

The ‘noisome comorbid spider bite’ integrating contemporary research

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Introduction and feedback

The narrative reproduced in the previous paper (Dunn, 2005) aroused mixed reactions from readers. A Queensland butterfly enthusiast remarked, “I very much enjoyed your story”, and a North American University Professor wrote “I thoroughly enjoyed reading your account - I wish I [could] read more articles like that”. A Melbourne member of the Entomological Society of Victoria responded, “Your spider [supposition] in the wasp story has caused some angst among supporters of the White-tail.” Others expressed ethical concern that I had promulgated “the urban myth”.

At the time of writing in March 2003 it seemed reasonable to suppose a White-tail spider as the likely culprit, given the indoor circumstances of the bite, and supported by some two decades of popular media opinion. Necrotic arachnidism linked to *Lampona* bites was (and still remains) promoted by hearsay and anecdotal evidence on relevant Internet pages examined during 2003. I attributed the necrosis to “the spider’s toxin, a possible fang-introduced infection, or an inappropriate immune response” (para.1). In addition to these possibilities, Young and Pincus (2001) suggest that dermonecrotic effects could also result from the gastric enzymes from spider bites of *Loxosceles*, *Badumna* and *Lampona*, three spider genera popularly linked with necrotic arachnidism (AVRU, 2005; Hawkeswood, 2003; Nimorakiotakis & Winkel, 2004; White 1999).

Revisiting the ‘lived experience’

The morning after the suspected bite I remained sceptical of spider contact. It was difficult to see the impact site in the mirror, and the redness and itchiness seemed reminiscent of an eczema or perhaps ‘ringworm’. Considering one of the latter a prima facie possibility, I self-medicated with a corticosteroid topical, Mometasone furoate 1mg/g (Elocon® 0.1%) and an antifungal topical Ketoconazole (Nizoral® 2%). These were applied alternatively for some three days to no obvious effect. Instead, epithelial blistering and seepage of clear serous fluid had by then commenced.

The spider bite option was revisited and I sought medical opinion, but by then a circular (of 8-10 mm diameter) cluster of honey-coloured, tiny pinhead-sized blisters had largely

obscured what could have been fang marks. My first treating medical practitioner suggested the supposed fang punctures (para.20) to be merely “a scratch”, later contaminated by “a wound infective-bacterium obtained overseas” (para.21). Epithelial blistering deteriorated quickly into the first ulceration by about the fourth day. By this stage I wondered whether the corticosteroid had adversely created localised immunosuppression enabling minor ulceration, yet there seemed no odour or pus exudate and the wound now remained largely painless after the itchy blistering subsided.

This slowly enlarging ulcer did not respond well to the broad-spectrum, acid-stable penicillin, Amoxicillin trihydrate (Cilamox® 500 mg, 8 hourly) prescribed on 14/3/2003. On a follow-up appointment the same treating doctor remarked that the infective agent “must be highly resistant” or perhaps I had “an immune deficiency” (24/3/2003). In this third week, the wound was prominent and still enlarging, then with two new disjunct and evolving, itching secondary blister centres within areas of previously healthy skin.

A second doctor at the same clinic, exclaimed, “Good heavens! I very rarely see anything like that!” whilst lens-magnifying the ulceration and eschars. Relaying my story, I now suggested necrotic arachnidism, and he verbally concluded, “I cannot rule out a spider bite” (13/4/2003). In its prominent stage the wound very closely resembled the lower section in the illustration of arachnidism by AVRU (2005). Mine similarly included some ‘lagoon islands’ of variably less damaged skin and these can still be distinguished in my scarred area. I then also had some distal deterioration at earlier stages of ulceration, but to a much more restricted extent than in the sample photograph by D.M. Starr (AVRU, 2005), showing forearm ulceration attributed to a ‘wolf spider’ (identified by the patient). Saline irrigated and dressed twice daily, the ulcers gradually healed. The main wound cluster remained largely painless and was described in the doctor’s notes as “scabbed over, reducing in size, and dry” (13/4/2003). In late April a fourth and final honey-coloured blistering cluster appeared anteriorly, this time within the hairline, about a centimetre beyond the main wound area (para.21). This healed without ulcerating into a blackened crater, and in terms of my ‘lived experience’, alleviated further existentialist concerns.

New Evidence

Anecdotal attribution of horrid necrotic bites to the White-tail spider has recently come into disrepute in the medical field. A quantitative study by Isbister and Gray (2003) examined the incidence of necrotic lesions and clinical effects of White-tail spider bites in southern Australia. Their study involved a sample of 130 definite White-tail spider bites (79 by *Lampona cylindrata* and 51 by *L. murina*). Isbister and Gray (2003, p.199) found that “bites from *Lampona* spp. cause minor effects in most cases, or a persistent painful red lesion in almost half the cases”. Since no bites produced necrotic lesions in their sample, they concluded that, “White-tail spider bites are very unlikely to cause necrotic ulcers.” Associate Professor and Head of Toxicology at the Women’s and Children’s Hospital in South

Australia, Julian White (2003, p.180) commented that “the lack of strong evidence to support this association [*Lampona* spider bite necrosis] seemed to be a trivia to be ignored”. The *Lampona* association in “necrotising arachnidism” has since been described as “a sad medical fable in Australia” (White, 2003, p.180). Although a moderate sample of 130 confirmed bites does not prove that a bite from *Lampona* cannot or never will develop into necrotic arachnidism, it does indicate serious doubt. In addition, earlier studies have shown that *Lampona* venom has “little potential to cause necrosis” (Isbister & Gray, 2003, p.202).

A subsequent but small study involving ten patients admitted to Christchurch hospital for “contact with venomous spiders” was undertaken during 2001-2003 in New Zealand, where *Lampona* also occurs (Banks *et al.*, 2004, p. 748). Banks’ research team similarly “found no evidence that patients developed necrotising arachnidism” after putative spider bites (p.748). These authors likewise claimed that the public’s fear was misplaced, and cautioned medical staff that “if a spider was not caught in the act of biting a patient, alternative diagnoses should be considered before assuming a white-tailed spider was responsible for the patients symptoms” (Banks *et al.*, 2004, p.748).

Alerting readers to two recent publications, Faulder (2005, p.53) wrote in response to my account, “Arachnologists had hoped that the myth of the White-tailed spider syndrome had expired after the publication of [Isbister & Gray 2003 and the editorial by White 2003]”. Realistically though, it may take more than a single rigorous quantitative study to undo nearly 20 years of apparent miss-association, now indelibly saturated in the minds of the populous. Indeed, Gully (2002) reminds that it is difficult to change public opinion after receipt of misinformation from the media. Nonetheless, it was not my intention to promote apparent mythology in relaying my anecdote and White-tail spider bite supposition.

Necrotising Fasciitis

Based on descriptions on the New Zealand Dermatology web-site (DermNet NZ, 2005), Faulder (2005, p.53) added that “the observed symptoms closely resemble those of necrotising fasciitis, a condition caused by bacteria”. This aggressively spreading and destructive disease (Nataranjan & Panayiotou, 2005) I have since suggested as a possible causative to the last practitioner who examined my wound. He remarked experientially that many “claimed spider bites” examined in his practice, indeed “are little more than skin infections”. His observations agree with literature findings. Reviewing prior research Isbister and Gray (2002, p.724) reported that “in two of the largest studies on suspected spider bites, 80% of cases proved to be injuries from other arthropods or due to micro-organisms”. However, concerning a diagnosis of necrotising fasciitis, my doctor recalled that the wound “did not give suspicions of that”. And, after a pause added, “I would have to say ‘No’ to that” (16/6/2005).

The visual damage may look similar as Faulder (2005) suggests, but the process differs

between these reactions. For readers' full information, necrotising fasciitis "is defined as: 'decaying infection of the fascia, the sheets of connective tissue surrounding the muscles' (Roemmele and Batdorff, 2000 [quoted in Gully, 2002]). It can spread alarmingly quickly, sometimes between 3 and 5 cm per hour" (Gully, 2002, p.39). It "spares skin and muscle in the initial stages of the infection (Callender, 1992 [cited in Gully, 2002])" and is "most often caused by a combination of two or more bacteria, of which Group A streptococcus is the most commonly identified" (Gully, 2002, p.39). In the same paragraph, Gully (2002) informs that other causative bacteria "include *Staphylococcus aureus*, bacteroides, clostridium, pseudomonas and prevotella". In addition, lesions with necrotising fasciitis "are often malodorous and produce copious exudate" (Ovens & Fairhurst, 2002, p.25). In contrast, my largely painless, slowly spreading wound involved full-thickness skin damage – typical of dermocratic damage linked with arachnidism (White, 1999); it had no association with connective tissue of surrounding muscles. The painful and potentially fatal systemic symptomatology of necrotising fasciitis is far more serious (Gully, 2002; Nataranjan & Panayiotou, 2005) than localised, slowly evolving skin damage associated with necrotising arachnidism (AVRU, 2005; Midgley, 2001).

Bite Symptomatology: White-tail Spiders and Recluse Spiders

Based on a study of 750 bites in Australia utilising expert spider identification, Huntsmans (Sparassidae) (23%), Orb weavers (Araneidae) (21%), White-tails (Lamponidae) (16%) and Widow spiders (Theridiidae) (11%) proved the most frequently identified biting groups (Isbister & Gray, 2002), with the remaining 29 percent comprising bites from 14 other spider families. Moreover, although greatly feared, bites from mygalomorph families involved little more than five percent of their sample. In contrast, the probability of being bitten by Lamponid spiders is markedly higher.

The White-tail spider, a common native urban dweller (White, 1999) can be abundant indoors in late summer. And, I suspect I have been bitten by this spider whilst asleep in bed on several occasions over the previous decade at Upper Beaconsfield, Vic. (para.20). Each time a mildly itchy red lesion was evident the following morning usually on an arm or shoulder, remaining for several days thereafter. This time though I recognised different symptoms (para.20): a predominantly upper body sweat (para.20) for example, is not listed among the range of clinical effect of the White-tail spider bite, and even headaches (para.20) are rather uncommonly recorded (Isbister & Gray, 2003). It was a feeling of sickliness, not anxiety that awoke me the second time. My t-shirt was damp, my chest wet, and I sensed steady tachycardia. I took a Paracetamol tablet or two for my headache. Another coincident symptom I recall, but not mentioned in my article, was a generalised dull ache with sensation of muscular tightness in the right side of my neck. Confirmed bites from *Lampona* however, variably include one or more symptoms involving pain, discomfort, puncture marks, initial bleeding, redness, or red lesion/mark, swelling, and itchiness, with malaise, nausea and vomiting (Isbister & Gray, 2003). The pain lasts for about five minutes (Isbister & Gray,

2002), a very short time relative to widow spiders (up to 36 hours) (Isbister & Gray, 2002). No localised sharp pain suggestive of a spider bite was recalled on waking the first time, but I may have slept through this, being later conscious of only a crawling sensation on my neck, and after a short unsuccessful search, returned to sleep believing in contact only.

White (1999, p.98) wrote contemporaneously that there had been “only three cases” of necrotic bites where the biting spider was “formally identified by an expert”. White elaborated, “In two this was a white-tailed spider, while the third case involved a black house spider (*Badumna* species)” (p.98), an abundant timid species creating the untidy, lacy webs seen around windowsills and on fences in southern Australia (Hawkeswood, 2003). White continued “This adds to the still scarce case reports of necrotic bites by identified spiders and, most importantly, provides three cases with expert identification.” Of the two confirmed White-tail spider cases, “one developed shallow ulcers only, the other a small ulcer that healed within one month” (p.98). In both cases the necrotic damage remained “mild” (p.98). Despite expert identification in all three cases, misattribution is still possible (Isbister and Gray, 2002 p.729) – if the wrong spiders were collected. Indeed, White (1999) recounted, from over 20 years experience with necrotising arachnidism, that in most instances “an unsubstantiated link” has usually been made “to a spider found in the house after the bite” – never confirmed (White, 1999).

The question remains do any spiders really cause necrotic wounds? Readers are reminded that there have been two cases of Recluse spider bites in Australia at localities where they have been introduced (White *et al.*, 1996, cited in White, 2003). The Recluse spider (*Loxosceles*) has confirmed cytotoxic and necrotic venom (Isbister & Gray, 2002, 2003), the active compounds being sphingomyelinases (Isbister & Gray, 2003; Young & Pincus, 2001). Not surprisingly, Recluse spider bite has been demonstrated to cause necrotic arachnidism (Isbister & Gray, 2002), creating a characteristic “deep ulcer, with a rolled edge, and necrotic base” that sometimes extends through the dermis to expose subcutaneous fat or even underlying muscle (Pincus *et al.*, 1999, p.100). The initial bite is relatively painless leading to erythema, oedema and blistering prior to ulceration (Pincus *et al.*, 1999). White (2003, p.181) follows on however, stating, “there is no evidence recluse spiders are widespread in Australia, and it would be erroneous to now label skin damage of uncertain origin as ‘loxoscelism’ instead of ‘white-tail spider bite’”. This introduced American genus has established in Adelaide, SA and Sydney, NSW (White, 1999). To assist identification, a *Loxosceles* fiddleback spider from Adelaide is illustrated online at AVRU (2005). Fortunately, *Loxosceles* bites remain very rare in Australia – Isbister & Gray (2002) in their sample of bites from mainland Australia and Tasmania, involving all Capital cities, recorded none.

Although the White-tail spider would now seem a most unlikely culprit for my lesion, Isbister and Gray (2003, p.202) still recognise that “some cases of necrotic ulcers attributed to white-tail spider bites were reported to occur in bed at night time, which is more consistent with definite white-tail spider bites”. Again, these spiders were never caught and identified

(Gray, 1989 and St George & Forster, 1991, both cited in Isbister & Gray 2003). The glimpsed black spider I saw on waking in the dark, was similarly never caught or identified (para.18), but was circumstantially “convicted on the balance of probabilities” as a White-tail (para.19) given its contemporary media publicity (eg. DHS, 2001; Midgley, 2001 and others), although three or four other spiders were listed as possibilities (para.19) – all still chief arachnidism suspects, at least according to Nimorakiotakis & Winkel (2004). In particular, Pincus *et al.* (1999) documented a solitary case from a *Badumna* sp. (indeterminate) identified by arachnologist, R. Raven of the Queensland Museum. After being sprayed with insecticide, the spider fell onto the victim’s forearm, biting her four times and was then collected. Four distinct wound ulcerations were evident nine days later and can be seen in the illustration in Pincus *et al.* (1999).

Lampona is an araneomorph spider belonging to the family Lamponidae (Hawkeswood, 2003; Nimorakiotakis & Winkel, 2004), but as stated the punctures seemed suggestive of a mygalomorph (para.20) which includes the trapdoors (Nemesiidae) and funnel-web groups (Hexathelidae: Atracinae). Although the atracines are the most dangerous spiders in the world (Isbister *et al.*, 2005, Nimorakiotakis & Winkel, 2004), their bites, usually treated as medical emergencies, remain infrequently recorded (Harrington *et al.*, 1999) – about one percent (n = 750 spider bites) according to Isbister & Gray (2002). In rural-woodland opposite Hamilton Reserve in Upper Beaconsfield I have seen two large spiders, which may have been the Dandenong Ranges funnel-web (a species of *Hadronyche*), creep indoors during or after very wet weather in summer and autumn (one in May this year). However the severity of the bite of some *Hadronyche* spp. (Harrington *et al.*, 1999, Isbister *et al.*, 2005) and the absence of any reported cases of necrotic arachnidism linked to atracines (Nimorakiotakis & Winkel, 2004) can reasonably eliminate them and also probably trapdoors as suspects. These spiders are far bigger and more frightening than what I seemingly saw... Indeed, even the spider’s reality was questioned in my account, “I thought I had dreamt this new one...” (para. 18). It may have been a hypnagogic hallucination – a usually, non-pathological perceptual disturbance, such as “a vivid image”, that can occur when awakening from sleep (Anderson, 2002, p.852). I doubt I would have so quickly returned to sleep had I feared a *Hadronyche* was lurking somewhere in the bedroom!

Conclusion

The data from Isbister and Gray (2002) suggest that spider bites causing necrotic or cytotoxic lesions remain “extremely uncommon” (p.729), and that “other diagnoses should be considered first” (p.729) before assumption of necrotic arachnidism. Nimorakiotakis and Winkel (2004) list 19 differential diagnoses for practitioners to consider before suspecting ‘necrotising arachnidism’ – also citing cases of cutaneous anthrax and sporotrichosis misdiagnosed as spider bite in Australia. In my case most options listed can be readily eliminated including it seems a fungal infection, given no apparent response to the antifungal topical applied soon after. Possibilities still include bacterial or viral infections, or “other

arthropod bites or stings” (Nimorakiotakis and Winkel, 2004, p.250). Hence, the sceptic can argue that rather than being a bite from some undetermined spider, secondarily infected that is comorbid in presentation as I think, my lesion may have evolved from an infected scratch linked to “travel history” (p.250) – as the first practitioner had surmised (para.20).

Reflections

Readers who may still assert that I have actually ‘identified’ the spider as a White-tail in the original anecdote, and therein promoted misinformation are reminded of nuances in English language. In terms of psychology, to suggest rigid identification here given my clear disclaimer to the contrary (para.1) is suggestive of primitive thinking of absolutism (Webster, 2000). I remind that *Lampona* supposition remained linked by the adjectives, “likely” (used twice in para.18) meaning something “reasonably to be believed” (Delbridge & Bernard, 1988, p.558) and “presumably” (para.1 - abstract), “to assume true in the absence of proof” (Delbridge & Bernard, 1988, p.776) to express the factual limitations of the association. An association at the time of writing that seemed believable, but now very much less so.

Overlooking an important contemporary paper specifically relating to *Lampona* bites remains disappointing, but omissions happen despite all efforts – everyone makes mistakes (Hirsch, 1994; Hovanitz, 1967). Nonetheless authors should strive to obtain current research where possible, and if some is overlooked for whatever reason, it is desirable for others, like Faulder (2005), to alert readers of relevant studies they know of. In terms of veracity, the anecdote did not obscure technicalities of associations, but reinforced the identification limitations (para.1) and its entertainment focus (“leisure reading” para.1), hence discerning readers should not be concerned.

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