

**RED BACK SPIDER**



*Latrodectus hasselti, (the Red Back Spider)*

*“A few days since, I brought a male of Mantis carolina to a friend who had been keeping a solitary female as a pet. Placing them in the same jar, the male, in alarm, endeavoured to escape. In a few minutes, the female succeeded in grasping him. She first bit off his left front tarsus, and consumed the tibia and femur. Next she gnawed out his left eye. At this the male seemed to realise his proximity to one of the opposite sex, and began to make vain*

*endeavours to mate. The female next ate up his right front leg, and then entirely decapitated him, devouring his head and gnawing into his thorax. Not until she had eaten all of his thorax except 3 mm did she stop to rest. All this while the male had continued his vain attempts to obtain entrance at the valvules, and he now succeeded, as she voluntarily spread the parts open, and union took place. She remained quite for 4 hours, and the remnant of the male gave occasional signs of life by a movement of one of the remaining tarsi for 3 hours. The next morning she had entirely rid herself of her spouse, and nothing but his wings remained”*

*L.O Howard 1886,  
The excessive voracity of the female mantis.  
Science 8: 326.*

*This magnificent early 20<sup>th</sup> century description was quoted by the great palaeontologist Stephen Jay Gould, as an introduction to his essay, “Only His Wings Remained”. The essay concerned one of the weirdest observations of the insect world, that of female sexual cannibalism. In the essay he describes the practice as allegedly occurring in two other species of the arthropod world, the desert scorpion *Paruroctonus mesaensis* and spiders of the genus *Latrodectus*. In the case of the black widow spider he (Gould) continues thus....*

*“...A hungry female black widow spider is also a formidable eating machine, and courting males must exercise great circumspection. On entering a female’s web, the male taps and tweaks some of her silk lines. If the female charges, the male either beats a hasty retreat or sails quickly away on his own gossamer. If the female does not respond the male approaches slowly and cautiously, finally cutting the female’s web at several strategic points, thereby reducing her routes of escape or attack. The male often throws several lines of silk about the female, called, inevitably I suppose, the “bridal veil”. They are not strong, and the larger female could surely break them, but she generally does not, and copulation as they like to say in the technical literature “then ensues”. The male blessed with paired organs for transferring sperm, inserts one palp, then if not yet attacked by the female, the other. Hungry females may then gobble up their mates, completing the double-entendre of a consummation devoutly to be wished...”*

*Stephen Gould himself actually doubted that the phenomenon of sexual cannibalism was as widespread in these species as is claimed. In fact he wondered if it was actually a genuine phenomenon at all. Perhaps, he mused, among the preying mantis it may only be an aberrant behaviour under conditions of captivity.*

*Whilst the practice of sexual cannibalism by the female red back may be open to discussion, there is no debate when it comes to envenomation - the female of the species is the one to fear!*

## RED BACK SPIDER

### Introduction

**Australian red back spiders** are members of the black widow spider genus of *Latrodectus* found worldwide. They are found throughout Australia in essentially all habitats.

Bites from mature females result in more serious symptoms. Males and immature spiders of the species do not cause significant symptoms.

While symptoms can be distressing and refractory to analgesics, envenomation is *rarely* life threatening.

**The utility of antivenom for symptom control is controversial among clinicians, with some advocating abandoning its use all together while others retain it as an option in cases of severe symptoms not controlled by other measures.**

### Epidemiology

Red Back spider bite is the most common significant envenoming in Australia.

It occurs most commonly in temperate regions of Australia. Very few bites are reported from northern tropical Australia or in cooler southern climates, such as Tasmania.

### Biology



*Female Red Back spider showing the hour glass ventral stripe.*

- The scientific name for the Australian species is *Latrodectus hasselti*
- The red back spider has a black round abdomen with a dorsal red or orange stripe.

The *ventral* surface of the female *also* has the pathognomonic hourglass stripe, as shown below:

- The male is smaller, at only 3-4 mm across, and does not have the ventral hourglass stripe.

## Pathophysiology

### Venom:

The active component of red back spider venom is alpha-latrotoxin.

This has 4 main actions:

1. Motor NMJ paralysis.
2. Stimulation of adrenergic nerve endings, leading to widespread release of catecholamines
3. Stimulation of cholinergic nerve endings, which results in sweating
4. Local pain, which can be severe.

## Clinical Features

### Important points of History:

These include:

1. When did the bite occur?
2. Can a Red Back spider definitely be identified as the cause of the bite?
3. Is a bite a strong possibility despite no definite identification of the culprit?
4. Last tetanus injection.

### Pattern of clinical illness:

The venom is generally slowly moving and serious illness is unlikely to develop in under 1-3 hours, unless a true anaphylaxis occurs in a previously sensitized individual, (rare).

The pattern of illness is generally as follows:

1. The initial bite is usually not immediately painful.
2. Within 5-10 minutes **intense local pain** develops.

*Then within an hour:*

3. Further local symptoms:

- **Piloerection**
- **Local sweating**
- Local erythema
- Painful swelling of regional lymph nodes.

*Symptoms of systemic illness generally occur within 1-3 hours*

3. Systemic symptoms:

Symptoms can be extremely variable and bizarre, including:

- Headache.
- Nausea and vomiting.
- Hypertension and tachycardia (due to catecholamine release).
- Pain:
  - ♥ Localized pain may progress from local to regional pain and then to bizarre and generalized myalgias, including the chest, back and abdomen, which may lead to diagnostic difficulties.
- Sweating may progress from local to regional to generalized.
- Neurological:
  - ♥ Parasthesiae
  - ♥ Patchy paralysis.
- Priapism.

*Clinical course:*

Untreated systemic envenoming may follow a fluctuating course lasting anywhere from 2 hours to 5 days.

Occasionally symptoms may persist for one week and rarely patients report symptoms lasting weeks or months.<sup>1</sup>

More serious illness (neurological symptoms) is more likely to occur in children but is rare.

## Investigations

There are no specific laboratory investigations that are necessary for diagnosis or management of Redback spider bite.

## Management

1. Immediate attention to any ABC issues.
2. Analgesia:
  - Locally applied ice is helpful
  - Analgesia:
    - ♥ Oral simple analgesia can be given for milder symptoms.
    - ♥ Opioid analgesia may be necessary for severe symptoms.
3. Pressure bandage immobilization:
  - Pressure bandage immobilization is **not** recommended, as this will **increase** local pain. Systemic spread of venom is slow and it is not highly toxic.
4. **Antivenom:**

The role of Red Back Spider antivenom is controversial.

A recent study has brought into question its effectiveness,<sup>5</sup> however there still remains diversity of opinion among experts on this issue.

**The current recommendation in the State of Victoria is that Red Back Antivenom remains an acceptable option for treatment.**

- Any patient who is to get anti-venom, should be in a monitored cube.
- **IV** use is safe and associated with very low reaction rates (0.5%)
- Premedication with SC adrenaline is **not** necessary, but should be considered if there has been a significant reaction to previous administration of antivenom.

### **Indications:**

- If the spider has been positively identified then many clinicians would still consider its use in situations where symptoms were severe and not controlled with opioid analgesia.

- If the spider has not been positively identified but there is a strong clinical suspicion of a spider bite together with significant systemic symptoms, some clinicians would give antivenom.
- Antivenom is safe to use in children and in pregnant and lactating women.<sup>1</sup>

### Dosing

- Redback anti-venom has traditionally been given as a single IM injection.
- Current expert opinion (among those who still advocate antivenom use) favors the use of a higher dose given **IV**.<sup>4</sup>

**Adults:**        **Give 2 ampoules (500 units per ampoule) diluted in 200 mls normal saline or Hartmann's solution IV over 20 minutes.**

**Children:**     The dose is the same as for adults.

- Further doses are unlikely to add any additional benefit.
- There is controversy regarding benefit for delayed presentations (> 48 hours). This situation should be discussed with a clinical toxicologist.

#### 5. Serum sickness:

- This is an uncommon, relatively benign and self limiting complication that may occur 5-10 days following antivenom administration.

Symptoms respond well to oral steroids. Patients should be warned of this potential complication prior to discharge.

#### 6. Tetanus immunoprophylaxis should be given as clinically indicated.

### Disposition

Patients who do not have symptoms 4 hours following a bite can be safely discharged. They should be advised to return if symptoms recur.

Patients may be safely discharged following resolution or reduction of symptoms.

### Specialist Advice

**For specialist advice concerning any Australian envenomation contact:**

**Poisons Information Center 13 11 26**

References:

1. Red Back Spider Bite and Red back Spider Antivenom in: Murray L et al. Toxicology Handbook 2nd ed 2011.
2. Banham ND, Jelinek GA et al: Late Treatment with Antivenom in Prolonged Red Back Spider Envenomation: MJA vol 161 (6) 19 September 1994, p.379-81
3. Isbister G.K, "Failure of intramuscular antivenom in Red back spider envenoming". Emergency Medicine: 2002 14, 436-439.
4. eTG - March 2016
5. Randomized Controlled Trial of Intravenous Antivenom Versus Placebo for Latrodectism: The Second Redback Antivenom Evaluation (RAVE-II) Study. Ann Emerg Med. 2014; 1 - 9.

Further reading:

Gould S. J. The Flamingo's Smile: Reflections in Natural History, W.W Norton 1985.

Dr J Hayes

Reviewed July 2016.