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## Injury with secondary infection and severe sequelae caused by a snook fish (*Centropomus* spp.) to a fisherman

*Lesão com infecção secundária e sequelas graves causadas por um peixe-robalo (*Centropomus* spp.) em um pescador*

### Abstract

**Introduction:** fish injuries are common among fishers and, if not properly assisted, can lead to major complications. **Objective:** to report the case of a fisherman who had an accident with a snook fish (*Centropomus* spp.) and presented secondary infection with severe sequelae. **Methods:** the information was obtained by reviewing medical records, interviewing the patient, and photographic record. **Results:** a 48-year-old fisherman was injured by the spike on the base of the fish fin. It affected the phalanx of his left hand fifth finger, showing signs of inflammation throughout the limb. The health service was unable to identify the infectious agent and prescribed several antibiotics. Without substantial results, the doctors discontinued the antibiotic therapy and adopted a symptomatic treatment. After 32 days in hospital, the patient was discharged. However, two months after the accident, he presented an abscess in the limb, which limited the fingers movement and required a surgical procedure. After the infection was controlled, he presented some sequelae such as muscle atrophy, partial loss of movement, reduced motor capacity, local sensitivity, and clawed-shaped hand. **Conclusion:** injuries caused by fish can result in serious and irreversible consequences, and more attention should be paid to the subject-matter.

**Keywords:** occupational health; accidents, occupational; wounds and injuries; fishes; case report.

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### Resumo

**Introdução:** ferimentos causados por peixes são comuns entre pescadores e, se não forem adequadamente assistidos, podem levar a complicações significativas. **Objetivo:** reportar o caso de um pescador que se acidentou com um camurim/robalo (*Centropomus* spp.) e apresentou infecção secundária com sequelas graves. **Métodos:** as informações foram obtidas por meio de revisão de prontuários, entrevista com o paciente e registro fotográfico. **Resultados:** um pescador de 48 anos se acidentou, com a espícula da base da nadadeira do peixe, na falange do quinto quirodáctilo da mão esquerda, apresentando sinais flogísticos em todo o membro. O serviço de saúde não dispunha de condições para identificar o agente da infecção e diferentes antibióticos foram administrados. Sem resultados expressivos, a terapia antibiótica foi suspensa e foi adotado tratamento sintomático. Após 32 dias de hospitalização, o paciente teve alta. No entanto, dois meses após o acidente, a vítima desenvolveu abscesso do membro com limitação de movimentos dos quirodáctilos, necessitando de procedimento cirúrgico. Após o controle da infecção, apresentou sequelas como atrofia muscular, perda parcial de movimento, redução da capacidade motora, sensibilidade local e aparência da mão em garra. **Conclusão:** lesões causadas por peixes em pescadores podem resultar em consequências graves e irreversíveis e mais atenção deve ser dada ao tema.

**Palavras-chave:** saúde do trabalhador; acidentes de trabalho; ferimentos e lesões; peixes; relato de caso.

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## Introduction

Accidents caused by aquatic animals are common in fishers due to the characteristics of their work. Rudimentary practices of artisanal fishing can cause accidents with fishes and diseases resulting from physical effort, climatic variations, and contact with pathological agents. Generally, wounds occur when victims tread or manipulate the fish improperly or when they remove them from the nets or hooks<sup>1-6</sup>.

Injuries can be caused by animals' teeth, stingers, and spicules. These morphological structures can provoke tissue loss, bleeding, and infections (e.g., bacterial, fungal) after trauma and/or envenomation<sup>7</sup>, which, if not well assisted, can lead to severe sequelae. Most of these injuries may require long recovery periods, leading to sick leave and causing socio-economic problems to fishers<sup>8,9</sup>.

Snook species are common in the state of Maranhão, Northeast Brazil. The scientific names of these species are *Centropomus parallelus* (Poey, 1860), *C. pectinatus* (Poey, 1860) and *C. undecimalis* (Bloch, 1792), but they are popularly known as *camurim branco* (fat snook), *camurim* (tarpon snook), and *camurim preto* (common snook), respectively<sup>10</sup>. These fishes belong to the Centropomidae family, and they live in marine and freshwater environments, and in tropical and subtropical waters<sup>11</sup>. As they are an excellent fishing resource due to their taste and commercial value, snook species became a target of artisanal fishing in the region<sup>12</sup>. Snooks have spines (spicules) that support their fins as a morphological feature<sup>11</sup>. These spines can cause trauma in humans through perforation.

Here, we report the case of a fisherman who was wounded during his work by a snook (*Centropomus* spp.) and was affected by secondary infection and severe sequelae. We also described the adopted therapeutic intervention, patient evolution, and how public health service precariousness interfered in his recovery.

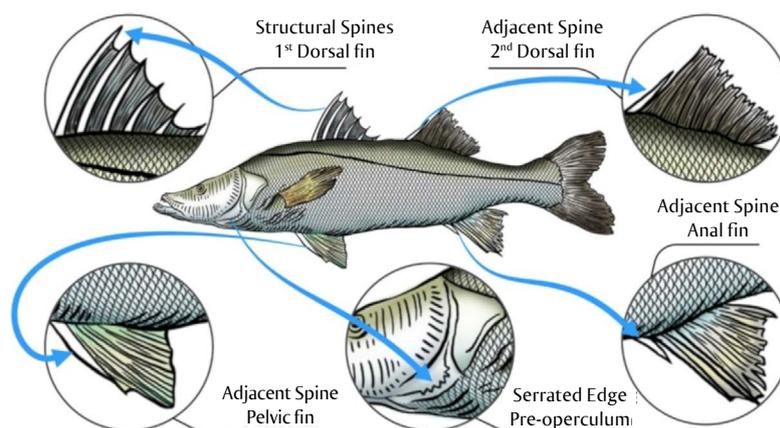
## Methods

This report consists of the description of the accident, the measures taken, and other relevant therapeutic issues. We interviewed the patients during the clinical course and obtained additional information through medical and photographic records of the infected lesion and sequelae.

The artisanal fisherman signed the Free and Informed Consent Form (ICF), consenting to his participation in the study. This report was approved by the Research Ethics Committee of the *Universidade Federal do Maranhão* (n° 1.649.669, July 2016), following the guidelines of the National Health Council (Resolution 466/12).

## Results

A 48-year-old artisanal fisherman was injured by a snook (**Figure 1**), while working in the sea at night (São Marcos Bay off Maranhão coast). The lesion was caused by a fin spine when he was reaping fishes off the net, and the trauma caused a perforation in the left hand fifth finger distal phalanx. The lesion bled and local edema and erythema quickly took place. On the next day, the lesion was aseptically cleaned with soap and water.



**Figure 1** Overall morphology of snook fish (*Centropomus* spp.) involved in the reported accident, with an emphasis on the spines scattered throughout the body

The symptoms persisted and with the increase of the edema and fever sensation (not measured) the fisherman looked for a secondary care unit. The patient exhibited pain, edema, and erythema on the lesion. Due to the general condition and persistent fever, he was admitted in the care unit. Despite the swelling, they did not search for bacterial culture because there were not laboratory supplies. The blood count at admission showed 21,190 leukocytes/mm<sup>3</sup>, 442,000 platelets/mm<sup>3</sup> with 76.3% of neutrophils, 14.3% of lymphocytes, 5.7% of monocytes, 3.5% of eosinophils, and 0.3% of basophils. The results corroborated the initial diagnosis of erysipelas. In the first week of hospitalization, doctors prescribed Ciprofloxacin 400 mg EV 12/12h and Clindamycin 600 mg 6/6h. After verifying that this combination was ineffective, the treatment was replaced by Oxacillin 500 mg EV 4/4h and Ceftriaxone 1 g EV 12/12h.

After 10 days with no beneficial response, Gentamicin 80 mg 12/12h was added to the treatment. After 26 days of hospitalization, the use of antibiotics was suspended, and only medication to treat the main symptoms was administered (analgesic, antiemetic, gastric protectors, anti-inflammatory, and antihypertensive). The patient was stabilized, showing a significant reduction in injury secretion, hand edema, and recovery of finger movements. The blood count was repeated, confirming that the condition improved. After 32 days of hospitalization, the patient was finally discharged with guidelines for outpatient follow-up and injury prophylaxis using saline, neomycin ointment, cotton wool, and adhesive tape. Two months after the accident, the fisherman sought medical help once more. In

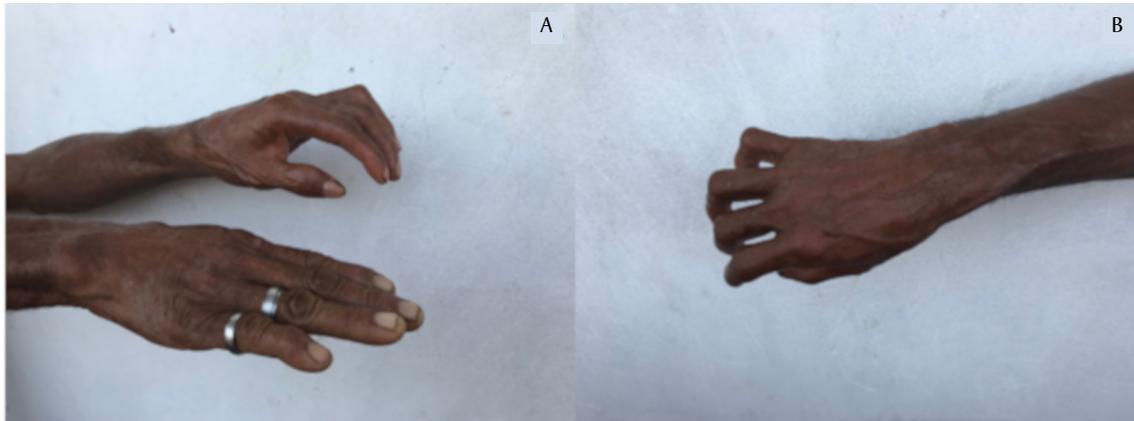
addition to the inflammatory process, the patient presented edema and erythema in the left upper limb, of the forearm up to the distal extremity, with limited movement of fingers (**Figure 2**).

An intravenous analgesic (dipyrone) was administered and the patient was transferred to a better equipped hospital to have the abscess surgically drained. Before the surgery, a complete blood count and coagulation test were produced, which showed 3.47 million/mm<sup>3</sup> erythrocytes, 14,980/mm<sup>3</sup> leukocytes, 1,722.70/mm<sup>3</sup> lymphocytes, 29.96/mm<sup>3</sup> basophil, 89.88/mm<sup>3</sup> monocytes, platelets at 410,000/mm<sup>3</sup>, C-reactive protein at 7.10 mg/dL and urea at 43.00mg/dL. Once again, bacterial culture was not produced due to the lack of laboratory supplies. The abscess was drained in the operating room and the patient was referred to the hospital bed, with indication for antibiotic therapy (Ceftriaxone 1 g 12/12h and Clindamycin 600 mg 6/6h). However, Ceftriaxone 1 g was not available, and it was replaced by Cefepime Hydrochloride 2 g 12/12h. After unsatisfactory evolution, the antibiotic Clindamycin 600 mg was replaced by Metronidazole 600 mg 8/8h. After the patient's recovery period had elapsed, with an improvement in the clinical condition, the patient was discharged.

Sequelae were observed, even after the complete recovery of the infectious condition. Among them, a claw-like hand and muscular atrophy with partial loss of movement and limb sensitivity, definitively incapacitating him to pursue his professional activities (**Figure 3**).



**Figure 2** Affected member of the fisherman when seeking medical care for the second time, just before the surgical intervention. A) Dorsal view of the left hand. B) Ventral view of the left hand



**Figure 3** Fisherman's affected limb after surgical intervention and antibiotic therapy. A) Comparative side view with unaffected limb. B) Claw shape of the affected limb as a resulting sequela

## Discussion

Accidents by aquatic animals are the most common occupational accidents suffered by fishers and constitute a public health issue due to their high frequency and severity<sup>8,13</sup>. In fact, the incidence of accidents caused by fish is very high within artisanal fishing communities<sup>14</sup>, due to precarious working conditions<sup>15</sup>, and their lack of information on fish handling hazards<sup>16</sup> and on ways to prevent work accidents.

The injured fisherman asserted that he had not used any safety measures when handling the fishes. Adoption of preventive measures during the work activity can contribute to minimize and avoid accidents, such as the use of personal protective equipment (PPE)<sup>15</sup>. In this case, the use of PPE might have prevented the accident. Lack of knowledge about accident prevention puts fishers in a vulnerable position. Thus, we emphasize the importance of producing and disseminating information materials and educational campaigns on this topic for professional fishers<sup>16</sup>.

The trauma in the fisherman's hand, caused by a snook of unidentified species, evolved into a severe secondary infection and, subsequently, crippling sequelae of the limb, which hindered him from performing his daily labor activities. Secondary infections are common in accidents caused by aquatic animals<sup>9</sup>. Most infectious processes are caused by *Staphylococcus* sp. and *Streptococcus* sp., but other powerful pathogenic bacteria may also cause infections, such as *Vibrio vulnificus* and *Aeromonas hydrophyla*<sup>9</sup>.

In order to define the most specific therapeutic intervention, it is necessary to identify the causative agent of the infection. However, this cannot be

done when the minimum conditions and laboratory supplies necessary to carry out this identification (bacterial culture) are not available. For antibiotic therapy, it is essential to ascertain the correct drug for use, to analyze the patient's clinical manifestations (e.g., fever and purulent secretion), and to request laboratory tests (*i.e.*, blood count and antibiogram test, used to detect the sensitivity of bacteria to certain antibiotics)<sup>17</sup>. The antibiogram—besides confirming the need for drug intervention—guides the best choice considering efficacy, cost benefit, and toxicity level<sup>17,18,19</sup>.

The empirical antibiotic therapy carried out in this case was due to the lack of laboratory supplies to produce bacterial culture and unavailability to perform the antibiogram, which are essential for the correct identification of the causative agent and subsequent treatment. The precariousness of the public health service did not make these procedures feasible, indicating the need to adapt protocols in cases like this. Empirical treatment, most often prescribed by doctors, reinforces the need for hospital institutions to implement policies to monitor the rational use of antibiotics and increased antibiotic resistance<sup>17,20,21</sup>. Furthermore, the lack of knowledge about accidents with marine animals led the medical team to perform the described protocol. Reporting these accidents is imperative to guide health professionals, primarily due to the lack of specific treatments, but also to the fact that many professionals do not receive adequate training to care for victims of this type of accident<sup>22</sup>.

Upper limbs are the body region in which most lesions occur, but few cases are followed up in Brazil to prevent possible sequelae<sup>8</sup>. In the reported case, there was a demand for medical assistance. Nevertheless, the injury consequences resulted in withdrawal of the fisherman from his work

activities, leading him and his family to social and financial difficulties.

In summary, it is necessary to promote public policies for implementing occupational health surveillance (VISAT) and environmental health surveillance (VISAM) actions, which are of paramount importance for the sanitary practice

aimed at these workers. These would help identify relevant or priority health problems and perform actions aimed at health promotion, risk identification and prevention, early injuries detection, besides offering adequate assistance to injured artisanal fishers, which prevents sequelae and subsequent socioeconomic distress<sup>23</sup>.

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## Authorship contributions

Carvalho IEM, Silva GVF, Haddad V Jr, Wosnick N, and Nunes JLS contributed substantially to the study, data collection, analysis and interpretation, writing, revisions, and final version approval, and they are responsible for the study and the published content.

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