizures.² Ophthalmic manifestations of toxoplasmosis include retinal scar, vitritis, retinal detachment and optic neuritis.³ It is also the commonest cause of posterior uveitis in the world.⁴ Children with mild infection present later in life with complaints of decreased visual acuity, strabismus, nystagmus, microphthalmia, optic atrophy and phthisis bulbi.⁵ In immunocompetent hosts, toxoplasmosis may manifest as fever, lymphadenopathy, maculopapular rash with severe clinical symptoms occurring in immunodeficient individuals including encephalitis, myocarditis, pneumonitis and neuropathy.⁶

We report here a 6 year old pediatric patient who was diagnosed with toxoplasmosis 2 years back with right eye sensory esotropia and bilateral facial nerve palsy who presented for yearly routine checkup.

II. CASE REPORT

A 6-year-old child presented for routine follow up after 1 year. He was diagnosed with squint and diminution of vision in right eye for 2 years. He had history of pre term birth at 28 weeks of gestation, a low birth weight of 1.5 kg and NICU admission for 10 days. The child also had expressionless face since birth with inability to close eyes and drooling of saliva since birth along with delayed milestones. His mother had history of fever in second month of pregnancy.

On examination, best corrected visual acuity (BCVA) in right eye (RE) was found to be counting fingers close to face (CFCF) whereas in left eye (LE) was 6/9 on snellen chart. Intraocular pressure (IOP) was normal in both eyes. Dry refraction was performed with no acceptance in RE on whereas BCVA was 6/9 on LE with acceptance of +1.50 sphere and -2.00 cylinder at 150 degrees.

On slit lamp examination, anterior segment was within normal limits and ocular movement was full in all gazes.

On cover test (CT), RE esotropia (ET) was noted with eccentric fixation while LE fixation was central, steady and maintained (CSM). Dilated retinoscopy, refraction and fundus evaluation was undertaken after dilating both eyes with cyclopentolate. The retinoscopy values of both eyes were similar and suggestive of with the rule (WTR) astigmatism with vertical meridian being neutralized with -0.25 D and horizontal meridian neutralized with +2.00 D. However like dry refraction, there was no acceptance on RE with BCVA remaining CFCF while LE BCVA was 6/9 after +1.50 D sphere and -2.00 D cylinder acceptance. On fundus examination a large punched out well defined lesion suggestive of healed chorioretinal toxoplasmosis scar was noted in macula in RE while LE fundus was within normal limits.

The child had facial asymmetry with drooling of saliva from angles of the mouth in addition to having an expressionless face. Poor Bell's phenomenon and lagophthalmos was noted on both sides. Non-contrast MRI imaging of brain 2 years back was suggestive of encephalomalacic changes in left occipital region with sign of volume loss due to disproportionate prominence of occipital horn of left lateral ventricle with hyperintense focus on T2W1 and FLAIR in right lentiform nucleus suggestive of chronic ischaemic focus. Blood examination undertaken 2 years back was suggestive of leucocytosis.

The following parameters were negative or normal: HIV, HBsAg, blood glucose. Serology for toxoplasma was positive for IgG suggesting chronic infection. The patient was prescribed glasses and hydroxypropyl methylcellulose eye ointment for application at night time to prevent exposure keratitis. Also half-yearly review was advised.

III. DISCUSSION

Toxoplasmosis, a zoonosis caused by *Toxoplasma gondii*, has manifestations depending on the organs involved.¹

Toxoplasma encephalitis can manifest as headache and multiple cranial nerve palsy.² Ophthalmic manifestations of toxoplasmosis include retinal scar, vitritis and posterior uveitis with later complaint of strabismus and nystagmus in mild infection.^{3,4,5} Congenital toxoplasmosis is bilateral and mostly has macular involvement due to end-artery anatomy of the fetal macular circulation.⁵ Toxoplasmosis has predilection for cranial nerve palsy mostly 3rd, 6th and 7th nerve with facial nerve palsy being reported in several studies.^{7,8,9} Toxoplasma induced facial nerve palsy has been demonstrated by movement of parasite from the intestinal lumen to the vascular endothelial cells. Epitope homologies between the parasite and host peripheral nervous system molecules is another contributing factor.⁹ There can also be an actual infection of the nerve.¹⁰ The management of long-standing facial nerve palsy is to aim for quick and complete recovery, preventing corneal complications and other sequelae.¹¹ However in this case due to long-standing palsy, management was focused on preventing corneal complications and exposure keratopathy. The patient was prescribed lubricant (hydroxypropyl methylcellulose) gel application at night time to prevent exposure keratopathy on account of inadequate lid closure due to poor Bell's. On neuroimaging toxoplasma encephalitis exhibits hyperintensity which corroborates with the MRI imaging undergone by the patient.² Fundus imaging (Fig 1 and Fig 2) showing well-defined punched-out lesion at macula with prominent pigment at the margins which was strongly suggestive of ocular toxoplasmosis.^{5,12,13} Despite the absence of recent blood reports, the MRI imaging findings as well as characteristic fundus imaging along with positive IgG titre is strongly suggestive of congenital toxoplasmosis with ocular involvement. Histologically retinochoroidal lesions are characterized by granulomatous inflammation and necrosis of the retina and choroid.^{14,15} Strabismus is frequently associated with congenital toxoplasmosis due to

poor fixation as macular lesions lead to decreased visual acuity or impaired visual function from neural involvement as compared to lesions not involving macula.¹² Due to macular involvement the prognosis is usually poor and treatment usually involves prescribing spectacles and cosmetic correction of strabismus. Routine follow-up is necessary as reactivation of infection may lead to vitritis with further loss of vision.¹⁶

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DISCLOSURE

Conflict of interest: None

REFERENCES

- [1]. Fakhar M, Soosaraei M, Khasseh AA, Emameh RZ, Hezarjaribi HZ. A bibliometric analysis of global research on toxoplasmosis in the Web of Science. *Vet World* 2018;11(10):1409-15.
- [2]. Marra CM. Central nervous system infection with *Toxoplasma gondii*. *Handb Clin Neurol* 2018;152: 117-22.
- [3]. Delair E, Latkany P, Noble AG, Rabiah P, McLeod R, Brézin A. Clinical manifestations of ocular toxoplasmosis. *Ocul Immunol Inflamm* 2011;19(2): 91-102.
- [4]. Henderly, D. E., Genstler, A. J., Smith, R. E., & Rao, N. A. (1987). Changing patterns of uveitis. *American journal of ophthalmology*, 103(2), 131–136.
- [5]. Brady-McCreery, K. M., Hussein, M. A., & Paysse, E. A. (2003). Congenital toxoplasmosis with unusual retinal findings. *Archives of Ophthalmology*, 121(8), 1200-1201.
- [6]. Galli-Tsinopoulou A, Kyrgios I, Giannopoulou EZ, et al. Acquired toxoplasmosis accompanied by facial nerve palsy in an immunocompetent 5-year-old child. *J Child Neurol* 2010;25(12): 1525-8.
- [7]. Mwanza JC, Nyamabo LK, Tylleskär T, Plant GT. Neuro-ophthalmological disorders in HIV infected subjects with neurological manifestations. *Br J Ophthalmol* 2004;88(11):1455-9.
- [8]. Riga M, Kefalidis G, Chatzimoschou A, et al. Increased seroprevalence of *Toxoplasma gondii* in a population of patients with Bell's palsy: a sceptical interpretation of the results regarding the pathogenesis of facial nerve palsy. *Eur Arch Otorhinolaryngol* 2011;268(7):1087-92.
- [9]. Couvreur J, Thulliez P. Acquired toxoplasmosis of ocular or neurologic site: 49 cases. *Presse Med* 1996;25(9):438-42.
- [10]. Hegab SM, Al-Mutawa SA. Immunopathogenesis of toxoplasmosis. *Clin Exp Med*. 2003;3:84-105

- [11]. Holland NJ, Weiner GM. Recent developments in Bell's palsy. *Br Med J.* 2004;329:553–557. doi: 10.1136/bmj.329.7465.553
- [12]. Hogan MJ. *Ocular toxoplasmosis.* New York: ColumbiaUniversity Press, 1951.
- [13]. Maumenee AE. Clinical entities in uveitis: An approach to the study of intraocular inflammation. *TransAmAcadOphthalmolOtolaryngol* 1970; 74:473-504.
- [14]. Wilder HC. Toxoplasmachorioretinitis in adults. *Arch Ophthalmol* 1952; 48:127-136.
- [15]. Paige BH, Cowen D, Wolf A. Toxoplasmic encephalomyelitis. V. Further observations of infantile toxoplasmosis; intrauterine inception of the disease; visceral manifestations. *Am J Dis Child* 1942; 63:474-514.
- [16]. Lambers SR. Ocular manifestations of intrauterine infections. In: *Pediatric Ophthalmology and Strabismus.* Taylor D, Hoyt GS, eds. 3rd ed. London: Elsevier Saunders; 2005:139-45.



Fig 1: Toxoplasma scar involving macula in right eye



Fig 2: Toxoplasma scar left eye(macula not involved)

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