FERRET ADRENAL GLAND DISEASE

Paul Gibbons DVM, MS, DABVP (Avian)
Animal Emergency Center & Specialty Services
(414) 540-6710

BACKGROUND

Ferret adrenal gland disease is one of the most common diseases affecting pet ferrets and is quite different than that in other mammals. Blood estradiol, androstenedione, and 17-hydroxyprogesterone increase in many cases, but cortisol rarely does. Adrenal gland hypertrophy, adenoma, and adenocarcinoma are common, but the pituitary gland has never been found with disease. Researchers have proposed several hypotheses for pathogenesis. First, early spay and neuter may predispose ferrets to disease. Gonad tissue may be present within adrenal glands because the adrenal glands, testicles, and ovaries all develop together during embryogenesis. This tissue might be stimulated by the increased levels of pituitary gonadotropic hormones that follows early spay or neuter. Although this is plausible, ferrets spayed or neutered late in life also develop adrenal gland disease. Second, artificial diurnal light cycles may alter melatonin levels. Low levels of melatonin can lead to an array of hormonal changes progressing to abnormal adrenal gland development. Third, inbreeding may have led to a genetic predisposition to the disease. Fourth, pet ferret diets are quite different than those of related wild species, so commercially available pet ferret foods might contribute to adrenal gland disease.

SIGNALMENT

Both male and female ferrets of all coat colors can be affected. Most cases are identified between 2 and 4 years of age, but adult ferrets of any age can be affected.

CLINICAL SIGNS

The most common signs include alopecia, muscle atrophy, and vulvar enlargement in females. Many ferrets with adrenal gland disease will scratch excessively and some have associated traumatic skin lesions. The alopecia often begins at the tail during spring and then resolves a few months later, only to return again the following spring. In untreated cases, the alopecic region can spread to include the entire torso, eventually affecting the legs and head. Owners may report sexually aggressive behavior toward other ferrets. Less commonly, male ferrets may strain to urinate because prostate gland enlargement compresses the urethra. This can be accompanied by bacterial prostatitis. Urogenital cysts can occur and may be associated with cystitis. On rare occasion, aplastic anemia can be found. Polyuria and polydipsia do <u>not</u> occur.

DIAGNOSIS

Adult ferrets with hair loss, behavior changes or difficulty urinating in males, vulvar enlargement in females, and pruritis without primary dermatological disease should be considered to be cases of adrenal gland disease until proven otherwise. The diagnosis can be confirmed by measuring adrenal gland hormone levels, examining the adrenal glands via ultrasound, or by exploratory surgery. It is not reasonable to perform endoscopic biopsies unless the intent of endoscopic surgery is complete removal of one or both adrenal glands. Clinical laboratory findings are usually within reference ranges, but nonregenerative anemia

occurs on rare occasion. Pyuria, bacteruria, and mucus may be found on urinalysis in affected males. Survey abdominal radiographs are usually normal, but an enlarged or mineralized prostate gland can be seen in some affected males. Ultrasound can be used to assess not only adrenal gland, but also prostate gland echogenicity and size. Differential diagnoses for hair loss and pruritis include ectoparasites (e.g., fleas) and dermatophytosis. Differential diagnoses for an enlarged vulva include an ovarian remnant or an unspayed female.

TREATMENT

Many ferrets with adrenal gland disease will continue with a good quality-of-life for several years after diagnosis. The average longevity of pet ferrets is between 6 and 8 years, so the cost/benefit ratio of the treatment options must be carefully considered for each individual case. Prostatic disease and anemia are potentially life-threatening problems that do require treatment in all cases. Alopecia is essentially a cosmetic concern, but pruritis does affect quality-of-life and should be treated.

Surgical removal of affected adrenal tissue is curative, but it is not possible to diagnose adrenal gland abnormalities by size or gross appearance during surgery. Therefore, in most cases it is best to remove both the left and right adrenal glands during the first surgery. Technical skills required to remove the left adrenal gland are minimal, but skills required for right adrenalectomy are quite advanced. The right adrenal gland is dorsal to the right liver lobe and shares its capsule with the vena cava in most ferrets. Although cryosurgery, laser ablation, and radiosurgical fulgration can help destroy right adrenal gland tissue, a portion of the vena cava wall must be removed together with the gland for complete removal in many cases. Surgical removal of the vena cava wall requires advanced surgical skills and specialized equipment. Some patients that have all adrenal gland tissue removed may need supplementation of prednisone and a mineralcorticoid.

Medical treatment of adrenal gland disease can improve an affected ferret's quality-of-life for several years. It is not recommended, however, for young ferrets because the efficacy of medical therapy declines over time and surgery is usually required within 2 years of diagnosis. Melatonin, leuprolide, arimidex, and flutamide have all been used for treatment. The most popular treatments include melatonin and leuprolide. Long-acting leuprolide is given by injection every 1 to 3 months. Melatonin is available as an implant designed for ferrets, but daily oral doses are effective and well tolerated. Patients treated with melatonin should be monitored for side effects including hypoglycemia, especially in cases of concurrent insulinoma.

KEY POINTS

- Adrenal gland disease is very common in adult ferrets
- Vulvar enlargement, hair loss, and itchiness are common signs
- Efficacy of medical treatment declines over time
- Complete removal of both left and right adrenal glands is curative
- Surgical removal of the right adrenal gland requires advanced surgical skills