



### **John Wehe, DVM** **Downtown Greensboro** **Animal Hospital**

Dr. John Wehe is a Greensboro native. He is the owner and veterinarian of Downtown Greensboro Animal Hospital, a new animal hospital in downtown Greensboro that opened in March 2013.

Dr. Wehe attended North Carolina State University College of Veterinary Medicine and received his Doctorate of Veterinary Medicine in 2007. His professional interests include small animal medicine, surgery and ultrasonography. He values serving his patients and educating his clients, as well as getting to spend time downtown. Dr. Wehe shares his life with his amazing wife and four children.

## **FERRET ADRENAL GLAND DISEASE**

Ferret adrenal gland disease (AGD) is one of the most common diseases that veterinarians diagnose in ferrets. The adrenal gland is a small hormone secreting organ in the abdomen. There is a right and left adrenal gland located in the abdomen next to the kidneys. They are responsible for secreting steroids and sex steroid hormones. Ferret adrenal gland disease is a condition of an overactive adrenal gland most commonly related to a benign tumor. The age of onset ranges from two to seven years, but most ferrets are typically diagnosed around three or four years of age. Symptoms that owners usually notice are hair loss, itchiness, lethargy, and an enlarged vulva in the case of female ferrets. The hair loss can become quite dramatic over time. More serious clinical signs include difficulty urinating in male ferrets and weakness caused by a low red blood cell count (anemia). AGD is very common in pet ferrets from North America. Researchers have proposed three main reasons for this, however, conclusive evidence is still lacking. The three main theories for the development of AGD in pet ferrets are related to early sterilization (neutering/spaying), increased “daylight” exposure and genetics.

In order to understand the how sterilization plays a role in the AGD, you must first understand a little about the sex hormones estrogen and testosterone. In the sexually mature ferret these hormones are produced by the gonads (ovaries and testicles). These sex hormones contribute to the signaling of the pituitary gland in the brain. The pituitary gland is like a conductor of an orchestra. It releases chemical signals called gonadotropins that drive the release of steroid and sex steroid hormones from the adrenal gland. One of the gonadotropins of particular interest is luteinizing hormone (LH). In order to prevent an imbalance in hormone secretion from any organ, there is a series of negative feedback loops. Researchers believe that early sterilization removes the negative feedback loop between pituitary gland and adrenal gland by removing the sex hormones. Loss of this negative feedback loop causes the pituitary gland to overstimulate the adrenal glands by LH. The chronic overstimulation of the adrenal gland by LH causes the adrenal glands to abnormally increase in size and potentially develop tumors, and release excessive amounts of sex

steroid hormones leading to the clinical signs associated with AGD.

Excessive “daylight” exposure is another proposed method of development of AGD in ferrets. When spring arrives and the daylight hours increase, sexually mature ferrets prepare for the breeding season. It is during this time that the complicated hormone cycling and feedback loops get exercised and the pituitary gland pumps out gonadotropins to prepare for reproduction. This system becomes inactive when the daylight hours decrease in the fall and winter after the breeding season is over. Indoor pet ferrets are generally exposed to longer daylight hours through indoor lighting. Therefore, they never go through the natural cycle of increasing and decreasing daylight hours. This prolonged “daylight” exposure causes excessive release of gonadotropins which overstimulates the adrenal gland, leading to AGD.

There are also theories that genetics contribute to the development of AGD. The majority of pet ferrets in North America come from only a few breeders. There are concerns that over breeding of ferrets with limited genetic diversity from these suppliers has caused a predisposal to development of AGD.

As veterinarians, we play a role in educating our clientele. All ferret owners or potential ferret owners should be aware of AGD and the clinical signs and behavior changes that may occur with AGD. Diagnosis of the disease is also crucial. While the clinical signs are widely recognized by most ferret owners and veterinarians, diagnostics are important to confirm the suspicion of AGD and rule out other diseases that may be present at the same time. AGD is diagnosed with blood work to assess for overall health of the abdominal organs such as the liver and kidneys, and measure the blood glucose. A blood sample is also typically used to assess for elevated sex hormones in the blood. An abdominal ultrasound is used to visualize the adrenal glands to assess their size, as well as look for abnormalities such as an adrenal gland tumor. Ultrasound also helps to determine if just one or both of the adrenal glands are diseased.

Currently, the only curative treatment for ferret adrenal gland disease is surgical removal of the affected adrenal gland. The short term and long term prognosis for an otherwise healthy ferret undergoing this surgery is excellent. As mentioned before, this disease can be bilateral or become bilateral, for this reason some veterinarians recommend surgically addressing both adrenal glands at the same time.

There are also nonsurgical treatment options for the treatment of AGD. It is important to note that these treatments are not curative, but can effectively alleviate the clinical signs of AGD. However, they will not stop the growth of an adrenal gland tumor. Two popular medical therapies available involve gonadotropin analogs that block the action of LH on the adrenal gland. These include leuprolide and deslorelin. Both are available in long acting injections. A third medical treatment is melatonin, which is also available as a long acting implant.

Knowing the clinical signs of AGD in your ferret and taking them to see your veterinarian if you are concerned is important to diagnose AGD and other concurrent diseases, and also to decide on which therapy, if any, is right for your ferret.



**John Wehe, DVM**  
**DOWNTOWN GREENSBORO ANIMAL HOSPITAL**

120 W Smith Street in Greensboro  
P: 336-338-1840 | F: 336-617-5351

[www.downtowngreensboroanimalhospital.com](http://www.downtowngreensboroanimalhospital.com)

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