Skin on the streets — the eyes have it

Increasing numbers of homeless people have dogs who provide invaluable companionship for them. Providing veterinary care for these pets can be challenging, particularly as diagnostic tests are usually not available and treatment regimes have to be tailored to the needs and capabilities of the owner and animal. This article describes how to approach dermatology cases in dogs belonging to the homeless and outlines some of the therapies that can be employed.

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When a veterinary surgeon is faced with a street dog with a skin condition and does not have access to all the diagnostic aids that we perhaps take for granted in a regular primary care veterinary practice, it is possible to diagnose and treat that animal safely without compromising animal welfare. A trained dermatologist, whether in the human or veterinary field, can diagnose many of their clinical cases by taking a good clinical history, looking at the distribution pattern of the skin lesions and assessing the lesions themselves. While, of course, best practice would always suggest that an initial tentative diagnosis is confirmed by the performance of basic investigations such as skin scrapes, hair plucks and impression smears it is possible (but of course less than ideal) to institute a therapeutic regime without these tests if they can not be performed in the case of a 'Street Vet'.

Distribution of skin lesions

There are exceptions to every rule, but many of the most common skin conditions have very characteristic distributions of skin lesions. As the dermatological disease process becomes more chronic the less typical the distribution pattern will become, but in the early stages of many problems the pattern of lesions together with more general signs such as the presence or absence of pruritus, can help narrow down the list of potential differential diagnoses.

1) Pattern distribution as an aid to differential diagnoses

a) Pruritic skin disease

Ectoparasites

There is some overlap between the presenting signs of some of the most common ectoparasitic problems but most have typical distribution patterns. Flea allergy tends to present with caudo-dorsal signs. Classically the flea allergic dog produces lesions within the 'flea triangle', which is an area of skin that extends as a broad-based triangle that has its base over the tail and forms its apex in the midline of the dorsum. *Sarcoptes scabiei* mites burrow through the skin and tend, therefore, to affect the glabrous areas such as the ear pinnae, especially the ear tips, as well as the extensor aspects of the elbow and hocks. Although dogs with *S. scabiei* infection will shake their head and exhibit a strong scratch reflex when the end of their ear pinna is scratched, they never exhibit signs of otitis externa. *Trombicula autumnalis* mites, picked up in the autumn time from grassland, affect contact areas of the skin so will be often found in the interdigital web. The foot licking that accompanies the mite infestation can mimic allergy, but close inspection of the affected area will reveal the paprika-coloured dots typical of the parasitic larval form of the mite. As well as producing pedal lesions, active outdoor dogs, especially those that forage will also pick up mites on their ventrum and in the small fold on the ear pinna, often referred to as Henre's pocket. *Cheyletiella* spp. mites produce generalised scaling mostly confined to the dorsum; there is usually sparing of the lower legs, face and ears.

Allergy

The distribution of lesions in cases of both cutaneous adverse food reactions (CAFR or food allergy) and atopic dermatitis (AD) can be identical. The only way to differentiate between the two is to food trial the dog with a novel protein or a hydrolysed diet. However, the pattern of lesions seen with both conditions is very different to those seen in ectoparasitic disease. Dogs have involvement of their feet especially their front feet, flexural surfaces especially the hocks and elbows, ventral skin in the axilla and groin, periocular skin and usually have otitis externa. In addition Favrot's criteria can be applied to help diagnose atopic dermatitis (Favrot et al, 2010). These are a list of criteria that can help establish a diagnosis of canine atopic dermatitis once ectoparasites, infections and other allergies have been ruled out. These are detailed in *Table 1*.

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Table 1. Favrot's diagnostic criteria for atopic dermatitis

Onset of signs under 3 years of age
Dog mostly living indoors
Glucocorticoid responsive pruritus
Pruritus before skin lesions
Affected front feet and concave surface of ear pinnae
None affected ear margins
None affected dorsolumbar area

Malassezia dermatitis

Infection with yeast can be exceptionally itchy and can occur concurrently with other diseases such as ectoparasites and allergy. However *Malassezia* spp. infection is usually seen as an intertriginous problem. Lesions tend therefore to be confined to the interdigital spaces, neck and lip folds, chin folds, axilla and scrotal or skin folds in the groin. In allergic skin disease the lesions are usually confined to the dorsal aspect of the foot, whereas when Malassezia infection occurs lesions are found in the interdigital spaces.

b) Alopecic disease

The pattern of alopecia can help determine if the hair loss is inflammatory or non-inflammatory.

Inflammatory alopecia encompasses diseases that cause direct and indirect damage to the hair within the follicle. This group of diseases includes many of the most common causes of alopecia including direct damage through infections such as *Staphylococcus* spp., dermatophytosis and the follicular parasites *Demodex canis*. Less commonly, autoimmune, immune mediated and neoplastic disease cause direct damage and inflammatory alopecia. Indirect damage to the follicle encompasses the many causes of vascular damage. Inflammatory alopecia is usually asymmetrical, multifocal and the dog's coat has a moth-eaten type of appearance. There are commonly signs of inflammation manifested as erythema, excoriation and ulceration. Primary lesions may be present in the form of pustules and papules.

The non-inflammatory alopecia group contains the hair cycle arrest alopecias, which includes all of the endocrine diseases as well as the more unusual diseases such as cyclical flank alopecia; and follicular dystrophies, which comprises many of the colour dilute alopecic diseases. Although there are exceptions to the rule, non-inflammatory alopecia is usually bilaterally symmetrical the stereotypical 'endocrine pattern'. There may be other changes associated with endocrine disease such as changes in the quality and colour of the hair coat and skin.

2) Lesion recognition as an aid to differential diagnosis

Most skin diseases present with some form of primary lesion and as such being able to find and identify a primary lesion can help to formulate a differential diagnosis. Primary lesions are directly associated with the disease process whereas secondary lesions are created through trauma, time and a degree of insult to the skin. Often primary lesions develop into secondary lesions.

Table 2. Primary lesions

Primary lesions	Description
Macules	Flat area of discolouration up to 1 cm in size
Patch	Flat area of discolouration >1 cm in size
Papules	Small solid elevation of the skin up to 1 cm in size
Plaques	Flat solid elevated lesion >1 cm in size
Nodule	Solid elevation of the skin >1 cm in size
Tumour	A large growth many cm in size
Pustule	Small circumscribed skin elevation containing purulent material usually inflammatory cells +/- infection
Vesicle	Small circumscribed elevation of the skin up to 1 cm in size filled with serum
Bulla	Circumscribed elevation of the skin >1 cm in diameter filled with serum
Wheal	Irregular elevated oedematous skin area that often changes in size and shape
Cyst	An enclosed cavity with a membranous lining that contains liquid or semi-solid matter

Table 3. Secondary lesions

Primary lesions	Description
Comedone	Blockage of follicle by sebaceous/epidermal debris leading to a 'black head' (comedone categorised by some authors as primary lesions)
Scale	Accumulation of superficial epidermal cells
Crust	Accumulation of epidermal cells with dried exudate
Erythema	Reddening of the skin due to increased blood flow
Erosion	Loss of superficial part of the epidermis down to but not including the basement membrane
Ulcer	Deeper loss to the epidermis including the basement membrane to expose the dermis
Fistula	Draining tract originating from the dermis or panniculus
Excoriation	Area of self inflicted trauma to the skin
Scar	Accumulation of abnormal fibrous tissue usually associated with full thickness skin damage
Fissure	Splitting of thickened usually lichenified or heavily crusted area of skin
Lichenification	Thickening of skin with accentuation of normal skin markings
Hyperpigmentation	Increase in cutaneous pigmentation
Hypopigmentation	Decrease in cutaneous pigmentation

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Table 4. Lesion type and common disease processes associated with them

Lesion type	Most common disease process
Pustule	Infection (*Staphylococcus* spp.), immune mediated (pemphigus foliaceus)
Papule (usually with pruritus)	Ectoparasites (fleas, sarcoptic mange, pediculosis, *Cheyletiella* spp.)
Ulcer/erosion	Autoimmune and immune mediated diseases (lupus, vasculitis) mucocutaneous pyoderma
Sinus formation	Bite wound, foreign body sinus, deep pyoderma, anal furunculosis, panniculitis
Nodular	Neoplastic disease (mast cell, basal cell carcinoma); infectious granulomas (*Cryptococcus* spp., mycetoma, *Staphylococcus* spp., mycobacteria); sterile pyogranulomatous disease
Crust/scale	Sebaceous adenitis, leishmaniasis, zinc responsive dermatosis; secondary scale due to inflammation with parasites, allergy, infection
Comedone	Demodicosis, dermatophytosis, endocrine disease (hypothyroidism, hyperadrenocorticism)

If afforded the luxury of biopsy collection, primary lesions hold far more information than the usually more chronic secondary lesions. Examples of primary and secondary lesions are detailed in *Tables 2* and *3*.

In view of the fact that the disease process in many skin problems can produce a range of different lesions and those lesions over time can develop into more chronic secondary lesions there is huge overlap between the presenting signs of different diseases. The guide below should therefore be used as a starting point only.

3) Empirical therapy as an aid to differential diagnosis

Careful use of empirical therapy can be invaluable to help establish a retrospective diagnosis of disease, or just to make an animal more comfortable when definitive diagnosis is not possible or is unnecessary.

Empirical therapy with ectoparasiticides is essential in any pruritic dog, and the author's drugs of choice would be one of new oral or topical isoxazalines. The high level of safety, broad spectrum of activity and rapid speed of kill makes these excellent choices to rule out ectoparasites and maintain routine flea control in any street dog.

In the author's opinion, empirical therapy with potent anti-inflammatory, anti-pruritic and immunosuppressive drugs (azathioprine, ciclosporin, oclacitinib), which would include high dose prednisolone, should never be undertaken until a definitive diagnosis has been made. Empirical therapy for skin disease with systemic antibiotics can also be rarely justified, in view of the need to practice appropriate antimicrobial stewardship and the availability of a wide range of effective, safe topical medication.

Topical products such as chlorhexidine based shampoos, mousses and wipes, often combined with climbazole, provide excellent activity against both bacterial and yeast pathogens. One study comparing the persistence of several antibacterial shampoos on dog hairs found that 2% and 3% chlorhexidine shampoo inhibited bacterial growth in vitro far more effectively than lower concentrations of chlorhexidine, benzoyl peroxide and ethyl lactate (Kloos et al, 2013).

While shampoo therapy provides the additional benefits of cleansing and soothing the skin, it is obviously not easily undertaken in dogs on the streets, therefore mousses, wipes and sprays form useful and more practical alternatives. A recent study considered the residual antibacterial activity of canine hair treated with antibacterial mousse products (Ramos et al, 2019). A 3% chlorhexidine 0.5% climbazole-based mousse was found to perform the best of those assessed and showed antibacterial effects for more than 10 days after application.

KEY POINTS

- Pattern recognition of skin disease is useful to help formulate a list of differential diagnoses.
- Identifying primary lesions can help decide on the underlying disease process.
- Carefully chosen empirical therapy can be useful in many cases.

Summary

There is no doubt that it is possible to diagnose and successful treat many of the dogs on the street without the need for extensive diagnostic tests. By assessing the type and distribution of the clinical signs, an initial list of pertinent differential diagnoses can be formulated. By then considering appropriate empirical therapy, many differentials can be eliminated and successful treatment regimes can be put in place that can make patients comfortable. CA

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