Bartonella neuroretinitis (cat-scratch disease)

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ABSTRACT
We report a patient with cat-scratch disease presenting with meningitis and neuroretinitis. This condition, caused by Bartonella henselae, has a worldwide distribution and is among the most common infective causes of neuroretinitis. Bartonella neuroretinitis is a rare but under-recognised mimic of optic neuritis; it should be suspected in a patient with an infective prodrome whose fundus shows optic disc oedema and a macular star. A low-positive initial serological test for Bartonella henselae does not exclude cat-scratch disease if there is high clinical suspicion, and repeat testing is recommended to look for titre rise.

CASE DESCRIPTION
A 36-year-old woman had a 5-day history of fever, sweats, left frontal headache, blurred left eye vision and painful left eye movements. Left eye examination identified visual acuity reduced to hand movements, a central scotoma, impaired colour vision and swelling of the optic disc and macula. There was no lymphadenopathy. Twelve weeks before, she had acquired a 2-month-old kitten. Serial retinal photography and optical coherence tomography of the left eye 2 weeks after symptom onset confirmed oedema of the optic disc and macula (figure 1A), and 3 weeks later showed the development of a partial macular star (figure 1B). MR scan of the brain was normal, but cerebrospinal fluid (CSF) analysis showed raised protein (0.65 g/L), a lymphocytic-predominant pleocytosis (white cell count 164/mm³, lymphocytes 97%) and negative screen for viral encephalitis. Serological tests for tuberculosis, toxoplasma, toxocara, Lyme, cytomegalovirus, HIV and syphilis were negative. Serum Bartonella henselae IgG titre was initially positive at 1:640 (<1:320) 2 weeks from symptom onset, subsequently rising to 1:1280 3 weeks later. After a 6-week course of corticosteroids, rifampicin and doxycycline, her left eye visual acuity normalised to 6/6.

DISCUSSION
We report a rare case of cat-scratch disease caused by Bartonella henselae, presenting as meningitis and neuroretinitis. Ocular involvement occurs in 5%–10% of people with cat-scratch disease, and neuroretinitis is among the more common manifestations. Neuroretinitis is defined as inflammation of the optic nerve and peripapillary retina—often clinically identifiable as optic disc swelling—and retinal deposits of lipid-rich inflammatory exudate in a radial configuration resulting in a ‘macular star’ appearance. The macular star is often partial rather than complete and importantly may be absent at initial presentation. In our patient, careful examination of the fundus through a tropicamide-dilated pupil identified a grossly swollen macula, in addition to optic nerve involvement. This unusual combination of ophthalmic findings steered the diagnosis away from isolated optic neuropathy and its common causes (eg, multiple sclerosis in the young adult, ischaemic optic neuropathy in the elderly) and instead suggested neuroretinitis and its established set of differential diagnoses, of which cat-scratch disease is among the most common infective causes. Another red flag was the febrile illness at onset, and the subsequent finding of a very high CSF white cell count, each of which supported an infective cause. These clinical deductions subsequently led to enquiry into pet ownership and identified the patient’s feline exposure.

Neuroretinitis may occur with various conditions; these differentials were excluded with clinical investigations listed earlier. Optical coherence tomography can particularly help neurologists by detecting retinal disease not visible with bedside
Where the initial serological test for Bartonella henselae is low positive, continued high suspicion for cat-scratch disease should prompt a second test, which can show a significant titre rise, as in this case. Although there is no standardised treatment for Bartonella neuroretinitis, recent evidence suggests better visual outcomes by using a combination of antibiotics and corticosteroids, compared with antibiotics alone.

**Key messages**

- Cat-scratch disease caused by Bartonella henselae occurs worldwide and is one of the most common infective causes of neuroretinitis.
- Bartonella neuroretinitis is a rare but under-recognised mimic of the more commonly occurring optic neuritis; it should be suspected in a patient with an infective prodrome and fundus showing optic disc oedema and a macular star (ie, deposits of inflammatory exudate in a characteristic radial pattern in the peripapillary retina).
- A low-positive initial serological test for Bartonella henselae does not exclude cat-scratch disease if there is high clinical suspicion, and repeat testing may identify a titre rise.

**REFERENCES**