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Dr. John Berg grew up in Southern California, Maryland, and Switzerland. Although his family always had cats, his interest in veterinary medicine did not blossom until he attended Colorado State University for his undergraduate work. He stayed at CSU for his Master of Science and veterinary degrees. Following his surgery residency, Dr. Berg spent a year in private practice south of Boston, but when a faculty position at Tufts became available in 1987, he jumped at the chance. Dr. Berg teaches in the school's Principles of Surgery and Small Animal Medicine and Surgery courses, as well as in the Problem Based Learning curriculum and the Accelerated Clinical Excellence course. While he enjoys classroom and small-group instruction, he finds hands-on instruction with fourth-year students particularly gratifying and likes watching them grow in confidence as they make supervised clinical decisions. Although he is adept at all types of small animal surgery, Dr. Berg is especially drawn to surgical treatment of cancer in animals. He is a diplomate of the American College of Veterinary Surgeons and an honorary member of the Society of Veterinary Surgical Oncology. He lives with his wife and two daughters, as well as an array of animals adopted from the Foster Hospital–including a German Shepherd, four cats, two guinea pigs, and a hermit crab. He enjoys cycling, tennis, skiing, and reading.

*John Berg, DVM, DACVS*

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# Gastric Dilatation and Volvulus

*John Berg, DVM, DACVS*

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## Known Dog-Specific Risk Factors

- Age (Glickman, *JAVMA* 1994, 2000, Pipan, *JAVMA* 2012)
- Large and giant breeds
- Deep chested dogs (Schellenberg, *JAAHA* 1998, Glickman, *JAVMA* 1994)
- First degree relative with GDV (Glickman, *JAVMA* 2000)
- Aggressive/fearful personality (Glickman, *JAAHA* 1997, 2000)

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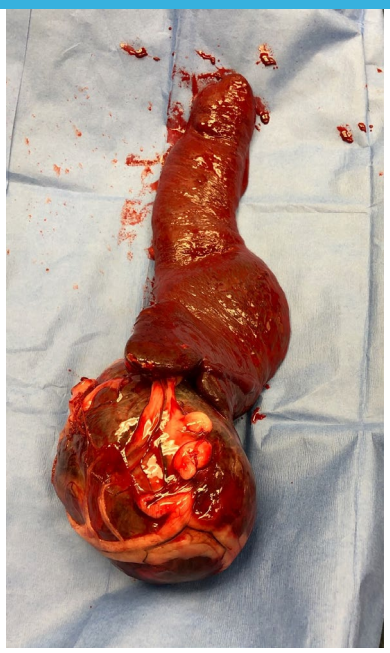
## Possible Dog-Specific Risk Factors

- Male (Glickman *JAAHA* 1997), female (Pipan, *JAVMA* 2012)
- Underweight (Glickman, *JAAHA* 1997)
- IBD
- Gastric FB (Battisti, *JAVMA* 2012)
- Splenectomy (Yes – Sartor, *JAVMA* 2013; No – Grange, *JAVMA* 2012)



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## Possible Environmental Factors

- Stressful event (kenneling, hospitalization, car ride)
- Cool weather (Texas) (Yes - Herbold, *AJVR* 2002)
- Hot weather (Switzerland) (No - Dennler, *Vet J* 2005)

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## Management Practices

- Known risks
  - Large volume of food/meal (Glickman, *JAAHA* 1997, *JAVMA* 1994)
  - Large total amount fed/day (Raghavan, *JAAHA* 2004)
  - Eating rapidly (Glickman, *JAAHA* 1997, 2006)
  - Single feedings (Glickman *JAAHA* 1997, Raghavan *JAAHA* 2004)
  - Kibble only (Glickman *JAAHA* 1997, Pipan *JAVMA* 2012)
  - Dry foods high in oil/fat (Raghavan, *JAAHA* 2006)

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## Management Practices

- Less certain
  - Moistening food
  - Small kibble
  - Water restriction after eating
  - Elevated food bowl (Glickman, *JAVMA* 2000)
  - Exercise after eating

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## An Internet-based survey of risk factors for surgical gastric dilatation-volvulus in dogs

Marko Pipan, DVM, DACVECC; Dorothy Cimino Brown, DVM, MSCE, DACVS; Carmelo L. Battaglia, PhD; Cynthia M. Otto, DVM, PhD, DACVECC

| Increased Risk | Decreased Risk |
|---|---|
| Dry kibble | Moderate exercise after eating |
| Anxiety | Fish and egg supplements |
| Located in the U.K. | Equal time indoors and outdoors |
| Born in the 1990s | |
| Family pet | |
| At least 5 hours per day with the owner | |
| Intact Female | |

2,551 Dogs

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## Management - Summary

- 2-3 feedings per day
- Prevent rapid eating
- Don't feed kibble exclusively
- Don't elevate the food bowl
- Moderate exercise after eating
- Minimize stress, maximize happiness
- Consider prophylactic gastropexy

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## What is the lifetime risk of GDV?

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**Prospective Study of 11 Breeds, 1,914 Dogs (Glickman, *JAVMA* 2000)**

| Dog Type | Lifetime Risk of GDV | Lifetime Risk of GDV Death |
|---|---|---|
| Large Breeds | **24%** | 7% |
| Giant Breeds | **22%** | 7% |
| Great Dane | **42.4%** | 12.6% |

**Prophylactic gastropexy makes sense!**

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## Presenting Signs

- Possible abdominal distension
- Nonproductive retching
- Hypersalivation
- Depression/shock
- Episodic bloating (rare)

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Radiography

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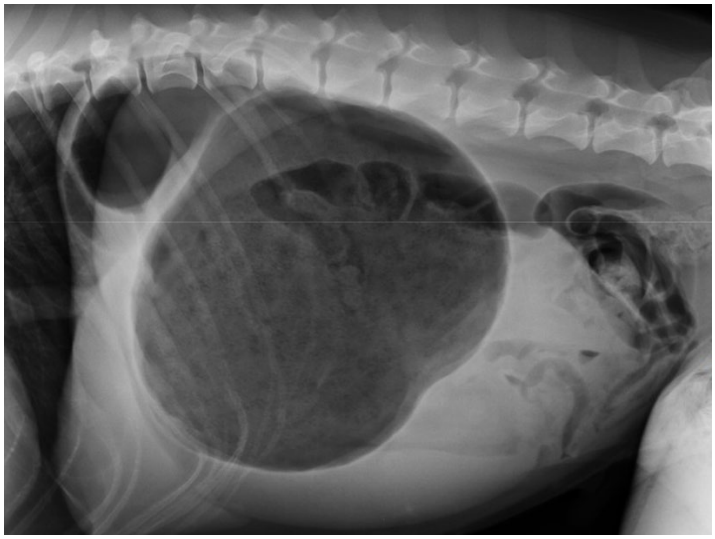
## Right Lateral View



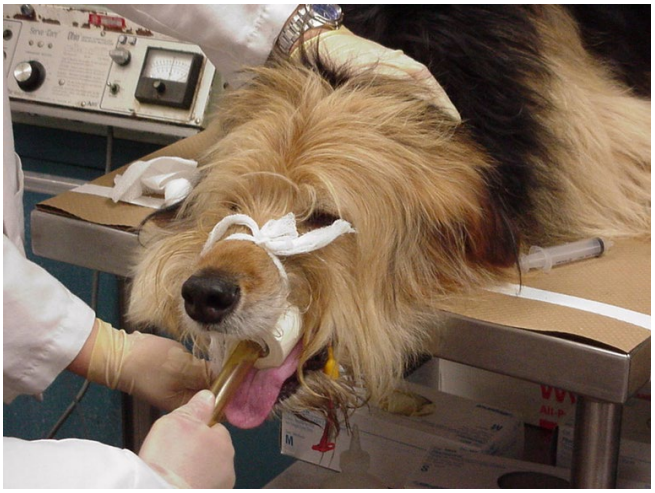
Gastric Dilatation and Volvulus

## Systemic Sequelae

- Ongoing shock
- Coagulopathies/DIC
- Cardiac arrhythmias
- Electrolyte and acid-base disturbances

## Gastric Decompression

- Orogastric tube
  - Excellent decompression
  - Consider general anesthesia
  - Measure to last rib
  - If no success, try repositioning
- Trocarization
  - 14 gauge over-the-needle catheter
  - Markedly unstable patients



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## Gastric Lavage

## Orogastric Tube vs Trocarization

- Goodrich, JSAP, 2013
  - Tube, 31; trocar 39; both 46
  - Awake/sedation for tube, awake for trocarization
  - Tube: Successful in 75.5%
  - Trocarization: Successful in 86%
  - Minimal/no complications (perforation, asp. pneumonia, leakage)
  - Either method is acceptable

## Surgery

- GDV is <u>always</u> a surgical emergency.
  - Assess direction of volvulus
  - Reposition the stomach
  - Assess viability of greater curvature and spleen
  - Gastropexy

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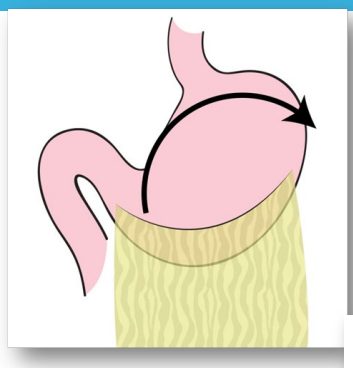
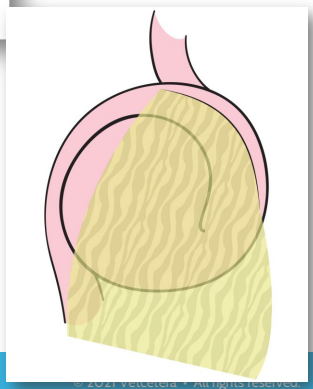
## Direction of Volvulus

- The pyloric antrum moves along the ventral abdominal wall from right to left
- Omentum overlies the ventral surface of the stomach





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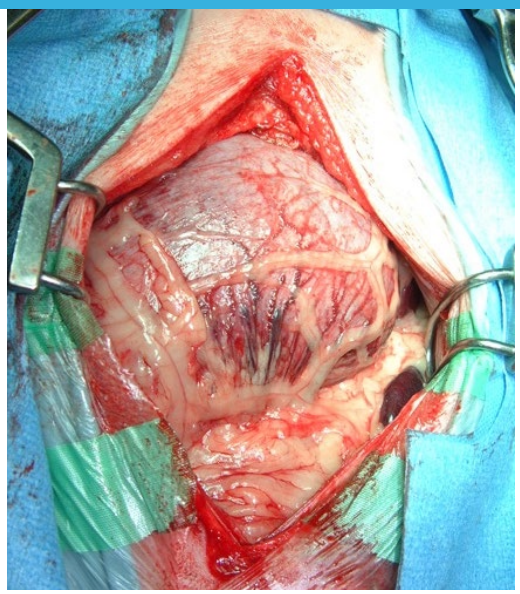
## Typical GDV



Courtesy Dr. Julius Liptak

## Indications for Splenectomy

- Very dark purple-black
- Lack of splenic artery pulse
- Tearing or thrombi of multiple splenic veins

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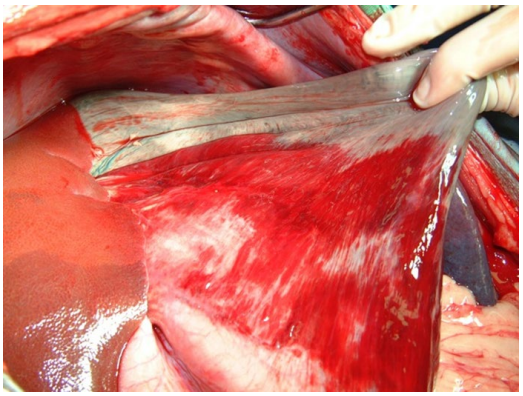
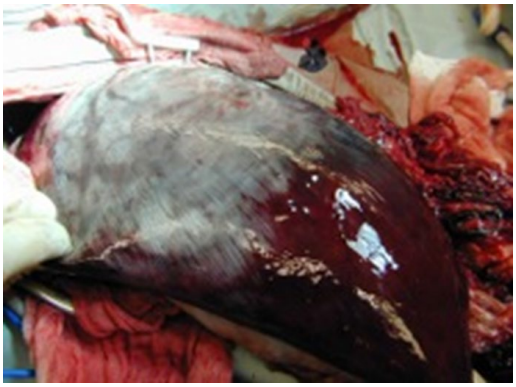
## Gastric Necrosis

Pink, red - viable

Grey, black, green – non-viable

Dark purple - uncertain





Courtesy Dr. Julius Liptak

## Gastric Resection Options

- Referral of all GDV's
- Hand-sutured resection
- Stapled resection (GIA)
- Invagination

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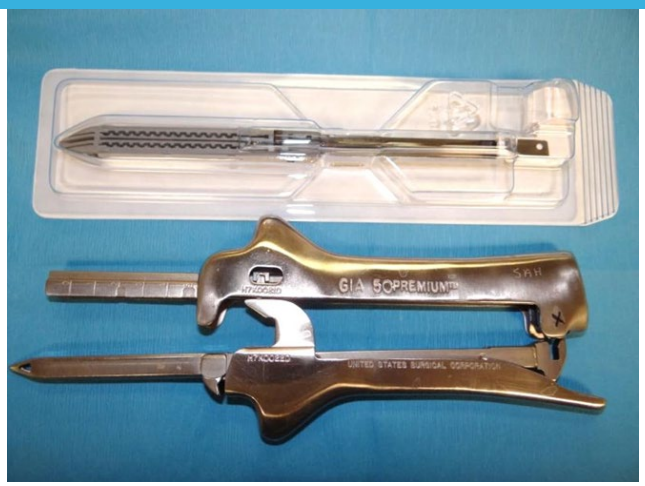
## GIA Stapler - Covidien




| Stapler cost | Cartridge cost (6) |
|---|---|
| $2264 | $165 |

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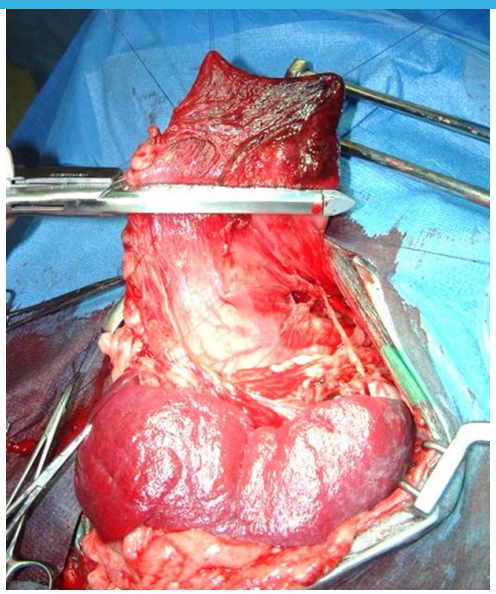
## Gastric Resection using GIA



Courtesy Dr. Julius Liptak

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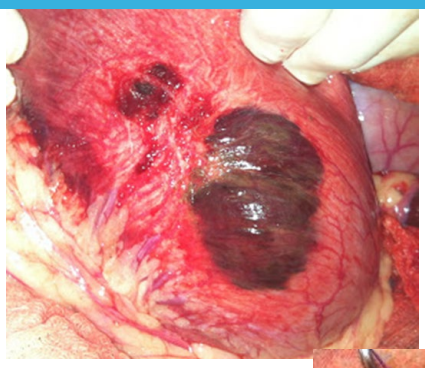
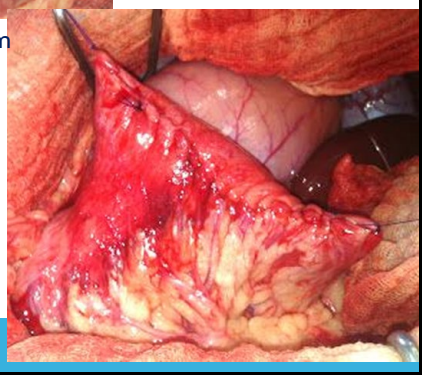
## Gastric Invagination

- MacCoy, *Vet Surg* 1986
- Occasional postop melena, gastric ulceration
- Probably works well in most cases



drstephenbirchard.blogspot.com



## Incisional Gastropexy

- Creates a permanent adhesion of the pyloric antrum to the right abdominal wall
- Quick and effective
- 2-0’ or 0’ PDS or Maxon
- Does not enter the gastric lumen
- Same method when done prophylactically

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# GDV

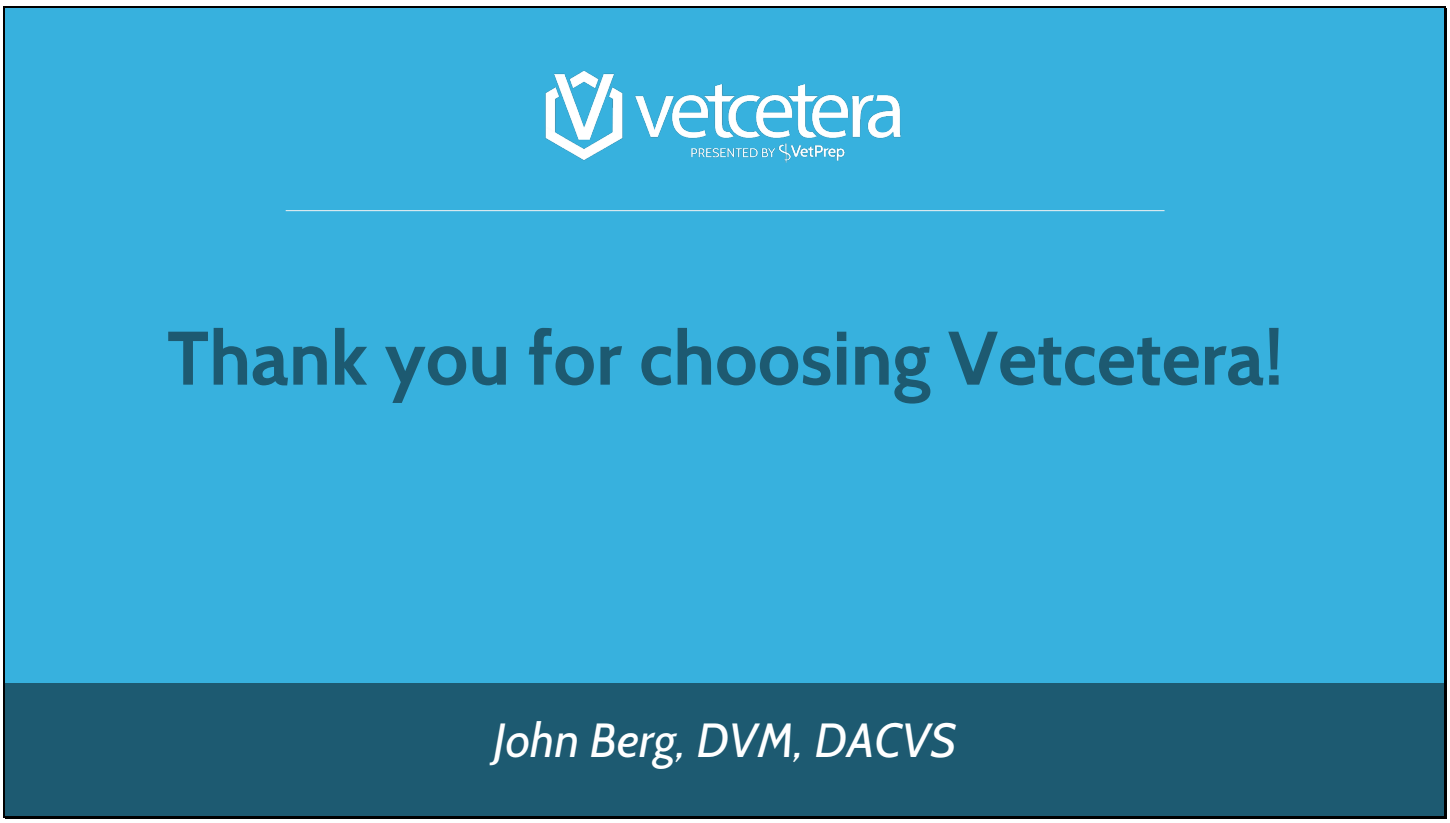
Gastric Dilatation and Volvulus

## Mortality Rate

- Is correlated with preop lactate, delta lactate
- 24.3% (Glickman, *JAAHA* 1998)
- 16.2%
  - Prolonged clinical signs
  - Splenectomy and partial gastrectomy
  - Any hypotension
  - Peritonitis, sepsis
  - DIC

## Pexy Problems

- Recurrent GDV – Consider pexy failure
- Bloating/vomiting – Consider malpostioned stomach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