

Adrenal Disease in Ferrets

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Adrenal disease is a common syndrome, usually affecting middle aged ferrets(three to seven years old). Ferret adrenal gland disease typically results in an overproduction of sex hormones. The most common cause is hyperplasia (excessive growth) of the adrenal gland(s), but tumors, both malignant and benign can be the cause as well. Metastasis (spread outside of the immediate area) of adrenal tumors is uncommon, however, some adrenal tumors can be very invasive locally, and may grow into the blood vessels or internal organs near the tumor's origin.

Research has shown that adrenal disease occurs as a result of neutering (spay or castration). The exact reason for this is somewhat complex but in simple terms; when the ferret is neutered it no longer produces sex hormones and consequently there is no sex hormone negative feedback to stop production of other hormones in the brain, specifically luteinizing hormone (LH). This excess LH continuously stimulates the adrenal gland and with time results in the cell changes (hyperplasia or tumor cells) associated with ferret adrenal disease. You might ask, "Then why are ferrets neutered?" Ferrets are neutered in order to prevent other serious health problems and because it makes them better, friendlier pets.

The most common symptom of adrenal disease is a symmetrical hair loss, usually starting at or near the base of the tail and progressing toward the head. If left untreated, affected ferrets can look nearly bald, and may have very dry, itchy skin. Despite being neutered or spayed, affected ferrets may return to behaviors typical of an animal that is sexually intact, and may develop aggression toward other ferrets or people. In some cases this behavioral change may be the only sign of adrenal disease. Females with adrenal disease may appear to be in heat, with an enlarged vulva. Male ferrets may have difficulty urinating or develop repeated urinary tract infections due to prostatic enlargement and inflammation. Some ferrets may lose muscle tone and become weak and lethargic. An increased odor and yellowing of the fur coat may also be noticed.

Diagnosis of adrenal disease is often based on medical history and the classic signs of illness. Routine blood tests are typically normal although anemia (decreased red blood cells) may develop in some ferrets. To definitively diagnose adrenal disease the University of Tennessee provides a blood assay that measures the circulating levels of several hormones produced by the adrenal glands. Elevated hormone levels support the clinical diagnosis of adrenal disease. Ultrasound is also a helpful diagnostic tool used to identify an abnormally enlarged adrenal gland. Monitoring the affected ferret for several months via ultrasound has the added benefit of determining which adrenal gland is growing and thereby most likely to be causing the clinical signs.

The preferred treatment for adrenal gland tumors or hyperplasia is the surgical removal of the affected gland(s). This is the only treatment that offers a cure for the disease. Blood work should

be done prior to surgery to evaluate the ferret's overall health. Chest x-rays are often recommended, and if there is any concern about the heart, an echocardiogram (ultrasound of the heart) should be done. There are several surgical methods used to remove the abnormal adrenal gland or glands. In addition to conventional resection, cryosurgery, the freezing of tissue with liquid nitrogen, has been advocated as another method of destroying abnormal adrenal tissue. The right adrenal gland lies very close to a major blood vessel (vena cava), which makes typical surgical removal challenging. Since adrenal glands are important in regulating a number of vital body functions, ferrets that have *both* adrenal glands removed because of disease may require medication following surgery. Blood tests performed several days after surgery can help determine if supplementation is necessary.

There are a variety of medical treatments available for ferrets that are not good surgical candidates. None of them cure the disease itself, their effectiveness will vary with the degree of adrenal hormone production, and the medications are limited in suppressing continued tumor development and growth. However, clinical signs can often be completely eliminated, giving the ferret a good quality of life. The most commonly used and most effective drug treatment option is Lupron (leuprolide acetate) which is given by injection once monthly until clinical signs resolve (usually this occurs within 3 months) and repeated if and when signs recur. Many exotics veterinarians advocate monthly Lupron treatment for the rest of the ferret's life as the best way of suppressing disease recurrence. Another drug used to treat the clinical signs associated with adrenal disease is melatonin. A new 90 day slow-release injectable product is now available. Due to the size of the needle associated with this melatonin slow-release pellet the ferret may need to be briefly anesthetized when it is given.

Can adrenal disease be prevented? Newer research has shown that giving Lupron injections once yearly during the ferret's natural breeding season (end of January/early February) may prevent the onset of adrenal disease as the ferret matures. Ongoing research will determine if this common disease can be prevented.