



 **VET**
STRATEGY

01



- *Tips and Tricks of Intestinal FB*

🕒 8am – 9:30am

- Diagnostic imaging
- Intestinal Surgery
- Complications and management

02



- *Pitfalls of GDV*

🕒 10am – 10:40am

- Pitfall on X rays
- Pitfall in Surgery

03



- *Splenic Tumor Essentials*

🕒 10:40 am – 11:15 am

- Types of tumor on Imaging
- Splenectomy 101

04



- *Q and A*

🕒 *11:15 am – 11:30*

Thank you!

 **OVET**
STRATEGY



Koji Aoki

DVM, MVS

Diplomate American College of Veterinary Surgeons



- Born and raised in Japan
- Internships in USA
 - UC Davis, Michigan State, U of Minnesota
- Surgical Residency
 - University of Saskatchewan
- Surgery Faculty
- WAVES
 - West Coast Animal Veterinary Emergency Specialty Hospital
 - Langford

Koji Aoki

DVM, MVS

Diplomate American College of Veterinary Surgeons



3D Print for Limb Correction

Alexandra Frey Belotta

DVM, MS, PhD

Diplomate American College of Veterinary Radiologist

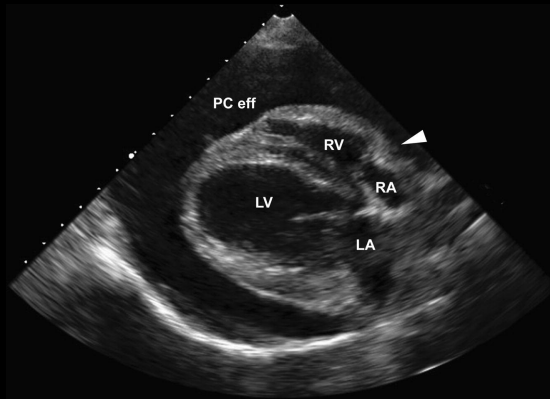
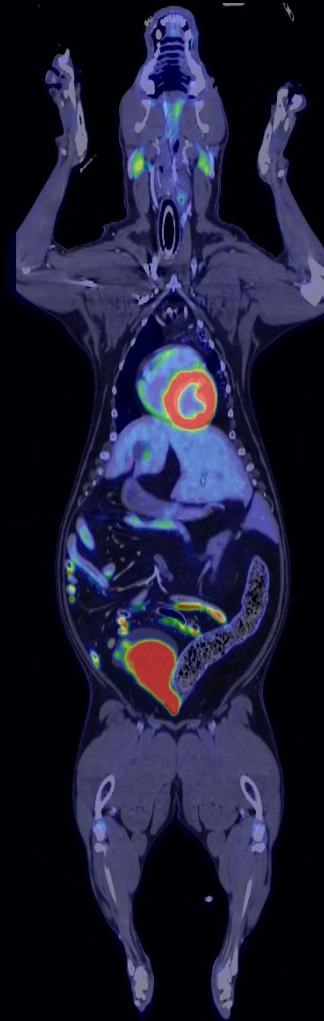
- Born and raised in Brazil
- Radiology Residency + PhD
 - In Brazil
- Internships and Radiology Residency
 - University of Saskatchewan
- Diagnostic imaging Faculty
- WAVES
 - West Coast Animal Veterinary Emergency Specialty Hospital
 - Langford



Alexandra Frey Belotta

DVM, MS, PhD

Diplomate American College of Veterinary Radiologist



WAVES in Langford



01



- *Tips and Tricks of Intestinal FB*

🕒 8am – 9:30am

- Diagnostic imaging
- Intestinal Surgery
- Complications and management

Is this a GI foreign body obstruction?

4YO, C, M, Mixed breed – Acute episodes of vomiting



How about this?

5YO, C, M, Mixed breed – Previous vomiting. Still nauseous after medical management.

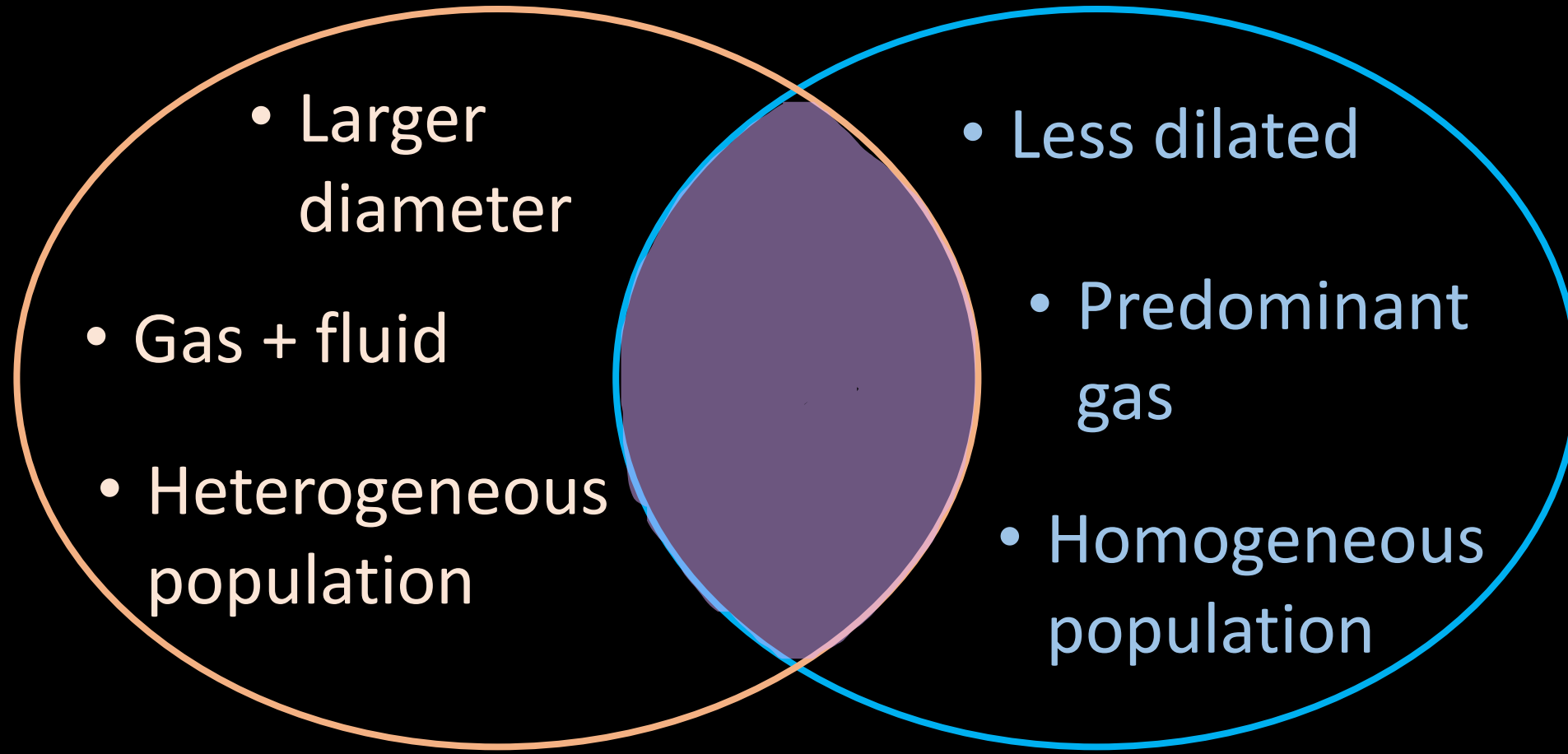


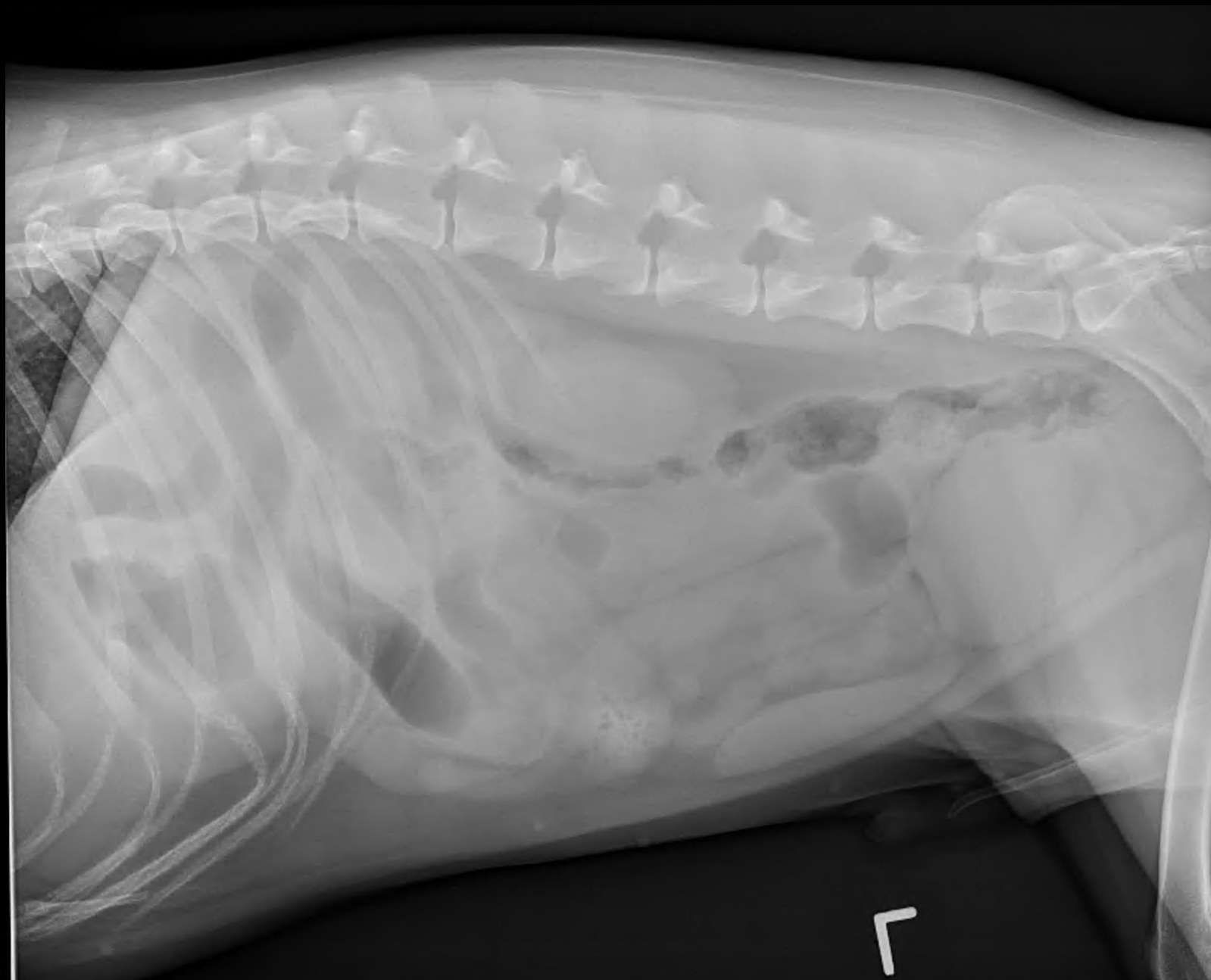
How about this?



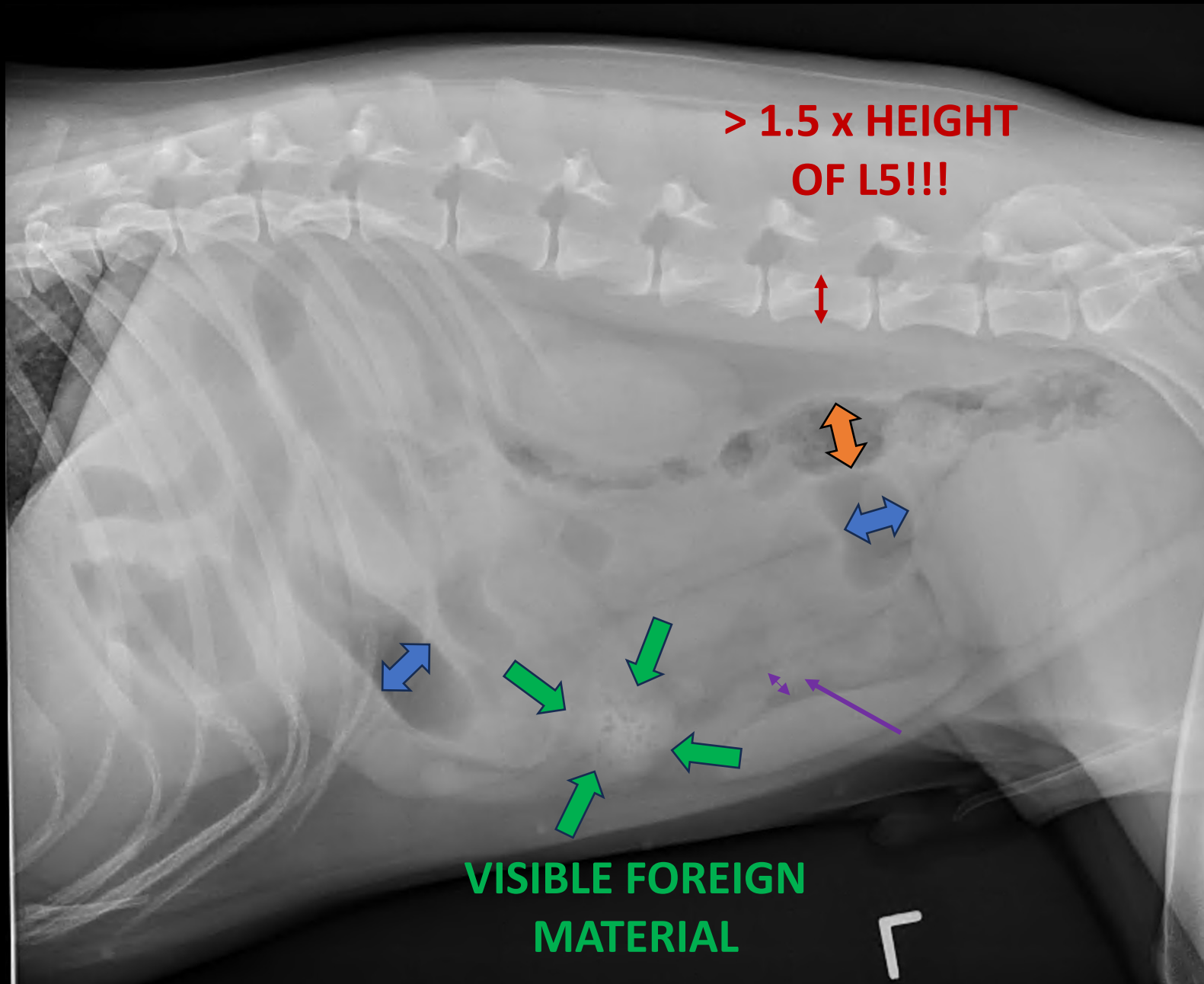
Mechanical obstruction

Functional ileus





Classic GI foreign body mechanical obstruction

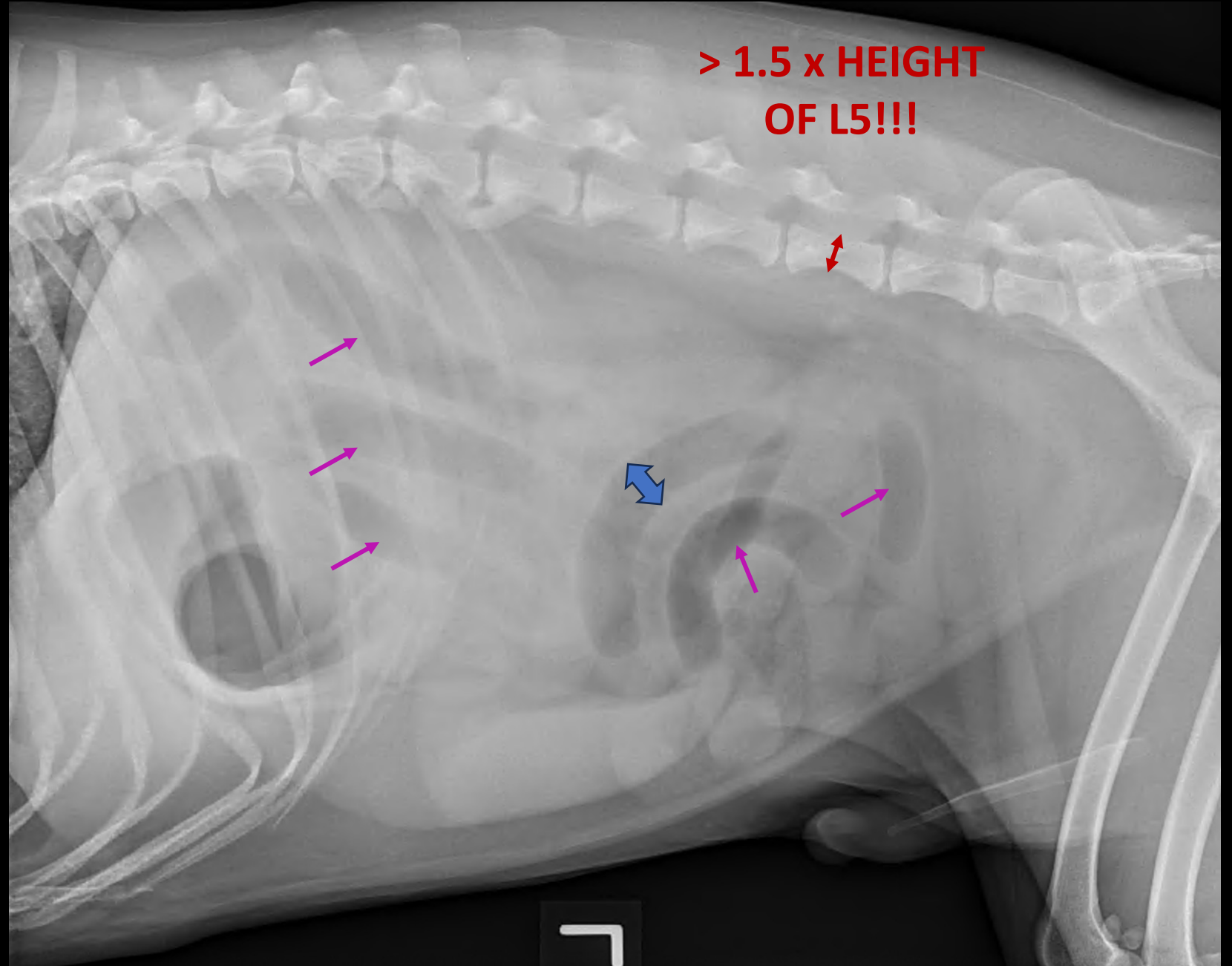


- Moderate dilation of small intestine
- Heterogeneous population
- Visible foreign material

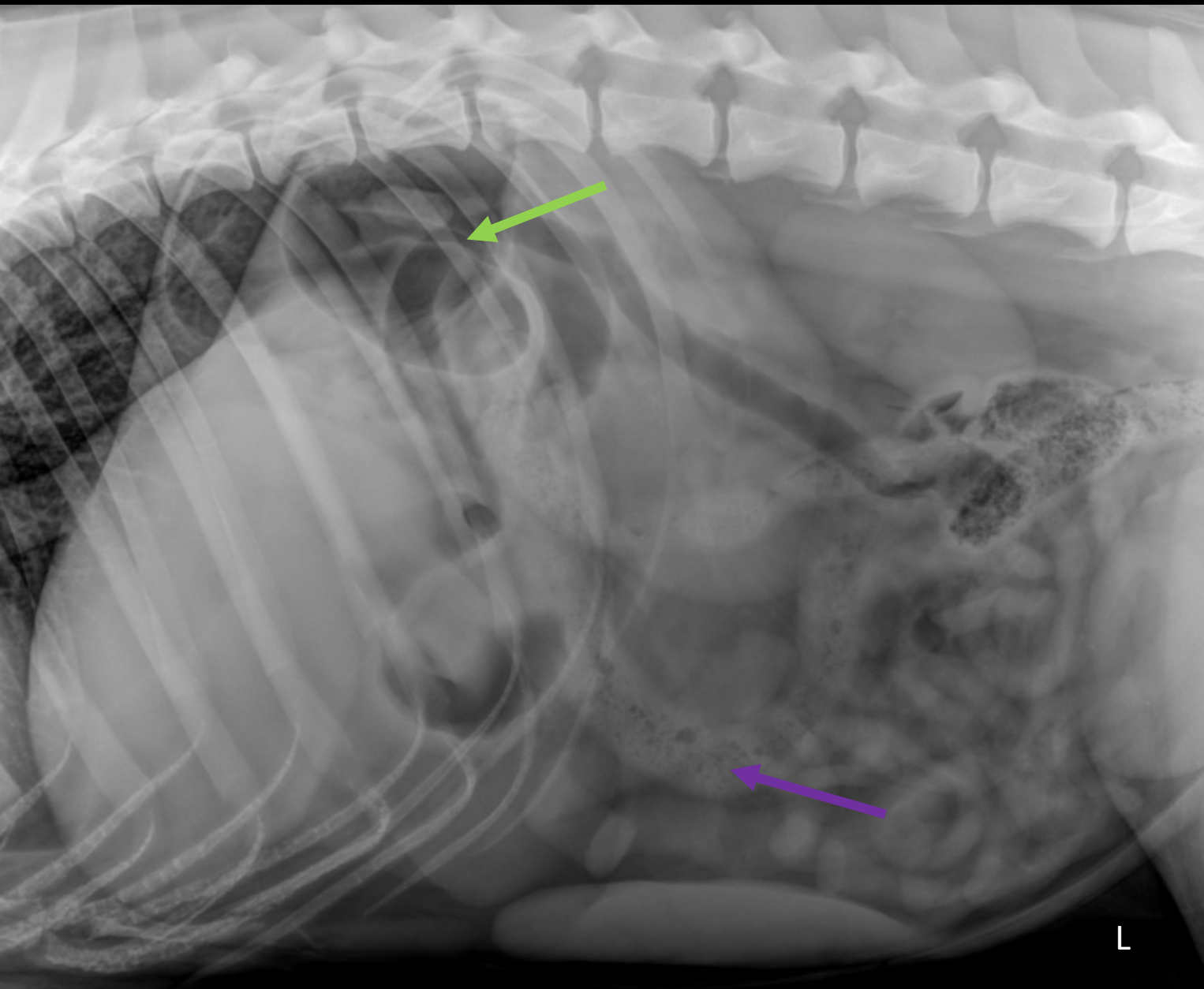


Functional ileus

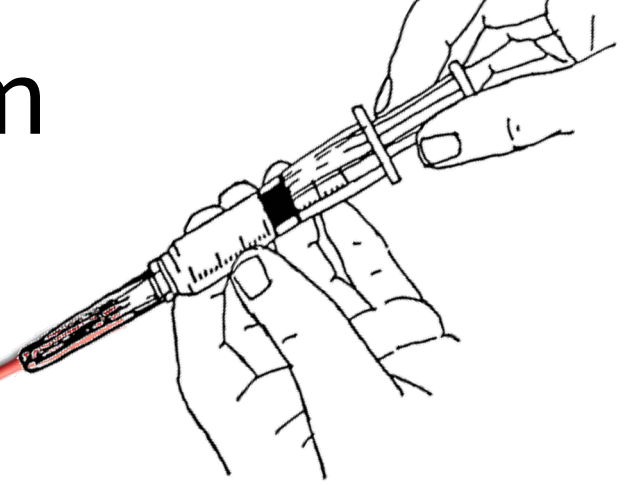
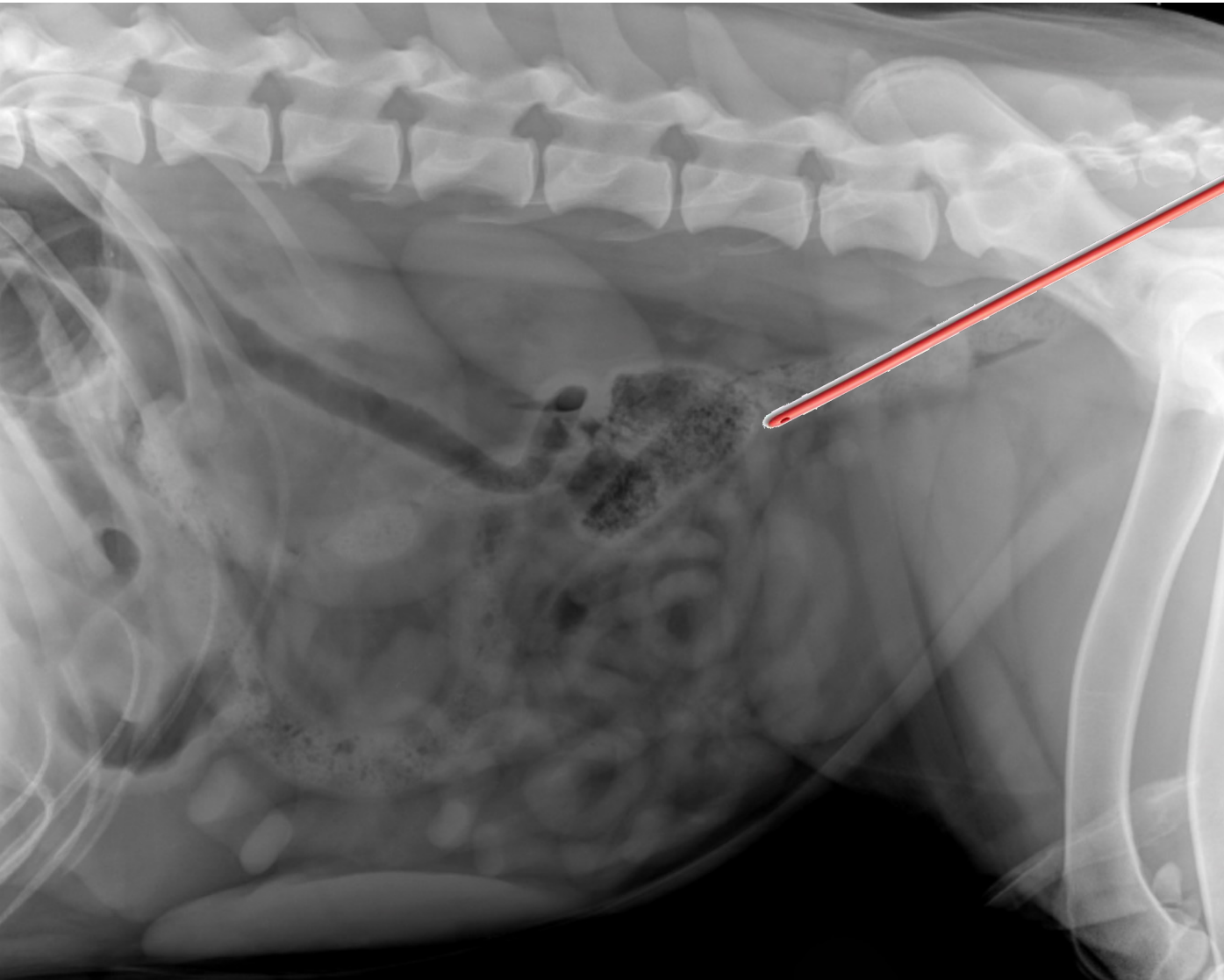
- Moderate dilation
- Homogeneous population
- No obvious FB



Is this colon or dilated small intestine?



Pneumocolonogram



ROOM AIR - DOSE:

DOG: 1-3 mL/kg

CAT: 20-30 mL

Is this colon or dilated small intestine?



SURVEY RADIOGRAPH

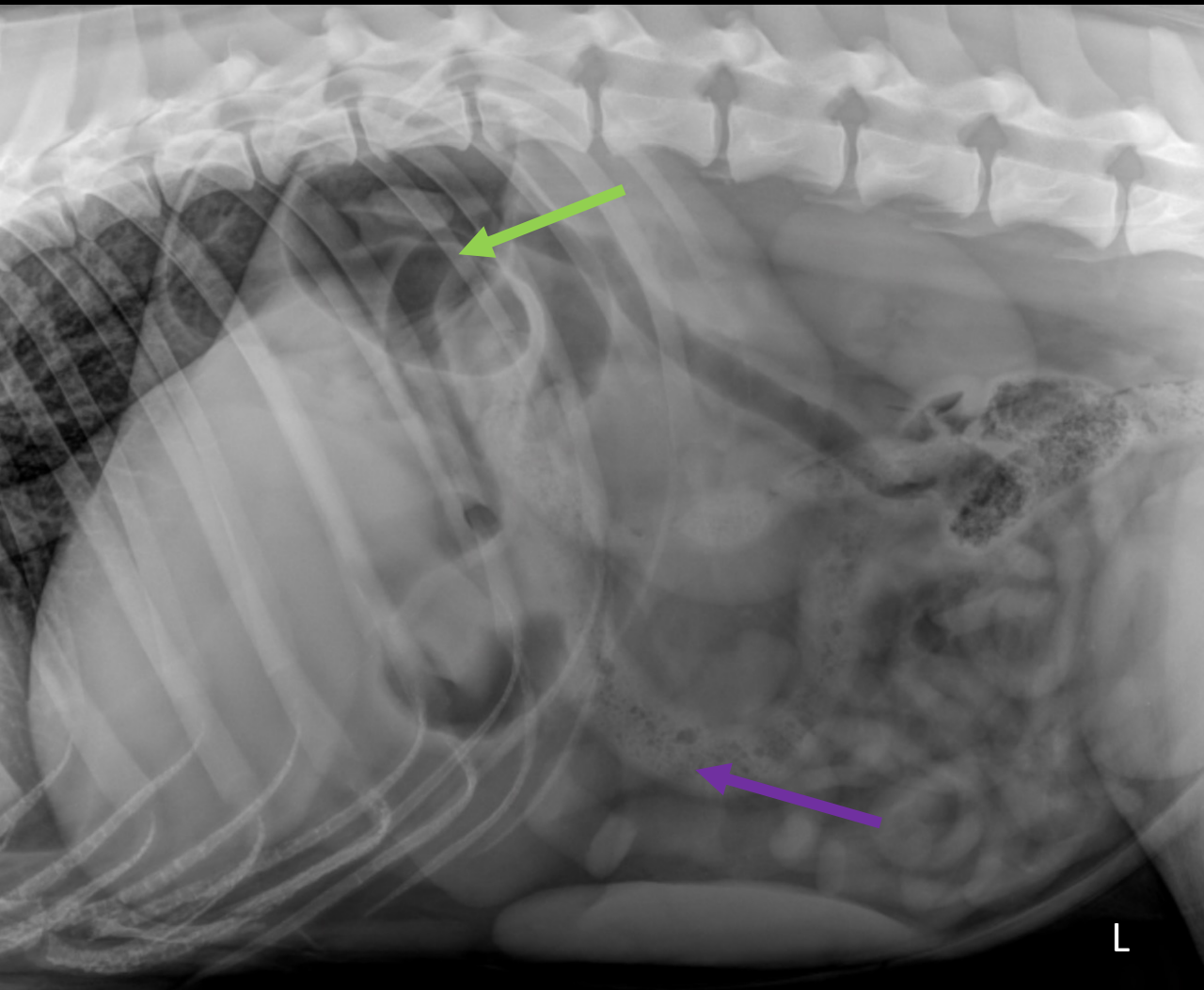
L

PNEUMOCOLONOGRAPH

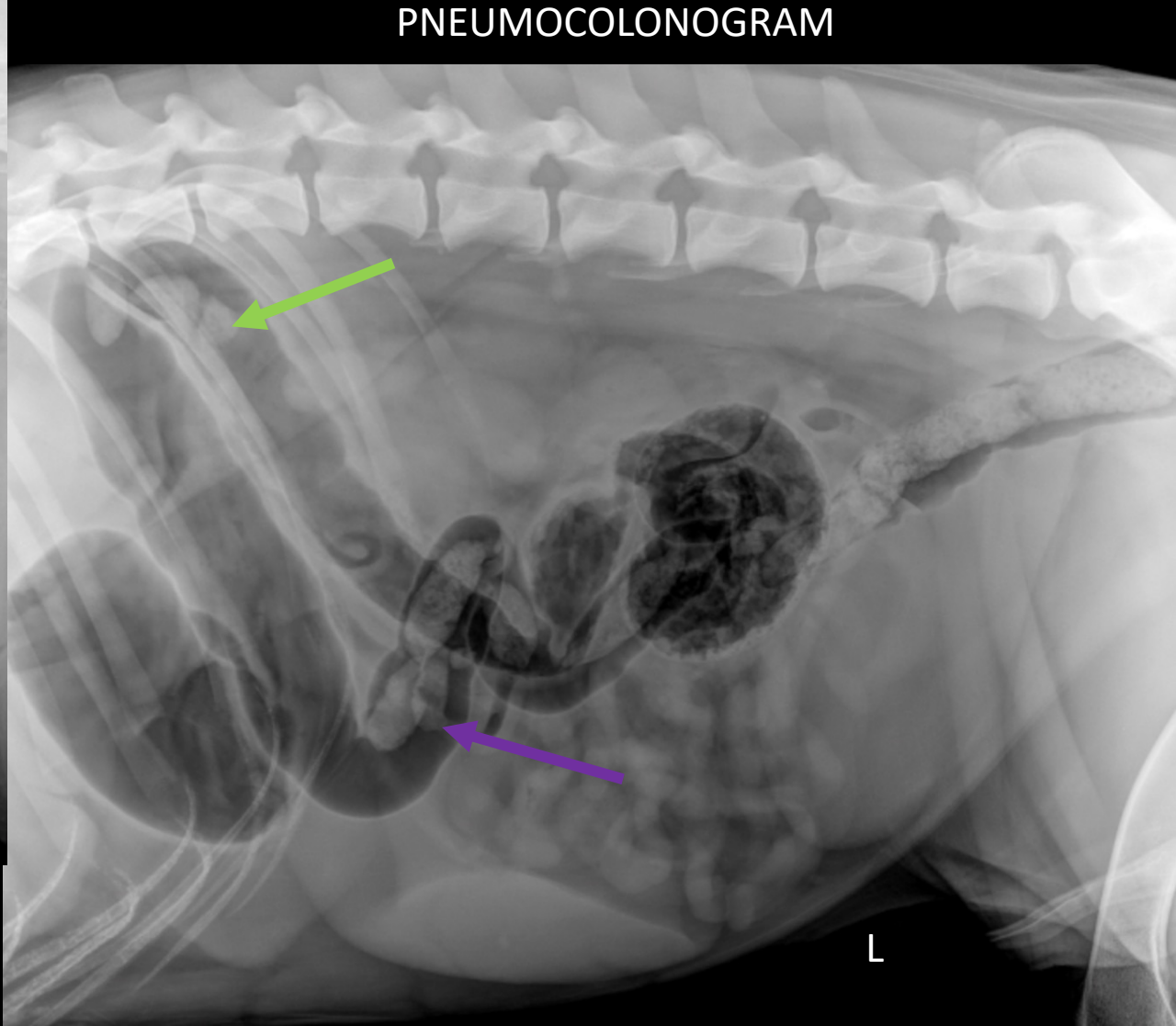


L

Is this colon or dilated small intestine?



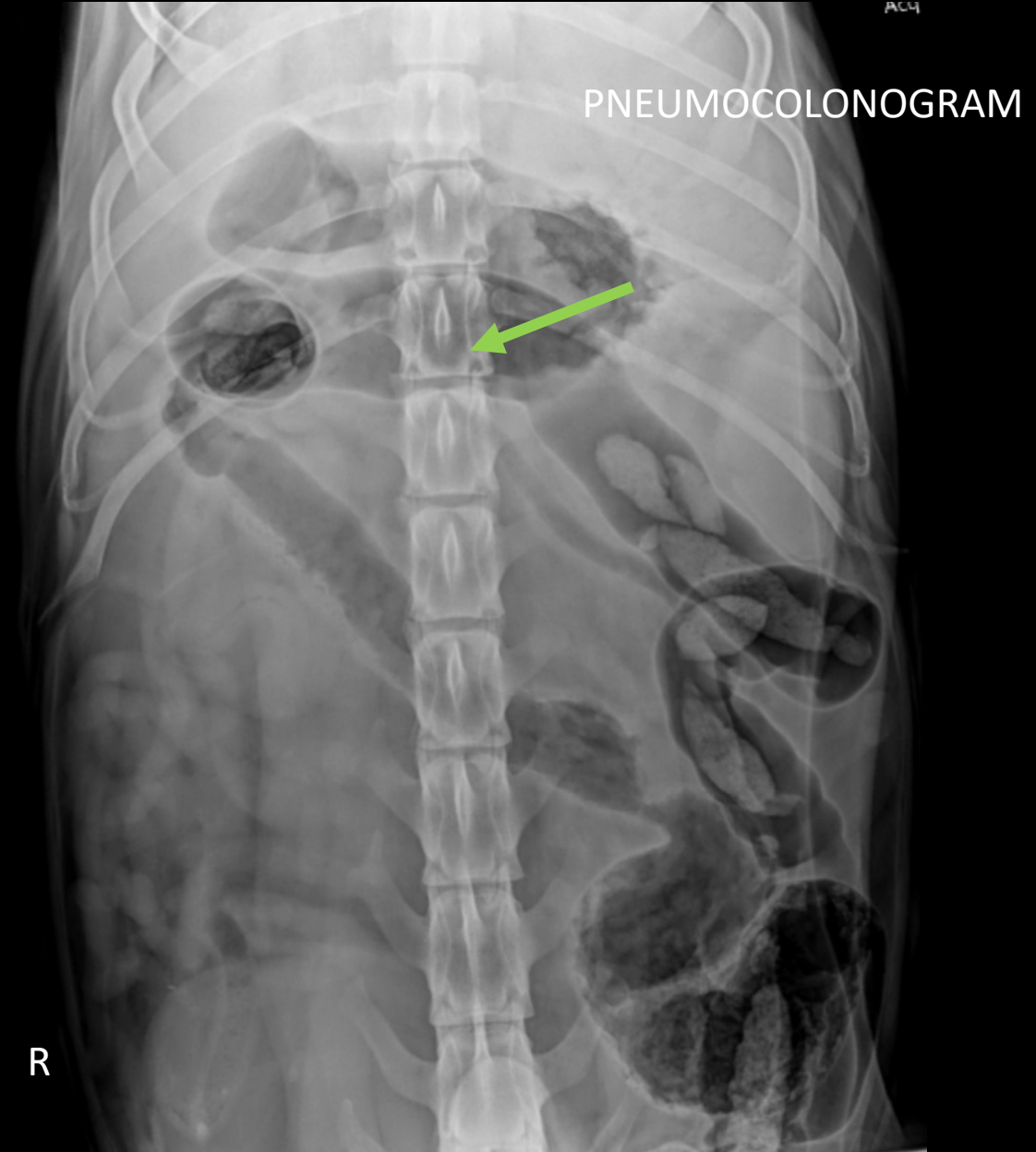
SURVEY RADIOGRAPH



Is this colon or dilated small intestine?



Is this colon or dilated small intestine?



The great mimickers

FALSE POSITIVE

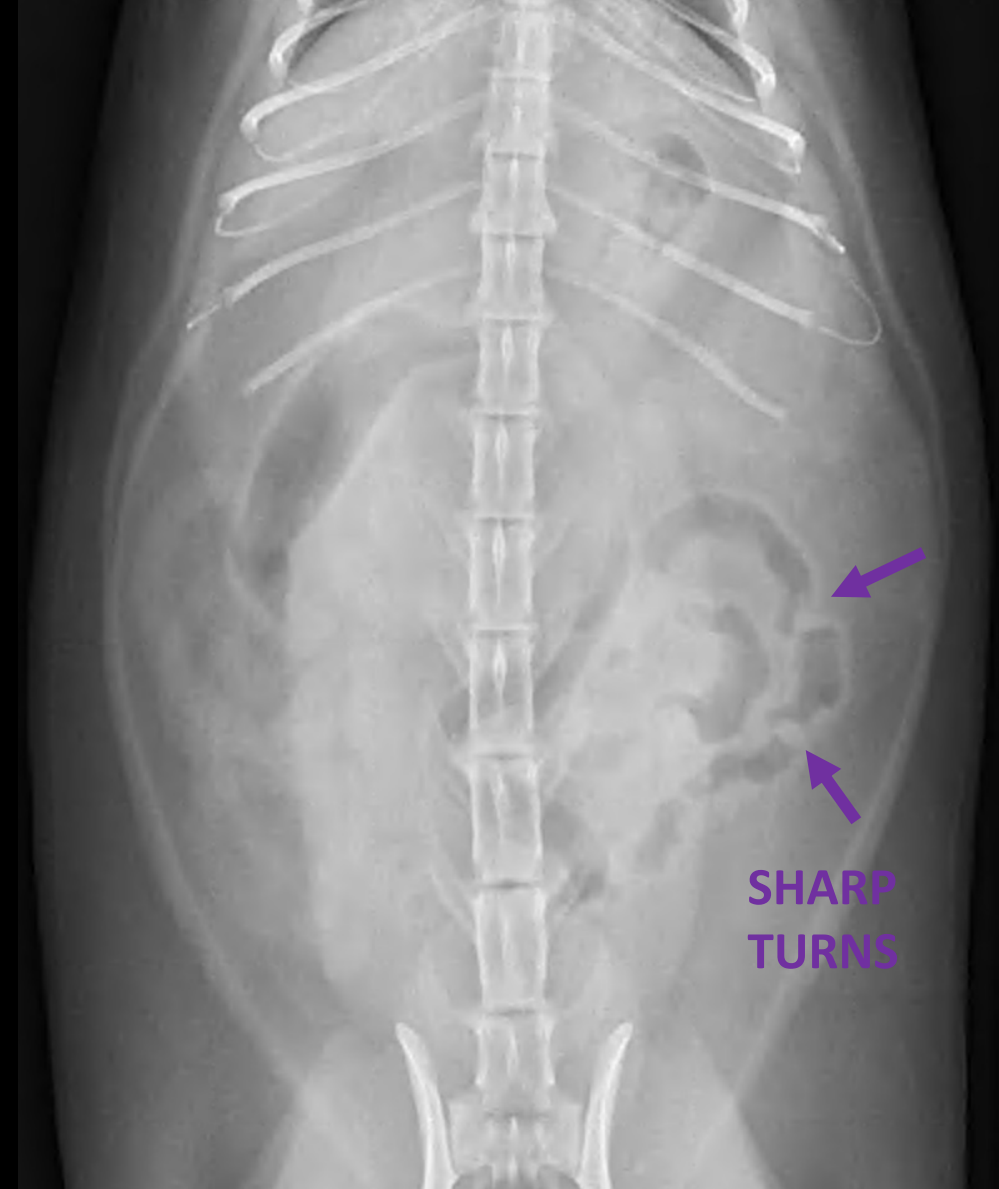
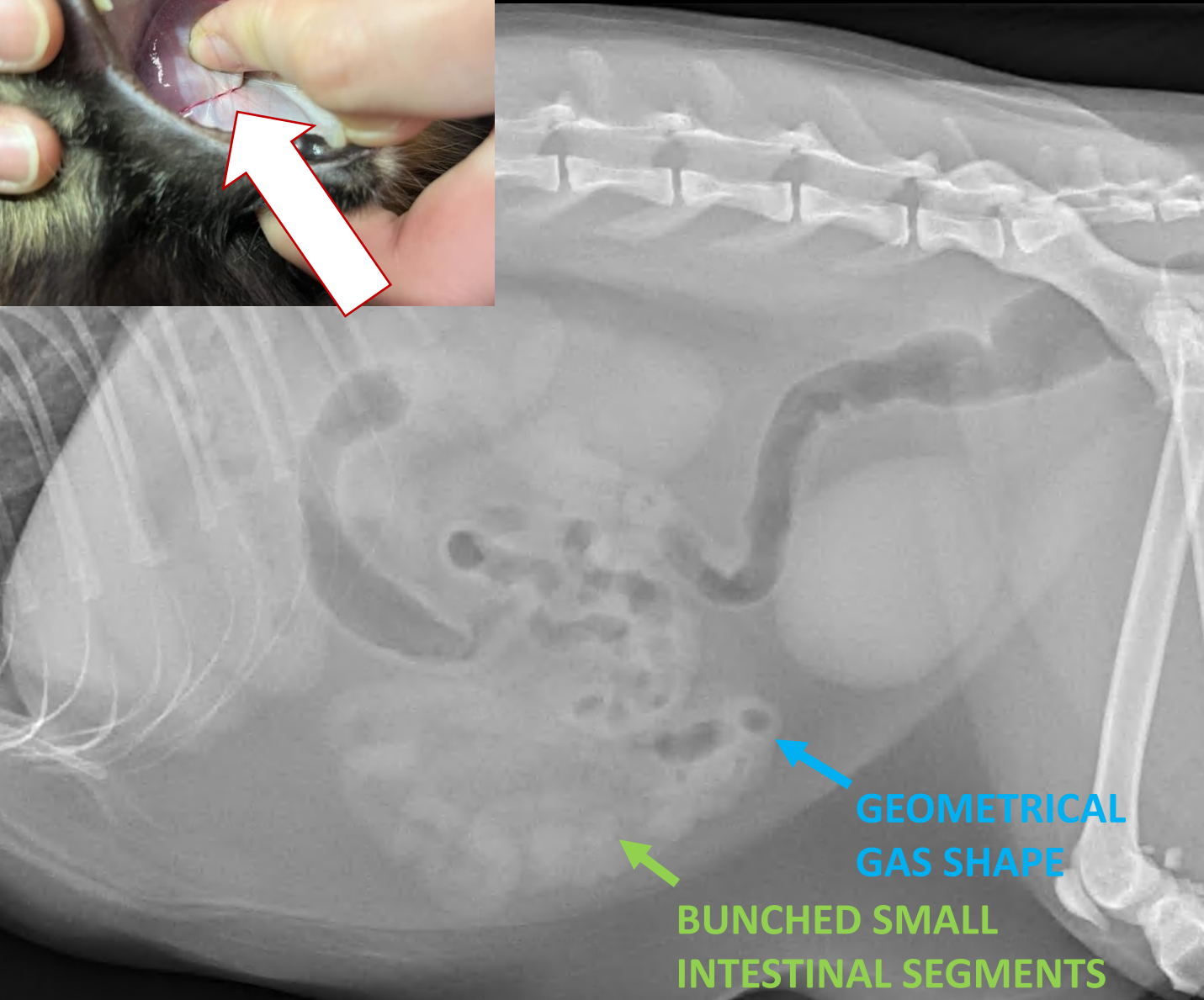
- Functional ileus
- Colonic redundancy

The great mimickers

FALSE POSITIVE

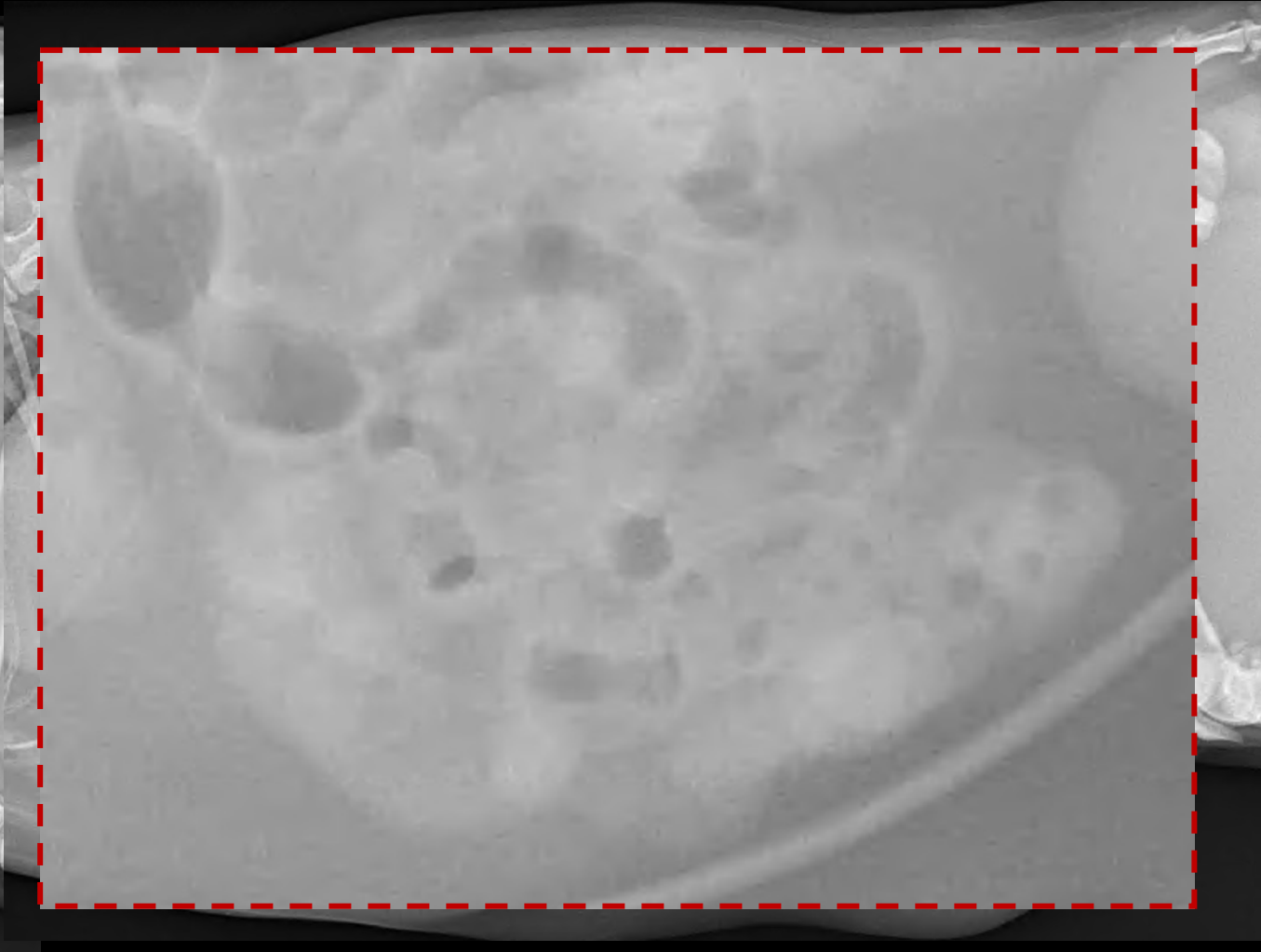
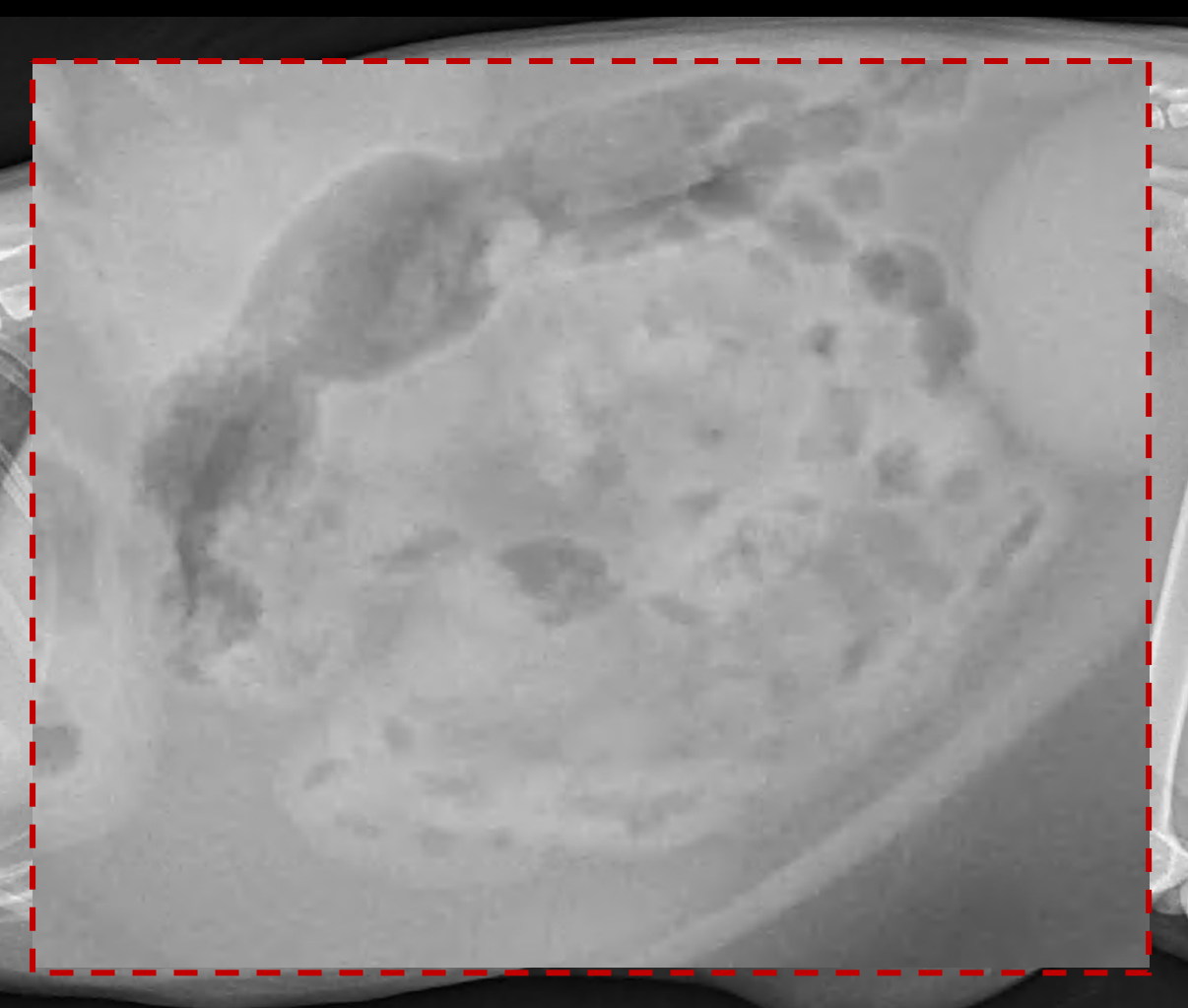
- Functional ileus
- Colonic redundancy
- Previous FB surgery and adhesions

Linear FB



Intestinal adhesions from
previous surgery

Linear FB



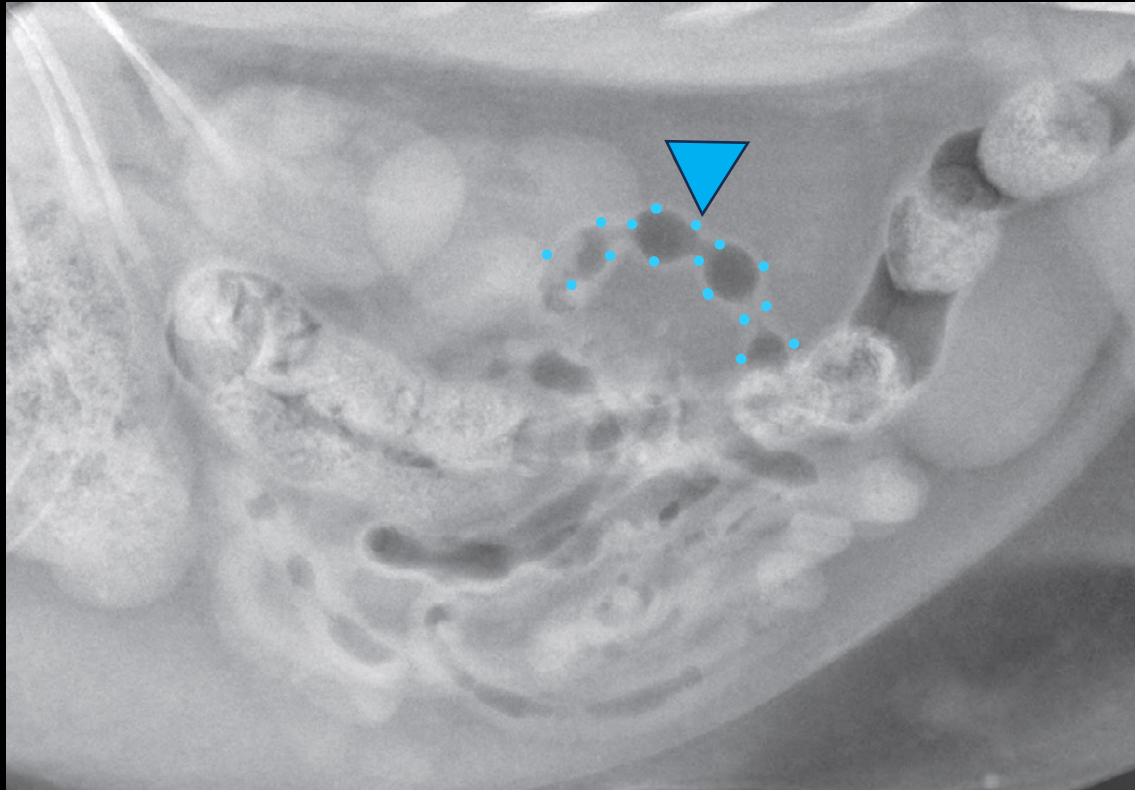
HARD TO DISTINGUISH BETWEEN WITH RADIOGRAPHS!!!

The great mimickers

FALSE POSITIVE

- Functional ileus
- Colonic redundancy
- Previous FB surgery and adhesions
- “String of pearls” in cats

“String of pearls”
(normal peristalsis in cats)



Thrall D & Robertson I (2023)

Linear FB



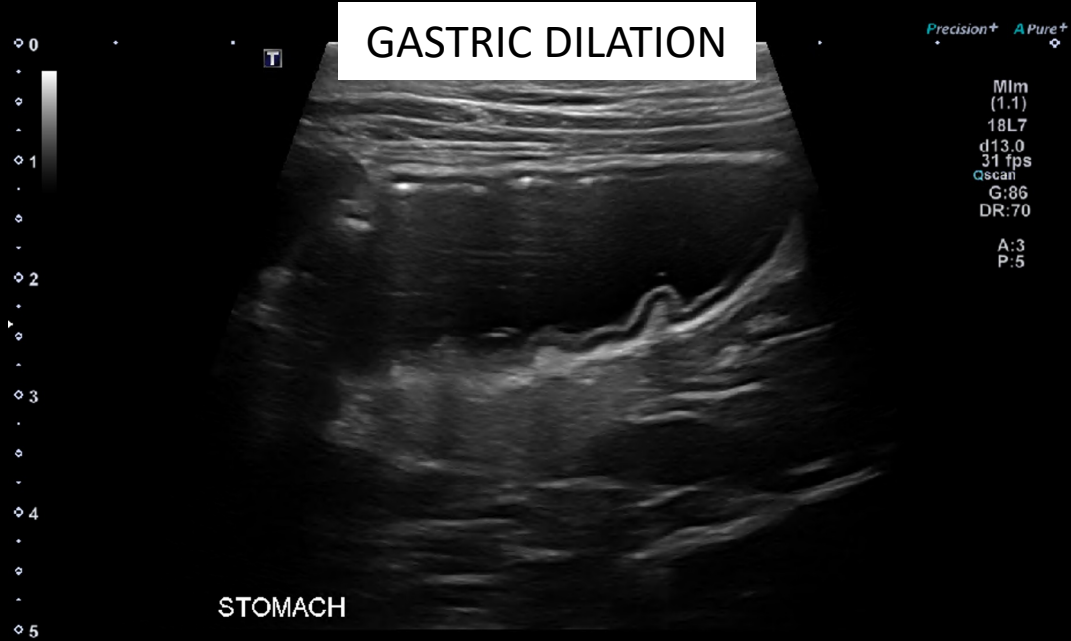
The great mimickers

FALSE NEGATIVE

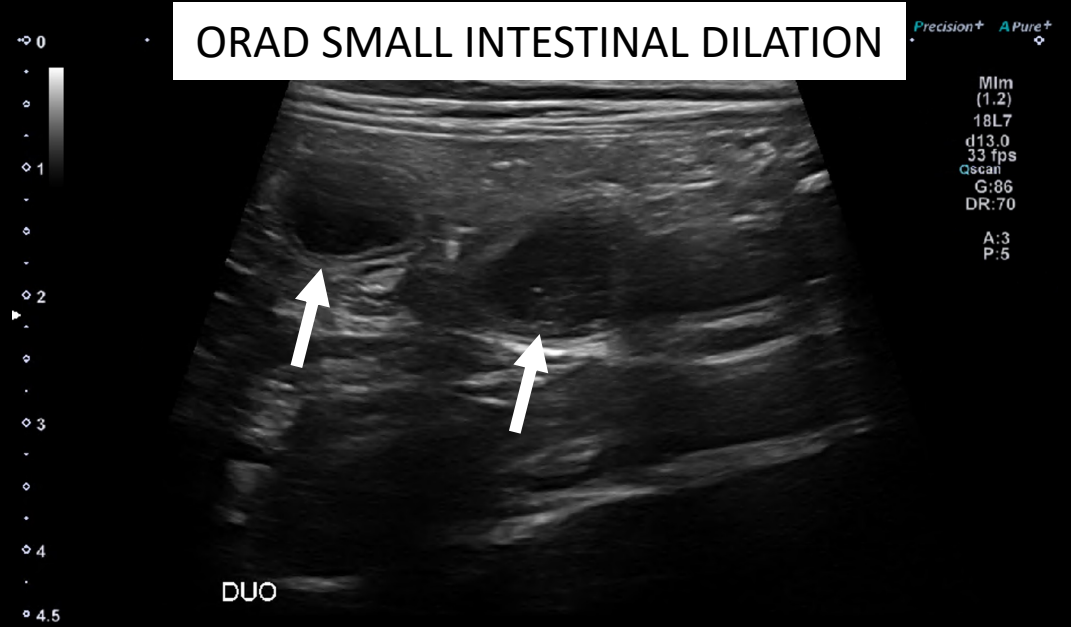
- Distal SI mechanical obstruction
- Non-obstructive or partially obstructive FB lodged in the walls

Ultrasound

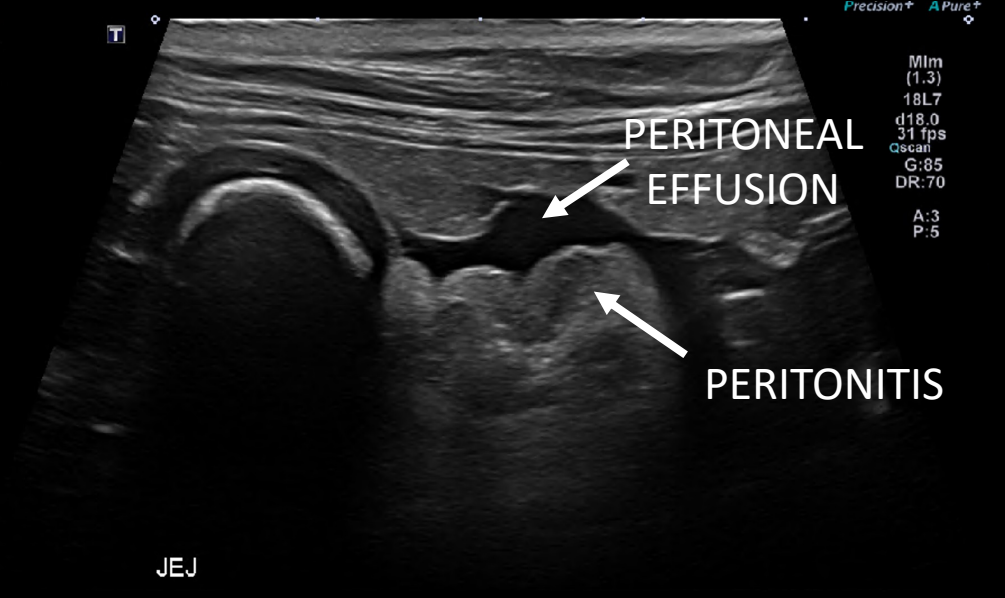
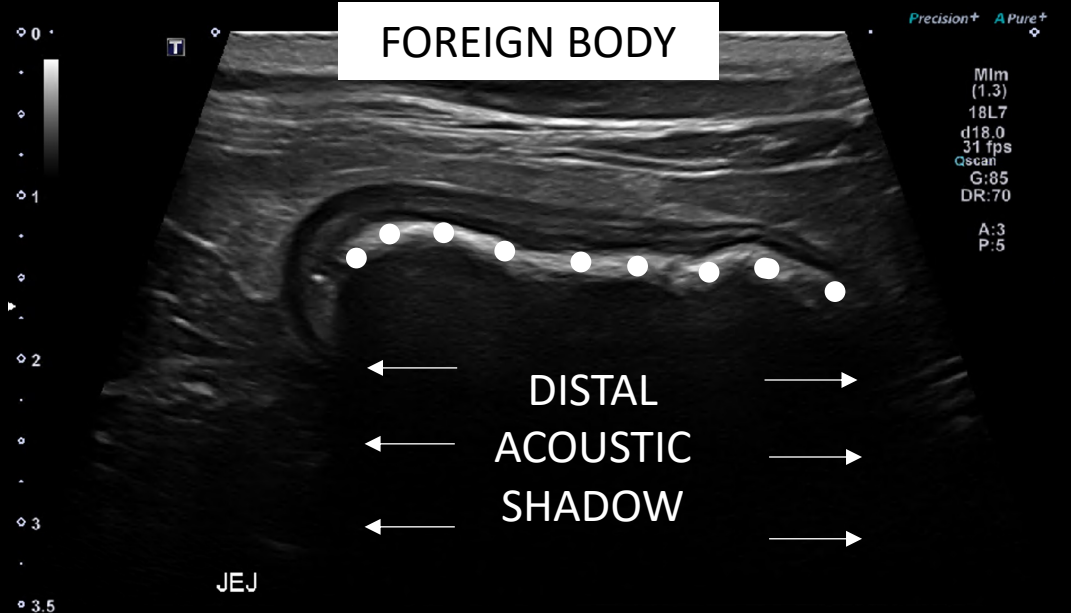
GASTRIC DILATION



ORAD SMALL INTESTINAL DILATION



FOREIGN BODY



T

MIm
1.3

18L7

d18.0

31 fps

Qscan

G:85

DR:70

A:3

P:5

JEJ

T

MIm
1.0

18L7

d13.0
29 fps

Qscan

G:92

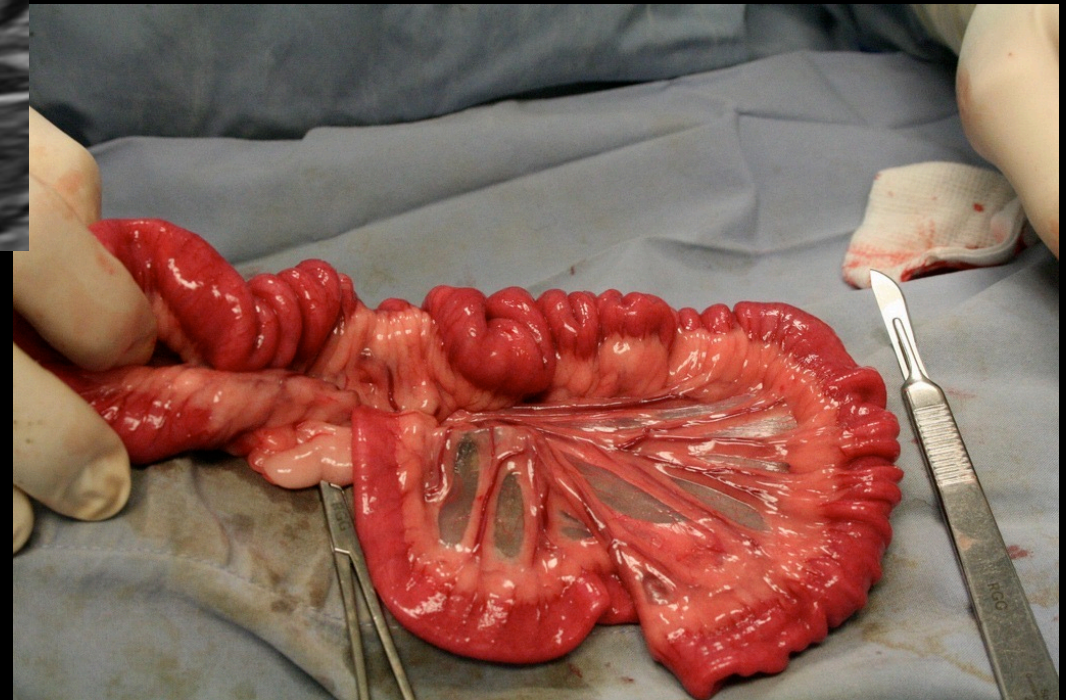
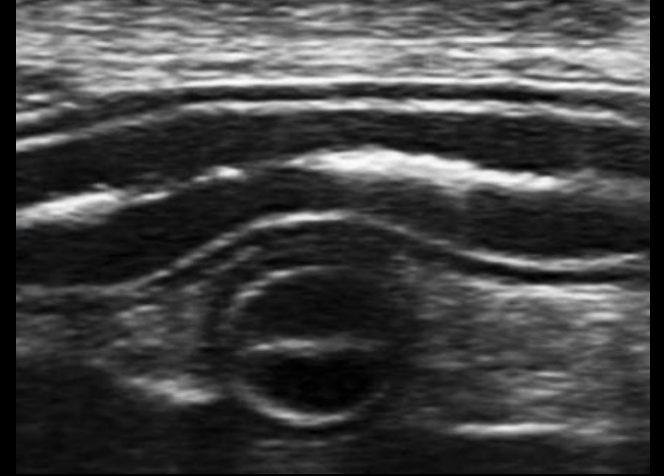
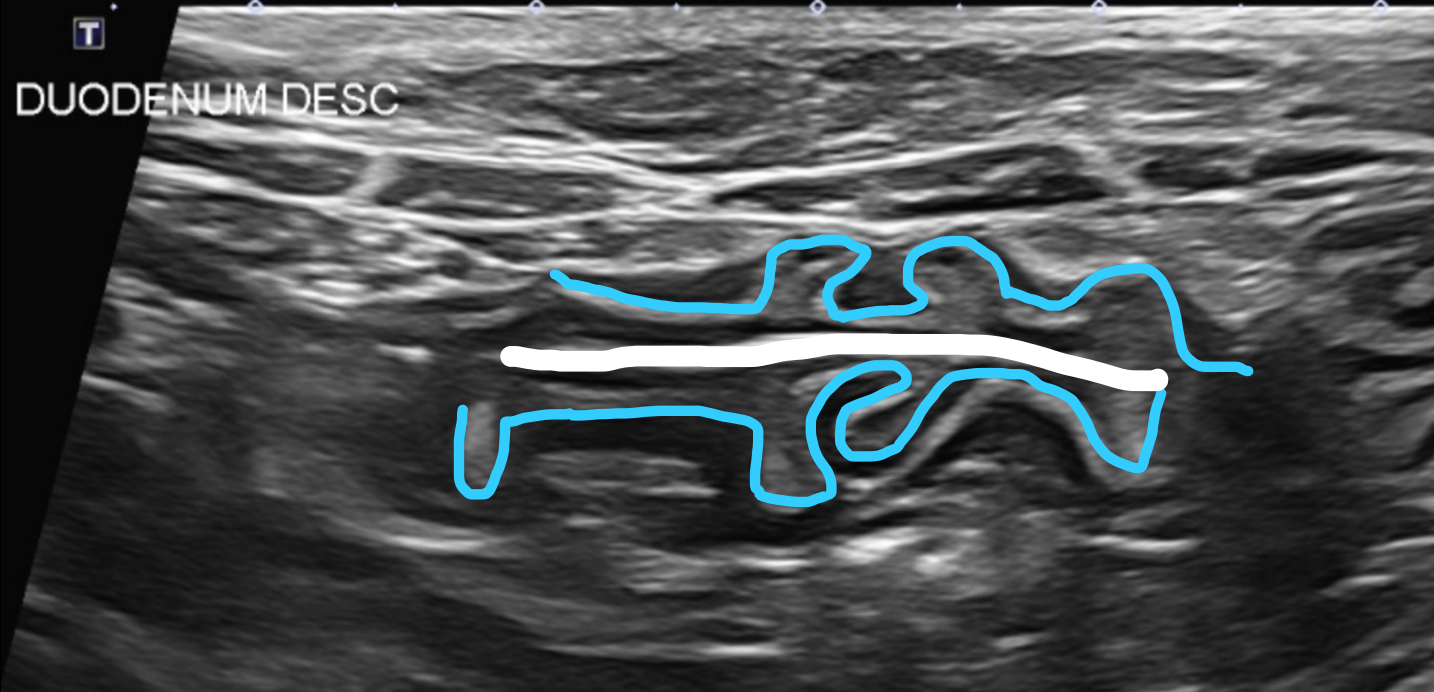
DR:70

A:3

P:5

STOMACH

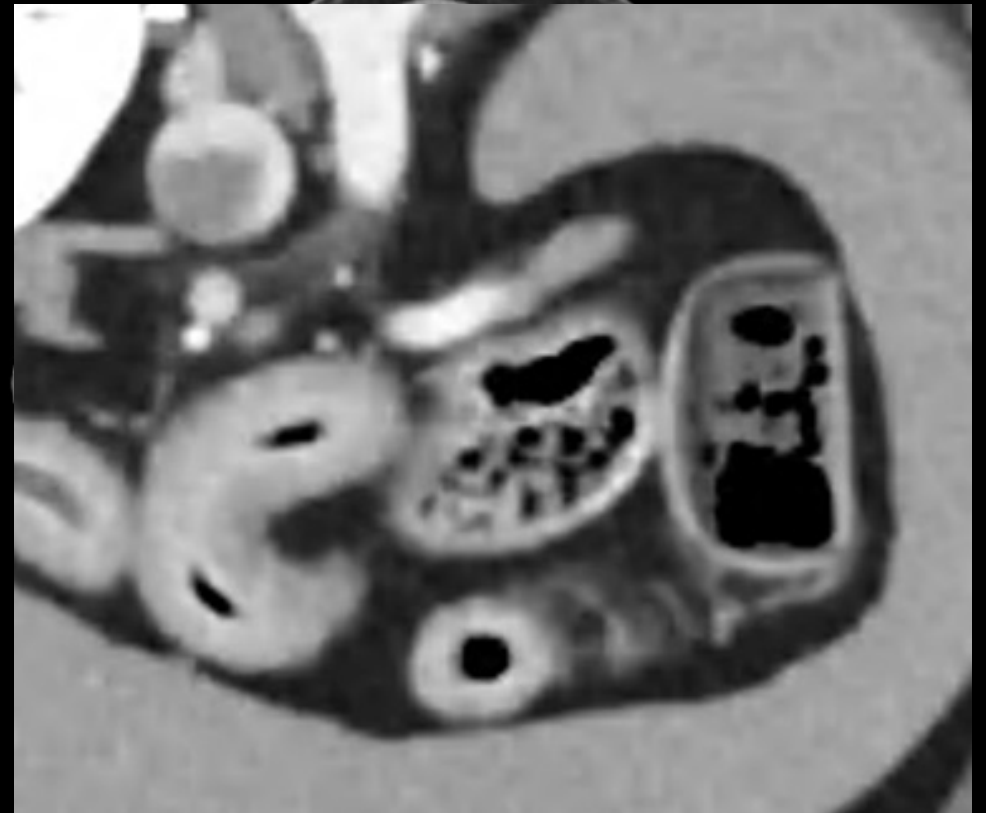
Ultrasound



Computed tomography

Indications:

- Large breed, deep-chested dogs
- Small intestinal segments cannot be traced
- Improved characterization of non-obstructive FBs



Just so you know....

- No magic
 - Stick to basics
 - Same with residency
- Can Make Difference
 - Small things = improve outcome
 - Some residents = Higher complication rate



Before Surgery

!?

- Prepare for worst case scenario
 - Surgery is all about planning
 - No surprise wanted



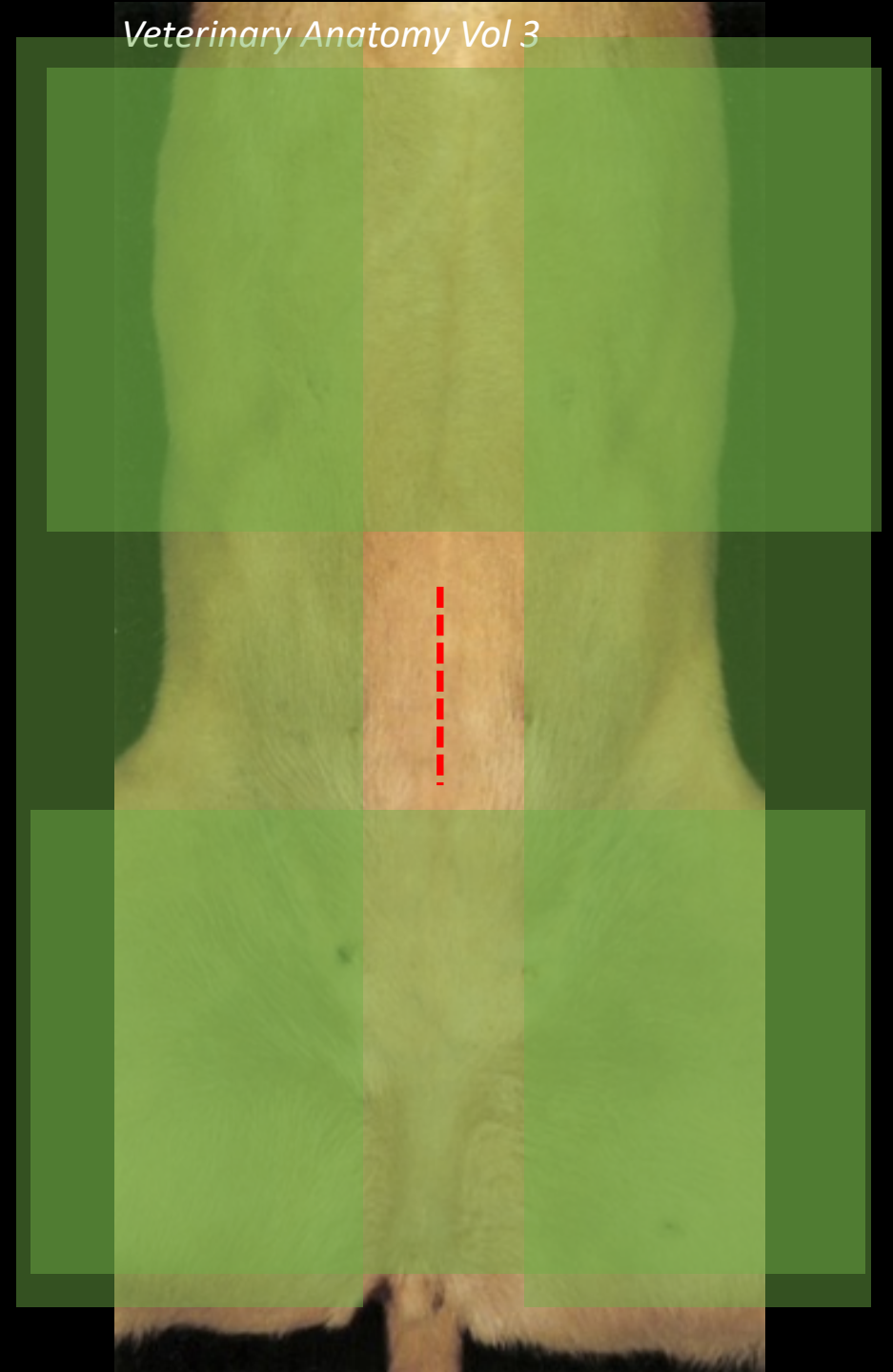
Before Surgery

- **Regurgitation**
 - After premed
 - Risk of aspiration pneumonia
- **Solution**
 - Placement of NG tube
 - Communication with anesthesiologist



Before Surgery

- Clipping and draping wide
 - Finding unexpected
 - Bladder stones
 - Liver nodules
 - Splenic mass



Male Dog

Xyphoid

Penis



Abdominal surgery

- **First step**

- Good explore the abdomen
 - = check all organs
 - Regardless of conditions
- Chance of missing things
 - Jejunal FB? Nothing in stomach?
 - Adhesion on GI tract
 - Splenic tumor



Principle of GI surgery

- Minimal contamination
- Gentle tissue handling
- Rule of 4
- Preservation of blood supply
- Controlled suture tightness

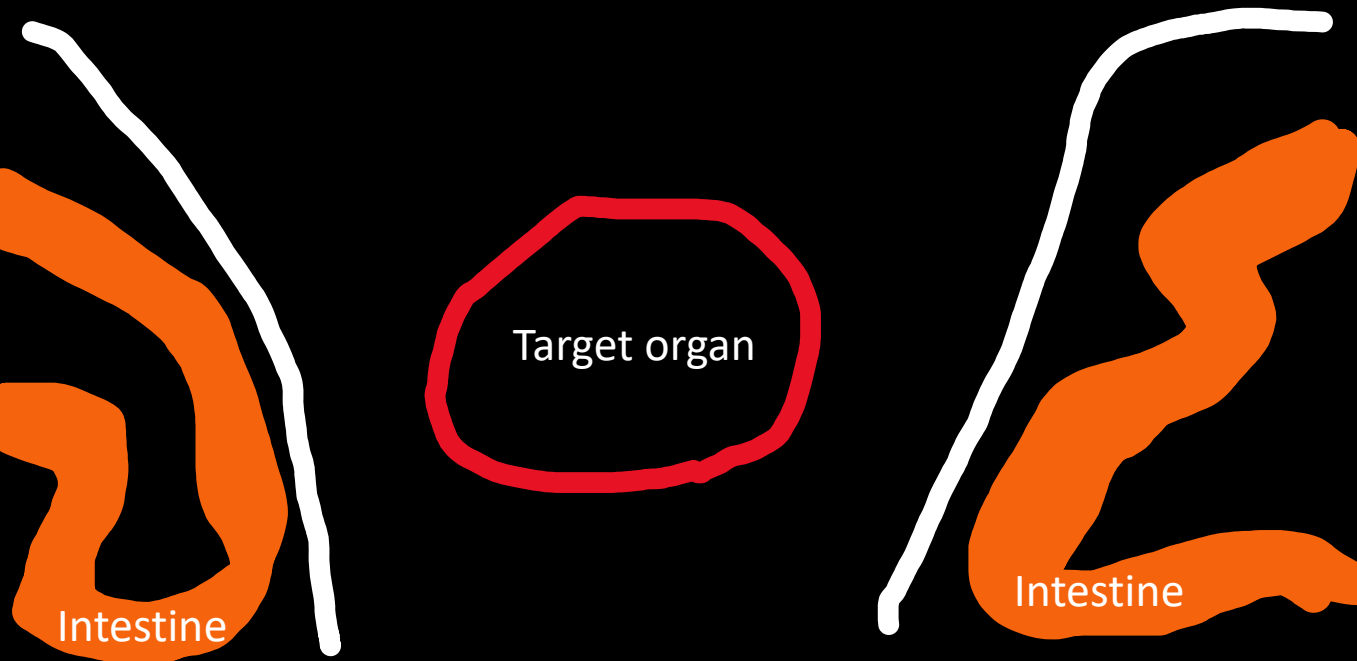
Minimal Contamination

- Isolation of the surgical site
 - Laparotomy sponges
 - Useful to push other organs away



Minimal Contamination

- Isolation of the surgical site
 - Laparotomy sponges
 - Useful to push other organs away



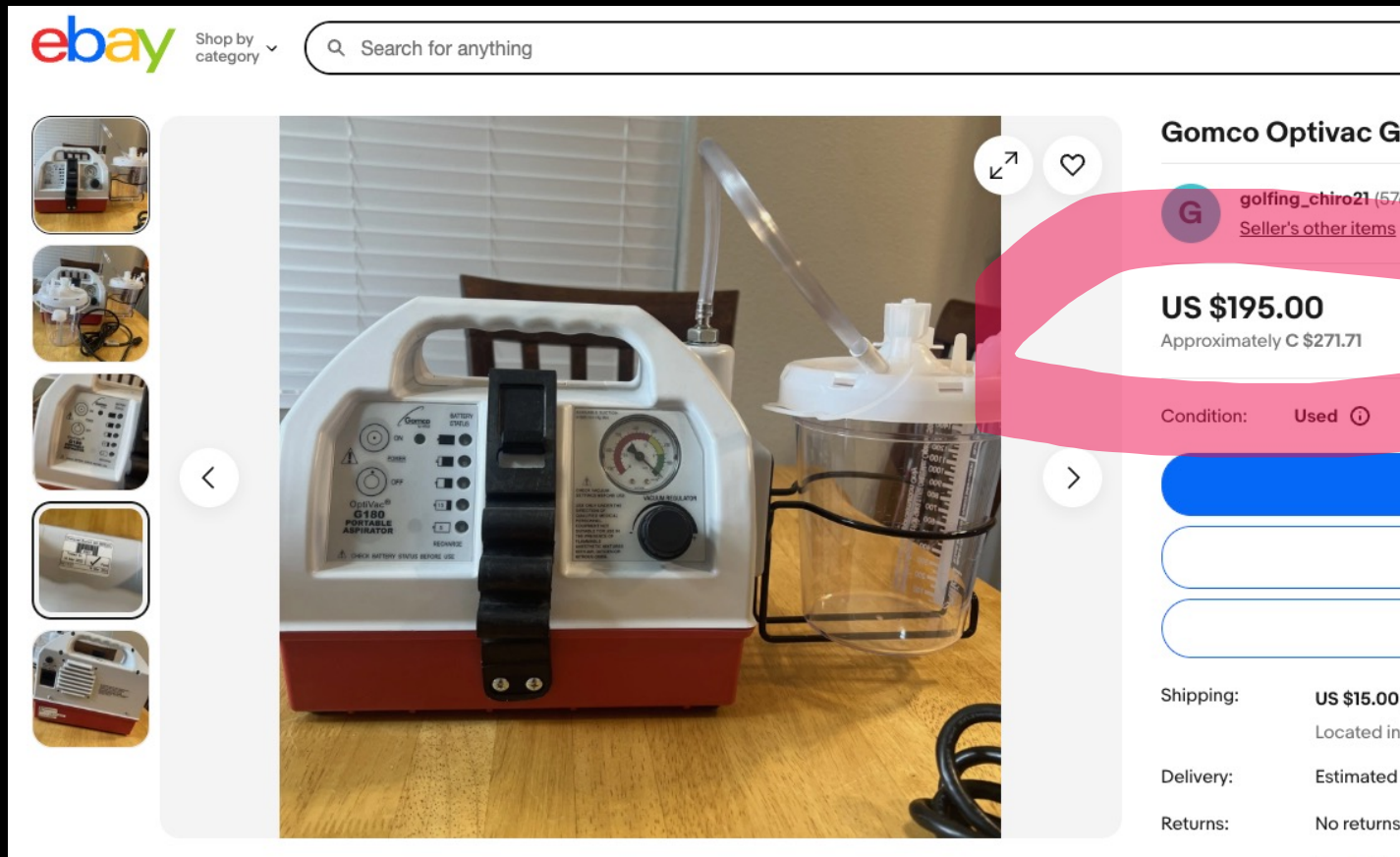
Minimal Contamination

- Suction is essential



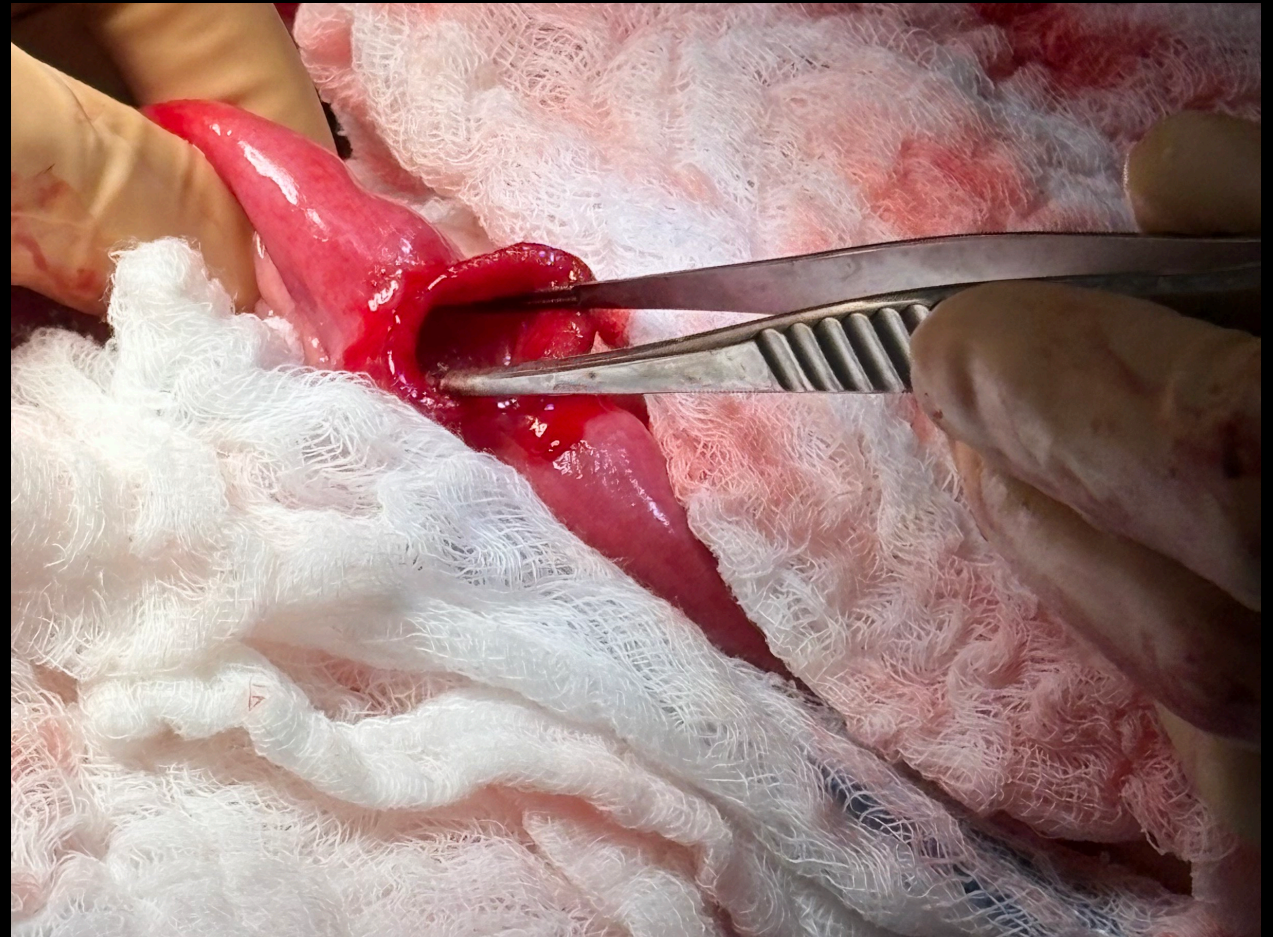
Minimal Contamination

- Suction is essential



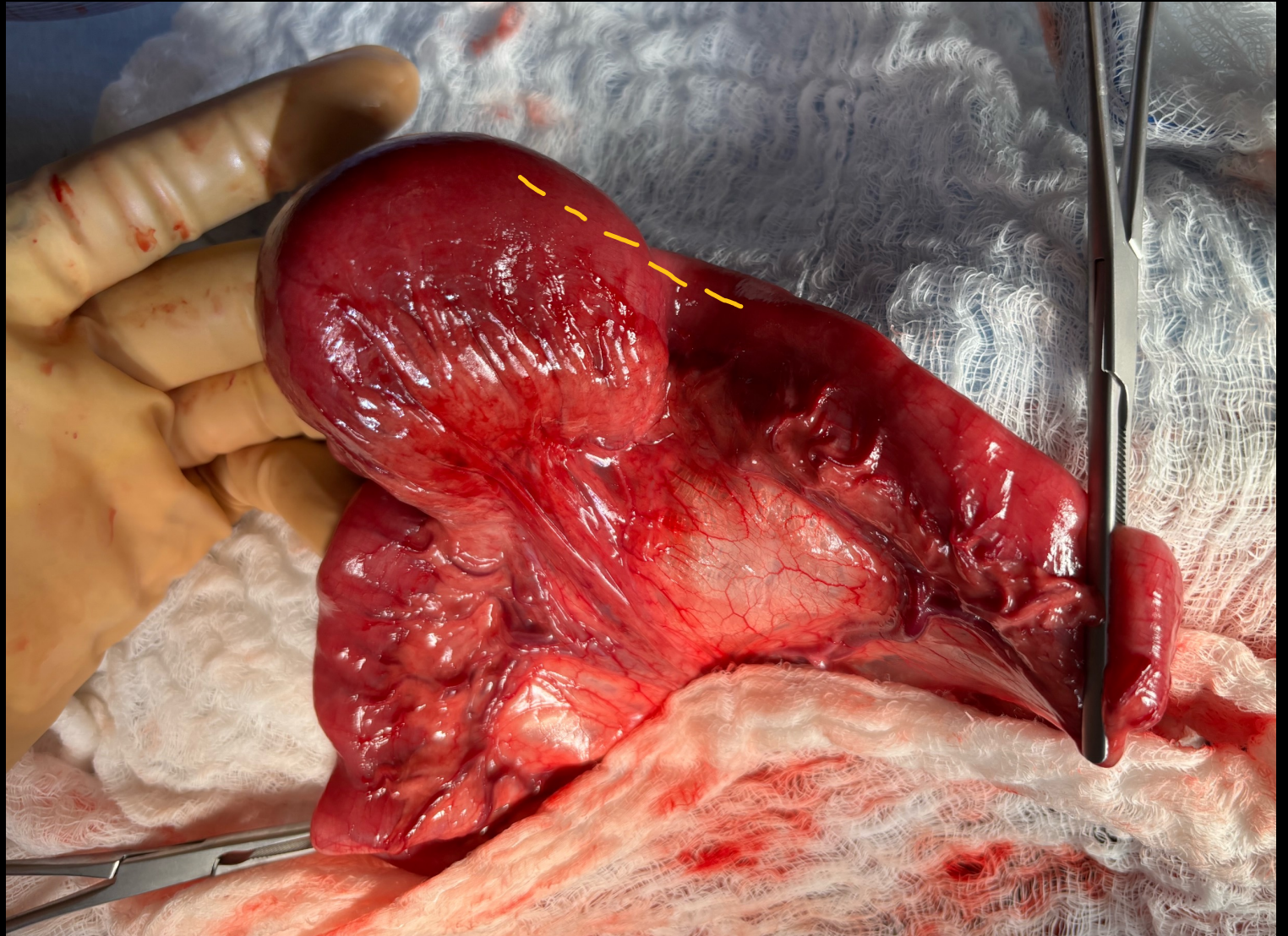
Gentle handling and blood supply

- Do not grab the tissue
 - Grab = Trauma
 - Trauma = Healing problem



Gentle handling and blood supply

- Do not grab the tissue
 - Grab = Trauma
- **Doyen Forceps**
 - Very useful



Controlled suture tightness

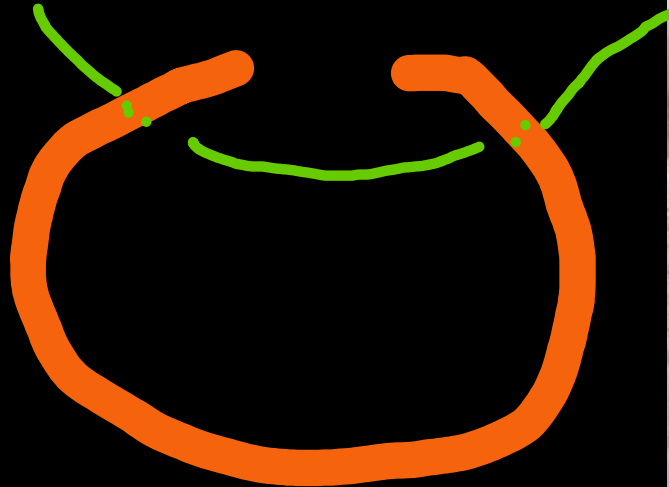
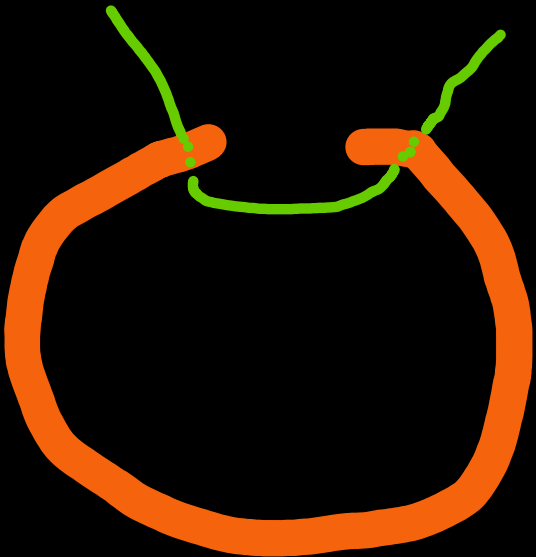
- Common cause of postop dehiscence
 - Young surgeons
 - Worried about dehiscence
 - = tightening suture too hard
 - = tissue dies due to lack of perfusion
 - = dehiscence/septic abdomen
- **Snug closure**
 - Allow perfusion to heal



Controlled suture tightness

Pressure ↑

Pressure ↓



Enterotomy vs. Resection?

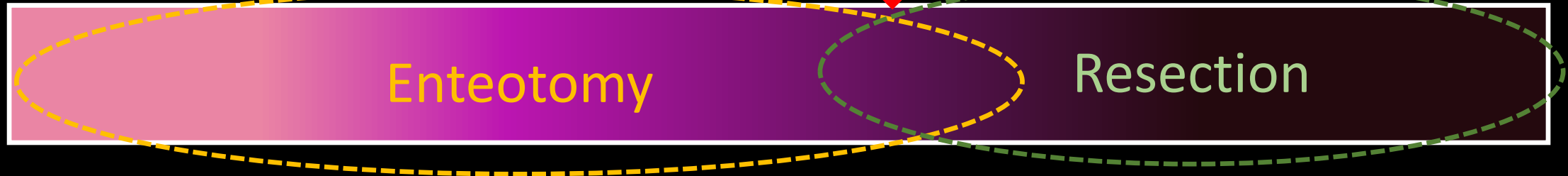
- **Color and texture**

- Most reliable indicator
- First to assess

- **If questionable**

- Assess after removal of FB and enterotomy closure
 - Warm abdominal lavage

Color of intestine



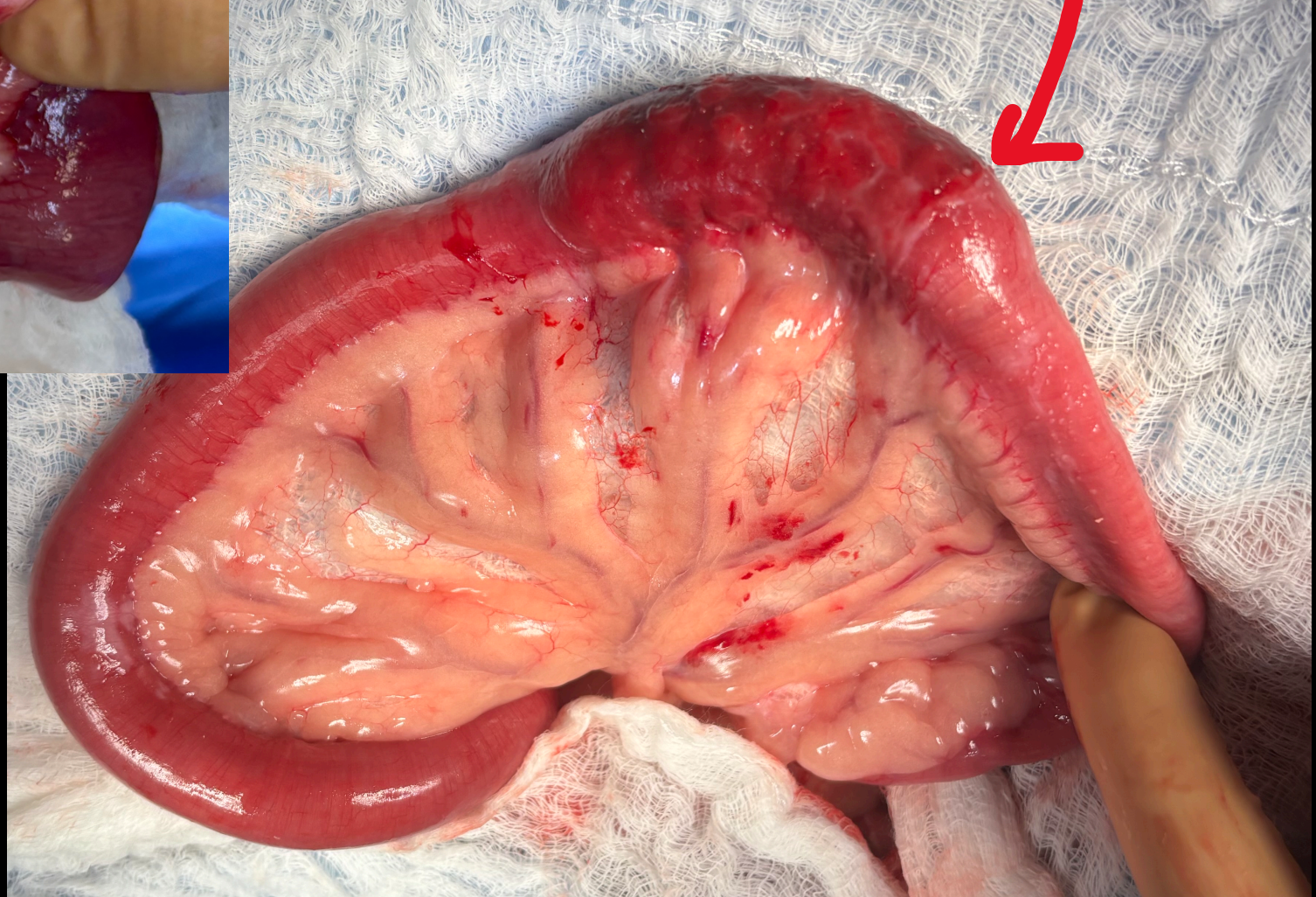
Enterotomy vs. Resection?

- Color and texture
 - Focal ischemia
 - = local blood supply damage
 - = more likely fail
 - = Resection recommended





on?



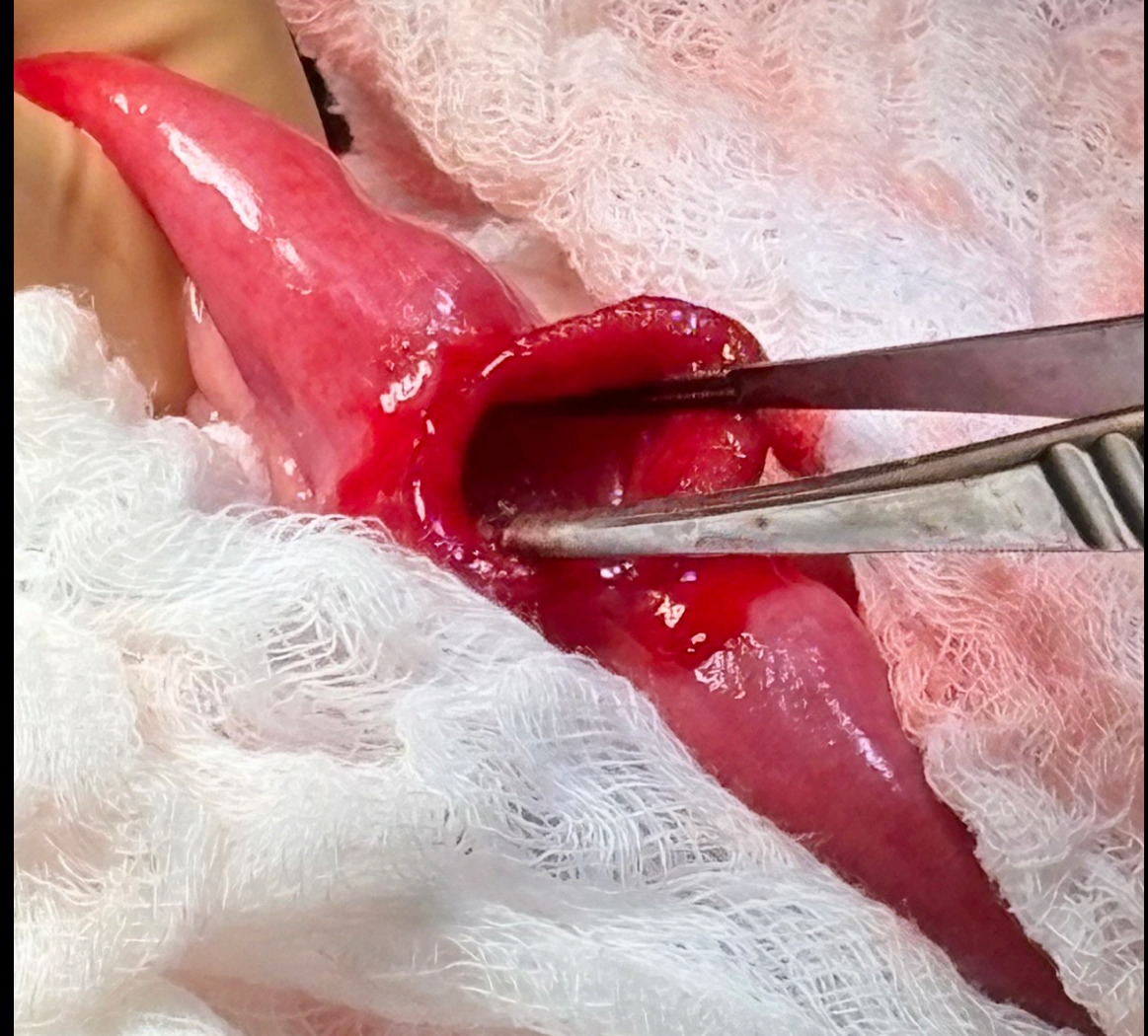
Enterotomy vs. Resection?

- **Thickness**

- Good = Thick and elastic
- Bad = Thin and friable

- **Assess**

- By palpation
- Mesenteric side after enterotomy
- Leak test
 - Mesenteric side viability
 - E.g. Linear FB



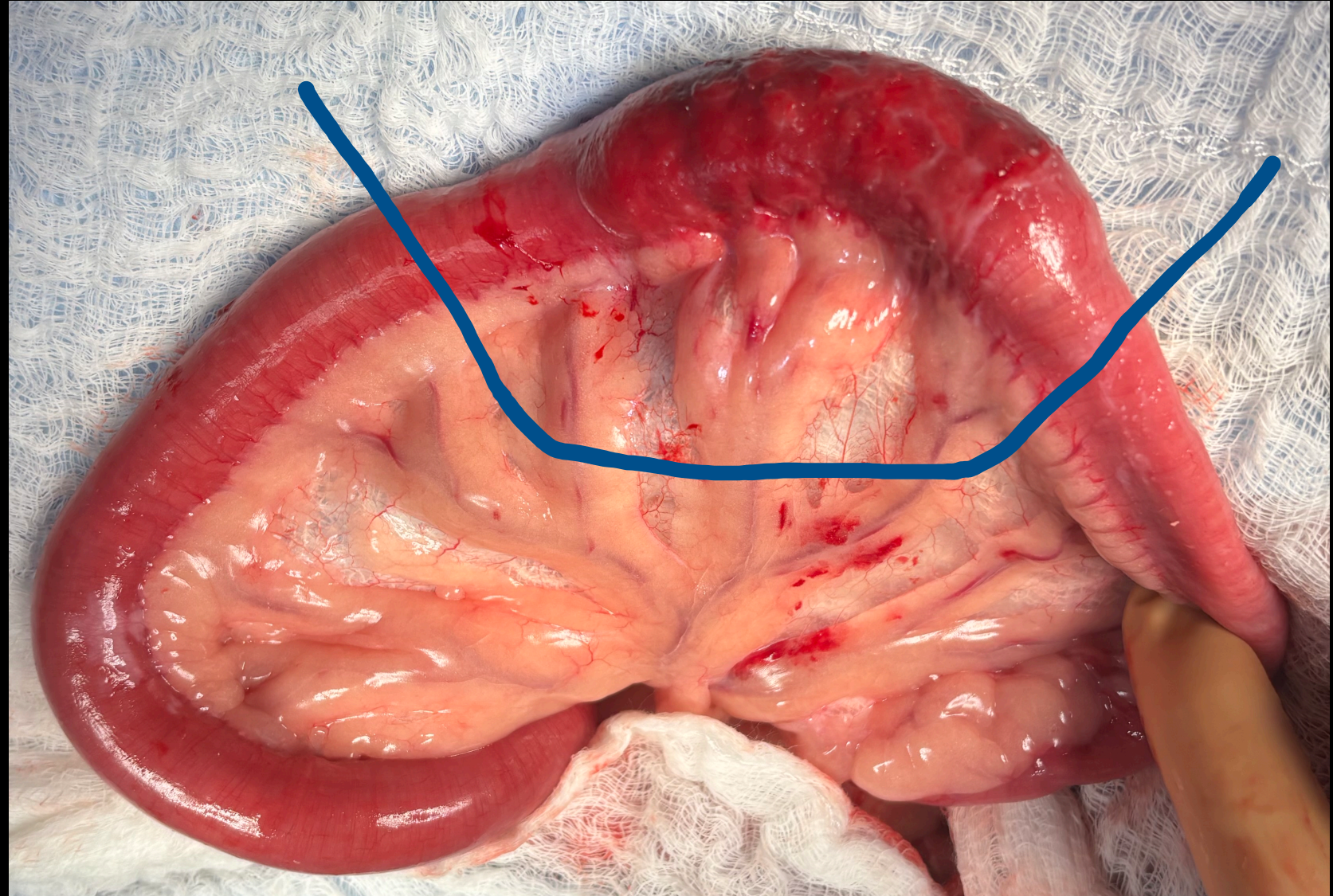
Enterotomy vs. Resection?

- **Motility**
 - Peristalsis = good
 - No motility = questionable
- **Assess after removal of FB**
 - Warm abdominal lavage



Resection and Blood supply

Goal



Resection and Blood supply

Step 1

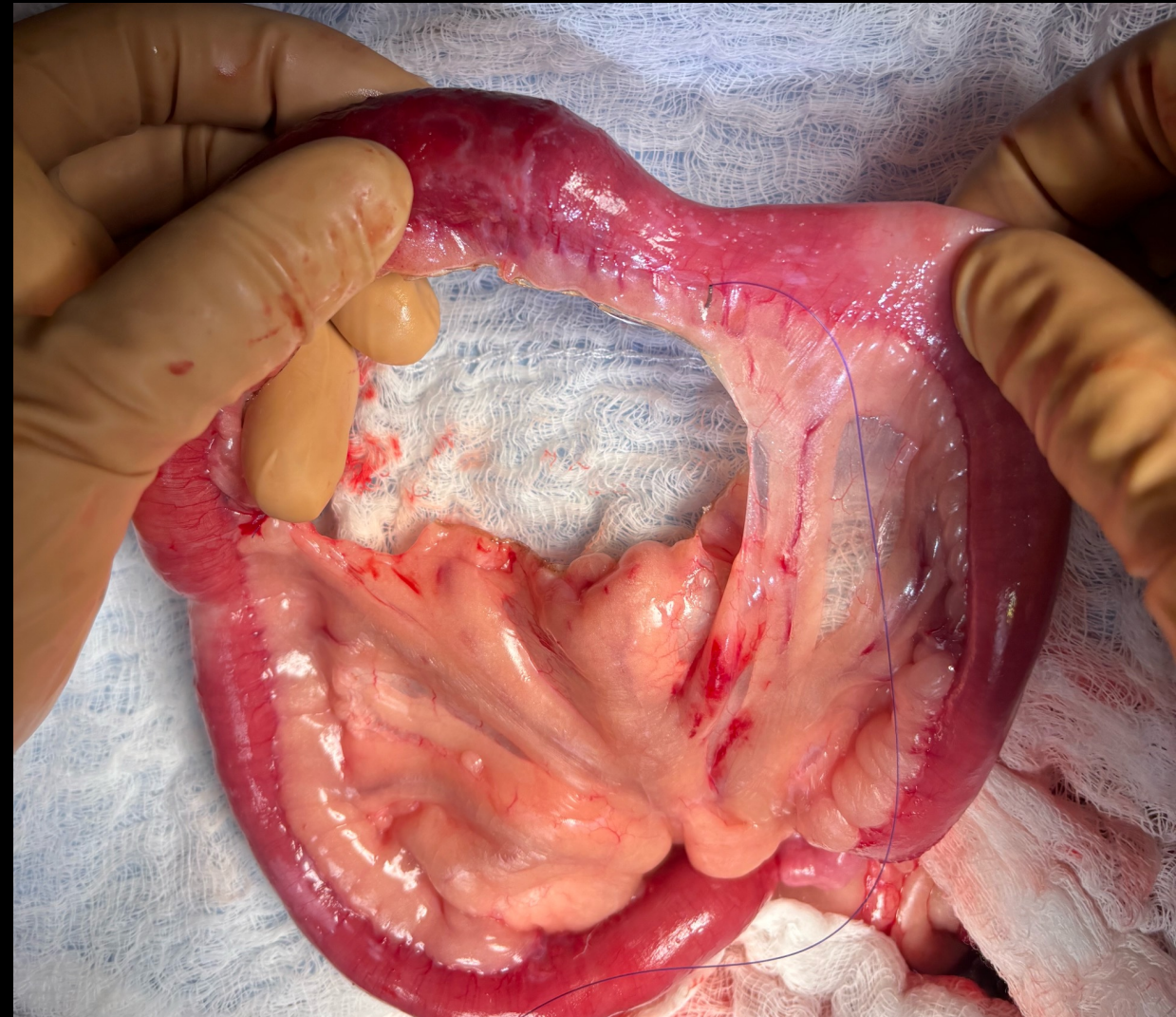
- Ligate mesenteric vessels
 - Stay close to the affected area



Resection and Blood supply

Step 1

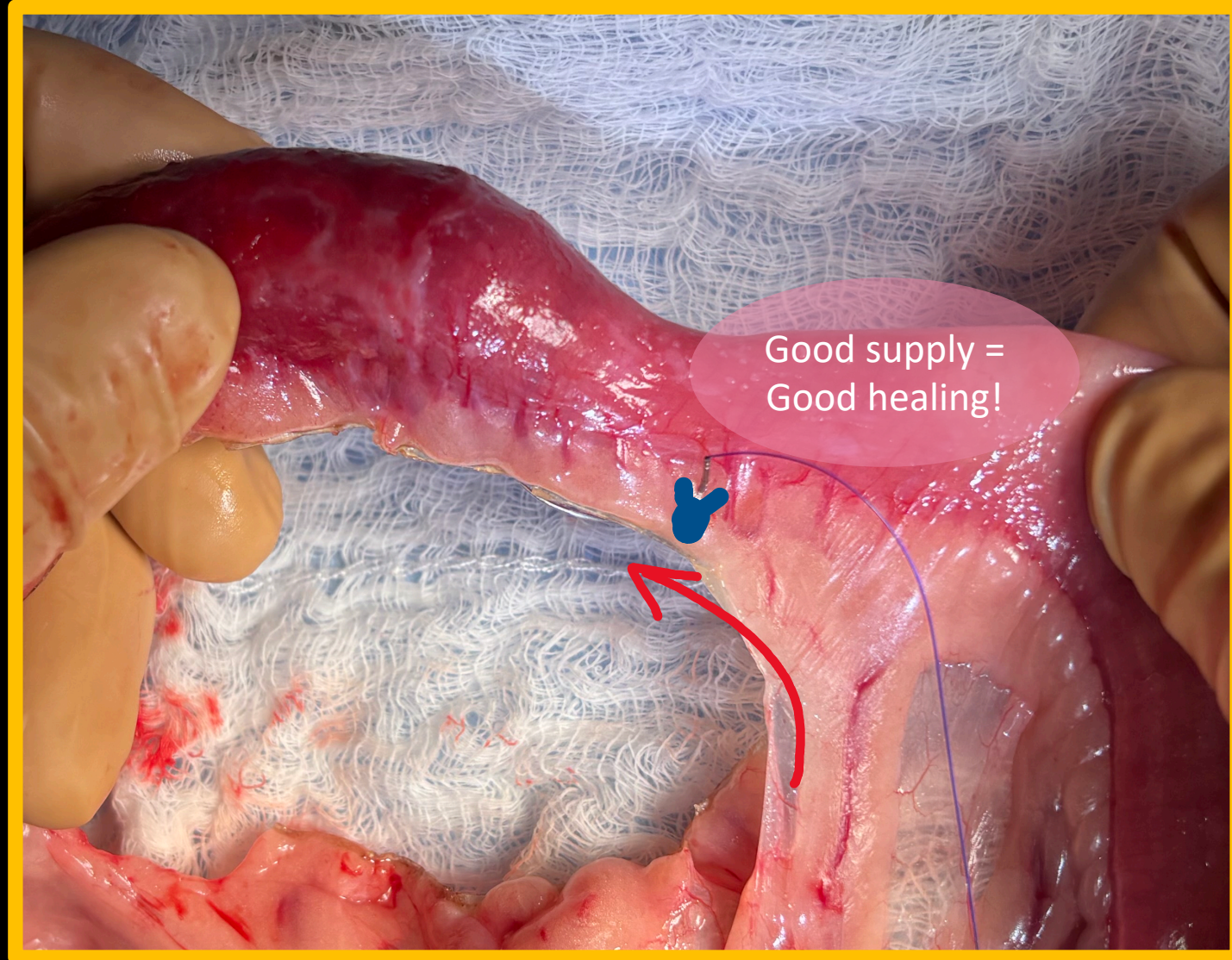
- Ligate mesenteric vessels
 - Stay close to the affected area



Resection and Blood supply

Step 2

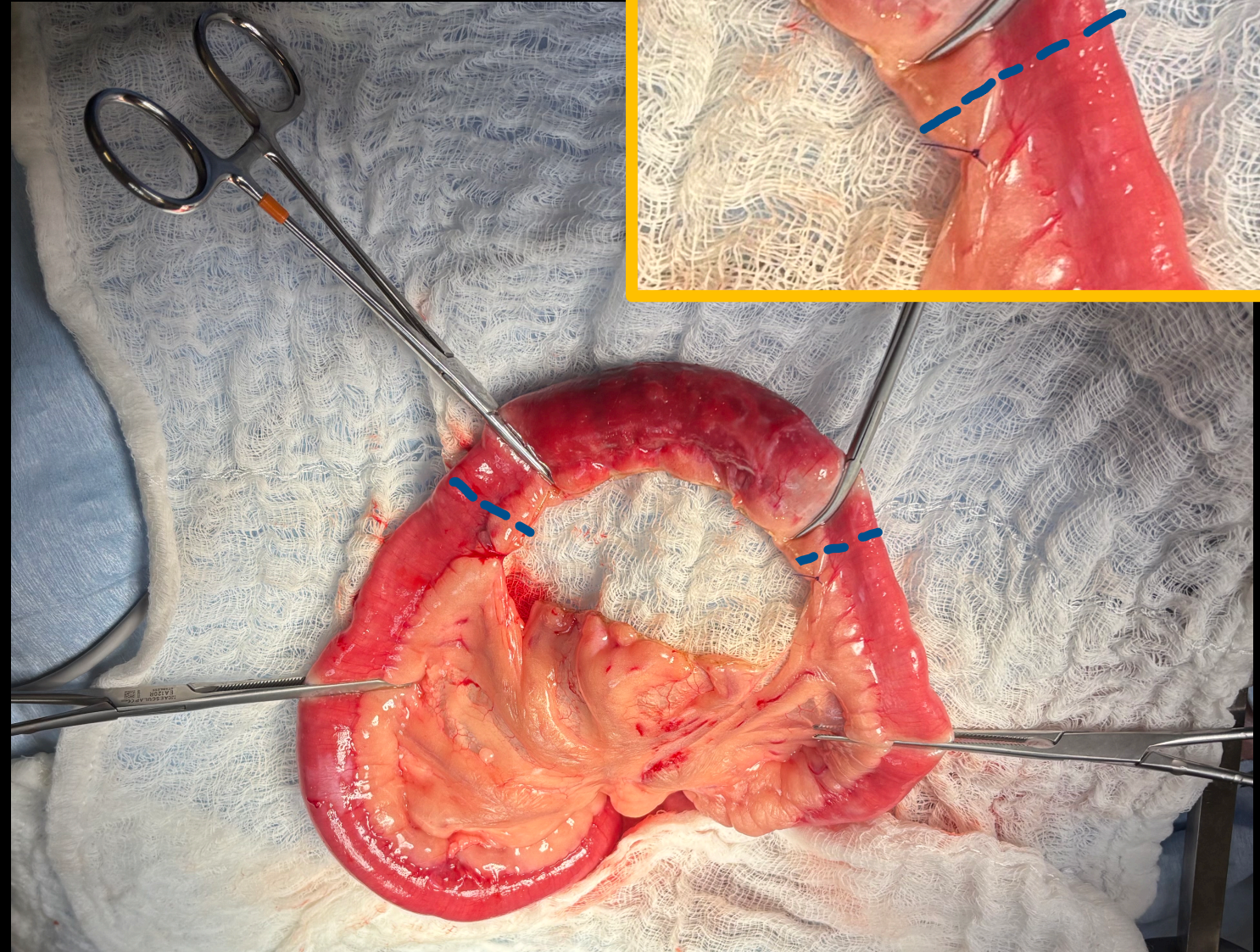
- Identify robust blood supply
 - Healthy/remaining intestine
- Ligate adjacent to the blood supply

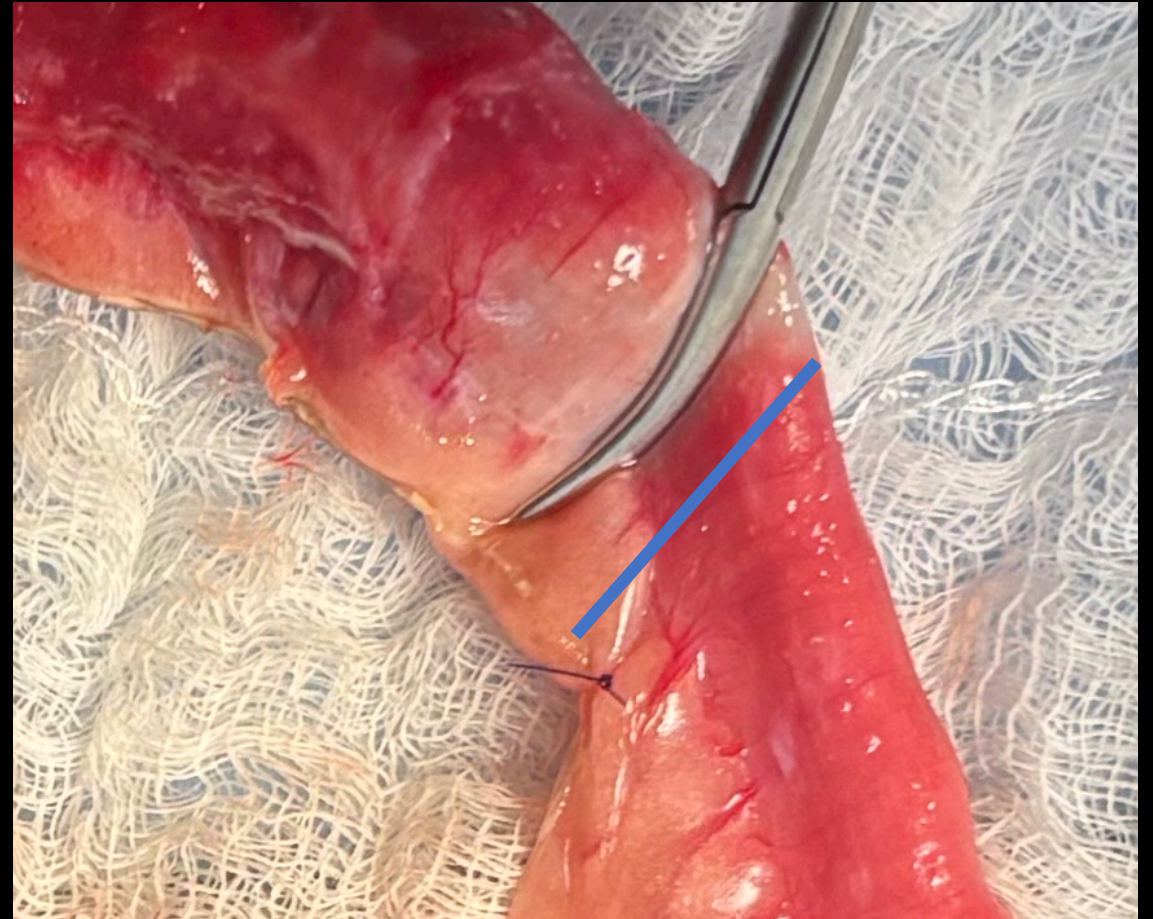
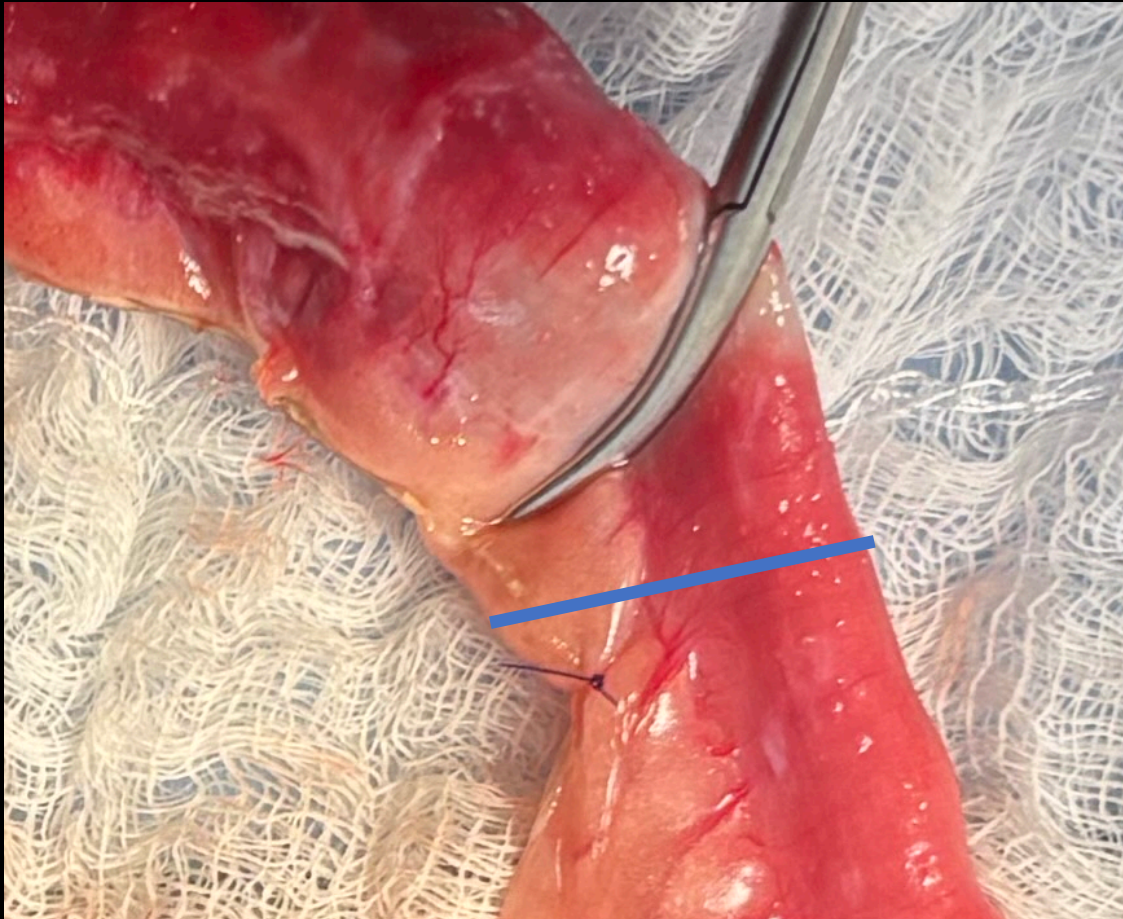
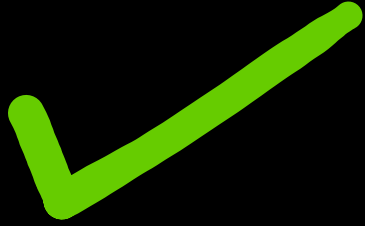


Resection and Blood supply

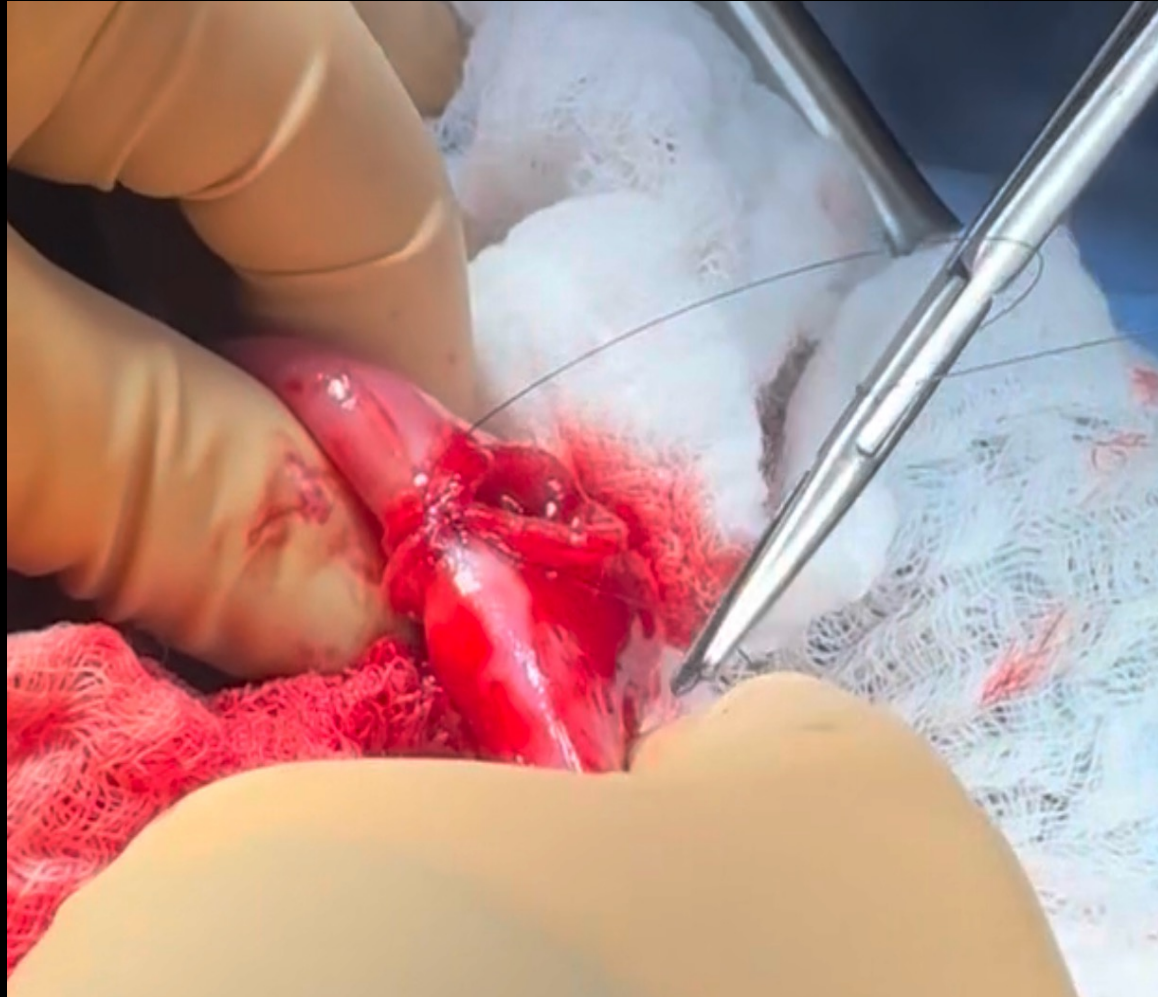
Step 3

- Occlusion of Intestine
 - Finger or Doyen for healthy remaining sides
 - Any clamp for resection side



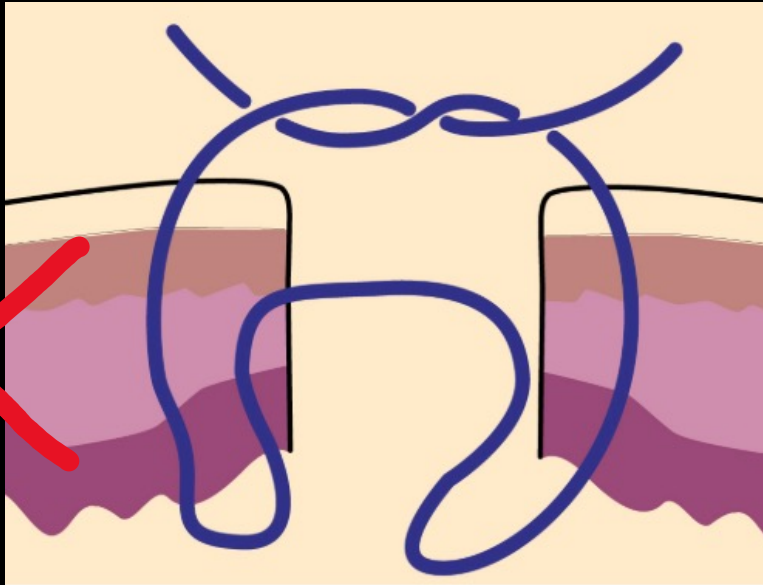
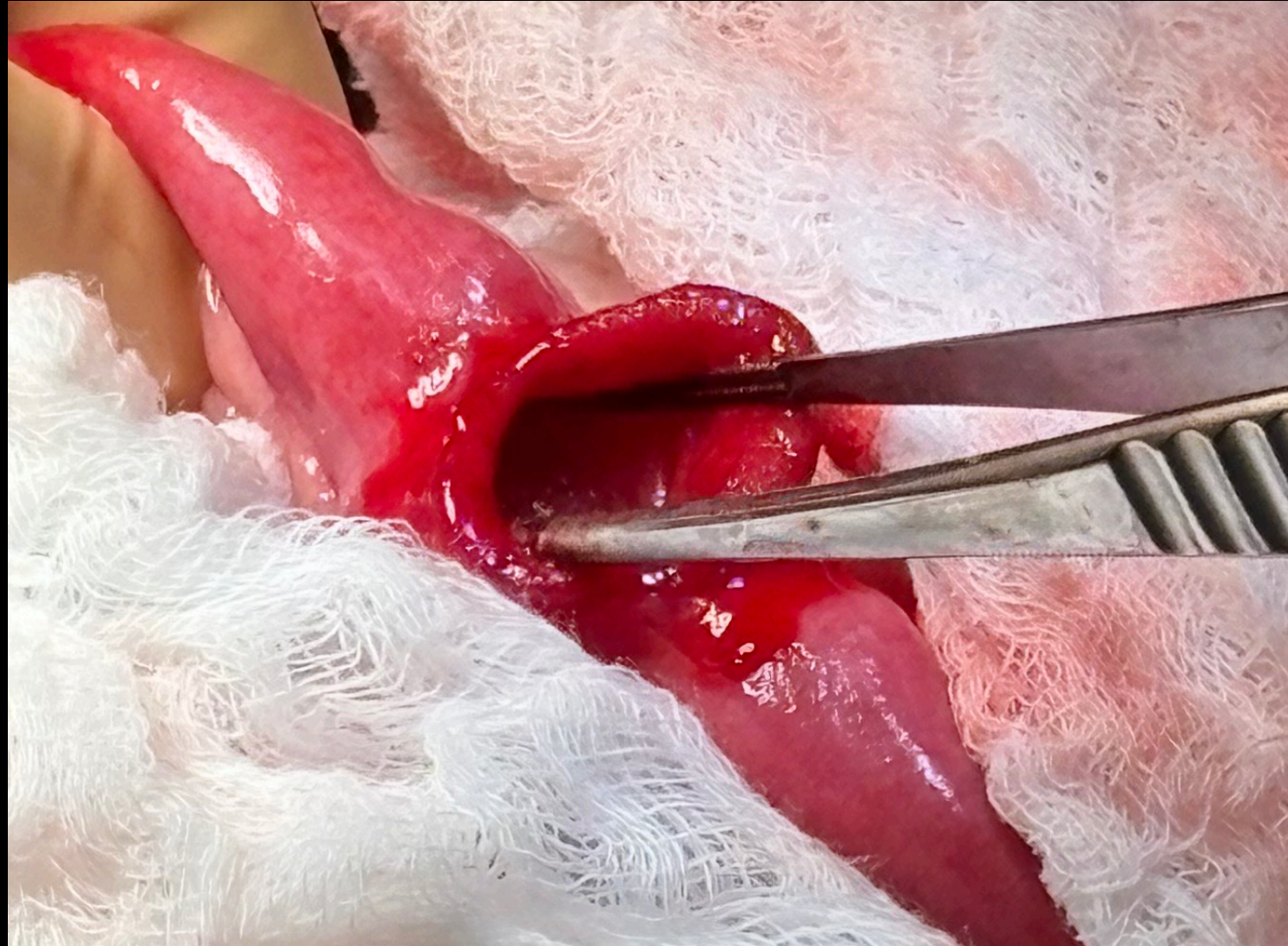


Get Good Submucosa



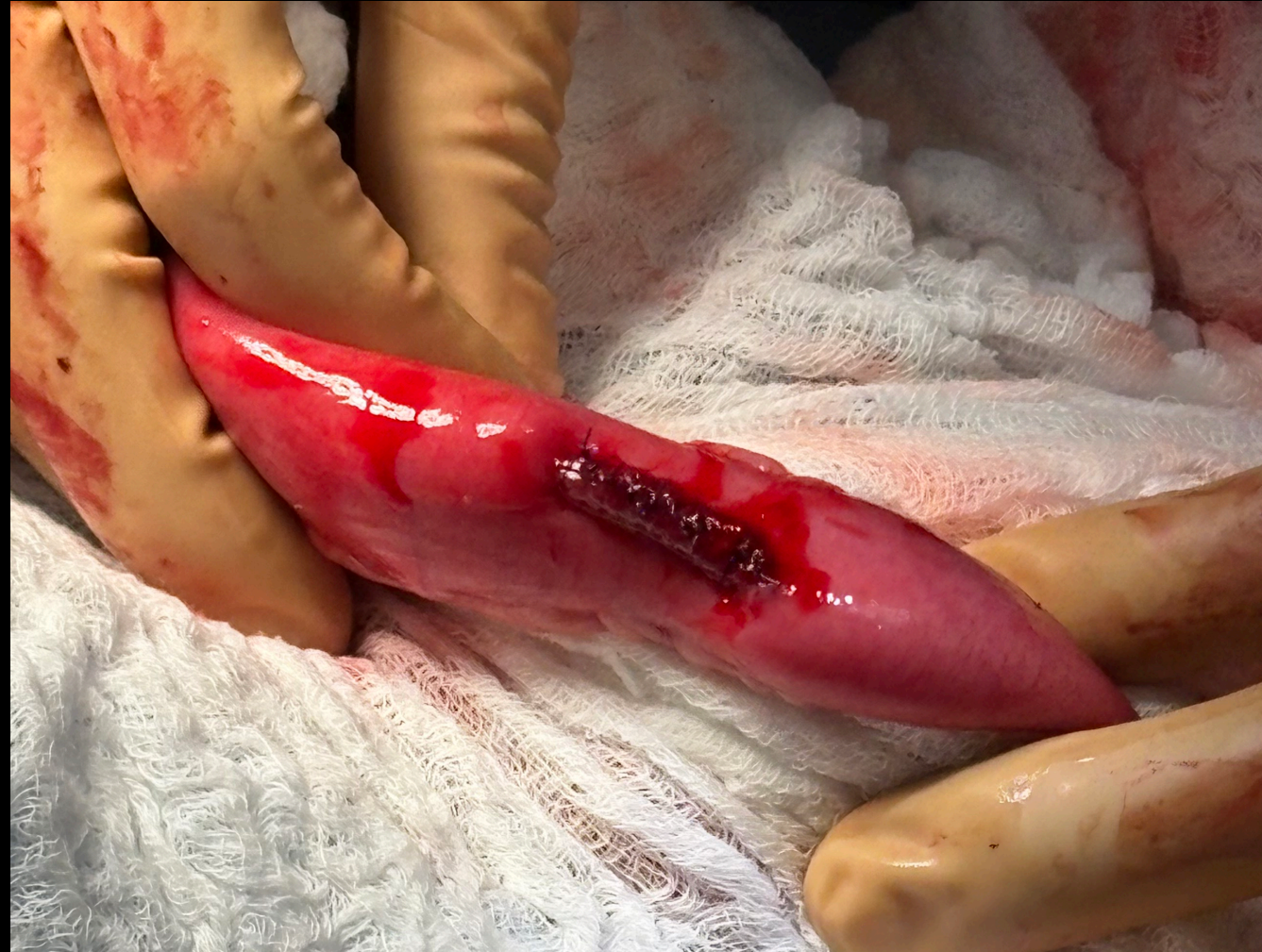
Common Questions

- **Mucosal apposition?**
 - Mucosa everts often...
 - Trimming edges?
 - Gambee suture?



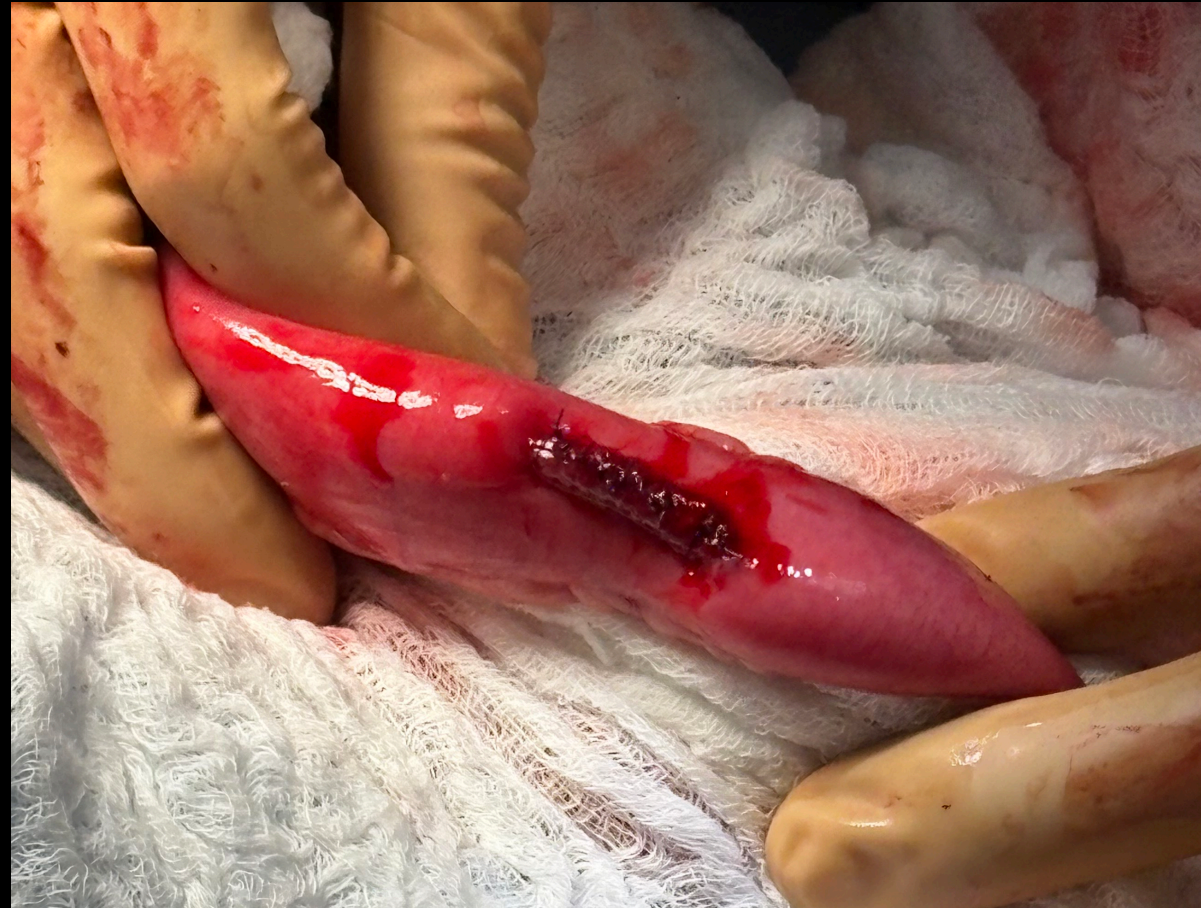
Common Questions

- Mucosal apposition?
 - Mucosa everts often...
 - Trimming edges?
 - Gambee suture?
- Answer
 - Not necessary
 - No Trimming or Gambee
 - As long as following principles



Common Questions

- Interrupted vs. Continuous?
 - Both good
 - I recommend “interrupted”
 - For in-experienced surgeons
 - More controlled
 - Tissue tightness



Small tip

- Leak Test
 - = Do not remove the clots
- Give 2-3 min before leak test
 - Stronger clots
 - Leak from suture holes



Imaging



Post-surgical complication

- **Dehiscence**

- Ultrasound

- Peritoneal effusion

- Steatitis

- Pneumoperitoneum



Usually present in any post-surgical enterotomy/enterectomy

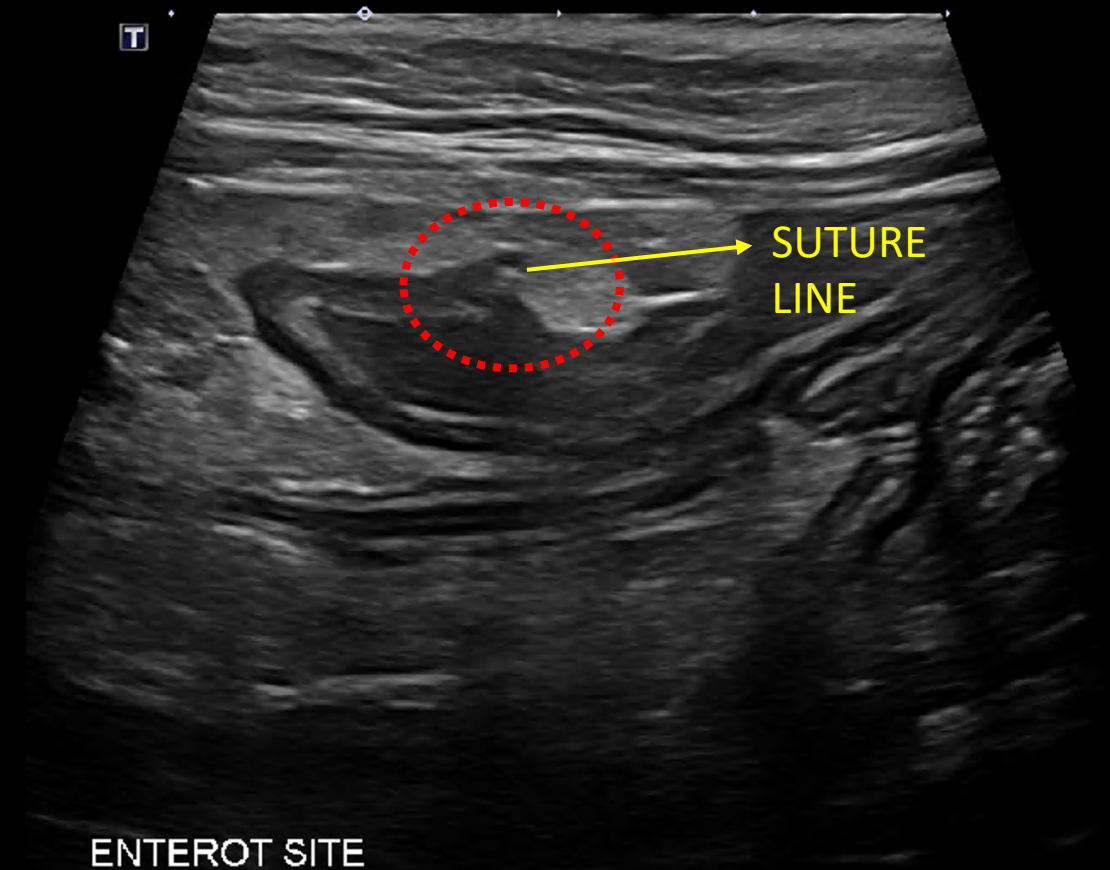
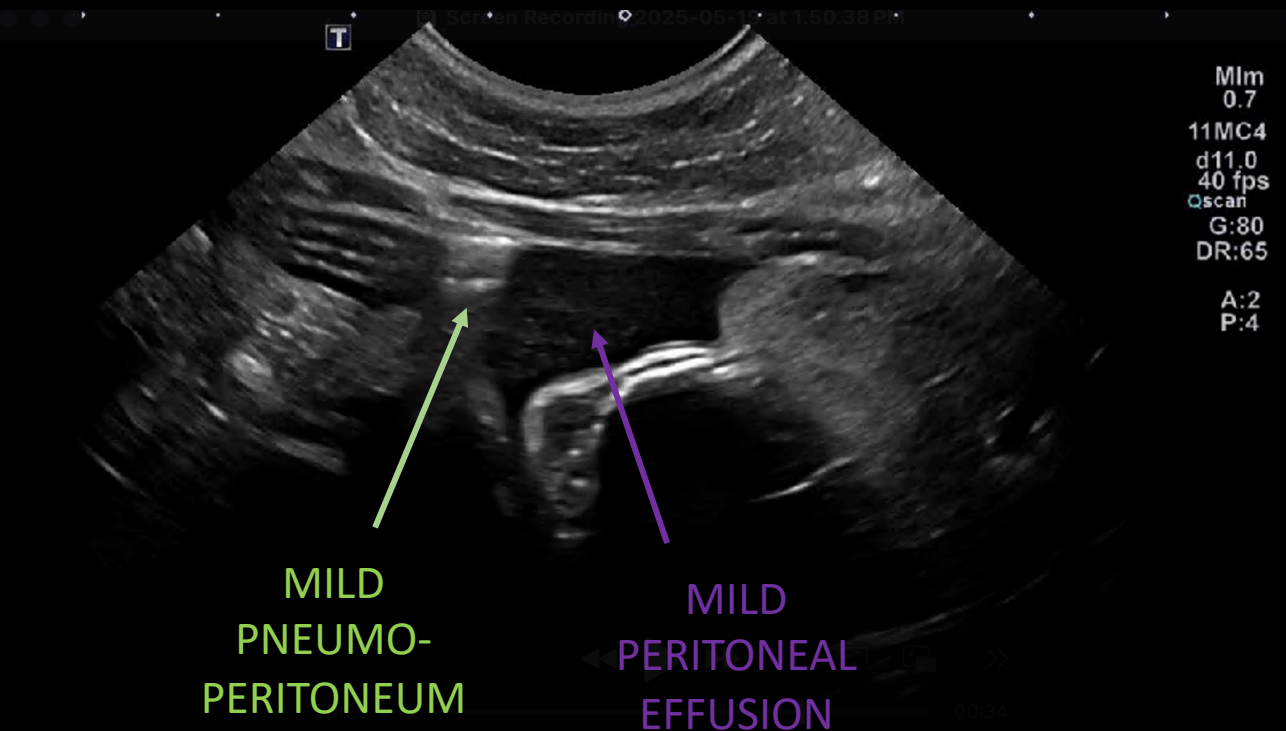


Birchard (2013)

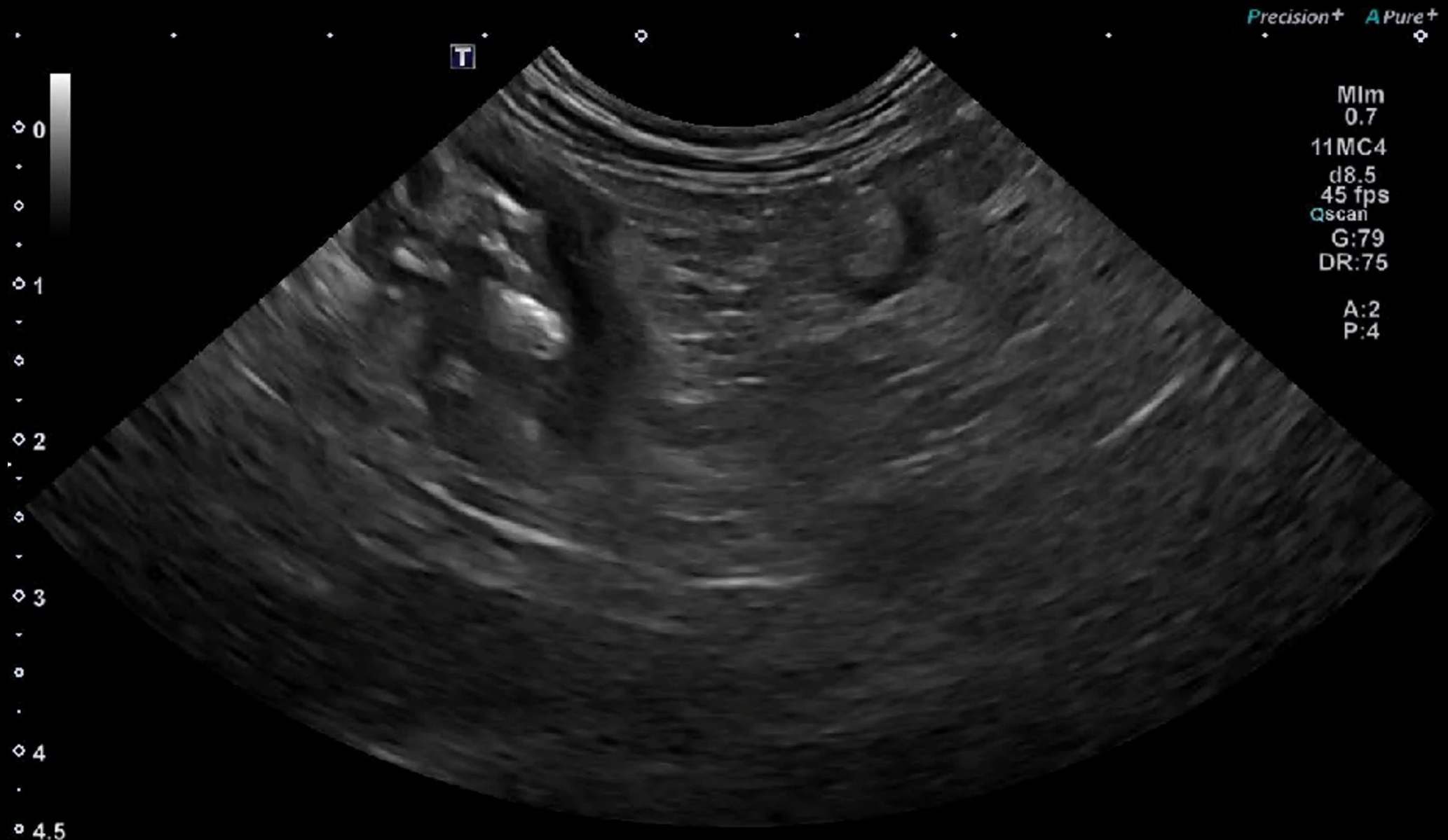
Then, how to diagnose dehiscence?

- First...

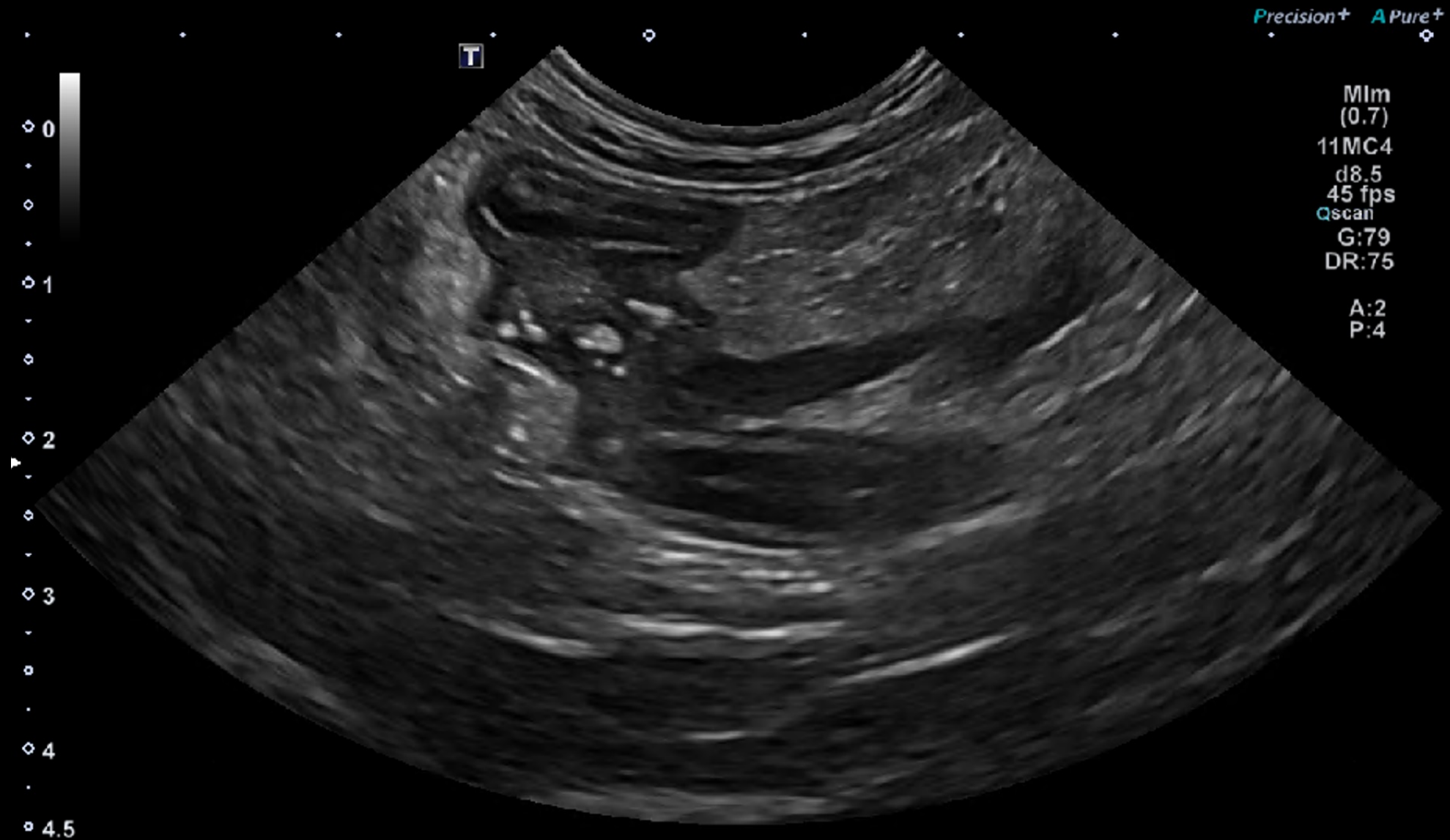
... be familiarized with the normal appearance of the enterotomy or enterectomy site.



Intestinal dehiscence



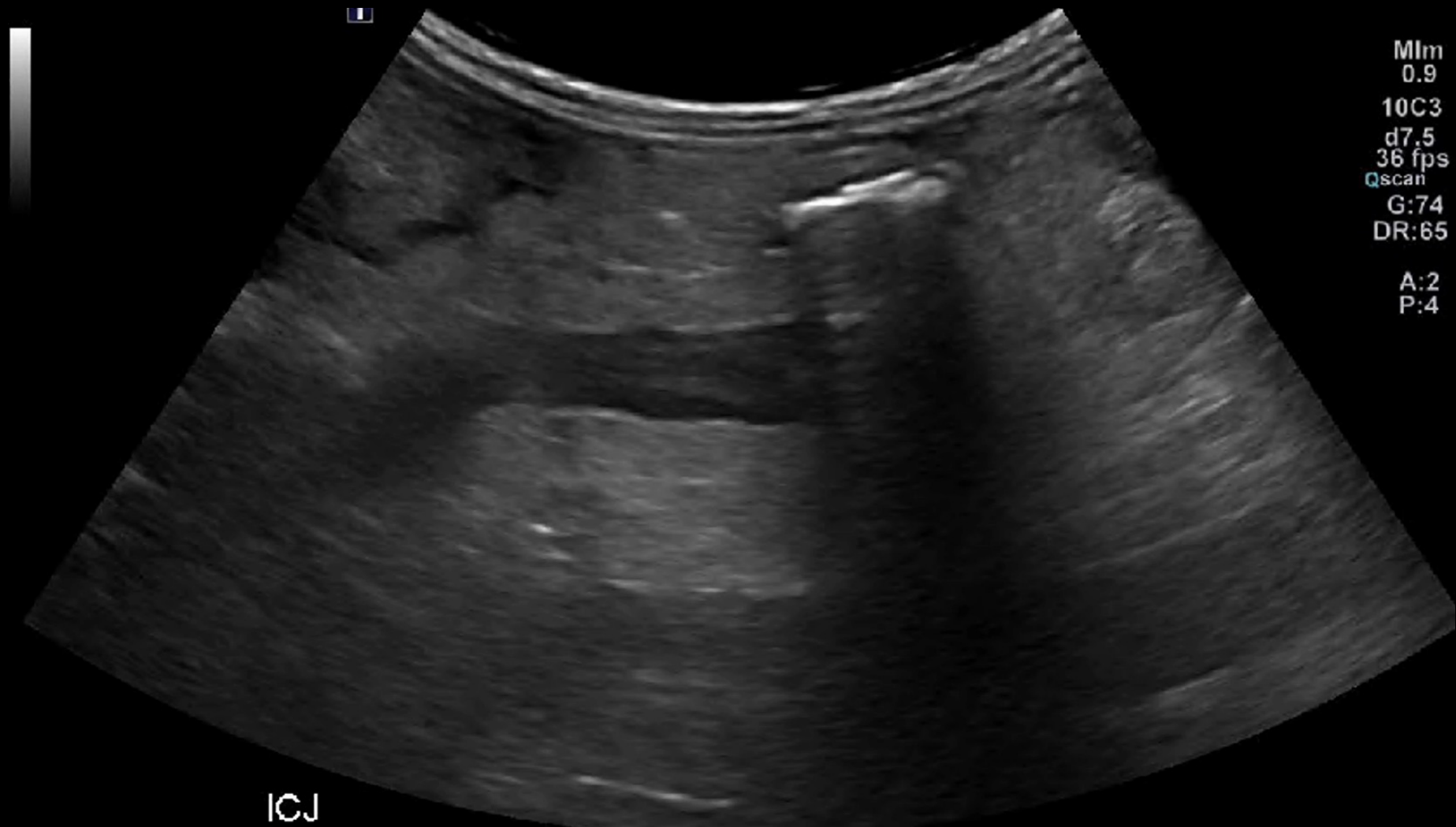
Intestinal dehiscence



Intestinal dehiscence



Intestinal dehiscence



Intestinal dehiscence



Intestinal dehiscence



Surgery

Almost done



Intestinal dehiscence and septic Abdomen

- After initial surgery
 - 3-5 days postop
- Surgical Principles
 - Same as general intestinal SX
 - Minor difference
- Prognosis
 - Varies but 50/50



Septic abdomen - Intestine

- Minor difference?
 - Severe adhesion
 - Between organs
 - Resection and anastomosis necessary
 - JP drain
 - Often required
- Anesthesia and postoperative care
 - Often require pressors intraop
 - Significant 24h care required

Septic abdomen - Intestine

- **Severe adhesion**

- Anatomy knowledge
 - What to cut and not
 - **Open big**

- If not sure...

- **Use finger**
 - Adhesion – Easily break with finger



Septic abdomen - Intestine

- Special stapler required?
 - No
 - Why?
 - Price
 - Studies
 - Less complication with stapler
 - Not consistent
 - Size limitation
 - Comparable outcome with hand suture
 - Experience how to use them

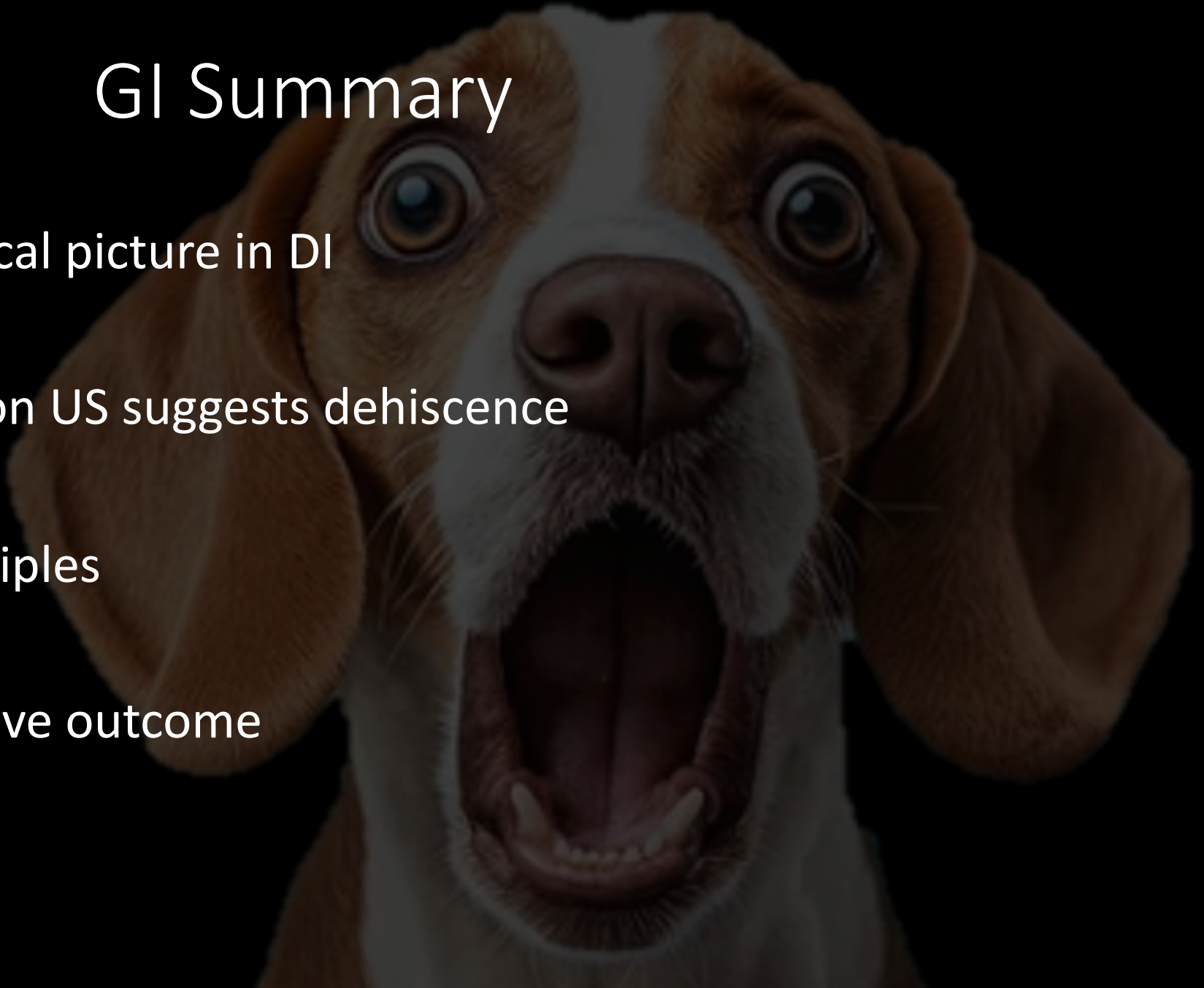
Linear GIA



TA Stapler

GI Summary

- Consider whole clinical picture in DI
- Mesenteric change on US suggests dehiscence
- Follow Surgical Principles
- Small changes improve outcome



Thank you!

See you in the second half!

