

Gastric Dilatation-Volvulus

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Your ACVS board-certified veterinary surgeon completed a three-year residency program, met specific training and caseload requirements, performed research and had research published. This process was supervised by ACVS Diplomates, ensuring consistency in training and adherence to high standards. After completing the residency program, the individual passed a rigorous examination. Only then did your veterinary surgeon earn the title of ACVS Diplomate.

Overview:

Gastric Dilatation-Volvulus (GDV) is a rapidly progressive life-threatening condition of dogs. The condition is commonly associated with large meals and causes the stomach to dilate, because of food and gas, and may get to a point where neither may be expelled. As the stomach begins to dilate and expand, the pressure in the stomach begins to increase. The increased pressure and size of the stomach may have several severe consequences, including:

- prevention of adequate blood return to the heart from the abdomen
- loss of blood flow to the lining of the stomach
- rupture of the stomach wall
- pressure on the diaphragm preventing the lungs from adequately expanding leading to decreased ability to maintain normal breathing

The entire body suffers from the poor ventilation leading to death of cells in many tissues. Additionally, the stomach can become dilated enough to rotate in the abdomen, a condition called volvulus. The rotation can lead to blockage in the blood supply to the spleen and the stomach. Most pets are in shock due to the effects on their entire body. The treatment of this condition involves stabilization of your pet, decompression of the stomach, and surgery to return the stomach to the normal position permanently (gastropexy). Abdominal

organs will need to be evaluated for damage and treated appropriately as determined at the time of surgery.

Several studies have been published that have evaluated risk factors and causes for gastric dilatation and volvulus in dogs. This syndrome is not completely understood; however, it is known that there is an association in dogs that:

- have a deep chest (increased thoracic height to width ratio)
- are fed a single large meal once daily
- are older
- are related to other dogs that have had the condition

It has also been suggested that elevated feeding, dogs that have previously had a spleen removed, large or giant breed dogs, and stress may result in an increased incidence of this condition. A 2006 study also determined that dogs fed dry dog foods that list oils (e.g. sunflower oil, animal fat) among the first four label ingredients predispose a high risk dog to GDV.

Nearly all breeds of dogs have been reported to have had gastric dilatation with or without volvulus, but many of the commonly seen breeds are Great Danes, Weimaraners, St. Bernards, Irish setters, and Gordon setters.

Signs and Symptoms:

Initial signs are often associated with abdominal pain. These can include but are not limited to:

- an anxious look or looking at the abdomen
- standing and stretching
- drooling
- distending abdomen
- retching without producing anything

As the disease progresses, your pet may begin to pant, have abdominal distension, or be weak and collapse and be recumbent. On physical examination, pets often have elevated heart and respiratory rates, have poor pulse quality, and have poor capillary refill times. Abdominal distension is also commonly noted.

Stabilization and surgery are best when performed early in the course of the disease; mortality rates increase with the severity of disease. If your pet has exhibited any of the above clinical signs, they should be evaluated by your primary care veterinarian immediately. Surgery is

indicated if the diagnosis of gastric dilatation with or without volvulus has been established. Your pet may be referred to an ACVS board-certified veterinary surgeon for treatment if this condition is diagnosed.

As gastric dilatation worsens and full body effects become prolonged, many secondary complications may occur.

- Diminished respiration and cardiac output throughout the course of the disease leads to poor oxygen delivery to many tissues (hypoxia). This leads to cell death in the liver, kidneys, and other vital organs.
- Cardiac arrhythmias (abnormal heart beats) are commonly seen because of the hypoxia.
- The lining of the entire gastrointestinal tract is at risk of cell death and sloughing.

As the condition progresses, toxins may be increasing locally and when gastric dilatation is relieved these may circulate through the body resulting in additional cardiac arrhythmias, acute renal failure, and liver failure. Bacteria also commonly gain access to the blood during this condition leading to bacteremia (bacteria in the blood) and sepsis.

Diagnostics:



Figure 1. A lateral radiograph of a dog with a gastric volvulus. Note the stomach is markedly distended with gas (which shows up as black on the radiograph) and the stomach is occupying nearly the entire abdomen.

Most veterinarians will recommend initial bloodwork that includes a complete blood count (CBC), serum chemistry, and a urinalysis. These allow for the determination of the nature of the metabolic disturbances that may be concurrently happening. It also allows your veterinarian to rule out certain diseases which may mimic the clinical signs of gastric dilatation. Additionally, abdominal x-rays are used to confirm a diagnosis (Figure 1) and an electrocardiogram (ECG) is

used to evaluate the presence of cardiac arrhythmias which are commonly seen later in the disease course. Blood gas analysis is also commonly performed to evaluate the nature and severity of the respiratory compromise. Additional tests may be recommended by your veterinary surgeon.

Treatment:

Stabilization of your dog is paramount and often begins with intravenous fluids and oxygen therapy. Gastric decompression often follows, which includes the passing of a tube down the esophagus into to stomach to release the air and fluid accumulation and can be frequently followed with lavage (flushing of water) into and out of the stomach to remove remaining food particles. In certain cases this is not possible and a needle or catheter may be placed into the stomach from outside the body to release air and aid in the passing of the tube. The time for general anesthesia and surgical stabilization will be determined by the stability of your pet and at the discretion of the veterinary surgeon.

Surgery involves full exploration of the abdomen and de-rotation of the stomach. Additionally, the viability of the stomach wall, the spleen, and all other organs will be determined. Removal of part of the stomach wall (partial gastrectomy) or the spleen (splenectomy) is performed if necessary. Once the stomach is returned to the normal position in the abdomen, it is permanently fixed to the abdominal wall (gastropexy). The purpose of this procedure is to prevent volvulus (rotation) if subsequent gastric dilation occurs again.

Aftercare and Outcome:



Figure 2. Laparoscopic view of a completed gastropexy

Most pets will be hospitalized and given intravenous fluids for several days and evaluated for cardiac arrhythmias and other postoperative

complications. Immediate postoperative care will include exercise restriction for a few weeks to allow the incisions to heal. Long term, dietary management will likely include multiple small meals (2-3) per day rather than a single large meal and continued monitoring for recurrence of clinical signs.

Mortality rates associated with gastric dilatation and volvulus have been reported to be approximately 15%. Mortality and morbidity (complication) rates increase as disease severity and time increase. Factors that have been shown to increase mortality rate include patients:

- with clinical signs for more than 6 hours
- with cardiac arrhythmias prior to surgery
- requiring removal of a portion of the stomach due to loss of blood supply
- requiring removal of the spleen

General anesthesia remains the most important risk to patients affected by gastric dilatation. Death may occur before, during, or after the procedure because of the disease. Following the procedure, cardiac arrhythmias are commonly seen, although relatively few are life threatening and require treatment. Further cell death and loss of organs may occur because of the toxins released when the stomach is returned to its normal position. Additionally, many dogs will have some degree of gastric dilatation; however, the gastropexy serves to prevent the life threatening complication of rotation. Surgery always carries a low risk of infection or breakdown of suture line (dehiscence) leading to a second surgery.

As a preventative measure, prophylactic gastropexy is currently being recommended by many veterinary surgeons for breeds at risk for development of the condition or in dogs that have relatives that have been related to others that have had this condition. Prophylactic gastropexy can often be done at the same time as sterilization surgeries (spay/neuter). Minimally invasive techniques such as laparoscopic-assisted gastropexy, endoscopically assisted gastropexy and grid (limited approach) gastropexy are possible for prophylactic gastropexies (Figure 2).

Photos provided courtesy of Gregory S. Marsolais, DVM, MS, Diplomate ACVS - Small Animal Surgery.