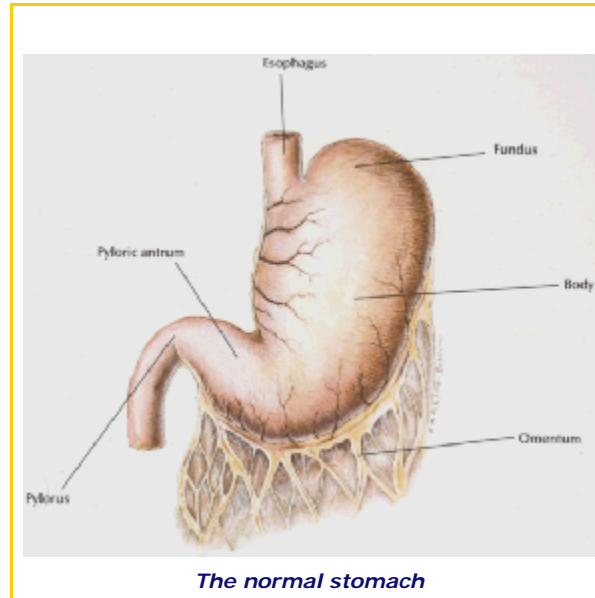


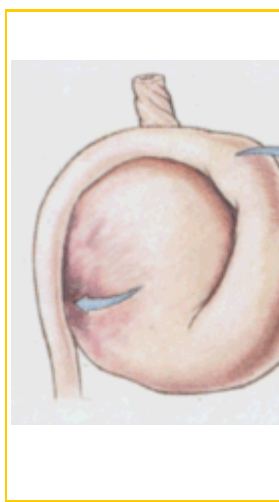
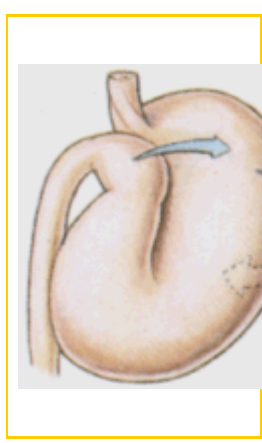
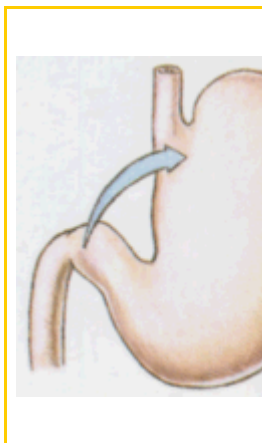
Gastro dilatation and volvulus (GDV) – or bloat (as commonly referred to):

There are many injuries and physical disorders that represent life-threatening emergencies. There is only one condition so drastic that it overshadows them all in terms of rapidity of consequences and effort in emergency treatment. This is the gastric dilatation and volvulus – the bloat.

What is it and Why is it so Serious?



The normal stomach sits high in the abdomen and contains a small amount of gas, some mucus, and any food being digested. It undergoes a normal rhythm of contraction, receiving food from the esophagus above, grinding the food, and meting the ground food out to the small intestine at its other end. Normally this proceeds uneventfully except for the occasional burp.



In the bloated stomach, gas and/or food stretches the stomach many times its normal size, causing tremendous abdominal pain. For reasons we do not fully understand, this grossly distended stomach has a tendency to rotate, thus twisting off not only its own blood supply but the only exit routes for the gas inside. Not only is this condition extremely painful but it is also rapidly life-threatening. A dog with a bloated, twisted stomach (more scientifically called gastric dilatation and volvulus) will die in pain in a matter of hours unless drastic steps are taken.

What are the Risk Factors for Developing Bloat?

Classically, this condition affects dog breeds that are said to be deep chested, meaning the length of their chest from backbone to sternum is relatively long while the chest width from right to left is narrow. Examples of deep chested breeds would be the Great Dane, Greyhound, and the setter breeds. Still, any dog can bloat, even dachshunds and Chihuahuas.

Dogs weighing more than 99 pounds have an approximate 20% risk of bloat

Classically, a dog who bloated had eaten a large meal and exercised heavily shortly thereafter. Still, we usually do not know why a given dog bloats on an individual basis. No specific diet or dietary ingredient has been proven to be associated with bloat. Some factors found to increase and decrease the risk of bloat are listed below:

Factors Increasing the Risk of Bloating

- Feeding only one meal a day
- Having closely related family members with a history of bloat
- Eating rapidly
- Being thin or underweight
- Moistening dry foods (particularly if citric acid is listed as a preservative)
- Feeding from an elevated bowl
- Restricting water before and after meals
- Feeding a dry diet with animal fat listed in the first four ingredients
- Fearful or anxious temperament
- History of aggression towards people or other dogs
- Male dogs are more likely to bloat than females
- Older dogs (7 - 12 years) were the highest risk group

Factors Decreasing the Risk of Bloat

- Inclusion of canned dog food in the diet
- Inclusion of table scraps in the diet - however, we do NOT recommend this as table scraps cause other problems that we see dogs in the emergency hospital for
- Happy or easy-going temperament
- Feeding a dry food containing a calcium-rich meat meal (such as meat/lamb meal, fish meal, chicken by-product meal, meat meal, or bone meal) listed in the first four ingredients of the ingredient list.
- Eating two or more meals per day

Contrary to popular belief, the presence of cereal ingredients such as soy, wheat or corn in the first four ingredients of the ingredient list does not increase the risk of bloat.

In a study done by the Perdue University Research Group, headed by Dr. Lawrence T. Glickman:

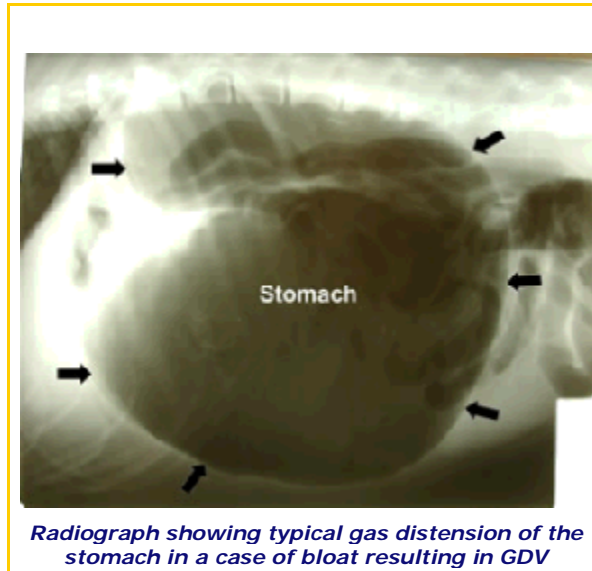
The Great Dane was the number one breed at risk for bloat.

The St. Bernard was the number two breed at risk for bloat.

The Weimaraner was the number three breed at risk for bloat.

A study by Ward, Patonek, and Glickman reviewed the benefit of prophylactic surgery for bloat. Prophylactic surgery amounts to performing the gastropexy surgery (see below) in a healthy dog, usually in conjunction with spay or neuter. The lifetime risk of death from bloat was calculated, along with estimated treatment for bloat, versus cost of prophylactic gastropexy. Prophylactic gastropexy was found to make sense for at-risk breeds, especially the Great Dane, which is at highest risk for bloat.

How to Tell if Your Dog has Bloat



The dog may have an obviously distended stomach, especially near the ribs, but this is not always evident depending on the dog's body configuration.

The biggest clue is the vomiting: the pet appears highly nauseated and is retching but little is coming up. They are also usually very uncomfortable, panting, pacing, whining or just standing in one position, panting and seeming anxious.

If this is seen, rush your dog to the veterinarian **IMMEDIATELY**.

What has to be Done

There are several steps to saving the life of a dog with GDV. Part of the problem is that all steps should be done at the same time and as quickly as possible.

First: Rapid Intravenous (IV) Fluids must be Given to Reverse Shock

Intravenous catheters are placed and IV fluids are administered immediately upon presentation to treat shock. This is done even BEFORE imaging (x-rays) is done to definitively diagnose GDV. Often, pain medications will also be given at this time. At the time of placing the IV catheter, blood is drawn to check some blood parameters – most importantly a lactate. Having a severely elevated lactate associated with GDV has been proven to be associated with a poorer prognosis.

Also First: The Stomach must be Decompressed

The huge stomach is by now pressing on the major blood vessels carrying blood back to the heart. This stops normal circulation and sends the dog into shock. Making matters worse, the

stomach tissue is dying because it is stretched too tightly to allow blood circulation through it resulting in tissue necrosis. There can be no recovery until the stomach is untwisted and the gas is released. A stomach tube is often placed at this time through the patient's mouth; however, sometimes we are unable to do this for a variety of reasons and we are left with trocharing the stomach (placing a catheter or needle through the body wall into the stomach to relieve some of the gas accumulation).

Also First: The Heart Rhythm is Assessed and Stabilized

There is a specific, very dangerous rhythm problem called a premature ventricular contraction or "PVC" (or VPC –ventricular premature contraction) that is associated with bloat/GDV and it must be ruled out. If it is present, **sometimes** IV medications are needed to stabilize the rhythm. Since this rhythm problem may not be evident until even the next day, continual ECG (echocardiogram) monitoring may be necessary. VPCs seen at the beginning of treatment is associated with a 38% mortality rate.

Once the patient is better stabilized, diagnostics can be done to actually diagnose the condition. This includes: radiographs of the abdomen and commonly the chest. If confirmed then surgery is recommended. Prior to surgery, bloodwork is conducted including a comprehensive profile as well as clotting times as patients sometimes stop clotting their blood normally with this condition.

Surgery

Without surgery, the damage done inside cannot be assessed or repaired plus bloat may recur at any point, even within the next few hours and the above adventure must be repeated. Surgery, called gastropexy, allows the stomach to be tacked into normal position so that it may never again twist. Without gastropexy, the recurrence rate of bloat may be as high as 75%!

Assessment of the internal damage is also important to recovery. If there is a section of dying tissue on the stomach wall, this must be discovered and removed or the dog will die despite the heroics described above. Also, the spleen, which is located adjacent to the stomach, may twist with the stomach. The spleen may also need to be removed.

If the tissue damage is so bad that part of the stomach must be removed, the mortality rate jumps to 28 to 38%.

If the tissue damage is so bad that the spleen must be removed, the mortality rate is 32 to 38%.

After the expense and effort of the stomach decompression, it is tempting to forgo the further expense of surgery. However, consider that the next time your dog bloats, you may not be there to catch it in time and, according the study described below, without surgery there is a 24% mortality rate and a 76% chance of re-bloating at some point. The best choice is to finish the treatment that has been started and have the abdomen explored. If the stomach can be surgically tacked into place, recurrence rate drops to 6%.

Results of a Statistical Study

In 1993, a statistical study involving 134 dogs with gastric dilatation and volvulus was conducted by the School of Veterinary Medicine in Hanover, Germany.

Out of 134 dogs who came into the hospital with this condition:

- 10% died or were euthanized prior to surgery (factors involved included expense of treatment, severity/advancement of disease, etc.)
- 33 dogs were treated with decompression and no surgery. Of these dogs, 8 (24%) died or were euthanized within the next 48 hours due to poor response to treatment. (Six of these 8 had actually re-bloated)
- Of the dogs that did not have surgical treatment but survived to go home, 76% eventually had another episode of gastric dilatation and volvulus.
- 88 dogs were treated with both decompression and surgery. Of these dogs, 10% (9 dogs) died in surgery, 18% (16 dogs) died in the week after surgery, and 71.5% (63 dogs) went home in good condition. Of the dogs that went home in good condition, 6% (4 dogs) had a second episode of bloat later in life.
- In this study, 66.4% of the bloated dogs were male and 33.6% were female. Most dogs were between ages 7 and 12 years old. The German Shepherd dog and the Boxer appeared to have a greater risk for bloating than did other breeds.

(Meyer-Lindenberg A., Harder A., Fehr M., Luerssen D., Brunnberg L. Treatment of gastric dilatation-volvulus and a rapid method for prevention of relapse in dogs: 134 cases (1988-1991) Journal of the AVMA, Vol 23, No 9, Nov 1 1993, 1301-1307.)

Another study published December of 2006 looked at 166 dogs that received surgery for gastric dilatation and volvulus. The point of the study was to identify factors that led to a poor prognosis.

- A 16.2% mortality rate was observed. The mortality rate for dogs over age 10 years was 21%.
- Of the 166 going to surgery, 4.8% were euthanized during surgery, and the other 11.4% died during hospitalization (2 of dogs died during surgery). All dogs that survived to go home were still alive at the time of suture removal.
- 34 out of 166 dogs had gastric necrosis (dead stomach tissue that had to be removed). Of these dogs 26% died or were euthanized.
- Post-operative complications of some sort occurred in 75.9% of patients. Approximately 50% of these dogs developed a cardiac arrhythmia.
- Risk factors significantly associated with death prior to suture removal included clinical signs of bloating for greater than 6 hours before seeing the vet, partial stomach removal combined with spleen removal, need for blood transfusion, low blood pressure at any time during hospitalization, sepsis (blood infection), and peritonitis (infection of the abdominal membranes).

(Beck, J.J., Staatz, A.J., Pelsue, D.H., Kudnig, S.T., MacPhail, C.M., Seim H.B, and Monnet, E. Risk factors associated with short-term outcome and development of perioperative complications in dogs undergoing surgery because of gastric dilatation-volvulus: 166 cases (1992-2003). Journal of the AVMA, Vol 229, No 12, December 15, 2006, p 1934-1939.)

It is crucially important that the owners of big dogs be aware of this condition and prepared for it. Know where to take your dog during overnight or Sunday hours for emergency care. Avoid exercising your dog after a large meal. Know what to watch for. Enjoy the special friendship a large dog provides but at the same time be aware of the large dog's special needs and concerns.

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