

Hyperparathyroidism

(Excessive Levels of Parathyroid Hormone in the Blood)

Basics

OVERVIEW

- “Hyperparathyroidism” is an abnormal condition in which high levels of parathyroid hormone (also known as “parathormone” or PTH) are circulating in the blood; “parathyroid hormone” regulates calcium and phosphorus levels in the blood—it increases blood calcium levels by causing calcium to be released from bone and recycled in the kidneys, and encourages vitamin D intestinal calcium absorption
- “Primary hyperparathyroidism” refers to a condition in which a (usually benign) adenoma tumor in the parathyroid gland produces excessive levels of parathyroid hormone, leading to increased blood calcium levels
- “Secondary hyperparathyroidism” can be caused by a deficiency of calcium and vitamin D associated with malnutrition or long-term (chronic) kidney disease
- The “parathyroid glands” are small, hormone-secreting glands that are located on or near the thyroid glands; thus the name, as “para-” refers to “adjacent” or “alongside” and “thyroid” refers to the thyroid gland; the thyroid and parathyroid glands are located in the neck, near the windpipe or trachea



GENETICS

- None known for primary hyperparathyroidism, but its association with certain breeds suggests a possible hereditary basis in some cases
- Secondary hyperparathyroidism can develop in association with hereditary kidney disease (known as “hereditary nephropathy”), but is not inherited per se

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs
- Cats

Breed Predilections

- Keeshonden
- Siamese

Mean Age and Range

- Dogs—mean age, 10 years; range, 5–15 years of age
- Cats—mean age, 13 years; range, 8–15 years of age

SIGNS/OBSERVED CHANGES IN THE PET

- Most dogs and cats with primary hyperparathyroidism do not appear ill
- Signs usually are mild and are due solely to the effects of high levels of calcium in the blood (known as “hypercalcemia”)
- Increased urination (known as “polyuria”)
- Increased thirst (known as “polydipsia”)
- Lack of appetite (known as “anorexia”)
- Sluggishness (lethargy)
- Vomiting
- Weakness
- Presence of stones (known as “uroliths”) in the urinary tract (condition known as “urolithiasis”)
- Stupor and coma
- Veterinarian may be able to feel enlarged parathyroid glands in the neck of cats
- Nutritional secondary hyperparathyroidism sometimes is associated with bone fractures and general poor body condition; “nutritional secondary hyperparathyroidism” is caused by diets that have too little calcium and vitamin D or too much phosphorus—it is a type of malnutrition

CAUSES

- Primary hyperparathyroidism—PTH-secreting tumor (known as an “adenoma”) of the parathyroid gland; in most cases only one gland has a tumor; malignant tumors of the parathyroid glands are uncommon and usually non-invasive
- Secondary hyperparathyroidism related to malnutrition—nutritional deficiency of calcium and vitamin D or nutritional excess of phosphorus
- Secondary hyperparathyroidism related to long-term (chronic) kidney disease—calcium is lost through the kidneys and absorption of calcium is reduced through the intestinal tract due to deficiency in a hormone (known as “calcitriol”) produced by the kidneys

RISK FACTORS

- Primary hyperparathyroidism—unknown
- Secondary hyperparathyroidism—calcium/vitamin D malnutrition or long-term (chronic) kidney disease

Treatment

HEALTH CARE

- Primary hyperparathyroidism generally requires inpatient care and surgery
- Secondary hyperparathyroidism related to malnutrition or long-term (chronic) kidney disease in non-critical pets can be managed on an outpatient basis

ACTIVITY

- No alterations recommended

DIET

- Calcium supplementation for secondary hyperparathyroidism, under the direction of your pet's veterinarian

SURGERY

- Surgery is the treatment of choice for primary hyperparathyroidism and is often important in establishing the diagnosis
- Surgical removal of a tumor of the parathyroid gland (surgical removal of a parathyroid gland known as a “parathyroidectomy”)
- Recently a technique using ultrasound-guided heat application through the skin (known as “percutaneous ultrasound-guided heat ablation”) has been used successfully for treatment of benign tumors of the parathyroid (known as “parathyroid adenomas”); this procedure may be recommended, if available

Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- No medical treatment exists for primary hyperparathyroidism itself, rather treatment is directed at high levels of calcium in the blood (hypercalcemia)
- Normal saline is the fluid of choice for treatment of high levels of calcium in the blood (hypercalcemia)
- Medications to remove excess fluids from the body (known as “diuretics,” such as furosemide) and steroids can be useful in treating high levels of calcium in the blood (hypercalcemia)
- Secondary hyperparathyroidism related to long-term (chronic) kidney disease is sometimes treated with the hormone, calcitriol, but its use has not gained wide acceptance
- A new class of medications that mimic calcium to lower parathyroid hormone levels (known as “calcimimetic drugs”) is being used to treat secondary hyperparathyroidism related to long-term (chronic) kidney disease in people, but studies of these drugs in dogs and cats have not been reported
- Pamidronate is a bisphosphonate used to prevent bone loss and osteoporosis; it has been used to treat high levels of calcium in the blood (hypercalcemia) of various causes in dogs and cats
- Post-operative low levels of calcium in the blood (known as “hypocalcemia”) requires treatment with vitamin D and calcium supplements; the hormone, calcitriol, is recommended

Follow-Up Care

PATIENT MONITORING

- Post-operative low levels of calcium in the blood (hypocalcemia) is relatively common after surgical removal of one or more parathyroid glands for treatment of primary hyperparathyroidism; the veterinarian will check serum calcium concentrations
- Ionized calcium levels will be monitored to guide dosage adjustments when treating post-operative low levels of calcium (hypocalcemia) with vitamin D, calcium supplements, or calcitriol
- Bloodwork (serum concentrations of urea nitrogen and creatinine) will be monitored in pets with kidney disease

PREVENTIONS AND AVOIDANCE

- No strategies exist for prevention of primary hyperparathyroidism
- Secondary hyperparathyroidism related to malnutrition is prevented by proper nutrition

POSSIBLE COMPLICATIONS

- Irreversible kidney failure secondary to high levels of calcium in the blood (hypercalcemia)
- Low concentration of calcium in the blood (hypocalcemia) is a potential complication of surgical removal of the parathyroid gland (parathyroidectomy)

EXPECTED COURSE AND PROGNOSIS

- Untreated disease usually progresses to end-stage kidney or nervous system disease
- Prognosis for surgical treatment of tumors of the parathyroid gland (parathyroid adenoma) is excellent
- Recurrence is seen in a small percentage of cases
- In pets that develop post-operative low levels of parathyroid hormone (known as “hypoparathyroidism”), the return of normal parathyroid gland function is unpredictable and can take weeks to months

Key Points

- Signs generally are related to changes in calcium status of the body
- Low concentration of calcium in the blood (hypocalcemia) is a potential complication of surgical removal of the parathyroid gland (parathyroidectomy)

