Pancreatic Hypoplasia: A Cause of Pancreatic Insufficiency in Puppies

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The pancreas is a small structure located near and attached to the wall of the small intestine. The pancreas has two major functions. It produces insulin to aid the blood in sugar absorption and it produces important enzymes to aid in the digestion of protein and fats (lipids). These enzymes travel from the pancreas to the small intestine through a small tube called the pancreatic duct.

The pancreas produces the protein-digesting enzymes trypsin and chymotrypsin. Fat digestion is aided by enzymes called lipases, also produced by the pancreas. Without these enzymes, dogs would not be able to break down important dietary components.

Hypoplasia is the term for an underdeveloped tissue or organ. One of the most common puppy abnormalities of the pancreas is congenital pancreatic hypoplasia, which refers to an underdevelopment of the pancreas. It is also called 'juvenile pancreatic acinar atrophy.' In puppies with this condition, the portion of the pancreas that produces the hormone insulin usually develops normally, while those cells that produce enzymes for digestion of food, especially fats, do not. When the pancreas does not produce these digestive enzymes, we call it 'pancreatic insufficiency.' Pancreatic hypoplasia, the most common cause of pancreatic insufficiency is genetic and is most noted in German Shepherds, Doberman Pinschers, Saint Bernards, Irish Setters, and Labrador Retrievers.

What are the symptoms?

The symptoms relate to the fact that food is improperly digested, preventing its absorption. The degree or severity of symptoms varies with the amount of loss of functional pancreatic tissue. A dog with pancreatic hypoplasia does not have a fully developed pancreas, but whether it is 50 percent or 90 percent developed alters the degree to which it functions. In other words, the pancreas may be capable of producing enzymes to digest a little, some, or most, but not all of its food.

Symptoms generally include a loose, greasy, foul-smelling stool. The hair coat is generally dry and brittle as a result of inadequate fat digestion and utilization. Most dogs have an increased, oftentimes voracious appetite, as they are functionally starved as a result of fecal loss of nutrients. Despite a great appetite, most dogs are thin - again due to nutrient loss. Coprophagy (stool eating) is common among affected individuals, although many normal puppies also engage in this habit.

What are the risks?

Mildly affected dogs, those with almost-normal enzyme production, are not at great risk. They may, however, experience loose stool and remain thin, with a dull hair coat. Dogs with moderate to severe pancreatic hypoplasia will be more severely affected. Left untreated, these dogs will experience severe signs of malnutrition, including death.

What is the management?

Management is aimed at improving the digestion of foods so that, nutritionally, the dog will not be severely compromised. Commercially prepared enzymes are available to replace or supplement what the pancreas is not producing. Pancreazyme and Viokase are the two most commonly prescribed enzyme formulations. Either one can be used. Basically, these supplements contain the enzymes needed for digestion. The enzyme supplement is mixed with the food prior to feeding. In addition to providing enzyme supplementation, it is beneficial to feed specially prepared diets, which are formulated for ease of digestion. The prescription diet i/d by Hill's is one such diet. From the authors' experience, it is important to discuss the costs associated with management with each owner. Enzyme supplements and prescription diets are costly and will need to be fed for the life of the animal. It is also possible the dog will be controlled with treatment, but may never return to perfect health. Symptoms to some degree may persist even with proper management.