

# Stingray injury

R J Evans, R S Davies

## Abstract

**A case of stingray injury is reported. Local symptoms and signs include intense pain, oedema around the wound, erythema and petechiae. Systemic symptoms and signs include nausea and vomiting, muscle cramps, diaphoresis, syncope, headache, muscle fasciculations, and cardiac arrhythmias. Treatment aims to reverse local and systemic effects of the venom, alleviate pain, and prevent infection. Antitetanus prophylaxis is important. Treatment for anaphylaxis may be necessary.**

(*J Accid Emerg Med* 1996;13:224-225)

Key terms: stingray injury

Stingrays form one of the largest and most important groups of venomous marine animals, with approximately 2000 stings reported annually in the United States.<sup>1</sup> They inhabit warm temperate, subtropical, and tropical waters. The favourite habitats of these passive, reclusive creatures are sandy or muddy bottoms of sheltered lagoons and estuaries, where they feed on crustaceans and molluscs. Stingrays have one to four venomous stings on the dorsum of an elongated, whip-like caudal appendage. The venom mechanism consists of a bilaterally retroserrate (saw edged) cartilaginous spine surrounded by a thin layer of skin called the integumentary sheath, and covers two ventrolateral grooves that contain the venom glands. The glandular epithelial sheath ruptures to release the venom as the spine penetrates the victim. As in other venomous fish, this sheath breaks upon contact with the victim, allowing the venom to enter the wound. The venom contains at least 10 amino acids and toxic fractions including phosphodiesterases, 5'-nucleotidases, and serotonin. Once extracted, the venom deteriorates rapidly, as it is highly unstable and very heat labile.<sup>1 2</sup>

Stingray "attacks" are defensive and usually occur when an unwary human handles, corners, or steps on the creature. When the wings of the stingray are touched, it thrusts its tail forward, driving the spine deep into the victim.<sup>2</sup> Out of the water, netted or hooked animals may also sting a careless human. A stingray injury has been reported after stepping on a dead, decomposing creature.<sup>3</sup>

Stingrays may occasionally visit the Welsh coast and we report the case of a fisherman who sustained a laceration to his lower leg from the spine of a stingray.

## Case report

Stingrays were attracted to the coasts of Wales during the hot summer in July 1994. An angler

caught a 42 lb stingray off South Wales<sup>4</sup> but managed to keep out of the way of the venomous sting. However, on Borth beach in West Wales an angler caught a 40 lb stingray during a National Fire Service fishing contest, which won him the competition. A number of colleagues helped to land the creature, and unfortunately one of them kicked the creature which then thrust its tail into one of the fishermen. The stingray's spine cut through his fireman's boots (reinforced rubber) and trousers and lacerated his left lower leg. The patient initially complained of a sharp pain localised to the wound, which later spread down to his ankle. He attended the local accident and emergency (A&E) department, where the examining doctors contacted the Welsh National Poisons Unit and were given advice on management. The wound was treated by immersion in hot water to inactivate any thermolabile venom. It was then irrigated and debrided, and the edges were excised under a general anaesthetic. The wound was not sutured but was packed, and the patient was kept in overnight for observation. Antitetanus vaccine was not required and antibiotics were prescribed. He was discharged the following morning and followed up by his general practitioner. Telephone follow up revealed that he was referred to his local A&E department as the leg became swollen and erythematous. He was reviewed on several occasions in the soft tissue clinic and the wound healed by secondary intention over a two month period, leaving an 8 cm scar on his lower leg.

## Discussion

### CLINICAL PRESENTATION

Symptoms of envenomation classically begin immediately, with intense local pain out of proportion to the degree of trauma. Oedema around the wound is a constant finding but is variable in extent. The wound becomes cyanotic with subsequent local erythema and petechiae. Progressive local necrosis, ulceration, and gangrene may result. The pain peaks within 90 minutes and if untreated may last up to 48 hours.<sup>1 2</sup> Systemic symptoms and signs vary considerably and include nausea and vomiting, muscle cramps, diaphoresis, syncope, headache, and muscle fasciculations. Cardiac dysrhythmias, hypotension, convulsions, and rarely death have been reported.<sup>1 2</sup>

The tissue damage inflicted by the stingray can be extensive. In addition to puncture wounds, the cutting action of the serrated spines can create a severe laceration and cause damage to underlying soft tissue structures. Humans are most commonly injured on the lower and upper limbs. Serious injuries and

Welsh National  
Poisons Unit,  
Ward West 5,  
Llandough Hospital,  
Cardiff CF64 2XX  
R J Evans R S Davies

Correspondence to:  
Dr R J Evans,  
Accident and Emergency  
Department, Cardiff Royal  
Infirmary, Newport Road,  
Cardiff CF2 1SZ.

deaths from stingrays are reviewed in an article by Cooper and include fatalities from thoracic and abdominal penetration.<sup>5</sup> Debris, including the spines and portions of the integumentary sheath, may contaminate the wound. Secondary infection is common and because of the unique milieu created by sea water, pathogenic marine microbes tend to be halophilic (a bacterium which can grow in salt culture medium), heterotrophic (a micro-organism which requires complex substances for its nutrition, as it possesses limited powers of synthesis), motile, and Gram negative rod forms. The genus *Vibrio* is specially common and poses a serious risk to the immunocompromised.<sup>2</sup>

#### TREATMENT

Treatment should attempt to reverse the local and systemic effects of the venom, alleviate pain, and prevent infection.<sup>1 2 6</sup> The wound should be immediately irrigated with whatever diluent is available, which in the field is usually sea water. Any visible pieces of the integumentary sheath or spines should be removed. As soon as is practically possible, the wound should be soaked in hot water (about 40-5°C) for 30 to 90 minutes, with appropriate care to avoid thermal damage. The heat will inactivate any thermolabile venom. If the pain persists, it may be relieved by further hot soaks or alternatively a regional nerve block or local infiltration can be performed. Vesicular fluid should be removed promptly and aseptically.<sup>2</sup> The wound should then be re-irrigated, explored, and debrided of necrotic tissue and

foreign material. Radiographs may help identify retained radio-opaque fragments of the spines.<sup>2 3</sup> The wound may need to be left open for delayed primary closure or healing by secondary intention. Prophylactic antibiotics are controversial, but should be considered in the immunocompromised or with high risk wounds.<sup>2 6</sup> In all cases, antitetanus prophylaxis should be remembered. Patients who are treated should be observed for up to four hours from the time of envenomation to detect a systemic reaction.<sup>6</sup> Occasionally, an envenomation will be accompanied by an allergic reaction and treatment for anaphylaxis may be necessary.<sup>6</sup>

Fortunately many stingrays lose or tear their integumentary sheaths (45% in one study of 4000<sup>7</sup>), so that stings often result in trauma without envenomation.

We thank Mr A D Merridith, Consultant Orthopaedic Surgeon, for allowing permission to publish the case report.

- 1 Brown CK, Shepherd SM. Marine trauma, envenomations and intoxications. *Emerg Med Clin North Am* 1992; 10:385-408.
- 2 Auerbach PS. Marine envenomations. *N Engl J Med* 1991;325:486-93.
- 3 Burk MP, Richter PA. Stingray injuries of the foot. Two case reports. *J Am Podiatr Med Assoc* 1990;80:260-2.
- 4 McKinty A. Stingray warning. *South Wales Echo* 1994;16th July:14.
- 5 Cooper NK. Stone fish and stingrays - some notes on the injuries that they cause to man. *J R Army Med Corps* 1991;137:136-40.
- 6 McGoldrick J, Marx JA. Marine envenomations. Part 1. Vertebrates. *J Emerg Med* 1991;9:497-502.
- 7 Russell FE. Studies on the mechanism of death from stingray venom: a report of two fatal cases. *Am J Med Sci* 1958;235:566-84.

## Oesophageal rupture in the course of conservative treatment of bleeding oesophageal varices

Agnieszka Crerar-Gilbert

#### Abstract

**Fatal oesophageal rupture is described as a complication of the management of bleeding oesophageal varices with repeated sclerotherapy and tamponade using the Sengstaken-Blakemore tube. The importance of chest radiographs is stressed in the early detection and prevention of malposition of the Sengstaken-Blakemore tube, as inflation of the gastric balloon in the oesophagus can result in oesophageal rupture.**

(*J Accid Emerg Med* 1996;13:225-227)

Key terms: gastrointestinal haemorrhage; oesophageal rupture; Sengstaken-Blakemore tube

Oesophageal perforation is a rare complication following treatment of bleeding oesophageal

varices with the Sengstaken-Blakemore tube<sup>1-3</sup> but carries a high mortality in patients already compromised by gastrointestinal haemorrhage.

In the unusual case presented here a massive oesophageal tear occurred in the thoracic part of the oesophagus and resulted in a most striking radiograph showing the gastric balloon of the Sengstaken-Blakemore tube inflated in the right hemithorax (figure).

Chest radiographs should be taken following the Sengstaken-Blakemore tube insertion to ascertain the correct position before inflation of the gastric balloon. Further chest radiographs taken after the gastric balloon is inflated are essential to detect dislocation into the oesophagus.

The probable mechanism and the underlying pathology of the oesophageal perforation are discussed.

Department of Anaesthetics, Whipps Cross Hospital, Leytonstone, Whipps Cross Road, London E11 1NR  
A Crerar-Gilbert

Correspondence to: Dr Agnieszka Crerar-Gilbert, 51 New Caledonian Wharf, 6 Odessa Street, London SE16 1TN