

## Protein contact dermatitis caused by fishing bait in a patient with contact urticaria caused by shrimp

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Protein contact dermatitis (PCD) is a cutaneous reaction that occurs mainly in atopic patients and presents as chronic hand dermatitis with acute vesicular or urticarial eruptions within minutes after contact with the culprit, high molecular weight proteins of animal or plant material (1). Prick tests with immediate readings and specific IgEs are typically positive, whereas patch tests in normal skin are negative (2).

Many larvae of species of the phyla Annelida, Mollusca and Arthropoda, used as sea fishing bait (3), are potential contact sensitizers among amateur fishermen (4, 5).

### Case Report

A 29-year-old female with no personal history of atopy presented with pruritic erythematous and scaly lesions on the hands, wrists, and, especially, the first three fingers of both hands, with cracked pulpitis (Fig. 1). Symptoms had begun 1 year before and had worsened in the last 6 months, with recurrent episodes of severe pruritus and small vesicles occurring when the patient was at work.

A few months before her dermatitis began, the patient had started working in a fishing shop, where she had

to prepare fishing bait for amateur fishermen (she was responsible for looking after the worms, and taking them from tanks). The more severe pruritus and vesicles occurred within 1 hr after handling live fishing bait, a task that she usually performed without gloves. She also reported that, for many years, she had experienced a localized pruritic lip oedema and a tingling sensation minutes after eating shrimp, but she never developed systemic symptoms.

Patch tests with the European and Portuguese baseline series, gloves and preservatives series, as well as with garlic and its main allergen (diallyl disulfide 1% pet.) (Chemotechnique Diagnostics, Vellinge, Sweden), gave negative results, as did semi-open tests with small fragments of the annelids.

Prick tests were performed by use of an allergy prick lancet, with histamine (1 mg/ml; Merck SA, Darmstadt, Germany) as a positive control, NaCl 0.9% as a negative control, and latex (Alyostal Stallergenes, Paris, France). Several fishing baits handled daily by the patient and shrimp were tested with a prick-by-prick technique. Prick-by-prick tests gave positive results at 20 and 60 min with some of the annelids – *Paranereis acrata* ('coreana'), *Sipunculus nudus* ('salsicha'), and *Diopatra bilobata* ('casulo') – and both raw and cooked shrimp, with erythema and infiltration of > 7 mm, as compared with a control test with histamine (Fig. 2). Reactions to *P. acrata* and *D. bilobata* persisted for > 24 hr as an infiltrated papule, with no vesicles (Fig. 2).

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Fig. 1. Chronic hand dermatitis, with desquamation and fingertip dermatitis.



Fig. 2. Positive immediate prick-by-prick test reactions to *Sipunculus nudus* ('salsicha') (S), *Diopatra bilobata* (casulo) (CA), and *Paranereis acrata* (coreana) (P). Erythema and infiltration were sustained for > 24 hr after the prick tests with *Paranereis acrata* and *Diopatra bilobata*. Positive reactions were also obtained with both raw and cooked shrimp (right).

Total IgE was slightly increased (125 UI/ml) and IgEs fluorescence enzyme immunoassay (FEIA) specific for several fish (cod, salmon, and tuna) and shellfish (shrimp and mussels), tropomyosin, *Anisakis* and latex were negative.

Hand dermatitis improved significantly with the regular use of latex gloves and avoidance of the fishing

baits, but lesions worsened after occasional re-exposure without gloves.

## Discussion

PCD is most often occupationally related, and may be caused by proteins from fruits, vegetables, spices,

plants, woods, grains, enzymes, and animals. Therefore, a wide variety of occupational activities can be affected.

Although the pathogenesis is not well understood, it is thought that macromolecules penetrate the skin, which is often previously damaged by concomitant exposure to irritants, and cause an immunological type I hypersensitivity reaction and activate specific T cells through IgE-laden epidermal or dermal dendritic cells, causing urticarial or eczematous lesions within minutes of exposure. The proteins responsible for the reaction have not been identified in most situations (2).

We report a case of PCD in a non-atopic patient with chronic hand eczema and immediate worsening on contact with the annelid's celomic liquid. Prick tests were essential to confirm the diagnosis of both PCD caused by the fishing baits and contact urticaria (grade I) caused by shrimp, but specific IgEs for the shrimp, tropomyosin or the annelids were not identified. A non-immunological mechanism inducing mast cell degranulation and epidermal attack by the digestive fluids of the annelids could not be excluded.

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