Case Report

A pleasant holiday ending in stonefish poisoning: from paralysis to recovery

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ABSTRACT

Stonefish poisoning is considered as one the most venomous poisons encountered in humans. Cases of stonefish poisoning are common in shallow coastal waters of tropical and temperate areas of the Indo-Pacific, Gulf and Arabian sea and rare in non-endemic areas like UK and may be observed only in returning travellers from endemic zones. Here, we present a case of such poisoning, occurring in a British returning traveller from Egypt. The initial treatment was provided in Egypt, while a review and follow up of the case was done in the UK. Our patient suffered from significant morbidity, mostly in the form of neurotoxic and myotoxic manifestations and the recovery was slow. Without prompt and proper treatment, cases like ours can result in complications, even death. As it is common for people to travel, knowledge of such envenomation can be life saving for the affected patient.

Key words: *poisoning, returning traveller, stonefish,* Synanceia *spp., United Kingdom.*

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INTRODUCTION

In the UK, stonefish poisoning cases are not endemic, as this venomous fish habitat in other parts of the world. Stone fish belongs to genus *Synanceia* spp., family *Synanceiidae*, whose members are dangerous and even fatal to human. It is considered as the world's one of the most venomous fishes.[1,2] There are five species of stonefish *S. horrida*, *S. verrucosa*, *S. alula*, *S. nana* and *S. platyrhyncha*.[3] *S. nana* is confined to Persian Gulf, Red and Arabian Seas, whereas *S. alula* and *S. platyrhyncha* have been observed there only occasionally.[4] Stings from this group of fish are known to cause painful and lethal human envenomations.[3] Treatment of stonefish poisoning must be prompt and recovery can be challenging because of local and systemic manifestations. Successful first aid mainly focuses on alleviating pain, treating the injury site and effects of envenomation.[5] Here, we report such a challenging case.

CASE REPORT

During a family vacation, a 30-year-old British female was 'stung' by something sharp in her left 2nd toe while walking bare footed in shallow waters of Makadi Bay beach, Hurghada, Egypt. Although she withdrew her left foot immediately, the initial sharp needle like pain turned into a flush of fiery hot liquid sensation, shooting upwards along the anterior aspect of her left leg and knee. Pain became diffused and throbbing type. There was tingling sensation from left inguinal region up to left costal margin. She felt thirsty, nauseated, mildly breathless and her throat felt "swelling up". Her affected 2nd left toe looked blue-black (Figure 1). She received intravenous dexamethasone and diclofenac at her hotel

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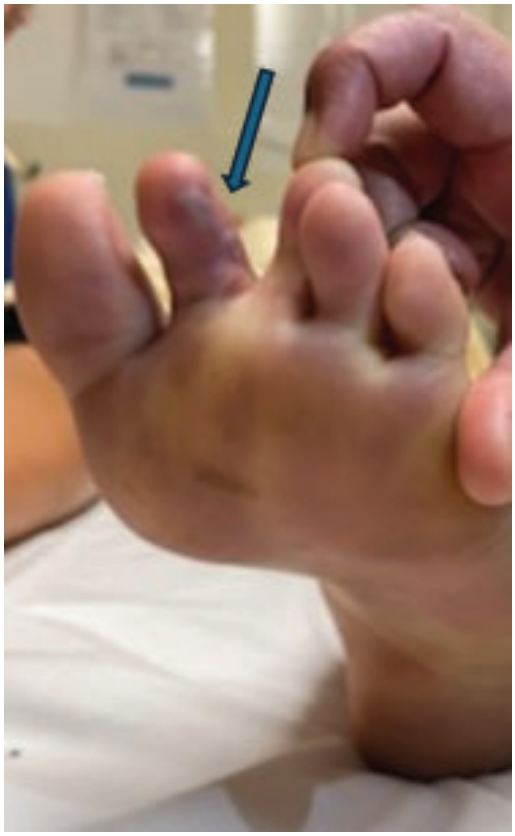

Figure 1. Two sting sites (arrow) on second left toe showing bluish-black discolouration with surrounding swelling and erythema

clinic 30 minutes after the 'sting' and was referred to a local hospital.

By the time of hospital admission in Egypt, her entire left lower limb became swollen "as if it would burst" with signs of inflammation and inability to move her left ankle and toes. A provisional diagnosis of toxic fish poisoning was made based on clinical features of the 'sting' site.

Lion fish poisoning was excluded after a plain X-ray of left foot which did not show any retained thorn. She was treated with intramuscular antivenom (Equine IgG Fab) for stonefish poisoning and her left foot was immersed in tolerable hot water. Although she was advised for overnight observation, she took discharge on request with a prescription of oral diclofenac 25 mg tds, linazoid 600 mg 12 hourly, combination of chemotrypsin 300 mg and trypsin 300 mg bid and prednisolone 20 mg bid for 3 days.

Two days later, she came back to UK and was admitted in Glangwili General Hospital, Carmarthen, Wales. By this time, her left swollen leg became numb and heavy. Patient had to drag her left leg forward during walking. She complained of nausea and mild chest discomfort. There was no history of fever, chest pain, haemoptysis, abdominal pain, headache or loss of consciousness.

On examination, her left leg and foot was swollen (Figure 2), non-tender with slightly raised temperature and pitting oedema. Neurological examination of left foot up to the ankle joint revealed reduced pain and touch sensations, absent posterior column sensations with grade 0 motor power (Figure 3, 4). Spinal tenderness was present at T7-10 levels. There was tingling sensation from left costal margin/T7 up to left leg with decreased sensations of pain and touch. Her muscle power was decreased at hip and knee. Ankle and planter reflexes were absent with no ankle movement as well (Table I).

Figure 2. Swelling extending from toe to entire left foot and ankle

Figure 3. Reduced pain and touch sensations, absent posterior column sensations with grade 0 motor power in the X marked area on dorsum of left foot

Figure 4. Reduced pain and touch sensations in the X marked area on sole of left foot

Table I. Motor examination findings on admission

Muscle	Rt. upper limb	Lt. upper limb	Rt. Lower limb	Lt. lower limb
Bulk	N	N	N	N
Tone	N	N	N	N
Power	5/5	5/5	5/5	2/5 hip3/5 knee0/5 ankle
Involuntary movement	**Absent**	**Absent**	**Absent**	**Absent**

Table II. Reflexes findings on admission

Reflexes	Biceps	Triceps	Supinator	Knee	Ankle	Planter
Right	++	++	++	++	++	**Flexor**
Left	++	++	++	+	**Absent**	**Absent**

All joints, peripheral pulses and vitals were normal throughout the event. Apart from a mildly raised CRP (6 g/L), other blood investigations (full blood count, renal function, liver function, serum electrolytes, serum creatinine kinase, random blood glucose) revealed no abnormalities. X-ray of the affected foot and magnetic resonance imaging (MRI) of thoraco-lumbar spine did not reveal any relevant pathology for given symptoms. Hence, the case was suggested to be ascending neuritis due to stonefish poisoning.

The challenge was how to treat and monitor this case. Consultations were taken from local microbiology and T&O departments, Cardiff infectious disease, TOXBASE, Infectious disease team and neurologist from nearby referral hospital. They advised hot water immersion of the site, analgesic for painful neuropathy

and compartmental syndrome was excluded. Also, it was stated that after 72 hours there is no role of antivenom. As for treatment, the site of sting was re-examined and cleaned for any residual foreign bodies. Her left foot was immersed in warm water (42º c) for 30 minutes. She was given intramuscular tetanus booster stat, oral linezolid 600 mg 12 hourly and prednisolone 40 mg od for 7 days. As for other symptoms oral chlorphenamine maleate, paracetamol and cyclizine were prescribed. The patient was discharged on day 5, advised to continue warm water submersion, monitor changes in sensation and swelling. She was scheduled for follow up with the neurology team.

It took 9 days to regain slight sensation in her left foot. After 2 weeks, the limb swelling subsided completely and she gained movement of left ankle joint in all directions. It took a month to be able to move her 1st and 5th left toes but not the three middle toes. Except the 'stinged' toe, full sensations returned to normal in other toes. The left foot was very sensitive to touch. At the time of reporting the case, though the recovery was taking slow, it is expected that the affected limb would return to normal state over times.

DISCUSSION

Understanding of nature and habitant of stonefish and its toxin helps not only to diagnose a case of stone fish poisoning but also allows confident application of treatment leading to cure. This fish has grey, mottled hue similar to the colour of a stone and are often covered by a coat of slime to which algae adheres, enabling excellent camouflage, hence the name "stone fish" (Figure 5). Their physical appearance and habit of partially burying themselves in coastal sand, makes them difficult to detect.[6] In our case, the patient was walking bare footed in the shallow beach water and missed the fish due to its camouflage.

The dorsal spines of stonefish are used as a defensive mechanism and are erected when threatened (Figure 6). Each spine has a pair of venom glands, which are covered by a loose and thick integumentary sheath. When stepped on a stonefish, the force is applied vertically on the spines, leading to rupture of the integument and compression of the venom glands. This releases venom through the spinal venom duct. The severity of symptoms is related to the number of spines involved in envenomation and depth of spine penetration.[3] Our patient had 2 spines partially penetrating her 2nd left toe.

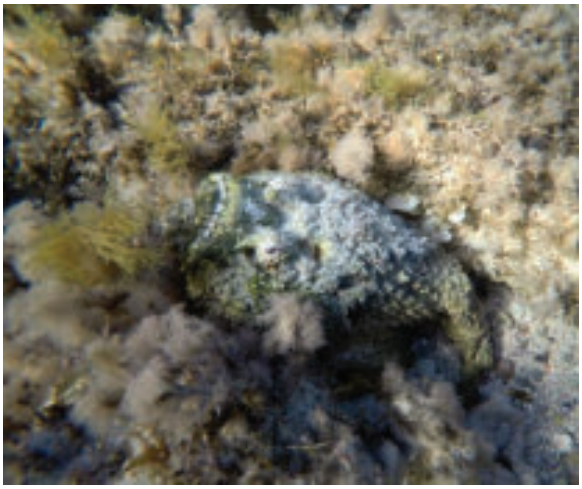

Figure 5. Showing excellent camouflage of *Synanceia nana* in its habitat

Figure 6. Synanceia nana with its sharp dorsal spines

The venom is a complex mixture of toxins such as stonustoxin, **verrucotoxin,** cytolysin, hyaluronidase and cardioleputin. Therefore, it has myotoxic, neurotoxic, vasopermeable and cardiotoxic effects.[3,7] It produces intense vasoconstriction, increased vascular permeability and myotoxicity resulting in blocking conduction in skeletal, cardiac and involuntary muscles. So, the clinical features can include muscular paralysis, respiratory depression, peripheral vasoconstriction, shock and in severe cases cardiac arrest. The puncture wounds are inflamed, sometimes cyanotic, extremely painful at first and then lessens after a few hours.[3,8,9] Surrounding area becomes hypersensitive and swollen, as seen in our case. Case reports mentioned that the pain can ascend along the affected limb, which was seen in our case.[6,9] The victim's distress can be disproportionate to clinical findings. General features like malaise, nausea, vomiting, sweating, delirium and pyrexia can occur. Cardiogenic shock, respiratory distress and death due secondary complications can occur in severe cases.[3,8,9] Our patient had nausea and mild chest discomfort only.

As the toxin is heat-labile, the affected site must be immersed in water at 42° C for at least 20 min to inactivate the venom.[8,10] Additional management might include radiography (to rule out spines of other toxic fish sting such as lion fish), ultrasound, debridement of the wound, local anesthetics, tetanus prophylaxis, administration of stone fish antivenom and prophylactic antibiotics.[3,8] Chemotrypsin and trypsin combination was prescribed in Egypt as per their protocol as it has an anti-inflammatory role. Synanceia antivenom works by neutralizing the hemolytic, lethal and vascular permeability increasing properties of the venom.[11] Delay in antivenom injection can result in further spreading of inflammation, blister formation and compartmental syndrome.[6,9] Without prophylactic antibiotics there are case reports of rapidly progressive necrotizing fasciitis with isolation of *Vibrio vulnificus* requiring urgent fasciotomy and in some cases amputations.[3,12] Our patient received full treatment and no such complications were faced. Duration of symptoms can vary, depending on severity of envenomation and complications, may last from days to weeks; full recovery may take many months.[3,13] Our case took at least a month to regain sensory and motor function in her affected parts.

Conclusion

Stone fish poisoning, if not treated promptly, can result in residual morbidity even mortality. In case of returning travellers from endemic zones, careful history of prior treatment and re-examination of the wound are vital to avoid further complications. Symptoms should be monitored closely with proper counselling. With prompt and appropriate treatment full recovery is possible.

Authors' contribution: SRA was responsible for follow up of the case during hospital stay and after discharge, contributed in literature search and drafting the manuscript. KK contributed in management of the patient. Both authors approved this article's final version to be submitted.

Consent: Informed written consent was taken from the patient for publication of this case report and accompanying images.

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