

Starfish Dermatitis Due to *Marthasterias Glacialis*

Dermatite da Estrela-do-Mar Induzida pela Marthasterias Glacialis

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ABSTRACT

Some marine organisms are known to inflict contact dermatitis, whether secondary to professional or recreational activities. We report a 23-year-old white woman with hypersensitivity reaction induced by *Marthasterias glacialis* starfish. To our knowledge this is the first report of starfish hypersensitivity reaction induced by *Marthasterias glacialis* on human skin. Because of the growing popularity of recreational subaquatic activities, such as scuba diving, reports about diving-related skin diseases are expected to increase.

KEYWORDS: Contact Dermatitis; *Marthasterias Glacialis*; Starfish

RESUMO

Alguns organismos marinhos podem causar eczemas de contacto, sejam secundários a atividades profissionais ou recreativas. Apresentamos uma mulher de 23 anos com reação de hipersensibilidade induzida pela estrela-do-mar *Marthasterias glacialis*. Do nosso conhecimento, este é o primeiro relato da reação de hipersensibilidade da estrela-do-mar induzida por *Marthasterias glacialis* na pele humana. Devido à crescente popularidade de atividades subaquáticas recreativas, os relatórios sobre doenças de pele relacionadas com o mergulho podem aumentar.

PALAVRAS-CHAVE: Dermatite; Estrela-do-Mar; *Marthasterias Glacialis*

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INTRODUCTION

Some marine organisms are known to inflict contact dermatitis, whether secondary to professional or recreational activities. With the increasing practice of the subaquatic recreational activities, the number of related dermatitis tends to increase. There are reports of dermatitis to several marine organisms, such as sea anemone,¹ marine sponges,² jellyfish,³ coral,⁴ and mucilaginous aggregates.⁵ Starfish, namely the *Acanthaster planci* starfish, known as “crown of thorns”, was also reported to inflict skin reactions. However, its toxicity is not hypersensitivity mediated but is caused by a venom in its fragile spines, that can cause not only topical injuries, but also serious systemic symptoms.⁶ We thereby present to our knowledge the first report of starfish hypersensitivity reaction induced by *Marthasterias glacialis* on human skin.



FIGURE 1. *Marthasterias glacialis* starfish in its natural environment.



FIGURE 2. Clinical photos showing fissured digital pulpitis in the first, third and fourth fingers of the right hand.

CASE REPORT

We report a 23-year-old white woman, a researcher studying the dynamics of coelomocytes during *Marthasterias glacialis* starfish regeneration. To accomplish the different goals of her study, she had frequent contact with *Marthasterias glacialis* (Fig. 1) even if she reported to wear gloves. Over time, she started reporting a painful bilateral digital pulpitis. These signs were mitigated after starfish contact eviction. After the frequent symptoms appearance and the possible relation with *Marthasterias glacialis* contact, she started to wear 2 pairs of gloves with different composition, such as nitrile and latex. During a period of more frequent contact with the starfish, she developed a painful and fissured digital pulpitis, more intense in the first, third and fourth fingers of the right hand (Fig. 2) that brought her to our attention. Other symptoms were denied. She was previously healthy, had no personal or familiar history of allergy or atopy and wasn't under any chronic or new medication. Epicutaneous patch tests were performed and the following series were tested: standard series of the Portuguese Contact Dermatitis Study Group (32 allergens); patient's personal products such as water from the starfish tank, a 4 mm tip of the arm of the starfish, anaesthesia plus asterosaponin, starfish coelomic fluid, nitrile glove impregnated with tank water, and dry nitrile glove. The patches were detached at 48 hours and the results interpreted at 72 hours. An extreme positive allergic reaction (+++) with erythema, infiltration and bullous reaction was induced by the arm of the starfish (Fig. 3). Mild positive reactions (+) were observed to nickel sulfate and perfume mixture. The patient started clo-



FIGURE 3. Patch test results showing positive allergic reaction (+++) with erythema, infiltration and bullous reaction induced by the arm of the starfish after 72 hours.

betasol 0.1% cream twice daily and desloratadine 5 mg once per day po. Concomitantly, the patient received instructions to avoid direct contact with the starfish. Two weeks after the beginning of therapy, the patient had almost fully recovered from her lesions. One month later, complete remission was obtained.

DISCUSSION

Starfishes, who belong to Asteroidea class of *Echinodermata phylum*, are dorsoventrally flattened with five to fifty rays projecting from a central disk.⁷ *Marthasterias glacialis* is the most seen starfish species in Portugal coast. *M. glacialis* is a major predator of marine animals with mussels being the preferred prey. This starfish species can attain 70 cm in diameter, however is commonly found with 25-30 cm. Each arm bears three longitudinal rows of spike-like spines surrounded by large cushions of pedicellariae with smaller spines scattered between these rows.⁸

Marine organisms resulted from adaptation of different environment conditions. In the sea, where there is almost no light, visual communication is disadvantageous. Organisms were forced to evolve other means of communication, e.g. chemical communication. *Echinodermata*, for instance, are known for the synthesis of some toxic compounds, named saponins (steroidal glycosides). Cytotoxic, hemolytic activity and repellent activity to other marine organisms have been observed, as well as antimicrobial, antiviral activities and anti-inflammatory effects.⁸ The asterosaponins spread inside the water, where many animals are present, so that contact with the surrounding water can induce a pruriginous, papulo-urticarial eruption.⁹

Some species are venomous. For example, the *Acanthaster planci* starfish, known as “crown of thorns”, can inflict a painful sting which may result in granulomatous lesions. This species is the only who has a toxin in its spines that can cause not only topical injuries, but also serious systemic symptoms.⁶ Other member of *Echinodermata phylum*, such as sea urchins and sea cucumbers, also produce venoms. While sea urchins produce toxins present in *pedicellariae* that can harm nervous or circulatory systems, sea cucumbers do not have spines, although they produce holothurin, a visceral toxin that irritates the skin and mucous membranes.^{10,11}

It has therefore been assumed that *Echinodermata* envenomation reactions are generally toxic rather than allergic. In the current case, skin lesions were clinically suggestive of an allergic contact dermatitis, and type IV hypersensitivity was confirmed using epicutaneous

patch tests. Starfish arm tip was confirmed as the causative agent while any water-soluble allergen from the starfish tank, or from the coelomic fluid were excluded.

There have been several reports of delayed, recurrent, persistent skin reactions that have been attributed to allergies with other marine species.¹⁻⁶ In addition to type I hypersensitivity, type IV allergy is considered to be involved in such eruptions. Addy *et al* showed coral dermatitis to be an allergic contact dermatitis because not all people who have contact with coral actually develop the dermatitis.¹² That study suggested some of the risk factors for coral dermatitis are seafood allergy and atopic dermatitis. In our case there was no identified risk factor such as atopic dermatitis or any known allergy.

In the management of *Marthasterias glacialis* contact dermatitis, specific recommendations are required, taking into account the environment and specific conditions of the patient. Contact eviction is the main form of management. In this case, the patient used different types of gloves without relevant effect. The treatment after contact should be symptomatic, and topical steroids may afford symptomatic relief.

This case is also particular because it results from a professional and recurrent contact. Although this type of exposition is unlikely to occur in the wild, allergic contact dermatitis must be considered. Patch tests can be useful in the study of contact dermatitis induced by Asteroidea class, namely starfishes.

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