Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Ophthalmology

Ocular Lyme Disease: A Case Report

A. Fiqhi[1]*, M. Boukssim[1], H. Moumene[1], I. Jeddou[1], Y. Mouzari[1]

[1]Department of Ophthalmology, Mohammed V Military Teaching Hospital, Mohammed V University, Faculty of Medicine, Rabat, Morocco

DOI: https://doi.org/10.36347/sjmcr.2026.v14i03.042 | **Received:** 04.02.2026 | **Accepted:** 22.03.2026 | **Published:** 24.03.2026

***Corresponding author:** A. Fiqhi
Department of Ophthalmology, Mohammed V Military Teaching Hospital, Mohammed V University, Faculty of Medicine, Rabat, Morocco

Abstract | **Case Report**

Background: Lyme disease is a multisystem infectious disease caused by the spirochete Borrelia burgdorferi and transmitted by Ixodes ticks. Ocular involvement is uncommon but may affect several ocular structures including the retina, choroid, and optic nerve. We report a case of bilateral multifocal chorioretinitis with juxtafoveal serous retinal detachment associated with Lyme borreliosis documented using multimodal imaging. ***Case presentation:*** A 33-year-old woman presented with progressive painless visual decline in both eyes three months after a stay in a mountainous endemic area. Best corrected visual acuity was 8/10 in both eyes. Fundus examination revealed multiple yellow-white punctiform lesions scattered in the posterior pole and mid-peripheral retina, predominantly in the superior quadrants. Macular optical coherence tomography (OCT) demonstrated bilateral juxtafoveal serous retinal detachments associated with hyperreflective subretinal deposits and retinal pigment epithelium irregularities. Infectious work-up excluded viral and syphilitic etiologies, while Lyme serology was positive. Cutaneous erythematous papular lesions on the lower limb supported systemic Lyme disease. The patient was treated with oral doxycycline for three weeks with complete visual recovery. ***Conclusion:*** Lyme borreliosis should be considered in the differential diagnosis of multifocal chorioretinitis associated with serous macular detachment, particularly in patients with exposure in endemic areas. Multimodal retinal imaging, especially OCT, plays a key role in identifying inflammatory macular changes and monitoring therapeutic response.

Keywords: Lyme disease, Borrelia burgdorferi, multifocal chorioretinitis, serous retinal detachment, optical coherence tomography, multimodal imaging.

1. INTRODUCTION

Lyme disease is a tick-borne zoonotic infection caused by Borrelia burgdorferi sensu lato and represents the most common vector-borne disease in Europe and North America [1]. Although the infection primarily affects the skin, joints, and nervous system, ocular manifestations have been reported at different stages of the disease [2]. These ocular manifestations are rare and highly heterogeneous, including conjunctivitis, keratitis, uveitis, retinal vasculitis, neuroretinitis, and multifocal chorioretinitis [3]. Posterior segment involvement is particularly uncommon and may mimic other inflammatory or infectious retinal diseases, making diagnosis challenging.

The diagnosis of ocular Lyme disease relies on a combination of epidemiological exposure, compatible systemic findings, positive serology, and exclusion of alternative etiologies [4]. Multimodal imaging techniques such as wide-field fundus photography and optical coherence tomography have significantly improved the characterization of inflammatory retinal lesions. In this report, we describe a case of bilateral multifocal chorioretinitis associated with juxtafoveal serous retinal detachment in a patient with confirmed Lyme borreliosis.

2. CASE PRESENTATION

A 33-year-old woman with no significant medical history presented with progressive visual impairment in a painless white eye. She reported a stay in a mountainous area three months prior to symptom onset. Best corrected visual acuity was 8/10 in both eyes. Slit-lamp examination showed a quiet anterior segment without conjunctival hyperemia, keratic precipitates, anterior chamber cells or flare, and no posterior synechiae.

Wide-field fundus examination revealed multiple yellow-white punctiform lesions scattered across the posterior pole and mid-peripheral retina in both eyes, predominantly in the superior quadrants. The optic discs were normal in appearance, while the macular region showed pigmentary changes with small macular exudates and subtle serous retinal detachment in the parafoveal region in both eyes.

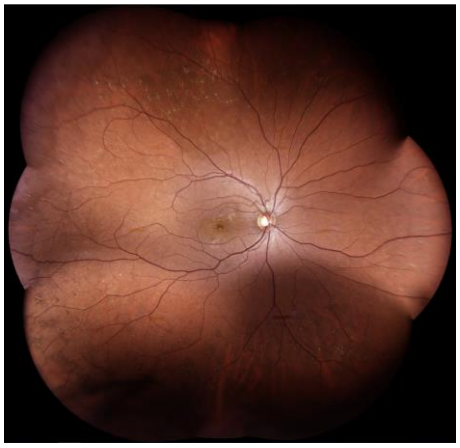

Figure 1: Wide-field fundus photograph of the right eye showing multiple yellow-white chorioretinal lesions in the mid-peripheral retina, associated with macular exudates and a localized serous retinal detachment in the superotemporal parafoveal region

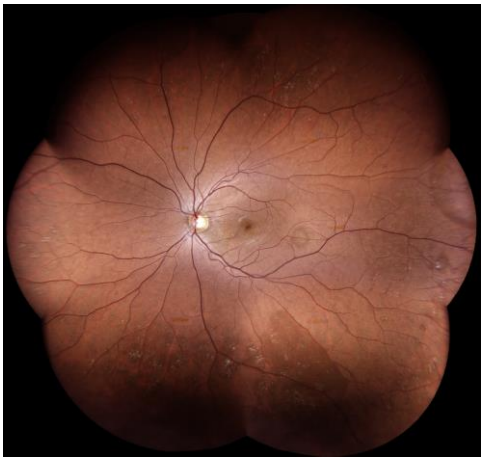

Figure 2: Wide-field fundus photograph of the left eye demonstrating similar multifocal chorioretinal lesions in the peripheral retina, associated with an inferotemporal serous retinal detachment in the macular region and a second serous retinal detachment in the temporal far periphery

Macular OCT demonstrated bilateral juxtafoveal serous retinal detachments. In the right eye, the detachment was located superior to the fovea with minimal involvement of the foveola. In the left eye, the detachment was located in the inferotemporal parafoveal region.

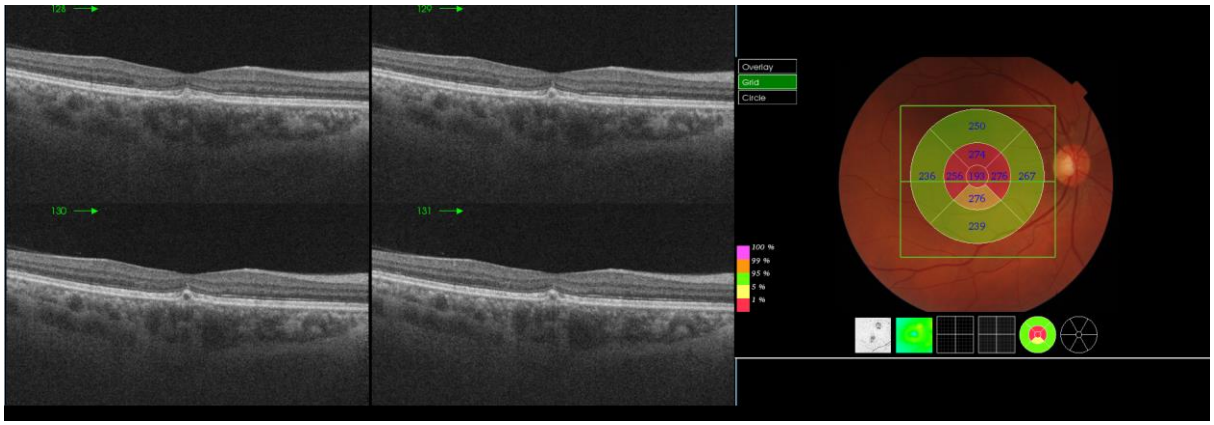

Figure 3: Macular OCT showing a small subfoveal serous retinal detachment with focal accumulation of subretinal fluid

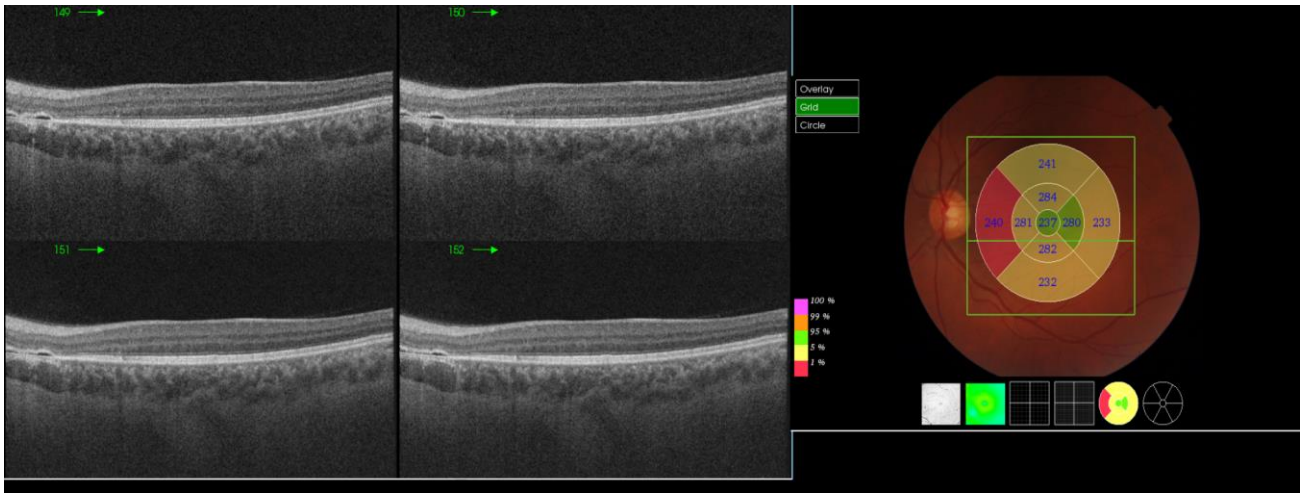

Figure 4: Macular OCT of the left eye revealing parafoveal serous retinal detachment

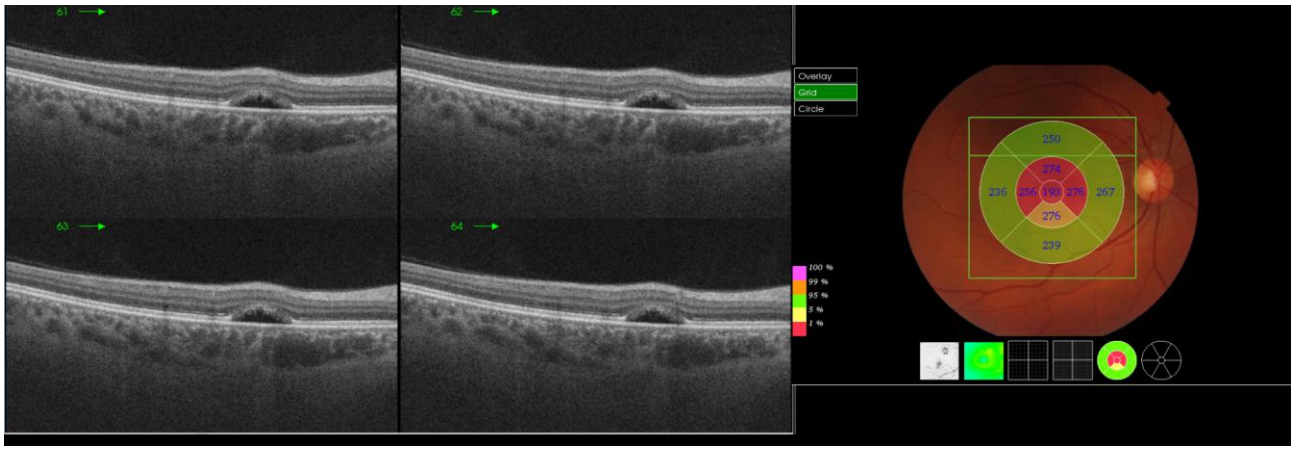

Figure 5: OCT scan illustrating supero-temporal serous retinal detachment on the right eye

Infectious work-up including HSV, VZV, EBV, and syphilis serology was negative, and the interferon-gamma release assay for tuberculosis was also negative. Lyme borreliosis serology was positive. Clinical examination additionally revealed erythematous papular skin lesions on the lower limb consistent with cutaneous manifestations of Lyme disease. The patient was treated with oral doxycycline for three weeks, resulting in complete visual recovery (10/10 in both eyes) and progressive regression of retinal lesions.

Figure 6: Cutaneous erythematous papular lesions of the lower limb compatible with dermatologic manifestations of Lyme borreliosis

3. DISCUSSION

Ocular involvement in Lyme borreliosis is uncommon, but it is now well recognized that Borrelia burgdorferi infection may affect virtually every ocular structure, with manifestations ranging from conjunctivitis and keratitis to intermediate uveitis, posterior uveitis, retinal vasculitis, neuroretinitis, papillitis, and multifocal chorioretinitis [2,3]. Among posterior segment manifestations, neuroretinitis and retinal vasculitis have historically been the best known, whereas bilateral multifocal chorioretinitis associated with serous macular detachment remains distinctly uncommon. This makes the present case clinically relevant, particularly because the combination of peripheral multifocal chorioretinal lesions, macular exudation, and juxtafoveal serous retinal detachment may mimic other infectious or inflammatory chorioretinal disorders such as ocular syphilis, tuberculosis, toxoplasmosis, or white-dot syndromes [4,5].

Several published reports and reviews have emphasized that ocular Lyme disease is largely a diagnosis of clinicobiological correlation rather than a diagnosis established by a single definitive ocular test [1,4]. In practice, diagnosis rests on the coexistence of four major elements: first, an epidemiological context compatible with tick exposure or stay in an endemic area; second, ocular findings consistent with inflammatory posterior segment disease; third, supportive systemic findings such as dermatologic or neurologic features; and fourth, positive Lyme serology after exclusion of alternative infectious and inflammatory causes [1,4,6]. Our case fulfills this framework well, as the patient had recent exposure in a mountainous endemic area, positive Lyme serology, cutaneous erythematous papular lesions, negative syphilis and viral testing, negative tuberculosis immunoreactivity, and a favorable response to doxycycline. Taken together, these features substantially strengthen the presumptive diagnosis of ocular Lyme disease. From a phenotypic standpoint, the retinal findings in our patient fit within the broader spectrum of Lyme-associated posterior uveitis, but with a somewhat unusual macular component. Earlier descriptions of ocular Lyme disease reported multifocal chorioretinal lesions, vitritis, optic nerve inflammation, or retinal vasculitis as the most characteristic posterior findings [3]. More recent reviews continue to identify chorioretinitis and neuroretinitis as important presentations, while also stressing that Lyme disease can masquerade as a wide range of posterior inflammatory disorders [5,7].

In comparison with these previously reported cases, our observation is notable for the presence of bilateral juxtafoveal serous retinal detachment with hyperreflective subretinal deposits, suggesting that the inflammatory process involved not only the choroid and retina but also the retinal pigment epithelium and the outer blood-retinal barrier. The pathophysiological basis of ocular Lyme disease remains incompletely understood. Two mechanisms are generally invoked in the literature: direct spirochetal invasion of ocular tissues and an indirect immune-mediated inflammatory response triggered by infection [2,6]. In posterior pole disease, inflammatory injury to the choriocapillaris, retinal pigment epithelium, and outer retina may lead to dysfunction of the external blood-retinal barrier, resulting in leakage of fluid into the subretinal space. This mechanism plausibly explains the serous retinal detachment observed in our patient. Similar OCT patterns of subretinal fluid accumulation have been described in other infectious chorioretinal diseases, but are only rarely highlighted in Lyme-associated ocular inflammation [5,8].

For that reason, the present case adds useful imaging documentation to the limited body of literature on Lyme disease with serous macular detachment. Another important point concerns the role of multimodal imaging. Recent ophthalmic literature increasingly emphasizes that OCT, wide-field fundus photography, and angiographic modalities are not merely descriptive tools but are central to localizing inflammation and identifying structural correlates of visual loss [8,9]. In our case, wide-field imaging documented the bilateral distribution of peripheral and posterior pole lesions, while OCT precisely demonstrated the juxtafoveal serous retinal detachment, minimal foveolar involvement in the right eye, parafoveal involvement in the left eye, and hyperreflective subretinal deposits corresponding to the clinically visible macular exudates. This imaging pattern supports the interpretation of an inflammatory chorioretinal process with secondary macular barrier breakdown. Compared with older reports, in which retinal findings were mainly documented by ophthalmoscopy and fluorescein angiography, current multimodal imaging allows a more refined phenotypic characterization of Lyme-related ocular disease [8,9].

Comparison with previously published cases also suggests that prognosis is generally favorable when diagnosis is made early and appropriate antibiotic therapy is initiated promptly. Reviews of ocular Lyme disease indicate that many patients experience substantial visual recovery after systemic antibiotic treatment, especially when permanent structural damage to the fovea or optic nerve has not yet occurred [2,3,6]. By contrast, delayed diagnosis has been associated with persistent visual impairment in cases complicated by severe neuroretinitis, occlusive vasculitis, chronic uveitis, or optic neuropathy [5,7]. In our patient, the excellent final visual outcome, with recovery to 10/10 in

both eyes after doxycycline, is consistent with the favorable prognosis described in previously reported posterior segment cases treated in a timely manner. The absence of optic disc edema, major vasculitic complications, or extensive foveal destruction may also explain the good anatomical and functional response. The issue of treatment is also worth discussing.

Although no large randomized ophthalmic trials specifically address ocular Lyme disease, current practice is extrapolated from systemic Lyme disease management and accumulated case-based ophthalmic experience [1,10]. Oral doxycycline is commonly used in non-neurologic Lyme disease and has shown good efficacy in many ocular presentations, particularly in patients without severe central nervous system involvement [10]. Intravenous ceftriaxone is more often reserved for neuroborreliosis or severe posterior segment disease with neurologic extension. Some published ocular cases have also included adjunctive corticosteroids, particularly when inflammation was prominent or when optic nerve involvement was present; however, antimicrobial therapy remains the cornerstone of management, and corticosteroids should not be used without appropriate anti-infective coverage [5,7,10]. In the present case, doxycycline alone was followed by both visual and anatomical improvement, supporting its adequacy in this clinical context. An additional challenge in ocular Lyme disease is the interpretation of serology. Recent diagnostic reviews caution that positive Lyme serology must always be interpreted within the clinical context, as seropositivity alone does not prove active ocular infection in endemic regions [1,4]. Conversely, when positive serology is accompanied by compatible ocular findings, exposure history, systemic manifestations, exclusion of major mimickers, and response to treatment, the diagnosis becomes considerably more persuasive. This is especially important in ophthalmology, where false attribution of posterior uveitis to Lyme disease can occur if serology is considered in isolation.

The present case illustrates a more convincing diagnostic constellation because the ocular phenotype, exposure history, cutaneous lesions, and therapeutic response all converged toward the same etiology. Overall, this case contributes to the limited literature on Lyme-associated bilateral multifocal chorioretinitis with serous macular detachment. Compared with the more classical presentations of neuroretinitis or retinal vasculitis, our case highlights that Lyme disease may also present with predominantly chorioretinal inflammation and subtle but visually significant macular subretinal fluid. It also reinforces two practical messages from the existing literature: first, ocular Lyme disease should remain in the differential diagnosis of multifocal chorioretinitis in endemic contexts; and second, early antibiotic treatment is associated with a favorable prognosis when irreversible macular or optic nerve damage has not yet developed.

4. CONCLUSION

Lyme borreliosis should be considered in patients presenting with multifocal chorioretinitis and serous macular detachment, particularly in endemic regions or in patients with relevant exposure history. Multimodal imaging, especially OCT, plays a critical role in identifying retinal involvement and guiding diagnostic evaluation. Early antibiotic therapy allows favorable anatomical and functional outcomes.

Funding: This study received no specific financial support

Disclosure of potential conflicts of interest: The authors declare no potential conflicts of interest

Consent: Informed consent was obtained from patients included in this study

REFERENCES

1. Stanek G, Wormser GP, Gray J, Strle F. Lyme borreliosis. Lancet. 2019.
2. Steere AC, Strle F, Wormser GP, *et al.,* Lyme borreliosis. Nat Rev Dis Primers. 2016.
3. Mikkilä HO, Seppälä IJ, Viljanen MK, Peltomaa MP, Karma A. Ocular manifestations of Lyme borreliosis. Am J Ophthalmol. 2000.
4. Dessau RB, van Dam AP, Fingerle V, *et al.,* To test or not to test? Laboratory support for the diagnosis of Lyme borreliosis. Clin Microbiol Infect. 2018.
5. Dersch R, Freitag MH, Schmidt S, *et al.,* Ocular manifestations of Lyme borreliosis. J Neurol. 2020.
6. Clare G, Kempen JH, Pavésio C. Infectious eye disease in the 21st century-an overview. Eye (Lond). 2024.
7. Eggenberger E. Optic neuritis. Continuum (Minneap Minn). 2025 ;31(2).
8. Pichi F, Srivastava SK, Chexal S, Lembo A, Lima LH, Neri P, *et al.,* Multimodal imaging in inflammatory chorioretinal diseases. Prog Retin Eye Res. 2021 ;82:100894.
9. Mahendradas P, Acharya I, Rana V, *et al.,* Optical coherence tomography and optical coherence tomography angiography in neglected diseases. Ocul Immunol Inflamm. 2024.
10. Lantos PM, Auwaerter PG, Wormser GP. A systematic review of Lyme disease treatment. Clin Infect Dis. 2021 ;72(6):e1-e48.
11. Asghar MA, Tang S, Wong LP, Yang P, *et al.,* Infectious uveitis: a comprehensive systematic review of emerging trends and molecular pathogenesis using network analysis. J Ophthalmic Inflamm Infect. 2024.