

Feline Hyperthyroidism

Extended version

Classic case: 10 year old cat, poor body condition, increased appetite and weight loss

Presentation: #1 endocrine disease in cats

- 95% are cats over 8 yr, no gender predilection
- **Weight loss with polyphagia**
- **Hyperactivity**, nervousness
- Poor body condition, **unkempt fur**, decreased grooming
- Panting, tachypnea
- **PU/PD**, ± vomiting & diarrhea, increased fecal volume
- Tachycardia
- Heat avoidance, cool-seeking
- Palpable thyroid gland(s) along trachea (thyroid slip)
– **normal thyroids are NOT palpable**
- **“Thyroid storm”**
 - Intense sympathetic discharge in response to restraint or other stressful event
 - severe tachycardia or severe bradycardia
 - severe systemic hypertension
- **“Apathetic” hyperthyroidism (<10%)**
 - depression, lethargy, weakness, anorexia
- **COMMON concurrent problems**
 - Cardiac – HCM, congestive heart failure, systolic murmur, arrhythmias
 - Systemic hypertension – systolic BP > 180 mmHg
 - Renal failure – often masked by hyperthyroidism
 - Hypokalemia – neck ventroflexion, weakness



Hyperthyroid cat

Image courtesy
Nottingham Veterinary School

DDX:

Renal failure, cardiomyopathy, hepatic insufficiency, diabetes mellitus, gastrointestinal lymphoma, inflammatory bowel disease, pancreatic insufficiency

Test of choice:

- **Palpation: enlarged thyroid gland** (30% unilateral, 70% bilateral)
- **Serum total thyroxine (TT₄)** is test of choice
 - Elevated TT₄ is diagnostic for 95% of cats (euthyroid sick may bring it down to upper part of normal reference range)
 - If TT₄ normal and clinical signs support hyperthyroidism
 - Recheck TT₄ in 2-3 weeks
 - Serum Free T₄ by equilibrium dialysis
 - Increased Free T₄ with high-normal TT₄ supports hyperthyroidism
 - More sensitive than TT₄, but 6-12% are false positive
- **Technetium scanning** (radioactive isotope Tc99m)
 - Functional thyroid tumors take up radioactive isotope more than normal or atrophied tissue
 - Confirms diagnosis, identifies location, ectopic thyroid or metastatic disease
 - Important if considering thyroidectomy

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Rx of choice: Several options depending on clinical status, client preference, compliance

- **Methimazole** (Tapazole) – this is used regardless of long-term treatment choice
 - Inhibits production of T₃, T₄ without destroying thyroid tissue
 - Treatment will unmask renal failure if present
 - If sole treatment, will require lifelong treatment and client compliance
 - Adverse effects (16-20% of cases) – usually reversible
 - **Vomiting, anorexia, pruritis of head/neck, depression**
 - Leukopenia, agranulocytosis, thrombocytopenia, IMHA, hepatopathy
- **Radioactive iodine** (I¹³¹): **Treatment of choice**
 - Long term control – potentially curative
 - Emits β and γ radiation
 - Destroys functional thyroid tissue
 - Spares normal or atrophic thyroid tissue
 - Atrophy secondary to lack of TSH or decreased iodine concentration
 - Disadvantage – special handling, special facility and post-treatment isolation
 - Riskier for older and male cats
- **Surgical Thyroidectomy** – potentially curative if normal or no ectopic tissue
 - Bilateral or unilateral thyroidectomy
 - If unilateral – potential for recurrent hyperthyroidism in contralateral gland
 - Complications
 - Iatrogenic hypoparathyroidism (bilateral surgery)
 - Preserve some parathyroid tissue to prevent hypocalcemia
 - Transient hypocalcemia may occur postop due to disrupted blood flow
 - Treat with Ca⁺⁺ gluconate, **NOT** Ca⁺⁺ chloride
 - Laryngeal paralysis, Horner's syndrome
- **Hill's Prescription Diet® y/d™ feline thyroid health** – **Controversial**, must be sole diet
- **Thyroid storm** **A factor to consider when choosing treatment**
 - In some cats with chronic, severe hyperthyroidism, the risk of "thyroid storm" outweighs the risk of iatrogenic hypothyroidism due to treatment
 - Ensure calm environment
 - ± mild sedation (not acepromazine)
 - If bradycardia treat with LOW dose atropine
 - May be acutely fatal



Hyperthyroid tumor removal

*Image courtesy
Nottingham Veterinary School*

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Prognosis:

- Without renal failure
 - Good to excellent
 - Many cured with thyroidectomy and ¹³¹I
 - Methimazole requires life-long treatment
- With renal failure
 - Good short-term,
 - Guarded to poor long-term

Prevention:

- Early screening
- Some studies have shown a connection between certain ectoparasitocides and hyperthyroidism
- Avoid canned cat foods (increased iodine in fish, liver, giblet flavors)
- Prevent thyroid storm with beta-blockade
(IF can be given with minimal stress and **NO hypokalemia** present – can cause sudden death)

Pearls:

- Purebreds significantly LESS likely to have hyperthyroidism than mixed breeds
- Benign thyroid neoplasia or adenomatous hyperplasia (< 2% thyroid carcinoma)

Refs: Cote, Clin Vet Advisor, Dog and Cat. 2nd ed. pp. 562-65; Small Animal Surgery, Fossum, 605-611; Merck Vet Manual 10th ed (online): Hyperthyroidism, Kass, P.H. et al.: Evaluation of environmental, nutritional, and host factors in cats with hyperthyroidism. J. Vet. Intern. Med. 13 (4):323-329; 1999.

My Notes: