CLINICAL VIGNETTE

A Case of Envenomation by a Stingray

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Case Report

A 28-year-old male presented to the Emergency Department one hour after sustaining a stingray injury to his left lateral leg. The patient stated that he was surfing at a local beach and felt immediate pain when his foot touched the sandy ocean floor. He was able to glimpse a small stingray attached to his left leg by its tail before it swam away.

The patient reported extreme lancinating pain in the left lower extremity at the site of the bite with radiation upward and reported feeling nauseated with two episodes of emesis while en route. On examination, the patient's vitals were as follows: temperature of 99.1°F, blood pressure 158/101, pulse 121, respiratory rate 22, and oxygenating 99% on room air. He was extremely diaphoretic and in severe distress. Examination of the wound revealed a 9 cm laceration to the lateral left lower leg with significant active venous bleeding. The patient was neurologically intact distally with symmetric dorsalis pedis and posterior tibial pulses bilaterally.

The wound was immediately immersed in a hot water bath for approximately 30 minutes and local pressure was applied to the wound to achieve hemostasis. Intravenous morphine was administered several times without significant pain relief. Local infiltration of 1% lidocaine into the wound finally resulted in adequate analgesia.

Examination of the wound under surgical light revealed the presence of cartilaginous barbs and stingray tissue fragments embedded within the wound. These were grossly removed and plain films of the leg were obtained, which did not reveal any radiographically apparent foreign bodies. After copious irrigation with normal saline, the wound was sutured closed, and the patient was discharged home after receiving a tetanus booster and a prescription for opiate pain medication.

The patient then returned to the Emergency Department five days after his initial evaluation with reports of increasing pain around the wound and leakage of purulent material. Examination revealed significant erythema surrounding the wound with obvious purulent drainage between the sutures. A surgical consultation was obtained, and the patient was taken to the operating theatre for surgical debridement. After a 3-day course during which the patient received intravenous cefazolin and doxycycline, the wound infection regressed to the point where he could be discharged home with a prescription for 7 additional days of doxycycline.

At follow-up one week later, the patient was doing well, and the wound was healing adequately by secondary intention.

Discussion

Stingray injuries, while rare, present a unique challenge to front-line providers owing to their unique and time-critical treatment requirements. Overall there are between 750 to 2,000 reported stingray injuries annually in the United States.[1] Fortunately, the vast majority of these are nonfatal with the rare stingray associated fatalities predominantly occurring off the coast of Australia.[2]

Stingrays comprise a large group of flat fish with large wings and a long tapered tail. The tail is whip-like and has sharp bilateral serrations. There are also a variable number of barbs on the tail with many species having associated venom glands. Though stingrays in general are rather reclusive and do not actively seek to engage in non-predatory aggression, they are more than capable of adequate defense using their whip-like tail to inflict trauma from superficial lacerations to deep penetrating thoraco-abdominal injuries.[3] Those species that possess venom glands can cause further injury, ranging from enhanced local pain to more systemic effects such as nausea, vomiting, hypertension/hypotension, cramps, and even cardiac dysrhythmias.[2,4]

Most stingray injuries occur in tropical or subtropical regions relatively close to the shore and tend to be more common in the summer months, likely owing to increased human marine activities.[5] As stingrays predominantly reside on the ocean floor, those individuals wading in shallow water or otherwise coming in contact with the ocean floor are most at risk.

Once struck by a stingray, there is often a sharp sensation of pain that gradually intensifies over the next 30 to 90 minutes, lasting several hours.[1,3] The pain may be disproportionate to the outward appearance of the wound, largely due to the presence of venom in the wound. There are anecdotal reports that stingray wounds tend to bleed profusely, though studies have failed to reveal a definitive anticoagulant effect.[1,6]

Most recommendations on stingray injury management are based on experience and expert recommendations owing to a lack of high-quality randomized controlled trials. Nonetheless, it is recommended that treatment be initiated as soon as possible after injury occurs. Besides the standard paradigm of first ensuring adequacy of the airway, breathing, and circulation, the next step in management focuses on decontamination and inactivation of the venom. It has been found that immersing the wound in a hot freshwater bath (110°F-114°F) markedly reduces pain.[3,7] Pain can also be alleviated by performing regional blocks with local anesthetics (without epinephrine).[3]

Attention must simultaneously be given to achieving hemostasis. This is best done by applying local pressure rather than using tourniquets that can compromise arterial perfusion. If large vessels are obviously lacerated, then emergent surgical consultation is warranted.[1,3]

Once pain is controlled and hemostasis achieved, the wound must be explored closely with attention directed to removing foreign tissue left behind by the stingray. This may include barbs, venom glands, stingray integument, as well as sand and other marine debris. Since stingrays are cartilaginous, their barbs are often radiographically occult, and plain films cannot be relied upon to rule-out the presence of a foreign body.[1,3]

Given the high risk of contamination, it is generally recommended that the wound be thoroughly irrigated and then left open to heal by secondary intention. Our patient unfortunately underwent primary repair initially, leading to a severe wound infection, necessitating surgical debridement. Given the interruption to the integumentary system, it is important to ensure that the patient is adequately vaccinated against tetanus. Furthermore, some sources recommended giving victims of stingray injuries prophylactic antibiotics to cover *Vibrio* species. Options include doxycycline, trimethoprim/sulfamethoxazole, or imipenem.[1,8]

Stingray injuries may be fraught with peril. However, attention to simple tenants of wound management and pain control can help the astute clinician successfully care for the unfortunate victim of a stingray injury.

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