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Case report: dog with food allergy and atopy

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Clinical history

Horsti is a neutered male terrier mongrel adopted from a shelter at the age of about 4 years with an unclear history. At that time, he showed poor nutritional status, moderately reddened conjunctivae, mucous eye discharge and high-grade pruritus (Fig. 1). The new owner also reported soft stools several times a day.

Dermatological examination

Dermatological examination revealed partial alopecia on the muzzle, neck, front chest, armpits, abdomen, inner thighs and tail. The skin was hyperpigmented, especially in the axillae and groin. The coat was dull and scaly.

Laboratory tests

The blood chemistry was unremarkable. The blood count showed mild anaemia and

Picture credits: Dr Maria Christian

a marked eosinophilia of 2.5 g/l (reference range 0.04 - 0.6 g/l). Sarcoptes antibody titre was negative. Serology for food allergens was performed, as the pruritus, skin lesions and altered stools were suggestive of food allergy.

Epicrisis

Allergy tests are not used for diagnosis: an allergy is always a clinical diagnosis. They are performed in patients with typical clinical signs (primary pruritus, erythema and pruritusassociated lesions such as alopecia and secondary infections) after ruling out other pruritic diseases. The allergy tests, which should better be called allergen tests, help to identify the allergens that trigger the allergy by measuring allergen-specific antibodies. When working up a suspected food allergy, the tests simplify the selection of ingredients for the elimination diet by which the diagnosis is then confirmed or ruled out. For 8 - 12 weeks,

the animal will receive a strict elimination diet consisting of one protein and one carbohydrate source, for which no IgE or IgG has been detected.



Fig. 1: Horsti at the age of about 4 years

Picture credits: Dr Maria Christian

Horsti showed numerous positive reactions in both the food allergens basic and extended tests. The duck was the only protein that showed a reaction class zero (RK 0) in IgE and IgG. Therefore, the elimination diet was started with a high-quality duck protein-based diet. Within a few weeks, the clinical signs showed a clear improvement. The pruritus disappeared completely, the coat became thicker and silkier, and the faeces normalised.

After four months on the restricted diet, Horsti was a new dog, to the owners' delight. The following spring, Horsti started scratching again more frequently. However, there were no lesions, and the owner considered the pruritus not worthy of treatment. Regular baths with Douxo[®] Calm shampoo (active ingredients: Ophytrium, Panthenol, Pentavitin, Vit PP, Jojoba extracts) brought temporary relief, and the pruritus subsided in autumn and winter. In successive years, the seasonal itching became increasingly intense and did not cease even in winter. To assess whether Horsti had developed an intolerance to his duck-based diet, he was switched to another monoprotein diet. However, after two days, he began to scratch his left ear intensely, the skin was reddened, and there was abundant brown earwax with a strong odour. Otic cytology revealed the presence of numerous Malassezia (Fig. 2). Feeding was changed back to the duck diet. The Malassezia otitis was treated with an ear cleaner, Epiotic[®], twice daily.



Fig. 2: Swab sample from otic exudate: numerous malassezia (dark blue), many adhering to the corneocytes.

Picture credits: Laboklin

Horsti's clinical course indicated that he was not only food allergic but also atopic. As the change of diet worsened the clinical picture and the pruritus could no longer be controlled with shampoo-therapy and skin barrier support, blood was sampled for serology testing against environmental allergens. After blood sampling, oral prednisolone at anti-inflammatory doses was prescribed. Some days later, Horsti presented erythematous, scaly, partially crusted alopecia lesions on the forearm, ventral thorax and abdomen (Fig. 3).

Some of the lesions had exudate under the crust, which was cytologically evaluated and showed abundant neutrophils with extra- and intracellular cocci (Fig. 4). Pyoderma, a common



Fig. 3: Alopecia with erythema and crusting on the forearm Picture credits: Dr Maria Christian



Fig. 4: Cytology of pyoderma: Numerous degenerated neutrophils and some intracellular cocci are detected (arrow).

Picture credits: Laboklin

secondary infection in allergic patients, was diagnosed. Topical treatment was initiated with an antibacterial and skin-care shampoo (Douxo® Pyo, active ingredients: phytosphingosine, chlorhexidine 3%, climbazole 0.5%, Lipacide C8G) and Allerderm® Spot-on (Skin Lipid Complex[™], Glycotechnology, Defensin Technology) to support the skin barrier function. Peptivet[®] foam (active ingredients include AMP2041, chlorhexidine digluconate max. 0.07%, Tris-EDTA) was massaged into the lesion areas twice daily, and Cytopoint[®] (lokivetmab) was administrated instead of prednisolone. The pyoderma resolved within a few weeks, and the pruritus decreased, although it did not disappear completely.

In the allergy test for environmental allergens, Horsti reacted positively to birch, hazel, mugwort, ragweed and *Dermatophagoides farinae* – a result that fits well with his clinic of seasonally increased pruritus. Although he was already nine years old, allergen-specific immunotherapy (ASIT) or hyposensitisation was started after the pyoderma had been treated.

ASIT is the only causal therapy for atopic dermatitis influencing the allergy's pathogenesis. But how does atopic dermatitis actually develop? Allergic reactions occur when the immune system identifies surface antigens (allergens) from harmless elements such as pollen, mites or food as pathogens and consequently fights them. Allergens penetrate through the skin, triggering sensitisation that activates inflammatory cells, mast cell degranulation and the release of numerous inflammatory mediators. Patients suffering from atopic dermatitis also have an altered skin structure with impaired barrier function, further promoting allergen penetration and inflammation. Understanding the pathogenesis illustrates the importance of supporting the skin barrier function and ASIT in managing the disease. The mode of action of ASIT is based on teaching the over-reactive immune system that the allergens it reacts to are harmless. It is achieved by administering small amounts of the allergens involved in the individual's allergy in increasing doses. The classic ASIT solution for subcutaneous application (Fig. 5) contains the natural allergens for which the individual patient has tested positive and correlate with the patient's medical history and clinic. The allergens are purified in a complex process subject to rigorous quality controls and are rechecked after guarantine to produce an injectable solution. Therefore, the production of ASIT takes 2 to 3 weeks. The injection vials, which must be kept refrigerated after opening, can be transported/stored without refrigeration for several days as long as the ambient temperature does not exceed 25°C. Back to our patient: In Horsti's case, ASIT was started in autumn. It is recommended for all seasonal allergic or seasonally aggravated allergic patients because without and with mild clinical signs there are hardly any side effects expected from the injections. Initially, Horsti was additionally treated symptomatically because of the still-existing pruritus. He was injected with Cytopoint® twice, bathed twice

a week with Douxo[®] Pyo and Douxo[®] Calm alternately, and once a week Allerderm® Spot-on was applied. Horsti showed no side effects; after two months, there was a clear improvement, and the antipruritic therapy was discontinued. Nevertheless, he was regularly treated with Douxo® Calm (shampoo and mousse) and Allerderm spot-on. Five months after starting ASIT, Horsti was free of clinical signs. Over the years, he had occasional episodes – especially in spring and late summer - of slightly increased pruritus, which was treated symptomatically (as described above). Horsti's case illustrates very well how valuable ASIT is as part of allergy management, even in an almost 10-year-old patient who has been suffering from the allergy for several years.