

1st Fel. Pract Sem.  
8/89

FELINE HYPERTHYROIDISM

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## FELINE HYPERTHYROIDISM

### INCIDENCE:

- Systemic disease
- No sex predilection
- No breed predilection
- Age span: 6-22 years
- Duration of clinical signs: 2 weeks to 1 year

### CLINICAL SIGNS:

- Weight loss
- Normal appetite to intense polyphagia
- Restless, hyperactive
- Pacing
- Crying or howling
- Vomiting
- Loose and/or voluminous stools
- Polydipsia, polyuria
- Dermatitis
  - 1) poor, unkempt hair coat with dandruff
  - 2) ventral abdominal/inguinal alopecia
  - 3) thinning of hair on lateral body wall
- Hyperemia of ears, mucous membranes
- Increased body temperature
- Heart murmur, arrhythmia
- Strong femoral pulse
- Palpable thyroids
- Muscle tremors
- Personality changes
  - 1) aggressive behavior, biting
  - 2) inappropriate urination +/- defecation
  - 3) unusual hiding or withdrawal

LABORATORY FINDINGS:

A. Hematology

- Elevated T<sub>3</sub>, T<sub>4</sub>
- Leucocytosis, eosinopenia
- Elevated SGPT, alkaline phosphatase
- Erythrocytosis (45-48% PCV)

B. Electrocardiology

- 60% tachycardia
- 50% tall R waves
- Cardiomegaly (left ventricular hypertrophy)
- Arrhythmia (atrial premature contractions)

C. Radiology

- Cardiomegaly, occasionally pleural effusion
- Hepatomegaly
- Normal

D. Thyroid scans

- Radioactive iodine (<sup>131</sup>I)
- Technetium

DIFFERENTIAL DIAGNOSIS:

- Diabetes mellitus
- Cardiomyopathy
- Chronic renal or hepatic diseases
- Neoplasia, esp. GI
- Pancreatic exocrine insufficiency

TREATMENT:

1. Medical

A. Methimazole (Tapazole)

- Inhibits thyroid synthesis
- Pre-op vs. long term
- 2.5-5.0 mg BID
- Recheck  $T_3, T_4$  in 2-3 weeks
- Adjust dose as necessary
- Disadvantages:
  - 1) does not cure condition
  - 2) side effects may be serious
  - 3) owner compliance long term
  - 4) relapses occur

OR

B. Propylthiouracil (PTU)

- 25-50 mg BID
- Side effects more frequently seen than with Tapazole

## SIDE EFFECTS OF THIONAMIDE TREATMENT:

- Vomiting
- Anorexia
- Lethargy
- Weak, disoriented
- Pupils dilated
- Facial edema and pruritus
- Edema of front feet
- Hepatopathy including icterus
- Immune-mediated anemia, thrombocytopenia
- Petechial hemorrhage from mouth, ears
- Drug-induced ANA+

### C. Propranolol (Inderal)

- Dose: 2.5-5.0 mg BID
- Use 1-2 weeks pre-op
- Counteracts catecholamine induced cardiac changes
- Reduces tachycardia and arrhythmias
- Contraindicated in CHF

## 2. Surgical

A. Prefer to remove both glands, even if only one is grossly affected

### B. Complications:

- inadvertent parathyroidectomy resulting in hypocalcemia and hyperphosphatemia
- injury to recurrent laryngeal nerve

## 3. Radiation

## SIGNS OF IATROGENIC SURGICAL HYPOCALCEMIA:

- Occurs from 1-4 days post-op
- Muscle tremors
- Weakness
- Confusion
- Prolapsed 3rd eyelids
- Tetany
- Convulsions

## TREATMENT OF IATROGENIC HYPOCALCEMIA:

### A. Convulsions

- 1) 1.0-1.5 ml/kg 10% calcium gluconate IV
  - 10 minute administration
  - discontinue if bradycardic or shortening of Q-T interval
  
- 2) 2.0 ml/kg 10% calcium gluconate IV over 6-8 hours

### B. Early maintenance

#### 1) calcium

500-750 mg/kg/day calcium gluconate }  
OR  
400-600 mg/kg/day calcium lactate } orally.  
divided TID

#### 2) Vitamin D

### C. Chronic treatment

- 1) Decrease exogenous calcium with addition of dietary calcium; usually off all calcium supplements in 2-3 weeks
- 2) Maintain low normal calcium levels (8-10 mg/dl)
- 3) Usually can eliminate vitamin D totally, slowly after calcium withdrawn

## HYPERVITAMINOSIS D

### Hypercalcemia

- Hypercalcemic nephropathy
- Soft tissue calcification
- Ix -saline diuresis
- furosemide

## THERAPY FOLLOWING TOTAL THYROIDECTOMY:

- Euthyroid 48 hrs. post-op
- L-thyroxine (Synthroid, Soloxine) 0.1 mg BID
- Recheck T<sub>3</sub>, T<sub>4</sub> levels at time of suture removal and adjust dose if necessary
- Recheck thyroid levels every 6 months once normal values are established
- Eventually some cats may not need any thyroid replacement
- Cardiac signs usually subside
- Liver function tests improve

## HISTOPATHOLOGY:

### A. Benign

- Follicular or solid adenoma
- Multinodular adenomatous hyperplasia or goiter
- Atrophy of follicles

### B. Malignant

- Adenocarcinoma (rare)