Guideline

Ministry of Health, NSW
73 Miller Street North Sydney NSW 2060
Locked Mail Bag 961 North Sydney NSW 2059
Telephone (02) 9391 9000 Fax (02) 9391 9101
http://www.health.nsw.gov.au/policies/

Snakebite and Spiderbite Clinical Management Guidelines 2013 - Third Edition

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Summary Revised clinical resource document which provides information and advise on the management of patients with actual or suspected snakebite or spiderbite, and the appropriate levels, type and location of stored antivenom in NSW health facilities. These are clinical guidelines for best clinical practice which are not mandatory but do provide essential clinical support.

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Author Branch Agency for Clinical Innovation

Branch contact Agency for Clinical Innovation 9464 4674

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Spiderbite
Guidelines for Assessment and Management

Introduction

Red-back spider envenoming or latrodectism is characterised by severe local or regional pain associated with non-specific systemic symptoms and less commonly autonomic effects. Funnel-web spider envenoming is rare, but causes severe and potentially life-threatening neurotoxicity. There are specific antivenoms for these two syndromes. All other spiders will almost always only cause minor effects and require symptomatic treatment. There are also many other stinging or biting creatures which are briefly covered in the appendices, but for which no guidelines have been developed.

Epidemiology and clinical effects

Spider bites occur more commonly in the warmer months of the year. The majority of funnel-web spider bites have been reported in Sydney, the Central Coast and Newcastle.

Most local effects are a result of simple mechanical trauma from the bite. Pain or discomfort occurs in almost every spider bite and the absence of pain suggests the patient has not been bitten. Most patients will recall the pain of the bite and often see or catch the spider after feeling the pain of the bite. Other local effects are a direct result of the mechanical trauma and include fang marks, bleeding and local erythema. Larger spiders will cause more trauma with bleeding fang marks (big black spiders) compared with minimal evidence of the bite with smaller spiders, such as red-back spiders.

Allergic reactions have not been reported following spider bites. Hypersensitivity reactions after a bite suggests bees, wasps or ants are the culprit. Secondary infection is also rare (< 1%) with spider bites.

Specific features of funnel-web and red back bite are discussed below. Other spiders do not cause severe systemic envenoming.

Clinical assessment

In contrast to snakebite, it is common for people to suspect spiderbite without observing a spider biting. Thus, the initial task is to establish if a spider was seen to bite, whether the culprit was collected and the timing of the signs and symptoms attributed to the bite. In most confirmed cases, the patient will present soon after a definite bite.

Relevant history

The following line of questioning may be useful, with the purpose of identifying if a funnel-web spider or related species needs to be considered

- Was a spider seen to bite (?multiple bites) OR were the circumstances such that a bite might have occurred?
- When did the patient get bitten (elapsed time)?
- Description of spider if possible (colour, size, shape)
- Geographic location that the incident occurred
- Timing and type of first aid and activity after the bite
- Type and timing of symptoms; specifically ask about tingling around lips, tongue fasciculation, excessive lacrimation, salivation, piloerection, hypertension, nausea, dyspnoea (pulmonary oedema), impaired conscious state

There are no specific diagnostic tests for funnel web spider or any other spider envenoming. Examination should include looking for typical features of redback spider and funnel web spider envenoming.

Definite spider bites are then managed in one of three clinical pathways:

1. **Big black spider bites**. This includes potential bites by funnel-web spiders, but also trapdoor spiders, mouse spiders and other mygalomorphs (large, primitive spiders). Distinguishing funnel-web spiders from other mygalomorph spiders should only be done by expert arachnologists. All bites by big black spiders in eastern Australia should be managed as suspected funnel-web spider bites for the first 4 hours after being bitten.
2. **Red-back spiders (Latrodectus hasseltii)**. The defining feature of red-back spider envenoming is severe pain, which may be associated with non-specific systemic symptoms. It develops gradually and is not life-threatening. Treatment is primarily for symptomatic relief and can include analgesia and/or the red-back spider antivenom. Most people can identify a red-back spider with reasonable accuracy.
3. **Other spiders**. Bites by all other Australian spiders only cause minor effects. If a patient has not been bitten by either a big black spider or red-back spider they can be reassured because no major envenoming will occur.

Some patients present with skin lesions or necrotic ulcers they attribute to a spider bite. Necrotic ulcers have not been reported from confirmed spider bites in Australia. The diagnosis and investigation should be focused on other important causes of ulcers including infection, immunological, inflammatory, vascular and neoplastic aetiologies.

RED-BACK SPIDER BITE

Clinical features and diagnosis

Red-back spider bites are not life-threatening but can result in severe pain and systemic symptoms that can continue for hours to days.

Bites typically occur when putting on shoes left outside, sitting on outdoor furniture, putting on bike helmets, moving things in storerooms or picking up pot plants or other garden items. Most people are able to identify red-back spiders and therefore provide a reliable identification if the spider is seen biting.

Red-back spider envenoming is characterised by pain (localised, radiating and regional), which may be associated with systemic symptoms. The initial bite may only cause mild discomfort or irritation, and sometimes is not even noticed. Local pain increases over an hour or two and may radiate up the limb. Abdominal or chest pain may develop as may pain at other sites. The pain is of an unusual quality, persistent and usually severe enough to interfere with normal activities (work or sleep). The duration of effects vary with only moderate pain for a few hours in some cases to severe persistent pain for 2-5 days.

The bite site is often red and the pathognomic finding is localised diaphoresis (sweating). An obvious bite mark with swelling, inflammation, fang marks or bleeding is uncommon. Non-specific systemic effects such as nausea, vomiting, headache, malaise and lethargy are also common. Rarely, other effects are reported such as neurological manifestations, fever, hypertension and priapism.

Red-back spider envenoming is not life-threatening even to infants and children. No deaths have been reported since the mid-1950s.

In most cases, the diagnosis is made based on the history of a bite by a red-back spider and the clinical effects. The type of pain and the presence of local diaphoresis alone may be sufficient to strongly suggest the diagnosis even if a bite is not confirmed. The diagnosis in children or infants who are unable to give a history may be difficult.

Management

First aid

There is no definitive first aid for latrodectism. Cold packs or alternatively heat packs on the bite area sometimes help diminish pain. A pressure bandage will make the pain worse and is not recommended.

Further management

Red-back spider bite is common but very unlikely to prove lethal, even if untreated. Significant envenoming occurs in about a third of cases, but these patients may have several days of distress.

Those patients who present to hospital with no or minimal symptoms may be allowed home. The patient should be instructed to seek further medical care should pain or other symptoms develop which require treatment.

Antivenom is sometimes given:

- if there is a history, symptoms and signs consistent with systemic envenoming, and
- severe pain unresponsive to oral analgesics.

However, recent trials show antivenom has a low response rate little better than placebo, and any effect is less than might be achieved with optimal use of standard analgesics.

There are no useful or diagnostic laboratory tests for red-back spider bite.

Antivenom treatment

CSL Red Back Spider Antivenom is refined horse IgG F(ab')2, averaging 1.5mL per vial.

Administration

The preferred route is intravenous (in contrast to manufacturer's product information which states 'This medicine is usually injected into a muscle, or in life-threatening cases may be diluted and given via a vein').

Anaphylaxis to this antivenom is rare.

1. Give 2 vials I.V; dilute the antivenom in 100ml of normal saline and administer over 20mins using a pump. Always have adrenaline and full resuscitation available in case of anaphylaxis, but premedication is not required.
2. If incomplete resolution of symptoms seek expert advice, repeat doses of antivenom are often given but there is no good rationale or evidence to support this and it is not recommended.
3. The dose is the same in adults and children.
4. Pregnancy or lactation are not contraindications to antivenom.

Further management advice can be obtained through the **NSW Poisons Information Centre (13 11 26)**.

FUNNEL WEB SPIDER BITE

Clinical Features and Diagnosis

Funnel web spider bite is potentially rapidly lethal. It should be treated as an acute medical emergency. Specific antivenom is available and life-saving in conjunction with supportive care. Expert advice is always available from the **NSW Poisons Information Centre (13 11 26)**.

First aid

The first aid for Funnel Web Spider bites is the same as for snake bites. Apply a pressure bandage with immobilisation (PBI). The pressure bandage should be a broad (15 cm) elasticised bandage, rather than a crepe bandage. The bandage is applied over the bite site and then distally to proximally covering the whole limb. It should be applied about as tight as that used for a sprained ankle. The limb and whole patient should be immobilised for the first aid to be effective. The bandage and immobilisation should remain until the patient has been transferred and assessed in hospital. The bandage should only be removed if antivenom is available and after there is no evidence of envenoming based on clinical examination. If the patient is envenomed the bandage can be removed after antivenom has been administered.

A considerable number of Funnel Web Spider bites do not result in significant illness, and do not require antivenom, but all suspected or confirmed funnel web spider bites must be observed for at least 4 hours with routine observations recorded i.e. pulse, blood pressure, respiratory rate and oxygen saturation levels as per local protocols.

The bite is usually painful and fang marks are present in most cases. If systemic envenoming is present, urgently consider antivenom therapy as this may be lifesaving (see Antivenom Therapy section in these guidelines).

The clinical features arise directly or indirectly from excessive activity of the autonomic and peripheral nervous system are summarised below.

Table 4. Summary of the clinical effects of funnel-web spider envenoming

CLINICAL SYNDROME	CHARACTERISTICS
Autonomic excitation including cholinergic and catecholaminergic effects	■ Generalised diaphoresis and piloerection ■ Hypersalivation, lacrimation ■ Hypertension, bradycardia or tachycardia ■ Miosis or mydriasis
Neuromuscular and sensory excitation	■ Fasciculations – local or generalised; characteristically tongue fasciculation is seen ■ Paraesthesia – local, distal and oral ■ Muscle spasms – local or generalised
Cardiac effects and Pulmonary oedema	■ Non-cardiogenic/neurogenic pulmonary oedema ■ Myocardial injury/stunning leading to – Cardiogenic pulmonary oedema (less common than non-cardiogenic) – hypotension
Other severe effects	■ Drowsiness or coma — rare and typically occurs late or in association with severe envenoming ■ Multiorgan failure — occurs late in life-threatening cases if antivenom has not been administered
Non-specific systemic symptoms	■ Agitation/anxiety ■ Abdominal pain ■ Nausea, vomiting ■ Headache

Clinical management of funnel web spider bite

Key toxicological principles for specific treatment

- If the patient arrives without a pressure bandage with immobilisation then apply one immediately
- Do not remove first aid until ready to treat with antivenom
- Establish intravenous access
- If there are any symptoms of systemic envenoming give 2 vials of CSL Funnel Web Spider Antivenom intravenously
- Be prepared to give more antivenom until major symptoms resolve.
- Children require the same dose as adults
- Seek consultation in any patient not responding to initial antivenom.

Supportive care

Respiratory failure is usually due to pulmonary oedema and may require emergency resuscitation and assisted ventilation. Intubation and PEEP may assist in severe cases. Atropine may be useful if cholinergic features are marked and antivenom is not immediately available.

Severe hypertension may occur, and sedation is the most appropriate first line treatment as it will not exacerbate other features of poisoning.

Antivenom administration

- Antivenom for funnel web spider bite should always be given IV with the patient and clinical environment appropriately prepared to manage anaphylaxis should it occur. No pre-medication is required.
- Due to the nature of envenomation by Funnel Web Spiders (i.e. catecholamine storm), anaphylaxis is very unlikely.

Other common spiders that cause minimal effects

There are a number of recognisable groups of spiders that cause minimal effects.

Orb-weaving spiders are common web building spiders and bites cause local pain and redness and often occur from spiders in clothes left out on the washing line overnight. **Huntsman spiders** are recognisable large spiders that are commonly found climbing walls in houses and are feared by many people. Bites from these spiders cause local pain, local bleeding and fang marks due to the size of the spider. **Wolf spiders** are common ground dwelling spiders and cause local pain, fang marks redness and local itchiness in a third of cases.

White-tail spiders are common and found in homes in eastern and southern Australia. These spiders do not cause necrosis and bites cause local pain and redness, and less commonly a persistent red mark and associated itchiness. **Black house spiders** are medium sized spiders found commonly in the corners of windows and doors and have also been blamed for necrotic ulcers. Bites by black house spiders cause local pain and redness.

There are a number of large black spiders that commonly get mistaken for funnel-web spiders. **Trapdoor spiders** look very similar to funnel-web spiders but bites only cause local pain and fang marks. **Mouse spiders** are another big black spider easily mistaken for funnel-web spiders. All bites by these spiders should be initially treated as a suspected funnel-web spider bite.

Clinical management of other common spiders

The treatment of all minor spider bites is reassurance and symptomatic relief of local effects including pain. Tetanus status should be assessed and updated as required for all spider bites.

Necrotic arachnidism and the white-tail spider myth

Necrotic arachnidism has never been confirmed in Australia although there has been significant misinformation in the past about bites by white-tail spiders. Bites by loxosceles spiders (Recluse spiders) can cause cutaneous lesions, but these spiders do not occur in Australia. There is no evidence that any Australian spiders can cause necrotic ulcers, although white-tail spiders, wolf spiders and black house spiders have been blamed for cases of necrotic ulceration.

Prospective studies of definite bites by white-tail spiders, black house spiders and wolf spiders found that none of these spiders cause necrotic lesions. There are numerous reports of cases of misdiagnosed spider bites where an alternate diagnosis has been found, including dermatophytoses, squamous cell carcinoma, staphylococcal infections, pyoderma gangrenosum, cutaneous polyarteritis nodosa, unusual infections and diabetic ulcers. The appropriate investigation of skin lesions attributed to spider bites is included in Table 5.

Table 5. An approach to the investigation and diagnosis of necrotic skin ulcers, presenting as a suspected spider bite

1. Establish whether or not there is a history of spider bite

- IF a clear history of a spider bite (best if spider is caught)
  - Refer to information on definite spider bites
- IF NO history of spider bite
  - Investigation should focus on the ulcer and the provisional diagnosis of a suspected spider bite is not appropriate.

2. Clinical history and examination

- Focus on features suggestive of infection, malignant processes or vasculitis.
- Consider underlying disease processes: diabetes, vascular disease
- Environmental exposure: soil, chemical, infective
- Prescription medications
- History of minor trauma
- Specific historical information about the ulcer (may assist in differentiating some conditions):
  - Painful or painless
  - Duration and time of progression
  - Preceding lesion

3. Investigation

- Skin biopsy:
  - Microbiology (with appropriate transport media): contact microbiology laboratory prior to collecting specimens so that appropriate material and transport conditions are used for organisms such as Mycobacterium spp., fungi and unusual bacterial.
  - Histopathology
- Laboratory: other supportive investigations may be important for underlying conditions (autoimmune conditions, vasculitis and pyoderma gangrenosum). These may include, but not be limited to:
  - full blood count
  - coagulation studies
  - biochemistry (including liver and renal function tests)
  - autoimmune screening tests
  - cryoglobulins
  - chest radiography
  - colonoscopy
  - vascular function studies of lower limbs

4. Treatment

- Local wound management
- Appropriate treatment based on established pathology.
- Investigation and treatment of underlying conditions may be important, (pyoderma gangrenosum or a systemic illness such as diabetes)

5. Follow up and monitoring

- Diagnosis: may take weeks or months to become clear.
- Essential that these patients are followed
- Continuing management: coordinated with multiple specialities involved

Source: From Isbister GK and Whyte IM, 2004, Suspected white-tail spider bite and necrotic ulcers, *Internal Medicine Journal* Volume 34, Issue 1-2, 38–44, January 2004