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CASE REPORT

Cellulitis induced by Jellyfish sting in a 3-year-old boy: a case report, Jazan, Saudi Arabia

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ABSTRACT

Background: Jellyfish stings, though often perceived as benign encounters of the sea, can precipitate severe complications, particularly in the pediatric population engaging in aquatic activities. While these injuries are rare in Saudi Arabia, they can still present as a distressing condition and warrant preparedness.

Case Presentation: This case report presents a rare occurrence of cellulitis induced by a jellyfish sting in a 3-year-old boy from Jazan, Saudi Arabia. Following the initial sting, the patient exhibited distressing symptoms including intense pain, erythema, and pronounced swelling in his left leg. Despite initial medical intervention, his condition worsened, necessitating hospitalization, and a comprehensive treatment regimen involving antipyretic, corticosteroid, and antibiotic therapies.

Conclusion: This case report underscores the imperative of timely and efficacious management of jellyfish sting injuries, particularly in regions where such incidents are infrequent. It also advocates for heightened awareness among healthcare practitioners regarding potential complications and the formulation of standardized protocols for optimal patient care.

Keywords: Jellyfish sting, cellulitis, children, Jazan, King Fahd Central Hospital, case report.

Introduction

Jellyfish, commonly found in marine environments globally, exhibit varying degrees of venomousness, with some species posing significant risks to human health [1,2]. Despite the prevalence of jellyfish injuries among coastal populations, Saudi Arabia has yet to report any case of jellyfish injury [3]. Symptoms of jellyfish stings encompass a wide spectrum of symptoms, ranging from mild pain, swelling, and redness to severe complications such as secondary bacterial infections [4]. The severity of these injuries can escalate to life-threatening conditions including vascular complications, intense pain, urticaria, superficial necrosis, cardiovascular issues, eye injuries, Irukandji syndrome, multiple organ dysfunction, and even fatalities [5-9]. Due to the scarcity of reported cases, obtaining accurate data on jellyfish envenomation remains challenging, though global estimates suggest an alarming 150 million cases annually [10]. Notably, a study conducted in Italy by Boulware [10] highlighted the substantial economic burden on public health providers, with medical services costing approximately €400,000 over 5 years [11].

This report presents the case of a 3-year-old boy from Jazan, Saudi Arabia, who developed cellulitis following a jellyfish sting on his left leg and subsequently sought treatment at King Fahd Central Hospital (KFCH). This case underscores the importance of healthcare providers remaining vigilant about such incidents and emphasizes the necessity of prompt and proper management to mitigate potential complications. Further research is warranted to establish standardized guidelines for managing jellyfish-inflicted injuries.

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Case Presentation

A previously healthy three-year-old boy presented to KFCH in Jazan, Saudi Arabia, accompanied by his family, exhibiting severe leg pain, swelling, and dark brown streaks encircled by erythema - a consequence of a jellyfish sting encountered while swimming at Jazan beach along the Red Sea.

Initially, he experienced intense pain and redness at the sting site, which rapidly escalated to include swelling, itching, and linear brown lesions with mild erythema and tenderness in the affected leg (Figure 1). Seeking immediate medical attention, his family turned to a peripheral hospital where he received antihistamine and analgesic treatment before being discharged. However, within a mere 2 hours, the pain intensified dramatically, rendering the boy unable to bear weight as the swelling continued to increase in size, prompting his admission to KFCH.

Figure 1. *Jellyfish sting on the left leg with erythema and swelling.*

Upon examination, the boy presented as alert, conscious, and vitally stable, albeit distressed by pain. His left leg exhibited tenderness, heat, swelling, and the characteristic brown streaks surrounded by erythema, while no palpable lymph nodes were noted. Laboratory findings revealed significantly elevated white blood cell counts, primarily neutrophils, amidst an otherwise unremarkable profile, including normal vital signs and systemic reviews.

Treatment commenced with a multifaceted approach, incorporating paracetamol, intravenous methylprednisolone, intravenous amoxicillin/clavulanic acid, and topical corticosteroid and fusidic acid with betamethasone cream applications. By the fourth day of treatment, a notable improvement was observed, with gradual pain reduction, diminished swelling, and the absence of evident erythema. Subsequently, the boy was discharged with oral amoxicillin-clavulanic acid, topical clobetasol ointment, and fucicort cream, alongside analgesics as needed. Follow-up at 2 weeks post-discharge revealed complete healing of the left leg, save for scarred skin at the site of the sting (Figure 2).

The boy exhibited clinical stability and a satisfactory response to treatment, reaffirming the efficacy of the therapeutic regimen.

Discussion

The phylum Cnidaria encompasses a diverse range of aquatic organisms, with coral organisms standing out as prevalent members [12,13]. Among the intricate structures of coral organisms are nematocysts, specialized

Figure 2. *Post-treatment recovery showing reduced swelling and scar formation.*

organelles equipped with venom-filled cells [12,14]. Coral injuries typically manifest as either lacerations or stings, with the latter leading to the injection of toxins, including substances like calcium carbonate from coral reef structures, into the body [12]. Commonly affected areas by coral injuries include exposed regions such as the forearm, elbow, and knees during marine-related activities.

The initial response to coral injuries often involves localized pain, redness, and swelling, which may manifest immediately or within a few hours post-injury. Additionally, some individuals may experience a low-grade fever, unrelated to infection [15]. Complications of coral injuries can manifest in various forms, including local eczematous reactions, foreign body reactions, or secondary bacterial infections [12]. Notably, contact dermatitis, a late complication more prevalent among individuals along the Red Sea coastline, may emerge up to 3 weeks post-injury [16].

Late reactions to cnidarian stings may appear between 2 and 14 days post-injury, presenting as erythematous papular or papulonodular eruptions accompanied by intense itching at the wound site. The healing process for these wounds can be protracted, often requiring weeks and necessitating the administration of steroids and antihistamines [13,17]. Infections commonly associated with marine environment injuries include those caused by various bacterial species prevalent in marine environments, such as *Streptococcus* species, *Escherichia coli*, *Pseudomonas aeruginosa*, *Mycobacterium marinum*, *Staphylococcus aureus*, *Vibrio cholerae*, *Vibrio vulnificus*, or *Vibrio parahaemolyticus* [13]. Consequently, coral injuries complicated by secondary bacterial infections may progress to cellulitis, potentially leading to tissue necrosis, underscoring the critical importance of meticulous wound management [13].

In the case presented herein, while no foreign material was found at the sting site, clinical and laboratory indicators suggested the presence of cellulitis, characterized by redness, warmth, and swelling in the left leg, along with leukocytosis, predominantly neutrophils. Management of secondary bacterial infections resulting from marine environment exposure often involves outpatient antimicrobial therapy administration, targeting Vibrio species with agents like ciprofloxacin or trimethoprim-sulfamethoxazole [14].

In this instance, the patient underwent inpatient antimicrobial therapy, including amoxicillin/clavulanic acid and fusidic acid, supplemented by topical clobetasol therapy. Following a 4-day hospitalization period, the patient was discharged with oral antimicrobial therapy to be continued for 9 days, along with prescribed topical medications and analgesics as needed. Healing of marine animal injuries can be prolonged, with reported cases requiring up to 15 weeks for resolution [12,15,17]. In cases of secondary bacterial infections, the healing process may be further extended.

Upon discharge, significant improvements were noted, with decreased swelling and redness. A follow-up appointment in the outpatient clinic was scheduled 2 weeks post-discharge to monitor the patient's progress. While prevention of marine animal injuries primarily involves avoiding contact with these creatures, injuries often occur unintentionally when humans are unaware of their presence.

Conclusion

In conclusion, this case report highlights the critical need for standardized protocols in managing jellyfish-induced injuries, particularly in regions where such incidents are infrequent, such as Jazan, Saudi Arabia. While the treatment protocol applied in this case yielded positive outcomes, further research is imperative to refine therapeutic strategies and optimize patient care. By advancing our understanding of jellyfish envenomation and its management, healthcare professionals can effectively mitigate associated risks and enhance patient outcomes. Such endeavors are essential for bolstering public health preparedness and ensuring comprehensive management of marine-related injuries.

Statement of ethics

As this manuscript represents a case report, ethical clearance was deemed unnecessary, given the absence of experimental interventions or identifiable patient information. Patient consent was not obtained, as the nature of the report precludes the inclusion of personal identifiers. All data presented have been anonymized to uphold patient confidentiality and comply with ethical guidelines for publication.

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

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Consent for publication

Due permission was obtained from the parents of the patient to publish the case and the accompanying images.

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

Author contributions

Dr. Hadi Daghriri played a pivotal role as the principal investigator, overseeing conceptualization, design, literature search, clinical studies, data acquisition, manuscript preparation, editing, and review. Dr. Mohammed Mahnashi, in his capacity as the consultant, provided critical input in defining intellectual content, conducting clinical studies, and contributed significantly to manuscript preparation, editing, and review. Dr. Sarah Arishi, leveraging her expertise as a pharmacist, contributed substantially to manuscript preparation and editing. Dr. Abdullah Alhamoud, serving as the corresponding and last author, played a crucial role in supervising the entire process, providing valuable insights, and conducting meticulous reviews to ensure the integrity and accuracy of the manuscript. Additionally, Dr. Ahussein Khawaji, Dr. Mohammed Auteen, Faris Alhazmi and Dr. Mohammed Almogheriah supported the study by assisting

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Data availability

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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