Canine Primary Hyperparathyroidism Fact Sheet

What is Canine Primary Hyperparathyroidism?

Primary hyperparathyroidism (PHPT) is a rarely diagnosed disease of older dogs and is caused by overproduction of parathyroid hormone by the parathyroid glands that are located in the neck. Parathyroid hormone is responsible for increasing the level of calcium in the blood, therefore in dogs with this disease, high blood calcium levels and their consequences are usually the first signal that hyperparathyroidism may be present.

What are the causes of primary hyperparathyroidism in dogs?

The majority of cases of primary hyperparathyroidism in dogs are as a result of a benign change to one or more of the parathyroid glands called 'hyperplasia’ or ‘adenoma’. These cause enlargement of the gland and cause it to produce parathyroid hormone in an uncontrolled way. The disease can occur in any breed of dog, but a very high prevalence is seen within the Keeshond breed, suggesting that there are at least some genetic factors that lead to its development.

In a small percentage of cases (around 5%), hyperparathyroidism can be caused by a malignant tumour of the parathyroid glands called a parathyroid carcinoma.

What are the clinical signs of primary hyperparathyroidism in dogs?

A high proportion of cases of primary hyperparathyroidism are detected incidentally when blood screens are performed in older patients before anaesthetics (for example for dental work). In these cases, often no clinical signs have been seen at home. In patients showing clinical signs, the most common sign is a significant increase in drinking and urination, as the high calcium levels stop the kidneys from effectively retaining water in the body. Less common signs can include reduced appetite, reduced activity levels and vomiting.
In most cases of hyperparathyroidism, the examination by your local vet will not identify any abnormalities. In the rare cases where a malignant tumour is present, occasionally this can be felt on close examination of the neck.

**How is canine primary hyperparathyroidism diagnosed?**

Hyperparathyroidism can only be diagnosed in patients who have a high blood calcium level, therefore testing for this disease is part of the investigations for high calcium (hypercalcaemia). This will include a detailed history, full blood screen and imaging (x-rays and ultrasound). Further testing and measurement of specific hormones typically follows this.

A diagnosis of hyperparathyroidism is made by demonstrating that there is an inappropriately high level of parathyroid hormone in the blood. In a normal dog with high blood calcium, the level of parathyroid hormone should be low or very low due to there being no requirement for more calcium uptake. In this situation, a parathyroid hormone level within or above the ‘normal’ range would be considered inappropriate and the diagnosis could be made. It is imperative that, in order to accurately interpret the parathyroid level, it is measured on the same blood sample on which the calcium was seen to be high. Measuring parathyroid hormone is challenging and needs to be sent to a specific laboratory with very specific sample handling and transport requirements.

Following a diagnosis of hyperparathyroidism, ultrasound scanning of the neck can be performed to attempt to identify which of the four parathyroid glands is affected prior to definitive treatment.

**What treatment is available for primary hyperparathyroidism in dogs?**

The most commonly performed treatment for hyperparathyroidism is surgical removal of the affected gland (parathyroidectomy). Ideally the affected gland is identified before surgery but, in some cases, this is not possible and the correct gland can only be identified during the procedure. The surgery can be challenging – as the glands are very small and some normal parathyroid tissue must be maintained in order to avoid very serious post-operative (and lifelong) complications.

Other less effective or less reliable treatment methods include ethanol ablation (where pure ethanol is injected into the parathyroid gland to destroy the tissue) or ablation with heat (generated by a radiofrequency transmitted into the gland through a needle).

Medical treatment is available to attempt to reduce the circulating calcium levels but this is not curative. The medications are also typically only partially effective and therefore are more commonly used in the short-to-medium term. In some cases, these medications may be given prior to surgery to reduce the calcium levels before the gland is removed, as this has been suggested as a means to reduce complications in the post-operative period.

**Are there any complications associated with treatment for Canine Primary Hyperparathyroidism??**

The most commonly seen complication with surgical treatment of hyperparathyroidism is a temporary rebound drop in blood calcium levels. This is due to the suppression of the other parathyroid glands by the over-active gland, and in some cases a period of a few days to weeks is required before the remaining glands resume normal production of parathyroid hormone. A low blood calcium level can cause seizures, so typically patients are hospitalised for 4-7 days following surgery for monitoring. In patients where calcium drops to levels that are too low, medication and/or calcium supplementation may be required for a period of time to support the body’s calcium levels. This is typically very effective and it is rare that severe adverse effects are seen. In some patients where the calcium level before
surgery was particularly high, these medications and supplements may be started early to attempt to reduce the risk of a dangerously severe drop in blood calcium occurring. A period of close monitoring of blood calcium levels after surgery is required in all cases to allow rapid treatment if this occurs.

**What is the prognosis for dogs diagnosed with primary hyperparathyroidism?**

In dogs who are successfully treated for primary hyperparathyroidism, prognosis is generally excellent. A small percentage of cases (5-10%) may show development of the disease again in one of the remaining parathyroid glands, however this occurs significantly more commonly in Keeshonden (up to 50%) than in other breeds. Removal of further affected glands is possible if this occurs.

In dogs who are not treated, long term high calcium levels can lead to build up of mineralised calcium deposits in the organs of the body. The kidneys are particularly vulnerable to this, and loss of kidney function and kidney disease can develop as a result, however other organs and structures are also at risk. Patients also become susceptible to dehydration and the consequences of this, therefore not treating the disease, even in patients showing no outward symptoms, is typically discouraged.