

There are just a few points worth making. The bite itself is not painful. We were lucky that the creature was seen and caught, otherwise I do not know what we would have thought. A little child playing among the rocks, would we have treated it as a sea snake bite? Other things that one might consider, stonefish, bullrouts, box jellyfish, are characterised by intense pain whereas this was not. What was the value of first aid? Whether or not the mother's grip of the leg was very important, I do not know. Whether the sudden collapse of the child would have occurred when it did or not is unknown. But one imagines that had a compression bandage been put on at the ambulance station, the course may have been a little less dramatic. Finally, although this is quite a rare occurrence, there are more and more people involved in water sports and diving and so forth, so it could happen again. Certainly coastal communities around Northern Queensland should be aware of the possibility and have access to sea-snake antivenom.

ENVENOMATION BY THE BLUE RINGED OCTOPUS

Hugh Stephens

When I arrived from the UK to take up my appointment at the Gold Coast Hospital I had never heard of a Blue Ringed octopus. I took it to be a man-eating monster of Jules Verne proportions. There was obviously someone else of equal ignorance in Queensland at the time. He had picked up the thing, died and was resuscitated. He was born in Mauritius and had spent much of his life in New Zealand before moving to Sydney where he worked as a bus driver. Thus he had no particular exposure to a Blue Ringed octopus previously. He was a member of a group of holiday makers who went on a day trip to South Stradbroke Island. Returning to the launch that conveyed them to the island he picked up two small octopi from a pool to show them to his two nieces who were with him. When he had discarded the second octopus there was a drop of blood on the back of his left hand, although he had been unaware of any bite at the time. A few minutes later he was relating the incident to the skipper of the launch when he felt a degree of numbness and tingling around his mouth. This was followed by weakness of his legs which caused him to collapse.

Fortunately for him there were nearby an off duty customs officer and an off duty ambulance officer who were talking to a seaplane pilot who, luckily, was on duty and had his plane with him. The ambulance and customs officers were both efficient in cardio-pulmonary resuscitation and, in fact, had just attended a revision course. Also the ambulance officer had recently read a headline in the local Gold Coast paper which had alluded to a plague of these monsters hitting the Gold Coast. Consequently he had read up the symptoms and signs and treatment of the bite. In short, God was with the patient that day. The trio overheard the conversation, and with the skipper came to the patient's aid. The urgency of the problem was not lost on them. They immediately bundled the patient onto the plane, radioed for an ambulance to meet them at the other end and took off to the mainland a few minutes ride away.

Approximately three minutes later the patient was noticed to twitch mildly in the plane and lost consciousness. As he did not have any pulse or respirations CPR was commenced. On landing the patient was transferred to the ambulance where CPR was continued and oxygen via a resuscitator replaced the mouth to mouth. The patient was taken to the Gold Coast hospital where he arrived two or three minutes later.

Examination in the Accident and Emergency department showed him to have fixed dilated pupils, no eye opening, no motor or verbal response, no pulse, no respirations and asystole on the Lifepak monitor. He was resuscitated with intubation, ventilation, intravenous adrenalin, sodium bicarbonate, DC counter shock. Sinus tachycardia and a spontaneous cardiac output were restored. His problems at this stage were paralysis from the bite, aspiration pneumonitis and anoxic ischaemic encephalopathy and possibly brain death. His management consisted of hyperventilation, dexamethasone, intravenous mannitol and antibiotics in the form of Amoxyl. The major concern at this stage was our inability to distinguish between brain death and the effects of the venom. Fortunately the patient was obviously comatose because I gather that a lot of conversation went on between the residents as to whether he was dead or not dead. Four hours post admission the patient was noticed to have some reflex withdrawal from painful stimuli of both hands and feet. At five and a half hours post admission his pupils were mid range and reactive, he had cough and gag reflexes and spontaneous movements of all limbs. Eighteen hours after admission we were able to extubate him. His cerebral status was still giving us cause for concern as he had no comprehensible conversation, although he had spontaneous eye opening and no focal neurological signs.

Over the next few days his mental status gradually improved. Between 24 and 48 hours confusion and disorientation gave way to a period of sexual harassment of the nursing staff. We were assured by his wife that this was definitely abnormal. He had no recollection of the events of the day throughout his stay of ten days. He was transferred to the Canterbury Hospital in Sydney on day eleven. By that stage a certain degree of confabulation had occurred and he claimed to have remembered the incident and wrestling with the octopus which he had said had a six foot span.

To summarize, a 44 year old male was bitten by a Blue Ringed octopus and within three minutes developed circumoral parathesiae, by four minutes limb weakness and collapse, and in seven minutes cardiorespiratory arrest. The complete paralysis persisted for up to about four hours. Reflex withdrawal from pain was then noted. Over the next four to eighteen hours he had gradual return of motor function, the course of which may have been modified by anoxic ischaemic encephalopathy.

Since then we have had another case of Blue Ringed octopus bite. A child found a Blue Ringed octopus in a coke tin and picked it up. He had actually kicked the tin first, and had noticed a mark on his foot. This was about a month after the first chap. The boy brought the octopus to casualty in his hand and pointed to the mark on his foot. So everybody was waiting for him to collapse. We sat there for 12 hours waiting for him to collapse but nothing

happened so we sent him home the next day. Perhaps his Blue Ringed octopus gave a “dry” bite.

STONEFISH, CONUS SHELLS AND BLUE RINGED OCTOPUS

Struan K Sutherland

THE STONEFISH

The Stonefish is found on nearly two-thirds of the Australian coast. It is the only stinging fish which has been known to kill people but there are no recorded deaths in Australia. The fish has 13 venomous spines but does not use its venom for collecting its food but more for protection. It is a very solidly built creature and if stood on the venomous spines may go deep into the sole of the foot. Not only is venom spurted in but actual parts of the venom gland enter and this causes extreme pain. As the fish is usually buried right up almost to its eyes in sand and coloured algae it is very very hard to see. Bob Endean says one can pick them up and put them down in their natural environment and spend half an hour trying to find them again. Some people say that a Stonefish is a bit like a politician. It sits round doing nothing all day, has a big mouth and is highly venomous if you try and shift it!

Severe local damage and extreme pain is produced by the Stonefish venom. Experimentally there is some evidence that it can effect cardiac muscle but I am not sure that this has been shown in humans.

Management of Stonefish Stings

We know that antivenom will quite dramatically reduce the pain and prevent necrosis but often one is in a situation where there is no immediate access to antivenom.

First-Aid

There is no place for restricting the movement of this venom because it is causing severe pain and tissue damage. The venom should be encouraged to move away to dilute itself, so do not apply pressure immobilisation. Never apply a tourniquet. Use warm water for pain relief of the injuries. Bathing the foot or hand in warm water increases the circulation of blood through the area. Some marine toxins are very heat labile and perhaps warm to hot water helps detoxify them. Getting hot water might be a problem but usually one can use cooling water from an outboard or inboard motor for this purpose. Often pethidine or morphine do not relieve the pain of a severe Stonefish sting. A severe case may need surgery to clean the injury up, so under such circumstances consider a regional nerve block with, say, bupivacaine to give the patient lengthy relief of pain. This will also allow debridement of the injury.

CONUS SHELLS

There are many Conus shells, three of which are known to

be highly dangerous to man. One species, *Geographis*, is the most dangerous. Conus shells are more or less sea going snails that produce very toxic venom. They have developed tiny harpoons which are soaked in venom. When a little fish that they would like to eat swims past, this harpoon soaked in venom is moved up to the front of the mouth and pushed into the fish which quickly becomes paralysed. Then the creature can open its mouth and quietly cover the fish and eat it. The harpoons are exquisitely made. They are only about a centimetre long, and the barb is different in each species. They are hollow and are only used once and are designed for the type of prey that the Conus shell likes. When a human is stung the harpoon can penetrate quite deeply. The toxin is unique. The *Geographis* has a little polypeptide of ten amino acids which acts postsynaptically and acts very very quickly. There is no antivenom for that particular toxin but the suggestion is that it would wear off in time like the octopus toxin. For Conus shell it seems reasonable to use pressure immobilisation for first aid. The main thing of course is not to pick them up because they can bring their mouth parts and harpoon almost to the other end of their body.

THE BLUE RINGED OCTOPUS

There are two species, the northern one and the southern one. I get the impression the southern one is far more common than the one found in tropical waters. Fully grown it is about 5 inches long, and carries enough toxin to paralyse perhaps 10 men. As far as I know it only bites people if they pick it up and hold it against their skin and restrain it. We had one person bitten under water and that was when he saw an octopus go into a hole on a pier. He stuck his finger in and I think any octopus has got every right to bite someone who does that! It seems reasonable to say that underwater the octopus poses no threat at all to the sensible diver who leaves it alone.

The anatomy of the octopus is quite fascinating. Where the arms join there is a little parrot-like beak. Its oesophagus goes upwards between its eyes, through its brain, and its stomach sits up on top. That is why it is called a cephalopod, head to foot. Near the stomach are two kidney shaped salivary glands, which produce the toxic saliva. The saliva flows down a duct to be released through the mouth. The octopus normally uses the toxin to paralyse crabs. It has a very delicate skin so it does not like getting in and fighting. If it sees a nice juicy crab it can swim over and just spray some saliva around the crab. When the crab gets ataxic and partially paralysed the octopus settles down and eats it. It is only if humans pick it up and annoy it, that it will sink its beak into the human. It is interesting that it is mainly adults who have been bitten.

The toxin from the Blue Ringed octopus is in all probability tetrodotoxin which is of course found in Puffer fish and Toad fish. The same toxin is also found in the Californian newt and in certain South African frogs. Tetrodotoxin acts specifically on the sodium gates in nerves. By stopping the movement of sodium, it very promptly blocks the movement of action potentials and hence produces a flaccid paralysis within a few minutes. Tetrodotoxin has a molecular weight of 319, and it is heat stable.