

GASTRIC DILATATION AND VOLVULUS IN A TWELVE YEAR OLD SPANISH MASTIFF: CASE REPORT AND A LITERATURE REVIEW OF THIS SYNDROME AND THE IMPORTANCE OF THE PROPHYLACTIC GASTROPEXY

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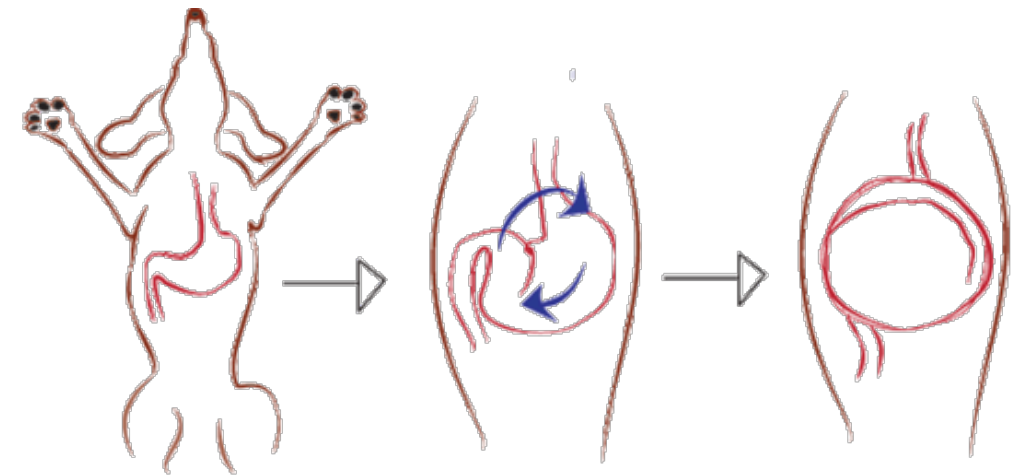


Introduction

Introducción

Definition

Gastric dilatation volvulus (GDV) is a life-threatening emergency in large-breed and deep-chested dogs, caused by multiple factors. When a dog develops gastric dilatation volvulus (GDV) or has gastric dilatation, simple repositioning of the stomach without fixation results in an unacceptably high risk of recurrent GDV, for these reason right-sided gastropexy is recommended to prevent it. An ideal method for gastropexy should be quick, safe and easy to perform.



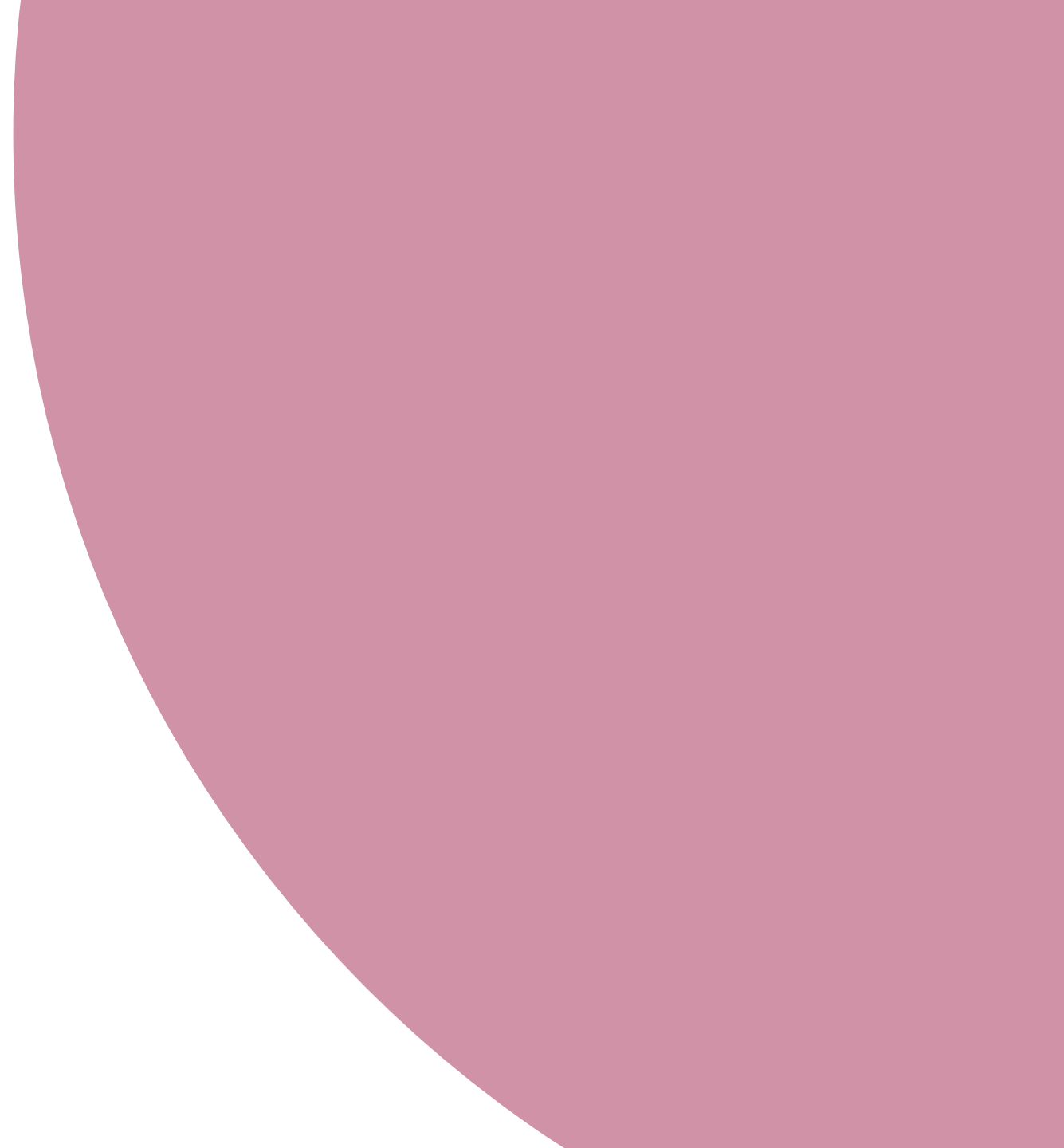
We report an illustrative case and review the pathogenesis, classification, diagnosis and treatment of this syndrome.

Objective

The purpose of this study is to review the Gastric dilatation Volvulus canine patients based in this case report with special emphasis on the importance of the prophylactic gastropexy.

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Case Report



Case description: Bruna



- A 12 years old,
- Spanish mastiff,
- Female dog ,60 kg
- Abdominal discomfort.

Physical examination

- abdominal distension and tympanic area
- sialorrhea, and unproductive retching
- mild hypothermia (rectal temperature, 36.5°C)
- tachypnea (100 bpm) and congested oral mucosa



Radiographic examination

- dilatation and rotation of 90° of the stomach
- NO ventricular extrasystoles

Blood tests and the hemantobiochemica

- Mild increase of glucosa
- ↓ Hematocrito, anemia, hemoglobin, lymphocytopenia, eosinopenia, thrombocytopenia hypocalcemia,
- hipoalbuminemia, hipocolesteronemia



Preoperative management



Stabilization
lactate Ringer.

Decompressed the stomach by
gastrocentesis
and
Stomach was probed to do stomach washing.

Premedication:
methadone and valium

General anesthesia was induced :
propofol and maintained with sevoflurane

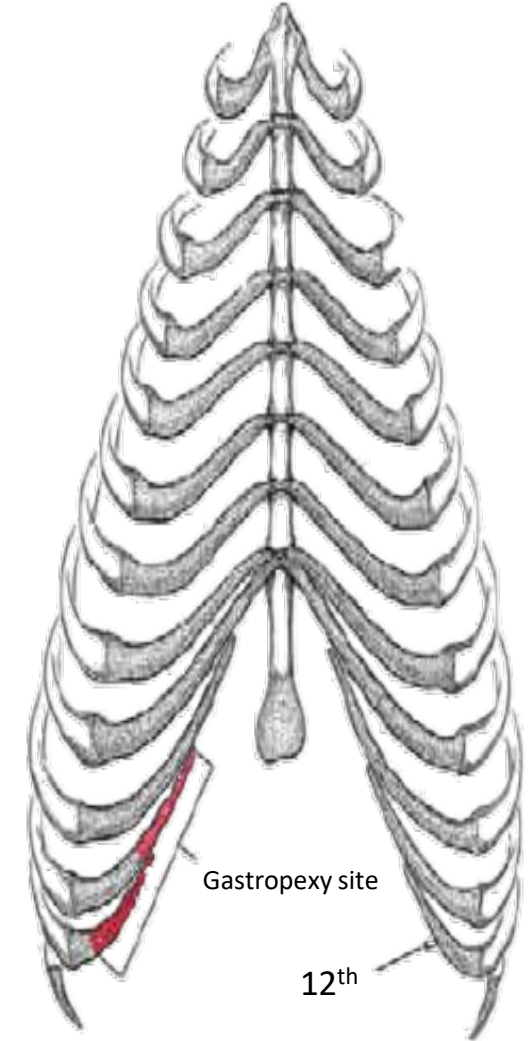
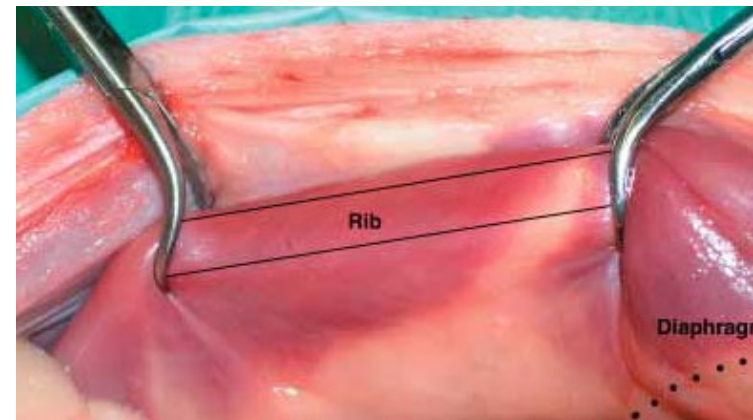
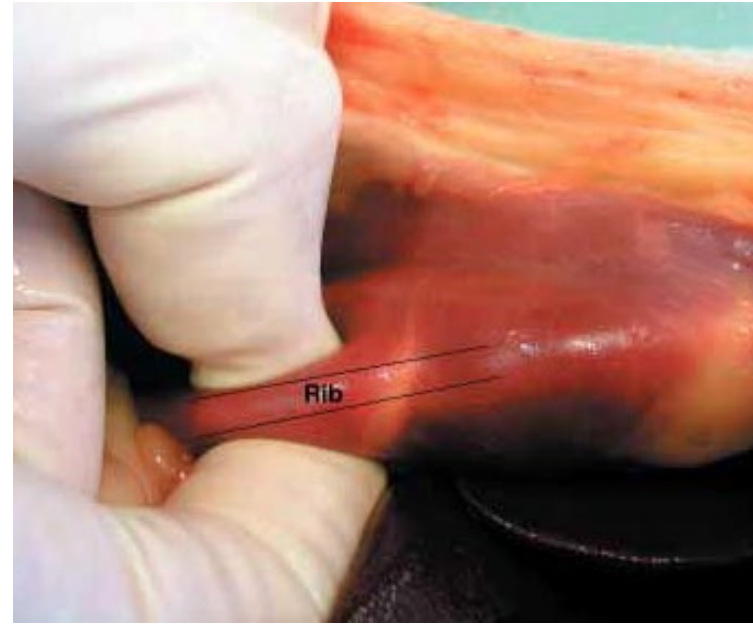
Intraoperative:
fentanile

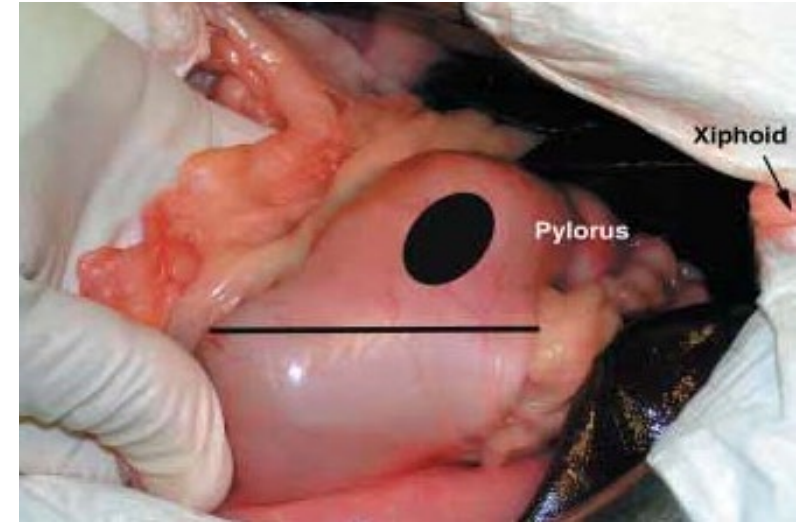
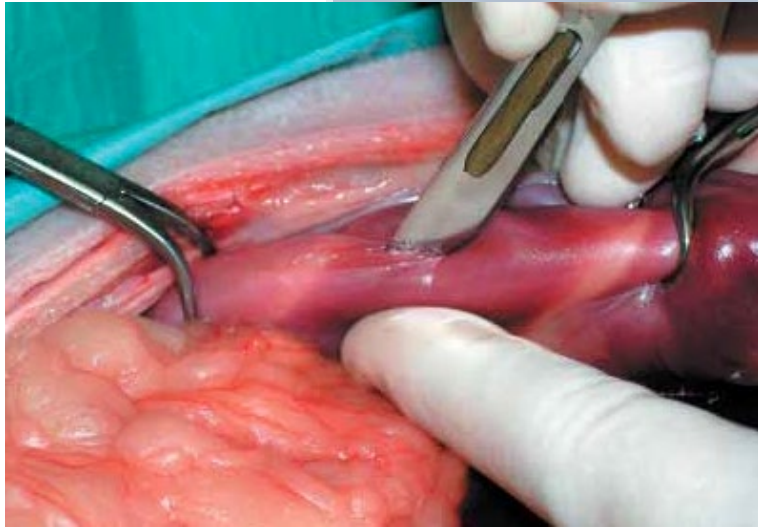
Routinely monitored:
cardiac and respiratory rates, spirometry, oxygen, end-tidal CO2.



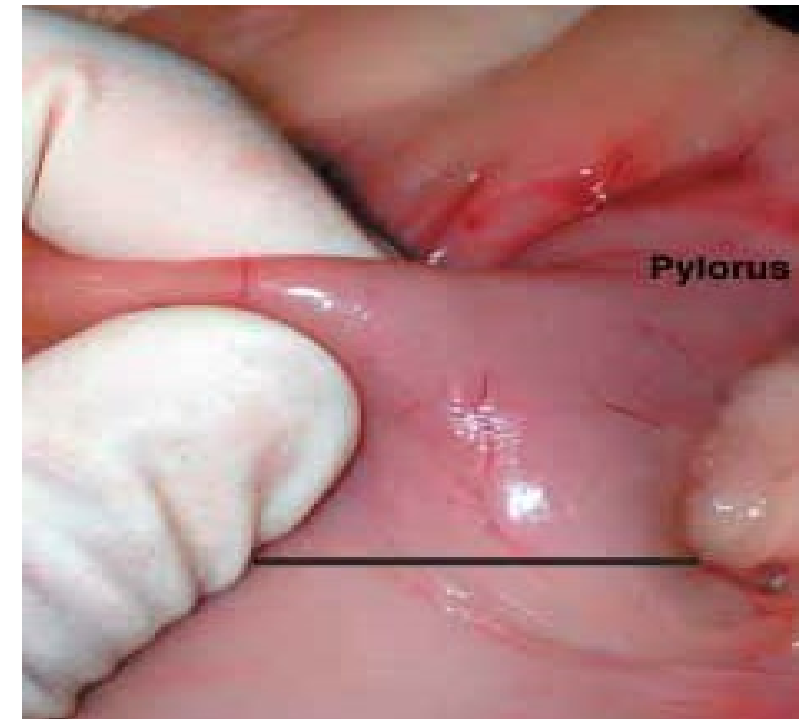
Surgical technique of gastropexy Daniel D. Smeak

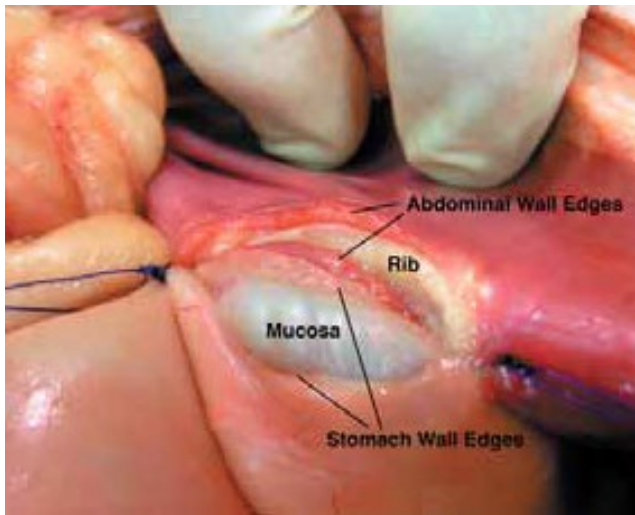
1. The correct abdominal gastropexy sites on eleventh or twelfth rib are marked in red.
2. The twelfth rib is palpated and fixed.



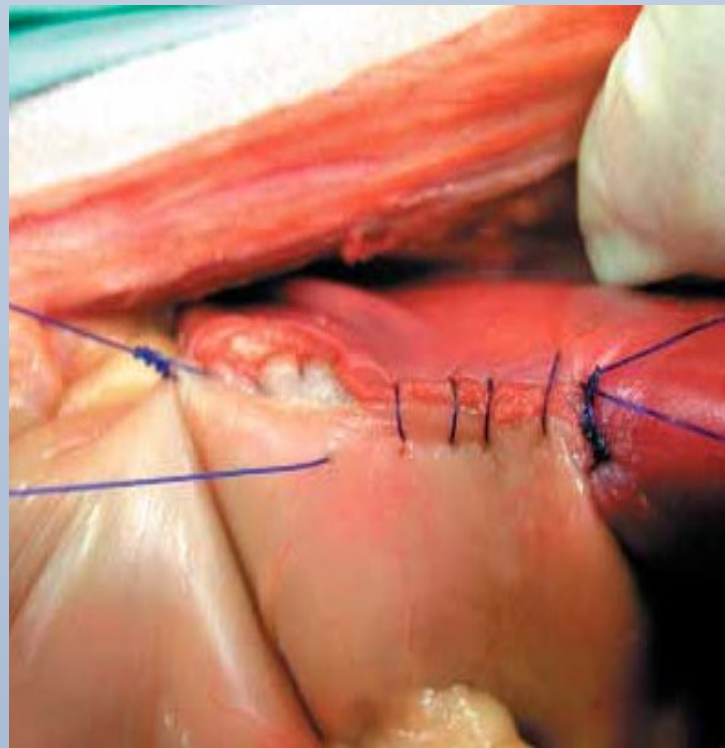
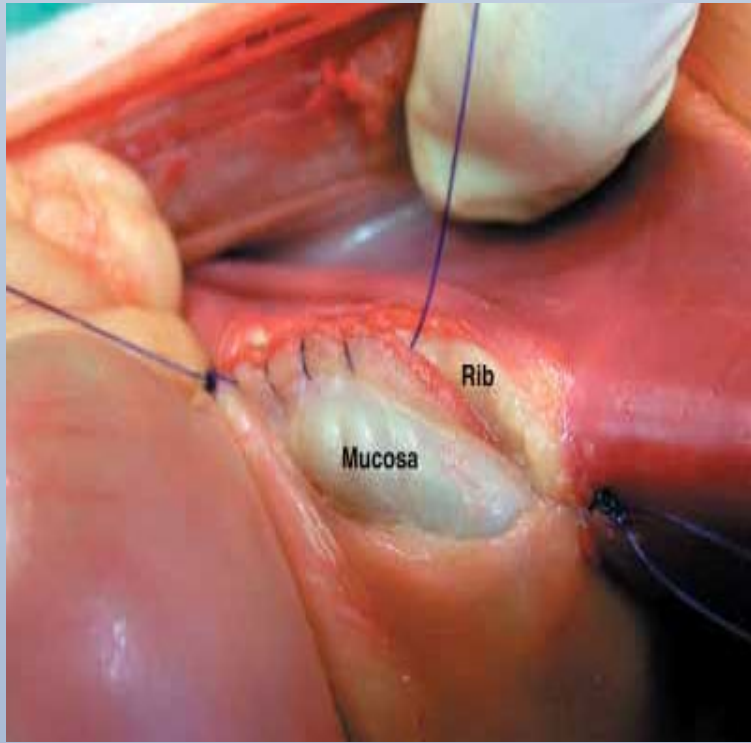


3. Transverse abdominal muscle is incised on top of the rib which is held by towel clamps
4. Towel clamps are removed after the incision completed.
5. The correct stomach gastropexy site, marked with an ellipse, is midway to the pylorus and lesser curvature line.
6. The stomach is pinched between fingers and lifted up to let the mucosa slip away





7. The stomach is cut with Metzenbaum scissors (only the seromuscular layer is incised).
8. Stay-sutures are knotted and gastropexy wounds that are about to be sutured, are appositioned.



9. View from the surgeon: The most distal edge of the stomach wound and the most proximal edge of the abdominal wall are sutured with a simple continuous pattern making use of stay sutures.

10. And the most proximal border of the stomach wound and the most distal edge of the abdominal wall, are sutured equally.

Postoperative care



Antibiotic treatment : cefazolin (4,8 ml/8h, IV,). The fourth day cefazolin was stopped



Kefavet (500mg) 2 and a half tablets/12h (VO), 2 last days



Analgesic: tramadol (6ml/ 12h, IM, 4 d), ranitidina (6 ml/ 12h, IV, 4 d) and Metronidazole (180ml/12h, IV, 2 d).



Metronidazole: (180 ml/12h, IV) 2 first days and tablets (metronidazole 250 Mg, 3 and a half tablets, VO, following days.



Maintenance treatment: glucosaline isotonic serum and KCL (90 ml / h) during 3 days postoperative



Feeding: 12h postsurgery



ECG and Lidocaine CRI (20ml/h), day of surgery and following 2 days → presence of extrasystoles.



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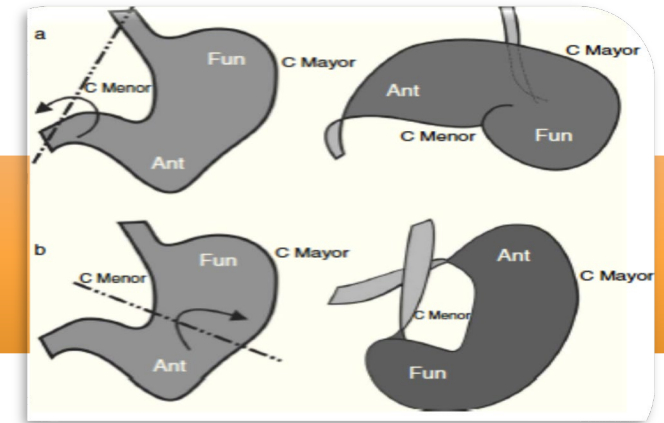
DISCUSSION



Definition

Gastric dilatation volvulus syndrome (GDVS) is a life-threatening emergency in large-breed and deep-chested dogs that is characterized by gastric dilatation with food and/or air, increased intragastric pressure and abnormal rotation of the stomach along its vertical axis.

General considerations and pathophysiology



Unknown etiology

Pathogenesis is complex and multifactorial

Stomach rotation

Cardiovascular dysfunction

Respiratory compromise

Gastric necrosis

Gastrointestinal dysfunctions

Acid-base imbalances

Electrolyte abnormalities

obstructive, distributive, hypovolemic and cardiogenic shock →
↓O₂ → MODS

arrhythmias
40% dogs - GDV → mortality and require proper evaluation and treatment.

DIC

hipoventilation, reduction of pulmonary perfusion and aspiration pneumonia

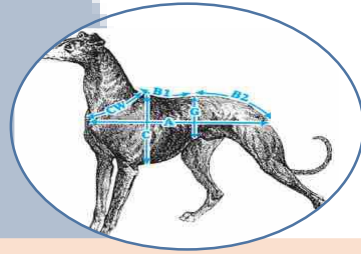
Require gastrectomy

Affected by anesthesia and analgesics, don't use post-surgical nonsteroidal anti-inflammatory drugs → pancreatitis in 3% of dogs.

Hipokalemia

Diagnosis

Predisposing Factors



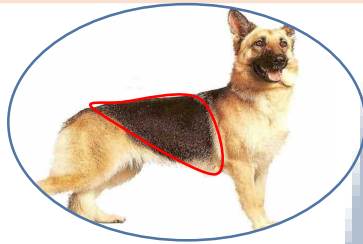
Predisposing breed

Increase in thoracic-depth-to-width ratio

Diet

Age

Dogs with splenectomy



Anamnesis and Physical examination findings

Check previous dilations

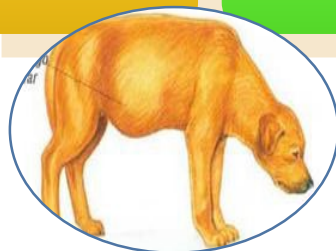
Increased abdominal in size

Pain with back arched

Frequent nausea without vomiting

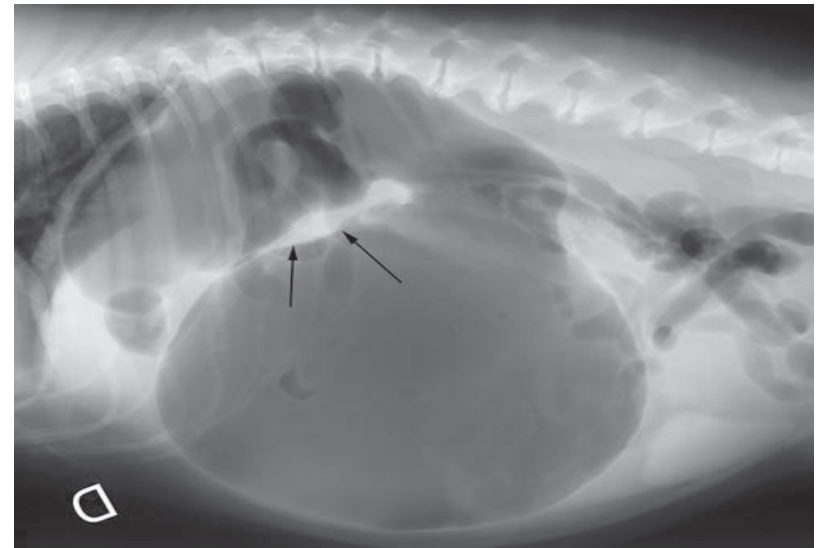
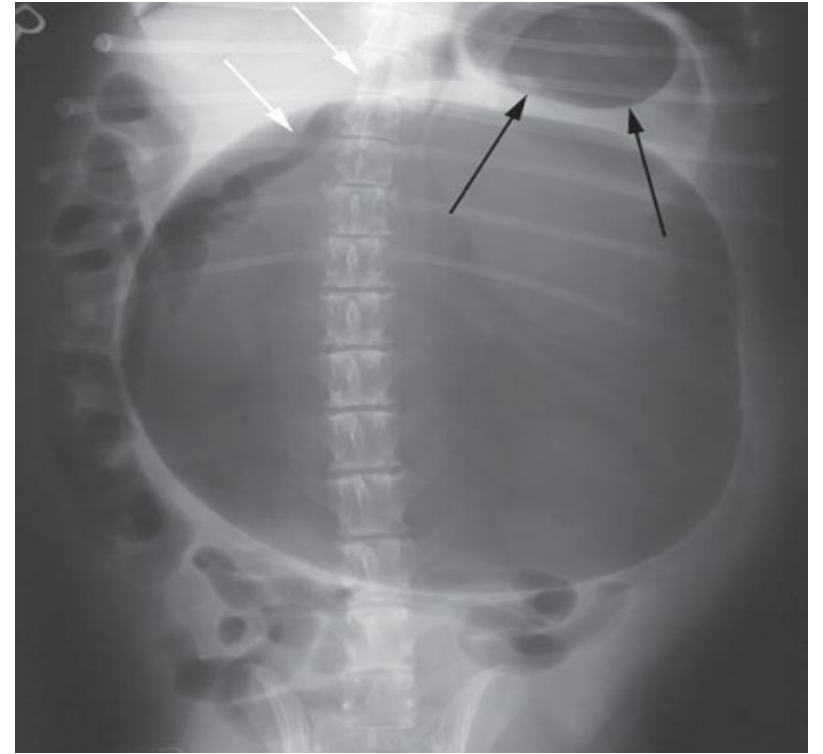
Hypersalivation and anxiety or restlessness

No pain but apathy



Imaging diagnosis

- Dorsoventral axis x-ray : pylorus is located on the left side of the median line
- Latero-lateral right x-ray : pylorus cranial to the body of the stomach
- Gastric pneumatosis → gastric necrosis
- Pneumoperitoneum → perforation



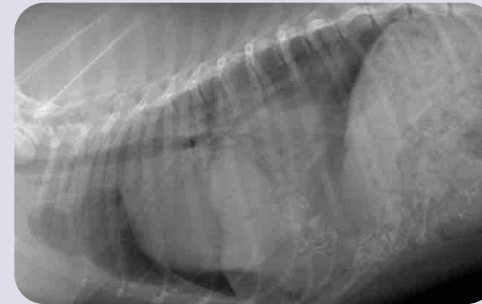
Diferencial Diagnosis



Small
intestine
volvulus



Primary
splenic torsion



Diaphragmatic
hernias



Ascites



Preoperative management

Stabilization:

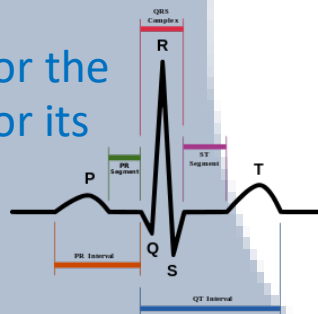
Fluid therapy: RL, Hipertonic serum ,Hetarstarch which increases the blood plasma lost.

Antibiotherapy: broad spectrum antibiotics intravenously

Blood samples

Disnea → oxygen therapy

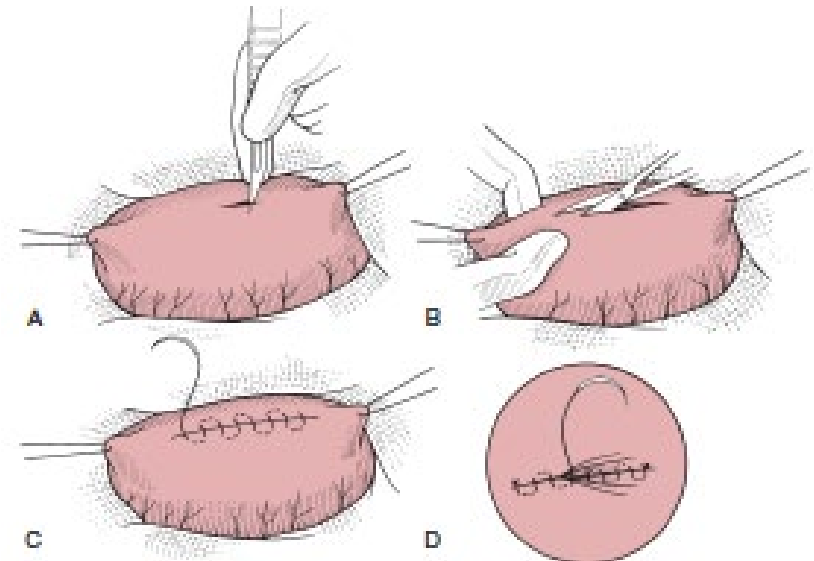
Electrocardiogram (ECG) → monitor the arrhythmias and apply lidocaine for its treatment.



Gastric decompression:

Large-caliber percutaneous needle or the passage of the gastric tube

Gastrostomy



Preoperative management



Anesthesia:

If arrhythmias are present a combination of Lidocaine and thiobarbiturate

Etomidate is a good choice for induction if the animal's condition has not been well stabilized because it helps to maintain cardiac output and is not arrhythmogenic.

If the patient is depressed or in shock even with fentanyl and diazepam alone or etomidate may be used for induction.

It will depend on the physical condition of the patient.

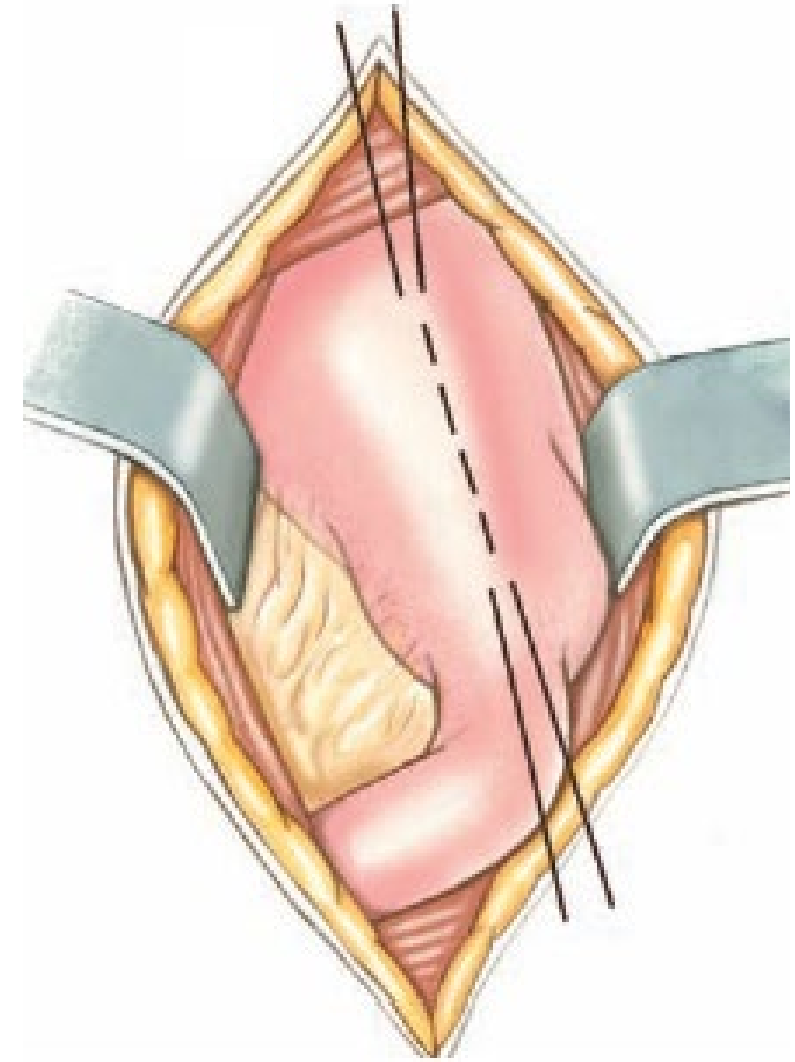
Not a specific anesthetic protocol for the anesthesia of this syndrome.

Surgical treatment: preoperative management

Gastropexy techniques



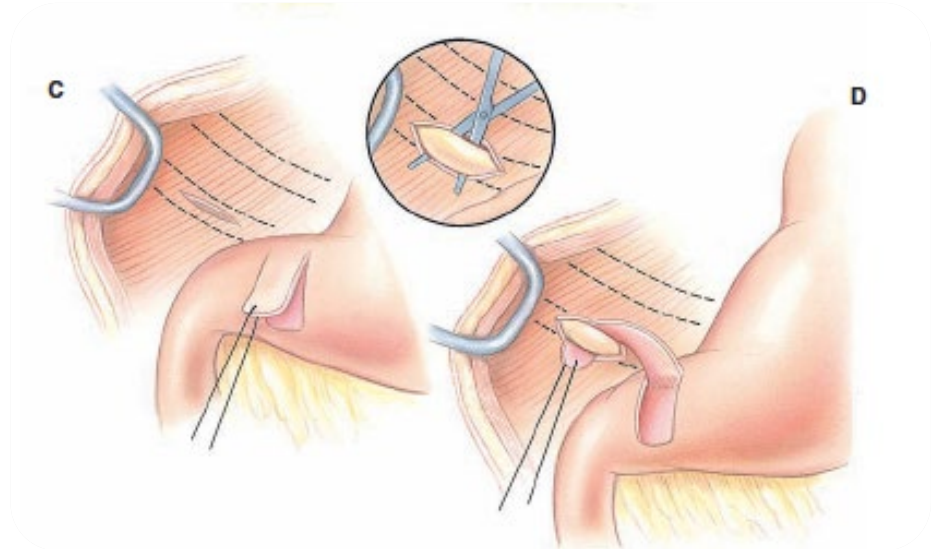
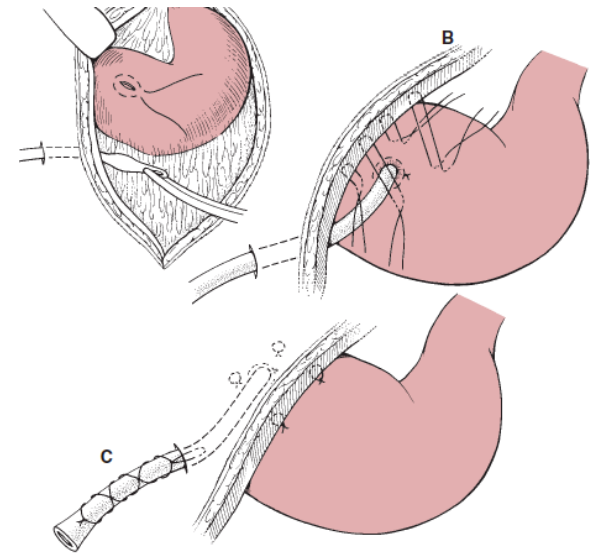
Incorporating gastropexy: the stomach wall is simply included in the linea alba closure but it is not recommended because gastric perforation can occur if another midline celiotomy is performed





Tube gastropexy: It is quick and relatively simple, gastric decompression allows but requires 14 days to get a good fixing, but this is less when compared to other techniques

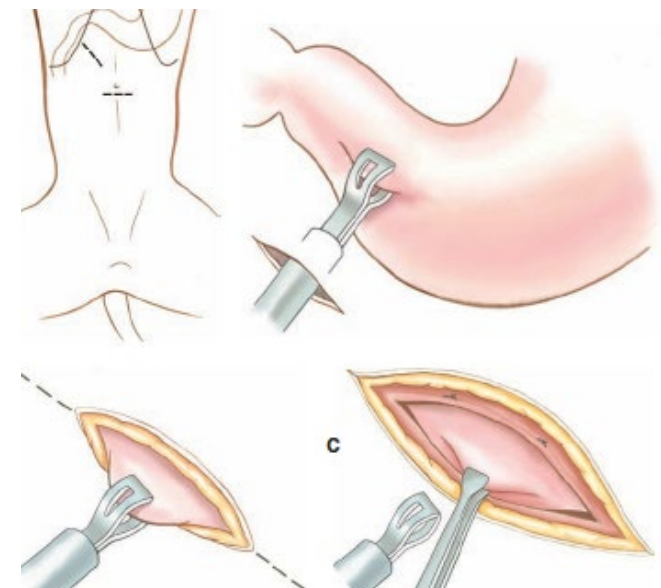
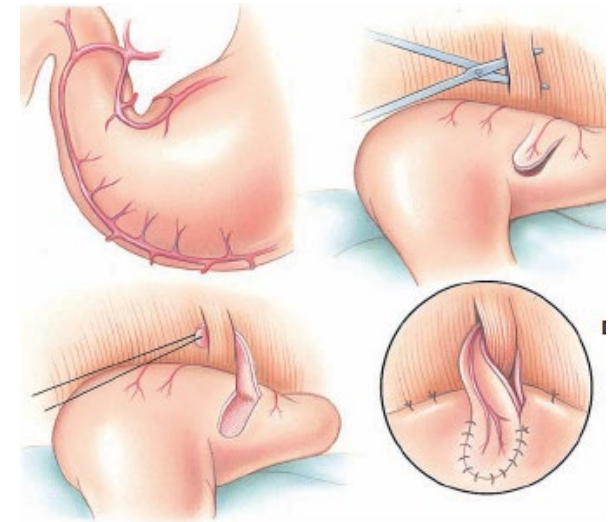
Gatropexy circumcostal: seromuscular flap from the stomach is wrapped around the last rib and secured back to the stomach wall. Not penetrate the stomach lumen and creates a strong adhesion but potential complications include iatrogenic rib fracture, pneumothorax, and increased surgical time.





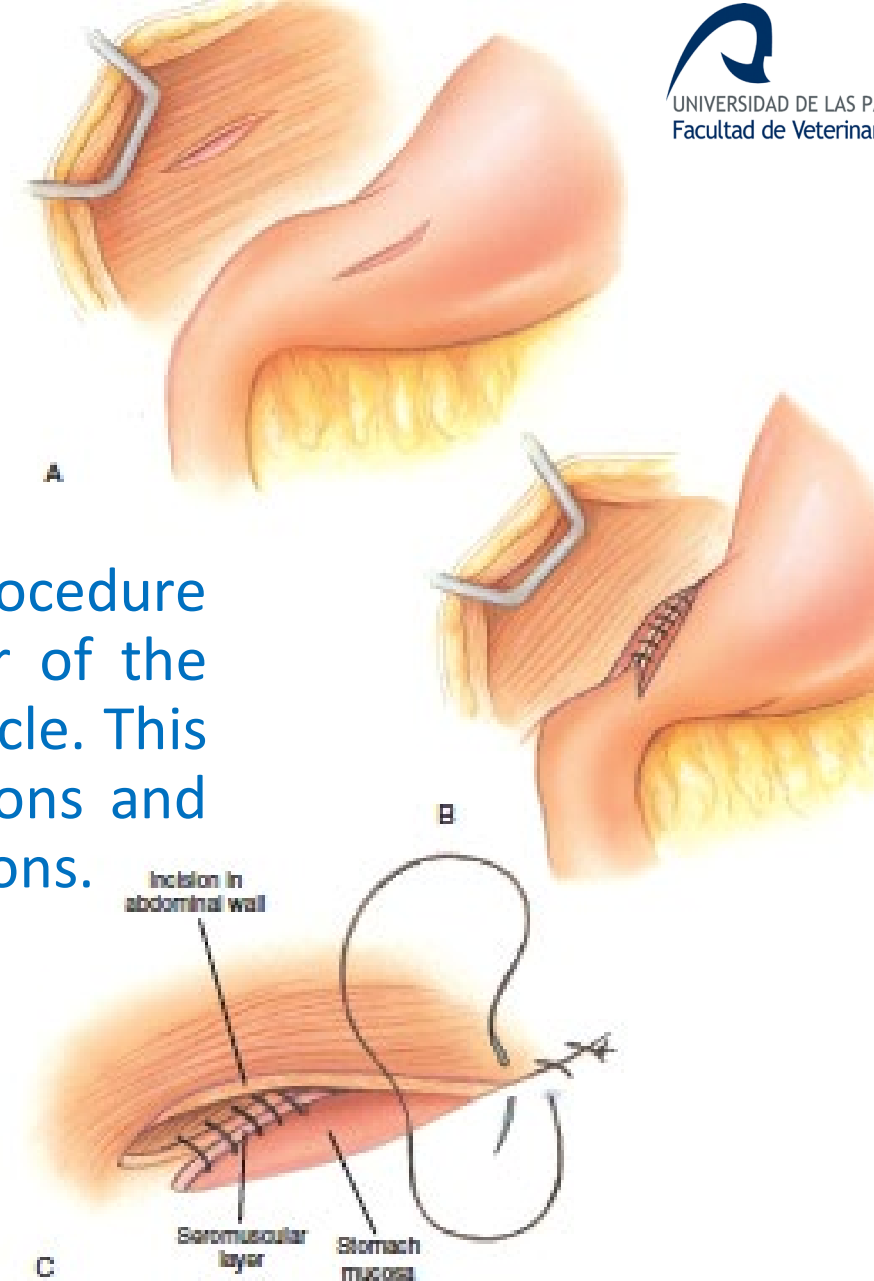
Belt-loop gastropexy: involves tunneling a seromuscular flap through the abdominal wall. Minimal complications have been reported, although pneumothorax can still occur.

Laparoscopic gastropexy: result in less tissue trauma, decreased postoperative pain, and a faster return to normal function but complications can be related to trocar placement (e.g. perforation of abdominal viscera), in addition, very expensive laparoscopic equipment and advanced training are required.





Incisional gastropexy: is a fast, simple procedure that involves apposing the muscular layer of the gastric wall and the right transverse muscle. This technique forms strong, long-term adhesions and results in minimal postoperative complications.



Postoperative management and possible complications



Postoperative analgesia: pain control

Postoperative fluid therapy : Ringer's Lactate solution as a bolus to minimize the risk of post-ischemic-reperfusion injuries.

Monitoring of perfusion parameters and ECG : arrhythmias are associated in the literature with a worse prognosis

Electrolyte analysis to assess: potassium and magnesium disturbances and acid-base status.

Inadequately removed of devitalized tissue in stomach necrosis: sepsis and peritonitis

Gastric complications: ulcers, regurgitation, ileus, vomiting.

Postoperative nutrition: is accepted the early feeding, after 12-24 h in order to regain the gastrointestinal motility and maintaining the nutritional status

Pronostic indicators



Temperatures below 38°C

Hypotension at any time during the hospitalization

Peritonitis

Splenectomy or gastrectomy.

Dogs who develop AKI.

Dogs with higher levels of Plasma lactate concentrations → gastric necrosis and a worse prognosis

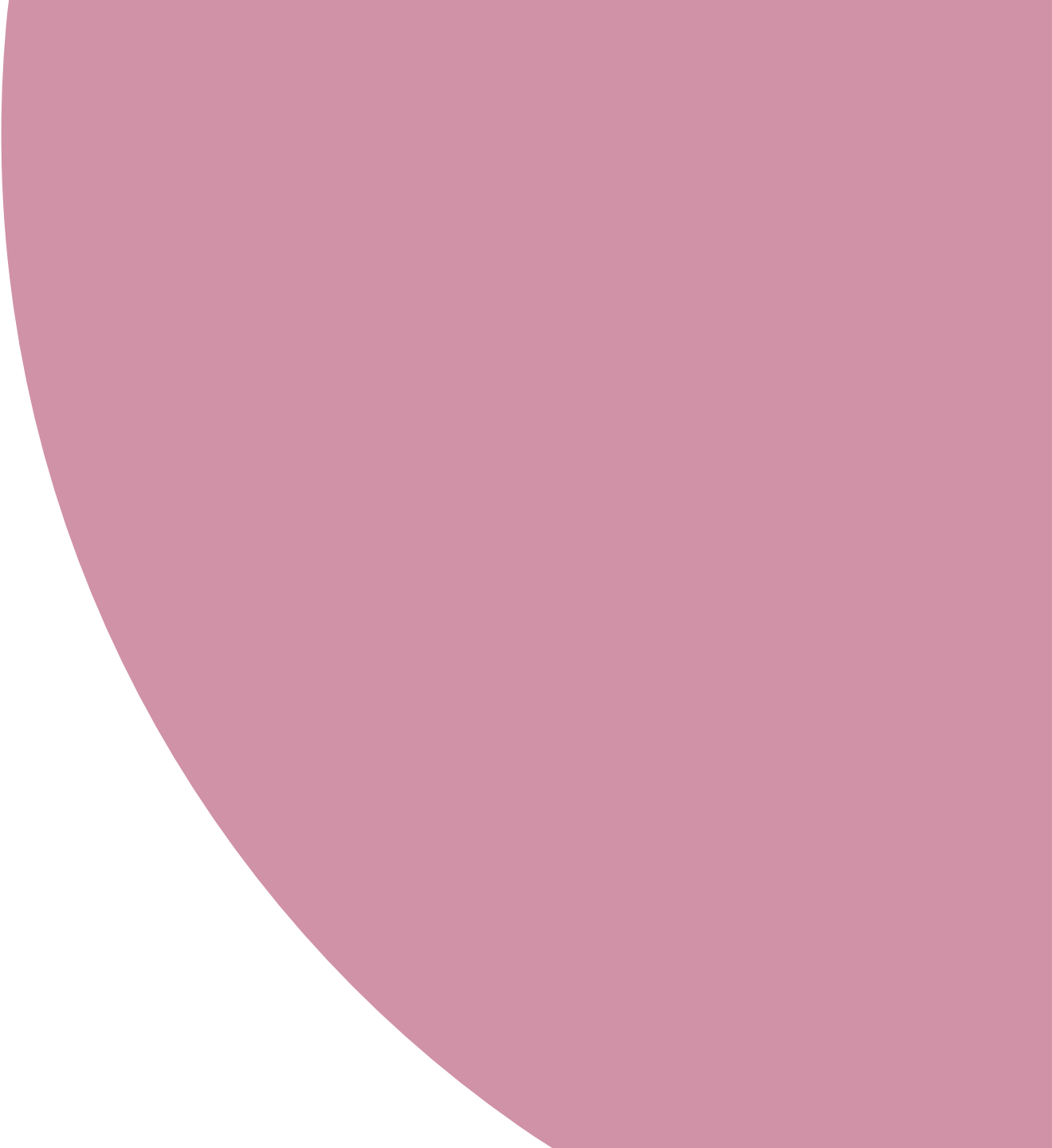
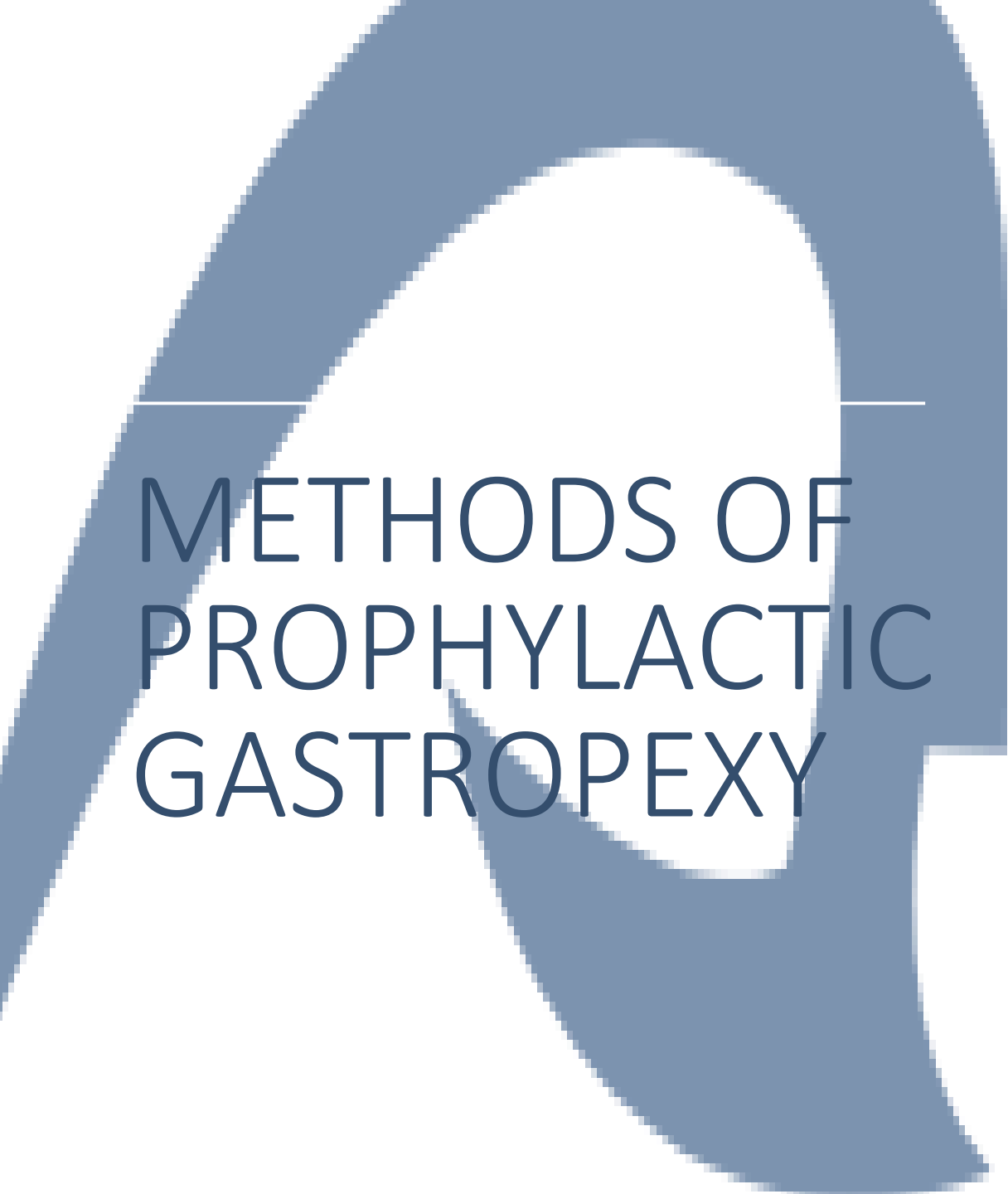
All of these have significantly higher mortality rates





CAN WE PREVENT THESE DOGS FROM GDV?

The answer is **YES**, taking Prophylactic gastropexy into consideration.



METHODS OF PROPHYLACTIC GASTROPEXY



Endoscopically assisted gastropexy



Prophylactic gastropexy: case 1

German Bracco mixed dog



- 2 years old
- Large-breed
- Non neutered male, 22,5 kg
- Physical examinations: normal
- Surgical procedure: HCV ULPGC



Technique:

Castration

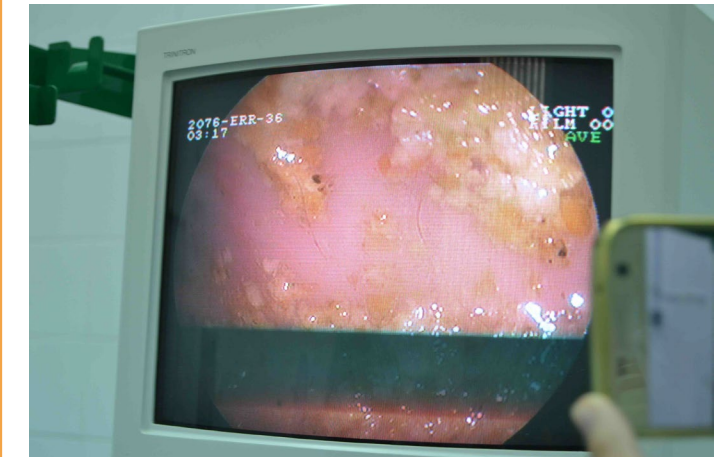
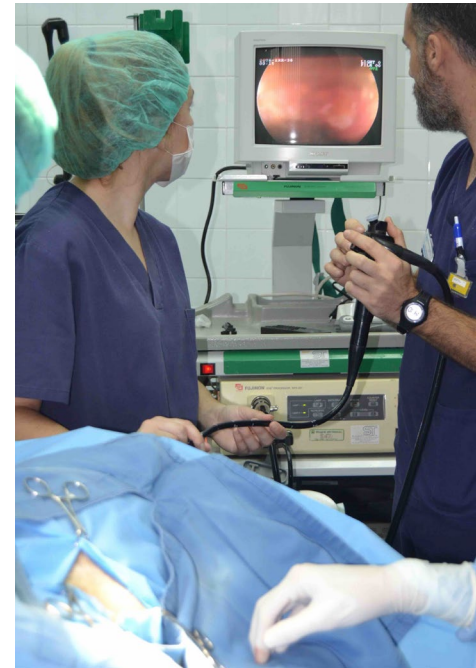
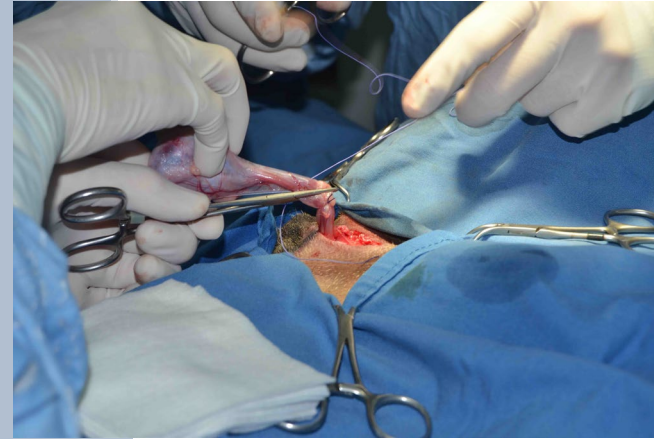
Positioned of left lateral recumbency.

Endoscope was passed from the oral cavity to the stomach

The stomach was inflated to adequate distension

Palpation through the wall of the abdomen

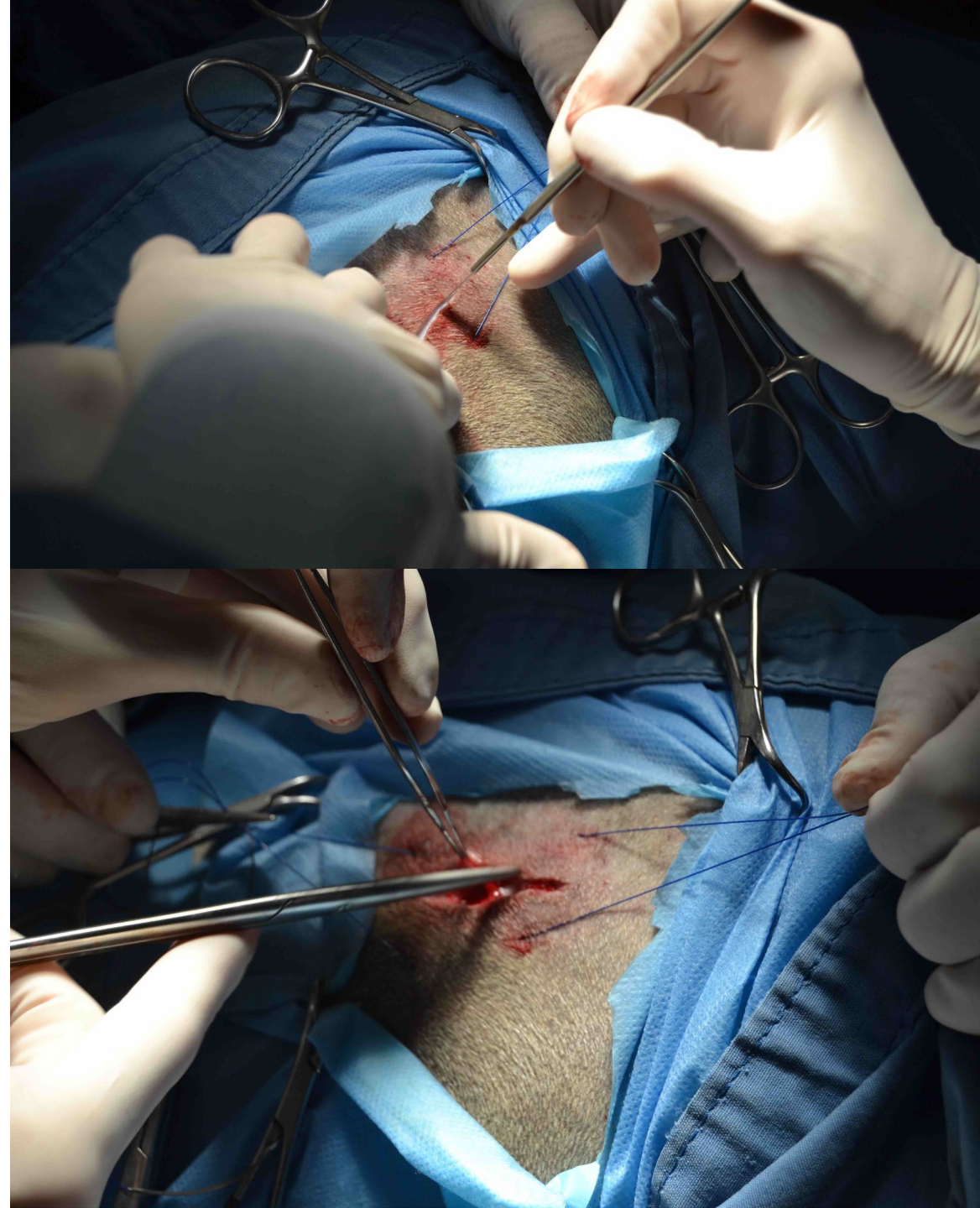
Visualized the pyloric antrum and evaluate possible lesions in the stomach.

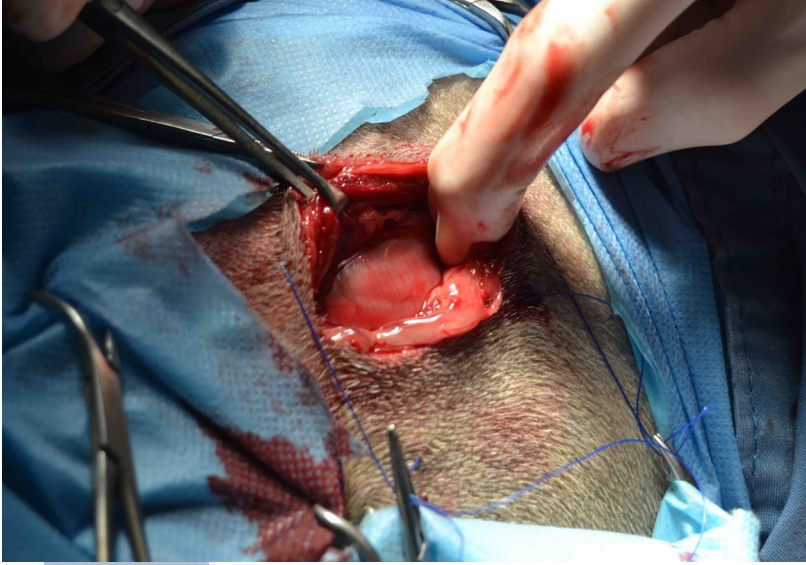


Pyloric antrum located, and the stomach sufficiently inflated, stay sutures were placed percutaneous through the right wall of the abdomen penetrating into the gastric lumen

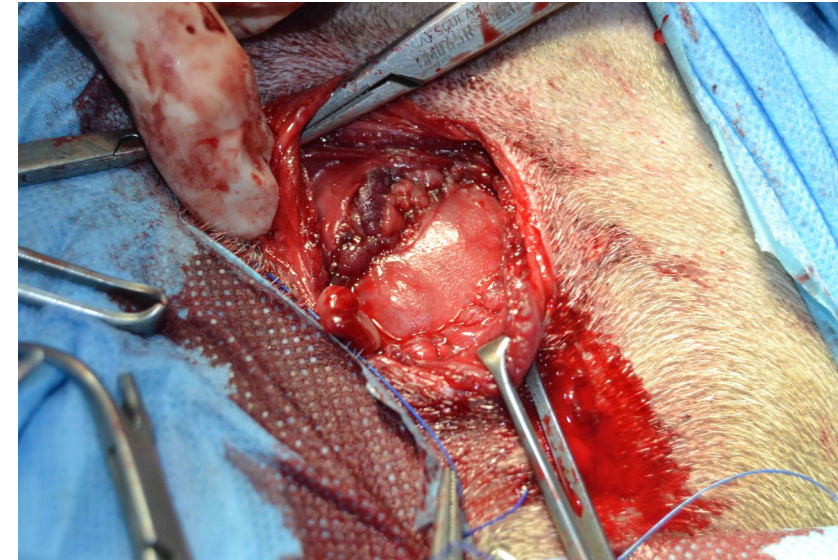
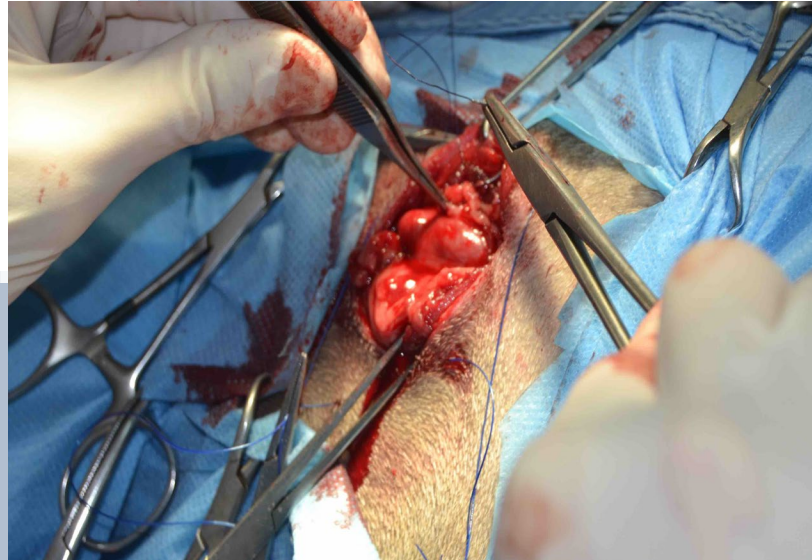
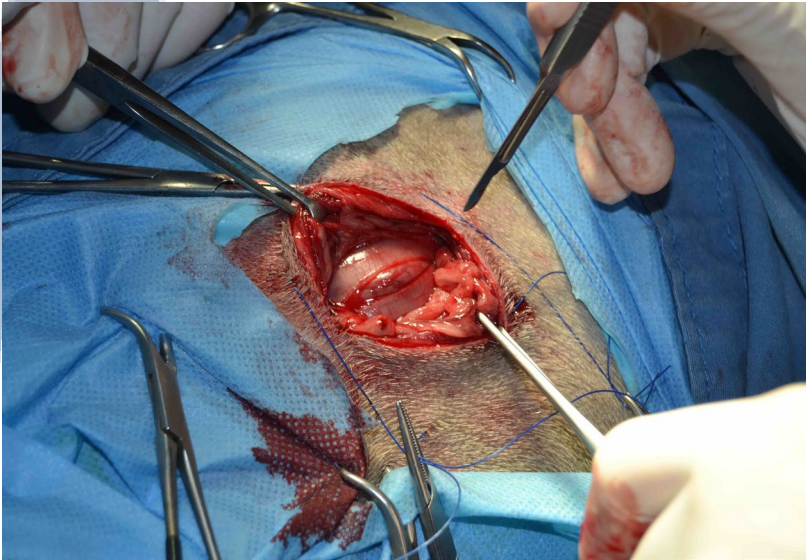


A skin incision of 4-5 cm long was made with a 10 blade scalpel and muscular layers of the abdomen (obliquus externus muscle and transversus muscle) were transected by metzembaum scissors.





Seromuscular layer and
abdomen muscle were
sutured





Tissues layers were closed
in continuous pattern

-
- subcutaneous
 - intradermic
 - skin



Postoperative and Follow up

- Ultrasound:
 - Well fixation
 - Mild inflammatory reaction
- No complications



Prophylactic incisional gastropexy



Prophylactic gastropexy: case 2

Martina: Spanish Mastiff mixed dog



- 7 months
- Large-breed
- Non neutered female, 36,4 kg
- Physical examinations: normal
- Surgical procedure: Animal Shelter of Bañaderos

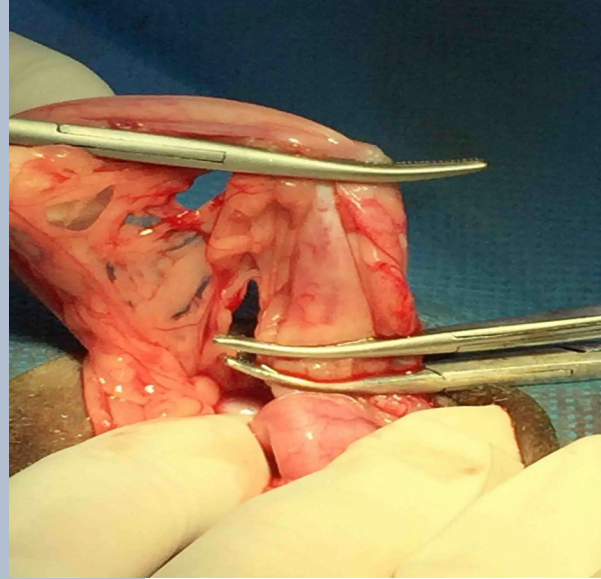


Technique:

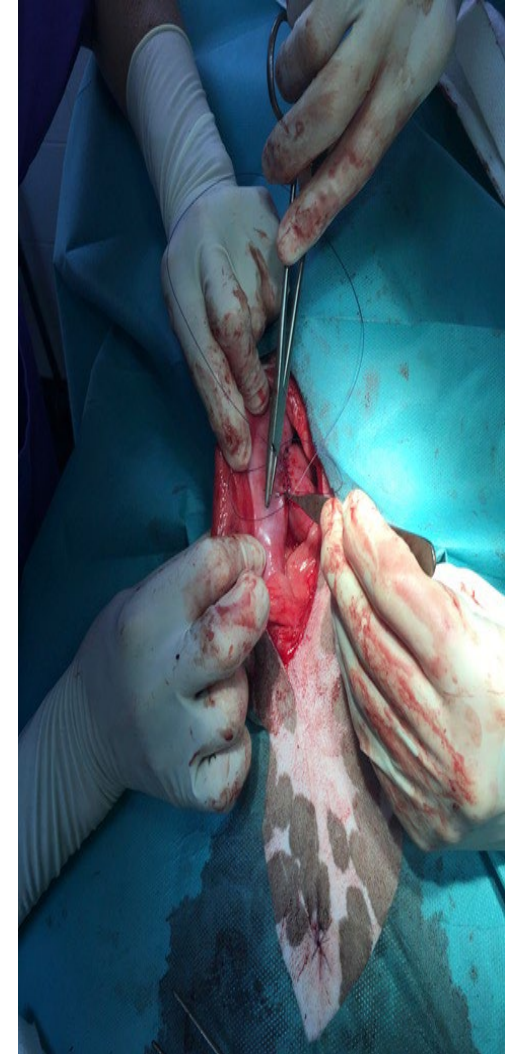
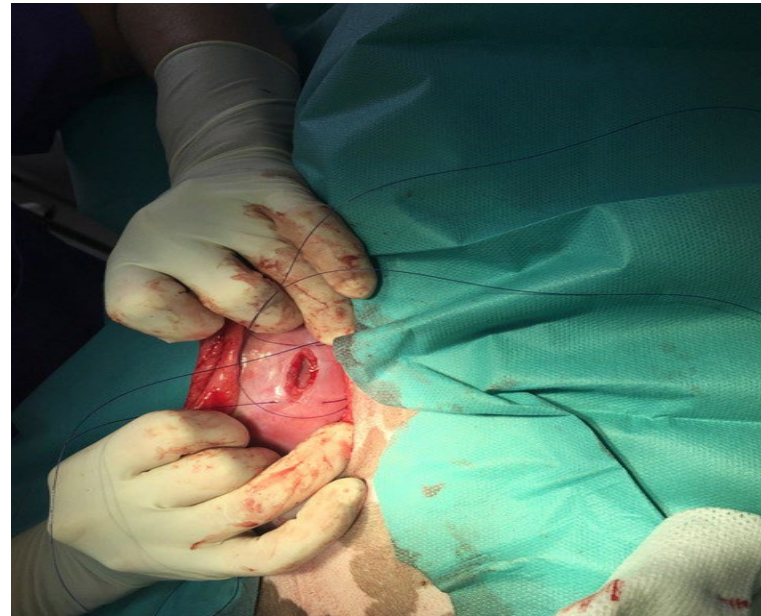
Supine recumbency

Laparotomy and OVH

Position sutures



- A 4-5 cm incision was made in the seromuscular layer of the gastric wall, parallel to the long axis of the stomach between the minor and major curvatures.
- Incision of equal length that was made through the peritoneum and the right transverse muscle.

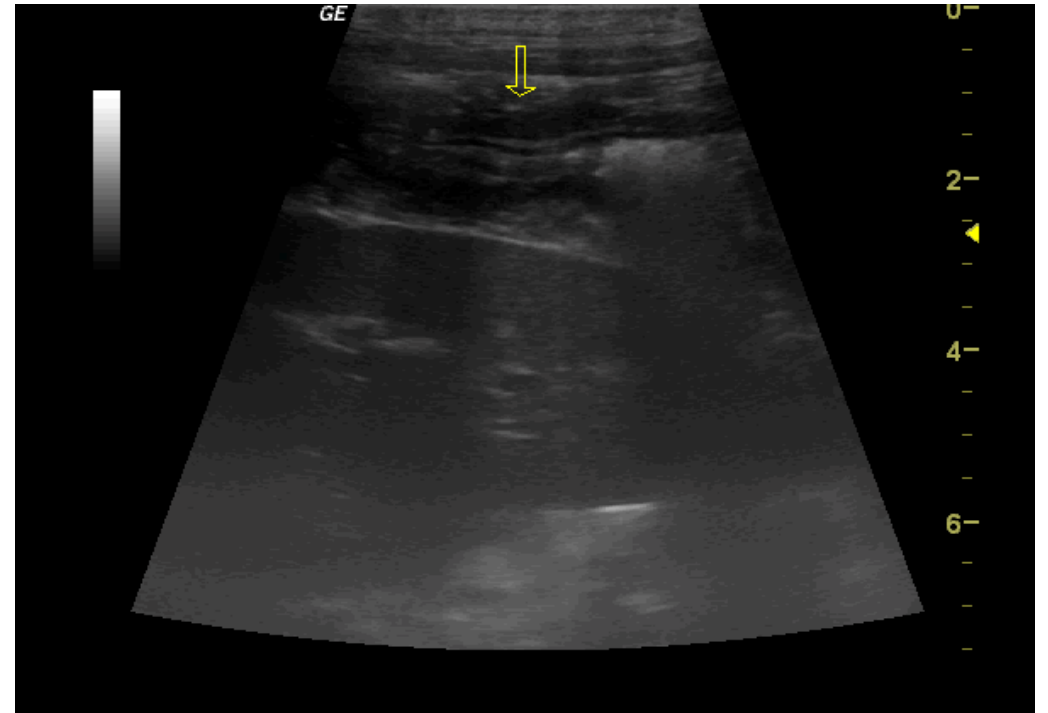


-
- Both incisions were sutured together in a simple continuous pattern.
 - Layers are closed routinely



Postoperative and follow up

- Ultrasound:
 - Good position
 - Well fixation
- No complications



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Conclusions



1. We strongly recommend the incisional gastropexy after a GDVS due to the high rates of recurrence 80% and because this technique is fast, easy and it can be carried out without much level of expertise.



2. After splenectomy performed in large breed animal prophylactic gastropexy has to be seriously taken into consideration due to the increment of the odds of the GDVS observed in this patients.



3. Prophylactic incisional gastropexy could be taken into consideration when ovariohysterectomy or castration are carry out to birth control and it seems a right time for this procedure.



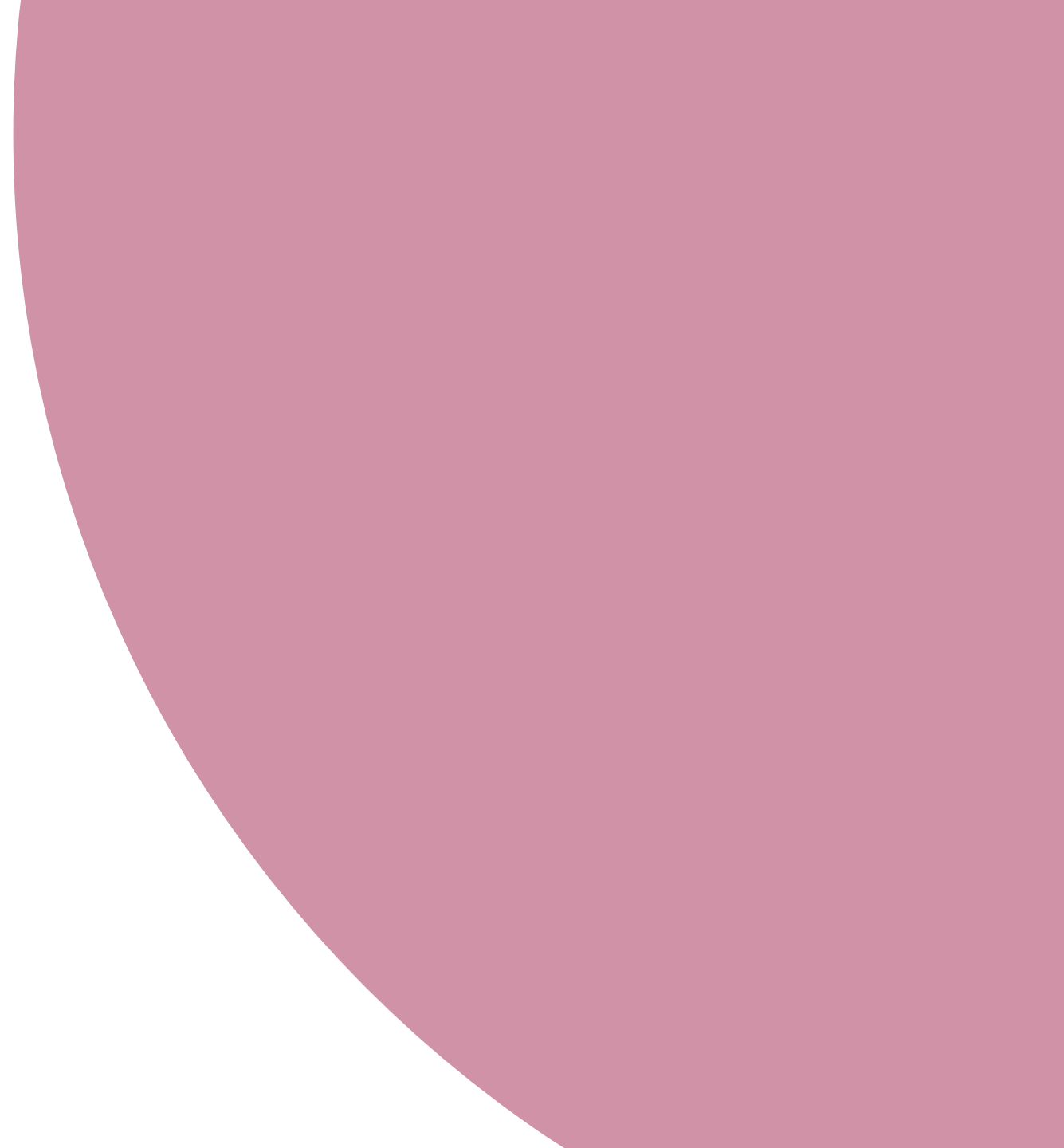
4. Recently, veterinary surgeons have proposed laparoscopic techniques to perform gastropexy with staples or sutures. Laparoscopic techniques result in less tissue trauma, decreased postoperative pain, and a faster return to normal function but in our opinion despite the good results presented by literature a very expensive laparoscopic equipment and advanced training are required



5. Endoscopically assisted prophylactic gastropexy decreases from a 80 to a 0.3% mortality ratios. It is feasible, quick and easy to perform and avoids post-surgery discomfort in dogs. Also, the appropriate location of gastropexy, adequate adhesion, and shorter length of the surgical incision, have made it superior to other compared methods. Because of its advantages, the endoscopically assisted technique is a suitable alternative to open incisional and belt loop gastropexies, especially if performed by a skilled surgeon.

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Thank You!

