

Cutaneous Disorders Due to Exposures to Marine Life: Simple review article

Abstract:

Exposure to aquatic organisms includes a variety of clinical situations. Skin damage after exposure to the marine environment includes bacterial and fungal infections as well as damage caused by aquatic plants and protists. Aquatic skin diseases are various skin diseases found among swimmers, divers, fishermen and tourists participating in water activities. Some conditions are particularly relevant to fresh or salt water, while other conditions may occur in both environments at the same time. Injuries can be divided into several general categories. There may also be overlapping, non-infected mechanical damage, infection after mechanical damage, and mechanical damage accompanied by inoculation of poisons or substances with sensitizing properties. The clinical manifestations of skin diseases generally include erythema, blisters, urticaria, edema, scars, pigment changes and paresthesias. General management is achieved through the application of first aid as well as diagnostic imaging and tetanus prevention.

Key words: Cutaneous Manifestations, Exposures, Skin, Marine Life

Introduction:

Exposure to aquatic organisms includes a variety of clinical situations. Skin damage after exposure to the marine environment includes bacterial and fungal infections, as well as damage caused by aquatic plants and protists. Dermatologists often find patients with erythema, blisters, wind masses, edema, scars, pigmentation changes, and paresthesias. The environment in which they occur and the distribution of these injuries can be characteristic. (1). Water occupies two thirds of the surface of our planet. Since ancient times, the aquatic environment has shaped the characteristics of our planet and profoundly influenced human civilization. The lipids of human skin are different from those of aquatic animals. Therefore, it is susceptible to the harmful effects of maceration, infection, allergies, poisonous bites and bites of aquatic animals, and extreme temperatures. (2). Aquatic skin diseases are various skin diseases found among swimmers, divers, fishermen and tourists participating in water activities. Some

conditions are particularly relevant to fresh or salt water, while other conditions may occur in both environments at the same time. (3)

Objectives:

The purpose of this study is to summarize the latest evidence on the classification, clinical manifestations and management, and general management of skin conditions after exposure to different types of marine organisms.

Types and classification:

Injuries can be divided into several general categories. Overlaps can also occur, for example, when wear also allows toxins to penetrate broken skin, or when microorganisms are inoculated into a puncture or wound. Some injuries may be accompanied by bleeding and / or dysfunction of the affected area, for example, after strong contact with jellyfish tentacles. Others, such as exposure to venom after injury, can be very mild and self-limited, but can also have fatal consequences (4).

Mechanical injuries without infection,

Wounds are caused by stabbings like sea urchin's spine, sting like octopus or fish, cut like coral, suction like octopus, abrasions and laceration like shell. In rare cases, vital organs of the human body may be fatally injured. A rare case of a catfish bite was also recorded, leading to a fatal myocardial perforation. (5)

mechanical injury followed by infection,

wound was infected by debris or microorganisms found in the water. Improper wound care, such as washing the wound with seawater that may contain microorganisms, may be a source of wound infection. Penetration or laceration caused by the spine of a sea urchin, stingray, a seal bite, or another sting, such as an octopus or fish, often infects the source of infection. (5) Depending on the depth of inoculation and the microorganisms inoculated, serious infections of the underlying tissues and structures can also occur.

In addition to the potential for serious systemic infections, these processes can also lead to deformities and loss of function (6).

Mechanical injuries accompanied by the inoculation of a venom or a substance with sensitizing properties,

Such as sea anemones, sponges, scorpion fish, rock fish, lion fish or manta rays. The most common phylum in this regard is cnidarians. These are animals that exhibit radial symmetry. Your body wall contains a substance similar to jelly. The gelatinous layer includes fire corals, polyps, Portuguese warships, jellyfish, sea anemones, and true corals. Almost everyone has a barbed wire capsule, usually in the tentacles. The barbed sac contains a toxin that is injected into the skin. (7). The sequelae of

poisoning depend on the species involved, the nature and quantity of the toxin, and the size of the injured person. Skin reactions can be immediate, such as urticaria, blisters, blisters, angioedema, or delayed hypersensitivity reactions. Complications include pain, hyperpigmentation after inflammation, scarring, and contractions. Systemic reactions, ranging from mild to severe, such as cardiac arrest and anaphylactic shock can occur. (8).

Clinical manifestation:

Organism-related dermatoses,

Infection-related injuries are the most common and serious ways, and the various vibriosis infections are infected with wound infections, gastrointestinal diseases and traumatic lesions of marine environments or the intake of raw shells or intake intake cause symptoms. (9) Swimmers contain two different syndrome. (A) Primary sepsis, especially due to the consumption of raw oysters, from the consumption of descending seafood. Patients experience fever, diarrhea, nausea, vomiting and more septic shock immediately after consumption. Typically, within 24 hours of the start of symptoms, the patient undergoes skin lesions characteristic, consisting of severe serum with eczema and Bullae. (B) Necrotizing wound infections after direct inoculation The second

syndrome, swimmer and divers, systemic symptoms and mortality in patients with hepatic patients, 50%, 50% mortality and mortality rate. Reduction rate > Disease or diabetes. Infectious diseases also affect men more often than women as a result of female estrogen hormone, which provides protection against endotoxin *V. vulnificus* through unknown mechanisms. (Ten).

Management: Treatment requires the use of fermented sefharosporin and doxycycline. Among children, trimethopisyl-oxazole and aminoglucoiside are used. Necrotic wounds may also require sections or cuts. (11)

E. Rhusiopathiae infection is generally prepared to handle colonial bacteria with an incubation period of 1 to 2 days after damage from the skin. Most human infections are two morphology of the skin, topical skin (ERSSVERLOID) and widespread skin. Both are characterized by pain, accompanied by the pain on the ZUKI scale and the injuries of violent reasons. Unlike skin infection, the invasive infection of E. rhusipatiae is abnormal and has sepsis and subacute bacterial endocarditis. (12)

Management: Biology is sensitive to penicillin, primary cephalosporin and carbapenem, but is resistant to vancomycin and aminoglucoiside. (13)

Invertebrate Stings and Envenomation,

Invertebrates are the largest group of organisms known to cause marine poison or damage to the skin of humans.

Cnidarians skin disease The tentacles of all cnidarians have tightly coiled, hollow, harpoon-shaped microtubules called sacs, which inject toxins into the skin on contact. Cnidarians are the most common poison found in the marine environment by humans. (14).

Human manifestations after cnidarian venom poisoning may include local reactions (whip tingling, blistering, urticaria, allergic contact dermatitis, erythema nodosa, and granuloma annulare) to life-threatening allergic reactions, hemolysis, arrhythmia, and kidney failure . (13)

Management: Generally speaking, affected swimmers should apply vinegar and a cold pack to the wound immediately. Some authors believe that applying sand to the area can help remove unburned bags of barbed wire. Doctors should also consider pain management and tetanus prevention. Hot compresses, antihistamines, and topical steroids can relieve symptoms. Swimmers with circulatory or respiratory failure need adrenaline. It should be noted that swimmers should not dive into fresh water after being bitten by a saltwater cnidarian, as this can activate the nematode sac. (fifteen).

Bather's rash, this is a type of dermatitis that affects bathers, swimmers and divers after contact with the larvae of the adult sea anemone *Edwardsiella lineata* and the thimble jellyfish *Linuche unguiculata*. The larvae are trapped in the swimmer's swimsuit and the pressure caused by the swimsuit or wetsuit causes the toxin to be released. The patient develops tingling and itching, followed by blisters, papules and pustules in the area under the swimsuit, with or without hives, which may begin to appear after the water has drained, but which can last for several hours. (sixteen). The rash usually occurs below the border of the swimsuit, where the larvae will be trapped, but the uncovered area will also be affected. The lesions can be follicular-like, with pustules and blisters variants possible. Systemic manifestations have been reported, including fever, headache, nausea, abdominal pain, and diarrhea. (17).

Management: Injuries are difficult to prevent; Treatment of seal rash includes the use of topical and systemic antihistamines and strong topical steroids. It is important that the swimsuit is washed with detergent before reuse to remove any remaining larvae. (18).

Coral cut, laceration of the hard coral calcium carbonate exoskeleton introducing fragments, bacteria and barbed wire sacs into the wound. Soft corals do not have a calcified exoskeleton, but they do contain sharp sacs. Coral incisions have the potential to cause infections, foreign body granulomas, and delayed wound healing.

Management: Povidone iodine should be used to adequately wash coral wounds, explore debris removal, and then use tetanus toxoid and preventive antibiotics. Coral lacerations can take several weeks to heal. (19)

Sponge dermatitis: Sponges belong to the phylum Porifera and are found in marine and freshwater environments. There are siliceous needles on the exoskeleton of the sponge, some of which secrete crinotoxin, which can cause harmful effects in contact with the skin. Freshwater sponge spicules can cause eye damage, while

sea sponge can cause immediate stinging, burning and erythema due to the action of crinotoxin.

Management: It is recommended to use tape to remove the needles, while acetic acid compression and topical steroids can help treat the effects of crinotoxin. (17).

Echinoderm skin disease, caused by contact with marine invertebrates of the phylum Echinoderm. Creatures that can cause harm include starfish, sea urchins, and sea cucumbers. Sea urchins usually crawl along the ocean floor. Their spines are shallow, blunt or sharp, and may contain venomous glands. Sea cucumbers are benthic sausage-like echinoderms, and their surface produces sea cucumber, a powerful cardiac glycoside. Patients with echinoderms skin diseases will have painful wounds with erythema around them. After divers are handling sea urchins or walking on the seabed, erythema may appear on the soles of their hands or feet. The holotoxin on the surface of the sponge can cause acute irritant dermatitis, painful chemical conjunctivitis or blindness. Ingestion of sea cucumbers can cause death. (18).

Handling: Divers should wear gloves when handling sea urchins and sea cucumbers. Symptomatic treatment after contact with sea urchins includes warm compresses, topical corticosteroids, and antihistamines. Swimmers affected by sea cucumbers should immediately wash their wounds with warm water, soap, vinegar, or isopropanol to remove toxins from the sea cucumber. Eye injuries should be treated with local anesthesia, followed by extensive irrigation and eye consultations (19).

Algal dermatitis

by *L. Majuscula* is a common blue-green algae found in the Pacific Ocean, India and the Caribbean, and can cause algal dermatitis. (twenty). Produces active irritants that cause

acute dermatitis. In this case, blisters and deep peeling appear in the area covered by the swimsuit. Swimmers usually experience a tingling, burning, or tingling sensation within 24 hours of contact. Before long, erythematous dermatitis will appear most of the time. It usually lasts about 1 week around the perineum and perianal area. Management: Treatment includes relief of symptoms with cold compresses, topical steroids, antihistamines, and analgesics. (twenty one).

General management of marine injuries

- Even minor abrasions and lacerations should be considered as likely to be contaminated by common marine Vibrio species
- All wounds should be washed with saline first
- Chopped or inactivated tissue should be removed. Remove peripheral nerves under local anesthesia or obstruction. Foreign body should be removed
- Diagnostic imaging is often an indication, especially in puncture wounds, to remove residual foreign body
- Potential contraction bands such as bracelets, rings and watches should be removed from injured limbs. If necrotizing fasciitis and compartment syndrome are present, measurements of the circumference of the limb should be taken initially. (22)
- All cases of necrotizing fasciitis require sequential surgical debridement, compartment syndrome may require fasciotomy
- Most wounds must be opened or bandaged for secondary healing. Delayed primary closure can be applied to facial wounds that may be disfigured
- Tetanus prevention applies to all marine wounds. (twenty three).

Conclusion:

Exposure to aquatic organisms includes a variety of clinical situations. Skin damage after exposure to the marine environment includes bacterial and fungal infections and

damage caused by aquatic plants and protists. The clinical manifestations of skin diseases generally include erythema, blisters, urticaria, edema, scars, pigment changes and paresthesias. General management is achieved through the application of first aid as well as diagnostic imaging and tetanus prevention.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

References:

1. Venkatraman K, Wafar M. Coastal and marine biodiversity of India. *Indian J Mar Sci.* 2005;34:57–75. [Google Scholar]
2. Tong DW. Skin hazards of the marine aquarium industry. *Int J Dermatol.* 1996 Mar. 35(3):153-8. [Medline].
3. Haddad V, de Souza RA, Auerbach PS. Marine catfish sting causing fatal heart perforation in a fisherman. *Wilderness Environ Med.* 2008 Summer. 19(2):114-8. [Medline].
4. Lippmann JM, Fenner PJ, Winkel K, Gershwin LA. Fatal and severe box jellyfish stings, including Irukandji stings, in Malaysia, 2000-2010. *J Travel Med.* 2011 Jul-Aug. 18(4):275-81. [Medline].
5. Tlougan BE, Podjasek JO, Adams BB. Aquatic sports dermatoses: Part 1. In the water: Freshwater dermatoses. *Int J Dermatol.* 2010;49:874–85. [PubMed] [Google Scholar]
6. Ottuso P. Aquatic dermatology: Encounters with the denizens of the deep (and not so deep) a review. Part I: The invertebrates. *Int J Dermatol.* 2013;52:136–52. [PubMed] [Google Scholar]

7. Gonzalez-Santiago TM, Drage LA. Nontuberculous mycobacteria: Skin and soft tissue infections. *Dermatol Clin*. 2015;33:563–77. [[PubMed](#)] [[Google Scholar](#)]
8. Basler RS, Basler GC, Palmer AH, Garcia MA. Special skin symptoms seen in swimmers. *J Am Acad Dermatol*. 2000;43:299-305. [[PubMed](#)]
9. Prohic A, Jovovic Sadikovic T, Krupalija-Fazlic M, Kuskunovic-Vlahovljak S. *Malassezia* species in healthy skin and in dermatological conditions. *Int J Dermatol*. 2016;55:494–504. [[PubMed](#)] [[Google Scholar](#)]
10. Bergendorff O, Hansson C. Contact dermatitis to a rubber allergen with both dithiocarbamate and benzothiazole structure. *Contact Dermatitis*. 2007;56:278–80. [[PubMed](#)] [[Google Scholar](#)]
11. Diaz JH. Skin and soft tissue infections following marine injuries and exposures in travelers. *J Travel Med*. 2014;21:207–13. [[PubMed](#)] [[Google Scholar](#)]
12. Haddad V, Jr, Lupi O, Lonza JP, Tyring SK. Tropical dermatology: Marine and aquatic dermatology. *J Am Acad Dermatol*. 2009;61:733–50. [[PubMed](#)] [[Google Scholar](#)]
13. Ahlén C, Iversen OJ, Risberg J, Volden G, Aarset H. Diver's hand: A skin disorder common in occupational saturation diving. *Occup Environ Med*. 1998;55:141–3. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
14. Päivikki Susitaival, Animals, Kanerva's Occupational Dermatology, 10.1007/978-3-319-68617-2, (1089-1098), (2020).[Crossref](#)
15. Lamiaa Hamie, Jihane Abou-Rahal, Water-related dermatoses, International Journal of Dermatology, 10.1111/ijd.14316, 58, 5, (515-529), (2018).Wiley Online Library
16. Domenico Bonamonte, Angela Filoni, Pietro Verni, Gianni Angelini, Dermatitis Caused by Fish, Aquatic Dermatology, 10.1007/978-3-319-40615-2, (159-183), (2016).[Crossref](#)
17. Domenico Bonamonte, Angela Filoni, Michelangelo Vestita, Gianni Angelini, Cutaneous Infections from Aquatic Environments, Aquatic Dermatology, 10.1007/978-3-319-40615-2, (185-216), (2016).[Crossref](#)

18. Masashi Mizuno, Envenomation by Cnidarians and Renal Injuries, The Cnidaria, Past, Present and Future, 10.1007/978-3-319-31305-4, (623-635), (2016).Crossref
19. Ulrich H, Landthaler M, Vogt T. Aquatic dermatoses. J Dtsch Dermatol Ges. 2008 Feb;6(2):133-46; quiz 147. English, German. doi: 10.1111/j.1610-0387.2007.06590.x. PMID: 18261083.
20. Oliver JD. Wound infections caused by *Vibrio vulnificus* and other marine bacteria. Epidemiol Infect 2005; 133:383–391.
21. Hicks JH (1977) Swimming and the skin. Cutis 19:448–450 [PubMedGoogle Scholar](#)
22. Kennedy CTC, Burd DAR, Creamer D (2010) Skin hazards of swimming and diving. In: Burns T, Breathnach S, Cox N et al (eds) Rook's textbook of dermatology, 8th edn. Wiley-Blackwell, Oxford, pp 28.53–28.56 [Google Scholar](#)
23. BURNETT JW, KUMAR S, MALECKI JM AND SZMANT AM. 1995. The antibody response in seabather's eruption. Toxicon 33: 99-104.

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