Annals of Clinical and Medical Case Reports[R] ISSN 2639-8109 | Volume 16

Case Report Open Access

Penetrating Injury and Envenomation by Gafftopsail Catfish (*Bagre Marinus*): A Case Report and Review of Management Strategies

Alexandria Soybel[1*], Sean Brennan[2], Michael Erickson[2,1]

[1]John Sealy School of Medicine, USA

[2]Department of Surgery, University of Texas Medical Branch, Galveston, Texas, USA

***Corresponding author:**

Alexandria Soybel,
John Sealy School of Medicine, USA

Received: 12 June 2026
Accepted: 30 June 2026
Published: 04 July 2026
J Short Name: ACMCR

Keywords:

Catfish Envenomation; Marine Injury; Penetrating Trauma; Fluoroscopy; Aquatic Infection

Citation:

Alexandria Soybel, Penetrating Injury and Envenomation by Gafftopsail Catfish (Bagre Marinus): A Case Report and Review of Management Strategies. Ann Clin Med Case Rep® 2026; V16(3): 1-3

Highlights:

- Gafftopsail catfish cause both penetrating injury and envenomation.
- Envenomation pain responds to heat denaturation pre-and peri-operatively.
- Intraoperative fluoroscopy assists with operative planning aiding spine removal.
- Empiric antibiotic therapy should cover marine pathogens.

1. Abstract

We present a case of penetrating right lower extremity injury caused by a Gafftopsail catfish (*Bagre marinus*) sustained during a fishing trip in the Texas Gulf Coast. The patient underwent operative debridement and foreign body removal. This report reviews a comprehensive approach to imaging, surgical technique, and infection control in the context of aquatic envenomation.

2. Introduction

Catfish injuries are complex marine traumas that involve both mechanical penetration and envenomation. Gafftopsail catfish, common in Texas estuarine environments, pose risk due to their venom-bearing dorsal and pectoral spines. The symptomatic inflammatory response to envenomation from marine catfish is due to a variety of large proteins and enzymes including proteases, phospholipases, and hyaluronidases with cell-death and tissue necrosis mostly mediated by cytolysins and hemolysins [1]. Most penetrative injuries with catfish spines therefore result in localized inflammatory reactions causing severe pain [2]. Complications may include retained foreign bodies and secondary infections from endemic bacteria [3-6]. This case demonstrates surgical and medical management of a Gafftopsail catfish injury, incorporating toxicologic, microbiologic, and trauma care principles.

3. Case Presentation

A 23-year-old male presented after a pectoral spine of a Gafftopsail catfish penetrated his right calf during a fishing trip. The patient reported immediate pain and swelling, which persisted in quality and severity until arrival at the emergency department. He did not report any additional systemic symptoms or signs such as fever, coagulopathy, or nausea.

On physical exam the patient was hemodynamically stable, with mild erythema and edematous changes surrounding the wound. Initial imaging included plain radiographs, which showed a 6.4 cm deep radiopaque foreign body in the lateral right leg with associated soft tissue swelling and subcutaneous gas. Prior to surgical evaluation, Computed Tomography Angiography (CTA) was performed and ruled out vascular injury. Given the nature of injury and concern for retained foreign bodies, decision was made to utilize fluoroscopy during surgical removal.

He was given IV analgesia and antiemetics in the emergency department. After surgical consultation, tetanus toxoid was given, and IV antibiotics were initiated with cefazoline and doxycycline. In cases of marine envenomation, pain should be initially managed with immediate submersion of the wound in water heated to the maximum temperature tolerable to the patient to begin denaturing proteins in the venom [1,2].

4. Operative Details

The patient was taken to the operating room and placed in the supine position under general anesthesia. The right lower extremity was prepped and draped in a sterile fashion. A time-out

was performed. The skin over protruding end of the foreign body was then incised with an 11-blade scalpel 3 cm superior and 3 cm inferior of the injury site. Silk suture was tied around the exposed end of the fish spine, and the spine was removed with gentle traction. Fluoroscopy revealed no remaining fragments. The fascia overlying his gastrocnemius at the site of the barb injury was opened with Metzenbaum scissors 5 cm distally. Hemostasis was achieved with electrocautery. Dilute sodium hypochlorite solution and normal saline was then used to copiously irrigate the wound. Bupivacaine 0.25% was administered locally to the site for local anesthetic. Bandage roll gauze soaked in dilute sodium hypochlorite solution was packed in the wound, and the lower extremity was covered with gauze, and an elastic bandage wrap.

The patient tolerated the procedure well. The patient was extubated and transferred to the PACU in stable condition.

5. Post-Operative Course

The patient's postoperative course was uncomplicated. The wound was packed for a single day after spine removal and left open for potential drainage and infection precautions. The wound showed no signs of infection or bleeding, and pain was well controlled prior to discharge.

6. Discharge Medications and Instructions

- **Cephalexin 500 mg** BID for 7 days
- **Doxycycline hyclate 100 mg** BID for 7 days
- **Hydrocodone-acetaminophen 5-325 mg** every 6 hours as needed for pain for 2-3 days

Patient instructions included keeping the wound clean and dry, avoiding submersion for 2 weeks, and watching for signs of infection.

One week later, he arrived in clinic for short term follow-up. He reported no fevers, chills, erythema of his right lower extremity, or discharge. On inspection, his wound was appropriately healing without any signs of infection. He was instructed to follow up as needed.

7. Discussion

Catfish-related injuries require a multidisciplinary approach. Envenomation symptoms can range from localized pain to systemic effects [2]. Subcutaneous gas on imaging raises concern for infection or soft tissue injury, but this case was managed successfully with early operative intervention and broad-spectrum antibiotics.

8. Infection Control

Antibiotic coverage should consider exposure to *Vibrio sp*. (saltwater) and *Aeromonas* (freshwater), with doxycycline providing coverage for both gram-negative bacilli. These bacteria predominate along the Gulf Coast, where estuarine environments exist due to the confluence of multiple river systems and urbanizing watersheds into the gulf [7,8]. The freshwater inflow and tidal saltwater result in salinity ideal for proliferation of both bacteria as well as Gafftopsail catfish [9,10]. Additionally, rising sea surface temperatures enhance the growth, survival, and lengthen transmission season for both Vibrio sp. and Aeromonas [11-13]. Generally, empiric therapy of soft tissue infection following water exposure includes either cephalexin 500mg PO QID, or cefazolin 1g IV Q8.5 Additional considerations may include ceftazidime such as to prevent Pseudomonas aeruginosa infection if additional concern exists such as in immunocompromised patients or patients with delayed presentation [14]. In addition to antibiotic therapy, copious irrigation with saline and dilute sodium hypochlorite solution should be employed to provide decontamination of the wound. Tetanus prophylaxis should also occur as soon as possible, and up to 7 days following injury. If presentation is delayed by patient greater than 7 days and vaccination status is unclear or unknown, patients should receive both tetanus-toxoid containing vaccine and tetanus immune globulin [15].

9. Pain

The various topical compounds involved in catfish envenomation *via* puncture from dorsal or pectoral spines produce significant pain. Adequate pain management should be delivered in a multifaceted approach. In the case of initial severe pain inadequately controlled with acetaminophen or NSAIDs, we recommend IV fentanyl 1μg/kg as tolerated due to rapid onset of action, short-acting nature, and ease of titration [16]. Further titration should be provided at a dose of 0.5-1μg/kg every 3-5 minutes if needed given oxygen saturation, respiratory rate, and consciousness are appropriately monitored and stable. The lowest effective dose for the shortest duration possible is recommended as needed, as opposed to scheduled dosing. Outside of oral or IV management with NSAIDs and other analgesics, we recommend thermal denaturing of pain producing proteins. In addition to considering hot water immersion (40°C to 45°C for 90 mins) in the immediate management, pain management may be improved with warmed irrigation by denaturing venom and relieving vasospasm [1,2,5].

10. Imaging

In all cases of traumatic injury, distal pulses should be examined to assess perfusion and rule out vascular injury [17]. If hard signs of vascular injury exist (such as active hemorrhage, expanding hematoma, absence of pulses, bruit/thrill), operative intervention should occur before imaging. Abnormal physical exam without hard signs warrants ankle-brachial index evaluation and subsequent CTA performed for surgical planning if ABI is <0.9. In cases where use of CTA is cost-limited or otherwise not available, distal pulses should be examined and Ankle Brachial Indices (ABIs) may be measured, and if ≥0.9, vascular injury is unlikely with high negative predictive value [18]. While dependent on the site of injury, plain films and CTA can help guide surgical planning. Operative fluoroscopy is a key imaging modality required to ensure all foreign bodies have been removed from the site. In lieu of fluoroscopy, ultrasound may be used as foreign body removal confirmation with high sensitivity in the majority of cases [19].

11. Surgical Management

Following spine removal, further debridement and extraction of retained foreign material may be warranted, particularly in cases of barb retention or compromised tissue perfusion. If there is clinical evidence of progressive soft tissue infection, additional debridement should be performed to achieve adequate source control. Primary closure is not indicated for marine penetrating injuries due to risk for enclosure of bacteria leading to increased risk for disseminated infection [20,21].

12. Conclusion

This case highlights a structured approach to managing injuries caused by Gafftopsail catfish, emphasizing the importance of early envenomation recognition, meticulous wound care, appropriate antimicrobial therapy, and the use of targeted irrigation techniques. Awareness of venom-associated risks in marine related injuries is critical to prevent complications and optimize clinical outcomes.

References

1. Ziegman R, Alewood P. Bioactive components in fish venoms. Toxins (Basel). 2015;7(5):1497-531.
2. Haddad V, Martins IA. Frequency and gravity of human envenomations caused by marine catfish (suborder siluroidei): a clinical and epidemiological study. Toxicon. 2006;47(8):838-43.
3. Bishop J, Morell S. Intraosseous catfish barb treated with cannulated drill in a pediatric patient. J Hand Surg Glob Online. 2022;4(5):311-14.
4. Carbone SJ, Jozefick JL, Sigal AP, Nordell RH 4th. Catfish puncture wound and retained spine management in the ED setting: a case report. Wilderness Environ Med. 2024;35(4):474-8.
5. Diaz JH, Lopez FA. Skin, soft tissue and systemic bacterial infections following aquatic injuries and exposures. Am J Med Sci. 2015;349(3):269-75.
6. Dorooshi G. Catfish stings: a report of two cases. J Res Med Sci. 2012;17(6):578-81.
7. Kaar CRJ, Nakanishi AK. Recreational and commercial catfishing injuries: a review of the literature. Wilderness Environ Med. 2017;28(4):348-54.
8. Scott WC, Breed CS, Haddad SP, SR Burket, Saari GN, PJ Pearce et al. Spatial and temporal influence of onsite wastewater treatment systems, centralized effluent discharge, and tides on aquatic hazards of nutrients, indicator bacteria, and pharmaceuticals in a coastal bayou. Sci Total Environ. 2019;650(Pt 1):354-64.
9. Johnson CN, Flowers AR, Noriea NF 3rd, Zimmerman AM, Bowers JC, DePaola A, et al. Relationships between environmental factors and pathogenic Vibrios in the Northern Gulf of Mexico. Appl Environ Microbiol. 2010;76(21):7076-84.
10. Wootton LA, Froeschke JT, Stunz GW. Gafftopsail catfish in Texas estuaries: population trends and ecosystem implications. North Am J Fish Manage. 2024;44(1):1-14.
11. Semenza JC, Ko AI. Waterborne Diseases That Are Sensitive to Climate Variability and Climate Change. N Engl J Med. 2023;389(23):2175-2187.
12. Vezzulli L, Colwell RR, Pruzzo C. Ocean warming and spread of pathogenic vibrios in the aquatic environment. Microb Ecol. 2013;65(4):817-25.
13. Bharathan A, Arafath Y, Fathima A, Hassan S, Singh P, Kiran GS, et al. Implication of environmental factors on the pathogenicity of Vibrio vulnificus: Insights into gene activation and disease outbreak. Microb Pathog. 2025;204:107591.
14. Murphey DK, Septimus EJ, Waagner DC. Catfish-related injury and infection: report of two cases and review of the literature. Clin Infect Dis. 1992;14(3):689-93.
15. Liang JL, Tiwari T, Moro P, Messonnier NE, Reingold A, Sawyer M, et al. Prevention of pertussis, tetanus, and diphtheria with vaccines in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2018;67:1-44.
16. Fabbri A, Voza A, Riccardi A, Serra S, Iaco F. Study and Research Center of the Italian Society of Emergency Medicine (SIMEU). The Pain Management of Trauma Patients in the Emergency Department. J Clin Med. 2023;12(9):3289.
17. James D, Pennardt AM. Trauma Care Principles. [Updated 2023 May 31]. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2025 Jan.
18. Hemingway J, Adjei E, Desikan S, Joel Gross, Nam Tran, Niten Singh, et al. Re-evaluating the safety and effectiveness of the 0.9 ankle-brachial index threshold in penetrating lower extremity trauma. J Vasc Surg. 2020;72(4):1305-11.e1.
19. Del Cura JL, Aza I, Zabala RM, Sarabia M, Korta I. US-guided Localization and Removal of Soft-Tissue Foreign Bodies. Radiographics. 2020;40(4):1188-95.
20. Noonburg Greer E. Management of Extremity Trauma and Related Infections Occurring in the Aquatic Environment. J Am Acad Orthop Surg. 2005;13(4):243-53.
21. Ono RH. An Illustrated Osteology of the Channel Catfish. Midwest Archeological Center Occasional Studies in Anthropology No. 2. National Park Service; 1980.