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Bites and Stings

Marine Spines*

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Issues this article will address

- New Zealand echinoderms and their hazards
- Spines people may have embedded in them on return to New Zealand

* The third in a series of articles on bites and stings. Previous articles in the journal dealt with spider bites (Vol. 3, No. 1) and marine stings (Vol. 4, No. 1).

Salient Points

- The major source of embedded spines in New Zealand is the Kina or sea urchin *Evechinus chloroticus*.
- An important source of embedded spines in tropical areas is the Crown-of-thorns starfish *Acanthaster planci*. Tourists often return to New Zealand with them still *in situ*.
- Initial treatment should concentrate on removal of visible spines (intact if possible).
- The possibility of tissue reactions, including reactive arthritis, should be considered.
- Retained spines may cause long-term local reactions.

Key words: Spines • Kina • Sea urchin • *Evechinus chloroticus* • Crown-of-thorns starfish • *Acanthaster planci*

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Introduction

A number of biological spines may give rise to injury in the New Zealand setting, most of which are from echinoderms, particularly Kina. A not uncommon injury brought back from coral reefs is embedded spines of the Crown-of-thorns starfish. Some bony fish (e.g. Schnapper) also have bony spines that may become embedded in tissue. These require removal and standard wound toilet, and will not be discussed further in this article.

If a patient presenting with an embedded marine spine cannot describe the organism responsible, the scenario of the injury often provides a clue to the likely culprit. In someone with an uncomfortable spine that became embedded on a rocky shore in New Zealand, the cause is likely to be a Kina spine, while someone returning from the tropics will hopefully have been told by the locals what the probable cause was.

Kina or Sea Urchin (*Evechinus chloroticus*)

The Kina is a member of the widespread sea urchin group. These creatures are found principally on rocky shores below the high-tide line. They graze on seaweed and algae while moving over rocks, mostly in shallow water.

Sea urchin spines are about 1-2 cm in length and composed of a single crystal of calcite (calcium carbonate) with a convoluted cross section,[1] and are quite fragile. The spines of some species carry a toxic component,[2,3] but the New Zealand species (Fig. 1) has a solid spine that does not appear to carry a significant toxin. The spines tend to break off in the skin and may further break up within the body as a result of removal attempts.

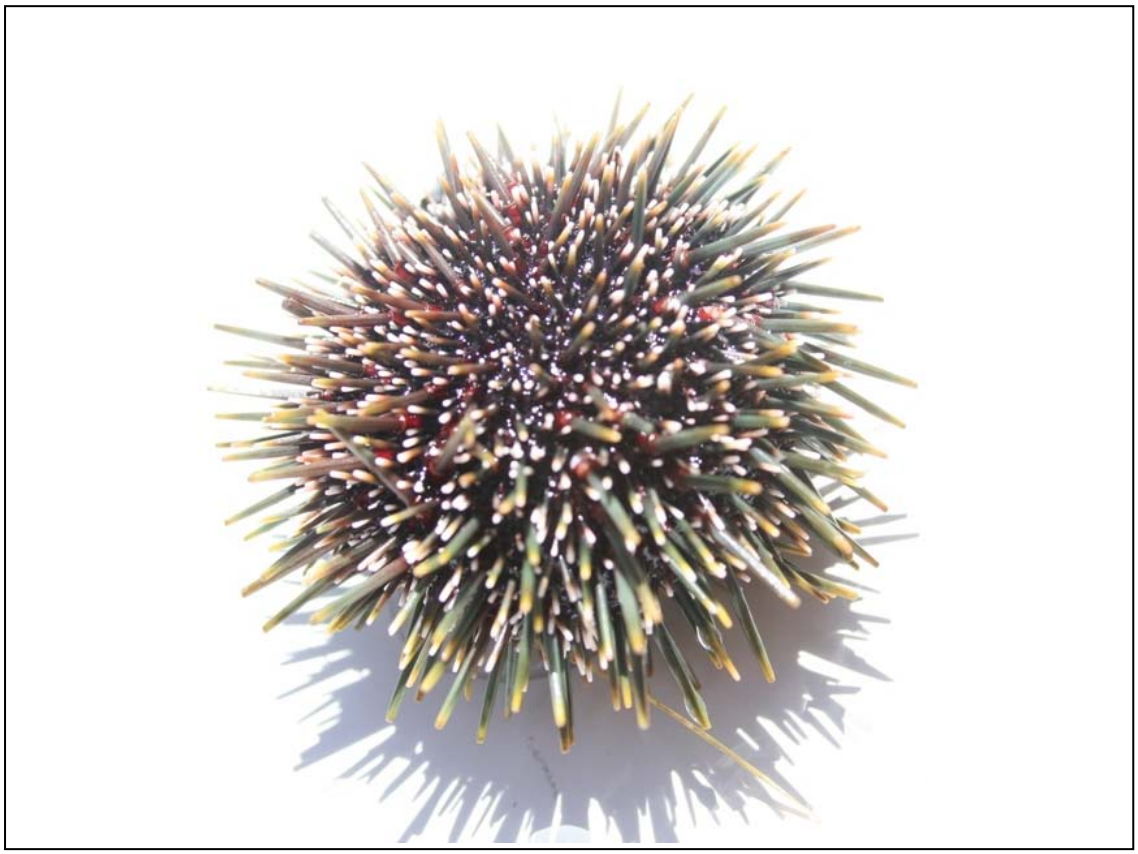

Fig 1. The New Zealand sea urchin / Kina *Evechinus chloroticus* (diameter 7 cm).

Initially, patients with an embedded Kina spine report the pain of a penetrating wound. Although they may be able to remove the spine of parts of it themselves, a local reaction may occur minutes later. This may have some superficial inflammatory component and later may form nodules that have a granulomatous histology.[2]

Direct injury to tendons may result in a tenosynovitis, but a local reactive arthritis may also occur much later in the locality, without evidence of direct spine injury to the joint. On X-ray, the spines are visible due to their calcium component but fade with absorption over time.

Crown-of-thorns Starfish (*Acanthaster planci*)

This large spiny starfish found in the tropics (Fig. 2) was at one time was thought to be a major threat to the coral reefs it feeds on. It has a mass of greeny-gray thorns up to 6 cm in length, and moves slowly over the coral, eating live coral through its base. The usual mode of injury by a Crown-of-thorns starfish is standing on it while reef walking, or occasionally contacting it when diving. The calcium carbonate spines are covered in a protein-containing coating which contains toxins which are presumably responsible for the immediate reaction occurring over the first few days after the injury.[3,4]

Initially the wound(s) look purplish and swollen around the puncture sites. With multiple punctures, the hands and feet may become entirely swollen. There is some support for the use of hot water, as in stingray envenomation,[3] to relieve pain.

Fig 2. The Crown-of-thorns starfish *Acanthaster planci*

As in sea urchin injury, the Crown-of-thorns spines can precipitate a tenosynovitis[5] or a reactive arthritis.[4,5] Early removal of spines at the site of injury followed by removal of buried spines under adequate anaesthesia is advocated.[4,5]

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