Surgical Treatment of a Catfish Spine Puncture Wound in the Hand

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Puncture wounds by catfish and other fish spines raise concerns for envenomation, foreign-body deposition, and infection by atypical pathogens, such as *Vibrio* spp.^{1–3} Envenomation is characterized by pain, throbbing, weakness, and paleness at the puncture site followed by muscle fasciculations, cellulitis, and necrosis.^{1,3} Infections can be local, ranging from mild to rapidly progressive, including necrotizing fasciitis or gangrene, or systemic and result in amputation or death.^{1–3} Furthermore, hand infections due to catfish spines or other aquatic injuries can last beyond the acute stage and become chronic, particularly if there is an involvement of atypical mycobacteria.⁴

Surgical debridement is paramount to treat penetrating wounds, particularly if a foreign body remains or severe skin infection follows. Furthermore, envenomation or bacterial pathogens can cause vessel thrombosis resulting in subtherapeutic levels of antibiotics reaching the area.³ Treatment recommendations for catfish spine puncture injuries include immediate irrigation of the wound followed by surgical debridement and empiric antibiotic coverage for organisms associated with these injuries, including gram-negative bacilli, staphylococcal and streptococcal species, anaerobes, and *Aeromonas hydrophilia* in the case of a freshwater catfish wound or *Vibrio* spp. in the case of a saltwater catfish wound, and *Mycobacterium marinum* if it is a chronic infection.^{1,4} Early intervention prevents worsening of the infection and avoids complications, such as suppurative flexor tenosynovitis, horseshoe abscesses, osteomyelitis, necrotizing fasciitis, and amputation.^{3,4}

We present the case of a 56-year-old man with catfish spine puncture wound who was taken urgently to the operating room for removal of the catfish spine and debridement of soft tissue. He presented to the emergency department with diffuse hand swelling after smashing his hand on a catfish 1 day prior. On physical examination, there was a small puncture wound on the volar aspect of hypothenar region at the base of the small finger, without a palpable foreign body. Imaging showed radiopaque material between the fourth and fifth metacarpal bones consistent with fish spine.

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Subsequently he was admitted to the hospital for intravenous (IV) antibiotics and exploration of the right hand. Preoperatively, he was given IV ciprofloxacin due to concern for exposure to *V. vulnificus*.

In the operating room, loupe magnification and tourniquet were used. Fluoroscopy was used to localize the foreign body, which was just radial to the fifth metacarpal bone. Longitudinal, linear incision was made on the volar surface overlaying the fish spine. Small area of purulent drainage distally was encountered while dissecting the subcutaneous tissue. Cultures were taken. Tendon sheath was visualized and noted to be lacerated. There was no purulent drainage from the tendon sheath. On further exploration, it was difficult to visualize the foreign-body fragment and the incision was extended proximally to visualize the proximal portion of the flexor sheath. After complete release of the flexor retinaculum and the flexor tendon sheath of the small finger, the catfish spine was finally visualized in the lumbrical muscle. It was approximately 3 cm in length with angled barbs that appeared to have advanced in the proximal direction from the site of entry. The spine was then dissected carefully and freed from the surrounding tissue for removal. After copious irrigation, the incision was closed in standard fashion.

Postoperatively, the infectious disease team recommended IV cefazolin, oral levofloxacin, and Flagyl to cover gram-positive, gram-negative, and anaerobic pathogens. The patient's intraoperative culture did not grow any organisms and he was discharged on a 3-week course of oral amoxicillin/clavulanic acid, levofloxacin, and doxycycline. The patient had a poor follow-up. Three weeks after the initial surgery, he presented again and was unable to flex both the proximal and distal interphalangeal joints of his fifth finger and was taken to the operating room for right hand exploration. Previous incision was reopened. He had secondary rupture of flexor digitorum superficialis and profundus of the small finger. The incision was extended distally and the A1 pulley was released. After debriding friable ends of the tendon, the flexor digitorum profundus (FDP) was repaired in a weave technique. Passive range of motion showed adequate gliding

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of the tendon without any gap formation. The deep space was irrigated copiously before and after repair of the tendon. The incision was closed in standard fashion and the patient was placed in a dorsal block splint of the ring and small fingers. Repeat cultures did not grow any organisms. He was advised to continue the same antibiotics, but it is unclear whether he did due to poor follow-up.

There have been case reports and series describing hand infections due to marine life and their treatments without detailing surgical treatment. In this present report, surgical debridement is outlined for catfish spine puncture wound. Treatment with surgical debridement along with broad antibiotic therapy is crucial in penetrating wounds secondary to marine life, especially with retained foreign body. This patient had tendon rupture that may have been avoided with antibiotic compliance, highlighting the necessity of medical optimization for best outcome.

Conflict of Interest

None.

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