

Lyme Neuroretinitis in Singapore: A Diagnostic Dilemma

Dear Editor,

Neuroretinitis is an inflammatory process of the optic nerve, typically characterised by optic disc oedema and the presence of a macular star.^{1,2} The aetiology is usually infectious³ and neuroretinitis secondary to Lyme disease is a rare occurrence worldwide.⁴ To date, there has been no reported incidence of Lyme disease in Singapore.

We report an interesting case of neuroretinitis with false-positive enzyme-linked immunosorbent assay (ELISA) serology for Lyme disease in Singapore. As a result, the patient was treated with antibiotics with some symptomatic relief. Subsequently, a repeat ELISA Lyme's test done did not show a rising titre and Western blot test for Lyme disease was negative. It is hence crucial to establish a correct diagnosis for Lyme neuroretinitis for appropriate treatment.

Case Report

A 59-year-old Chinese man was referred to us with a 1-week history of blurring of vision in the left eye. The blurring of vision was painless and was noticed upon awakening one morning. There was no progression and no associated floaters or photopsia, headache, scalp pain or jaw claudication. Patient had no significant medical illness in the past. No ischaemic risk factors such as hypertension, diabetes mellitus, ischaemic heart disease or hyperlipidemia were reported.

On examination, the visual acuity in the left eye was counting fingers (CF) closely with a relative afferent pupillary defect (RAPD). Ocular examination revealed the presence of mild nuclear sclerotic cataract. Retinal examination of the left eye showed the presence of flame haemorrhages and macular oedema covering an area of

three-disc-diameters with a pale, swollen optic disc (Fig. 1A). Colour vision, using the Ishihara's screening test for colour deficiency, was normal in the right eye but left eye testing could not be performed. A Humphrey™ visual field test showed a diffuse dampening of the left visual field. Based on these findings, a provisional diagnosis of left non-arteritic anterior ischaemic optic neuropathy (NA-AION) was made.

Blood investigations revealed normal full blood count, erythrocyte sedimentation rate, renal panel, glucose and glycated haemoglobin levels. The Venereal Disease Research Laboratory (VDRL) and fluorescent treponemal antibody absorbed (FTA-ABS) tests were negative. Autoimmune antibodies, such as anti-nuclear antibody, anti-double-stranded DNA antibody and anti-phospholipid antibody, were negative.

One week later, there was no improvement in vision in the left eye. However, the macular oedema appeared to be resolving and the disc was pale. Magnetic resonance imaging (MRI) of the brain and anterior visual pathways was then performed, which were normal. A macular star started to appear at 3 weeks from onset of symptoms with persistence of a pale disc with blurred disc margins (Fig. 1B). A diagnosis of left neuroretinitis was made and a work-up for possible infective causes was done.

The patient was then reviewed a week later and visual acuity in the affected eye had shown some improvement to CF at 3 metres. Visual field testing by confrontation revealed a central scotoma and a left RAPD was still present. Patient was then started on oral prednisolone 30 mg once-a-day in view of possible inflammatory aetiology for the neuroretinitis. Immunoglobulin G (Ig G) titres for

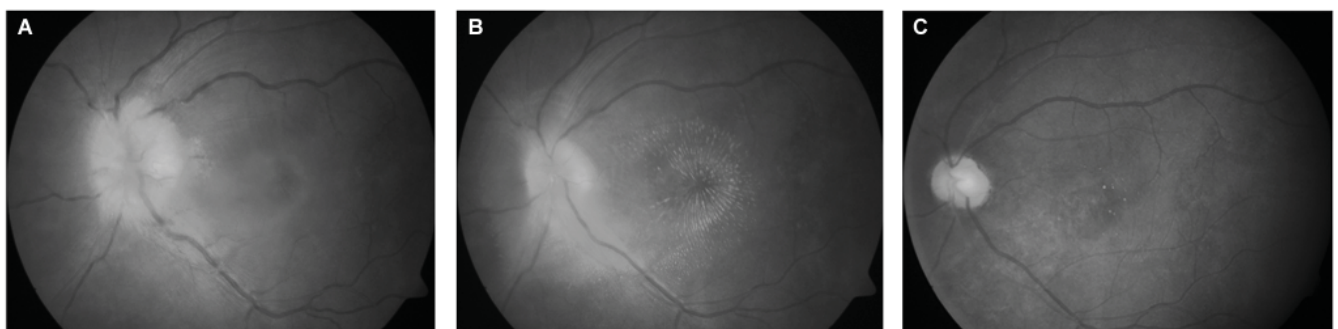


Fig. 1. (A) Fundus photograph showing optic disc appearance of the patient (taken at first presentation). Note the pale, swollen optic disc with macular oedema. (B) The left eye fundus at 3 weeks after the onset of visual loss. Note the appearance of the macular star and reduction in optic disc swelling. (C) Fundus photograph of the left eye at 18 months after initial presentation. The macular star and disc swelling have since resolved.

Borrelia burgdorferi (Lyme) was positive and directed questioning unveiled a history of severe ticks and loss of appetite in the patient's dog.

In view of possible left neuroretinitis secondary to Lyme disease, intravenous administration of ceftriaxone 1g twice-a-day was started. After 2 days of intravenous ceftriaxone, the patient reported having some subjective improvement in his vision (increased brightness in the left eye was reported) but the macular star and pale optic disc were still present. Intravenous ceftriaxone was then converted to oral amoxicillin 500 mg thrice-a-day as the treatment for Lyme disease.³ Oral prednisolone was then tapered to 10 mg once-a-day.

Sequential reviews of the patient in the clinic showed gradual resolution of the macular oedema and hard exudates (Fig. 1C). There was no improvement in visual acuity with treatment. The infectious disease team suggested that Lyme serology be repeated a second time in lieu of possible false positive titres. There was no rising titre. A confirmatory test using Western blot was also done. Three weeks later, the Western blot test was negative and all medications were then discontinued. The patient's best corrected visual acuity improved to 6/45, 18 months after initial presentation.

Discussion

Although ocular manifestations of Lyme disease have been described earlier, they are a rare feature of the disease. Ocular findings in Lyme disease were first noted by Steere *et al* in 1977,⁵ and might more commonly present as a nonspecific follicular conjunctivitis, nummular keratitis or ocular inflammatory syndromes, such as vitritis and uveitis. Neuro-ophthalmic manifestations of this disease may include optic neuritis, atrophy or disc oedema, multiple cranial nerve paresis and neuroretinitis.⁶ If detected, management of ocular manifestations often require intravenous antibiotic therapy.³

Diagnosing Lyme disease is based mainly on clinical findings, coupled with a possible history of exposure in an endemic area. Serological confirmation of the disease is important; however, its quality of detection has been frequently debatable. False positive serology has been reported in concurrent infections (syphilis, *Epstein-Barr* virus, *varicella*) or autoimmune diseases (systemic lupus erythematosus, juvenile rheumatoid arthritis).⁷⁻⁹ It may also be present secondary to cross-reacting antibodies to *Borrelia burgdorferi* in patients with other tickborne diseases.¹⁰ In addition, comparisons between commercial test kits have shown that concordance between test kits can be very low,¹¹ with variable specificities ranging from 83% to 100% between test kits. Hence, current CDC (Communicable Disease Centre) recommendations require Western blot analysis for the confirmation of positive or equivocal ELISA results.¹²

Neuroretinitis secondary to Lyme disease is a rare occurrence worldwide,⁴ and none has been reported in Singapore as yet. In our patient, although Western blot test was negative for Lyme Ig G, treatment with intravenous antibiotics was reported with a subjective improvement in visual acuity of the patient, with gradual resolution of the macular oedema. This case report primarily suggests that, in the absence of all other infectious, systemic diseases or uveitis entities, Lyme disease still remains a possible cause in this patient.

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