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Unilateral Neuroretinitis Secondary to Lyme Disease: Report of Two Cases in Young Women

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Abstract **Case Report**

Background: Neuroretinitis is an uncommon manifestation of Borrelia burgdorferi infection [1,2]. It typically presents as acute visual loss associated with optic disc edema and macular star [3]. ***Case Presentation:*** We report two cases of neuroretinitis secondary to Lyme disease in young women. The first patient, aged 42, presented with acute painless ision loss in the right eye (counting fingers at 3 meters), and the second, aged 35, in the left eye (1/10 on the Monoyer scale). Both had erythema migrans one month prior to ocular symptoms. Fundus examination revealed papillary edema with a macular star, and OCT confirmed macular edema. Serologic testing showed positive Borrelia burgdorferi IgM, while other infectious causes were excluded. MRI findings were unremarkable. The first patient received intravenous ftriaxone and the second doxycycline (due to C3G allergy), combined with high-dose corticosteroids followed by a tapering course over three months. Both showed progressive improvement in visual acuity after three weeks, reaching 5/10 and 7/10 respectively at three months. ***Conclusion:*** Lyme disease should be considered in the differential diagnosis of neuroretinitis, particularly in patients with a history of outdoor exposure and erythema migrans [1,2,4]. Early diagnosis and appropriate antibiotic therapy are essential to optimize visual prognosis [2,3].

Keywords: Neuroretinitis, Borrelia burgdorferi, Lyme disease, Optic disc edema, Macular star, Erythema migrans.

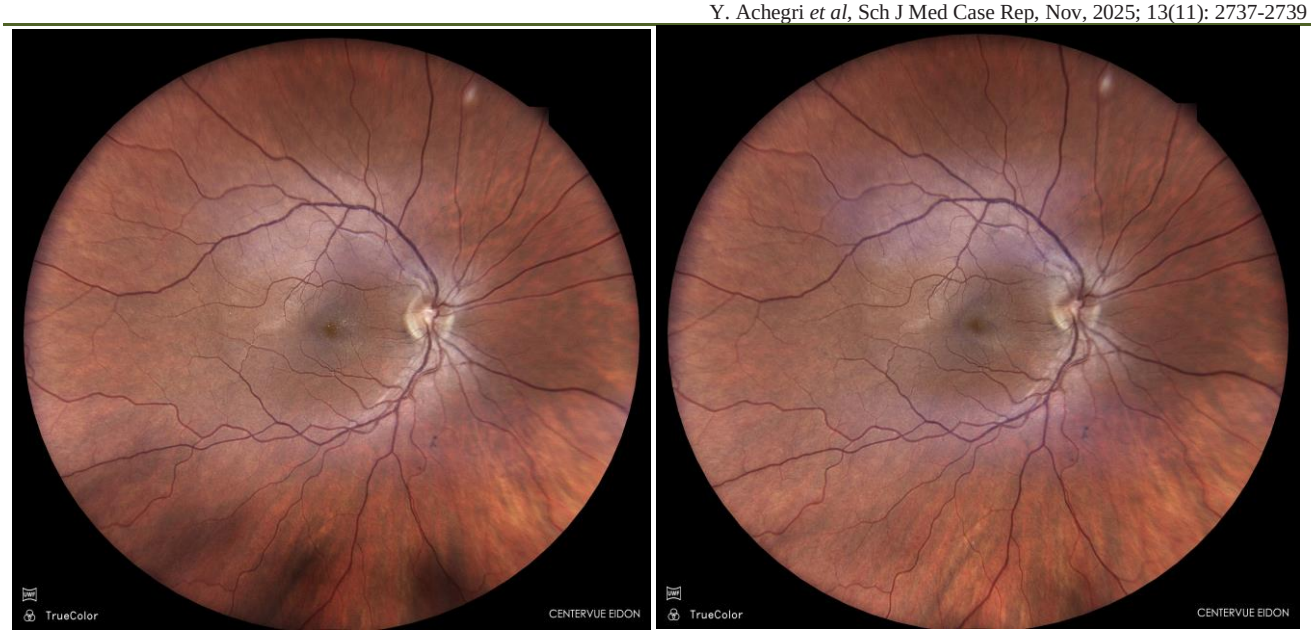
INTRODUCTION

Neuroretinitis is a rare form of optic neuropathy characterized by optic disc edema and macular star formation, most commonly associated with Bartonella henselae infection (cat scratch disease) [4]. Other infectious and inflammatory etiologies include Borrelia burgdorferi, syphilis, tuberculosis, and viral infections [1,2]. Lyme disease, caused by Borrelia burgdorferi and transmitted through Ixodes tick bites, primarily affects the skin, joints, and nervous system, but ocular manifestations remain uncommon [1,2]. We report two cases of unilateral neuroretinitis due to Lyme disease in young women, highlighting the importance of recognizing this rare presentation [2,4].

CASE PRESENTATIONS

Case 1

A 42-year-old woman presented with acute painless vision loss in the right eye. Visual acuity was counting fingers at 3 meters. The patient reported a history of erythema migrans one month before symptom onset following hiking in a forest during spring. No systemic or neurological symptoms were noted. Ophthalmic examination revealed optic disc edema with a macular star (Fig 1). Visual field testing showed a deep diffuse scotoma, and OCT confirmed macular edema. MRI of the brain and orbits was normal. Serologic testing was positive for Borrelia burgdorferi IgM and negative for VDRL, HIV, Bartonella, Rickettsia, and ASLO [1,2]. The patient was treated with intravenous ceftriaxone (2 g/day for 4 weeks) and high-dose corticosteroids (1 g/day intravenous methylprednisolone for 3 days) followed by oral prednisone 1 mg/kg/day, with gradual taper over three months [2]. Visual improvement began after three weeks, and at three months, visual acuity improved to 5/10, consistent with previous reports of favorable outcomes following early antibiotic and corticosteroid therapy [1,2].



A **B**

Figure 1: A) Fundus copy image of a right eye showing a discrete papillary edema with macular star-like shaped exudations B) The same image after 3 weeks of treatment

CASE 2

A 35-year-old woman presented with acute painless vision loss in the left eye, with a visual acuity of 1/10 on the Monoyer scale. Like the first patient, she had a history of erythema migrans one month prior, following outdoor activity in a forest during spring [2]. Fundus examination revealed optic disc edema and a macular star (Fig 2). The visual field demonstrated a deep diffuse scotoma, and OCT showed macular edema. MRI findings were normal. Serologic testing showed Borrelia burgdorferi IgM positivity, with all other serologies negative [1,2]. Due to C3G allergy, she was treated with oral doxycycline (200 mg/day for 4 weeks). Corticosteroid therapy mirrored that of Case 1. Visual recovery began after three weeks, and at three months, visual acuity reached 7/10. This clinical course aligns with previous observations suggesting favorable prognosis under timely antibiotic and corticosteroid treatment [1,2,4].

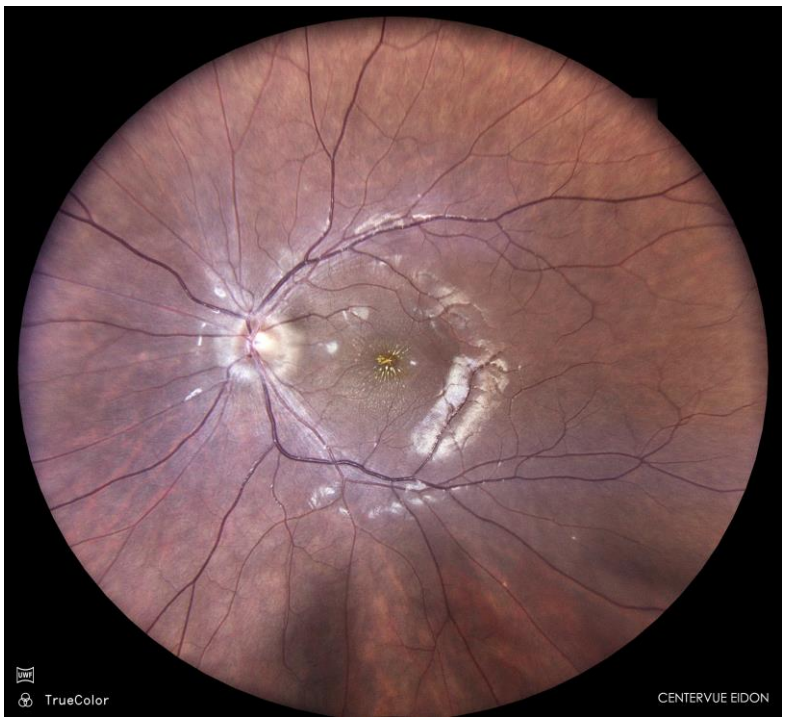


Figure 2: Fundoscopy image of a left eye showing the classic papillary edema and macular star of neuroretinitis

DISCUSSION

Neuroretinitis secondary to Borrelia burgdorferi infection is an uncommon but well-documented entity [1,2]. Its pathogenesis likely involves immune-mediated inflammation of the optic nerve and peripapillary retina [3]. The typical clinical picture includes unilateral optic disc swelling, macular star, and decreased visual acuity [4]. Both of our patients shared several key features: unilateral painless visual loss, recent erythema migrans, positive Borrelia serology, and exclusion of other etiologies [1,2]. Neuroimaging was normal in both cases, helping to rule out compressive or demyelinating causes [3]. Management of Lyme-associated neuroretinitis includes appropriate antibiotic therapy—either ceftriaxone or doxycycline depending on patient tolerance—and adjunctive corticosteroids to control inflammation and prevent optic nerve damage [2,4]. Early treatment is crucial to improve visual outcomes [1,2,4]. In our cases, both patients experienced substantial visual recovery after combined antibiotic and corticosteroid therapy, consistent with outcomes reported in prior studies [1,2].

CONCLUSION

Lyme disease should be included in the differential diagnosis of neuroretinitis, particularly in patients with a compatible clinical context or erythema migrants [1,2,4]. Prompt recognition and initiation of antibiotic therapy can lead to significant visual improvement [1,2]. Collaboration between ophthalmologists and infectious disease specialists is key to optimal management [4].

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