



Pituitary-Dependent Cushing's Disease Treatments

What is Cushing's Disease?

Hyperadrenocorticism, commonly referred to as Cushing's disease, is a condition characterized by increased levels of the hormone cortisol circulating in the bloodstream. Excess cortisol can be caused by tumors in the pituitary gland or the adrenal glands. The pituitary gland is about the size of a pea, and is located in the brain. It normally secretes hormones that regulate growth and normal body function. The adrenal glands are located in the abdomen and secrete hormones, including cortisol, that help the body deal with stress and regulate electrolytes. Tumors of the pituitary gland are tiny and usually benign, but they produce a hormone called ACTH excessively. This in turn causes the adrenal glands to produce excess cortisol. The pituitary-dependent form of this disease is by far the most common type in dogs and the following are options for treatment of pituitary dependent Cushing's disease.

Medical Therapy

- Trilostane
 - Veteryl (trilostane) is a commonly used drug and the preferred medical treatment for hyperadrenocorticism, aka Cushing's disease. Trilostane works by reducing the synthesis of cortisol. It can control the disease, but does not cure it. Possible side effects of trilostane include lethargy, vomiting, diarrhea, and a disinterest in food. Trilostane is given daily for the life of the animal. Your veterinarian will need to perform monitoring tests to make sure the dose is right. These tests are more frequent early in treatment, but then need to be done only once or twice a year thereafter.

- Mitotane
 - Lysodren (mitotane) is another drug treatment. Mitotane works by causing a controlled destruction of adrenal tissue to decrease production and release of cortisol. Mitotane is given in two phases:
 - Induction phase: A higher dose of drug is given once daily with food for seven-10 days. During this time a large amount of adrenal tissue is being destroyed.
 - Maintenance phase: A smaller dose of drug is administered several times a week in this phase to try maintain the adrenal glands in their suppressed state.

Mitotane has good efficacy, but is not a complete fix and studies show that 50 percent of patients relapse to cortisol overproduction within one year. Mitotane is not recommended for animals with pre-existing kidney or liver disease, and should also be avoided in animals with diabetes. Possible side effects of mitotane use include lethargy, ataxia, weakness, anorexia, vomiting and diarrhea.



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Both of these medications require continual monitoring, and your veterinarian will need to draw blood to monitor cortisol and electrolyte levels. It is essential to monitor your dog's drinking, urination, appetite and energy levels.

Radiation Therapy

Radiation therapy is not a treatment option to reduce the hormone secretion of the pituitary tumor. Radiation therapy can only reduce the size of the pituitary tumor. This may be beneficial if an animal is experiencing neurological signs because of the size of the pituitary tumor and its pressure on other parts of the brain. However, if no neurological signs are present, radiation therapy is not recommended because it is not effective in controlling the hormone output of the tumor. Research has shown that after radiation therapy, some dogs will see some temporary improvement in their clinical signs, but will ultimately relapse. Some dogs show no improvement in clinical signs at all. Most dogs end up needing medical therapy (mitotane or trilostane) after radiation therapy.

Surgical Therapy

A third option for Cushing's therapy is a hypophysectomy. This procedure is commonly performed in people, and involves surgical removal of the pituitary gland. While it is an available treatment for dogs with a microadenoma (tumor less than 10mm in diameter), it is seldom performed by veterinary surgeons because it is a highly specialized skill that requires particular instruments.

The surgery begins with a cut into a specific area on the roof of the mouth. The tissue is moved aside and a bone drill is used to remove the thin layer that surrounds the pituitary gland. The gland is detached and the space left behind is filled with a surgical gelatin. Bone wax is then used to close the hole made within the roof of the mouth and the tissue sutured together.

The surgery has an 80 percent remission rate (symptoms subside) and an 11 percent recurrence rate (clinical signs reoccur). However, despite the removal of the pituitary gland and successful remission of the disease, the patient will need medication supplementation for life. When the tumor causing the adrenals to overproduce hormones is removed, so is the signal for the adrenals to produce any hormones at all. This means that after a hypophysectomy, patients will need corticosteroids supplements to replace what the adrenals will no longer be producing. The pituitary gland is also directly responsible for stimulating the thyroid gland, so thyroid hormone will also need to be given for life.