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Case Report

Cat Scratch Disease Presenting with Right Branch Retinal Artery Occlusion and Left Neuroretinitis

Samira Jafari[a] Jonathan A. Micieli[a, b]

[a]Kensington Vision and Research Centre, Toronto, ON, Canada; [b]Department of Ophthalmology and Vision Sciences, University of Toronto, Toronto, ON, Canada

Keywords

Bartonella henselae · Cat scratch disease · Neuroretinitis · Branch retinal artery occlusion

Abstract

Introduction: *Bartonella henselae*, the causative agent of cat scratch disease (CSD), presents with diverse ocular manifestations, posing diagnostic challenges. This study aimed to elucidate the diagnostic complexities through a unique case. ***Case Presentation:*** A 42-year-old male presented with vision loss in the right eye, subsequent to flu-like symptoms following exposure to a stray kitten. Clinical examination revealed branch retinal artery occlusion (BRAO) in the right eye and neuroretinitis in the left, indicating concurrent ocular manifestations of CSD. Thorough investigations, including serological testing, ruled out alternative causes, highlighting the rarity of such coexisting ocular complications. ***Conclusions:*** The coexistence of BRAO and neuroretinitis in different eyes underscores the variable presentation of CSD. Recognition of infectious etiologies, particularly *Bartonella*, is paramount in diagnosing ocular vasculopathies. This case emphasizes the importance of considering *Bartonella* infection in patients with ocular vascular occlusions, especially in the context of recent cat exposure and systemic symptoms suggestive of CSD.

Introduction

Bartonella henselae, the causative agent of cat scratch disease (CSD), is notorious for its wide array of clinical manifestations. Typically, CSD presents as a self-limiting regional lymphadenopathy following a scratch or bite from a cat. Common symptoms include fever,

Correspondence to:
Jonathan A. Micieli, jmicieli@kensingtonhealth.org

malaise, and headache. However, CSD can also present with various atypical manifestations, affecting the liver, spleen, central nervous system, and eyes.

Ocular involvement in CSD, while less common, can be significant and includes a range of presentations such as Parinaud's oculoglandular syndrome, conjunctivitis, optic neuritis, and neuroretinitis. Neuroretinitis, characterized by optic disc edema and macular star formation, is one of the more frequently encountered ocular manifestations. The variability in clinical presentation poses diagnostic challenges for clinicians.

Rarely, CSD may manifest with retinal artery occlusions. Eiger-Moscovich et al. [1] described a series of 8 CSD patients presenting with branch retinal artery occlusion (BRAO) with or without retinitis. The coexistence of BRAO and neuroretinitis in different eyes is exceptionally rare, adding complexity to the clinical diagnosis and management of the disease. Here, we present a compelling case where BRAO and neuroretinitis coexist, manifesting in different eyes, highlighting the importance of considering *Bartonella* infection in patients with ocular vascular occlusions.

We present the following case in accordance with the CARE reporting checklist. The authors have completed the CARE Checklist for this case report, which is attached as online supplementary material (for all online suppl. material, see https://doi.org/10.1159/000540125).

Case Report

A 42-year-old healthy man presented to the hospital with vision loss in his right eye. He had recently taken in a stray kitten and subsequently experienced flu-like symptoms, night sweats, headaches, and unintended weight loss. A computed tomography scan revealed diffuse lymphadenopathy, raising concerns of an infectious, inflammatory, or neoplastic etiology. The patient described his vision loss as central and painless in the right eye. Upon ophthalmological examination, his visual acuity was 20/30 OD and 20/20 OS. Humphrey visual field testing showed a central scotoma OD, without relative afferent pupillary defect. Dilated fundus examination revealed a superior BRAO in the right eye, accompanied by retinal edema and focal retinitis [2] (shown in Fig. 1–3). Additionally, there was left optic disc edema with peripapillary exudate and vitreous cells. Considering infectious, inflammatory, or neoplastic causes, the patient underwent further investigations. Magnetic resonance imaging of the brain and orbits, computed tomography angiogram of the head and neck, and cardiac evaluations were unremarkable. Additional investigations for alternative causes of neuroretinitis such as toxoplasmosis, syphilis, Lyme disease, viral infections (HSV, VZV, CMV), tuberculosis (PPD or QuantiFERON-TB Gold test), and sarcoidosis were negative. Furthermore, the patient had a negative workup for hypercoagulable states including antiphospholipid antibodies, factor V Leiden, proteins C and S, and antithrombin III. However, the *B. henselae* antibody IgG titer showed an elevated level of 1:256, indicating *Bartonella* infection. The titer was retested 2 weeks later and remained high at 1:256. Hence, treatment with azithromycin 500 mg PO daily followed by 250 mg PO daily for 4 days was initiated, resulting in a decrease in *Bartonella* IgG titer to <1:64 posttreatment. Notably, 2 weeks later, the patient developed a partial macular star in the left eye. At the 1-month follow-up, his visual acuity had improved to 20/20 OD and 20/20 OS, with residual central scotoma in the right eye resolving, along with the retinal and optic disc edema.

Discussion

This case highlights the rare manifestation of CSD presenting with BRAO and neuroretinitis in different eyes. The patient had an exhaustive workup that excluded other causes of vasculitis and neuroretinitis, and he had a history that supported the diagnosis

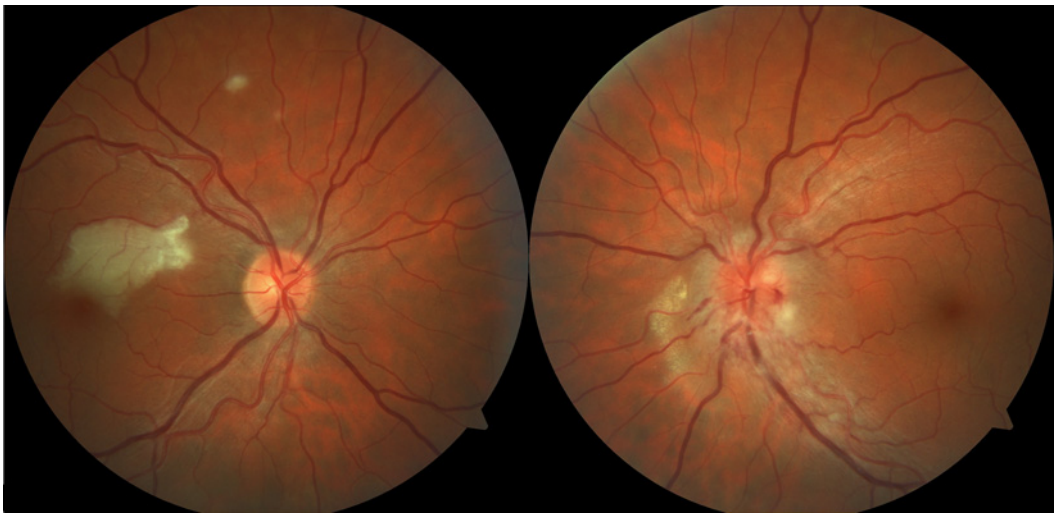

Fig. 1. Dilated fundus examination revealed a superior BRAO in the right eye, accompanied by retinal edema and focal retinitis. Additionally, there was left optic disc edema with peripapillary exudate and vitreous cells.

as he took in a new, stray kitten prior to the disease manifesting. This case was unique as the patient presented with two different manifestations of CSD, each in different eyes. Our review of the literature revealed few cases of retinal artery occlusion coexisting with neuroretinitis.

In a case series by Eiger-Moscovich et al. [1] describing 8 patients with BRAO, only one had the neuroretinitis in a separate eye. This case was a 27-year-old man presented with acute painful vision loss to 20/200 preceded by 2 days of headache, night sweats, vertigo, and dyspnea. Color fundus photograph of his right eye showed sectoral retinal edema adjacent to the lower temporal arcade and on the left eye showed optic disc edema with temporal flame-shaped hemorrhage and macular star. Gray et al. described a 20-year-old man with a positive *B. henselae* titer developing unilateral neuroretinitis, a large peripapillary angiomatous lesion, BRAO with ischemic maculopathy, and vision loss that failed to improve with clindamycin. All these findings were in the same eye [3].

Batsos et al. [4] documented the case of a 23-year-old woman presenting with a 2-day history of scotoma in the left upper visual field of her left eye. Her best-corrected visual acuity was 10/10 in both eyes. A progressively rising IgG titer for *B. henselae* (512, escalating to 1,024 during the second month of the disease), indicated an active infection. Fundoscopy revealed occlusion of the inferior temporal branch of the left retinal artery and multiple foci of retinitis in the posterior pole of both eyes, notably more prominent in the left. Subsequent fluorescein angiography confirmed the diagnosis of arterial occlusion and revealed evidence of vasculitis in the contralateral eye. Cohen et al. [5] reported 7 patients with BRAO associated with multifocal retinitis and optic nerve edema. Three patients had titers positive for CSD, none showing macular star. Among these three, only one had findings similar to our case with BRAO in the right eye and optic disc edema in the contralateral eye. In contrast to our case, this patient had a titer also positive for Lyme disease. The other 2 patients showed 1+ vitritis and white spots in the contralateral eye.

The mechanism underlying *B. henselae*-induced BRAO is not well understood and likely complex, involving various factors such as vasculitis, thromboembolism, direct endothelial damage, and immune-mediated responses which are well described in pathogenies of systemic manifestation of the CSD [6, 7]. Furthermore, direct compression on the artery by the

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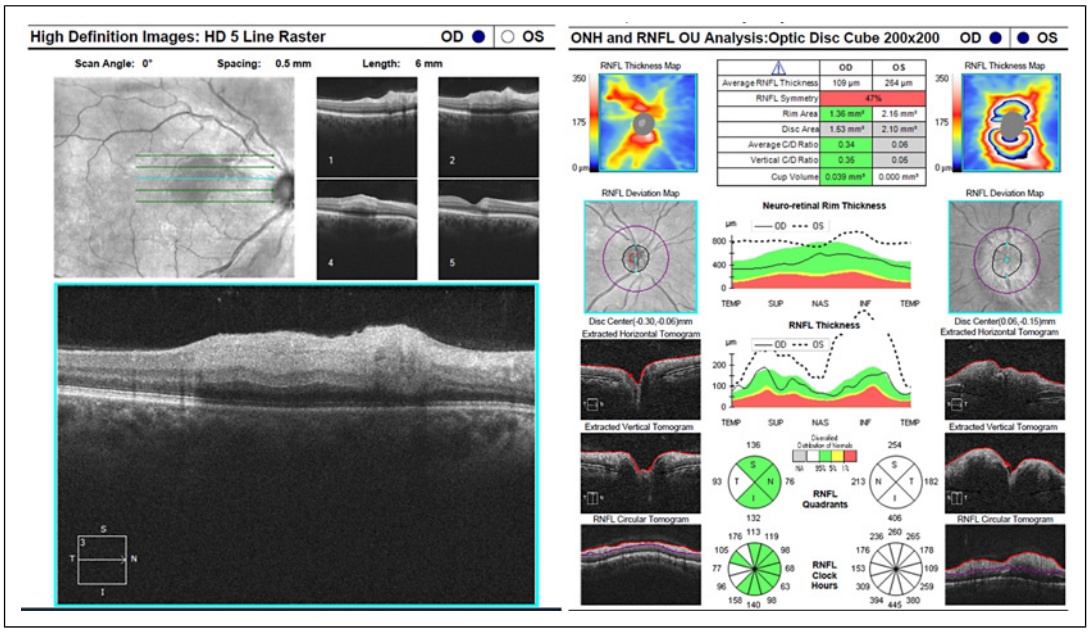

Fig. 2. OCT image of the right eye exhibits significant retinal edema due to a superior branch retinal artery occlusion (BRAO). RNFL OCT of the left eye demonstrates optic disc edema.

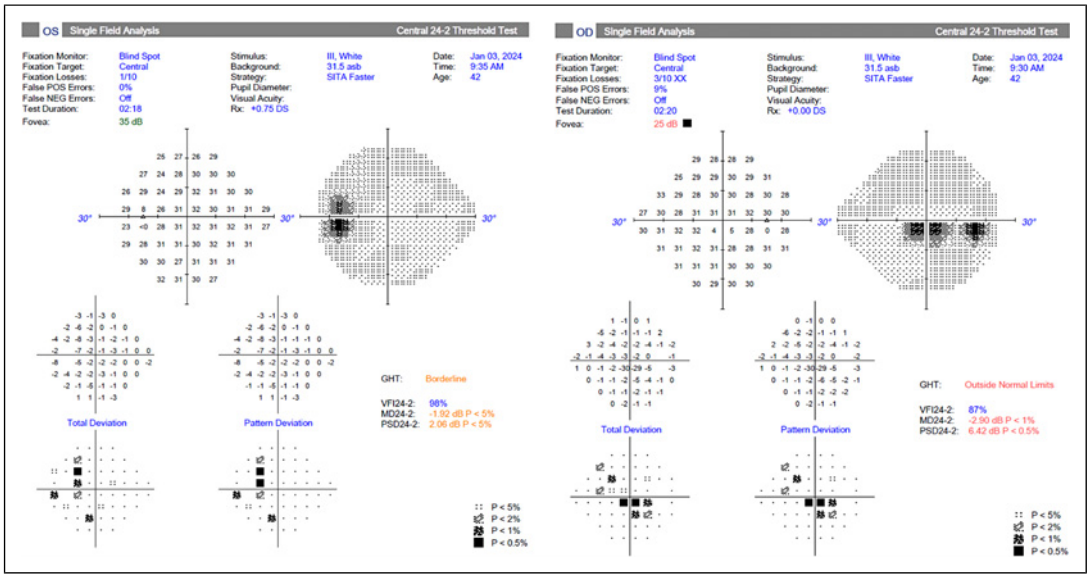

Fig. 3. The visual field image showed a central scotoma on the right side and an enlarged blind spot on the left side.

focus of retinitis and invasion of vascular endothelium by *Bartonella* may contribute to the occlusion via stimulation of thrombogenic mediators [8].

In conclusion, BRAO secondary to *Bartonella* infection is rare. This case underscores the importance of considering infectious etiologies, particularly *Bartonella*, in patients presenting with ocular vascular occlusions and neuroretinitis, especially in the context of recent cat exposure and systemic symptoms suggestive of CSD.

Statement of Ethics

This retrospective review of patient data did not require ethical approval in accordance with local/national guidelines. The patient provided written informed consent for the publication of this case report and accompanying images.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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Author Contributions

Samira Jafari: writing – original draft, methodology, validation, investigation, preparation, and visualization. Jonathan A. Micieli: supervision, conceptualization, validation, reviewing, and editing.

Data Availability Statement

The data supporting this study's findings are not publicly available due to privacy and security reasons but can be obtained from the corresponding author upon reasonable request.

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