Neurology Perspectives 4 (2024) 100172

NEUROLOGY PERSPECTIVES

www.journals.elsevier.com/neurology-perspectives

SCIENTIFIC LETTER

Bartonella henselae neuroretinitis: A rare manifestation of cat-scratch disease

Neurorretinitis por *Bartonella henselae*: Una rara manifestación de la enfermedad por arañazo de gato

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Cat-scratch disease (CSD) is a self-limited systemic infection caused by *Bartonella henselae* (*B. henselae*), transmitted through scratches, licks, and bites from cats. It is more commonly observed in children and young adults.[1,2]

Only 5%–10% of people have ocular manifestations, neuroretinitis (NR) being one of the most frequent.[3] *Bartonella henselae* is also one of the main infectious causes of NR.[4,5] NR is an inflammatory neuropathy characterized by a set of fundoscopy findings: optic disc edema and hard macular exudates arranged in a stellar pattern, which is highly suggestive but may be absent in the initial assessment.[3,5] The typical presentation is unilateral visual loss and dyschromatopsia, 2 weeks after the onset of systemic symptoms.[1,3]

A 15-year-old otherwise healthy girl was referred to our hospital for evaluation due to acute visual loss in her right eye 3 days ago. She denied pain in eye movements and had no systemic complaints. She experienced a subfebrile and malaise episode 1 month prior. There was close contact with 10 domestic cats, including 5-week-old kittens without a history of traumatic exposure. The patient denied previous visual deficits. Her family history was unremarkable. No abnormalities were detected on physical examination such as lymphadenopathy or skin lesions. Right eye examination on admission identified visual acuity reduced to counting fingers at 50 cm with impaired color vision. Left eye visual acuity was preserved. Fundoscopy revealed a unilateral swelling of the optic disc and macular exudates without a macular star. Intra-ocular pressure and anterior chamber were normal. An optical coherence tomography performed revealed right exuberant retinal and macular edema with vitritis. Laboratory tests revealed a slight increase in transaminase levels and a C-reactive protein of 1.08 mg/dL. Serological tests for *Cytomegalovirus, Epstein–Barr, Toxoplasmosis, Herpes Simplex Virus I/II, Lyme, Syphilis, Varicella Zoster Virus, Leptospirosis*, and *Human Immunodeficiency Virus* 1/2 were negative. Blood analysis for autoimmune causes was unremarkable. Cerebrospinal fluid studies were normal, including a negative screen for viral encephalitis and absent oligoclonal bands. Brain and orbit computed tomography were also normal. Serum *B.henselae* IgG titers by indirect fluorescence assay (IFA) was positive at a titer of $\geq$1:1024 and IgM titer was negative. No *B.henselae* DNA was detected. Five days after admission, a fluorescein angiography confirmed the presence of right papilledema with a partial macular star (Fig. 1). The patient was thus diagnosed with CSD-NR and started treatment with rifampicin 300 mg and doxycycline 100 mg twice a day for 6 weeks. Two weeks after, a brain

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https://doi.org/10.1016/j.neurop.2024.100172

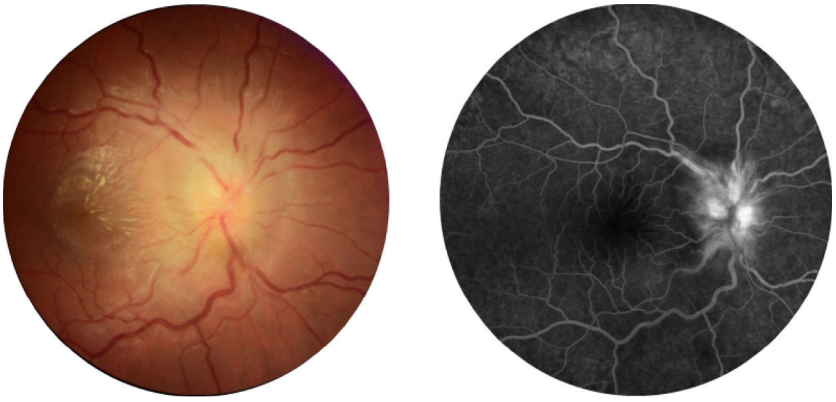

Fig. 1 Right eye multimodal imaging. Retinography (left) shows papilledema and macular exudates in an incomplete macular star pattern. Fluorescein angiography (right) shows marked optic disc hyperfluorescence.

magnetic resonance imaging (MRI) performed showed a slight hypersignal on the STIR - Short tau inversion recovery sequence emitted by the right optic nerve sheath in its immediate retrobulbar segment, which could translate into a local inflammatory process. One month later, the patient fully recovered the right visual acuity (10/10). Six months later, she does not complain of any visual deficit, maintaining a slight change in macular brightness on fundoscopy.

We report a rare case of CSD-isolated NR. Diagnosis of NR relied on the hallmarks: absence of pain, acute visual loss, unilateral involvement, fundoscopic findings, and the presence of a macular star. As seen in this case, the macular star may be absent at the initial presentation and should not exclude this diagnosis.[3] Serial ophthalmological evaluation is important to detect the later appearance of the macular pattern. Serologies confirmed our suspicion with highly positive IgG for *B. henselae*. IgG titers $\geq$1:512 strongly suggest active or recent infection.[3,6] The sensitivity of IgM values in IFA analyses is limited. Therefore, a significant increase in IgG levels, combined with the pertinent clinical data, was decisive for confirming the diagnosis, even in the absence of elevated IgM antibodies.[3,5,6] Thus, the presence of a positive IgG titer and a negative IgM titer is consistent with the known kinetics of CSD.[1] Valerie et al. suggested that short retrobulbar optic nerve enhancement as detected on MRI is characteristic of NR but not specific for NR due to CSD.[5]

While there are no systemic signs of CSD or a history of scratches or open wounds, similar case reports hypothesize the possibility of animal transmission by feces, that host *Bartonella* and could infect humans through a mucosa.[7–10] Data about the treatment of CSD ocular manifestations in the pediatric population are limited. Recent evidence suggests that the combination of antibiotics (doxycycline plus rifampin) and steroids shorten the disease course and improve visual recovery compared with antibiotics alone.[11,12] However, even though the patient did not receive the corticosteroid therapy, the prompt treatment with antibiotics brought a complete resolution of the visual deficit.

Ethical considerations and Patient consent

Verbal and written consent were obtained, in addition to approval by the institution's research and ethics committee.

Funding and conflict of interest

This research has not been previously published. The authors declare that the work received no funding from public, commercial, or non-profit sources. Likewise, it is declared that there is no potential conflict of interest related to the publication of the research article.

Protección de personas y animales

Los autores declaran que para esta investigación no se han realizado experimentos en seres humanos ni en animales.

Confidencialidad de los datos

Los autores declaran que en este artículo no aparecen datos de pacientes.

Derecho a la privacidad y consentimiento informado

Los autores declaran que en este artículo no aparecen datos de pacientes.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare that this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Every precaution must be taken to protect the privacy of human subjects and the confidentiality of their personal information.

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