Why Is My Patient Bald?

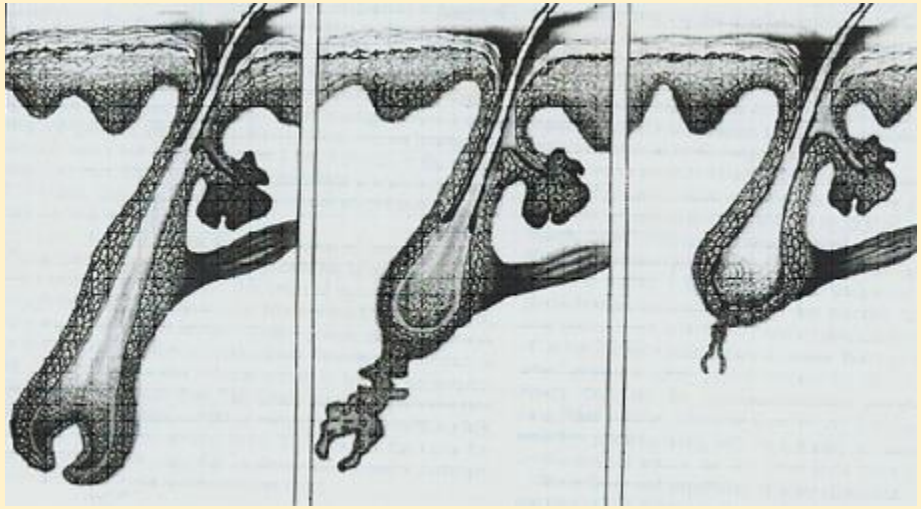
Karen L. Campbell, DVM, MS,
DACVIM, DACVD
Professor Emerita, University of Illinois
Clinical Professor of Dermatology,
University of Missouri

Definitions

- Alopecia = loss of hair
- Hypotrichosis = presence of less than the normal amount of hair
  - Most commonly used in reference to congenital disorders

Causes of Alopecia

- Failure of hair growth
  - Endocrine disease
    - Hypothyroidism
    - Hyperadrenocorticism
    - Sex hormone abnormalities
    - Grow hormone deficiency
  - Ectodermal dysplasia
    - Decreased # hair follicles
  - Hair cycle arrest
    - Hereditary
    - Disease or drugs
    - Nutritional deficiencies



Causes of Alopecia

- Damage to hair follicle
  - Infections
    - Dermatophytes
    - Bacteria
  - Parasites
    - Demodex
    - Pelodera
  - Follicular dysplasia
  - Vascular damage
  - Immune-mediated damage
  - Neoplasia
  - Trauma

First decision = Pruritic?

- History
- Salivary staining
- Broken hairs (other ddx: dermatophytes and follicular dysplasia)
- Hair in feces
- Elizabethian collar-responsive

Hair Loss with Pruritus

- PARASITES: fleas, sarcoptes, notoedres, cheyletiella, otodectes, pelodera, hookworms, chiggers, lice, etc.
- ALLERGIES: environmental (atopy, contact), dietary, parasitic, drug
- INFLAMMATORY: Infectious, Immune-mediated, irritants
- NEUROTIC: Neurogenic, neoplastic, nutritional

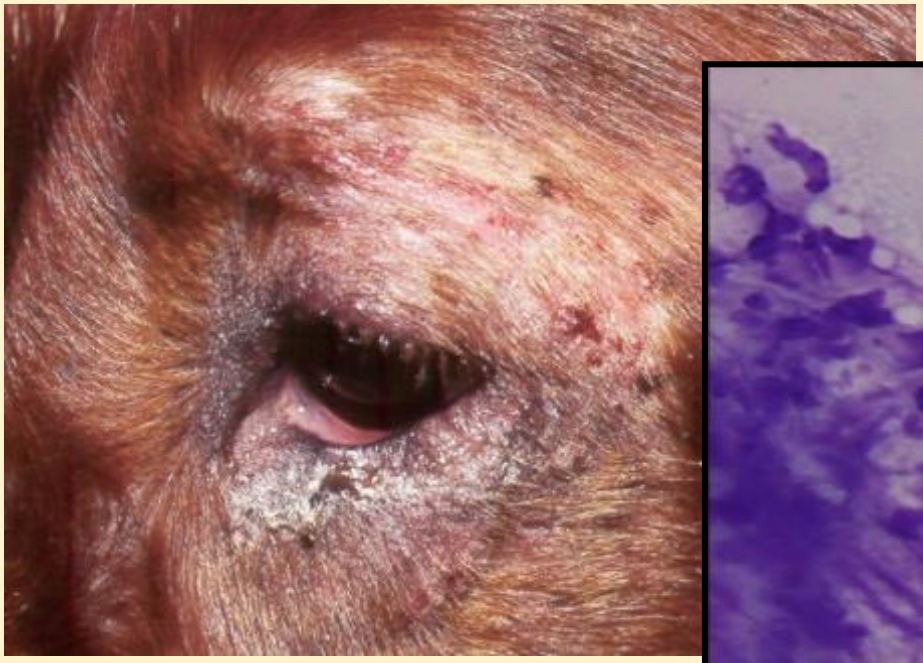
Non-pruritic

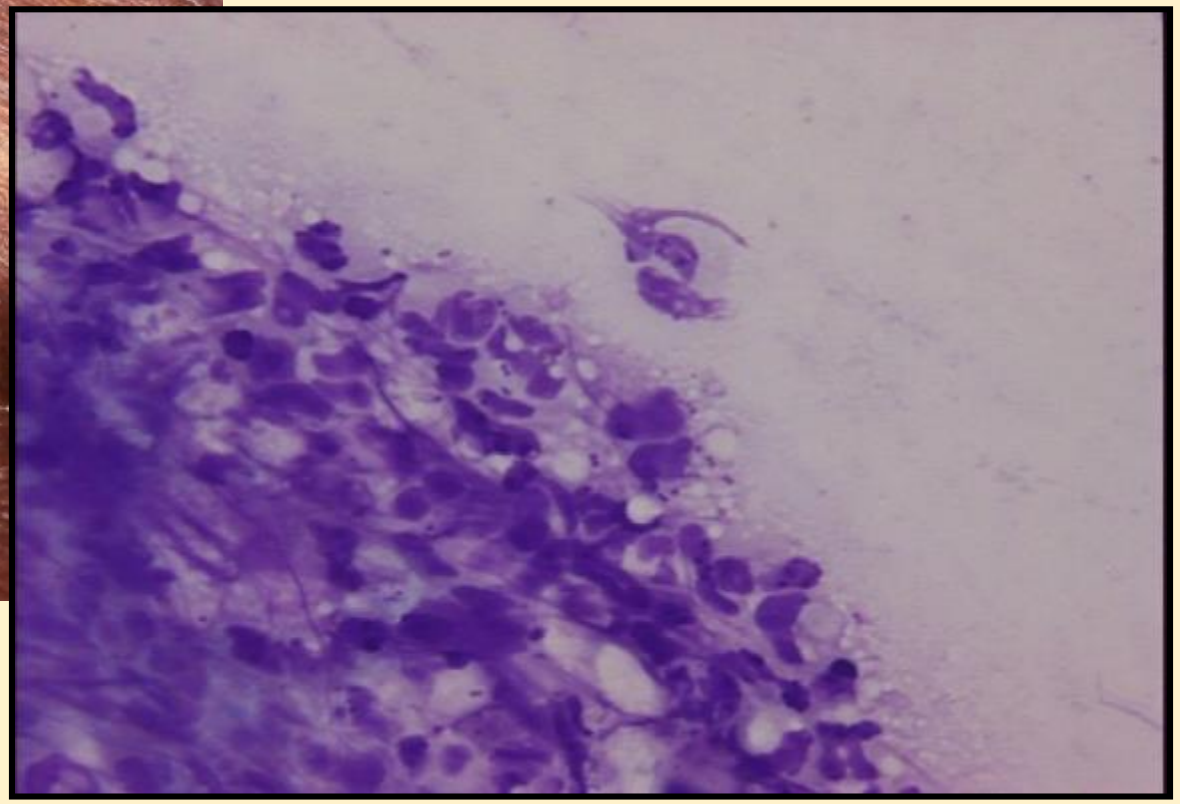
Next decision = distribution: (1) localized, (2) patchy (multifocal), (3) symmetrical or generalized

Non-Pruritic Localized Alopecia

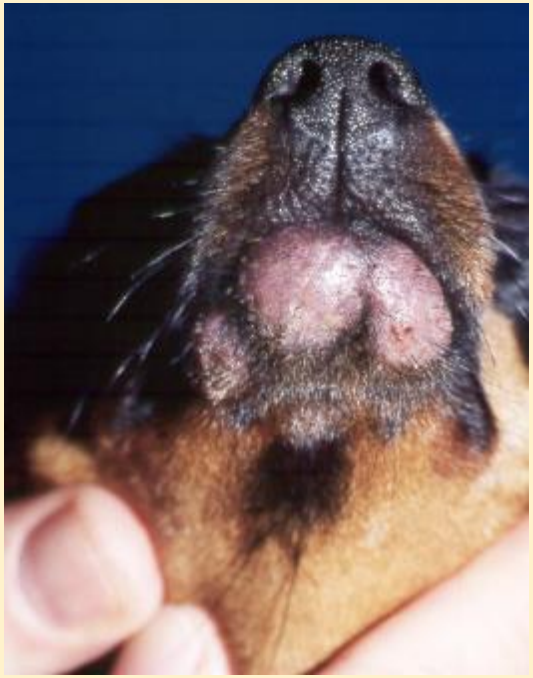
- Demodicosis
- Dermatophytosis
- Bacterial infections
- Discoid lupus erythematosus
- Injection site reaction
- Contact reaction
- Alopecia areata
- Traction
- Cicatricial alopecia
- Iatrogenic (e.g. post-clipping)

Localized Alopecia: Bacterial Infections





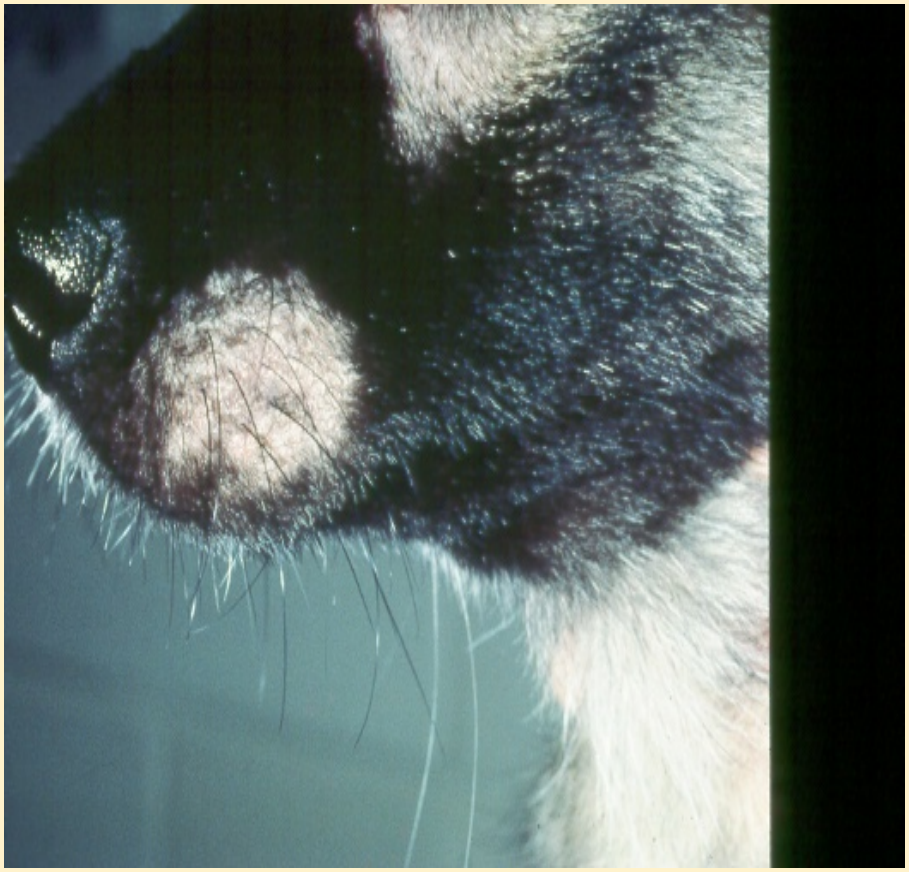
Localized Alopecia: Dermatophytosis



Common

Localized Alopecia: Dermatophytosis

Localized Alopecia: Demodex



Common

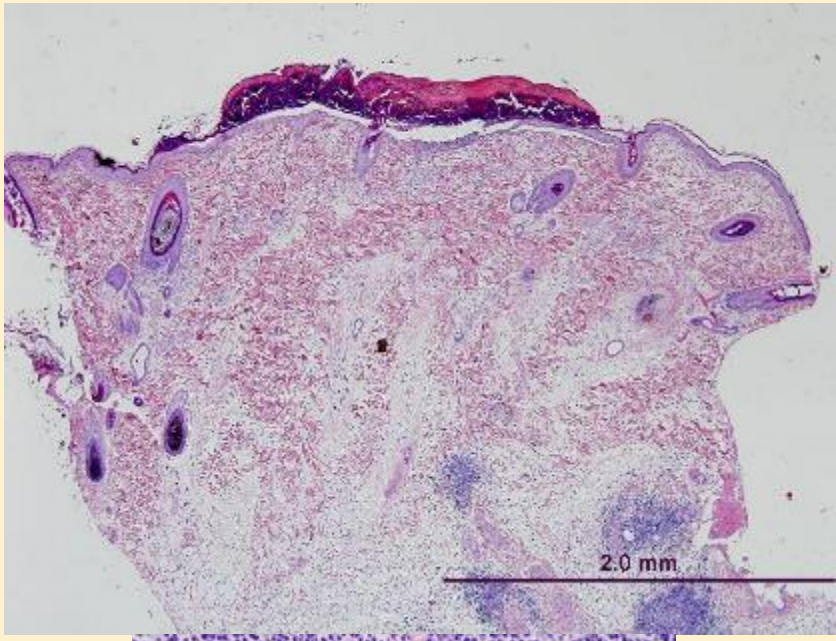
Post-Injection Alopecia (Rabies Vaccine)

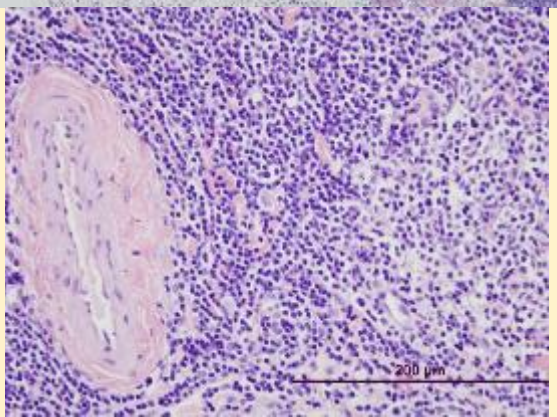
- SQ rabies vaccination
- SQ depomedrol injection
- Usually 2-3 months post-injection, up to 8 months in some dogs
- Rabies-Vaccine induced Vasculitis & Alopecia

  Predisposed breeds: Miniature and Toy Poodles, Bichon Frise, Shih Tzu, Lhasa Apso, Chihuahua, Yorkshire Terrier, Maltese, Manchester Terrier, Silky Terrier, American Eskimo

Rabies Vaccine-Induced Alopecia: Pathogenesis

Antigen-antibody deposits in blood vessels → Localized vasculitis → impaired blood supply to hair follicles (ischemic vasculopathy) → atrophy of hair follicles → alopecia (usually localized to skin over injection site)



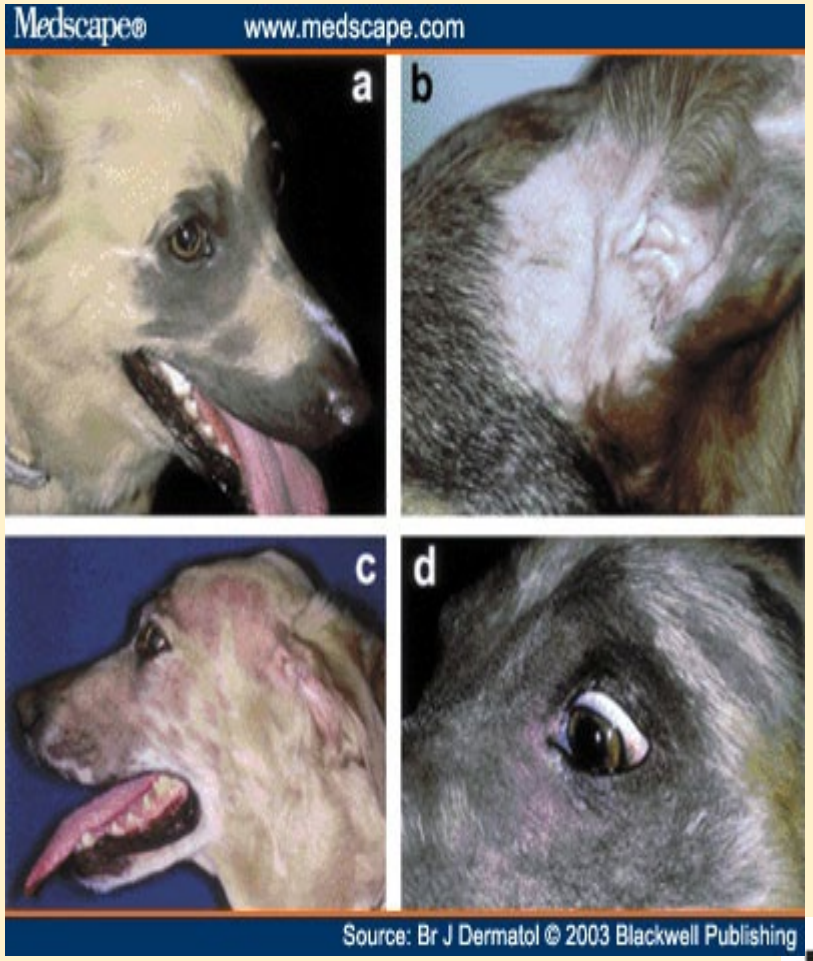


Rabies-vaccine induced alopecia: treatment

- Observation
- Topical tacrolimus (0.1%; Protopic)
- Pentoxifylline (20 mg/kg q 8-12 hrs)
- Surgical excision (must include SQ)
- Check titers rather than vaccinations

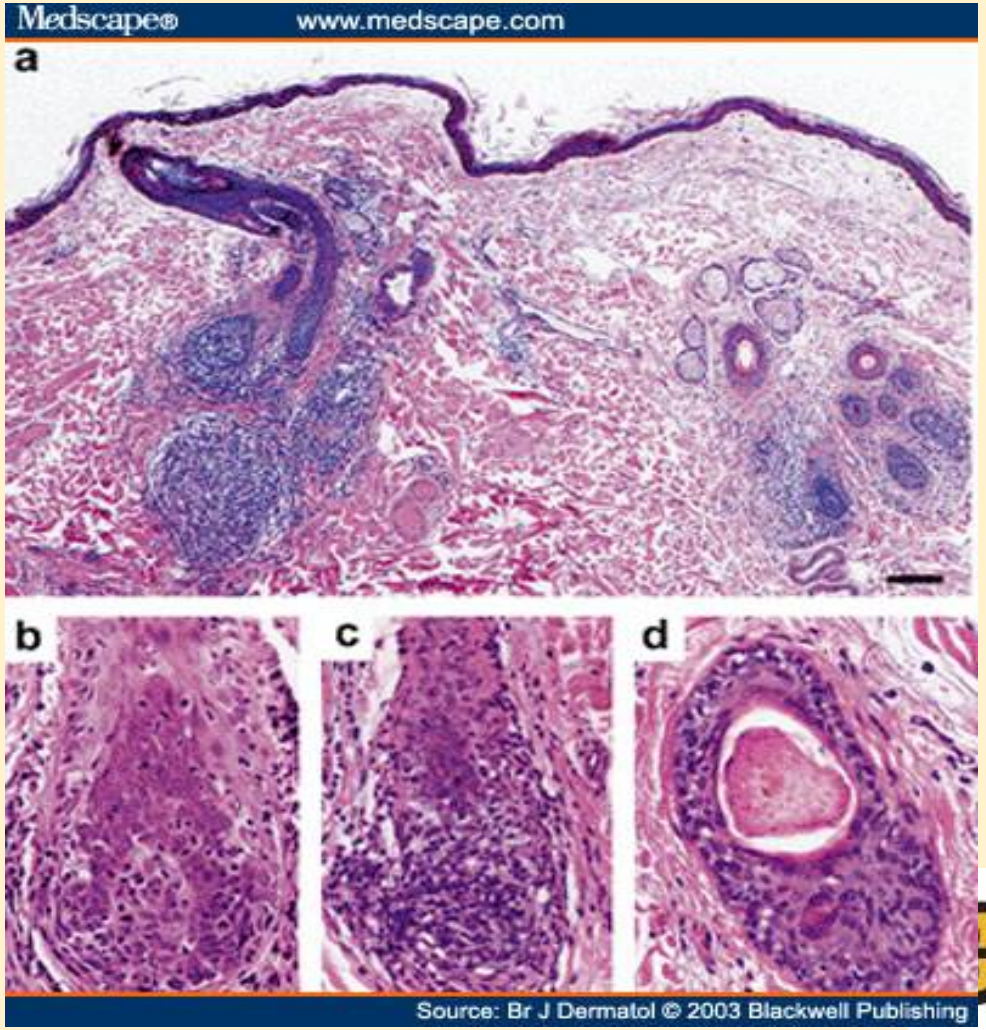
Alopecia Areata

- ↑Dachshunds (?)
- Focal or multifocal
  - Head, neck, trunk
- Immune-mediated
  - Anti-follicular antibodies and cytoxic T lymphocytes



Alopecia Areata

- Biopsy
  - “swarm of bees” = lymphocytes and plasma cells surrounding hair bulb
- Treatments: topical corticosteroids or tacrolimus



Localized Alopecia: Traction

- Hair bows
- Rubber bands

Photo above from pg 196
Small Animal Dermatology: A Color Atlas

Post-Clipping Alopecia

- Plush-coated breeds
  - Chow chow, Siberian husky
- Hairs may not regrow for 1-2 years after clipping
  - Catagen arrest
- History and r/o other causes
- Try Melatonin (3-6 mg/dog q 12 hr)

Non-Pruritic: Patchy (multifocal) alopecia "moth-eaten" hair coat

- Staphylococcal folliculitis
- *Dermatophytosis
- *Demodicosis
- Dermatomyositis
- *Sebaceous adenitis
- *Endocrinopathies
- Alopecia areata
- *Follicular dysplasia
- Congenital alopecia
- *Pemphigus/SLE
- *Epitheliotrophic lymphoma (CTCL, MF)

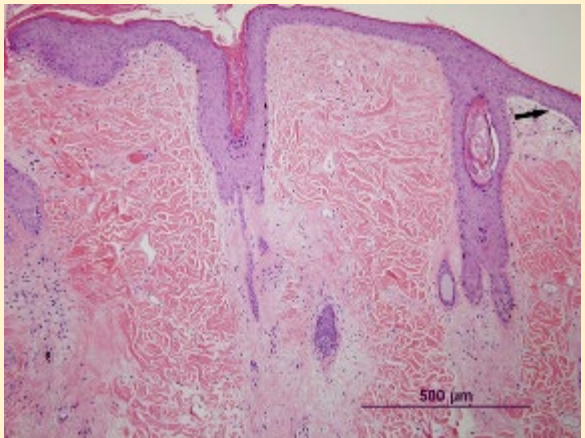
**These may also be diffuse (symmetrical)*

Patchy Alopecia: Staphylococcal Folliculitis (COMMON)

Patchy Alopecia: Dermatophytosis

Patchy Alopecia: Demodicosis

Canine Familial Dermatomyositis



Canine Dermatomyositis

- Management:
  - avoid trauma
  - pentoxiphylline 20 mg/kg q 8 hrs
  - Vitamin E 100-400 IU BID
  - Tetracycline + Niacinamide
  - Corticosteroids (prednisolone 0.5 mg/# BID)
  - treat secondary infections, neuter

Non-pruritic: Patchy Alopecia: Sebaceous adenitis

Sebaceous Adenitis

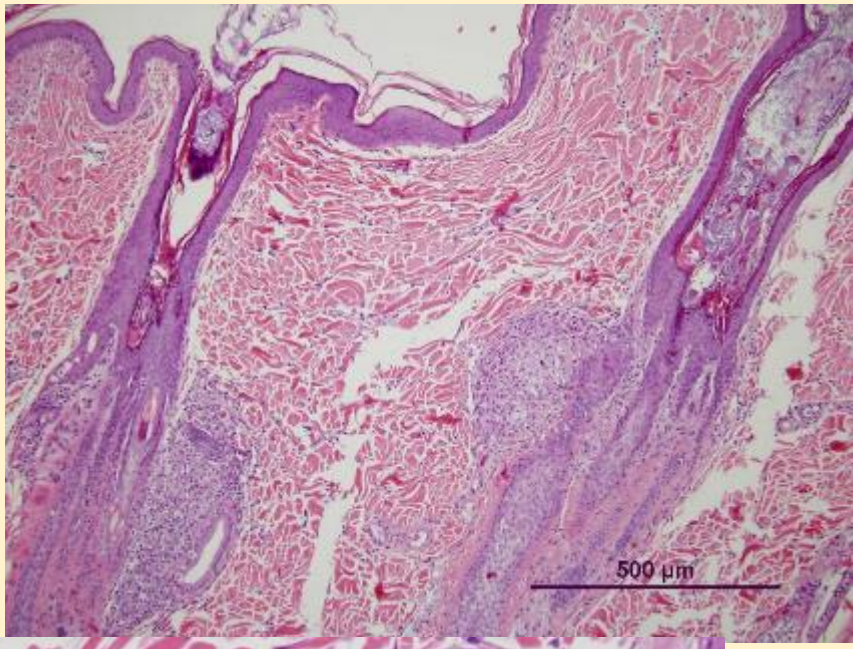
- Breeds
  - Standard poodle (autosomal recessive)
  - Akita
  - Vizsla
  - Samoyed
  - other
- Age
  - young to middle-aged

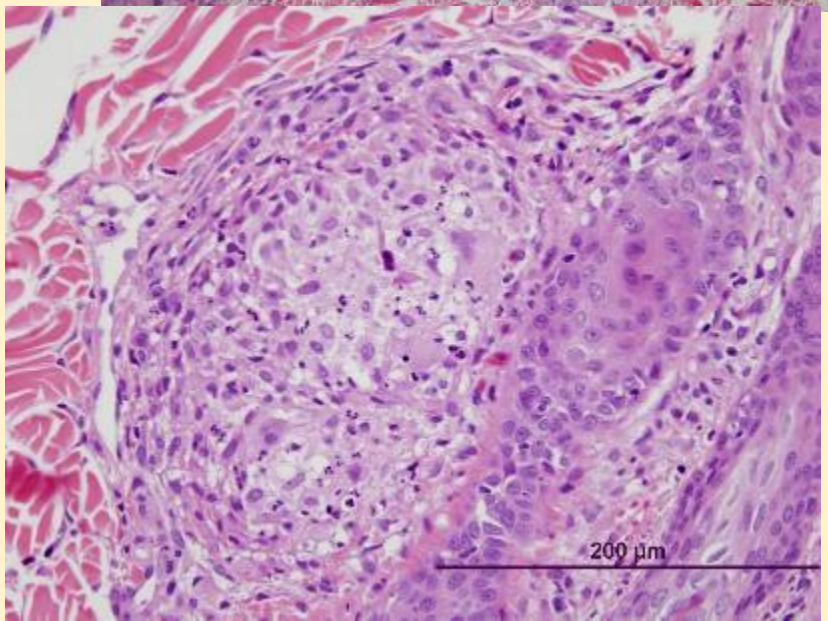
Sebaceous Adenitis

- Long-coated dogs
  - symmetrical alopecia, scaling, dry coat on dorsum, nose, tail, pinnae, truck
  - later follicular casts and matting
- Short-coated dogs
  - “moth-eaten”alopecia
  - secondary pyoderma

Sebaceous Adenitis

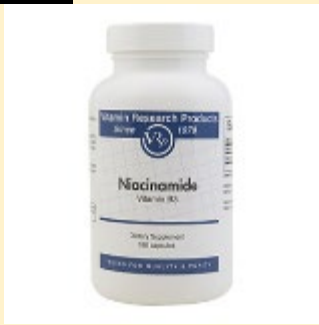
- Diagnose
  - R/O other diseases
  - Clinical signs
  - Skin biopsy
    - Absence of sebaceous glands or periadnexal pyogranulomatous inflammation





Sebaceous Adenitis-Treatment

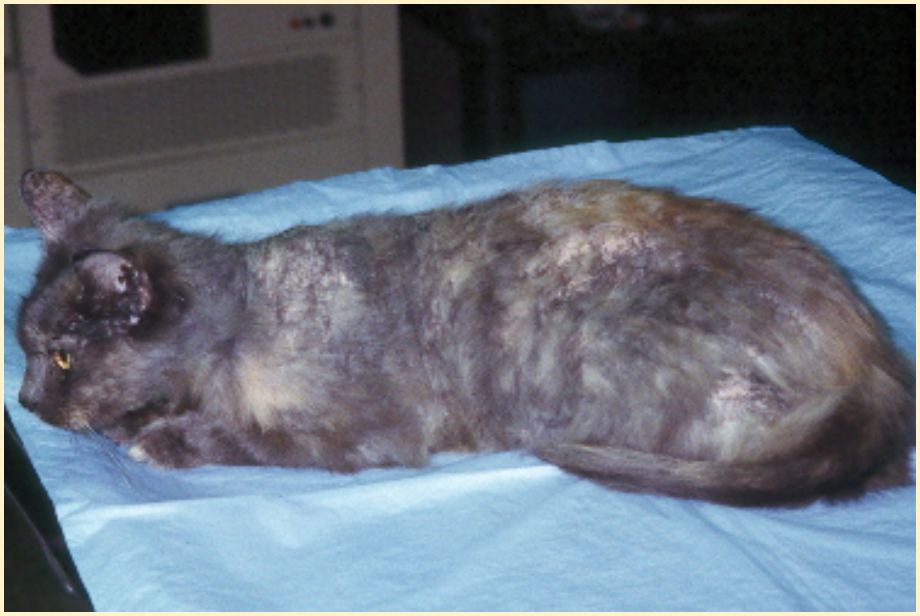
- Follicle flushing shampoos (Ethyl lactate)
- Moisturizers (“soak-in-oil treatment”)
- Isotretinoin (1 mg/kg)
- Vitamin A (1000 IU/kg)
- Tetracycline + Niacinamide
- Cyclosporine 5 mg/kg
- Treat secondary infections
- Client education: goal is to minimize symptoms; no cure, is hereditary



Congenital Hypotrichosis

- Multifocal forms due to ectodermal defect
- Autosomal recessive or X-linked recessive
- Agenesis of hair follicles in affected areas
- Protection from uv light damage needed
- More generalized forms will be discussed under symmetrical alopecia

Patchy Alopecia: Pemphigus Foliaceous



Lesions may be multifocal or generalized
Diagnose with cytology & skin biopsy

Patchy Alopecia: Cutaneous T cell Lymphoma

Hair loss may be localized, multifocal or generalized; biopsy for diagnosis

Non-pruritic Symmetrical Alopecia

- *Endocrine
  - Hypothyroidism
  - Hyperadrenocorticism
  - Sex hormone imbalances
  - Alopecia X?
  - Pituitary dwarfism
- Infectious
  - *Demodecosis
  - *Dermatophytosis
- Neoplastic
  - *CTCL
  - Paraneoplastic alopecia
- Hereditary
  - *Congenital alopecia
  - Dermatomyositis
  - Pattern baldness
  - Cyclic flank alopecia
  - Color dilution alopecia
  - Alopecia X?
- Miscellaneous
  - Feline symmetric alopecia
  - *Telogen/anagen defluxion

**Often generalized (Diffuse)*

Endocrine Alopecia: Hypothyroidism

- Common Disorder
  - Lymphocyctic thyroiditis
    - Many breed predispositions
  - Idiopathic thyroid atrophy
  - Iatrogenic (sulfa antibiotics, other drugs, surgery)

Endocrine Alopecia: Hypothyroidism

- Common signs
  - Thin, dry haircoat, scaling
  - Failure of hair regrowth after clipping
  - Secondary infections
  - Weight gain
  - Lethargy, heat seeking
- Diagnosis
  - History and physical exam
  - TT4, fT4, cTSH, TSH stim
- Treatment
  - T4 supplementation
  - Monitor for therapeutic levels

Endocrine Alopecia: Hyperadrenocorticism

- Common in dogs, uncommon in cats
- Predisposed breeds
  - Dachshunds, Boxers, Boston Terriers, poodles
- Causes
  - Iatrogenic
  - Bilateral adrenal hyperplasia
    - Excessive ACTH production from pituitary
  - Adrenocortical tumor

Endocrine Alopecia: Hyperadrenocorticism

- Clinical signs
  - PU/PD/PP/Panting
  - Muscle loss
  - Pendulous abdomen
  - Thin skin, hair loss
  - Calcinosis cutis
  - Comedones
  - Hyperpigmentation
  - Easy bruising
  - Secondary infections
  - many others

Endocrine Alopecia: Hyperadrenocorticism

- Diagnosis
  - History, physical exam
  - Screening bloodwork & UA
    - ↑neutrophils, ↓ lymphocytes & eosinophils
    - Corticosteroid-induced isoenzyme of alkaline phosphatase
    - Hypercholesterolemia
    - Low urine specific gravity
  - Adrenal function testing
    - ACTH stimulation test
    - Dexamethasone suppression tests
    - Endogenous ACTH
  - Abdominal ultrasound
  - MRI/CT (pituitary & adrenals)

Endocrine Alopecia: Sex Hormone Imbalances

- Hyperestrogenism
  - Sertoli cell
  - Ovarian cysts
  - Symmetrical alopecia
  - Variable pigmentation
  - Seborrhea
  - Nipple enlargement
- Diagnosis
  - Estrogen levels
  - Ultrasonography
- Treatment
  - neuter

Endocrine Alopecia: Pituitary Dwarfism

- German shepherd dogs & Karelian bear dogs predisposed
  - Autosomal recessive
  - Persistent cysts of Rathke's pouch compress pituitary gland ↓ growth hormone, ↓ TSH, may ↓ FSH, LH & ACTH

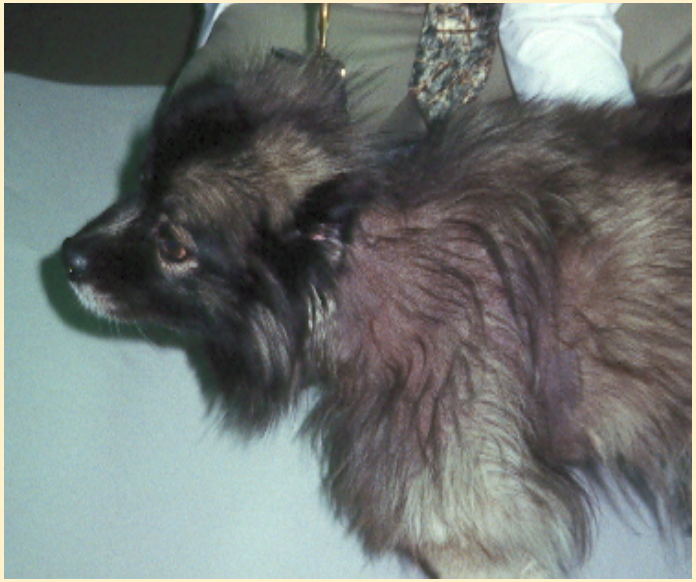
Endocrine Alopecia: Pituitary Dwarfism

- Proportionate dwarfs
- Retain puppy coat and teeth; over time develop alopecia and secondary infections
- Diagnose with history, examination, radiographs show persistence of growth plates in bones, CT or MRI to find pituitary cyst, pituitary function tests
- Treat secondary infections, thyroid supplementation if concurrent hypothyroidism

Alopecia X

Variety of hormonal imbalances
- Elevated progesterone (common)
- Low androgens
- Variable estrogens
- Mild increases in cortisol

- Breed predispositions
  - Pomeranian
  - Chow chow
  - Keeshond
  - Samoyed
  - Alaskan Malamute
- Males may be predisposed, also seen in females
- Coat changes usually start 1-3 yrs of age

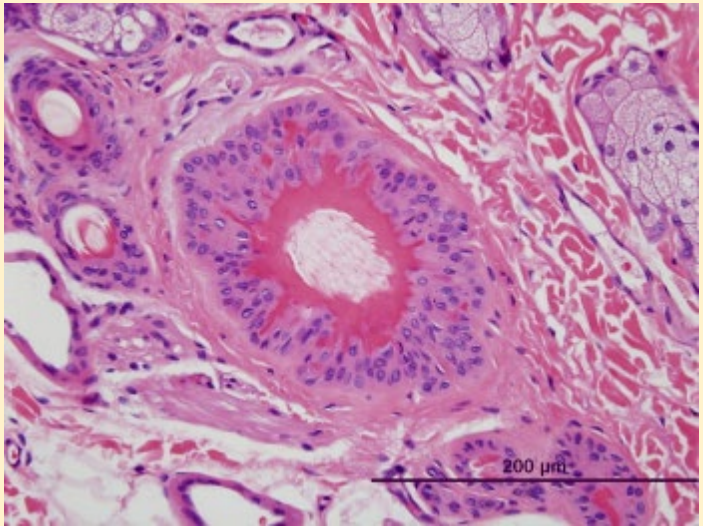


Alopecia X: Clinical Signs

- Dull, dry coat
- Loss of guard hairs (leaving a "wooly” or puppy-like coat)
- Spares head and extremities
- Frictional areas loose hair first
- Alopecic areas become hyperpigmented
- Hairs do not regrow after clipping

Alopecia X: Diagnosis

- Rule out other endocrinopathies and other causes of generalized alopecia
- Document abnormalities in sex hormones
- Skin biopsies



Alopecia X: Management

- Neuter intact animals
- Melatonin 3-6 mg/dog BID for 2-3 mo
- Melatonin implants
- “observation”
- Micro-needling
- Methyltestosterone (may cause cholestasis, monitor liver enzymes)
- Ketoconzole 10-15 mg/kg BID
- op’DDD 15-25 mg/kg daily for 5-7 days and then twice weekly
- Trilostane 5-10 mg/kg daily or 3 mg/kg bid
  (inhibits 3 β-hydroxysteroid dehydrogenase)

Alopecia X

Generalized Alopecia: Dermatophytosis

Generalized Alopecia: Demodex

Sebaceous Adenitis

- See previous discussion

Cutaneous T cell Lymphoma

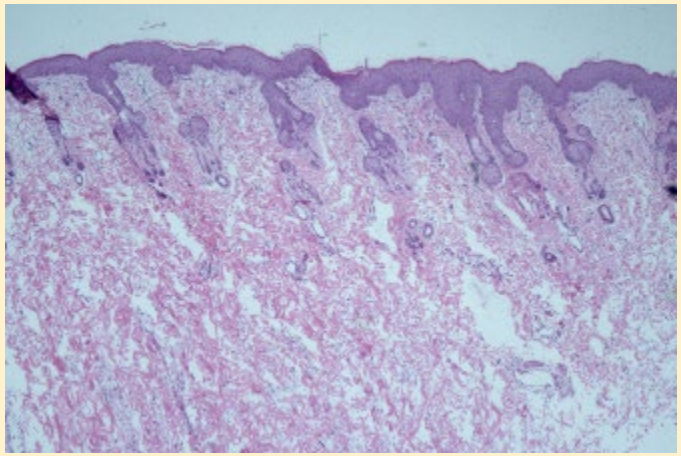
Alopecia may be localized, multifocal or generalized; diagnose with biopsy.

Paraneoplastic alopecia

- Associated with pancreatic adenocarcinoma and bile duct carcinomas
- Older cats
- Sudden onset of malaise and hair loss
- Marked exfoliation of hair
- Shiny appearance to skin

Paraneoplastic Alopecia

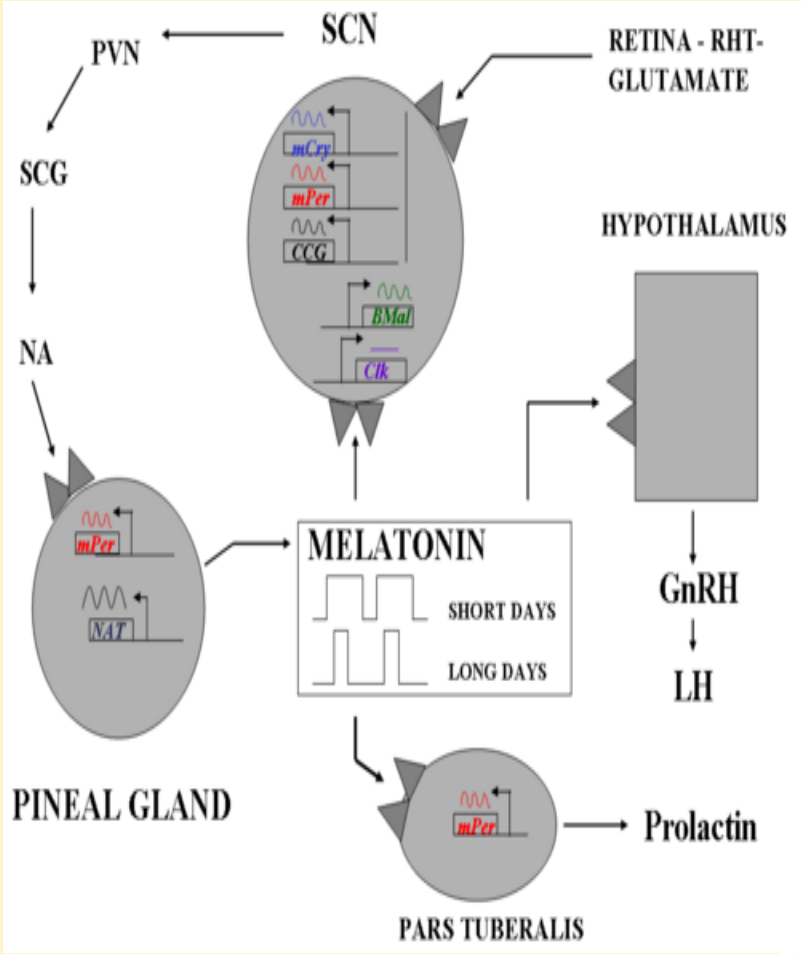
- Diagnosis
  - Rule out other diseases (thyroid and adrenal function tests)
  - Skin biopsies: miniaturization of hair follicles
  - Abdominal ultrasonography—may find pancreatic or hepatic tumors
- Management
  - Not successful to date
  - Consider euthanasia



Recurrent (Seasonal) Flank Alopecia

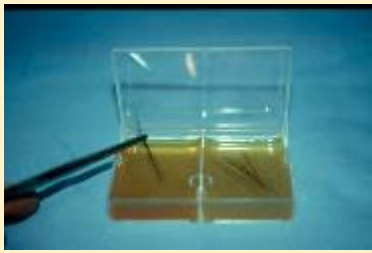
Canine Recurrent Flank Alopecia

- Genetic deficiency of melatonin?
- Melatonin influences production of other hormones involved in hair growth:
  - Prolactin
  - Androgens
  - Estrogens
  - Growth hormone



Canine Recurrent Flank Alopecia

- Diagnosis: r/o other causes of multifocal alopecia
- Skin biopsy
  - Marked follicular hyperkeratosis
  - Follicular plugging results in distortion of the hair follicles, keratin plugs extend from primary follicles into secondary ones
  - “witches feet”



Canine Recurrent Flank Alopecia

- Management
  - Observation
  - Melatonin
    - 3-6 mg q 8-12 hours
    - Treat approximately 2 months
    - Discontinue when good hair regrowth
    - May be used prior to anticipated onset of hair loss to prevent future recurrence
    - Effective in 50-75% of cases
  - Melatonin implant

Color Mutant Alopecia

- Dobermans (blue, some red and fawn)
- Dachshunds (blue)
- Whippets (blue)
- Standard Poodles (blue)
- Great Danes (blue)
- Chow Chows (blue)
- Irish Setters (fawn)

Color Mutant Alopecia

- Melanin clumping in hair bulbs and shafts results in brittleness (* DIAGNOSTIC CLUE)
- Hairs break
- Secondary infections common
- Management includes use of follicle flushing shampoos (BP, ethyl lactate), antibiotics for secondary infections, topical emollients and humectants

Black hair follicle dysplasia

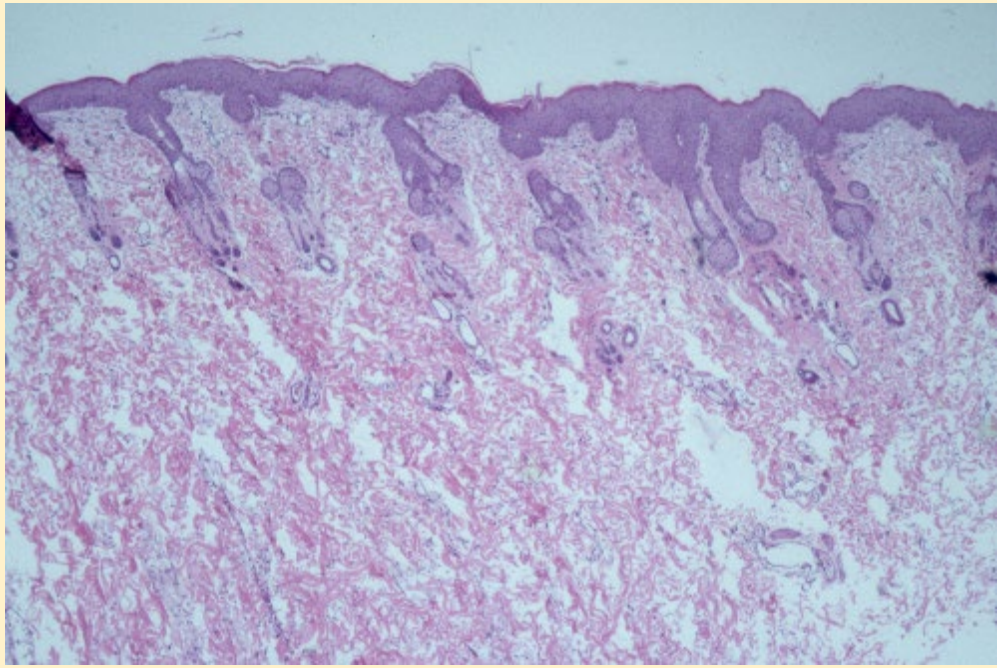
- Hair loss and scaling only affects black-haired regions
- Skin biopsies show follicular dysplasia with clumping of melanin in hair bulbs and shafts

Canine Pattern Baldness

- Hair loss typically begins around 6 mo
- Affected areas include
  - Ear pinnae
  - Ventral neck
  - Ventral chest and abdomen
  - Caudal thighs
  - Perineal region
- Affected breeds include
  - Dachshund
  - Boston terrier
  - Chihuahua
  - Whippet
  - Italian greyhound
  - Greyhound
  - Boxer
  - Miniature pinschers
  - Manchester terriers

Canine Pattern Baldness

- Diagnosis
  - Rule out other causes of symmetric alopecia
  - Biopsy
    - Hair follicles are atrophic
    - Residual hairs have small diameter
- Management
  - Try Melatonin ?
  - Observation

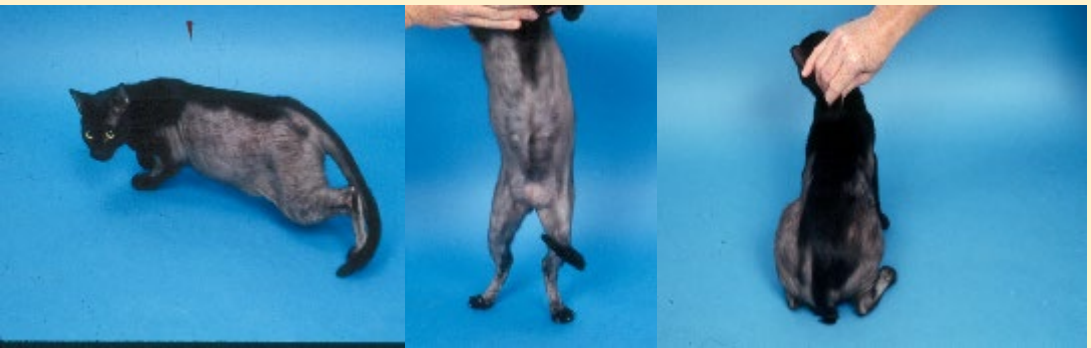


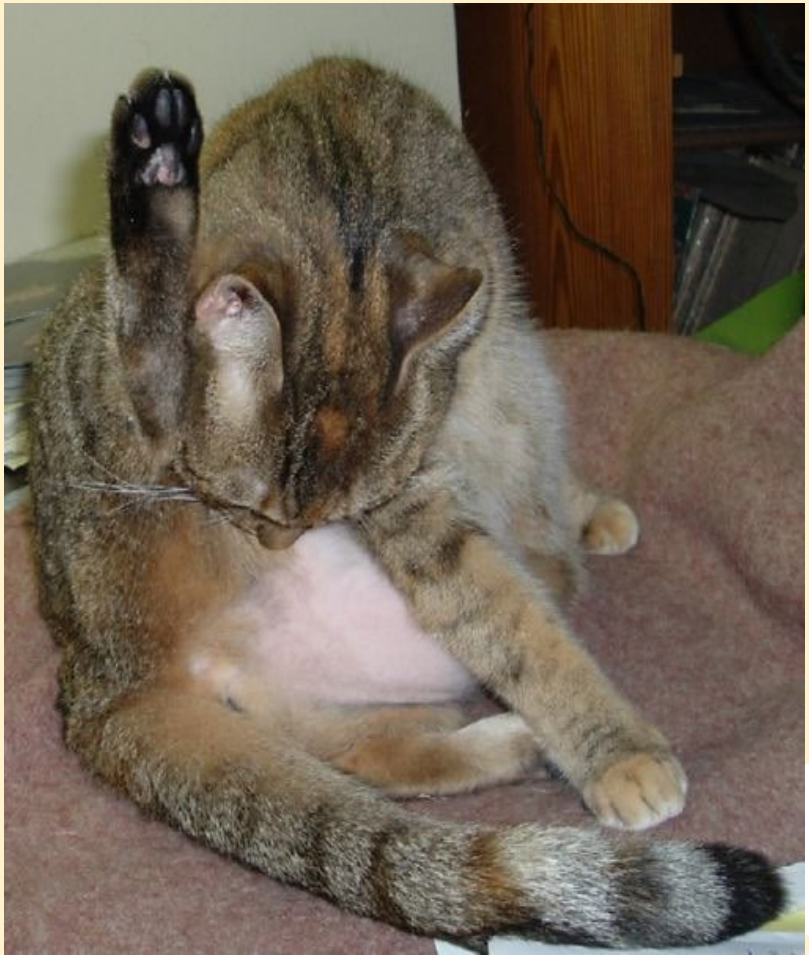
Congenital Hypotrichosis

Breeds developed to appear hairless, on skin biopsy the hair follicles are dysplastic and hairs do not reach surface of skin.

Feline Symmetrical Alopecia

- Differential Diagnoses
  - Psychogenic alopecia
  - Allergies - food, flea, environmental
  - Ectoparasites
  - Dermatophytes
  - Endocrinopathies
  - Telogen /Anagen defluxion





Feline Symmetric Alopecia Management

- Identify and treat cause
- Elizabethan collar or sweater trial
- Corticosteroid trial
- Hormonal therapy
  - thyroxine
  - Progesterone (numerous side effects!!!)
- Anti-anxiety drugs if suspect psychogenic

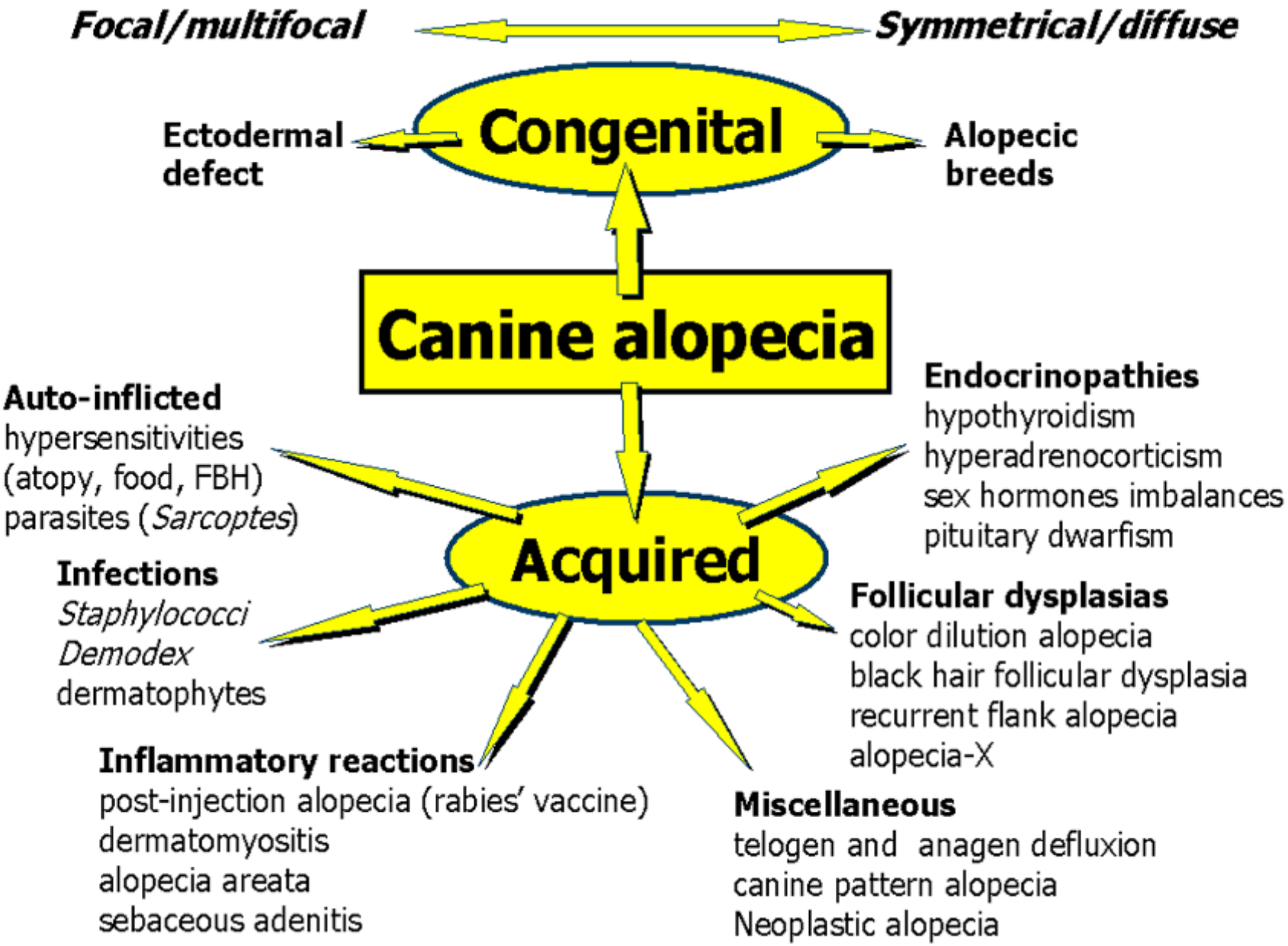
Telogen Defluxion

- Stressful circumstance or drug results in all hairs entering telogen
- When new hairs start to grow see a massive shedding of the old hairs
- Common example is the post-partum shedding seen in many breeds of dogs about 6 weeks post whelping

Diagnose with history, rule out other causes of alopecia

Anagen Defluxion

- Sudden loss of hair within days of a severe illness or chemotherapy
- Result of interruption of hair growth
- Hairs are misshapened
- Diagnose with history + rule out other causes of alopecia
  - Chemotherapy predisposes to infections and demodicosis



From: Secrets in Small Animal Dermatology: page 288

Thank you to Dechra for Sponsorship!

NAVDF provides up-to-date Dermatology CE (NAVDF.ORG) 2019 meeting in Austin, TX

WCVD9 in Sydney, Australia– an experience of a lifetime!

(October 20-24, 2020)

Karen L. Campbell, DVM, MS
Diplomate, American College of Veterinary Internal Medicine
Diplomate, American College of Veterinary Dermatology

University of Missouri Veterinary Health Center—Wentzville
1092 Wentzville Parkway
Wentzville, MO 63385

(636) 332-5041
(636) 327-6400 fax

campbellmotsingerk@missouri.edu

klcampbe@Illinois.edu