

Symmetric alopecia in the dog:
not always an endocrine disorder

Lluís Ferrer

Department of Clinical Sciences



Tufts
UNIVERSITY

Cummings School of
Veterinary Medicine

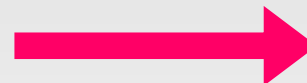
Alaskan Malamute Club of America – Sturbridge Massachusetts, Nov. 2015

Alopecia: clinical presentations

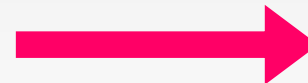
1. Focal-multifocal alopecia



2. Alopecia associated to pruritus (self-induced)



3. Symmetric bilateral alopecia (progressive)



4. Cicatricial alopecia (on scar areas)

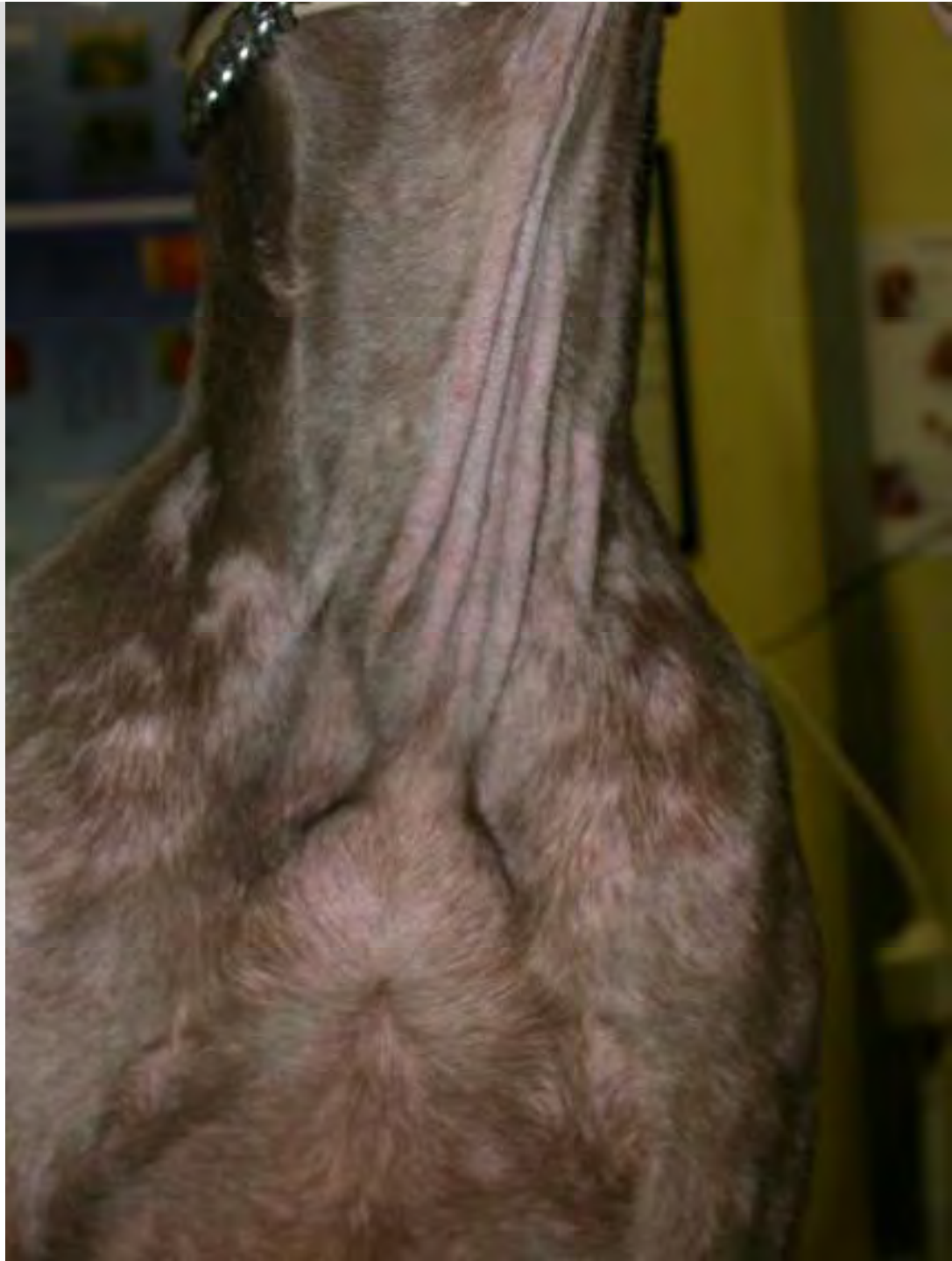


Pathogenesis of and clinical presentations of alopecia in the dog

Pathogenesis	Clinical appearance of alopecia
Folliculitis.	Focal-multifocal alopecia.
Auto-induced (pruritus).	Appears in the areas of pruritus. Commonly broad & symmetric. Associated with erythema and other lesions (lichenification).
Disturbance of hair growth.	Symmetric non-pruritic alopecia. Frequently on the trunk. Slowly progressing.
Post-scarring.	Localized, limited to areas of previous damage. Depigmentation common.

Patchy
(multifocal)
alopecia:
demodicosis







Patchy (multifocal) alopecia:
demodicosis







Demodex canis mites

Patchy (multifocal) alopecia:
ringworm

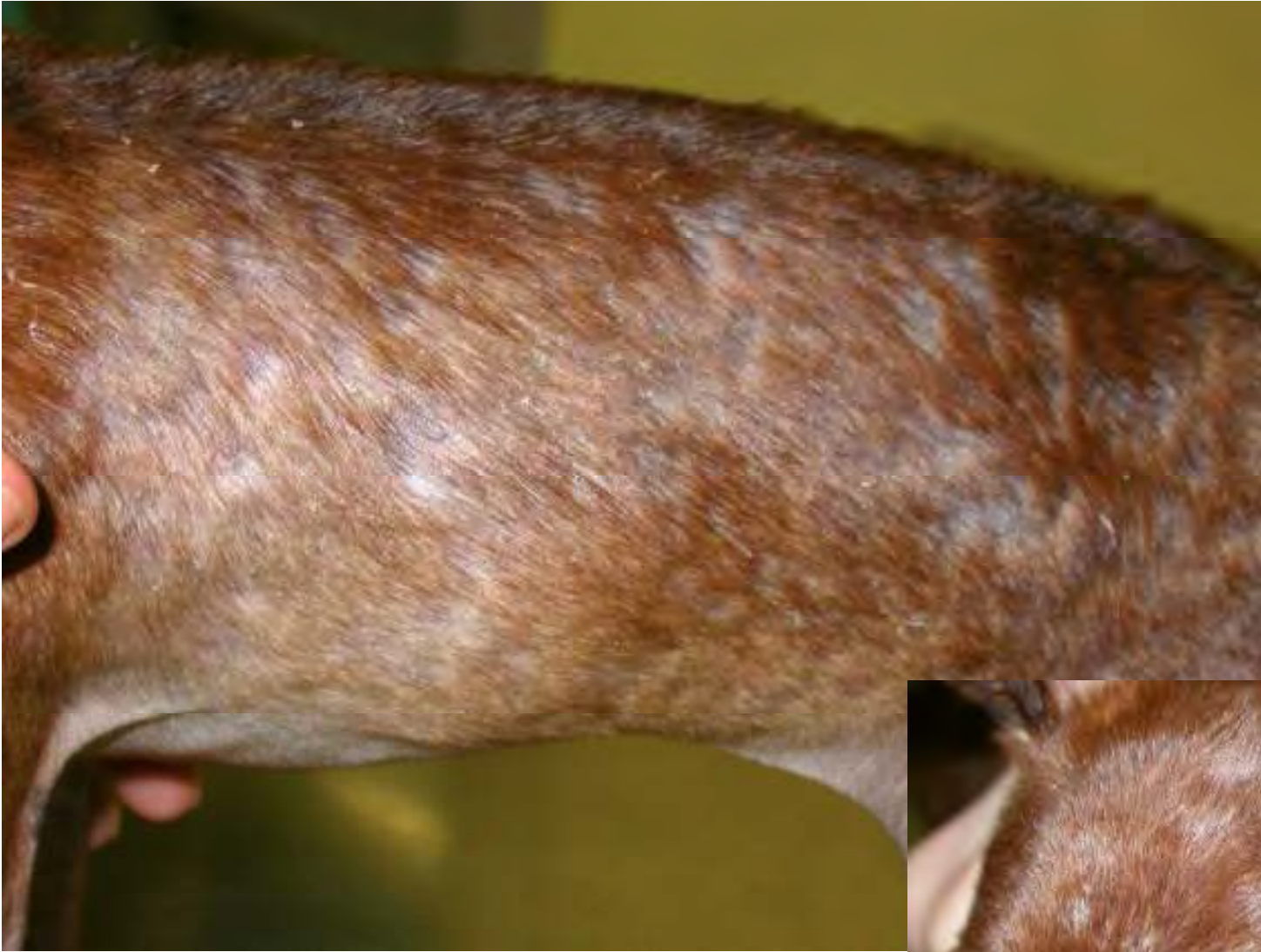


Patchy (multifocal) alopecia:
ringworm



Patchy
alopecia:
pyoderma





Patchy
alopecia:
pyoderma



Pruritic alopecia: scabies



Pruritic alopecia: scabies







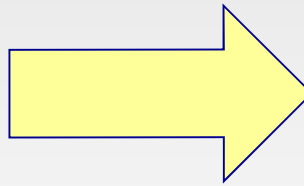






Until the 90's, in veterinary dermatology...

Non-pruriginous
symmetric bilateral
alopecia



Endocrine disorder:

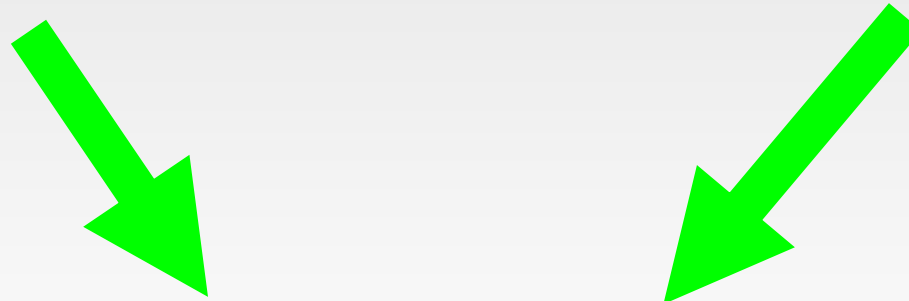
- Hypothyroidism
- Cushing's Disease
- Sex hormone disorders

Endocrine disorders

- *Middle-aged to old dogs*
- *Systemic signs commonly present*

Non-endocrine disorders:

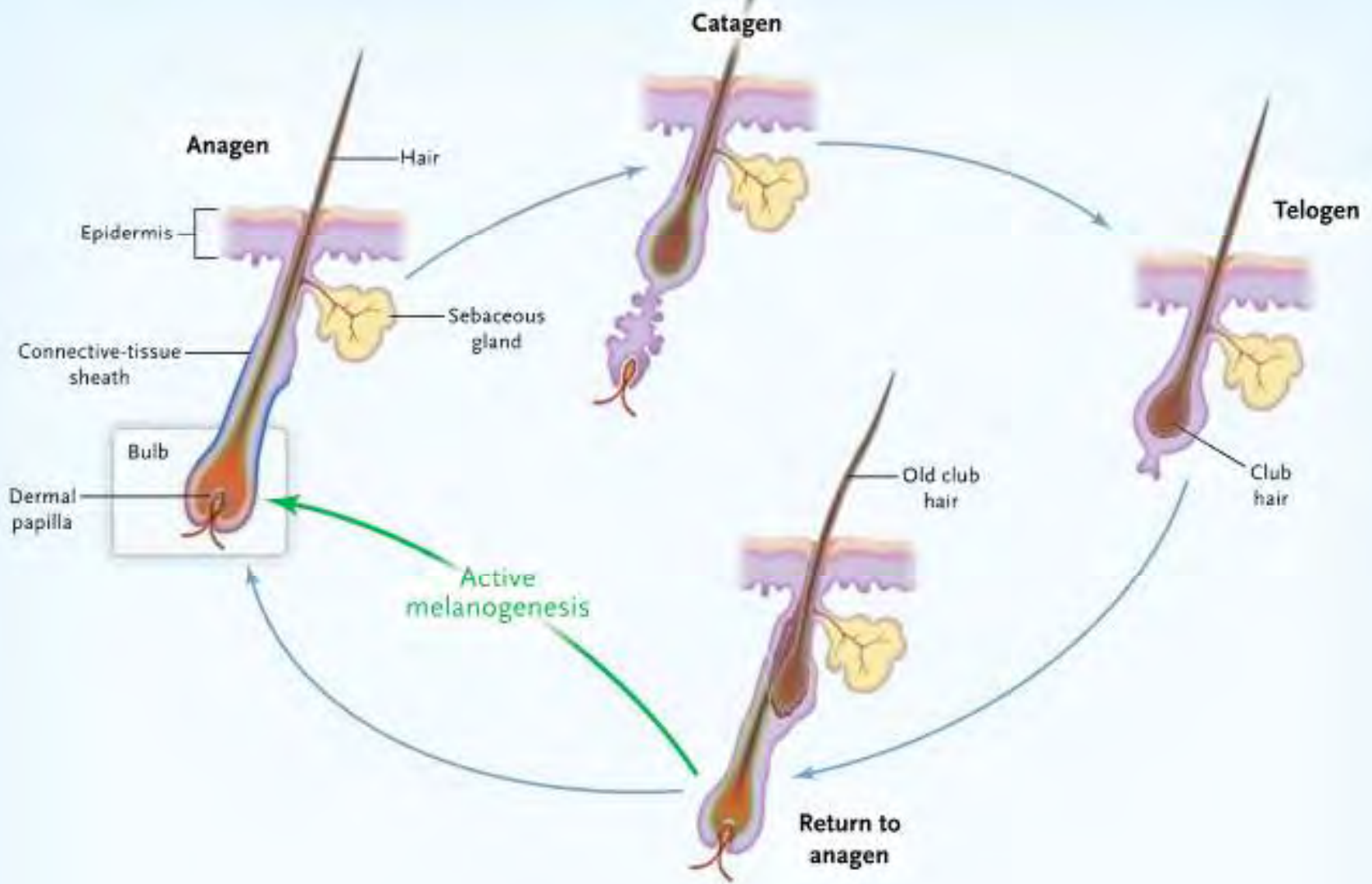
- *Young animals*
- *No systemic signs*
- *Breed predisposition*



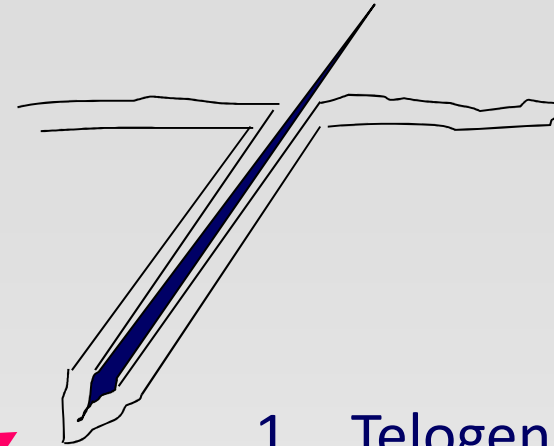
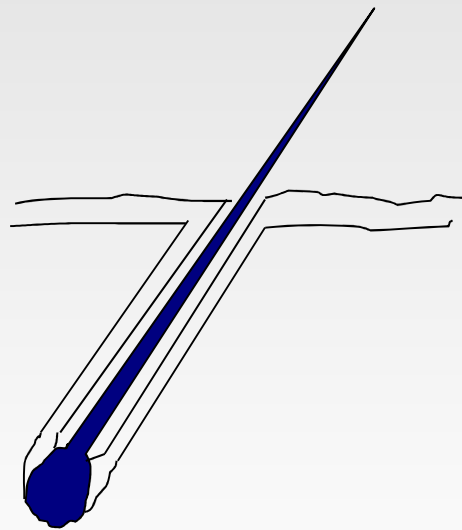
Symmetric bilateral alopecia

A

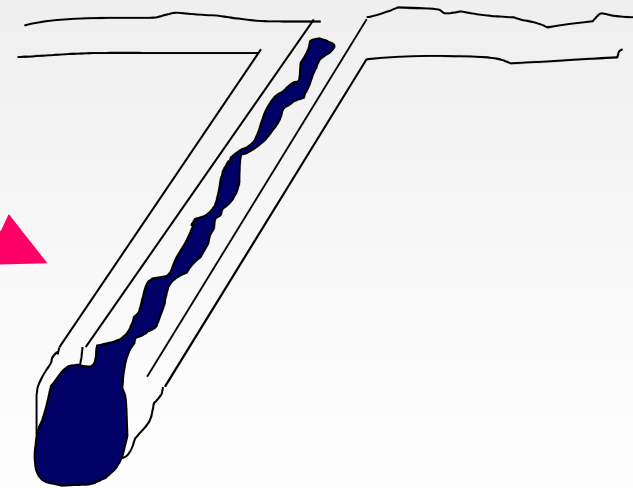
Normal Hair Cycle



Hair cycle disturbances leading to bilateral symmetrical alopecia



1. Telogenization
(excessive, generalized)



2. Follicular dysplasia

Endocrine disorders

- *Middle-aged to old dogs*
- *Systemic signs present*
- *Telogenization of hair follicles*

Non-endocrine disorders:

- *Young animals*
- *No systemic signs*
- *Breed predisposition*
- *Hair follicle dysplasia*



Symmetric bilateral alopecia

Alopecia

due to abnormalities in hair cycle: **telogenization**

Endocrine disorders

Hypothyroidism

Hyperadrenocorticism-Cushing's disease

Sex-hormone disorders

(Sertoli cell neoplasia; ovarian tumours)

Hypothyroidism (acquired, primary)

- Cause: autoimmune lymphocytic thyroiditis (> 90% cases), leading to the destruction of the thyroid parenchyma.
Low T4 levels leads to telogenization of hair follicles (arrest)
- Irish setter, golden retriever, beagle, great Dane
- > 2 years of age
- **Cutaneous signs:**
 - Trunk/generalized desquamation
 - Alopecia on the trunk or pressure points (dorsal nose, neck,...)
 - Facial mixedema (*facies tragica*)
 - Relapsing pyoderma/folliculitis
 - Otitis externa chronica (ceruminous or suppurative)

Hypothyroidism

Cutaneous + systemic disease

- **Systemic signs:**
 - Lethargy
 - Overweight
 - Hypothermia
 - Bradycardia
 - Cardiomyopathy
 - Neuromuscular disorders









Hypothyroidism: diagnosis

CBC (non-regenerative anemia) and serum biochemistry (hypercholesterolemia)

Thyroid function tests:

Serum total T4 (low)

Total basal T4 alone not useful. Euthyroid dogs can have low serum total T4 levels (sick euthyroid syndrome). However, remember that very rarely a dog with total T4 WNL is hypothyroid.

Serum free T4 (low)

Useful; less influenced by other diseases. Can be used a single diagnostic test.

Serum TSH (high)

Not to be used alone. Adequate to be used together with total T4 or with free T4.

Anti-tyroglobulin antibodies (ATAs). Found in 50% of hypothyroid dogs and <5% of euthyroid dogs.

Hypothyroidism: treatment and follow up

- L-thyroxine (T4): 0.02 mg/Kg PO q12h.
- After 8 weeks, basal T4 (4-6 hours after taking the pills) must be determined and the dose has to be adjusted.
- Serum T4 should be in the upper quarter of the range. Most patients are treated long-term with a dose of 0.02 mg/kg q 24h.

Hyperadrenocorticism (Cushing's disease, CD)

Systemic disease

1. Spontaneous Cushing's disease

- Bilateral adrenal hyperplasia due to pituitary adenoma -PDH- . 85% of the cases
- Neoplasia (functional) . 15% of the cases
- Paraneoplastic production of ACTH (very rare)

2. Iatrogenic Cushing's disease

Hyperadrenocorticism (CDz)

- Poodle, English bulldog, Boston terrier, boxer
- Middle age to old
- **Cutaneous signs:** progressive, bilateral symmetric alopecia affecting the trunk; cutaneous atrophy, comedones, hyperpigmented macules, *calcinosis cutis*.
- **Systemic signs:** PU/PD, polyphagia, pendulous abdomen, hepatomegaly, muscle atrophy, dyspnea (panting).







To confirm the diagnosis..

- Ratio cortisol/creatinine in urine
(screening test, very low specificity)
- **ACTH stimulation test (↑specificity)**
(adequate for the diagnosis of iatrogenic CDz and to monitor the treatment response)
- **Dexamethasone –Low Dose Suppression test (↑sensitivity)**

CDz: Treatment

PDH:

- Trilostane [inhibitor of 3 β -hydroxysteroid hydrogenase; 3-6 mg/kg q 24h]
- Mitotane [O, p'-DDD ; antineoplastic drug, induces necrosis of the adrenal cortex]
- Radiotherapy (macroadenomas)
- Surgical excision (transsphenoidal hypophisectomy)

Adrenal neoplasia:

- Surgical adrenalectomy
- Mitotane

Cutaneous diseases consequence of sex hormone imbalances (hyperestrogenism)

Sex hormone overproduction in the gonads:

Intact males: testicular neoplasia (usually Sertoli's cell tumor) (> common in cryptorchid dogs)

Intact females: usually ovarian cysts, less commonly ovarian neoplasia

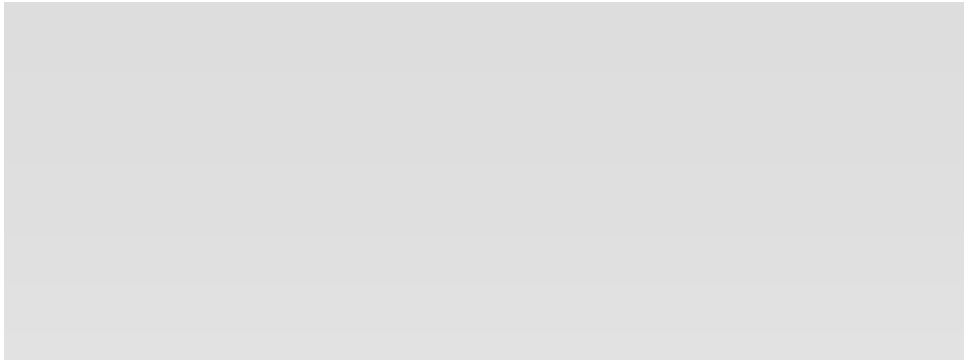
Sex hormone overproduction in the adrenal glands

(Alopecia X):

etiopathogenesis unknown. An enzyme abnormality in the adrenal gland is suspected













Alopecia due hyperestrogenism (ovarian cysts). Before and after OH

Endocrine disorders

- *Middle-aged to old dogs*
- *Systemic signs present*
- *Telogenization of hair follicles*

Non-endocrine disorders:

- *Young animals*
- *No systemic signs*
- *Breed predisposition*
- *Hair follicle dysplasia*



Symmetric bilateral alopecia

Alopecia

due to abnormalities in hair cycle: **follicular dysplasia**

- Color dilution alopecia
- Black hair follicular dysplasia
- Follicular dysplasias in other breeds
(black-brown Doberman pinschers, curly coated dogs)
- Pattern alopecia/baldness
- Canine recurrent (flank) alopecia

Color dilution alopecia

- Diluted dogs (blue/gray/fawn)
- Doberman pinscher, Yorkshire terrier, Saluki, Irish setter...
- Onset: 3 months - 1 year
- Progressive alopecia that affects all diluted areas
- Alopecia, scales; papules and pustules with secondary bacterial folliculitis (common)









Color dilution alopecia

- Diagnosis
 - History (color, age)
 - Distribution of the alopecia
 - Trichoscopy
 - Skin biopsy
- Treatment
 - Control of secondary pyoderma
 - No effective therapy

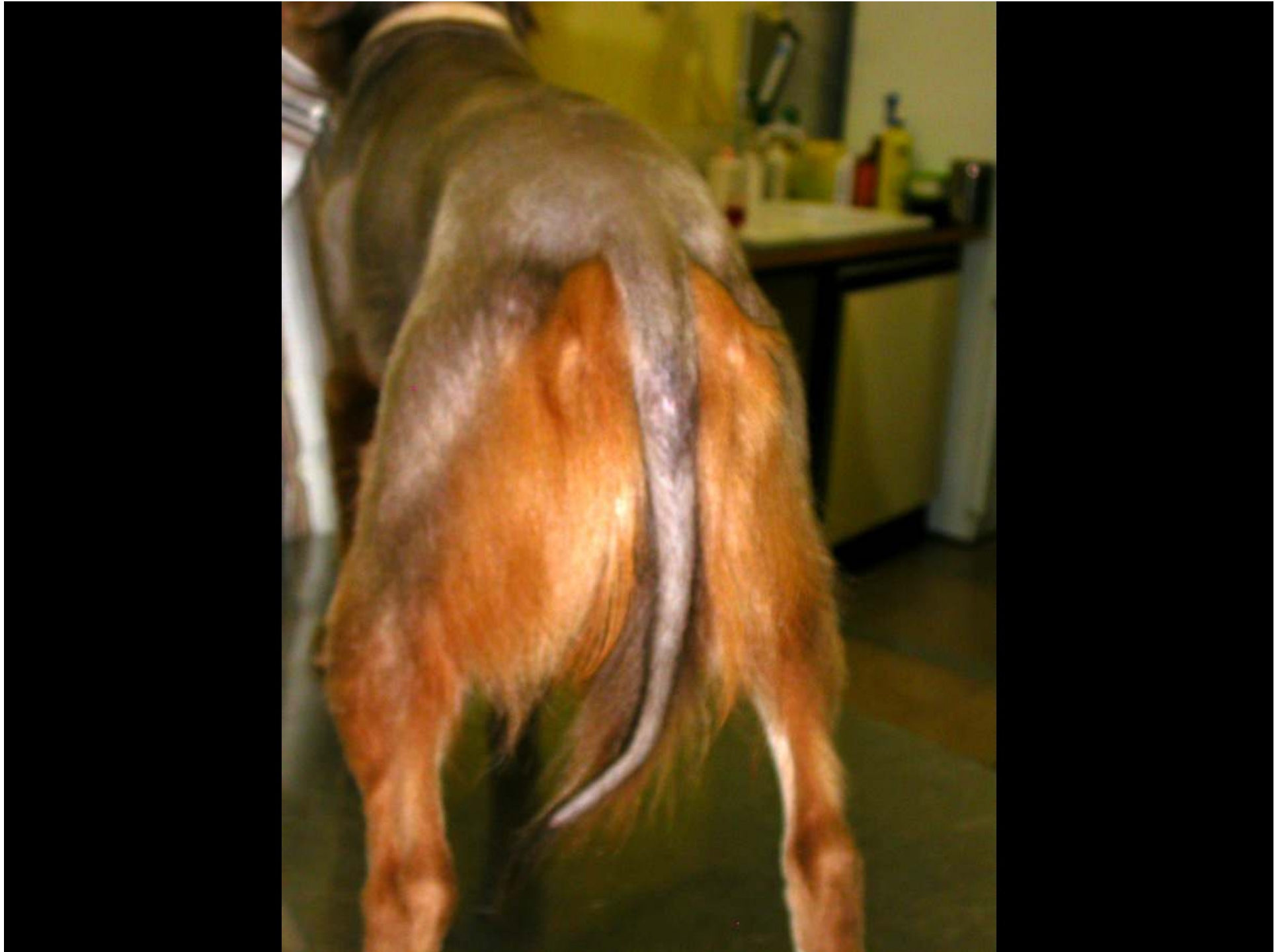
Black hair follicular dysplasia

- Probably a variant of CDA that presents in the black hairs of bi and tri-color dogs
- Same clinical presentation (young dogs, symmetric progressive alopecia affecting all black hairs). Same histopathology.
- Diagnosis: generally easy (clinical appearance). No effective treatment known.











“Johnny” is a 6 years old mongrel. He had a black-and-white coat, but from the 3rd month of age he began to loose the black hairs (only). Now, as you can see, he has lost all the black coat.. Apart from this, he is healthy and happy...





Pattern alopecia (baldness)

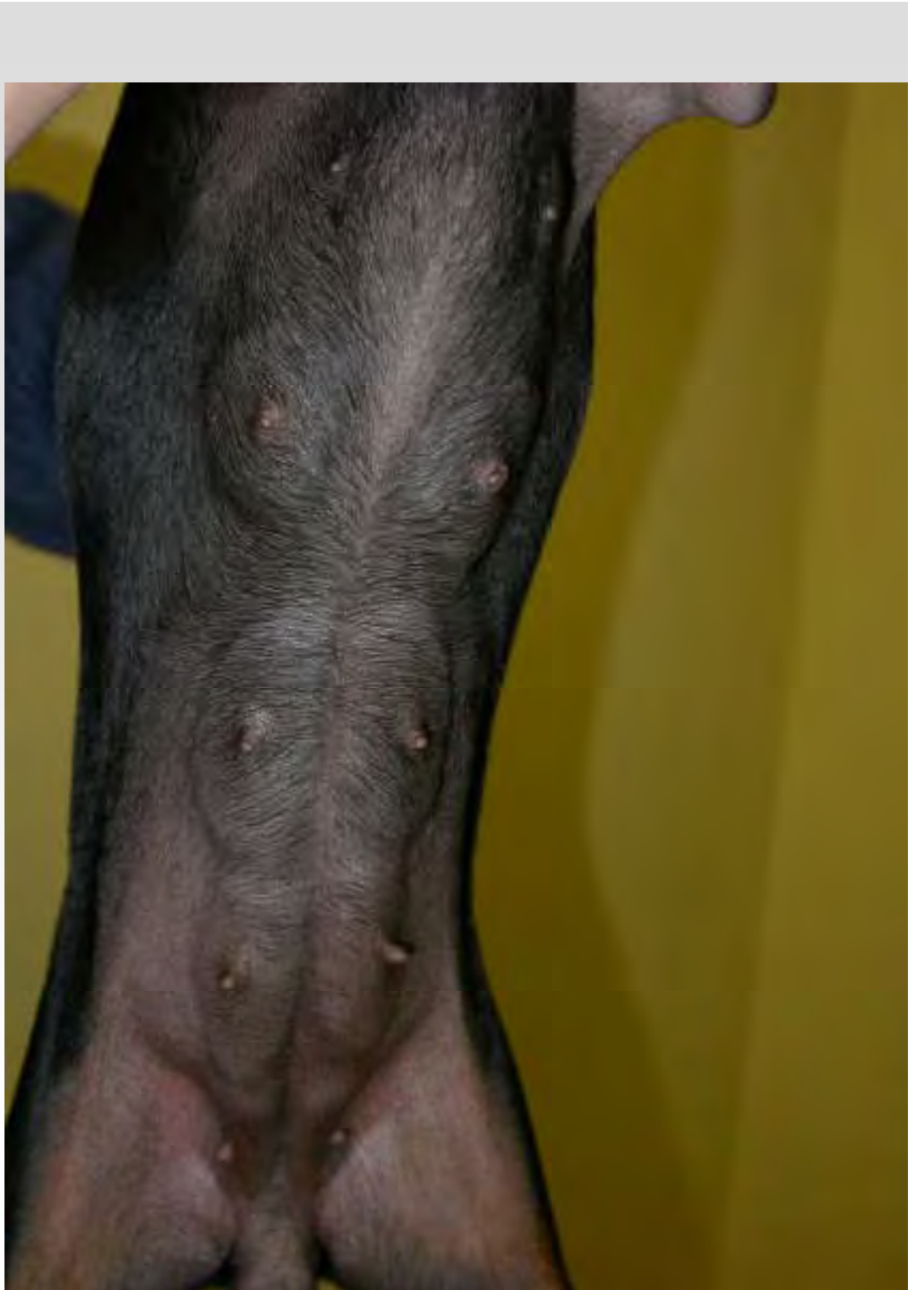
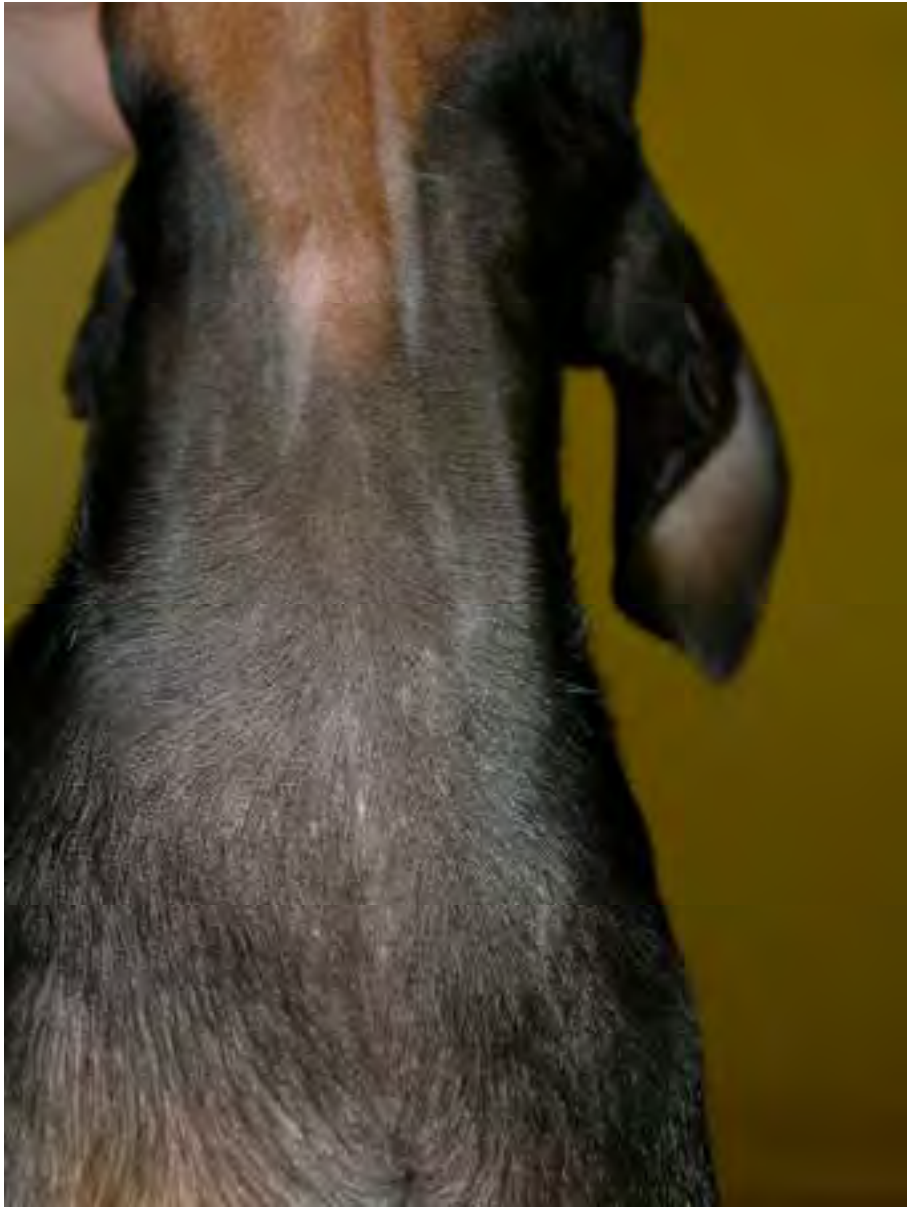
- Cause: unknown (suspected genetic disease)
- Onset: 6 months - 1 year
- Dachshund, Chihuahua, greyhound, Boston terrier
- Progressive alopecia of ear flaps, post-auricular region, ventral neck and thorax, caudo-medial thighs
- Diagnosis: rule out endocrine skin diseases, skin biopsy
- Treatment: melatonin?





















Canine recurrent alopecia

(Cyclic flank alopecia, Recurrent flank alopecia)

- Cause: unknown. Suspected a dysregulation of the hair cycle due different photoperiod.
- Airedale terriers, boxers, bulldogs predisposed.
- Young adults, males and females.
- Spring or autumn in the North hemisphere.

Canine recurrent alopecia

(Cyclic flank alopecia, Recurrent flank alopecia)

- Self limiting, usually seasonal (spring or autumn), symmetric bilateral flank alopecia.
- Alopecic areas are well demarcated (“geographic”) and hyperpigmented.
- 80% of cases there is more than one episode.
- Other cutaneous areas may be affected (nose, rears...).
- Dogs otherwise healthy.



















Canine recurrent flank alopecia

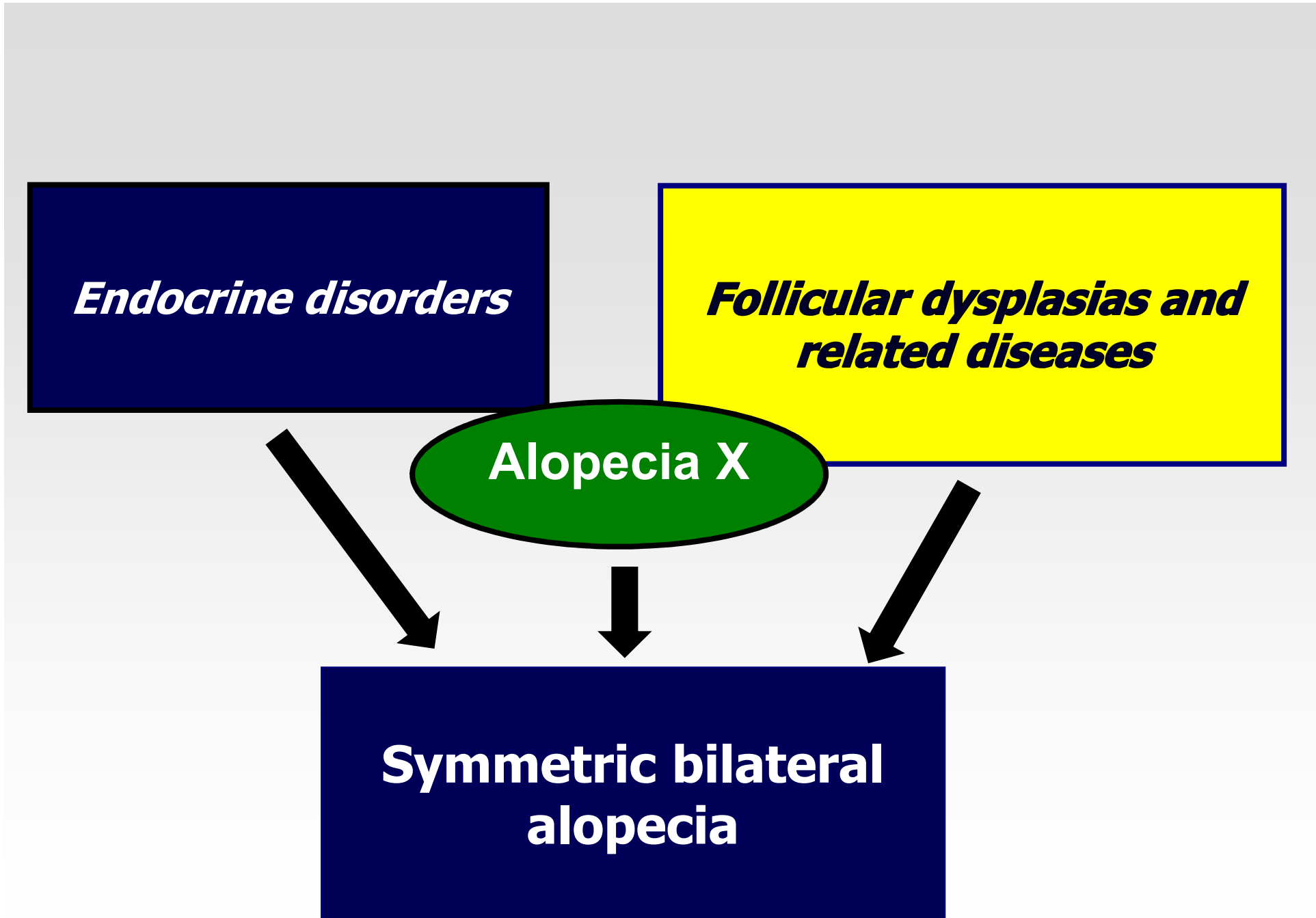
- Diagnosis:
 - History, clinical picture.
 - Rule out endocrine diseases.
 - Biopsy + histopathology (dysplastic telogen hair follicles with jelly-fish appearance)
- Therapy:
 1. Scientific neglect
 2. Melatonin (3-6mg/dog PO, BID/TID, at least 1 month before the onset of alopecia)

Endocrine disorders

***Follicular dysplasias and
related diseases***

Alopecia X

**Symmetric bilateral
alopecia**



Alopecia X

- Current definition of dogs suffering from what previously defined GH-responsive alopecia, castration responsive alopecia, congenital adrenal hyperplasia-like syndrome
- Etiology unknown. Some authors believe that in fact a pseudo-Cushing's disease. Adrenal glands would produce high levels of sex hormones due to an enzyme defect.
- However, not all dogs with the disease present high levels of sex hormones.
- The genetic background seems evident because of the strong breed predisposition and age of presentation.

Alopecia X

- Young adult male (and female) dogs (1-2 years)
- Plush-coated breeds: Pomeranian, Chow-chow, Keeshond, Alaskan malamute.
- Alopecia (woolly haircoat due to loss of primary hairs) of the rear thighs (onset), neck and trunk.
- Alopecic areas usually hyperpigmented.
- No systemic signs.
- Histologically characterized by “flame” follicles (hair follicles in catagen/early telogen arrest), with some dysplastic appearance.



07.10.2009















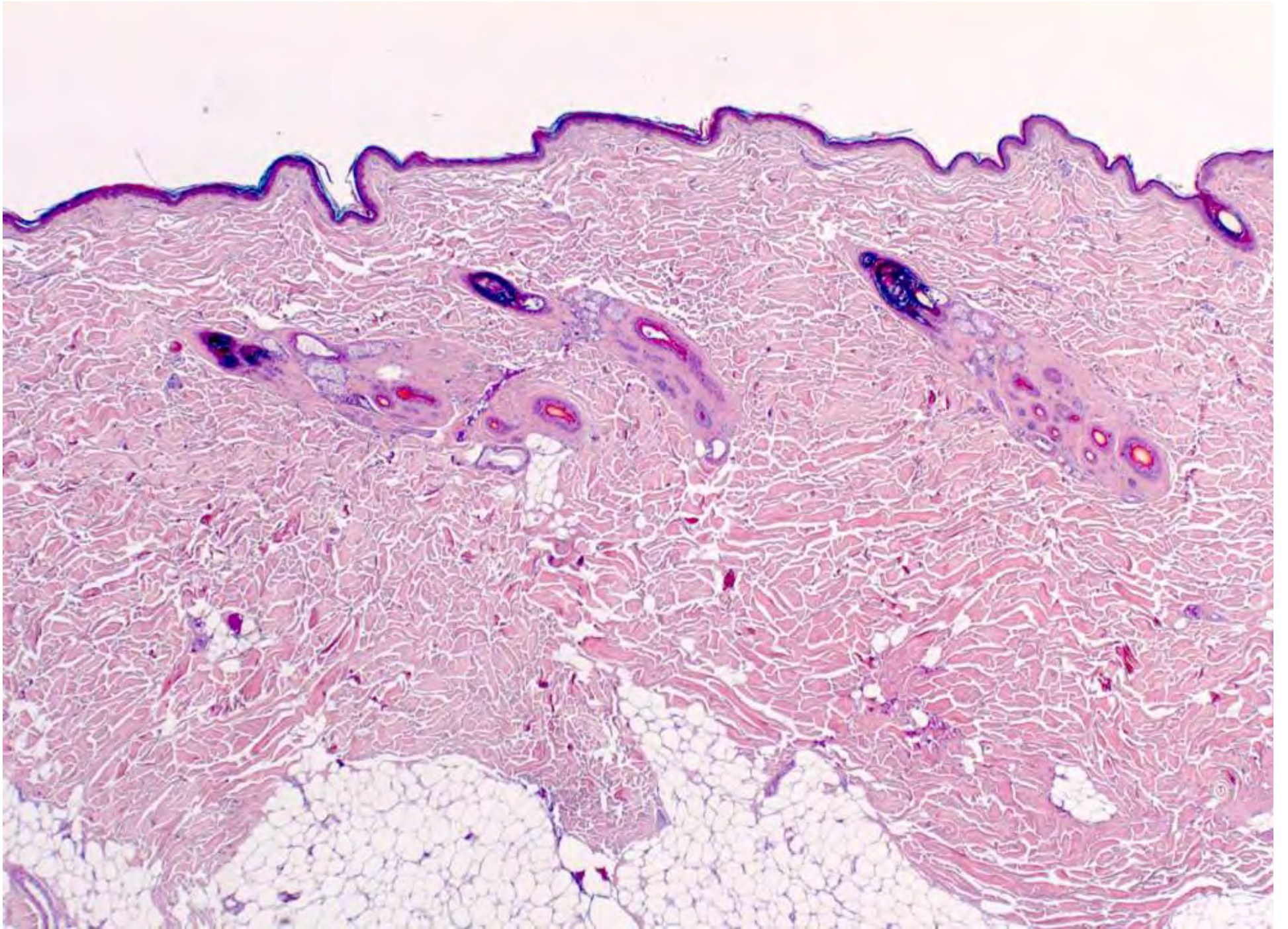


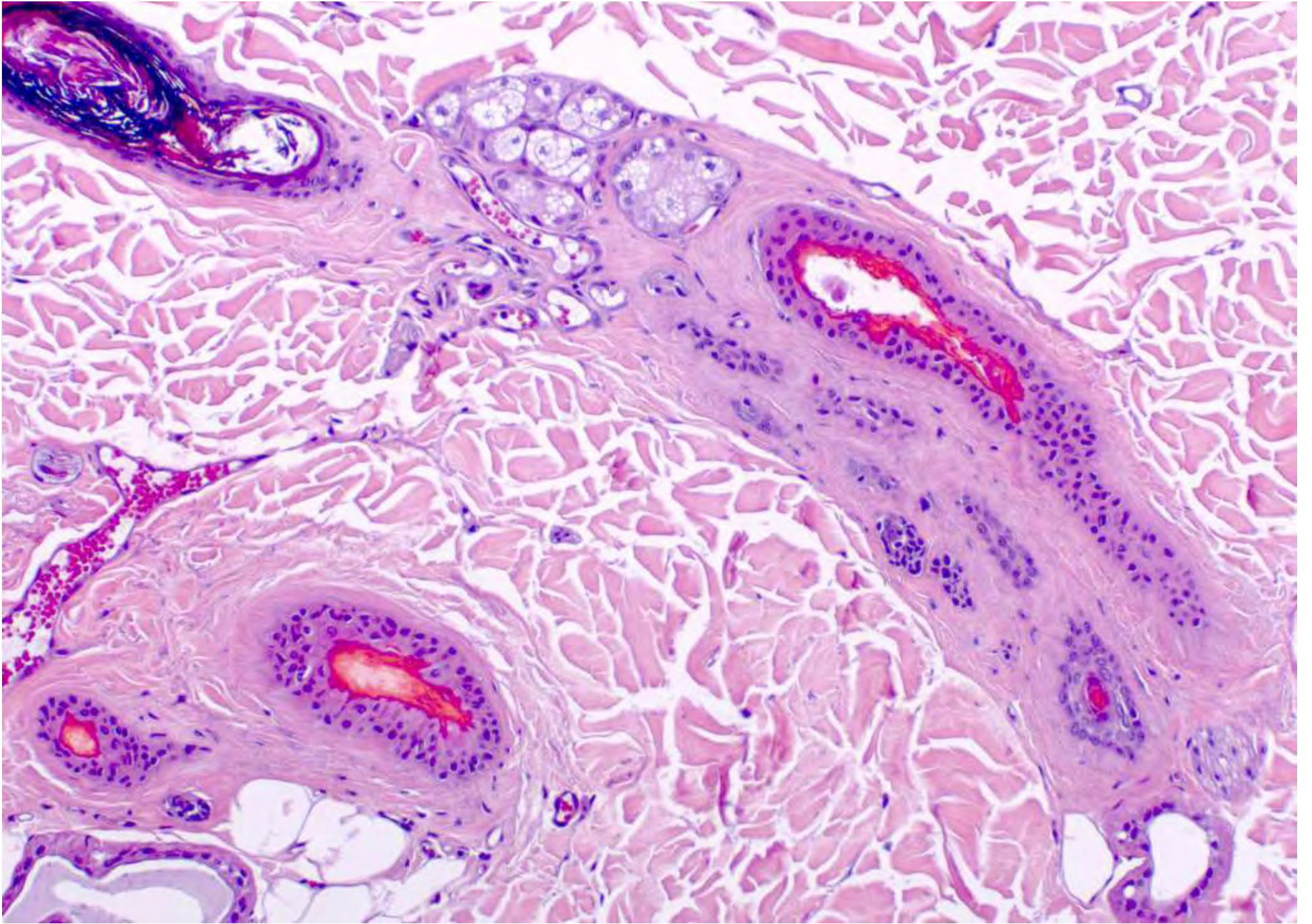


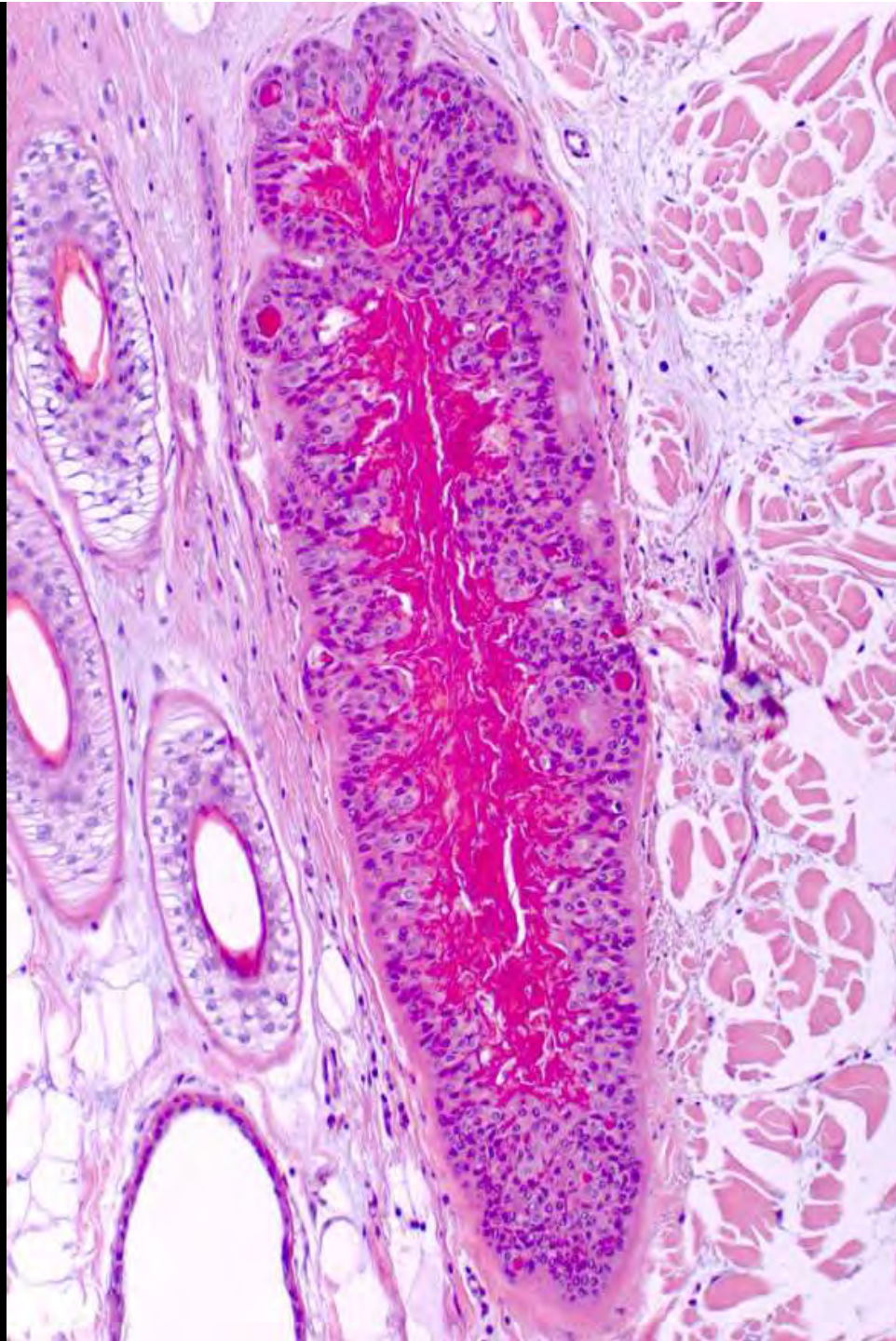












Alopecia X / Hair cycle arrest

- Diagnosis:
 - History, clinical picture
 - Ruling out endocrine skin diseases
 - Biopsy + histopathology (“flame” follicles = abnormal catagen follicles)

- Treatments:
 1. Castration (if intact! 50% respond well).
 2. Melatonin (3-6mg/dog BID-TID; > 2 months)
 3. Trilostane.
 4. Deslorelin acetate [Suprelorin^R] implant
 5. Microneedling
 6. **Scientific neglect**





Veterinary Dermatology

Vet Dermatol 2014; 25: 519–e88

DOI: 10.1111/vde.12148

Deslorelin for the treatment of hair cycle arrest in intact male dogs

Francesco Albanese*, Eleonora Malerba†, Francesca Abramo‡, Vincenzo Miragliotta‡ and Federico Fracassi†



- 1 implant / 6 months
- 60% success
- Not effective in spayed females
- Hair regrowth in 2-3 months

Microneedling as a successful treatment for alopecia X in two Pomeranian siblings

Steve Stoll*, Christian Dietlin† and Claudia S. Nett-Mettler‡







Thanks!