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Case Report : Management of Neuroretinitis due to Infection of Toxoplasmosis and Cytomegalovirus

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Management of Neuroretinitis due to Infection of Toxoplasmosis and Cytomegalovirus

Abstract
Background: Neuroretinitis is an inflammation of the neural retina and optic nerve. Inflammation of the optic nerve can result from direct infection of the nerve by a variety of infectious agents such as viruses, bacteria and parasite.
Purpose: To report a case of neuroretinitis, management given and the visual outcome
Case Report: A 35 year old woman came with chief complaint of progressive unilateral visual loss and black floater on the left eye (LE) since one week. Ophthalmologic examination revealed best corrected visual acuity 1/60 and swelling optic disc with undefined margin and macular star on retina with tigroid fundus on LE. Laboratory result showed reactive result IgG toxoplasma with >700 IU/ml and IgM Anti CMV with 2.4 index value. She was then diagnosed as Neuroretinitis due to infection of toxoplasmosis and Cytomegalovirus. She was treated with 3 days intravenous methylprednisolone 250 mg four times daily with consecutive tapering off of the steroid. After three days therapy,there were significant clinical improvements.
Conclusion: Neuroretinitis require urgent further investigations to find out causes of inflammation of optic nerve head and treat them accordingly.
Keywords: optic neuritis, intravenous steroid, neuroretinitis

I. Introduction

Neuroretinitis is an inflammation of the neural retina and optic nerve. Inflammation of the optic nerve can result from direct infection of the nerve by a variety of infectious agents such as viruses, bacteria and parasite. Parainfectious optic neuritis typically follows the onset of a viral, or less often a bacterial infection by 1 to 3 weeks. [1-3]

The pathogenesis of infectious optic neuropathies remains unclear. Direct involvement of the optic nerve by a pathogen and indirect involvement with inflammatory, degenerative, or vascular mechanisms might contribute to the development of optic nerve involvement. Ocular toxoplasmosis is a common cause of infectious retinochoroiditis worldwide. Toxoplasmic optic neuropathy is rare which characterized by subacute visual loss and optic nerve swelling, sometimes accompanied by a macular star (neuroretinitis). Lesions adjacent to the optic disc may produce significant morbidity leading to central vision loss or sectorial visual field defects.[1,4-6]

II. Case Report

A 35-year old woman came to the Neuro Ophthalmology unit consulted from retinal unit on March 1st 2021 , with the chief complaint of progressive unilateral visual loss and black floater on the left eye since one weeks before admission. Patient regularly uses eye glasses, denied histories of pain in eye movement, fever, flu-like syndrome, head trauma, severe headache, nausea and projectile vomiting. She had no systemic disease such as hypertension, diabetes mellitus nor hypercholesterolemia.

Figure 1. Eye movement of the patient showed no eye movement restriction.

Physical examination showed normal vital signs. Ophthalmological examination revealed best corrected visual acuity of the right eye (RE) was 0.8 and left eye (LE) was 1/60. Intraocular pressure (IOP) within normal limit, no restriction of eye movement and no pain in both eyes movement. Hirschberg test showed ortothropia. Anterior segment on both eyes were within normal limit, with decreased pupillary light reflex and relative afferent pupillary defect (RAPD) grade 3 on LE.

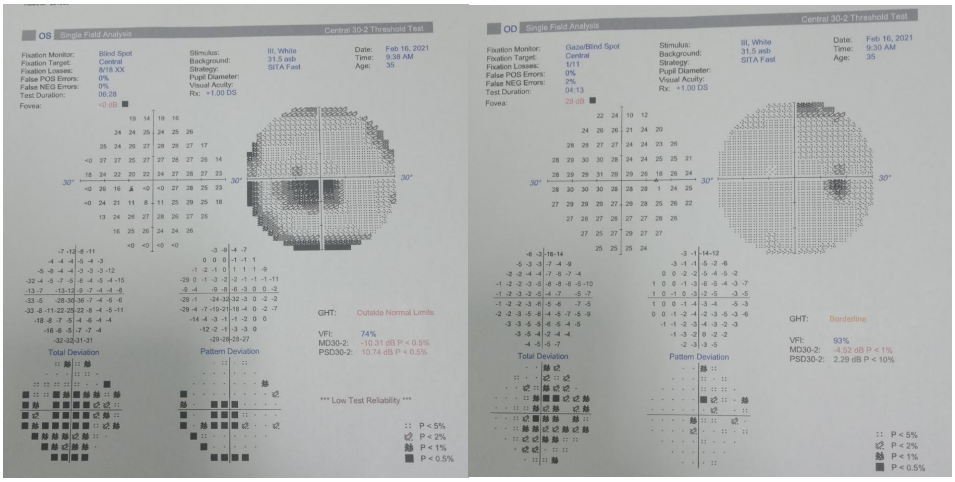

Figure 2. Visual field testing after 3 days methylprednisolone treatment showed scotoma in central visual field area on LE.

Posterior segment with indirect funduscopy revealed normal optic disc appeareance with tigroid fundus on RE, and swelling optic disc with undefined margin, exudation on inferotemporal retina and macular star with tigroid fundus on LE. Ancillary examinations such as colour vision with Ishihara, amsler grid and contrast sensitivity test showed normal result on the RE, meanwhile on the LE patient could not see the demoplate on ishihara, there was no metamorphosia but patient saw scotoma on amsler grid examination, and contrast sensitivity result was more than 25%.

Patient was diagnosed with Neuroretinitis ec susp Toxoplasmosis with Miopia Gravior and was admitted to hospitalized and receive intravenous injection of methylprednisolone 4x250 mg for three days, Omeprazole intravenous 1x30mg, mecobalamine iv 1x500mcg, calcium supplement tablet and vit D3 3x per day, cotrimoxazole 2x960 mg per oral and pyrimetamine 3x25mg for three days.

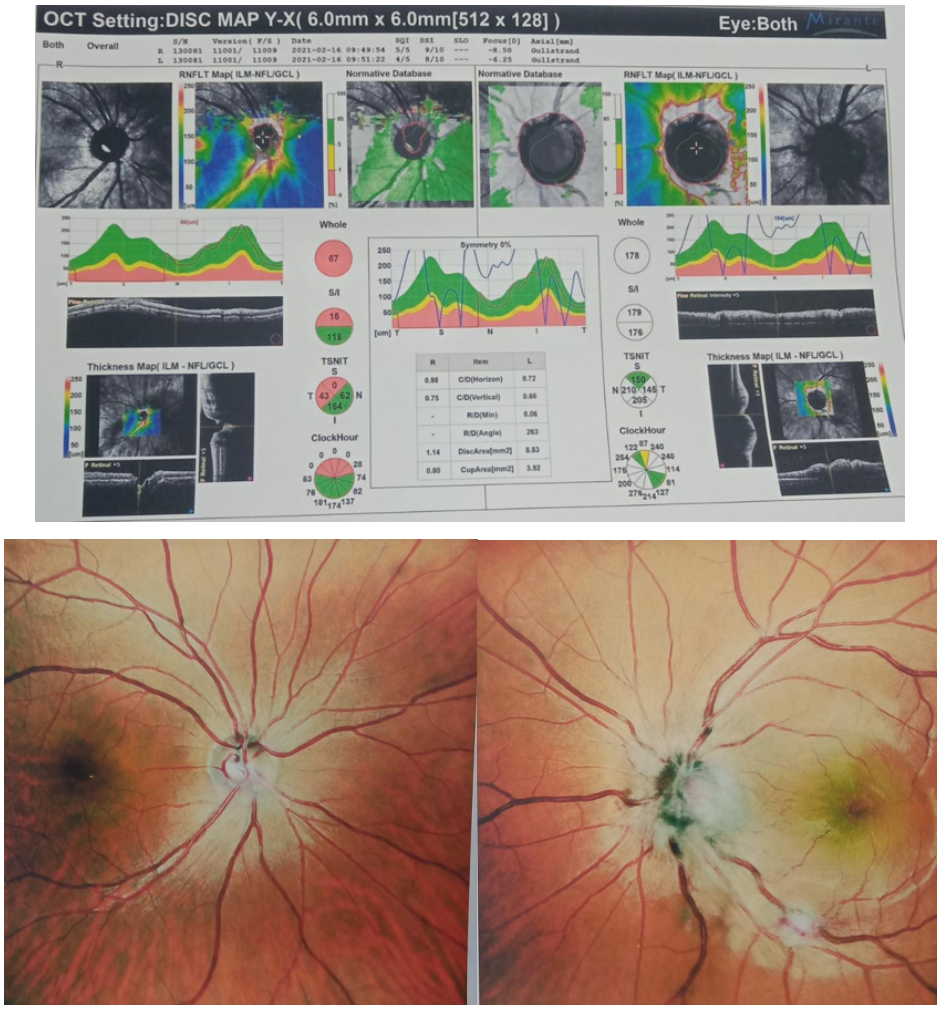

Figure 3. Fundus Photograph and OCT of the patient showed swelling optic disc with undefined margin and exudation on retina with tigroid fundus.

On one weeks follow up visit after discharged, the eyesight on LE got better, patient did not report any side effect of the given treatment, patient denied histories of headache, nausea and vomiting. Vital sign was within normal limit. Ophthalmological examination showed visual acuity of the RE was 0.8 and the LE was 0.25 with eye glasses. IOP was within normal limit. Eye movement showed no restriction and no pain, Hirschberg test showed ortothropia.

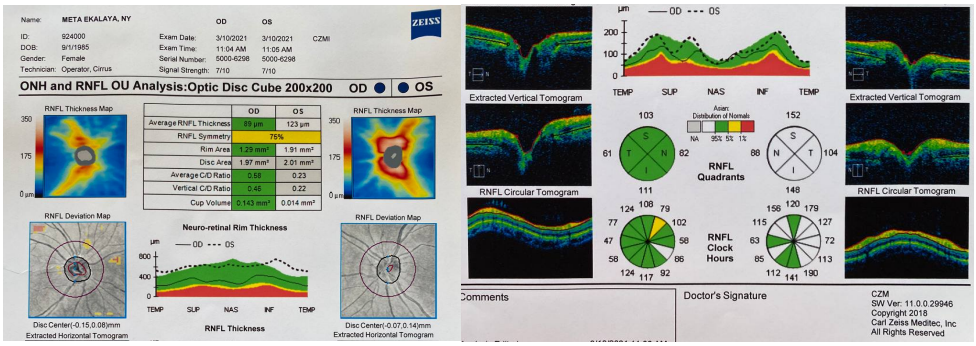

Figure 4. Fundus Photograph and OCT of the patient showed retinal exudate (macular star) with slightly swollen left optic disc.

Anterior segment on the RLE showed similar result compared to before admission. Posterior segment with indirect funduscopy revealed swelling optic disc with undefined margin and retina scar on LE. Ancillary examinations such as colour vision with Ishihara, amsler grid and contrast sensitivity test showed normal result on the RE, meanwhile on the LE patient saw 16 plate from 21 plate on ishihara, there was no metamorphosia but patient saw scotoma on amsler grid examination, and contrast sensitivity result was 1.25%.

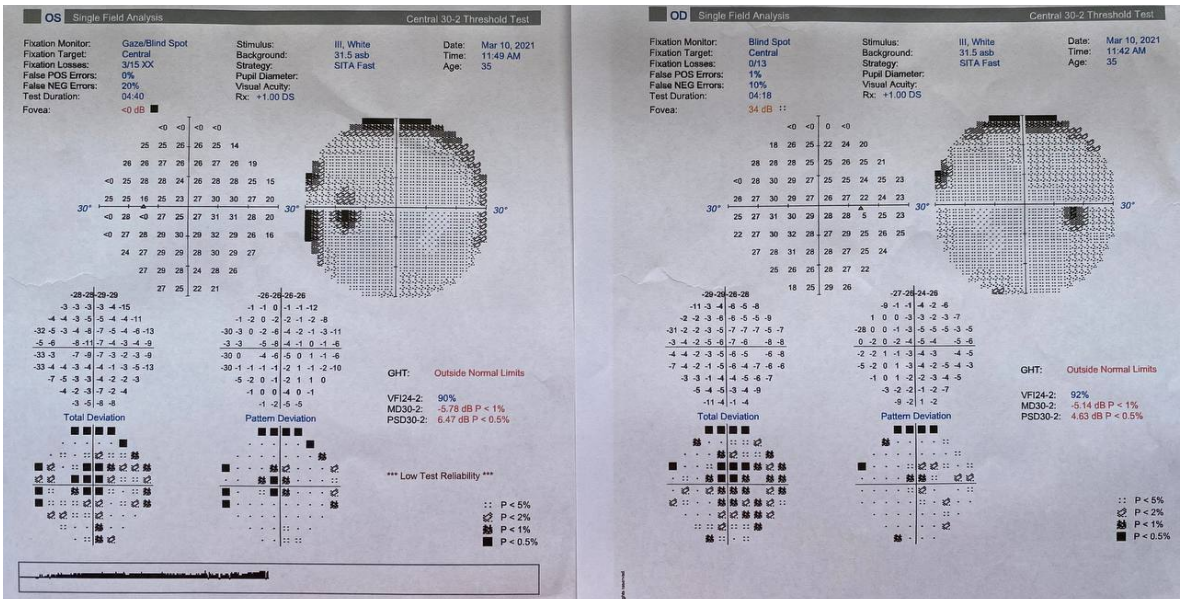

Figure 5. Visual field testing after 1 week methylprednisolone treatment showed improving in central visual field area after previous central scotoma in left eye.

Routine haematologic examination showed within normal limit, while serologic testing of IgG toxoplasmosis showed reactive result with >700 IU/ml, no reactive on HIV test, and IgM Anti CMV infection showed reactive result with 2.4 index value. Patient was diagnosed with Neuroretinitis ec Toxoplasmosis and CMV infection with Miopia Graviour and admitted to receive methylprednisolone (tapering off) per oral, Lansoprazole 1x30mg per oral, mecobalamine 1x500mcg per oral, calcium supplement tablet and vit D3 3x per day, cotrimoxazole 2x960 mg per oral and patient was consulted to internal medicine.

III. Discussion

Optic neuritis is an inflammation of the optic nerve characterized by swelling of the optic nerve, reduction of vision, and usually, marked reduction of colour vision. Atypical Optic Neuritis is a heterogeneous collection of disorders whose presenting features suggest inflammation of the optic nerve. The inflammation may be triggered by an inflammatory or immune-related disease such as neurosarcoidosis, neuromyelitis optica or by a different process such as infection.

Neuroretinitis is an inflammation of the neural retina and optic nerve. This patient was diagnosed with Neuroretinitis due to the presence of other comorbid ocular diseases, namely vasculitis which is suspected due to a toxoplasma infection and CMV which is the most common cause of retinal infection in tropical countries.[1,2,10]

Inflammation of the optic nerve can result from direct infection of the nerve by a variety of infectious agents such as viruses and bacteria. It may present as anterior optic neuritis, also called papillitis, retrobulbar optic neuritis, anterior ischemic optic neuropathy, or another form of optic neuropathy. Parainfectious optic neuritis typically follows the onset of a viral, or less often a bacterial and parasite infection by 1 to 3 weeks. Willerson et al stated pathogenesis of infectious optic neuropathies remains speculative and direct involvement of the optic nerve by a pathogen and indirect involvement with inflammatory, degenerative, or vascular mechanisms might contribute to the development of optic nerve involvement. The clinical picture in this patient is neuroretinis due to swelling of the optic nerve head accompanied by exudate on the retina. Symptoms in this patient appeared one week at the time of admission to the hospital which means that it is in accordance with the characteristics of optic neuritis, namely subacute symptoms. Due to the diagnosis of neuroretinitis in the patient, the management applied to the patient is to look for the etiologic of the disease by means of hematology and serology of viruses and parasites. [1,4-6]

Toxoplasmic optic neuropathy is rare, characterized by subacute visual loss and optic nerve swelling and accompanied by a macular star (neuroretinitis). Küçükerdönmez et al stated lesions adjacent to the optic disc may produce significant morbidity leading to central vision loss or sectorial visual field defects and scars within one disc diameter of the disc are more likely to be associated with absolute defects breaking out to the periphery. This patient showed positive Toxoplasma IgG and CMV IgM serology results. This finding supports the clinical findings that have been previously obtained, namely inflammation of the retina accompanied by inflammation of the optic nerve. The patient also expressed

complaints such as black spots which may be related to retinal lesions exacerbated by inflammation of the optic nerve.[5-7,11]

The diagnosis of toxoplasmic optic neuritis may be challenging in the absence of an active or inactive retinochoroidal lesion. A positive assay for IgG does not confirm the diagnosis of ocular toxoplasmosis, given the high rate of seropositivity in the normal population in most countries. The presence of high IgM indicates recently acquired infection. A negative serology can exclude the diagnosis of ocular toxoplasmosis. In this patient, there is a high value on the serologic examination of toxoplasma IgG which indicates that an infection has occurred. This supports the diagnosis that is established because there is already a lesion on the retina.[4-8]

Mansour et al stated Cytomegalovirus (CMV) optic neuritis has been reported in 4%–14% of patients with acquired immune deficiency syndrome and CMV retinitis. Several cases of CMV optic neuropathy in immune-compromised patients unrelated to CMV retinitis have also been described, including isolated optic neuritis, and retrobulbar optic neuritis associated with meningoencephalitis. Chang et al stated a few cases of bilateral CMV papillitis without associated retinitis have been reported in young immunocompetent patients with good recovery after antiviral therapy with or without associated corticosteroid therapy. In this patient, there was a high value on the serological examination of CMV IgM which supported the diagnosis. The management for these patients is in collaboration with the internist regarding the infection that the patient has acquired.[8,9]

Visual recovery following parainfectious optic neuritis is usually excellent without treatment. Whether corticosteroids hasten recovery in patients with postviral optic neuritis is unknown, this treatment is reasonable to consider, particularly in cases in which visual loss is bilateral and severe. Management of toxoplasmosis-associated optic neuropathy involves the use of a combination of antiparasitic therapy and corticosteroids. The standard treatment includes pyrimethamine, given in a loading dose of 100 mg on day 1 followed by 50 mg

daily (25 mg in children) and sulfadiazine 4 g/day. Management of this patient is in accordance with the ONTT procedure and is adjusted to the handling of the infection that occurs. In this patient, good results were obtained with increased visual capacity, visual field, contrast and color sensitivity. [1,3-5]

Eckert et al stated overall visual outcome of toxoplasmosis-associated optic nerve involvement is good after systemic antitoxoplasmosis treatment and corticosteroids but scars within one disc diameter of the optic disc are more likely to be associated with absolute defects leading to considerable field loss. Kupersmith et al stated when atypical features are present, urgent further investigations are indicated to find out causes of inflammation of optic nerve head and treat them accordingly. It is more important to pick up cases which do not spontaneously improve or show progressive deterioration, as one needs to rule out compressive or infective lesions and treat them urgently. De Silva et al stated the prognosis of CMV-associated optic neuritis remains guarded despite aggressive antiviral therapy with or without associated corticosteroid therapy. In this case report, prognosis of this patient was quo ad vitam ad bonam because on admission there was no abnormality on general examination and quo ad functionam dubia because she had an improvement in visual acuity after treatment but there was still retinal scars and mild swelling of the optic nerve.[10-12]

IV. CONCLUSION

Neuroretinitis is an inflammation of the neural retina and optic nerve. Inflammation of the optic nerve can result from direct infection of the nerve by a variety of infectious agents such as viruses, bacteria and parasite. Neuroretinitis require urgent further investigations to find out causes of inflammation of optic nerve head and treat them accordingly.

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