CASE REPORT

Marinefish stings

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INTRODUCTION

Envenomation from fish spines is well recognized by professional fishermen, life-guards and emergency medicine specialists working in tropical climates. It has rarely been seen in inland accident and emergency departments in the UK but this may change with the increasing public interest in exotic fish kept as pets.

The presentation and treatment of a lionfish sting is described and the potential complications discussed.

THE LIONFISH

Pterois volitans (L.), commonly known as the lionfish, zebrafish or turkeyfish, belongs to the family Scorpaenidae (venomous scorpion fishes). Well known equally for their beauty as for their poisonous dorsal spines, they are found in the Red Sea, Indian Ocean, China, Japan, Australia, Melanesia, Micronesia and Polynesia. They are often seen swimming in pairs in shallow water coral reef areas displaying their fanlike pectorals and lacy dorsal fins. The venom apparatus consists of 13 dorsal spines, three anal spines, two pelvic spines, their associated venom glands and enveloping integumentary sheaths. The spines are long and slender, each with two anterolateral grooves containing venom producing polygonal glandular cells which vary in size and morphology (Halstead, 1971). Scorpionfish venom is cardiotoxic to frogs and produces motor paralysis, respiratory distress, convulsions and death in a variety of other laboratory animals (Dunbar-Brunton, 1896; Briot, 1904; Briot, 1905; Lumière & Meyer, 1938; Saunders & Taylor, 1959).

The effects in humans have been documented by Halstead (1971). There is local swelling leading to impaired movement and in some case paralysis of the limb. The wound site may be cyanotic and numb and the skin surrounding the wound painful to touch. Systemic complications are discussed below.

CASE REPORT

A 22-year-old man presented himself to the accident and emergency department 50 min after he had been stung. He had been removing extraneous material from inside the fish-tank when the fish slowly approached and stung his right index finger with its dorsal spines. He complained of an immediate sharp throbbing pain, numbness and stiffness of the finger spreading across the hand up to the elbow. The hand became swollen and the pain increased in severity. He was otherwise fit and had no history of allergies or previous stings.

On examination he had a small puncture wound in the distal phalanx (dorsolateral aspect) of his right index finger with surrounding erythema and a swollen hand. The skin in the vicinity of the wound was tender to touch, but the initial pain gradually settled. He had no lymphadenopathy, no sensory deficit and no paresis, maintaining full movements of his fingers, wrist and elbow. He was afebrile, normotensive with a regular pulse and had no muscle tremor.

The affected hand was immersed into hot water for one hour. The temperature was maintained as hot as could be tolerated. Chlorpheniramine maleate (10 mg) and hydrocortisone (100 mg) were given intravenously. Paracetamol was all that was required for pain. The patient was admitted overnight for observation in view of the possible toxic effects of the venom. The wound was treated with a dry dressing and the arm was placed in a sling. He remained stable apart from a tachycardia of 150 beats per min, an increase in blood pressure to 170/100 from a previous value of 135/70 and a feeling of being slightly breathless. These settled overnight and he was discharged the next day on a 7-day course of flucloxacillin 500 mg qds and terfenadine 60 mg bd.

Ten days later he returned to the accident and emergency department complaining of a recurrence of swelling of his finger, hand and forearm though he had not suffered any further stings or injury. He was readmitted for 24 h observation, and the above treatment repeated. Recovery was uneventful.

DISCUSSION

The symptoms produced by the various species of scorpionfishes are essentially the same, varying in degree rather than quality (Halstead, 1971). Recovery from most scorpionfish stings in humans is usually complete within a few hours. However stonefish, *Synanceja horrida* (L.), stings are often more severe and may persist for several months.

The toxin of *P. volitans* has been described by Saunders *et al.* (1959). Water extracts of the integumentary sheaths were turbid, reddish-orange in colour and had a pH of approximately 7. The toxin was unstable at room temperature and was non dialyzable. In mice it had an LD₅₀ of 1.1 mg protein/kg body weight. In rabbits small doses of the toxin produced a fall in blood pressure and an increase in respiratory rate. Lethal doses produced a precipitous fall in blood pressure, extensive electrocardiographic changes and marked respiratory depression leading to death. Artificial respiration was ineffective at prolonging life. The combined extract from the dorsal spines of one fish produced 2500 LD₅₀ for mice.

From the same family, Scorpaenidae, the stonefish belongs to the genera *Synanceja* and the venom is of a similar nature to that of the lionfish (Saunders *et al.*, 1959). Stonefish have a similar distribution of spines to the lionfish but they are shorter and stouter with highly developed venom glands situated at the mid-shaft of the spine and terminating in ductlike structures running in the anterolateral grooves to the tip of the spine. They are a menace to bathers as they lie half buried in the mud or sand.

Envenomation produces pain which is very severe causing the victim to thrash about wildly, scream and finally lose consciousness. Systemic effects include hypotension, myocardial ischaemia, conduction defects, cardiac failure, delirium, convulsions, muscle tremor, nausea, vomiting, local lymphangitis and lymphadenitis, joint aches, fever, respiratory distress and death.

The apparently less dangerous consequences of lionfish envenomation as compared to stonefish may reflect a difference in the amount of venom entering the wound rather than important differences in the nature of the venom (Saunders *et al.*, 1959).

Treatment is aimed at alleviating the pain, combating the effects of the venom by raising the temperature, thereby inactivating the heat labile venom and also preventing secondary infection. Stonefish and lionfish stings are more serious than weeverfish stings (Russell, 1965; Cain, 1983). Even so, the initial treatment with heat and analgesia, as described, may be all that is required. The use of chlorpheniramine and hydrocortisone was probably unnecessary in this case and should possibly have been reserved. In view of the possibility of complications, observation overnight may be justified in the case of lionfish stings and certainly in the case of stonefish stings. The use of tetanus toxoid is advisable, especially if the wound is contaminated with mud. The use of prophylactic antibiotics is recommended as secondary infections occur commonly in cases treated inadequately (Halstead, 1971) and have been known to be fatal in weeverfish stings in three cases (Russell, 1965). The Poisons Information Unit at Newcross Hospital had no record of recurrence of local symptoms in the absence of infection or a repeat sting, though it has been documented that the swelling may persist for several weeks (Russell, 1965).

There is a case for making an incision over the wound of venomous stings, or making multiple punctures, 3–5 mm deep, with a needle and applying suction (Rosenfeld, 1971), possibly using a ligature proximal to the wound to prevent further absorption of venom. This method applies particularly to the immediate treatment of poisonous snake bites where comparatively large amounts of venom are injected into the tissues. In contrast lionfish do not inject their venom. Small amounts enter the tissues along the line of laceration caused by the spine. Incision and suction are therefore less valuable in such cases. (Halstead, 1971).

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