

Canine Cushing's Disease



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Introduction

Cushing's disease, also known as hyperadrenocorticism, is a condition resulting from excessive secretion of normal hormones called glucocorticoids from the adrenal glands. Glucocorticoids are vital for overall body health, however, when produced in higher than normal quantities, negative effects occur. In the normal dog the pituitary gland, which is located in the brain, produces a hormone called ACTH. This ACTH stimulates the adrenal glands to produce many hormones including glucocorticoids. Dogs have two adrenal glands, each located adjacent to the kidneys.

There are two types of Cushing's disease. The most common form occurs when a tumor develops on the pituitary gland. This tumor releases elevated levels of ACTH, thus constantly stimulating the adrenals to secrete glucocorticoid. As a result, too much glucocorticoid is released. This form is known as pituitary-dependent hyperadrenocorticism and is the type present in 80% of dogs with Cushing's disease. The second form of the disease occurs when a tumor forms on one of the adrenal glands. In this situation, the tumor secretes excessive glucocorticoid on its own with no regulation from ACTH. This type is referred to as Adrenal-dependent hyperadrenocorticism and is present in 20% of dogs with Cushing's disease.

Clinical Signs

Cushing's disease is considered a disease of middle-aged to older dogs. There

are many symptoms associated with this disease as a result of excess glucocorticoid production. Most dogs have several of these signs, but they do not have to have all of the signs. Dogs with Cushing's generally have increased water intake and urination. These signs can be very profound and dogs that have always been well house broken may begin to urinate in the home. They may also have a significant increase in appetite. Dogs with previously good table manners may begin to steal food or perhaps get into the trash. They often also have abdominal enlargement. This is a result of decreased muscle tone and liver enlargement. It is also very common to see hair loss, particularly along the back and tail. Increased panting, seeking cold surfaces, urinary tract infections and skin infections are also clinical signs that are observed.

Diagnosis

The diagnosis of Cushing's disease involves multiple tests. Different tests are required because there is not one perfect test available, and the two types of Cushing's are treated differently, so determining which form is present is important. The two most common screening tests in a dog that presents with clinical signs consistent with Cushing's disease are a low dose dexamethasone suppression test (LDDS) and the ACTH stimulation test. Both of these tests are good tests and both have faults.

The LDDS test is done by pulling a blood sample and administering dexamethasone. Two additional blood tests are then evaluated four hours apart at four and eight hours post-injection. This test is very sensitive, meaning that it is unlikely to give a false negative but it does give quite a few false positives. Dogs that are sick for reasons other than Cushing's can come back with a positive test. It is very important when interpreting this test to make sure that the dog has the appropriate clinical signs and no other illness. This test can be used to help determine between the two types of Cushing's disease.

The ACTH stimulation test is performed

by pulling a blood sample, administering a drug called cortrosyn, and pulling a second sample one hour later. This test is not as sensitive, and as a result can give a false negative result in around 30 percent of cases; however it is not as likely to give a false positive. This test is not able to distinguish between the two types of Cushing's.

An abdominal ultrasound is also often recommended in the work-up for a dog with potential Cushing's disease. The ultrasound allows the veterinarian to visualize the adrenal glands. If your dog has pituitary-dependent Cushing's disease, both adrenal glands may be large. If they have adrenal-dependent Cushing's, one of the adrenal glands may be enlarged with a mass present. The ultrasound also allows for evaluation of other organs to help rule out other possible diseases that could make interpretation of the LDDS or ACTH stimulation tests difficult.

Other tests that may be recommended are the high dose dexamethasone suppression test and the endogenous ACTH test. These tests help determine which type of Cushing's is present. Occasionally, MRI or CT scan may be suggested, especially if the dog has been diagnosed with pituitary-dependent Cushing's, and there is concern that there may be a large tumor versus a small one on the pituitary.

Treatment

Most dogs with Cushing's disease are treated with oral medications. The dogs that are most successfully managed with oral drugs are those that have the pituitary-dependent form and have a small tumor on the adrenal gland. The medications that have been shown to be effective are mitotane or trilostane. Both of these medications are administered life-long. Mitotane has an induction phase and a maintenance phase. During induction, dogs are given the medication daily while watching carefully for a slight decrease in appetite or water consumption. This usually happens within the first week, but can take longer. Once this change is appreciated, the medication is stopped



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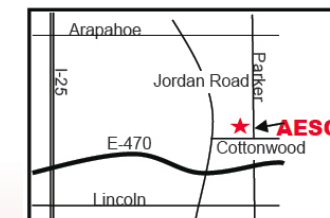
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and a repeat ACTH stimulation test is performed. If the values are at the appropriate level, the dose will be reduced. With trilostane there is not an induction phase, so the dose is initiated and a recheck is planned in two weeks to see if the dose is appropriate.

The treatment of choice for dogs that have an adrenal tumor is to have the tumor removed. Fifty percent of these tumors are benign and fifty percent are malignant. Unless there is evidence of tumor spread seen on the ultrasound, it is difficult to distinguish benign from malignant prior to surgical removal. Dogs that have benign tumors removed go on to have normal lives with no additional treatment needed. The dogs with malignant tumors have a less favorable prognosis because of the likelihood of metastasis (spread of the disease to other body parts). In the rare situation where there is a large tumor identified on the pituitary gland, the treatment of

choice is radiation therapy or surgery.

Prognosis

The prognosis for dogs with Cushing's is difficult to evaluate. The main reason is that Cushing's disease is most often diagnosed in older dogs and as a result they often have other diseases as well. In one study, the average survival time for a dog diagnosed and treated for pituitary-dependent Cushing's was two years. This is, however, difficult to interpret because only half of the dogs died of reasons related to Cushing's. The other half died from diseases unrelated to Cushing's. Furthermore, dogs that were not treated for Cushing's lived an average of two years as well. The main goal of therapy is to remove the clinical signs and to decrease the chances of producing a blood clot (thromboembolism) that could be life threatening. The medications improve the quality of life, not necessarily the quantity.

The prognosis for adrenal-dependent Cushing's disease is dependent on if the adrenal tumor is benign or malignant. If the tumor is benign and they survive surgery, the prognosis is excellent. If the tumor is malignant the prognosis is poor, because the malignant adrenal tumors have likely already microscopically metastasized at the time of diagnosis.

Overall, many dogs are successfully diagnosed and treated for Cushing's disease. This treatment can significantly increase the quality of their life. As a complicated disease, a thorough understanding of the diagnostic and treatment options will help the pet owner to make decisions regarding their dog.

Dr. Anne Dalby is a Board-Certified Specialist in Small Animal Internal Medicine and sees patients by appointment at Animal Emergency & Specialty Center in Parker. For more information, please call 720-842-5050 or visit www.AESCparker.com.