

ORGAN TORSION

Guide to Diagnosis and Treatment of Organ Torsions

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- AMC – Rotating internship
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- Residency – Tufts

Torsion vs. Volvulus

- Veterinary medicine:
 - Torsion – Organ twists on its axis
 - Volvulus – Organ twists on its mesentery
- Human medicine: The terms are interchangeable



What we will cover:

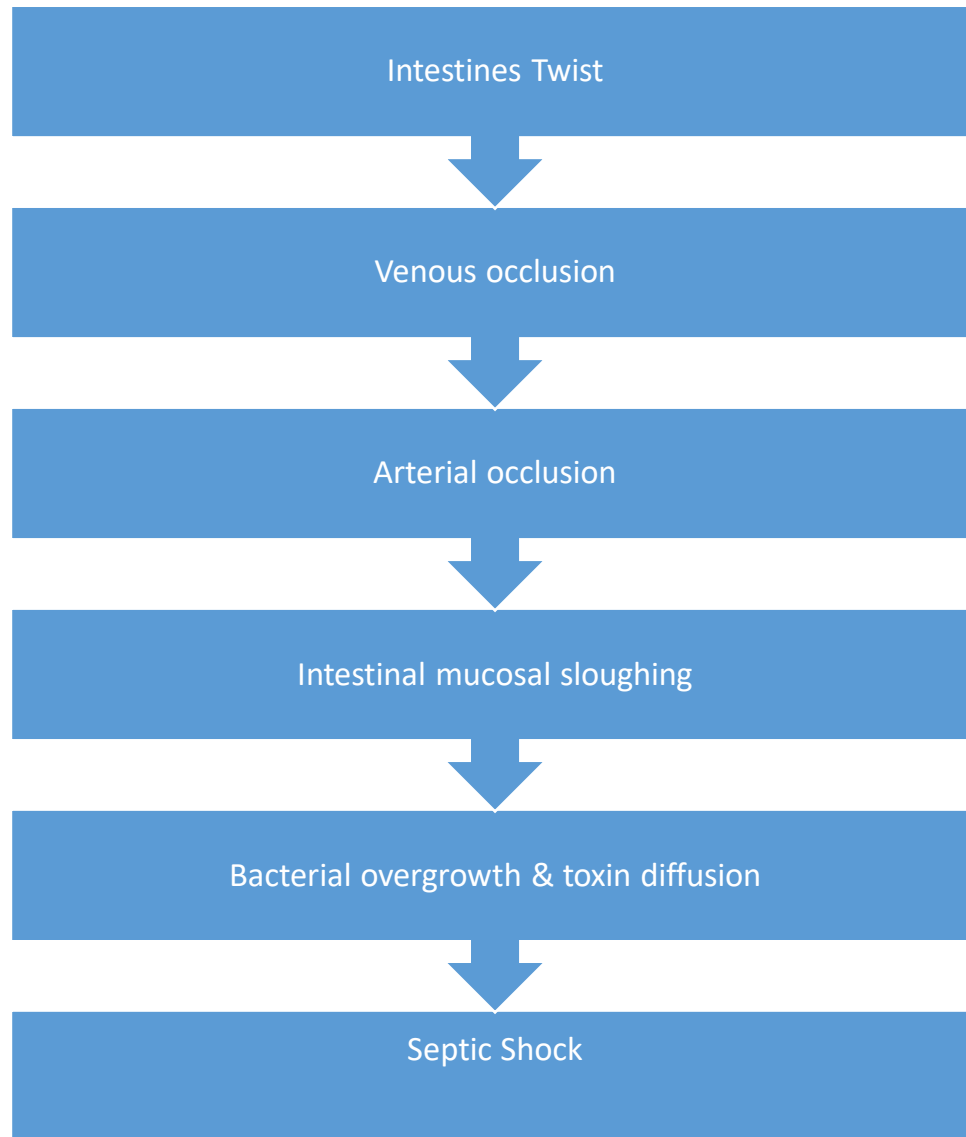
- Mesenteric volvulus
- Colonic torsion
- Splenic torsion
- Liver lobe torsion
- Lung lobe torsion
- Testicular torsion

Whenever possible, remove the affected organ without reducing the torsion.

Mesenteric volvulus

- German shepherds, English pointers, other large breeds
- Mean age ~ 4 years
- 10% of German shepherds with EPI
- Most cases are idiopathic
- Usually involves the entire mesentery, but can be segmental





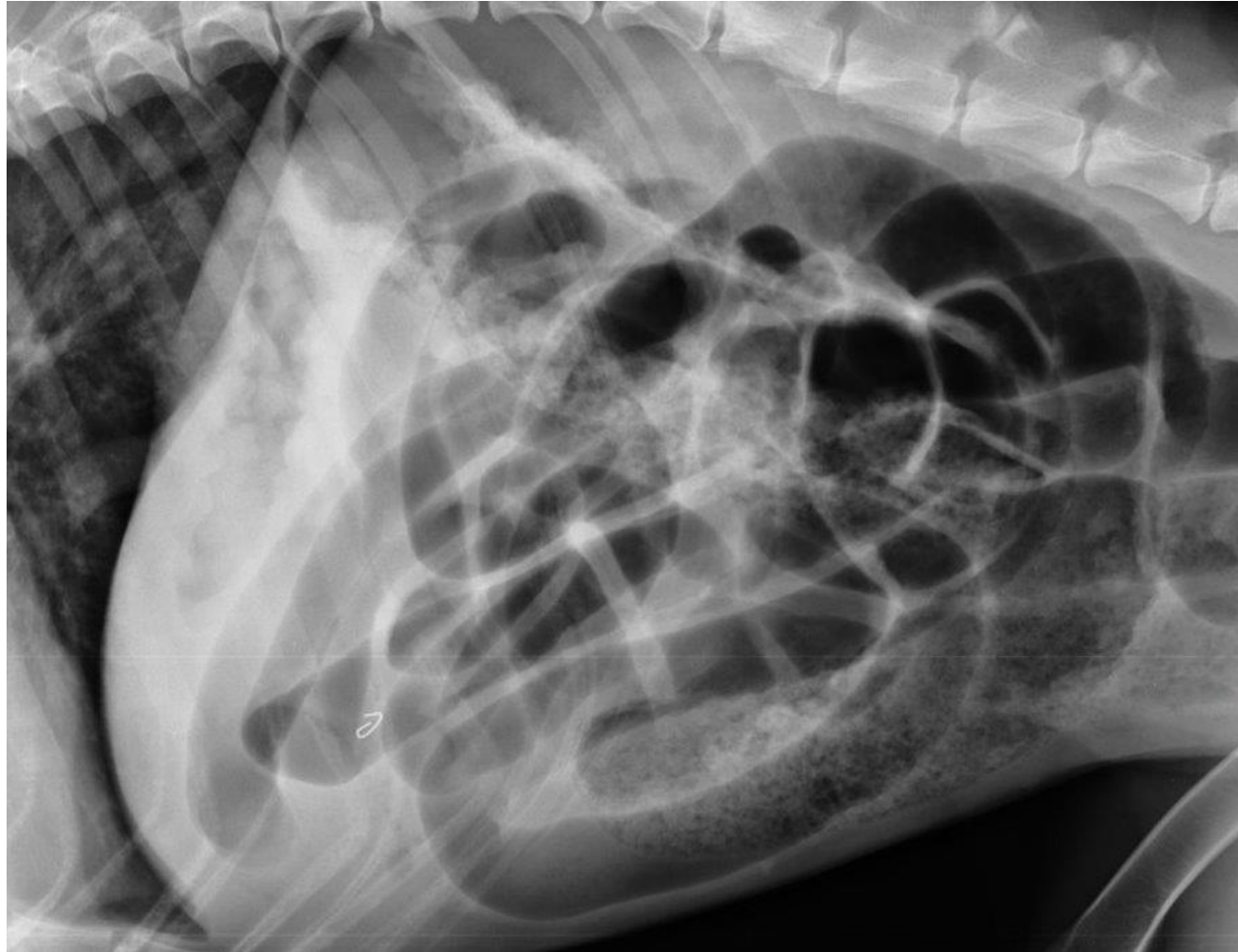
Clinical signs

- Hyperacute
- Severe abdominal distension
- Hematochezia
- Vomiting
- Shock
- **Main rule-out: GDV – Pass an orogastric tube!**

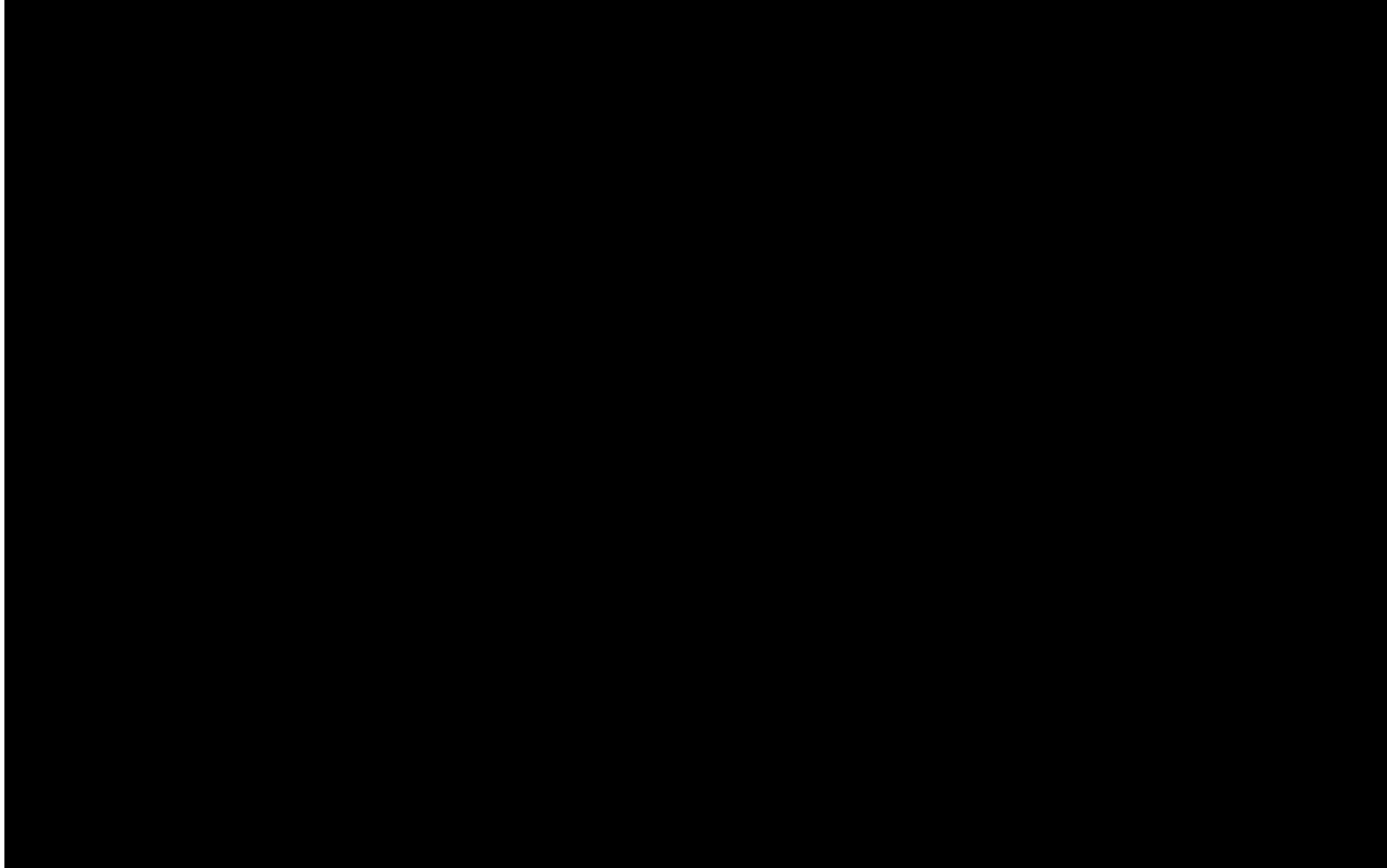
Workup/treatment

- Patient stabilization
- +/- Imaging
- Immediate surgery

Radiography



Ultrasound



CT

Whirl sign

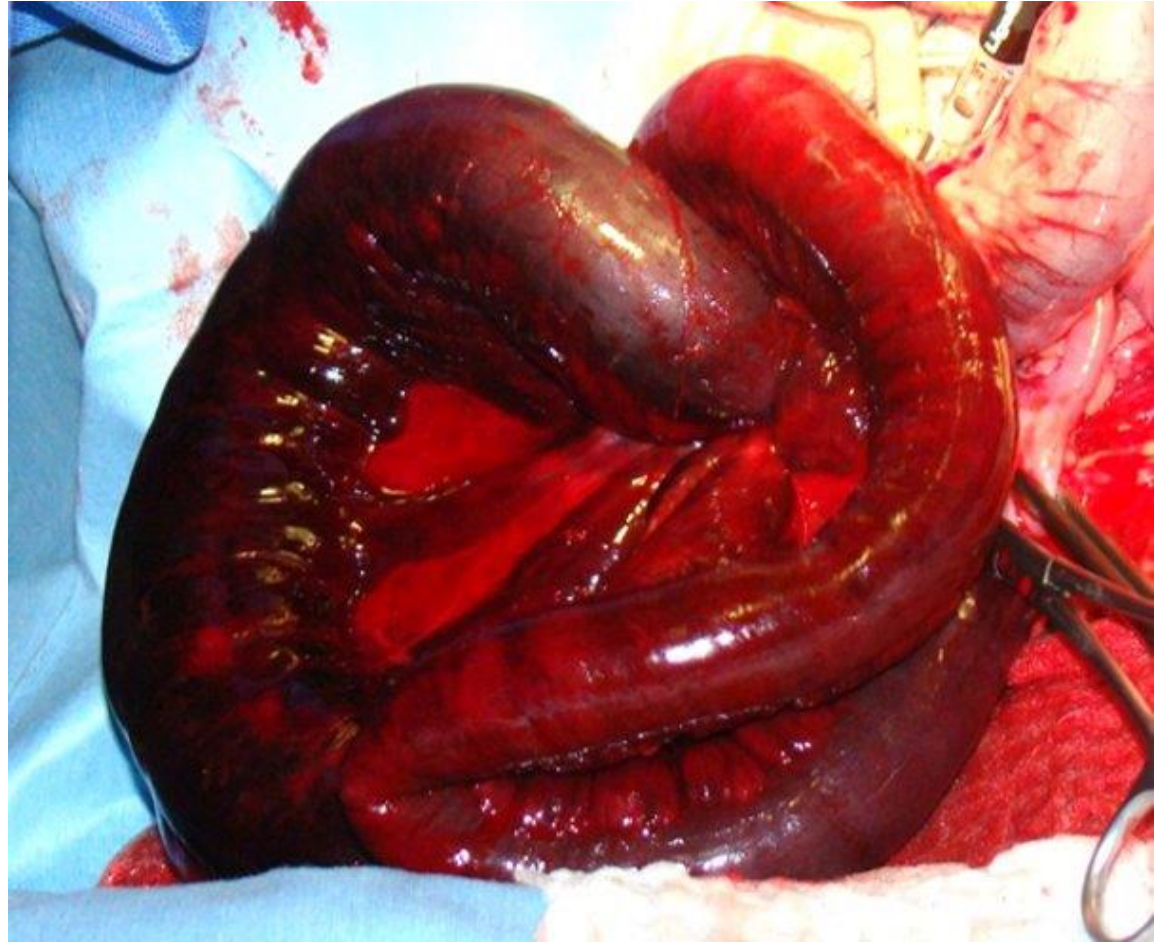


Surgical Options

1. Derotate without resection

2. Resect without derotating

3. Derotate then resect



Short Term Outcome

- Westermarck, JAVMA 1989:
 - - N=21 German shepherds with EPI
 - - 9 went to surgery, all 9 died
 - - Why EPI? Excess gas, abnormal motility or flora
- Junius, JSAP 2004:
 - - N=12 large breed dogs
 - - 2 had concurrent GDV
 - - 4 dogs derotated and survived
 - - 1 resected and survived
 - - Prognosis may be worse in German shepherds

How much intestine can be safely resected?

- Gorman, JAVMA 2006:
 - N=10 dogs, 5 cats with $\geq 50\%$ resection of SI (mean 68%)
 - MST 828 days
 - All had transient soft stools

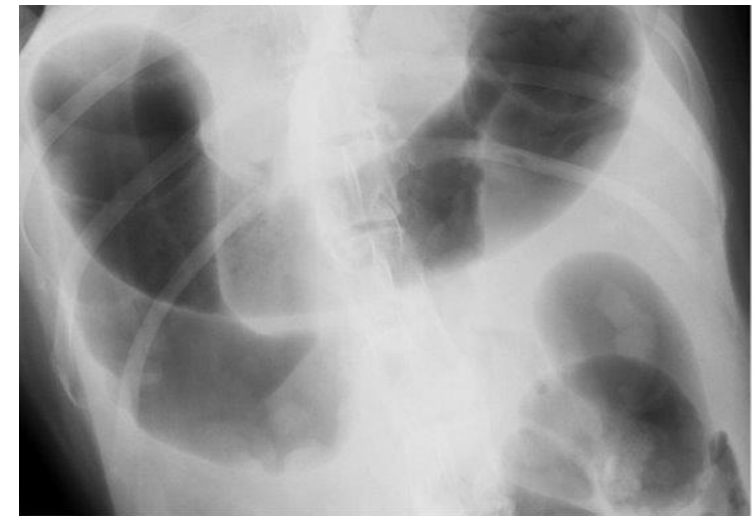
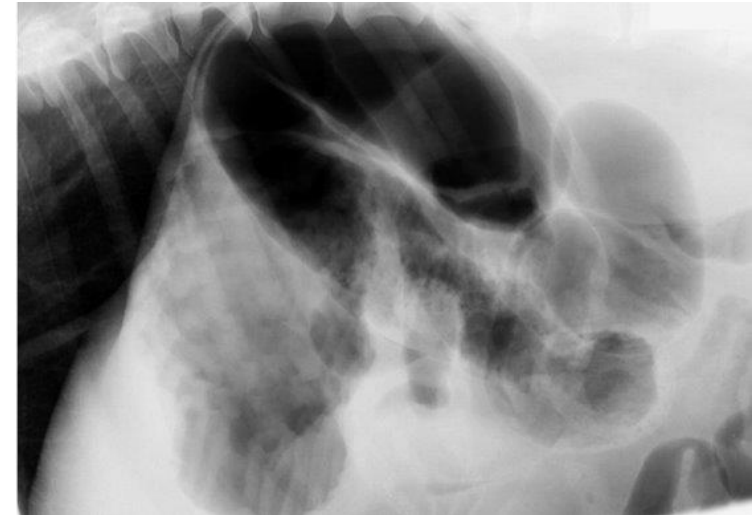
 - 8 dogs were normal
 - 2 dogs had ongoing diarrhea/weight loss, euthanasia

 - 3 cats had ongoing soft stools or diarrhea, 1 euthanasia

 - No correlation with extent of resection

Colonic volvulus/displacement

- Young to middle aged dogs
- +/- tearing of mesocolon
- Also reported in humans, cats, horses, cattle, swine
- May have chronic GI issues
- Acute vomiting



Colonic volvulus/displacement

- Gagnon, JAAHA 2013:
- 4/6 had previous GDV and gastropexy
- 3/6 had entrapment around gastropexy site
- 5 dogs had surgery, all had left sided colonopexies, all survived

Colonic volvulus/displacement

- Bentley, JAVMA 2005:
- 4 large breed dogs
- 1 – displacement
- 3 – volvulus
- Left sided colonopexies or gastrocolopexies

Other Predisposing Factors

- German shepherd dogs
- Previous abdominal surgery
 - Intussusception w/EPI
- Chronic enteritis
- Neoplasia
- Chronic intussusception
- Intestinal parasites
- Vigorous exercise

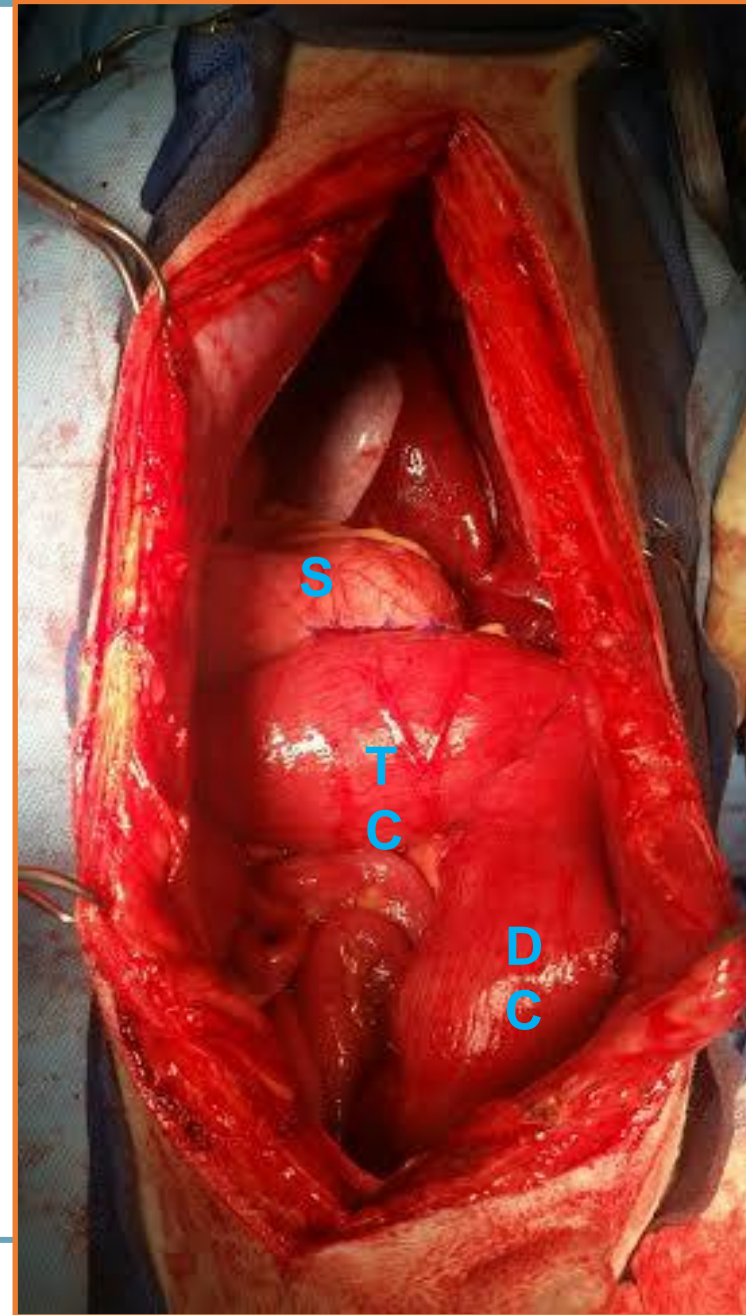
Diagnostics

- Imaging
 - Radiographs +/- contrast enema
 - Ultrasound—non-specific findings
 - CT
- Clinical suspicion



Surgical Treatment

- Ex-lap ASAP!
- Decompression to facilitate derotation
- +/- colonic resection
- Colopexy
 - Simple appositional
 - Incisional



BREAK



Why cats are not allowed in the operating room.

Splenic Torsions

Large, deep chested dogs:

- German shepard
- Great Dane
- English bulldog

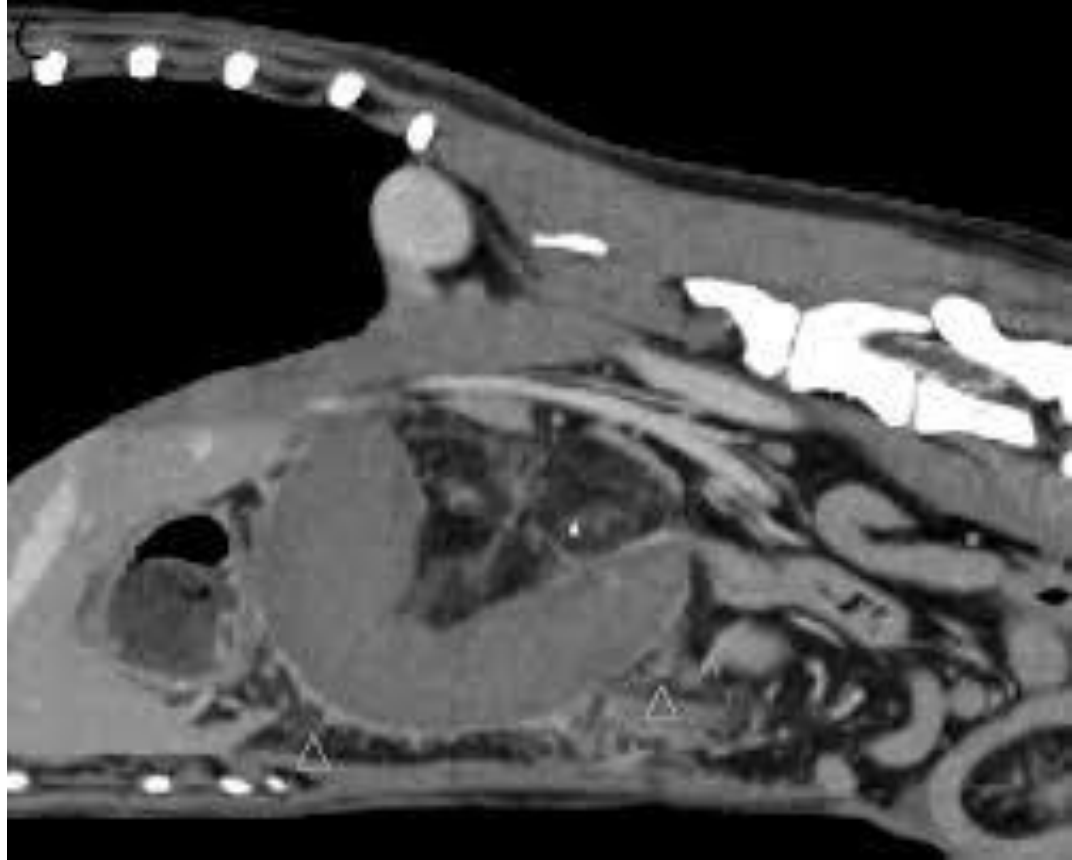
Associated with spontaneously resolving GDV?

Can be acute or chronic (several days in >50%)

- If chronic, vague, non-specific signs
- Abdominal pain

Excellent prognosis with splenectomy

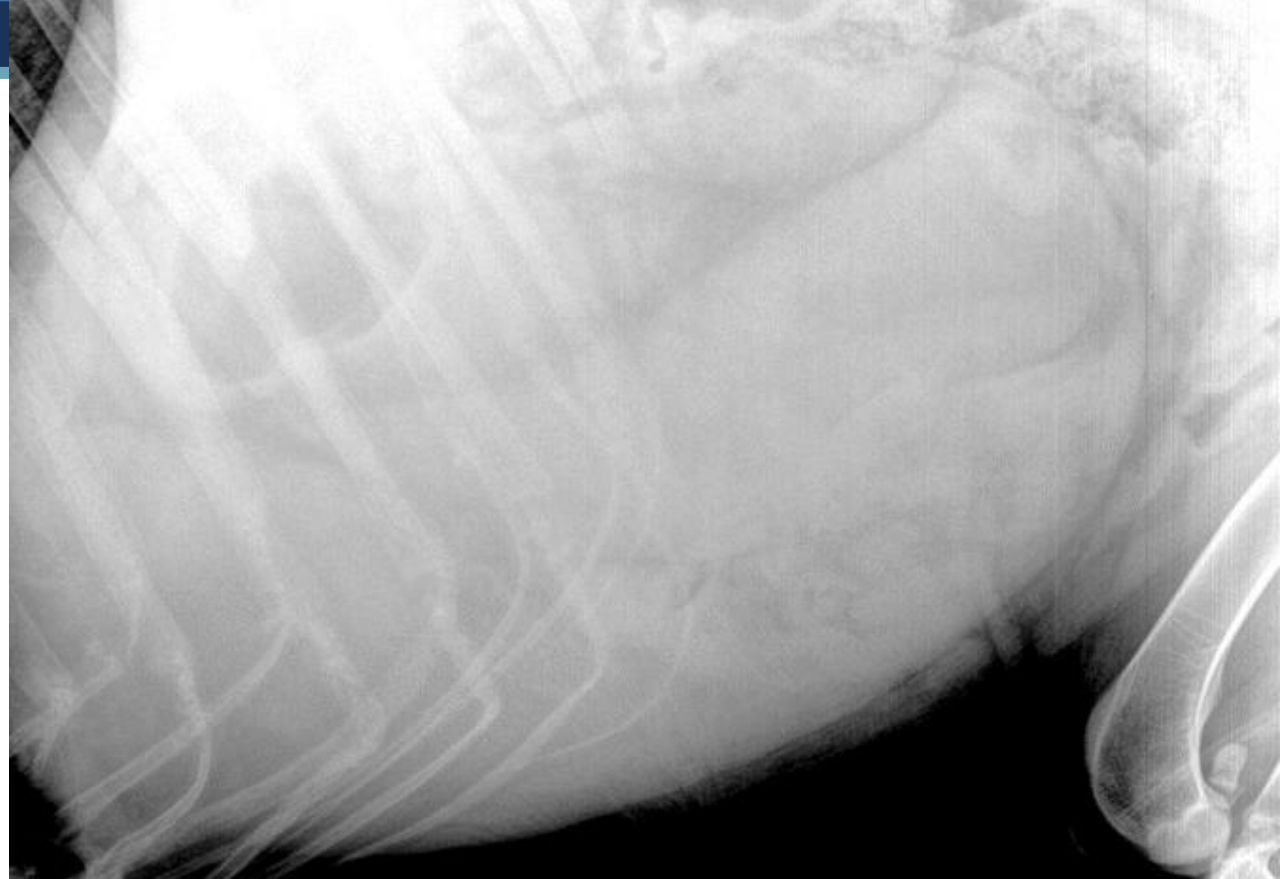
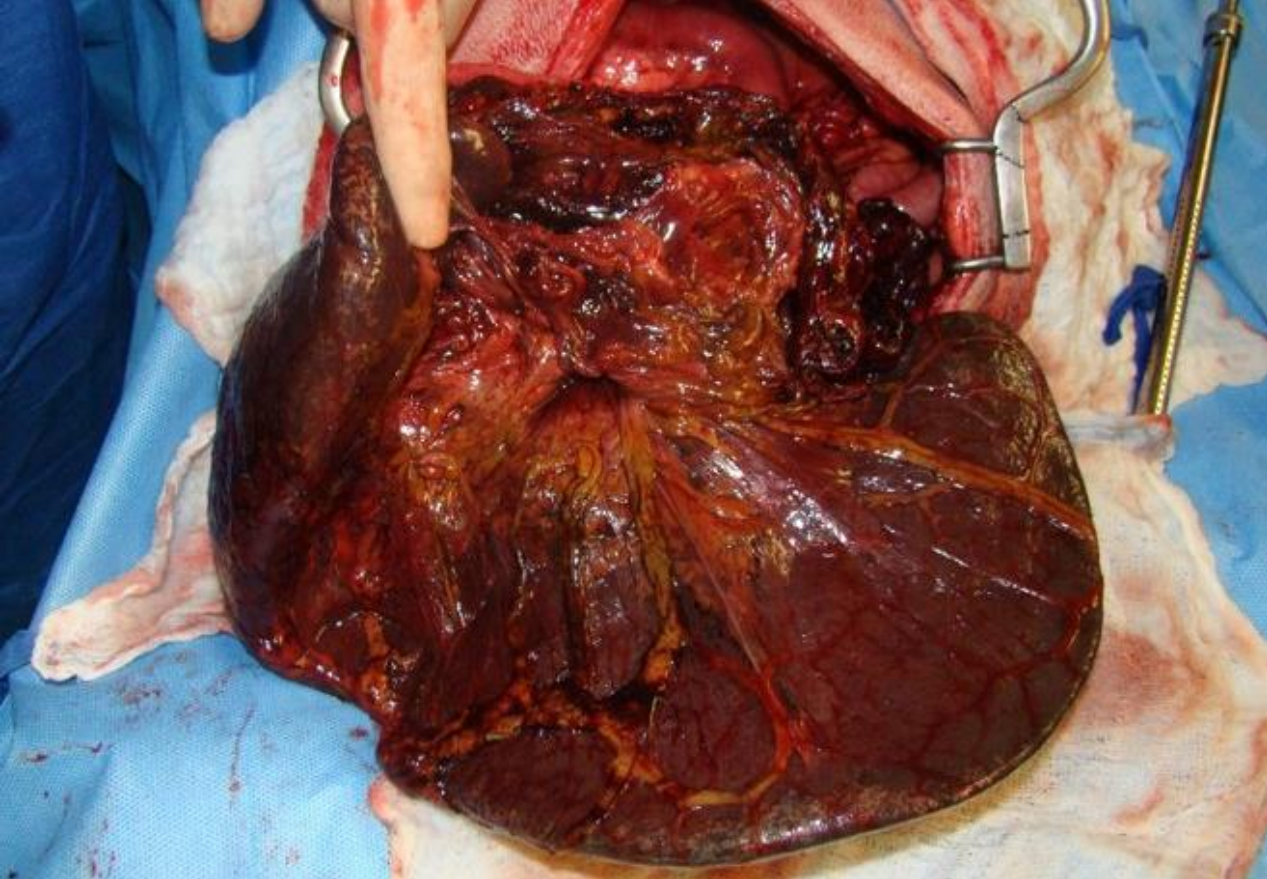
Consider gastropexy



Flatz et al, Mathews Open Access 2016

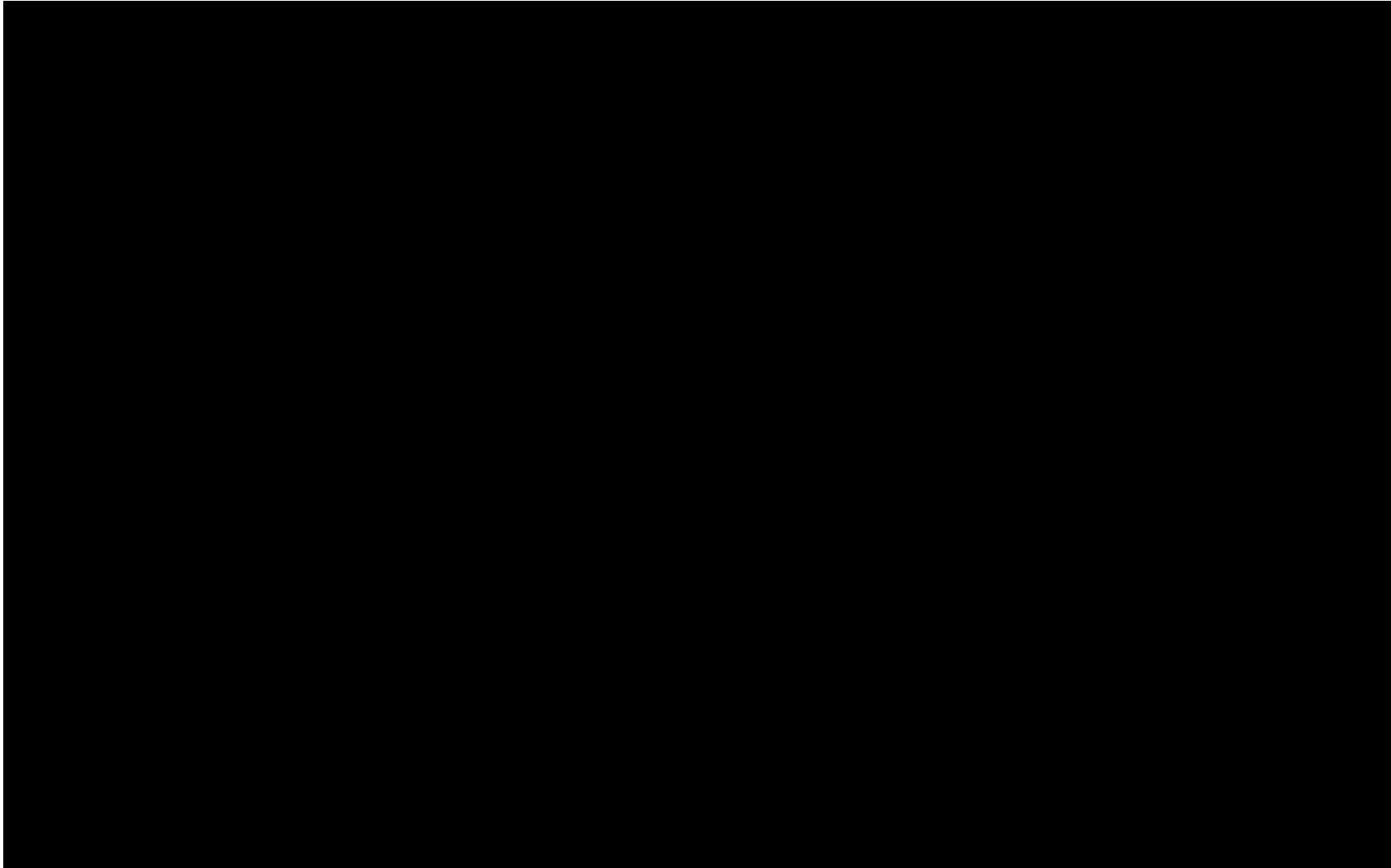
Diagnosis

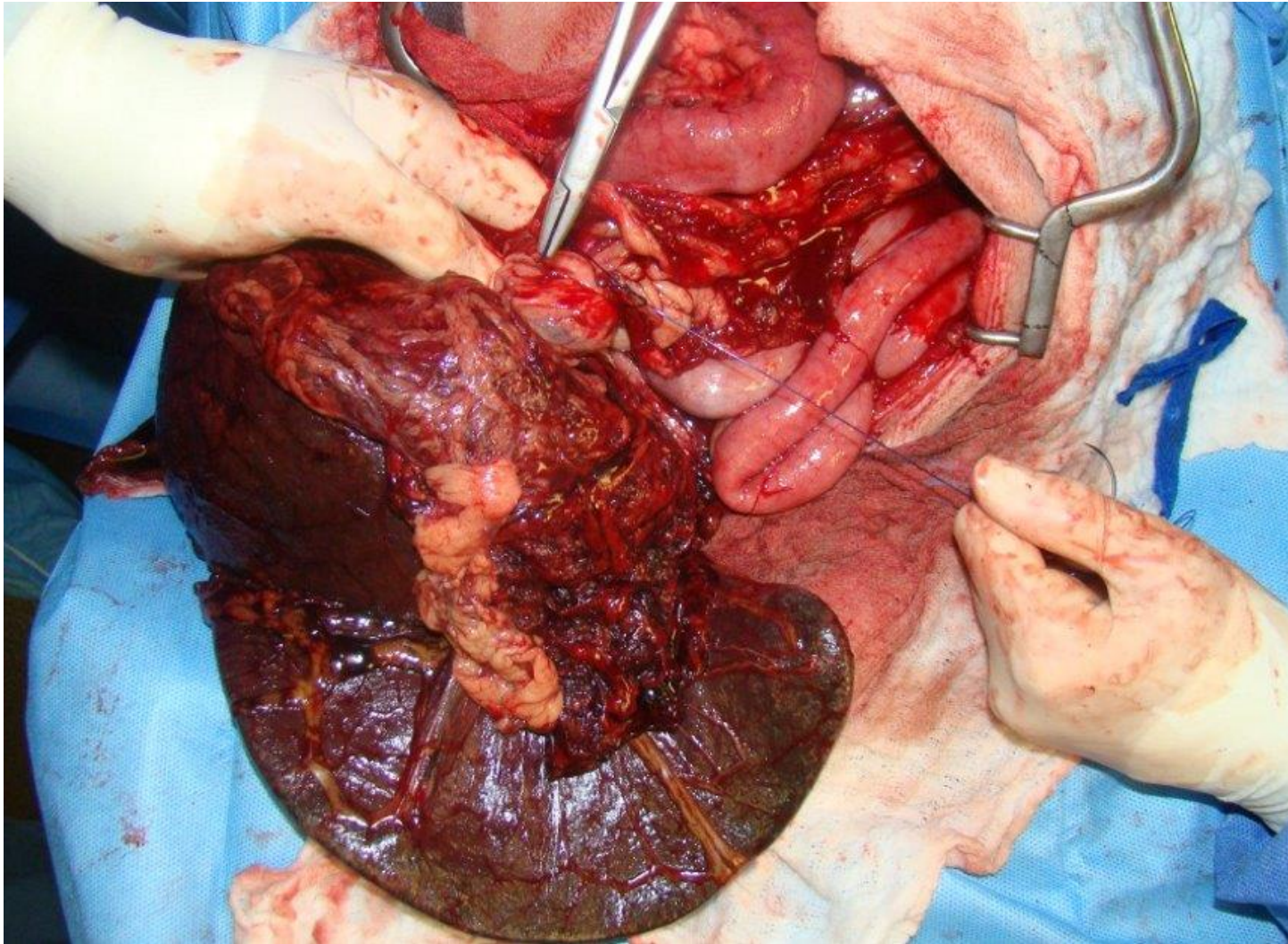
- Imaging
 - Radiographs
 - Midabdominal mass
 - C-Shape
 - Ultrasound
 - Splenomegaly
 - "Lacey"
 - Diffusely hyperechoic
 - CT
 - "Corkscrew" like soft tissue mass



C- SHAPED SPLEEN

Ultrasound





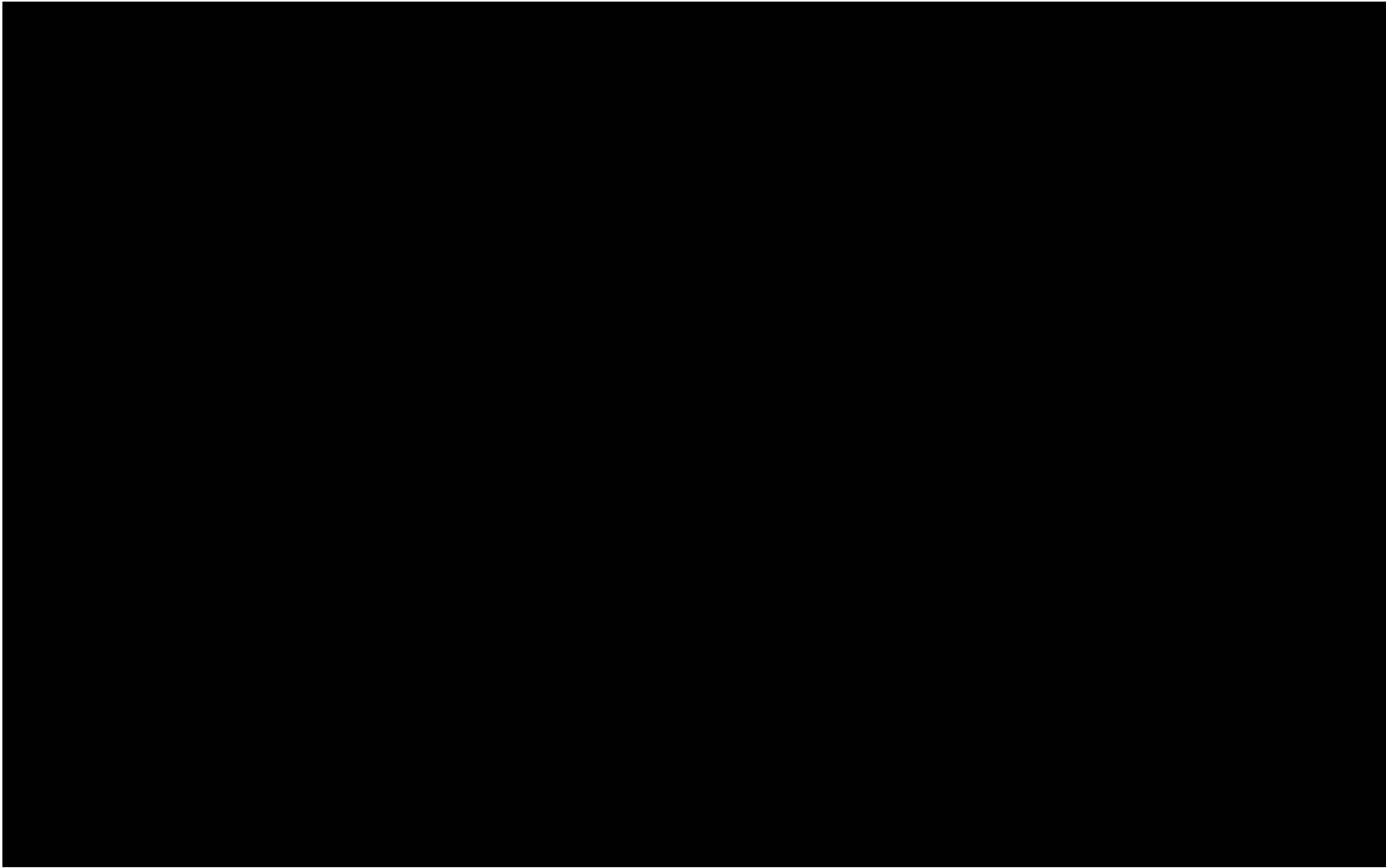
Splenic Torsion – Surgery

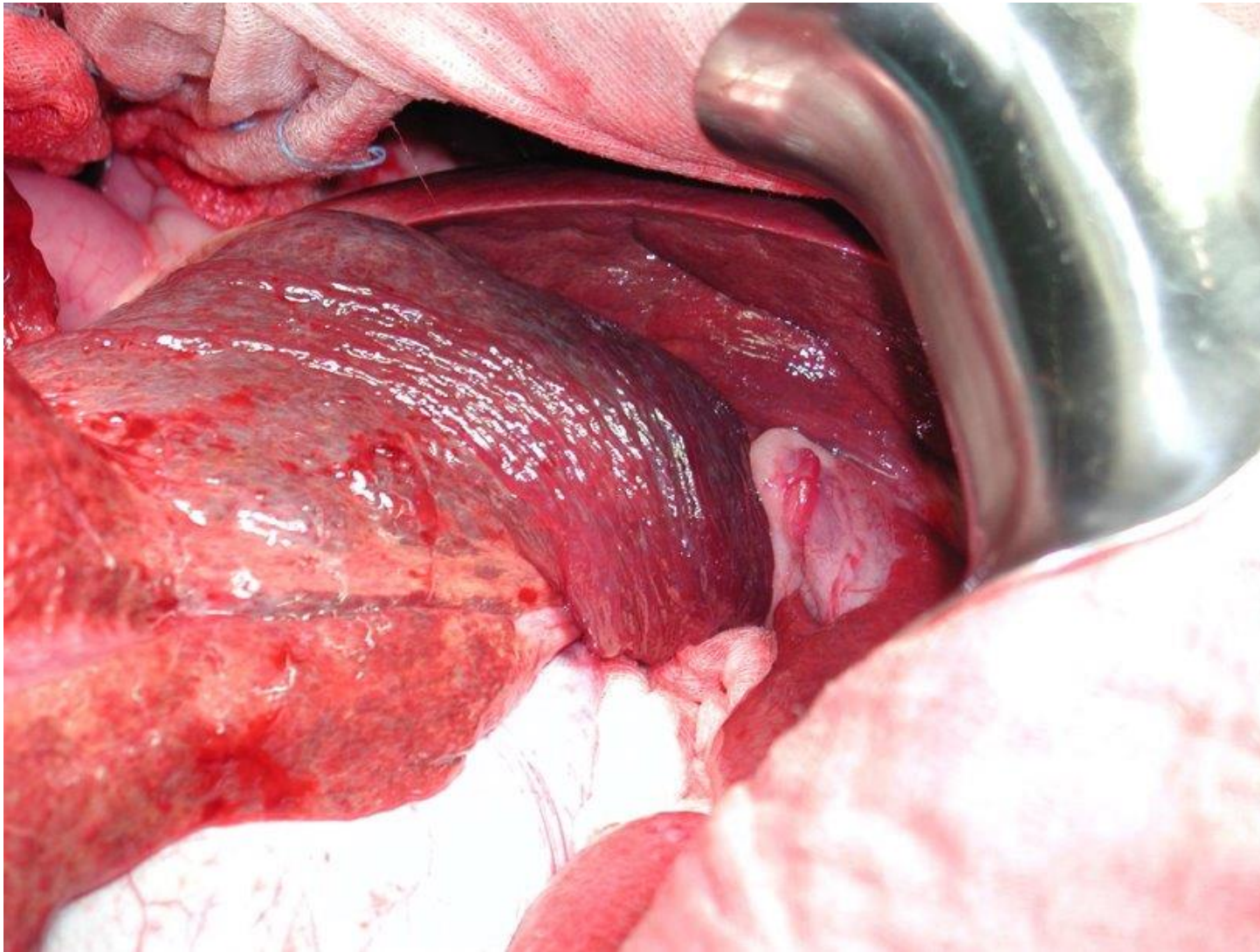
- Neath, JSAP 97: 18/18 survived
- DeGroot, JAVMA 2016: 93/102 (91.2%) survived

Liver Lobe Torsion

- Similar to splenic torsion
- Typical Signalment
 - Middle aged/older large breed dogs, possible GDV history
 - Rabbits
- Vomiting, lethargy, anorexia, liver enzyme elevation, effusion
- Acute or chronic
- Left lobes predisposed
- Good prognosis with lobectomy, consider gastropexy

Ultrasound (Radiographs not helpful)





Surgery

- Derotation may be necessary for safe lobectomy
- Hinkle, JAVMA 2006: 11/12 survived



Lung Lobe Torsion

- Rare, life-threatening
- Lung lobe rotates around the bronchus and vascular supply
- Predisposition in large, deep-chested dogs
 - Afghan hound – overrepresented
 - 133 times more
- Documented in pugs, Yorkshire terriers, miniature poodles, beagles, and mixed-breed dogs, cats

Lung Lobe Torsion

- Most common: right middle and left cranial lobes
- Proposed mechanisms (conditions that lead to increased lung lobe mobility):
 - Long, narrow shape of the right middle lung lobe
 - Pneumothorax, pleural effusion, previous thoracic surgery, thoracic trauma, and pathologic changes of the affected lobe
 - Bronchial cartilage dysplasia

Older deep chested breeds (esp. Afghans)	Young pugs
Right middle lobe	Left cranial lobe
Often associated with other thoracic disease, esp. chylothorax	Idiopathic
Guarded prognosis	Good prognosis

Strange Phenomenon

Chylothorax



Lung lobe torsion

Clinical Signs & PE

Clinical Signs:

- Acute or chronic coughing
- Hemoptysis
- Dyspnea
- Epistaxis
- Systemic signs (anorexia, lethargy, and fever)
- Gastrointestinal (vomiting and diarrhea)

PE:

- Dyspnea,
- Dull heart and lung sounds
- Dull lung sounds dorsally (pneumothorax)
- Weakness
- Shock
- Cyanosis.

Diagnosis

Fluid analysis

- Sterile inflammation, blood, or chyle

Radiographs

- Pleural effusion → Tap → repeat x-rays
- Air bronchograms
- Abnormal bronchial alignment ** hallmark
- Mediastinal shift, pneumothorax, and pneumomediastinum reported

Ultrasound

- Hypoechoic lung lobe, rounded, pleural effusion
- Overtime – hepatized lung

Bronchoscopy

- visualization of bronchial occlusion

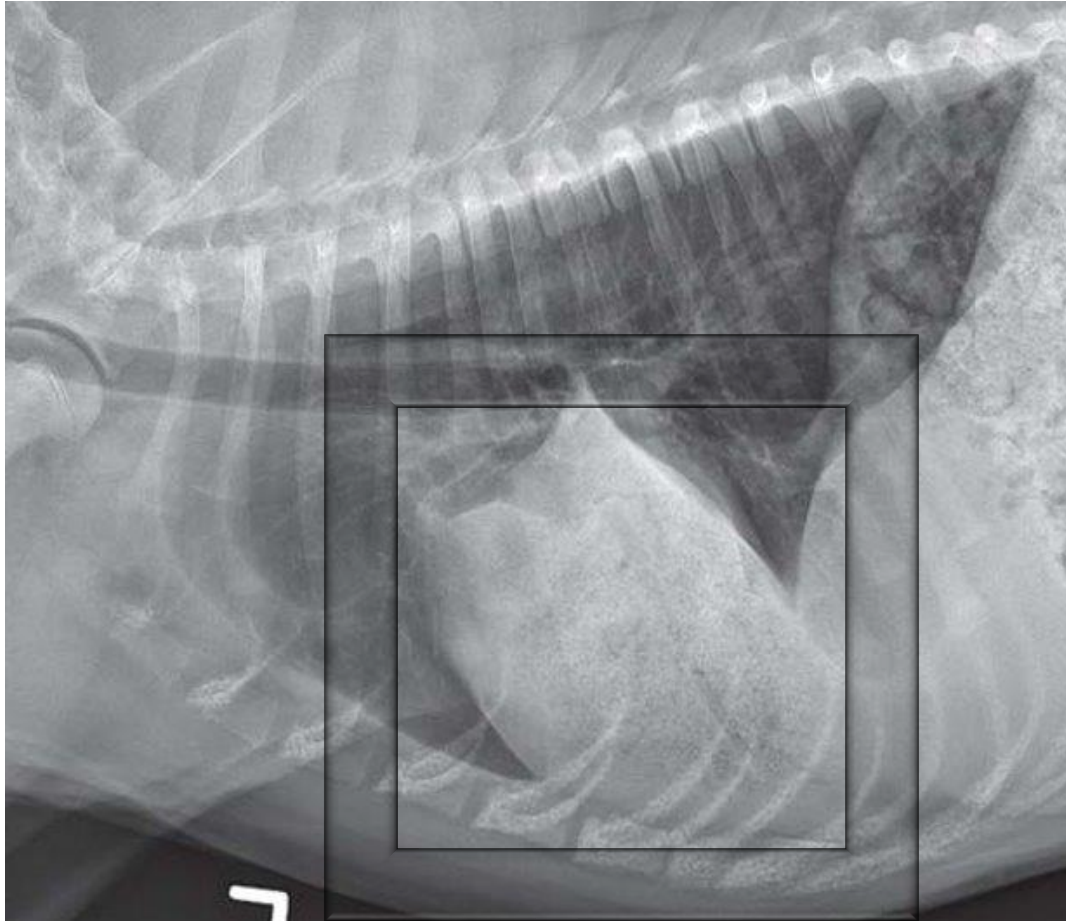
CT

Imaging- DV Radiograph (Idealized)

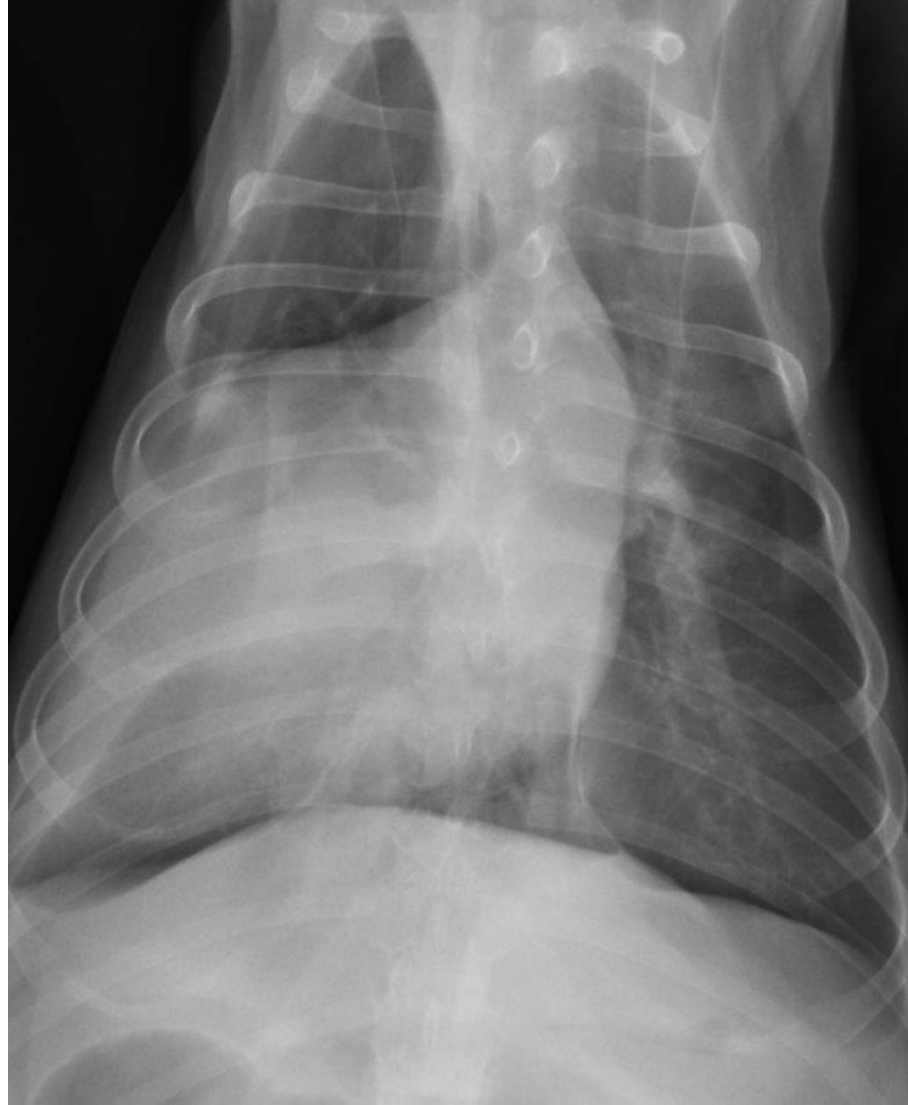


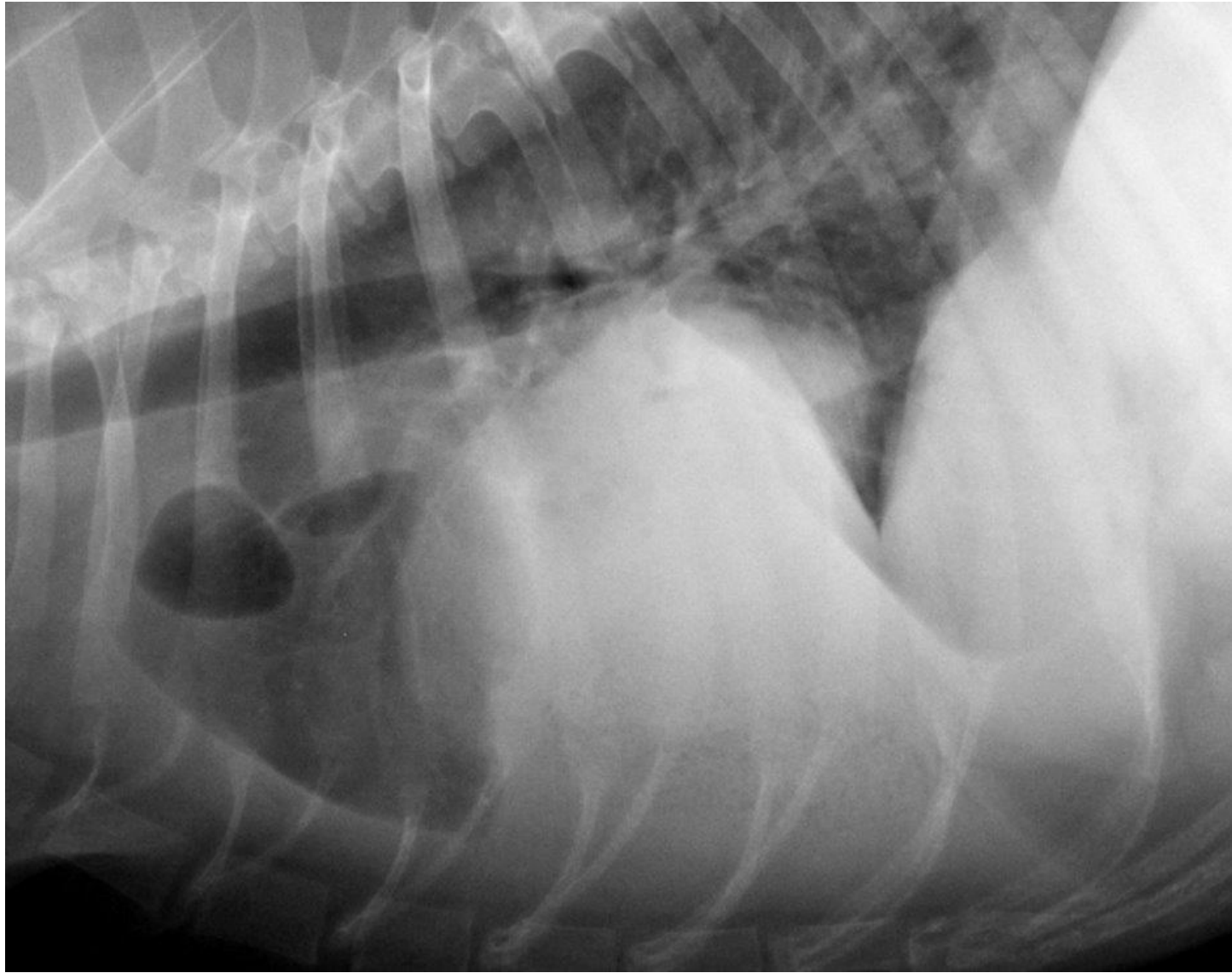
Latimer, *Clin Brief* 2015

Imaging- Lateral Radiograph (Idealized)

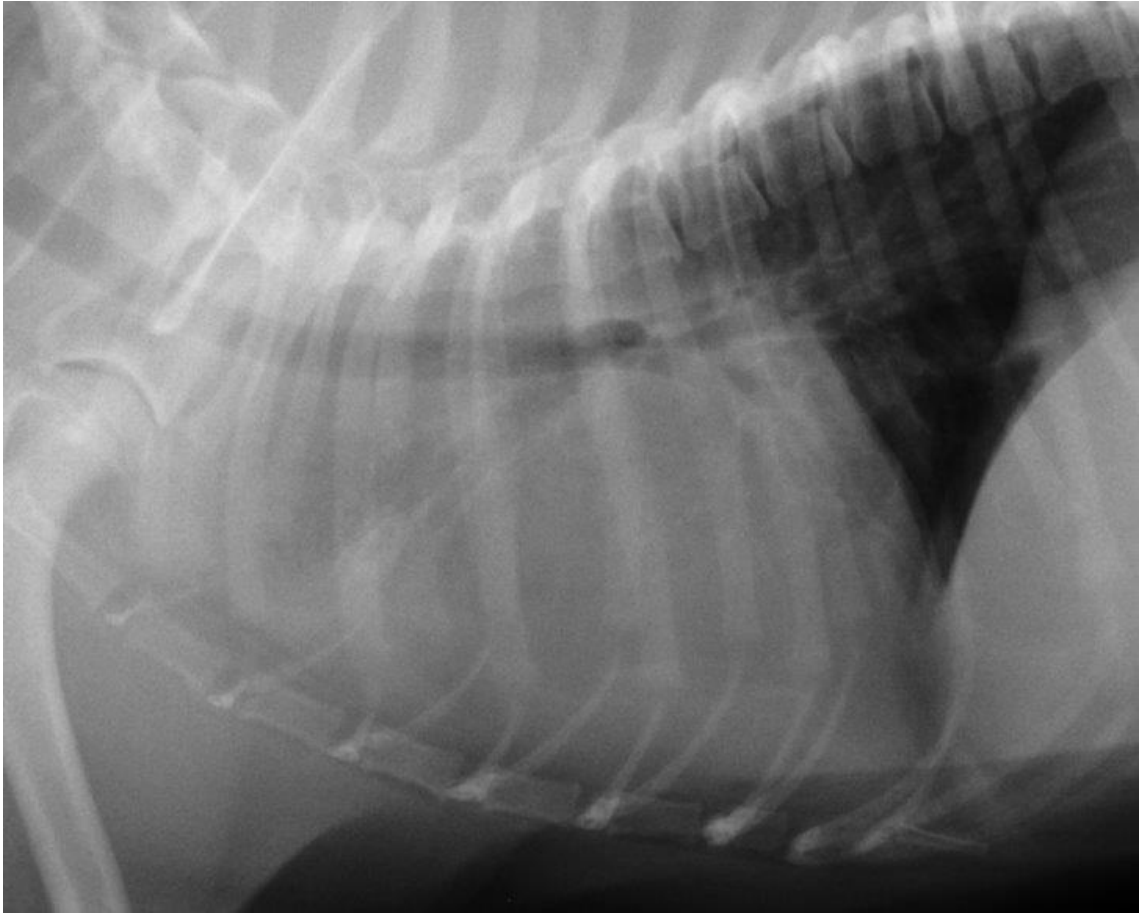
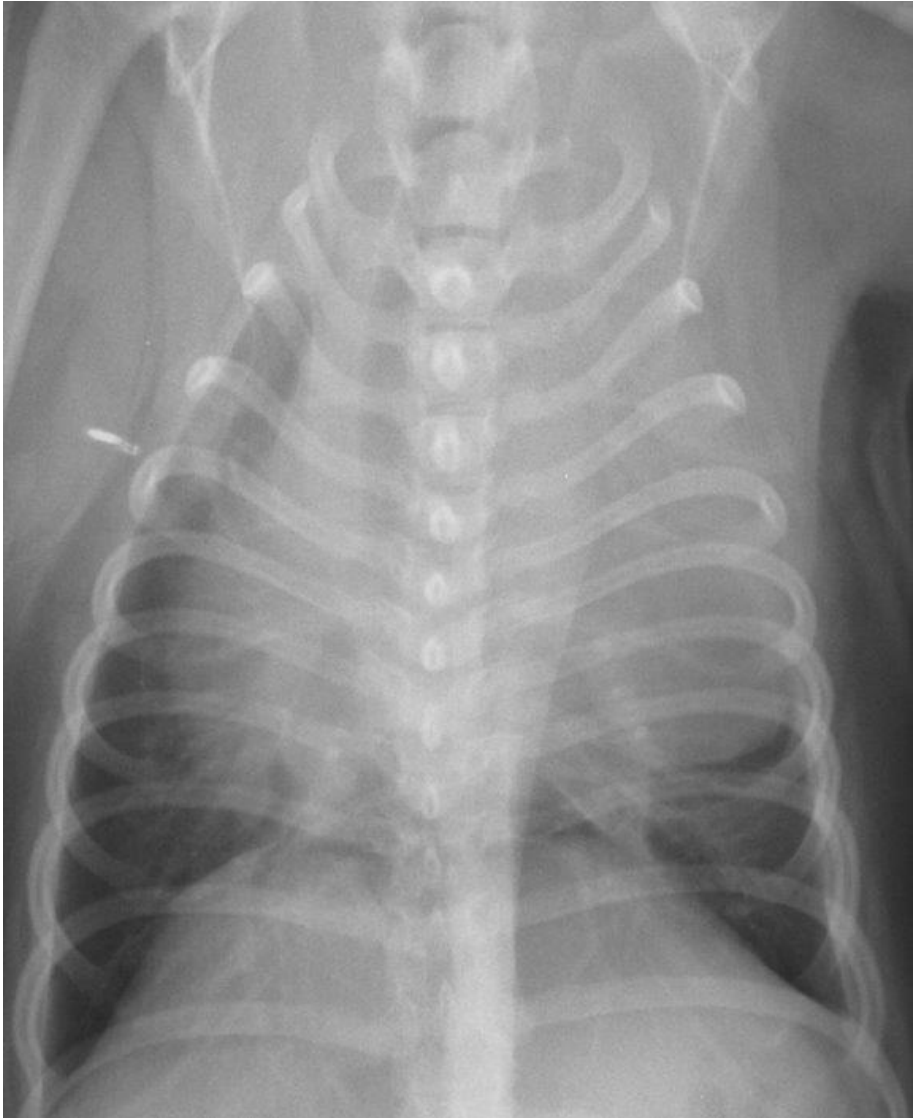


Latimer, *Clin Brief* 2015

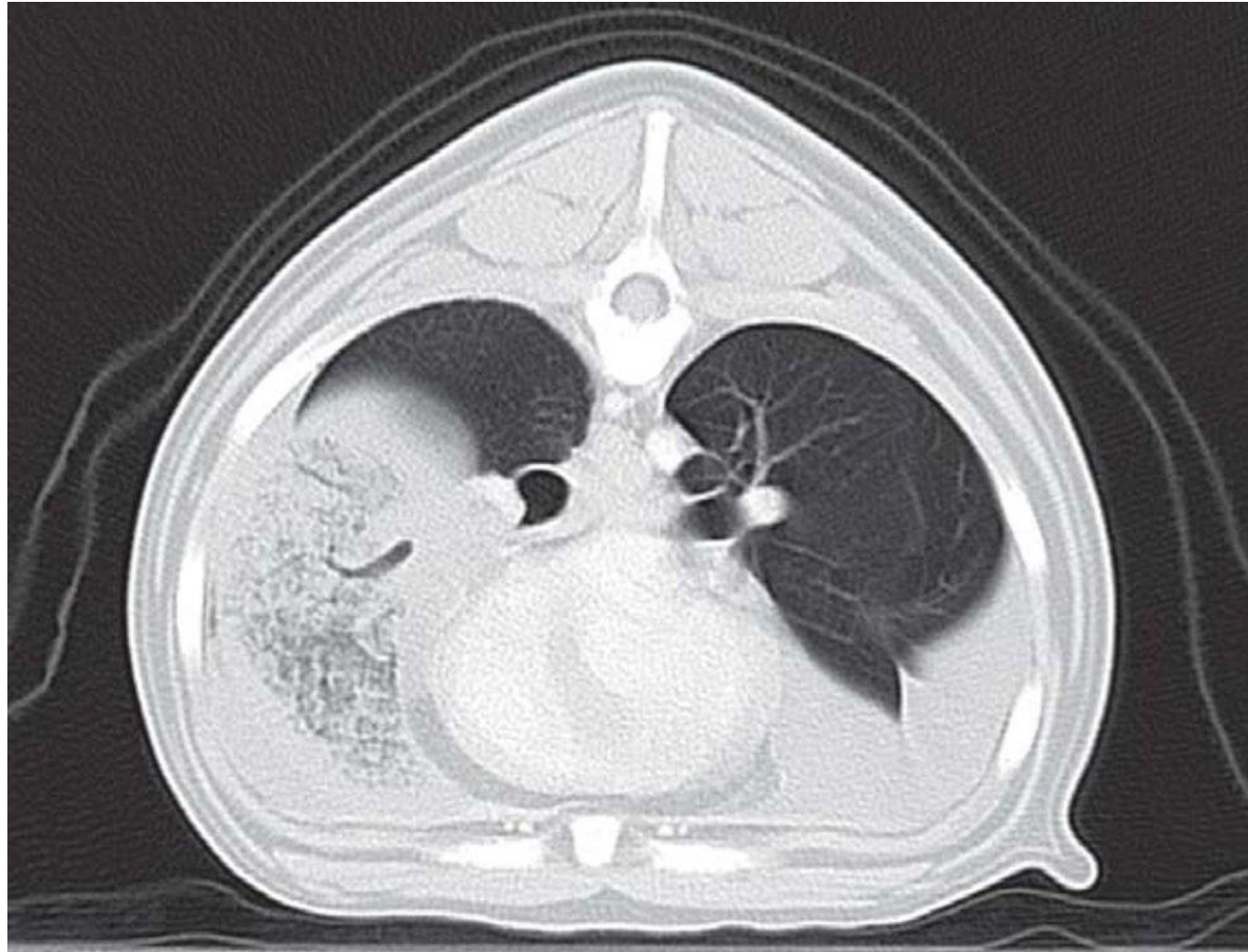




Pug

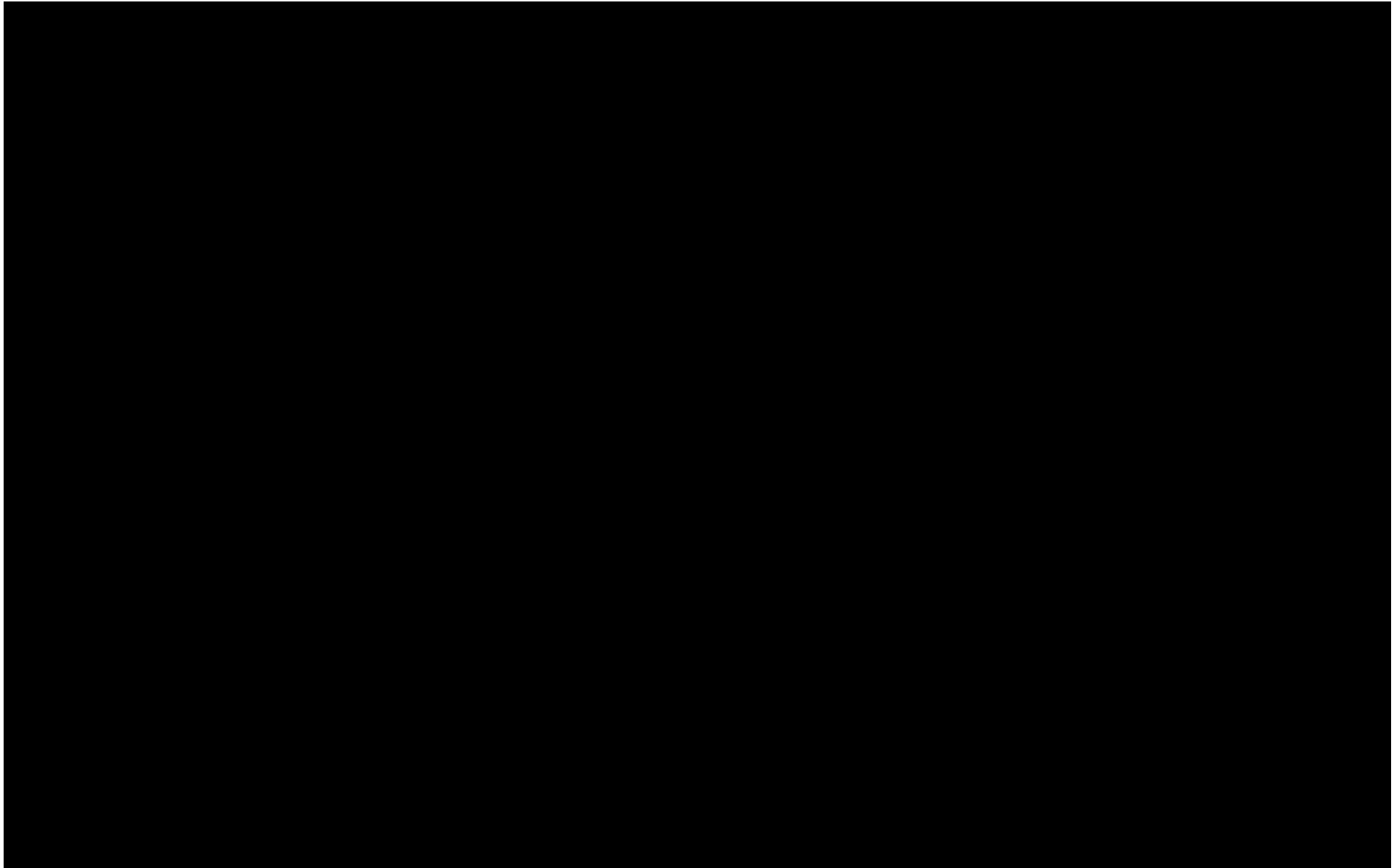


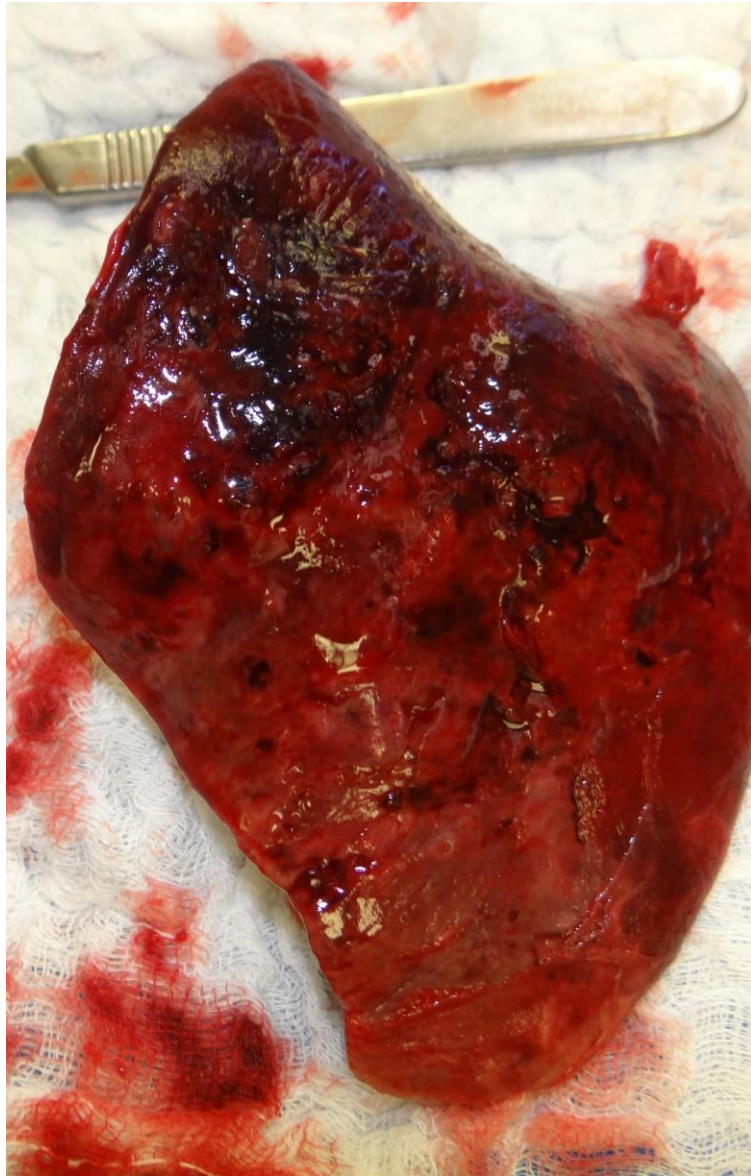
CT Scan



Latimer, *Clin Brief* 2015

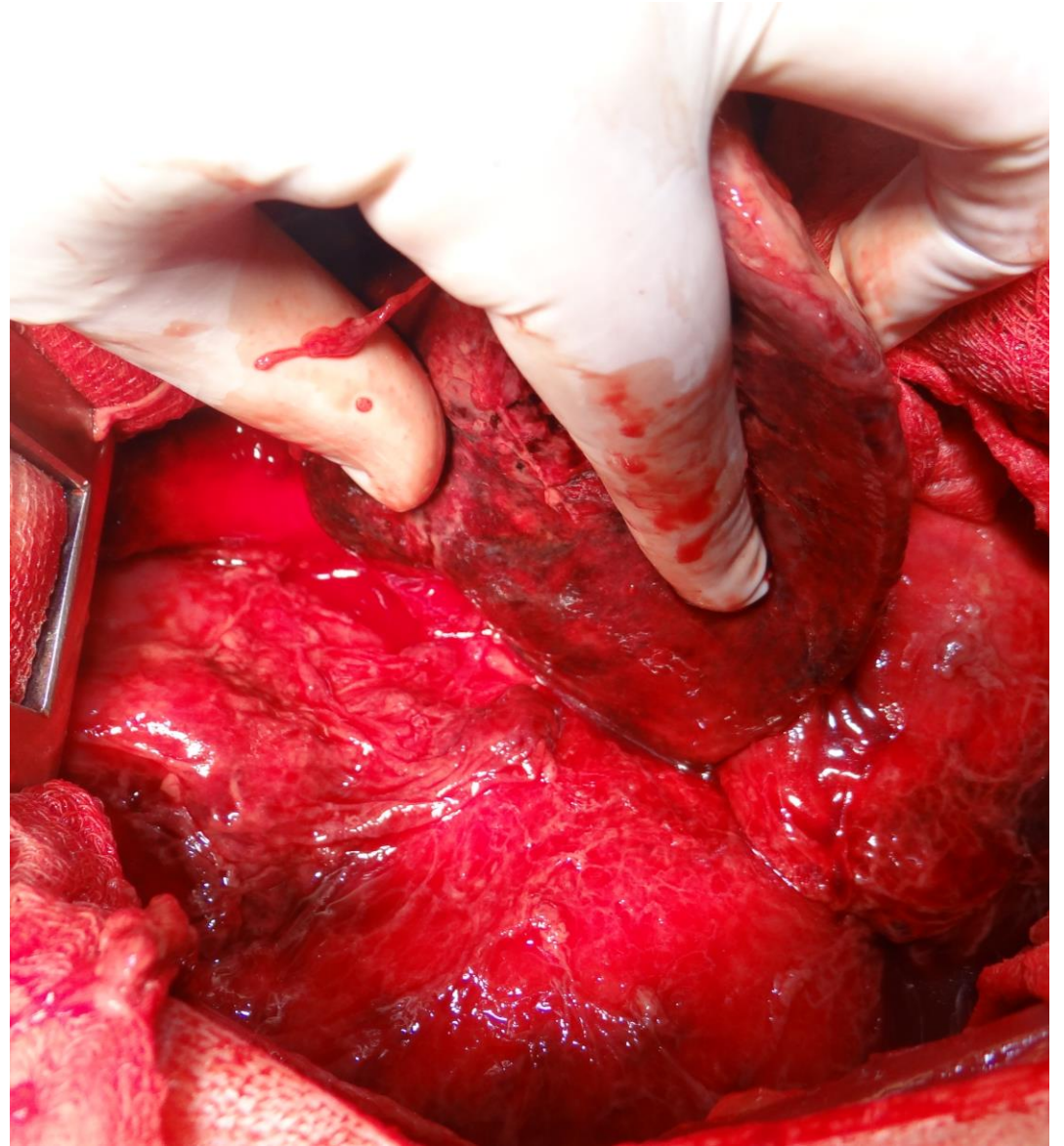
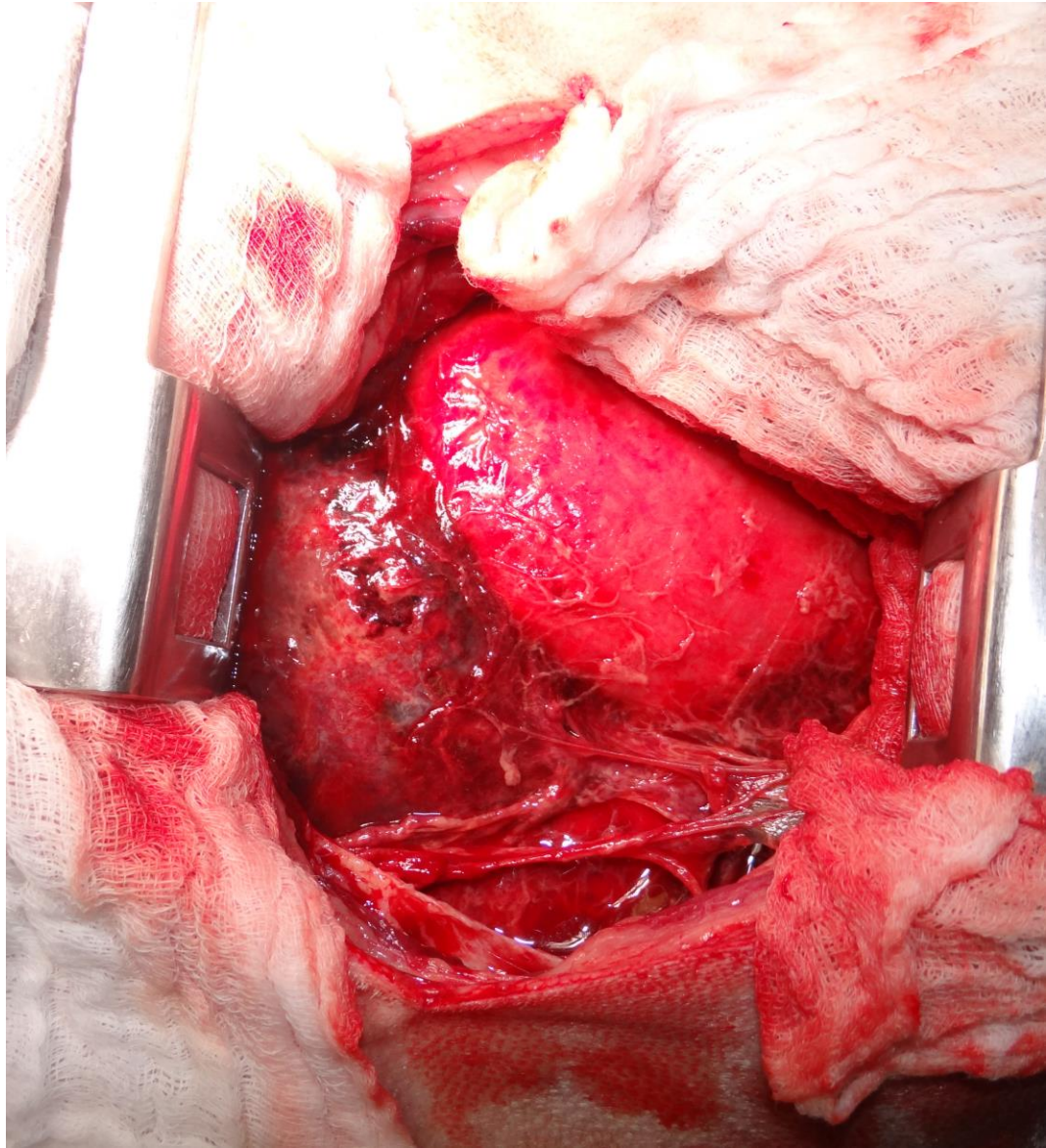
CT





Treatment

- Emergency management and stabilization
- Thoracocentesis to remove pleural effusion or air (pneumothorax)
- Surgical resection of the affected lung lobe ** treatment of choice in small animals
 - Derotation - discouraged in small animals due to the potential for ischemia–reperfusion injury
 - LLT → damage of the pulmonary parenchyma - usually too advanced at the time of presentation
 - Placement of a thoracostomy tube -for removal of air and fluid during the postoperative period



Prognosis

- Neath, JAVMA 2000:
 - 22 dogs – 15 deep chested, 5 toy breeds
 - 6 presented with chylothorax
 - 21 had surgery, 11 survived
 - 10 died within 2 wks -2 mos of various thoracic problems
 - 2 developed chylothorax postop
- Murphy, JAVMA 2006:
 - 7 Pugs
 - All survived

Prognosis (General Rules)

LLT (idiopathic or secondary to thoracic trauma): fair to guarded

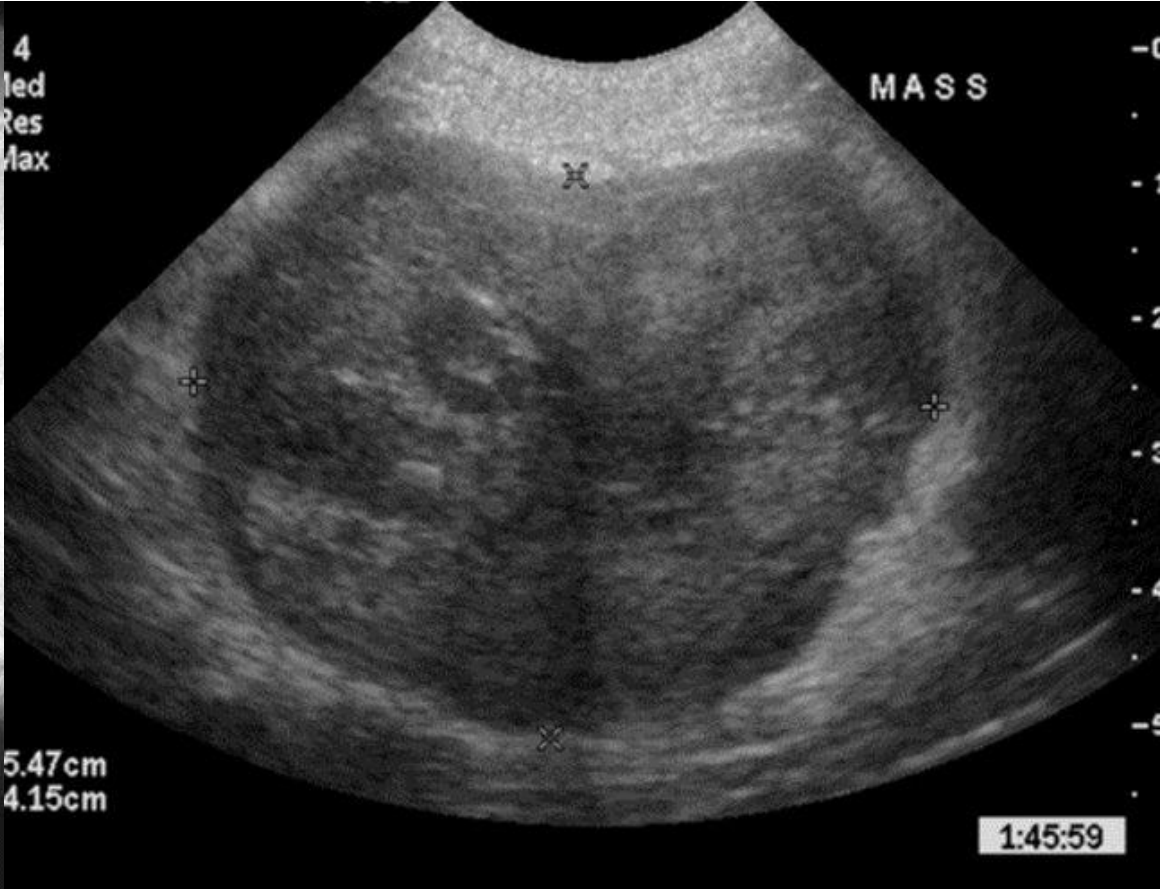
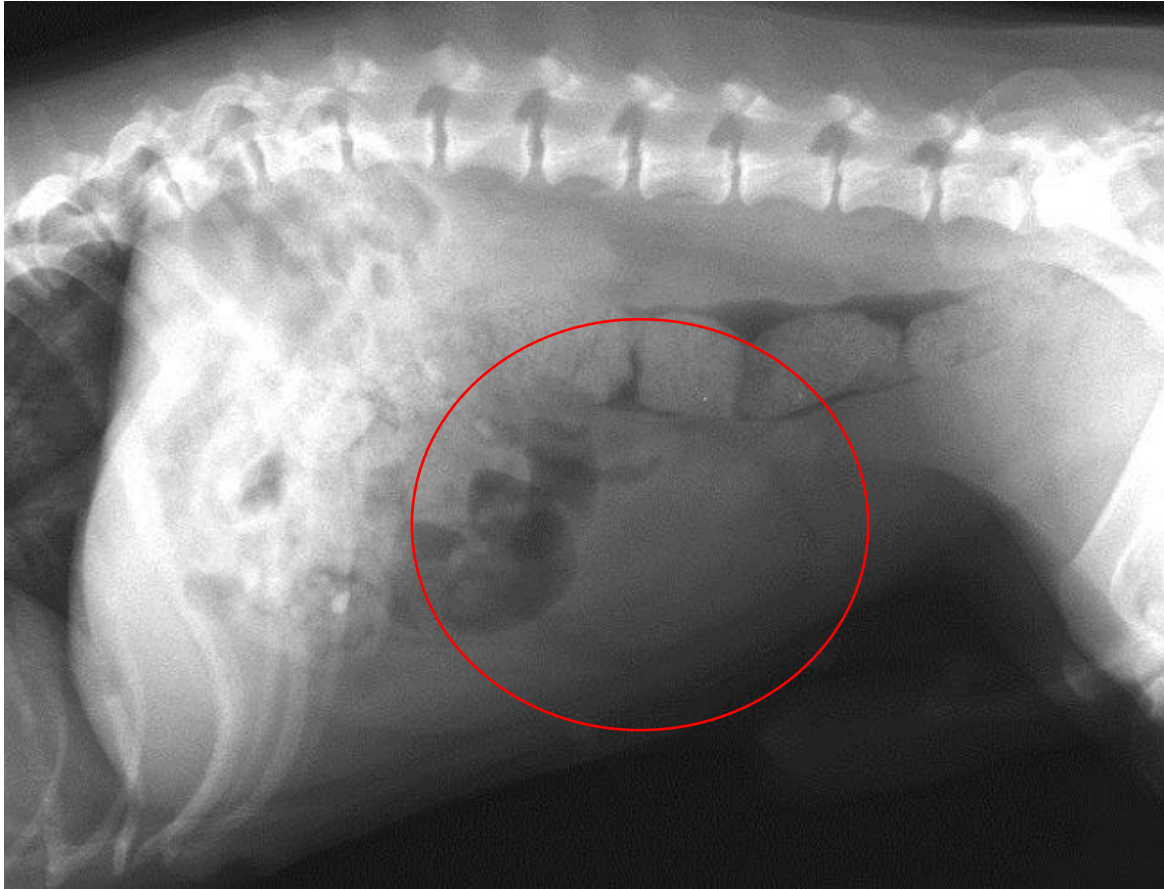
LLT (associated with chylothorax):
poor

LLT (identifiable underlying cause):
depends on the underlying condition

Testicular Torsion

- Rare
- Cancerous testicles (Sertoli) predisposed
- Usually abdominal testicles. But not always.
- Non specific signs or signs of severe acute abdomen
- Enlarged testicle on imaging +/- evidence of gas

Imaging





SURGERY

Conclusion

Prompt
Stabilization &
Diagnosis

Owner discussion

Removal is
attempted
without
derotation

Questions

