Gastric Dilatation Volvulus (GDV)

Gastric Dilatation Volvulus (GDV) is a condition most prevalent in the dog. There is an approximate 15-30% mortality rate, and it is always considered a surgical emergency. Patients are typically in critical condition with shock at presentation requiring aggressive resuscitation and in need of immediate supportive care and monitoring. Definitive therapy involves surgical decompression and de-rotation of the stomach followed by a gastropexy to prevent recurrence. This is a topic that frequently appears on board examinations due to its recognizable clinical features and the importance of rapid action on the part of the technician and clinician.

**Key Points**
- Large breed, deep-chested dogs. Great Dane most common breed
- Non-productive retching/vomiting
- Abdominal distension
- Right lateral radiograph is diagnostic: Gastric compartmentalization of air, or “double bubble”
- See omentum covering stomach as you enter abdomen surgically

**Pathophysiology**
- Exact cause unknown
- Rotation of the stomach **counter-clockwise when viewing from cranial to caudal in dorsal recumbency**
  - Also can be stated that stomach rotates clockwise when viewed caudal to cranial
- Volvulus of the stomach also results in venous compression, congestion, and local compromise of blood perfusion to the stomach resulting in necrosis
  - Can also result in tearing of short gastric vessels connecting the stomach and spleen
- Air accumulates in stomach, eventually impeding venous return to the heart via the vena cava resulting in **hypovolemic shock**
  - Can lead to global tissue ischemia and systemic inflammatory response
  - Inflammatory mediators and myocardial ischemia can lead to arrhythmias
  - Result is death if you don’t decompress very quickly!

**Signalment**
- Usually large to giant breed dogs, esp. deep-chested dogs
- Usually middle-aged to older
- **Great Dane**, German Shepherd, Rottweiler, Irish Wolfhound etc.
  - Great Dane is **most predisposed** with a 37% life-time likelihood of developing a GDV
- Other predisposing factors
  - Related to a dog that had a GDV
  - Anxious dogs
  - Very fast eaters

**Clinical Signs**
- Restless/nervous pacing/painful
- Non-productive retching/vomiting
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- **Abdominal distension**
- Increased respiratory rate
- Signs consistent with shock/cardiovascular collapse
  - Tachycardia, weak pulses, pale mucous membranes, prolonged CRT
  - Depressed to comatose mentation

**Diagnostics**
- ECG
  - Arrhythmias common before and especially after surgery, **VPCs** most likely
- Blood gas
  - Metabolic acidosis (lactic acidosis) +/- respiratory compensation. May have hypercapnia from gastric distention and impaired ventilation
- Radiographs

**Treatment**

**Stabilize Patient:**
- Place two large-bore cephalic catheters (**avoid saphenous** since caudal venous return is poor)
- Shock dose **crystalloid fluid therapy** (80-90 ml/kg in fractions until resuscitation achieved)
  - Patient’s large size often requires use of pressure bags for rapid administration of fluids
- Monitor blood pressure and ECG
- Lactate levels may provide some insight as to prognosis

**Decompress stomach**

1) **Orogastric tube:**
   - Pros: more effective emptying
   - Cons: requires heavy sedation, tube might not pass, possible esophageal trauma/rupture

2) **Trocarization:**
   - Pros: more rapid intervention, does not require sedation
   - Cons: limited decompression, risk of lacerating gastric wall, puncturing spleen
   - Trocarize at point of maximum tympany, can’t be sure if spleen is on the left or right
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**Surgery:**
- Goal is to fully decompress and reposition stomach. Evaluate viability of stomach and resect any necrotic tissue. Also assess spleen, determine if splenectomy is indicated (rarely necessary)
- Perform gastropexy to prevent recurrence. Many ways to perform:
  - Incisional, circumcostal, belt-loop, incorporating, tube

**Prognosis**
- Prognosis reported at 75-85% with surgery and post-operative care
  - Negative prognostic indicators:
    - Lactate > 6 mmol/L
    - Need for gastric resection/splenectomy
    - Long onset of signs to time of presentation (5 or 6 hours)
    - Recumbency at presentation
- If gastropexy is performed, recurrence is less than 4%
  - If not, recurrence is 50%

**Prevention**
- Can perform a prophylactic gastropexy
  - Can do traditional procedure such as one of the ones listed above or apply minimally invasive techniques to reduce incision size and morbidity
    - Endoscopically assisted gastropexy
    - Laparoscopically assisted gastropexy