

Lyme-Borreliose, Ko-Infektionen u.a. und Augenbefall Lyme disease, co-infections a.o. and eye infections

**Strabismus, Myositis, Horner Syndrom, Angiopathie, Neuritis nervi optici,
Makuladegeneration etc.**

Remember: Centers for Disease Control and Prevention (CDC) **Feeling Worse After Treatment? Maybe It's Not Lyme Disease** <https://www.youtube.com/watch?v=823jkRlaLgA#t=81>

Bacteria

Wu G (1986), Balesewicz AA (1988), Baum J (1988), Bertuch AW (1988), Aalberg TM (1989), Winward KE (1989), Bienvenot M (1990), Kaufmann DJ (1990), Bienvenot M (1990), Smith JL (2x 1991), Liu AN (1993), Zaidman GW (1993), Berglöf J (1994), Schubert HD (1994), Leys AM (1995), Lesser RL (1995), Gérard P (1996), Mikkilä H (1997), Savas R (1997), Meier P (1998), Reed JP (1998), Mikkilä H (1999, 2000), Wade NK, (2000), Cunningham Jr ET (2000), Rothermel H (2001), Fatterpekar GM (2002), Carvounis PE, (2004), Carvounis PE (2004), Pérez de Arcelus M (2008), Mora P (2009), Massimo Accorinti (2009), Sauer A (2009), Norfarizal Ashikin A (2014), Correll MH (2015), Psatta DM (2015), Sathiamoorthi S (2016), Tan CL (2017)

Toxins

Rorsman H (1996), Moschos MM (2004), Victoria McGovern (2005), Barabasi Z (2008), Saliba N (2010), Ostheimer TA (2014),

Huismans H. (1979) Tierische Parasiten des menschlichen Auges. Tropenkrankheiten Erkrankungen durch Arthropoden, Helminthen, Protozoen. Enke Verlag
<http://www.amazon.de/Tierische-Parasiten-menschlichen-Auges-Huismans/dp/3432905718>

Wu G, Lincoff H, Ellsworth RM, Haik BG (1986) Optic disc edema and Lyme disease. Ann Ophthalmol 18(8), 252-5.

Balesewicz AA, Rupprecht KW, Naumann GOH et al. (1988) Bilateral **diffuse choroiditis and exudative retinal detachments** with evidence of Lyme disease. Am J. Ophthalmol. 105, 419-420.

Baum J, Barza M, Weinstein P et al. (1988) Bilateral **keratitis** as a manifestation of Lyme disease. Am J Ophthalmol. 105,75–77.

Bertuch AW, Rocco E, Schwartz EG et al. (1988) Lyme disease: ocular manifestations. Ann Ophthalmol. 20, 376–378.

Aalberg TM (1989) **The expanding ophthalmologic spectrum of Lyme disease**. A. J. Ophthalmol. 107, 77-80

Winward KE, Smith JL, Culbertson WW, Paris-Hamelin A. (1989) Ocular Lyme borreliosis. Am J Ophthalmol 108(6), 651-7.

Kaufmann DJ, Wormser GP. (1990) Ocular Lyme disease: case report and review of the literature. Br J Ophthalmol 74(6), 325-7.

Bienvenot M, Tranchant C, Flament J, Warter JM, Sahel J (1990) Oculomotor paralysis and Lyme disease]. J Fr Ophthalmol 13(6-7) 339-42.

Smith JL, Winward KE, Nicholson DF et al. (1991) **Retinal vasculitis in Lyme borreliosis** [J Clin Neuroophthalmol](http://www.ncbi.nlm.nih.gov/pubmed/1827466). 11(1), 7-15. <http://www.ncbi.nlm.nih.gov/pubmed/1827466>

„... visual acuity of 20/15 in both eyes, and showed no progression of his vascular occlusions or recurrence ... diffuse syphilitic chorioretinitis neuritis papulosa of Fuchs gummatous lesions of retinagummatous lesions originating in optic nerve syphilis of retinal blood vessels ...“
[Cited by 28 Related articles](#)

[Smith JL](#) (1991) **Neuro-ocular Lyme borreliosis.** [Neurol Clin.](#) 9(1), 35-53.
<http://www.ncbi.nlm.nih.gov/pubmed/2011111>

« Any patient who has a Bell's palsy (unilateral or bilateral), aseptic meningitis, chronic fatigue syndrome, atypical radiculoneuropathy, presenile dementia, atypical myopathy, or symptoms of atypical rheumatoid arthritis should be asked specifically about the following: visits to highly endemic areas, any known tick bites, any skin lesion suggestive of erythema migrans, any history of palpitations or of prior Bell's palsy, aching in joints (especially the knees), paresthesias, chronic fatigue and depression, forgetfulness, and eye problems. Any patient showing a chronic iritis with posterior synechiae, vitritis in one or both eyes, an atypical pars planitis-like syndrome, big blind spot syndrome, and swollen or hyperemic optic discs should be asked the same questions. »

Liu AN (1993) Lyme disease in China and its ocular manifestations. *Zhonghua Yan Ke Zhi* 29(5), 271-3.

Zaidman GW (1993) [The ocular manifestations of Lyme disease.](#) - International ophthalmology clinics, - [journals.lww.com](#)

„... Burgdorfer and Barbour isolated a new spirochete, called *Borrelia burgdorferi*, from the I . dammini tick. ... which may occur also in stage 2) Iritis Pars planitis Vitritis Choroiditis Panuveitis Retinal vasculitis Exudative retinal detachment Branch retinal artery occlusion skin rash ...“
[Cited by 11 Related](#)

Berglöff J et al. (1994) Ophthalmic Manifestations in Lyme Borreliosis, *Journal of Neuro-Ophthalmology* 14 (1), 15-20

Schubert HD, Greenebaum E, Neu HC (1994) Cytologically proven seronegative Lyme choroiditis and vitritis. *Retina* 14(1), 39-42.

Leys AM, Schönherr U, Lang GE et al. (1995) [Retinal vasculitis in Lyme borreliosis.](#) [Bull Soc Belge Ophthalmol.](#) 259, 205-14. [europepmc.org](#) <http://www.ncbi.nlm.nih.gov/pubmed/8936779>
„... Moreover arterial occlusions were observed in two patients. ... Find all citations with this subject(default). Or filter your current search. Optic Neuritis. Formation of new blood vessels originating from the retinal veins and extending along the inner (vitreous) surface of the retina. ...“

[Lesser RL.](#) (1995) **Ocular manifestations of Lyme disease.** [Am J Med.](#) 98(4A), 60S-62S.
<http://www.ncbi.nlm.nih.gov/pubmed/7726193>

Brazis PW, [Lee AG](#) (1996) [Optic disk edema with a macular star.](#) [Mayo Clin Proc.](#) 71(12), 1162-6.
<http://www.ncbi.nlm.nih.gov/pubmed/8945487>

„Optic disk edema with a macular star is a descriptive term encompassing a heterogeneous group of disorders. The clinical features include sudden visual loss, swelling of the optic disk, peripapillary and macular exudates that may occur in a star pattern, and cells in the ...“ [Cited by 30 Related articles More](#)

Gérard P, Canaple S, Rosa A (1996) Meningopapillitis disclosing Lyme disease. *Rev Neurol (Paris)* 152(6-7), 476-8.

Mikkila H, Seppala I, Leirisalo-Repo M, Immonen I, Karma A. (1997) The etiology of uveitis: the role of infections with special reference to Lyme borreliosis. *Acta Ophthalmol Scand* 75(6), 716-9.

Savas R, Sommer A, Gueckel F, Georgi M. (1997) Isolated oculomotor nerve paralysis in Lyme disease: MRI. *Neuroradiology* 39(2), 139-41.

Meier P et al. (1998) Pars plana vitrectomy in *Borrelia burgdorferi* endophthalmitis. *Klin Monatsbl Augenheilkd* 213(6), 351-4 <http://www.ncbi.nlm.nih.gov/pubmed/10048013>
“Despite intravenous ceftriaxone therapy *borrelia burgdorferi* must have survived in the vitreous body. Further investigations are required with respect to the use of other antibiotics or immunosuppressives. »

[Reed JB](#), [Scales DK](#), [Wong MT](#) et al. (1998) ***Bartonella henselae* neuroretinitis in cat scratch disease.** *Ophthalmology* 105(3), 459-466

Mikkilä H, Karma A, Viljanen M, Seppälä I (1999) The laboratory diagnosis of ocular Lyme borreliosis. Graefes Arch Clin Exp Ophthalmol. 237(3), 225 - 30. <https://www.ncbi.nlm.nih.gov/pubmed/10090586/>
„For efficient diagnosis of ocular Lyme boreliosis, immunoblot analysis and PCR should be used in addition to ELISA. A positive PCR seems to be associated with a negative immunoblot.“

Wade NK, Levi L, Jones MR et al. (2000) [Optic disk edema associated with peripapillary serous retinal detachment: an early sign of systemic Bartonella henselae infection](http://www.ncbi.nlm.nih.gov/pubmed/11020412) Am J Ophthalmol. 130(3), 327-34. <http://www.ncbi.nlm.nih.gov/pubmed/11020412>
„... optic disk edema with a small detachment of the temporal peripapillary retina (Figure 2, E ... optic disk edema associated with serous detachment involving the fovea and occlusion of multiple ...recovery occurred in one patient as a result of multiple branch retinal arteriolar occlusions ...“

Mikkilä HO, Seppälä IJT, Viljanen MK, et al (2000) [The expanding clinical spectrum of ocular lyme borreliosis](http://www.aaojournal.org/article/S0161-6420%2899%2900128-1/abstract). - Ophthalmology, - Elsevier 107(3), 581-587
<http://www.aaojournal.org/article/S0161-6420%2899%2900128-1/abstract>
„... One patient had branch **retinal** vein **occlusion**(patient 6, Fig 4). One patient with vitritis had ...There are multiple, small, round, punched-out lesions in the peripheral **retina**. ... Figure 3. Patient 5. A, fluorescein fundus angiography showing leakage from **retinal** venules and cystoid ...“
[Cited by 80 Related articles More](#)

[Cunningham](http://www.ajo.com/article/S0002-9394%2800%2900573-0/abstract) Jr ET, [Jane E Koehler](http://www.ajo.com/article/S0002-9394%2800%2900573-0/abstract) JE (2000) **Ocular bartonellosis** American Journal of Ophthalmology 130(3), 340–349 <http://www.ajo.com/article/S0002-9394%2800%2900573-0/abstract>

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Carvounis PE, Mehta AP, Geist CE (2004) Orbital myositis associated with Borrelia burgdorferi (Lyme disease) infection. Ophthalmology 111(5) 1023-8.

Pérez de Arcelus M, Salinas A, García Layana A. (2008) **Retinal manifestations of infectious diseases**. An Sist Sanit Navar31 Suppl 3, 57-68. [Article in Spanish] Departamento de Oftalmología, Clínica Universitaria de Navarra, Pamplona, Spain.
<http://www.ncbi.nlm.nih.gov/sites/pubmed/19169295>
„The retina and the choroids are richly vascularised structures and can therefore be colonised by germs via the haematogenous route in the course of a systemic infectious disease. The germs responsible for this type of infection can be fungi, viruses, bacteria and parasites. Ocular candidiasis is outstanding amongst these colonisations because of its frequency; it can manifest itself as an endophthalmitis with a slow and hidden course. The so-called ocular histoplasmosis syndrome, although it is infrequent in our setting, is an important cause of choroidal neovascularisation. The viruses that most frequently affect the retina are of the herpes type and can produce devastating symptoms in immunoincompetent patients, named acute retinal necrosis syndrome. Retinitis due to cytomegalovirus is more frequent in immunodepressed patients, as in the case of AIDS, but it must also be contemplated in patients with lymphoma and immunomodulatory treatment. The most frequent bacterial diseases that affect the retina are syphilis and tuberculosis. Disease due to cat scratches, caused by a borrelia, can produce a neuroretinitis. Toxoplasmosis is the most common of the infectious diseases caused by a parasite and gives rise to chorioretinitis. Toxocariasis, also caused by a parasite, is second in importance, giving rise to choroidal granulomas and retinal tractions.“

Mora P, Carta A (2009) **Ocular manifestations of Lyme borreliosis in Europe**. Int J Med Sci 6(3), 124-125. doi:10.7150/ijms.6.124 <http://www.medsci.org/v06p0124.htm>

Massimo Accorinti (2009) **Ocular Bartonellosis**. International Journal of Medical Sciences. 6(3), 131-132 <http://www.medsci.org/v06p0131.htm>

Sauer A, Hansmann Y, Jaulhac B, Bourcier T, Speeg-Schatz C. (2009) **Five Cases of Paralytic Strabismus as a Rare Feature of Lyme Disease**. Clin Infect Dis. [Epub ahead of print]
Departments of 1Ophthalmology, 2Infectious Disease, Pole Specialty Medicine Ophthalmology

Hygiene, and Bacteriology, Hopitaux Universitaires de Strasbourg, Strasbourg, France.
<http://www.ncbi.nlm.nih.gov/pubmed/19193112>

„Lyme borreliosis can cause a variety of ocular manifestations, and the frequency of these manifestations among cases of Lyme disease involving systemic manifestations is approximately 1%“

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➔ **Horner Syndrom** http://en.wikipedia.org/wiki/Horner%27s_syndrome

Augenerkrankungen im Zusammenhang mit Tätovierungen, tattoo-associated ocular diseases

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