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# Neuroretinitis Following Bull Ant Sting

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## Keywords

Neuroretinitis, cat scratch disease, *bartonella henselae*

## Abstract

Cat scratch disease causes the majority of cases of neuroretinitis. Neuroretinitis is characterized by clinical features of papillitis, macular oedema and macular star. We report a case study of infection with *bartonella henselae* most likely to transmitted by a bull ant sting. The patient presented with blurred vision and reduced visual acuity after being stung by an ant in her garden some 7 days earlier. Further testing revealed positive serology to *bartonella henselae* and the patient improved with appropriate treatment.

## Background

Neuroretinitis is characterized by clinical features of papillitis, macular oedema and macular star.

The majority of cases are seen in Cat scratch disease. Other causes include syphilis, lyme disease, mumps, leptospirosis and idiopathic.

Cat-scratch disease is a systemic condition caused by infection with *Bartonella henselae*, a gram negative rod. Ocular features include Parinaud oculoglandular syndrome, retinal vascular occlusions, panuveitis, intermediate uveitis and focal choroiditis. Neuroretinitis occurs in approximately 1-2% of cases [1]. Systemic features can include fever, malaise and generalized lymphadenopathy.

As the name suggests, the infection is typically transmitted by a bite or scratch from an infected cat or flea bites. Other suspected sources include dog [2] and monkey bites [3], thorns, and splinters. Cats are thought to be the reservoir host for *Bartonella* species, whereas humans and dogs are accidental hosts [4]. Arthropods can be vectors for transmission [4].

We describe a case of neuroretinitis and probable *bartonella henselae* infection in a patient who was stung by a Bull Ant (genus *Myrmecia*) in South Australia (Figure 1).

## Case Description

A 52 year old Caucasian female presented with a 3 day history of blurred vision. The patient at this stage did not mention anything else of note in the history.

On examination, best corrected Snellen visual acuity (BCVA) was HM os and 6/4.8 od.

Examination revealed a quiet eye with normal anterior segment. Posterior segment examination revealed papillitis, macular oedema and macular star in the right eye (Figure 2). Examination of the left eye was unremarkable.

On further enquiry the patient denied any contact with cats or recent trauma including scratches or skin lacerations. She did, however, describe being bitten and stung by a “Bull ant”, in the garden, 7

days prior to developing visual symptoms. She brought in an example for identification. Shortly after receiving the sting the patient described having rigors and sweats, and pain at the sting site. The site was visible on the right inner thigh when the patient presented. There was no lymphadenopathy.

Full blood count, urea and electrolytes and blood serology for *bartonella*, *toxocara*, *toxoplasma*, herpes viruses and *borellia* was requested. The only positive findings were titres of 256 for *bartonella henselae* on paired sera 4 weeks apart, the first sample being taken 10 days following the sting. This is consistent with *bartonella henselae* infection.

Treatment was started with oral erythromycin 500 mg qds for 3 months and was well tolerated. BCVA improved to 6/10 od 3 months after original presentation with residual red colour desaturation and a paracentral scotoma.

## **Discussion**

Bull ants are aggressive creatures ranging in size from 15 mm to 25mm. They usually nest underground in dry, sandy soils with the entrance surrounded by fine gravel. The ants attack any animal which threatens the nest. The ants deliver a painful sting by firstly biting the attacker with their mandibles, and then curling their abdomens to deliver one or multiple venomous stings.

Bull ant stings are an important cause of life threatening anaphylaxis in Australia [5], although the venom itself is not lethal in humans. Acute renal failure with widespread internal organ necrosis and haemorrhage with eventual death (euthanasia) has been reported in a dog following massive envenoma [6].

The venom contains histamine-like activity, a heat-sensitive haemolytic factor and causes the release of cyclooxygenase products [7]. We felt it was unlikely that the venom was responsible for this patients ocular presentation because it was unilateral, presented some time after the sting and has not been reported previously despite bull ant stings being relatively common. Discussions with

an infectious disease physician and an entomologist specialising in ants revealed that *B. henselae* was probably introduced via the stinger or mandibles providing an entry point into the skin. Bartonella species have been shown to have remarkable strategies to adapt to their hosts and arthropod vectors [8]; and they can survive for several days in faeces of vectors [4,8]. It is therefore possible that the bacteria were introduced into the skin by the bull ant; via either its faeces or after accidental contact with other arthropod vectors.

This case represents a previously unreported mode of transmission for *bartonella henselae* causing neuroretinitis. On the basis of this case and other known causes, we suggest that the term cat-scratch disease is no longer used for infection with *bartonella henselae*.

## Learning Points

- *Bartonella henselae* can be transmitted by a sting of the South Australian Bull Ant
- Neuroretinitis should trigger the investigation of causes, even if some appear unlikely.

## References

1. Ormerod LD, Dailey JP. Ocular manifestations of cat scratch disease. *Curr Opin Ophthalmol* 1999;10:209-16
2. Tsukahara M, Tsuneoka H, Iino H, Ohno K, Murano I. *Bartonella henselae* infection from a dog. *Lancet* 1998;352:1682.
3. O'Rourke LG, Pitulle C, Hegarty BC, Kraycirik S, Brown JW, Bretschwerdt EB. *Bartonella quintana* in cynomolgus monkey (*Macaca fascicularis*). *Emerg Infect Dis* 2005;11:1931-34
4. Kalogeropoulos C, Koumpoulis I, Mentis A, Pappa C, Zafeiropoulos P, Aspiotis M. *Bartonella* and intraocular inflammation: a series of cases and review of literature. *Clin Ophthalmol*. 2011; 5: 817–829
5. Douglas RG, Weiner JM, Abramson MJ, O'Hehir RE. Prevalence of severe ant-venom allergy in southeastern Australia. *J Allergy Clin Immunol* 1998;101(1):129-31.
6. Abraham LA, Hinkley CJ, Tatarczuch, Holloway SA. Acute renal failure following Bull Ant mass envenomation in two dogs. *Australian Veterinary Journal* 2008; 82 (1-2):43–47
7. Matuszek MA, Hodgson WC, Sutherland SK, King RG. Pharmacological studies of the venom of an Australian bulldog ant (*Myrmecia pyriformis*). *Natural Toxins* 1994;2(1):36–43
8. Chomel BB, Boulouis HJ, Breitschwerdt EB, Kasten RW, Vayssier-Taussat M, Birtles RJ, Koehler JE, Dehio C. Ecological fitness and strategies of adaptation of *Bartonella* species to their hosts and vectors. *Vet Res*. 2009 Mar-Apr; 40(2): 29.

## Legends

Figure 1. Bull ants (*myrmecia* species)

Figure 2. Photograph of right fundus showing neuroretinitis