

Lepidopterism – oak processionary caterpillar dermatitis: Appearance after indirect out-of-season contact

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Summary

Lepidopterism by contact with oak processionary caterpillars is becoming more frequent in Germany and is often described in the lay press. The hairs of the adolescent caterpillars cause localized and generalized mechanic-irritative, toxic and allergic skin reactions. We describe the oak processionary caterpillar dermatitis in a married couple caused by indirect contact via their dog's saliva, after the dog had oral contact with an abandoned caterpillar nest in winter and became ill. Accordingly, the recommendation for prophylaxis by avoiding contact with oak processionary caterpillars has to be extended beyond the direct contact with caterpillars in summer.

Keywords

caterpillar dermatitis – *Thaumetopoea processionea* – hypersensitivity – *Thaumetopoein* – poisonous hairs (setae) – larval stage – Erucism

Introduction

The proverbial German saying “stay clear of the oaks” (“*Den Eichen sollst Du weichen...*”), which actually refers to thunderstorms, has experienced a renaissance and acquired a new meaning in recent years. No longer referencing storms, it now refers to insects. A growing number of reports of oak processionary moth/caterpillar hair dermatitis have appeared in non-scientific publications and the disease has now become a serious concern, especially in southern Germany. We report a case that is unusual given the mode of contact with the caterpillar hairs as well as its occurrence outside of the summer months.

Case report

While taking a walk on New Year's Day 2007, a couple's ten-week old dog began poking around on the ground in a nest of oak processionary moths, which had been very widespread in the region during the previous summer. About a half-hour after picking up the nest in its mouth, the dog began salivating, scratching itself, and gagging. After another half-hour, it began to vomit intermittently and its flews, tongue, and pharynx became swollen. While tending to the dog, which was salivating profusely, and taking it to the veterinarian, the couple came into contact with its saliva. The woman, in particular, was exposed on the forearms, neck, and face. The dog remained in the animal hospital overnight where it was given antibiotics, corticosteroids, antiemetics, and infusions. By the next morning, its symp-

toms had largely subsided, with the exception of mild itching.

Overnight, the couple developed severely pruritic, intense red papules measuring a few millimeters in size as well as a few blisters on a background of macular erythema (Figures 1, 2) at the sites exposed to the dog's saliva (medial aspects of the forearms, neck, and face). The woman also had generalized symptoms consisting of severe chills, fever (39.5 °C), and extreme fatigue. An attempt at self-medicating with hydrocortisone ointment and oral antihistamines was unsuccessful. Only after administration of oral corticosteroids and oral antihistamines did symptoms improve after a few days.

Discussion

Oak processionary moths (*Thaumetopoea processionea*) are predominantly found in southern and central Europe [1, 2, 3] as they prefer warm, dry, sunny regions with solitary oaks or trees along the edges of oak forests [1, 4, 5, 6]. In Germany, they used to be concentrated in the state of Baden-Württemberg, but as a result of warmer temperatures in recent years are now found throughout southern Germany.

The oak processionary moth belongs to the order of butterflies (moths). The adult flies at night and has a wingspan of up to 30 millimeters. The forewings are light grey with slight dark markings and the hind wings are a whitish grey. The caterpillars responsible for transmitting disease to humans remain in the eggs over winter and hatch during May of the following year as yellowish-brown insects heavily covered with hair. As they develop, they shed their skin five times, and there are thus six stages of larval development. During the last one, the caterpillars grow to about 5 centimeters in length. On their backs they have a brownish or black stripe with short, soft hair or wart-like structures of a more reddish color and longer hair (Figure 3). In the first larval stages, the insects prefer smaller groups of around 25 which travel in “processions” to feed in the tree-tops. In later stages, the caterpillars form large processions 50 centimeters wide and more than 10 meters long, hence the name “processionary moth” (Figure 4). When it comes time to shed their skin, for example, the caterpillars retreat into well-camouflaged nests near the tree



Figure 1: Oak processionary caterpillar dermatitis.

trunks or on large branches. These nests consist of gossamer webs, caterpillar excrement, shed skin, and pupal cases (Figures 5, 6).

Larvae shed their skin five times, and pupation occurs in June or July. After a diapause of 3–6 weeks, the adult insects (imago) emerge and fly from July to early September, although they live for only a few days. After mating, the females lay their eggs in long plaques on thin twigs in the canopy. Each egg mass may contain 30–300 eggs measuring one millimeter each [7]. Embryonic development occurs in the egg in the autumn. The immature caterpillars remain in the eggs over winter and hatch in the spring. From the third larval stage onward, starting in May, the irritant hairs (setae) of the insects pose a risk to humans. The tube- or harpoon-shaped hairs measure 150–250 μm in length and 5–10 μm thick [7, 8]. The barbed hairs adhere to the skin and mucous membranes, causing clinical symptoms due to mechanical irritation and the presence of a foreign body. Furthermore, they contain the toxin thaumetopoein, which elicits a toxic response, mainly by direct non-IgE-mediated mediator release [4, 9–12]. There have also been reports of allergy symptoms [13, 14] with detection of IgE-antibodies to thaumetopoein (28 kDa) and a 45 kDa protein detected on Western blot [8, 10]. However, studies are still lacking on the significance of a type I allergic reaction, especially in high-risk areas. The duration and clinical course of disease in the patients described here suggest causes of a



Figure 2: Oak processionary caterpillar dermatitis.



Figure 3: Oak processionary caterpillar.

mechanical (from the barbed hairs) and toxic nature (from the toxins contained in them).

The caterpillar hairs serve to protect it against potential predators such as birds and small rodents [1, 7]. Hairs break off easily and either fall to the ground or are carried up to several hundred meters by the wind [5]. Concentrations of the very hardy toxic hairs can increase over several years in the underbrush of oak forests. Abandoned nests can remain toxic for years [15, 16]. Such a nest was the cause of the symptoms observed in the couple described here and their dog.

Given the risk to humans and the stubbornness of the caterpillar hairs, in affected regions the fire department may be brought in to blowtorch the nests and caterpillar processions.

When diagnosing lepidopterism or eru- cism [8], patient history will provide a

clue to the cause. People living in high-risk areas have usually already been informed by the media. The predilection for uncovered areas of the body is often more helpful than the appearance of the lesions themselves. Red, intensely itching urticarial papules and occasionally vesicles appear 6–10 hours after contact and persist for 3–10 days [1, 4, 5, 14, 17]. This corresponds to the signs and symptoms seen in the couple described here. In milder cases, lesions may have a red stripe-like aspect or the clinical appearance of irritant dermatitis [5, 14, 17]. Children tend to have small urticarial lesions which appear within 1–2 hours [4, 5, 14, 17]. Secondary excoriation caused by scratching can heal with scarring. Asthmatic reactions to mechanical/irritant or toxic or allergic causes have been observed when the small hairs are inhaled and reach the mucosae of the



Figure 4: Caterpillar procession.



Figure 5: Caterpillar nest.

lower respiratory tract. Along with conjunctivitis, pharyngitis, bronchitis, and coughing attacks [1] systemic anaphylactic reactions have also been described [2, 18–21].

Differential diagnosis includes contact urticaria, polymorphous light eruption, irritant dermatitis of another cause, insect bites, and drug-induced exanthema [1]. The treatment of choice is a moderately strong topical corticosteroid and oral antihistamine. For severe symptoms, systemic corticosteroids may be given. Corticosteroids, beta-2-mimetics, and/or parasympatholytic sprays are indicated in patients with mucosal involvement.

To summarize, the case presented here is noteworthy because it occurred off-season and underscores the significance of the caterpillar hairs even in the absence of live insects. In addition, the contact was indirect and occurred via the saliva of an affected dog. This shows the risk posed by the oak processionary moth, not only to human beings. Contact should thus be avoided outside of the summer months as well. <<<

Conflict of interest

None.

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Figure 6: Caterpillar nest.

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