

Gastric dilatation and Volvulus (GDV) – What is it and how can we prevent it?

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Gastric dilatation and volvulus (GDV) is a sudden-onset life-threatening disease that requires emergency veterinary treatment. If affected dogs are left untreated then they can quickly die from the disease. It is a disease that tends to affect deep-chested large and giant purebred dogs. It has been shown to be an important cause of death in Flat Coated Retrievers (FCRs) accounting for 5% of overall FCR deaths and over 20% of non-tumour-related FCR deaths. Therefore, it is very important that FCR owners are familiar with the signs of GDV and ways that it can be prevented.

What is a GDV?

Gastric dilatation is the expansion of the stomach with air and/ or fluid and it is commonly referred to as 'bloat'. Dilatation can occur on its own or in combination with volvulus. Gastric Volvulus (GV, which can also occur independently) is the rotation of the stomach on its long axis i.e. twisting of the stomach (see figure 1). When gastric dilatation and volvulus (GDV) occur together the disease can become rapidly fatal. The distended stomach interferes with breathing and blood flow around the body. The twisting of the stomach prevents exit of the stomach contents either into the intestines or by vomiting. The twisting of the stomach can cause tearing of blood vessels of the stomach and spleen and obstruction of blood flow in both these organs and around the body. This causes the body to go into shock. If dogs are not treated quickly they can suffer from severe damage to the stomach lining, heart problems, damage to organs like the kidneys and eventually death, often due to lack of blood flow to vital organs and difficulty breathing.

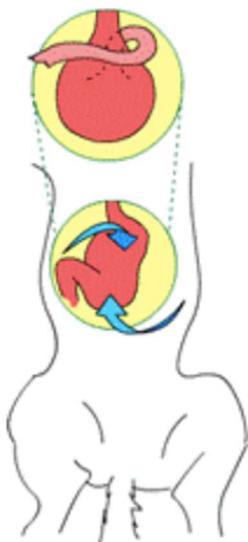


Figure 1. Clockwise rotation of the stomach in GDV (Fossum et al, 2002)

Factors affecting the development of GDV

Classically GDV occurs when a deep chested dog is fed a large meal and then vigorously exercised.

- *Diet* - Feeding a diet of small food particles; feeding from a height; feeding large volumes in one sitting and exercising the dog immediately after eating have all been implicated in the development of GDV.
- *Genetics* - Certain breeds appear predisposed – deep-chested large-giant breeds.
- *Environmental Stress* –such as recent kennelling, car journeys and changes in environment may predispose a dog to GDV (happy dogs may be less likely to develop GDV)
- *Prior surgery* - Surgical removal of the spleen or a foreign body may increase the likelihood of GDV.

Signs that your dog may have developed a GDV

Initial signs are often associated with abdominal pain. These may include:

- restlessness
- panting
- standing and stretching
- drooling
- retching without producing anything
- distending abdomen

If you see these signs, contact your vet immediately. GDV can be rapidly fatal if left untreated. As the condition progresses, there is increasing abdominal distention, weakness and collapse.

Diagnosis of GDV

Your vet may be able to diagnose GDV just by examining your dog. When the stomach twists and dilates it can distend the whole abdomen. This can be seen or felt from the outside, the abdomen will distend and the stomach makes a drum like noise ('tympany') when it is tapped ('ballotted') whilst listening with a stethoscope. Typically signs of shock are seen including a weak rapid pulse, pale gums and a fast breathing rate. Diagnosis is usually confirmed by X-ray (see figure 2).

Figure 2. A radiograph (x-ray) of a dog with a GDV : note how the stomach is markedly distended with gas (black on the radiograph) and fills almost the entire abdomen



Treatment of GDV

Treatment must be rapidly initiated. Stabilisation of your dog is paramount and often begins with oxygen and intravenous fluid therapy. Decompression of the stomach often follows, which involves passing a tube down the oesophagus into the stomach to release the accumulated air and fluid. However, this is not always possible. Sometimes a needle/trocar/ catheter must be passed through the skin into the stomach to release some air to help passage of the tube (percutaneous decompression).

Surgery involves full exploration of the abdomen and de-rotating the stomach. The viability of the stomach wall, the spleen, and all other organs will be assessed. Sometimes it is necessary to remove part of the stomach wall (partial gastrectomy) or the spleen (splenectomy) if they are damaged. Once the stomach is returned to the normal position in the abdomen, it is permanently fixed to the abdominal wall by a 'gastropexy'. The purpose of a gastropexy procedure is to prevent volvulus (rotation) if subsequent gastric dilatation re-occurs. When a gastropexy is not performed at the time of surgery, recurrence of the GDV occurs in 80% of dogs.

Post-operatively, most pets will be hospitalised for several days and will be evaluated for heart rhythm disturbances and other postoperative complications that can occur. Immediate postoperative care will include exercise restriction for a few weeks to allow the incisions to heal.

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 to treatment increases.

As gastric dilatation worsens and full body effects become prolonged, many secondary complications may occur including damage to organs, particularly the intestines and stomach. As the condition progresses, toxins get trapped in the twisted blood vessels of the stomach and when the twist is corrected they can rapidly circulate around the body resulting in further heart rhythm disturbance (arrhythmia), acute kidney failure and liver failure. Bacteria also commonly gain access to the blood during this condition leading to bacteremia (bacteria in the blood) and sepsis.

Gastric Volvulus Prevention

The risks of GDV may be minimised by avoiding the aforementioned diet and stress risk factors. In particular, you should avoid feeding your dog a large meal before exercising them. Fortunately, gastric volvulus can also be prevented by a surgical procedure under general anaesthetic called a 'gastropexy'. Gastropexy is a short procedure where the stomach is permanently anchored to the body wall. It has a low complication rate and when properly performed can almost completely eliminate the risk of GV. Note that gastropexy does not prevent dilatation of the stomach, but does prevent volvulus and GDV. In most cases, if gastric dilatation occurs then it can be treated with a stomach tube and medical management. Preventative or 'prophylactic' gastropexies are now commonly performed in GDV at-risk dog breeds like the Flat Coat Retriever. The best time to undertake prophylactic surgery is when animals are young adults and otherwise healthy.

Gastropexy can be performed by an open abdominal surgery or a minimally invasive laparoscopic or 'keyhole' procedure (*see figure 3*). Regardless of technique, the goal is to create a very strong adhesion between the stomach and the body wall with the stomach in as normal an anatomical position as possible. Laparoscopic- Assisted Gastropexy (LAG) is a minimally invasive surgical procedure. During the LAG procedure

a small incision is made just behind the umbilicus to allow the scope or camera to visualize the internal organs. A second small incision is made on the last right rib to allow the stomach to be sutured to the body wall (the gastropexy).

Since LAG is a minimally invasive procedure, recovery is usually quick with most dogs going home from the hospital the same day or the following morning.

Dogs may eat and go on short walks several hours after surgery. Activity is limited to short leash walks for the first two weeks, then normal activity can be resumed. Surgical complications are uncommon but may include incisional infections, inadvertent organ trauma, or gastric bloat.

The prognosis for dogs that have had a prophylactic gastropexy is excellent. It is worth noting that there are no studies documenting the long-term outcome of this procedure however there has never been a report of GDV in a dog that has received a prophylactic gastropexy.



Figure 3: A LAG being performed at Davies Veterinary Specialists in Hertfordshire