



Hypothyroidism

Extended Version

Classic case: Lethargic Golden Retriever with **weight gain**, **bilateral nonpruritic alopecia**, “tragic” face

Presentation: Very common endocrine disease of DOGS

- History and Signalment
 - ANY dog 2-9 yo, no gender predilection
 - Predisposed breeds
 - Mixed breeds, Boxers, Doberman Pinschers, Dachshunds, Golden Retrievers, Irish Setters, Miniature Schnauzers
 - Cats – **iatrogenic** hypothyroidism due to hyperthyroid treatment
 - Congenital
 - Foals –
 - Pregnant mares grazing on plants containing goitrogens or dietary iodine imbalance (too much or too little)
 - Thyroid gland hyperplasia and multiple congenital musculoskeletal anomalies
 - Dogs –
 - Disproportionate dwarfism
 - Impaired mental development (cretinism)
- Clinical signs (adult onset) stem from decreased basal metabolic rate
 - Gradual onset
 - **Weight gain without increased appetite**
 - **Dullness, lethargy, exercise intolerance**
 - Heat seeking
 - **Tragic facial expression**
 - Droopy eyes
 - Myxedema – thickening of skin, mostly on forehead and face
 - **Bilateral nonpruritic truncal alopecia**
 - Flaky skin, seborrhea, pyoderma
 - Failure to cycle, decreased libido, infertility
 - Neuropathy – weakness, facial paralysis, ataxia, bark change
 - Myxedema coma – rare syndrome
 - Lethargy, stupor, coma
 - Hypoventilation
 - Hypotension
 - Bradycardia
 - Profound hypothermia



Classic “tragic face” of hypothyroidism-
Droopy eyes, thickening of facial skin
Photo courtesy of Caroldermoid



Alopecia on tail.
Photo courtesy of Caroldermoid

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DDX:

- Obesity, weight gain, alopecia, seborrhea from other causes. Hyperadrenocorticism, hyperestrogenism, ectoparasites, neoplasia

Test(s) of choice:

- **Serum concentrations of total T₄, free T₄, and TSH**
 - **Total T₄**
 - About 90% sensitive
 - Could also be low due to sick euthyroid syndrome
 - **Free T₄ – by dialysis**
 - More useful in distinguishing euthyroid from hypothyroid dogs
 - **T₃** – may be low, normal, or high in hypothyroidism
 - **TSH** – must be species specific assay
 - Normal or increased TSH
 - **Evaluate in light of T₄, cholesterol, etc**
 - **Hypothyroid**
 - Normal or low TSH
 - Sick euthyroid, early hypothyroid, or pituitary (rare)
 - High TSH with normal T₄
 - Early hypothyroid, recovery from sick euthyroid illness, antibody interference
 - **Thyroid levels may be decreased by other factors**
 - **Certain breeds:** Greyhounds, Scottish Deerhounds, Alaskan sled dogs
 - **Phenobarbital**, KBr, **prednisone**, clomipramine, propranolol, some **NSAIDs** and other medications
- **Fasting hypercholesterolemia (80% of cases) – excellent screening test**
 - May see normochromic target cells secondary to hypercholesterolemia
- Normocytic, normochromic regenerative anemia (40-50% of cases)
- **TSH stimulation test – Gold standard**
 - **Accurate but TSH is expensive**
- Circulating thyroid hormone autoantibodies against T₃ or T₄ (Extremely rare)
- Therapeutic trial with thyroxine supplementation



Greyhounds have naturally low thyroid levels.

Photo courtesy of neurodoc



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Rx of choice:

- **Levothyroxine sodium (synthetic T₄)**
 - Use brand name as bioavailability varies in generics

Prognosis:

Good to Excellent for primary hypothyroidism

Usually Guarded for secondary hypothyroidism – pituitary neoplasia most common

Prevention:

Monitor T₄ levels periodically after diagnosis to prevent recurrence of clinical signs

Pearls:

- Obesity far more prevalent than hypothyroidism
- If concurrent disease, treat other disease first
- 2 most common causes of adult onset primary hypothyroidism
 - Lymphocytic thyroiditis
 - Idiopathic atrophy of thyroid gland

Refs: Cote, Clin Vet Advisor, Dog and Cat. 2nd ed. pp. 588-90, Merck Vet Manual 10th ed (online): Hypothyroidism, Mar Vista Animal Medical Center, Hypothyroidism.



Obesity is more common than hypothyroidism.

Photo courtesy of sa_ku_ra

My Notes: