

Alopecia in companion animals – from hair cycles to hormones

Author : Sue Paterson

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Sue Paterson MA, VetMed, DVD, DipECVD, MRCVS explores normal hair growth patterns and how and why these may be interrupted

HAIR growth in companion animals follows an orderly pattern called the hair cycle, which can be divided into three different stages. The growing phase is referred to as anagen, the intermediate phase as catagen and the resting phase as telogen, when the hair is shed. As telogen finishes, a small dermal papilla lies deep in the dermis below the hair follicle. As anagen starts, germ cells from the base of the follicle extend down to surround the dermal papilla and a new hair starts to grow.

When the anagen phase is lengthy, hair growth is prolonged and a long hair forms. At the end of the anagen phase, hair growth stops, the papilla moves away from the matrix cells and the hair moves up the dermis. As the follicle moves into the resting phase, the dermal papilla separates away from the matrix cells in the bulb to await the initiation of anagen again.

Alopecia

Various mechanisms are responsible for causing alopecia or hair loss. Hair cycle abnormalities are the most common cause of alopecia in the dog. Various hormones play important roles in either stimulating anagen or prolonging telogen. Thyroid hormone is known to be important in stimulating the anagen phase of the growth cycle and, therefore, when levels of thyroxine drop, one of the most commonly observed signs is hair loss. Typically, hormonal alopecia in dogs presents with

bilaterally symmetrical alopecia, usually of the flanks.

Cushing's disease

Glucocorticoids tend to prolong the telogen phase of the hair cycle, which means that the hair is shed, but anagen is not kick-started, resulting in hair loss. High levels of circulating steroids can occur through over-zealous administration of steroid drugs or through the naturally occurring disease hyperadrenocorticism (Cushing's disease). Hyperadrenocorticism in dogs can sometimes be difficult to distinguish from hypothyroidism as both can produce identical signs of bilateral alopecia. However, because of the effect steroids also have on the skin, subtle cutaneous changes – such as the presence of comedones or blackheads, and thinning of the skin – can help to differentiate the two hormonal diseases.

Alopecia X

Alopecia X is an unusual disease seen in plush-coated breeds such as the chow chow and Pomeranian. The precise aetiology is unknown, but may be caused by an imbalance of hormones or problems at the level of the hair follicle receptors rather than an absolute deficiency of hormones.

Telogen defluxion

Other diseases that can affect the hair cycle are telogen and anagen defluxion. These diseases can occur in both the dog and cat. In telogen defluxion, some form of metabolic stress leads to a synchronisation of the hair cycle so that all of the hairs move into telogen together and an abnormally heavy moult occurs, leading to excessive hair loss.

Causes of telogen defluxion include pregnancy, systemic disease, pyrexia and surgery. As the hair cycle is not halted during the growing phase, the hairs that are lost are normal but dead. The hair tips are not traumatised, but the bulbs are typical of telogen hair bulbs (see [Table 1](#)). Alopecia usually occurs one to three months after the initial insult.

Anagen defluxion

In anagen defluxion, hair growth is stopped abruptly in anagen, leading to hair loss within days. Because hairs are growing while the insult occurs, they are usually abnormal in shape – often referred to as dystrophic hairs – and the bulbs are in anagen (see [Table 1](#)). The most common cause of anagen defluxion is antimetabolic drugs – including many of the oncological therapies. Infectious and metabolic diseases can also cause anagen defluxion, but more commonly lead to telogen defluxion. In both anagen and telogen defluxion, hair loss tends to be diffuse and involves the dorsum and flanks.

A range of diseases can cause damage to the hair follicle and lead to hair loss. The hair can be damaged due to a direct insult to the follicle itself or damaged as a bystander. Insult to the hair follicle can be through infections, parasites, immunemediated attack or neoplasia.

Demodicosis is the most common parasitic problem to affect the hair follicles. Hair pluck can be useful to identify the *Demodex* mites that are often seen lined up along the hair shafts.

Dermatophytosis (ringworm) caused by *Microsporum canis* is probably the most common reason for hair loss in young cats. Bacterial infection of the follicles (bacterial folliculitis) is usually caused by *Staphylococcus pseudintermedius*.

In young dogs, this damage can be associated with parasites such as *Demodex* spp and with allergy, especially atopic dermatitis. In older dogs, it can be seen accompanying hormonal disease.

Rare causes of hair loss in both dogs and cats are the immune-mediated diseases. Alopecia areata is the most common. Cutaneous neoplasia – especially lymphoma – can present in a range of ways, one of which is generalised scaling and hair loss.

The hair is damaged as a bystander in diseases such as vasculitis, where damage to the blood vessels locally leads to loss of the blood supply to the follicle and hair loss. Similarly, when the skin is burned, there is widespread cutaneous damage leading to hair loss.

Hair loss in cats

The most common reason for hair loss in cats is traumatic alopecia. In these cases, the cat over-grooms and plucks out its own hair. Pruritus is usually the trigger for the over-grooming, which can be caused by parasites such as *Cheyletiella*, fleas and lice, and by allergy. Allergic triggers include atopic dermatitis, food allergy and flea allergy. All three diseases can present with hair loss, often with little in the way of other lesions.

Alopecia can affect any part of the body, but cats commonly present with ventral or flank alopecia. Psychogenic alopecia is a very rare cause of hair loss in cats. When it does occur, it is said to be more common in Oriental breeds; however, it should only be diagnosed when more common causes of pruritic alopecia have been ruled out.

Cats can be secret groomers and will often sneak away to pluck out hair so that their owners do not notice. It can be difficult to decide whether hair has been lost because it has fallen out or if it has been pulled out. To try to establish the cause of hair loss, hairs can be plucked out and mounted in liquid paraffin (trichography).

When the hair has been nibbled, the end of the shaft is ragged rather than finely tapered ([Table 1](#)). Where hair has been cut with scissors or clipped, the end of the hair is sharply truncated. When

dogs are pruritic they tend to chew, scratch and rub, rather than groom, so the subtle hair plucking that is seen in felines is rarely present, making traumatic alopecia less common in dogs.

Congenital conditions

Congenital disease is a very rare cause of alopecia in dogs and cats. It can be caused by abnormalities in the formation of the hair follicle or of the hair itself. Where animals are born without hair follicles, they will never grow hair. In other animals, where the hair follicle is present, but abnormal, some hair may grow, but is often fragile and easily broken.

This is the situation in some of the hairless breeds, such as the Chinese crested dog. The most common diseases to affect the hair are the colour-mutant alopecias seen in the so-called colour-dilute dogs. Colour-dilute dogs are those with blue-grey or fawn coats.

Affected breeds include the Yorkshire terrier, Staffordshire bull terrier and Dobermann. In colour-dilute dogs, the pigment within the hair shaft is abnormal. The normal robust scaffold of regular pigment granules is replaced by abnormal granules that produce a weakened hair that is far more susceptible to damage and is often shed.

Further reading

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