

Aquatic Antagonists: Marine Rashes (Seabather's Eruption and Diver's Dermatitis)

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PRACTICE POINTS

- Seabather's eruption and diver's dermatitis have similar clinical presentations but differ in the ways that organisms come in contact with the skin.
- No commonly utilized imaging modality can differentiate between seabather's eruption and diver's dermatitis, but eliciting a thorough history often can aid in differentiating these marine rashes.
- Physicians should understand the pathologies of common marine rashes due to a projected uptick in the number of cases related to climate change.

When treating marine rashes, it is imperative to properly diagnose the root cause to guide appropriate treatment. Two of the most common rashes experienced after ocean contact are known colloquially as seabather's eruption and diver's dermatitis. In many cases, a thorough history and physical examination can aid in elucidating the responsible organism. Understanding the etiology of rashes obtained in marine environments can improve patient education on precautionary measures that can be taken to avoid exposure. Reasons for further research in this area include development of more effective treatments, as current therapies are limited to symptom management.

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Background and Clinical Presentation

Seabather's Eruption—Seabather's eruption is a type I and IV hypersensitivity reaction caused by nematocysts of larval-stage thimble jellyfish (*Linuche unguiculata*), sea anemones (eg, *Edwardsiella lineata*), and larval cnidarians.¹ *Linuche unguiculata* commonly is found along the southeast coast of the United States and in the Caribbean, the Gulf of Mexico, and the coasts of Florida; less commonly, it has been reported along the coasts of Brazil and Papua New Guinea. *Edwardsiella lineata* more commonly is seen along the East Coast of the United States.² Seabather's eruption

presents as numerous scattered, pruritic, red macules and papules (measuring 1 mm to 1.5 cm in size) distributed in areas covered by skin folds, wet clothing, or hair following exposure to marine water (Figure 1). This maculopapular rash generally appears shortly after exiting the water and can last up to several weeks in some cases.³ The cause for this delayed presentation is that the marine organisms become entrapped between the skin of the human contact and another object (eg, swimwear) but do not release their preformed antivenom until they are exposed to air after removal from the water, at which point the organisms die and cell lysis results in injection of the venom.

Diver's Dermatitis—Diver's dermatitis (also referred to as "swimmer's itch") is a type I and IV hypersensitivity reaction caused by schistosome cercariae released by aquatic snails.⁴ There are several different cercarial species known to be capable of causing diver dermatitis, but the most commonly implicated genera are *Trichobilharzia* and *Gigantobilharzia*. These parasites most commonly are found in freshwater lakes but also occur in oceans, particularly in brackish areas adjacent to freshwater access. Factors associated with increased concentrations of these parasites include shallow, slow-moving water and prolonged onshore wind causing accumulation near the shoreline. It also is thought that the snail host will shed greater concentrations of the parasitic worm in the morning hours and after prolonged exposure to sunlight.⁴ These flatworm trematodes have a 2-host life cycle. The snails function as intermediate hosts for the parasites before they enter their final host, which are birds. Humans only function as incidental and nonviable hosts for these worms. The parasites gain access to the human body by burrowing into exposed skin. Because the parasite is unable to survive on human hosts, it dies shortly after penetrating the skin, which leads to an intense inflammatory response causing symptoms of pruritus within hours of exposure (Figure 2). The initial eruption progresses over a

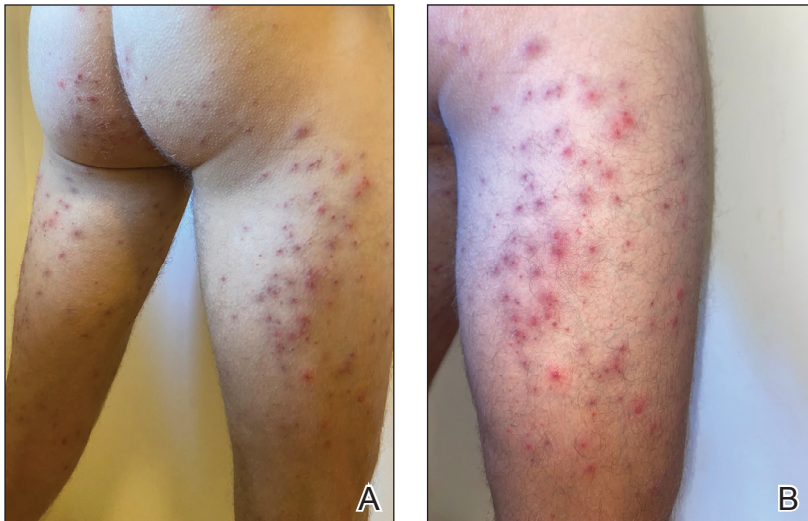
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FIGURE 1. A and B, Presentation of seabather's eruption localized to the buttocks and legs as well as the left arm, respectively, in a patient after prolonged time spent in the ocean wearing a neoprene wet suit. This case represents the classic distribution coinciding with the anatomic areas covered by clothing during water exposure.



few days into a diffuse, maculopapular, pruritic rash, similar to that seen in seabather's eruption. This rash then regresses completely in 1 to 3 weeks. Subsequent exposure to the same parasite is associated with increased severity of future rashes, likely due to antibody-mediated sensitization.⁴

Diagnosis—Marine-derived dermatoses from various sources can present very similarly; thus, it is difficult to discern the specific etiology behind the clinical presentation. No commonly utilized imaging modalities can differentiate between seabather's eruption and diver's dermatitis, but eliciting a thorough patient history often can aid in differentiation of the cause of the eruption. For example, lesions located only on nonexposed areas of the skin increases the likelihood of seabather's eruption due to nematocysts being trapped between clothing and the skin. In contrast, diver's dermatitis generally appears on areas of the skin that were directly exposed to water and uncovered by clothing.⁵ Patient reports of a lack of symptoms until shortly after exiting the water further support a diagnosis of seabather's eruption, as this delayed presentation of symptoms is caused by lysis of the culprit organisms following removal from the marine environment. The cell lysis is responsible for the widespread injection of preformed venom via the numerous nematocysts trapped between clothing and the patient's body.¹

Treatment

For both conditions, the symptoms are treated with hydrocortisone or other topical steroid solutions in conjunction with oral hydroxyzine. Alternative treatments include calamine lotion with 1% menthol and nonsteroidal anti-inflammatory drugs. Taking baths with oatmeal, Epsom salts, or baking soda also may alleviate some of the pruritic symptoms.²

Prevention

The ability to diagnose the precise cause of these similar marine rashes can bring peace of mind to both patients and physicians regardless of their similar management strategies. Severe contact dermatitis of unknown etiology



FIGURE 2. Presentation of diver's dermatitis on the arm, with distribution limited to an area that was directly exposed to water. Photograph courtesy of Tomas Machacek, PhD (Prague, Czechia).

can be disconcerting for patients. Additionally, documenting the causes of marine rashes in particular geographic locations can be beneficial for establishing which organisms are most likely to affect visitors to those areas. This type of data collection can be utilized to develop preventative recommendations, such as deciding when to avoid the water. Education of the public can be done with the use of informational posters located near popular swimming areas and online public service announcements. Informing the general public about the dangers of entering the ocean, especially during certain times of the year when nematocyst-equipped sea creatures are in abundance, could serve to prevent numerous cases of seabather's eruption. Likewise, advising against immersion in shallow, slow-moving water during the morning hours or after prolonged sun exposure in trematode-endemic areas could prevent numerous cases of diver's dermatitis. Basic information on what to expect if afflicted by a marine rash also may reduce the number of emergency department visits for these conditions, thus providing economic benefit for patients and for hospitals since patients would better

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know how to acutely treat these rashes and lessen the patient load at hospital emergency departments. If individuals can assure themselves of the self-limited nature of these types of dermatoses, they may be less inclined to seek medical consultation.

Final Thoughts

As the climate continues to change, the incidence of marine rashes such as seabather's eruption and diver's dermatitis is expected to increase due to warmer surface temperatures causing more frequent and earlier blooms of *L unguiculata* and *E lineata*. Cases of diver's dermatitis also could increase due to a longer season of more frequent human exposure from an increase in warmer temperatures. The projected uptick in incidences of these marine rashes makes understanding these pathologies even more pertinent for physicians.⁶ Increasing our understanding of the different types of marine rashes and their causes will help guide future recommendations for the general public when visiting the ocean.

Future research may wish to investigate unique ways in which to prevent contact between these organisms and humans. Past research on mice indicated that topical application of DEET (N,N-diethyl-meta-toluamide) prior to trematode exposure prevented penetration of the skin by

parasitic worms.⁷ Future studies are needed to examine the effectiveness of this preventative technique on humans. For now, dermatologists may counsel our ocean-going patients on preventative behaviors as well as provide reassurance and symptomatic relief when they present to our clinics with marine rashes.

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