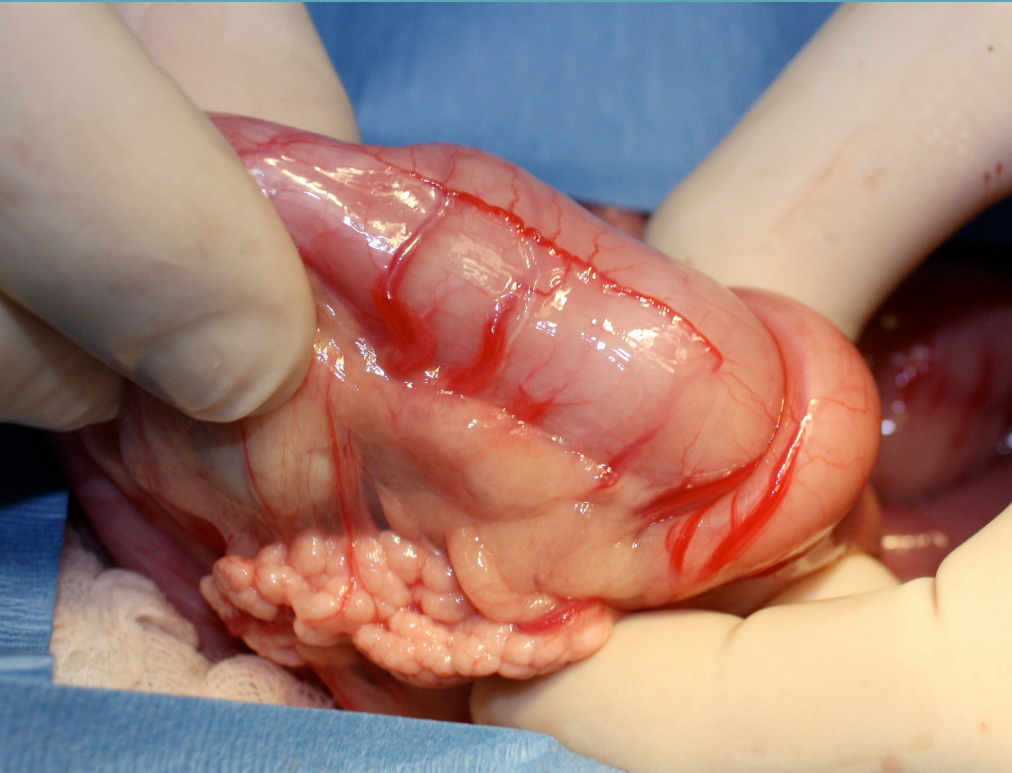


Tennis Balls, Tumors and Tinker Toys...

GI Surgery and Complications

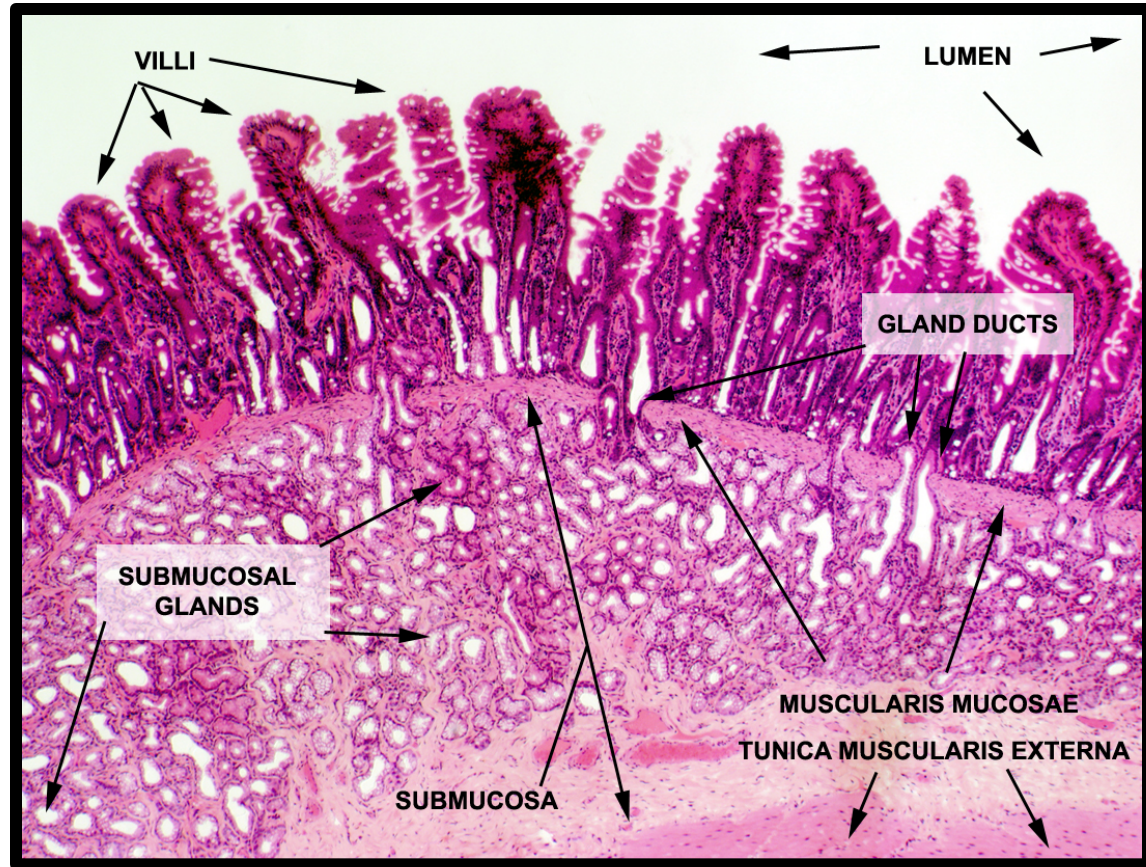


Rebecca Ball, DVM, MS,
Diplomate, ACVS

MedVet Indianapolis

Intestinal histology 101

- Serosa
- Muscularis
- Submucosa
- Mucosa
- Which is the “holding” layer?



Intestinal healing

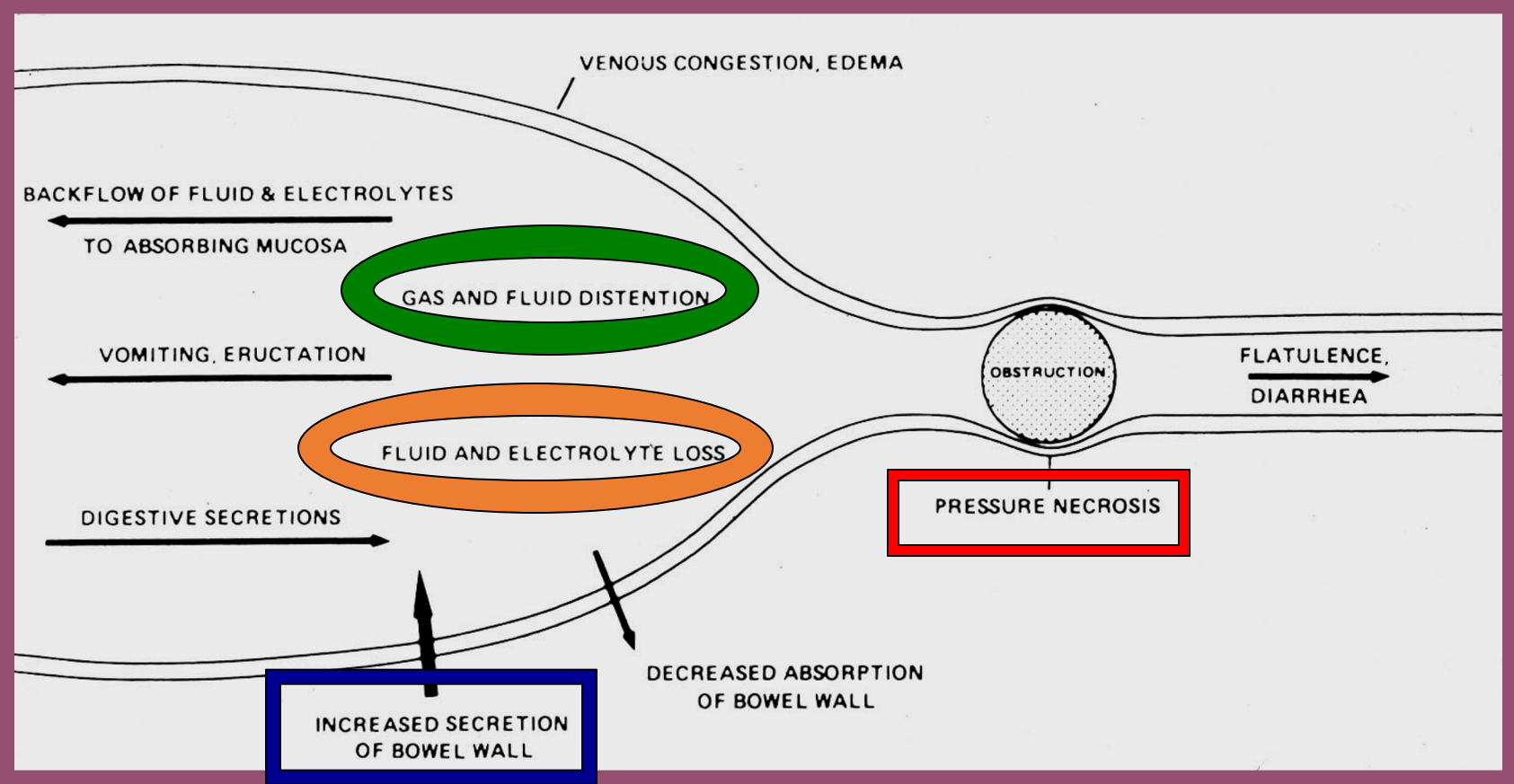
- 80% return of tensile strength in 10-14 days
- Leakage usually occurs in first 3-5 days



Indications for intestinal surgery



Pathophysiology of intestinal obstruction



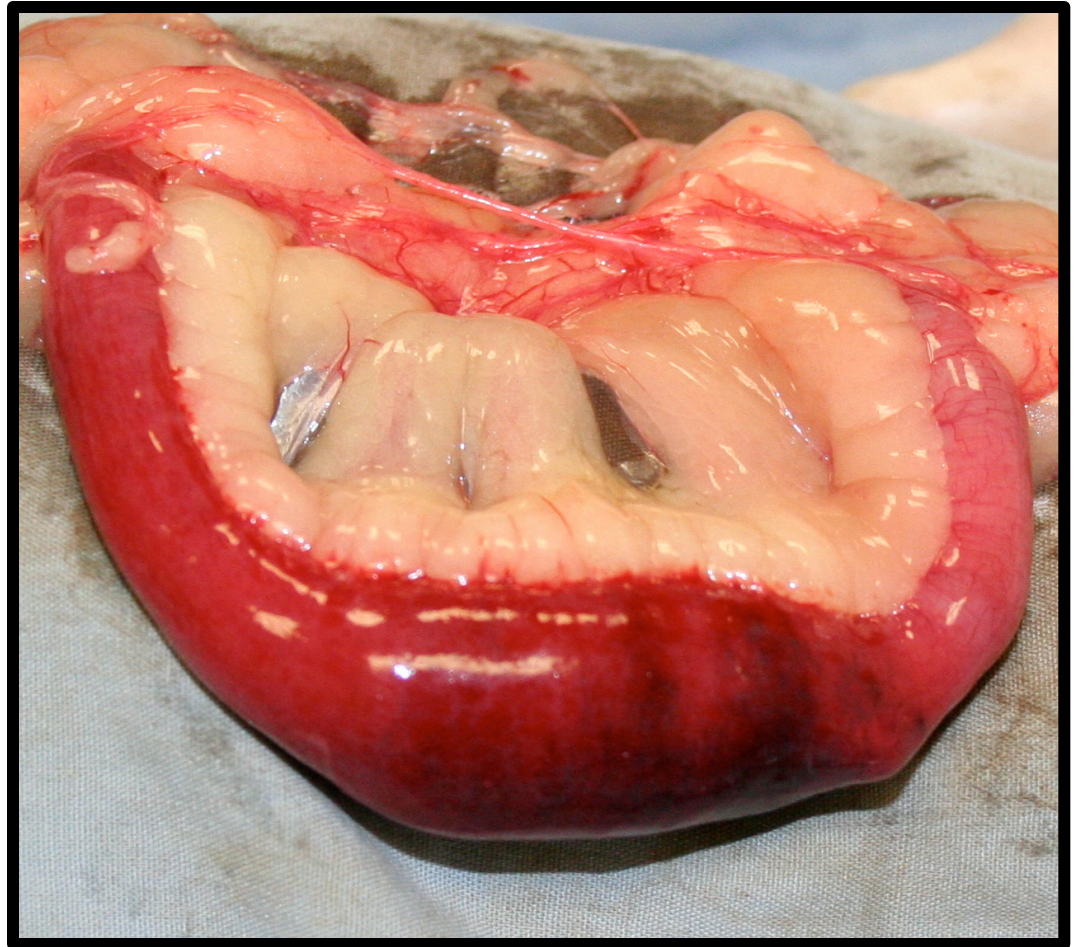
Preoperative Care

- IV fluids
- Electrolytes
- IV antibiotics



Assessment of intestinal viability

- Color
- Peristalsis
- Temperature
- Bleeding
- Other



Pulse Oximetry

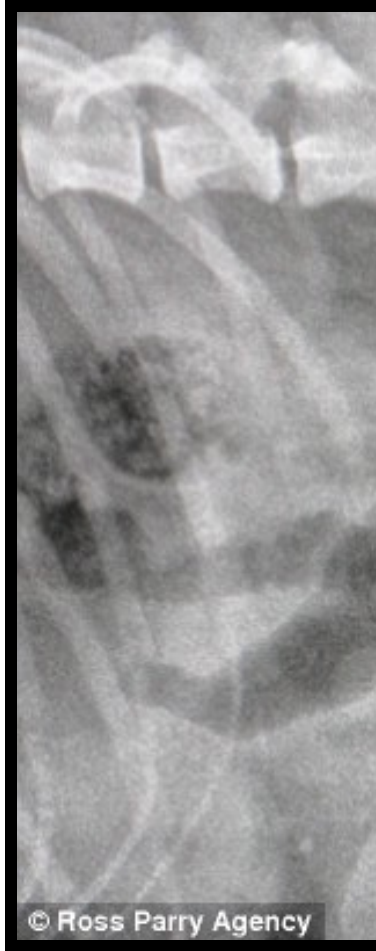
- Intraoperative Determination of Intestinal Viability by Pulse Oximetry

LTC David F.J. Tollefson, MD, USAMC, et.al. *Annals of Vasc Surg*, 1995

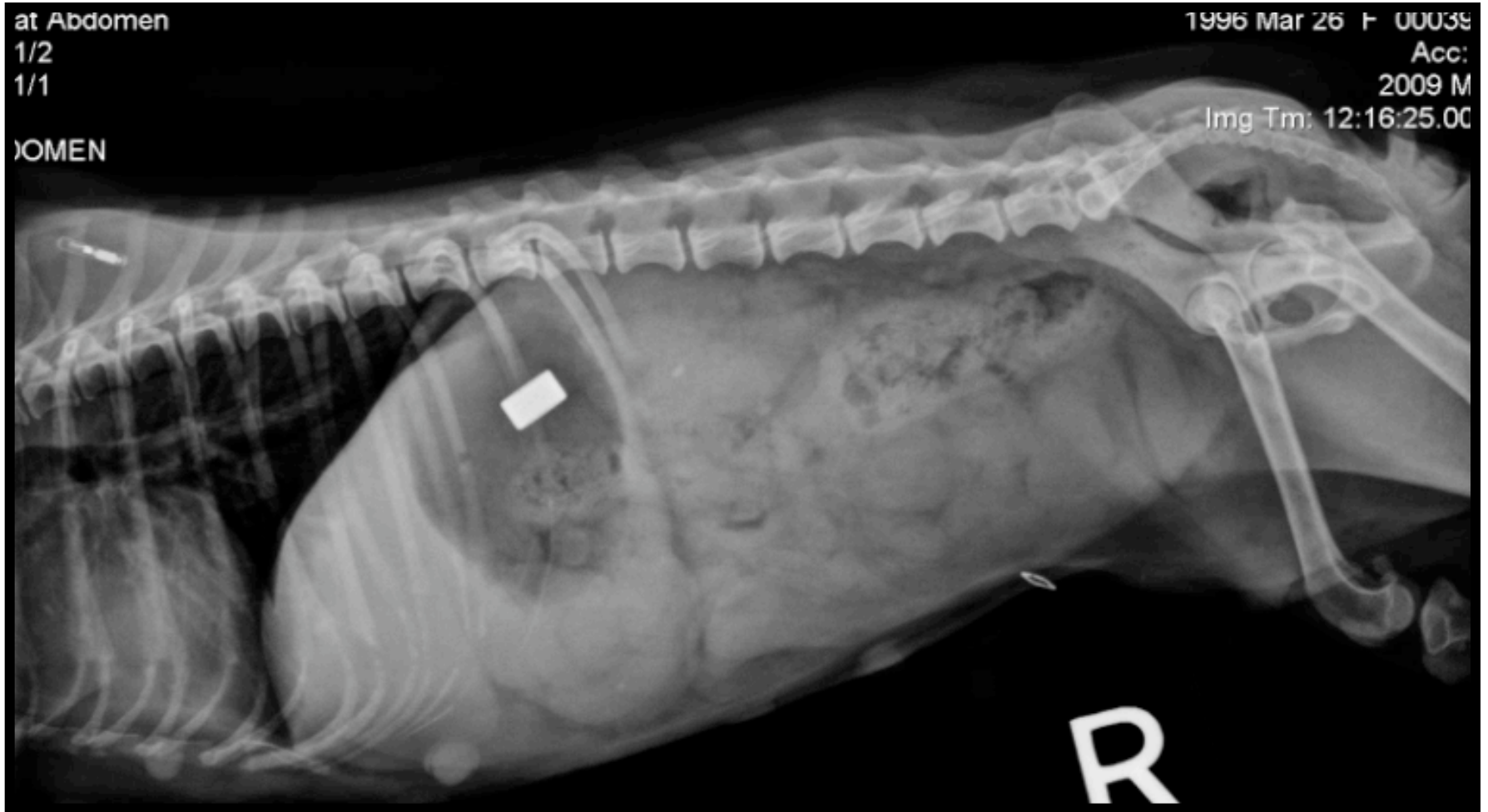
- Canine intestinal ischemia model
- PO similar to Doppler and Fluorescein Dye techniques
- Verified by histopathology
- PO is the preferred technique

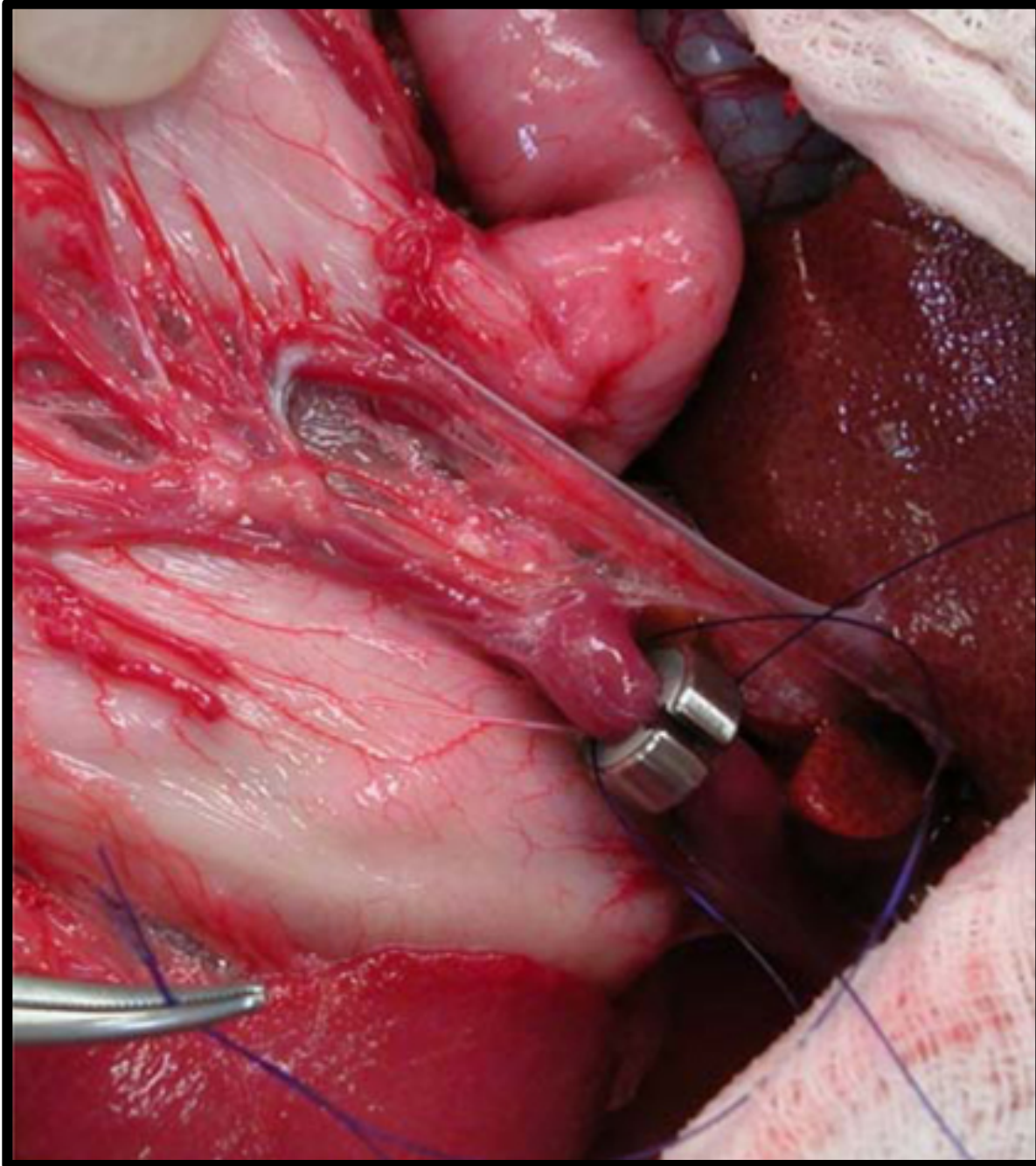


Intestinal Foreign Bodies



ID the foreign body...



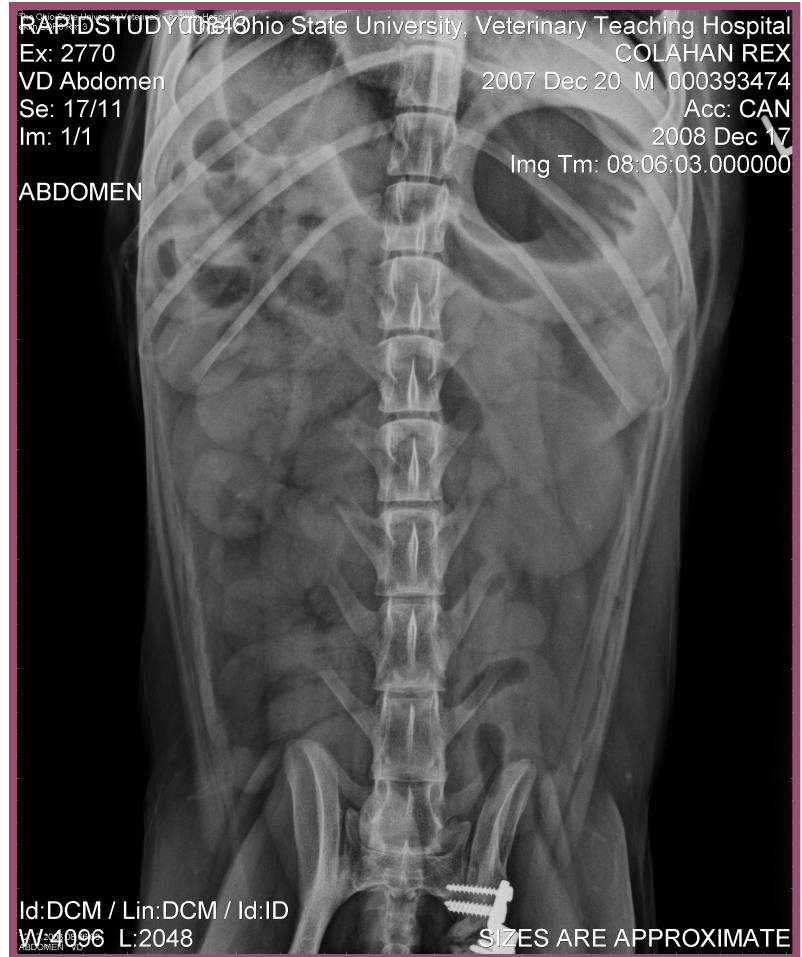


Gastrointestinal foreign bodies in dogs and cats: a retrospective study of 208 cases

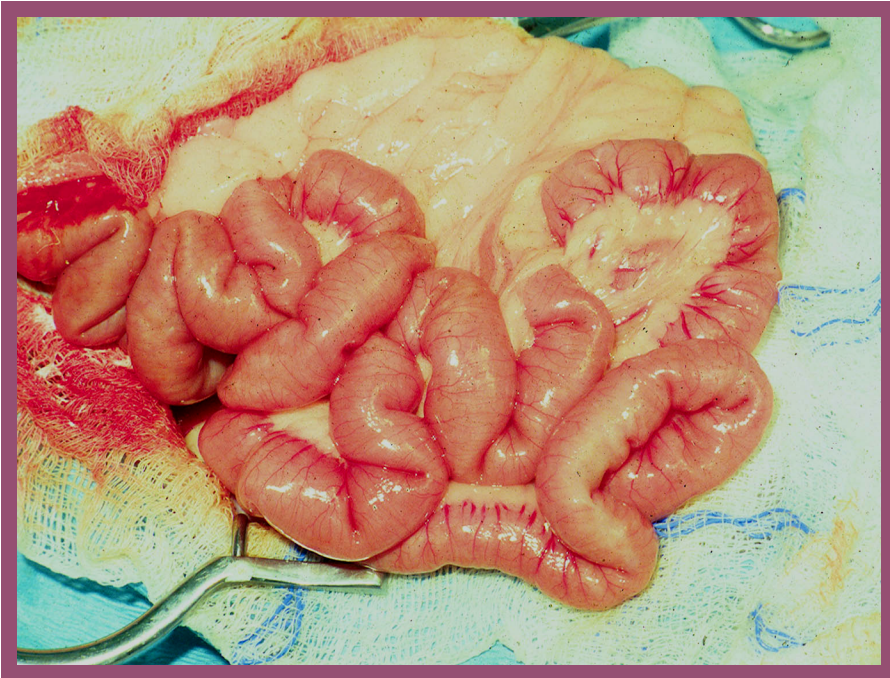
(Hayes, G JSAP Vol 50, Nov 2009)

- Survival

- 94 % dogs with single FB, 100% cats
- 80% dogs with linear FB, 63% cats



Linear foreign bodies

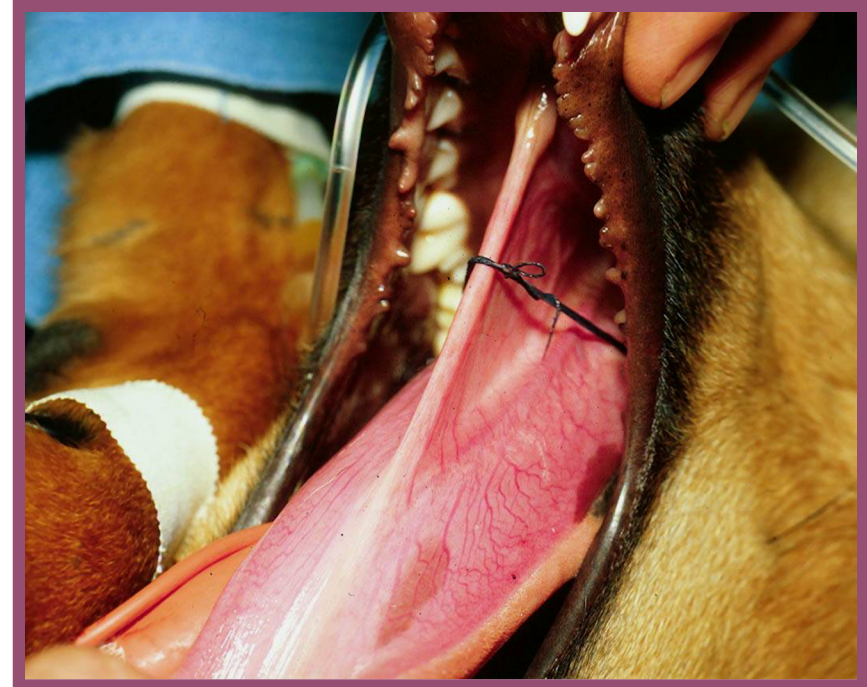


Gastrointestinal foreign bodies in dogs and cats: a retrospective study of 208 cases

(Hayes, G JSAP Vol 50, Nov 2009)

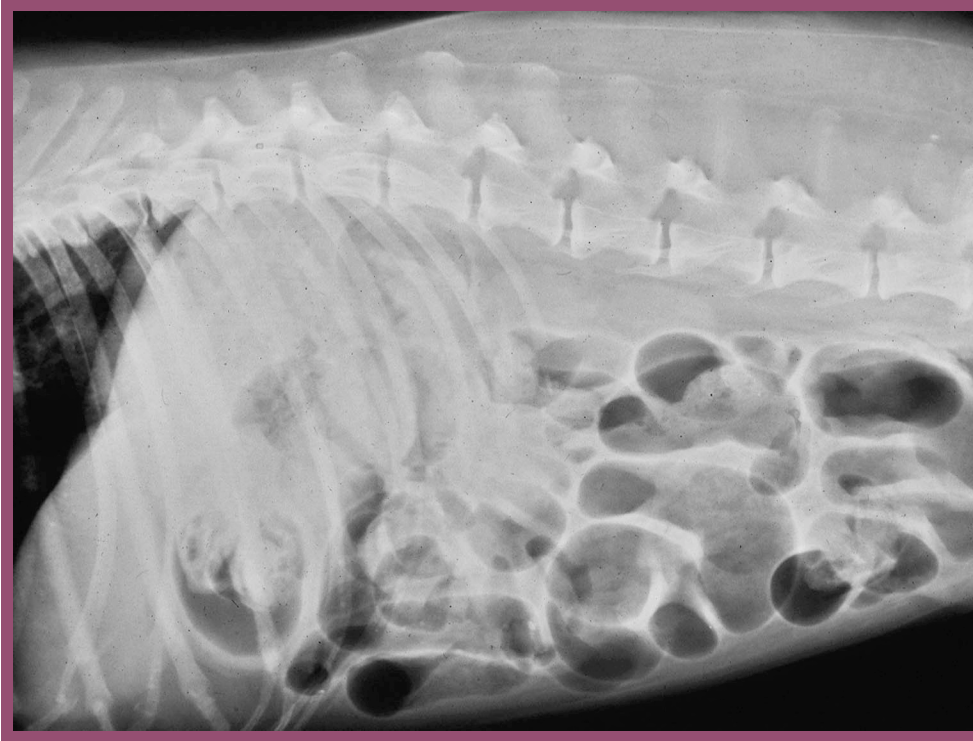
- Linear FB
 - Dogs
 - 16%
 - 67% anchored in pylorus
 - Cats
 - 33%
 - 63% anchored around tongue

Linear foreign bodies

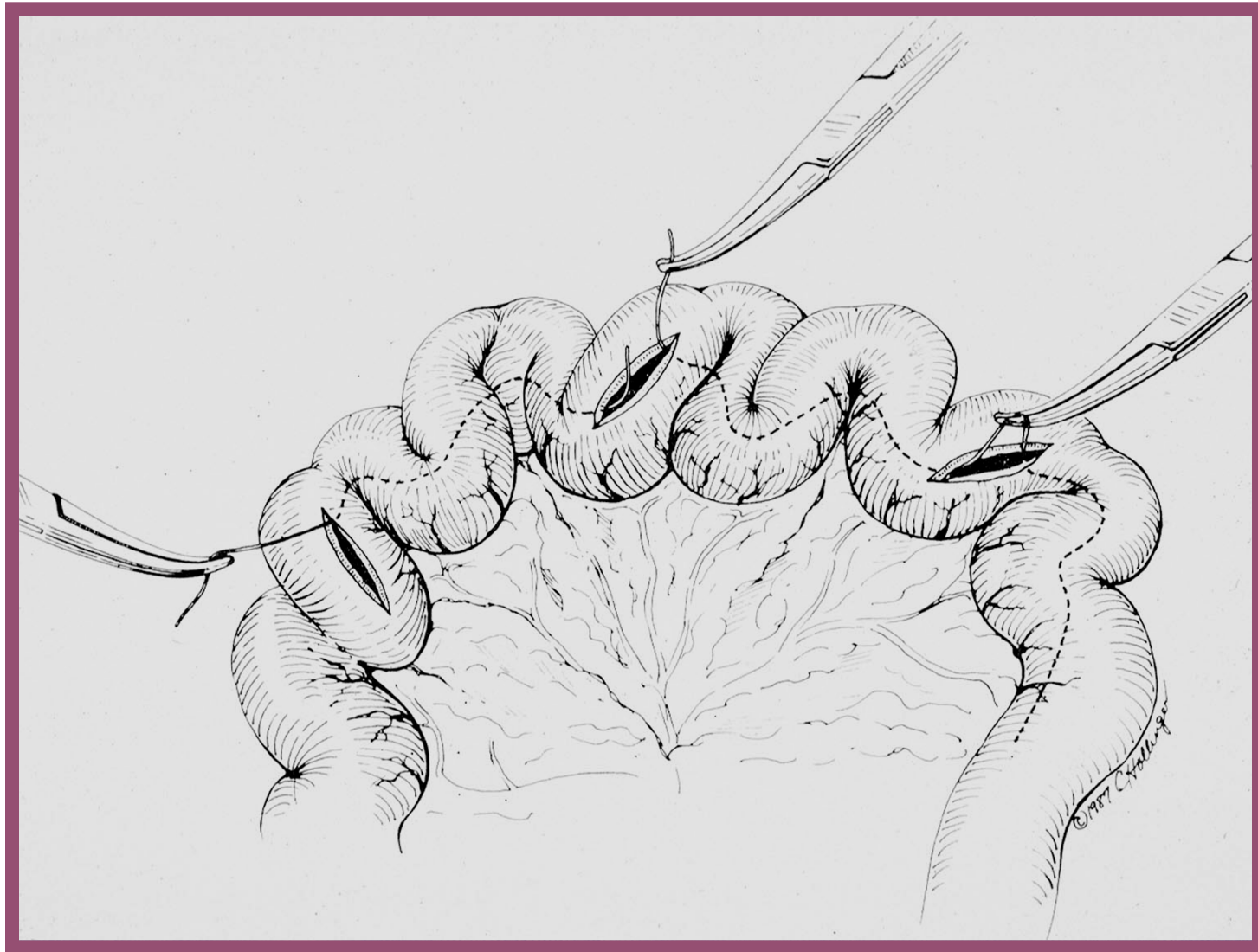


What should we do with the string?

Linear foreign bodies



Linear foreign bodies

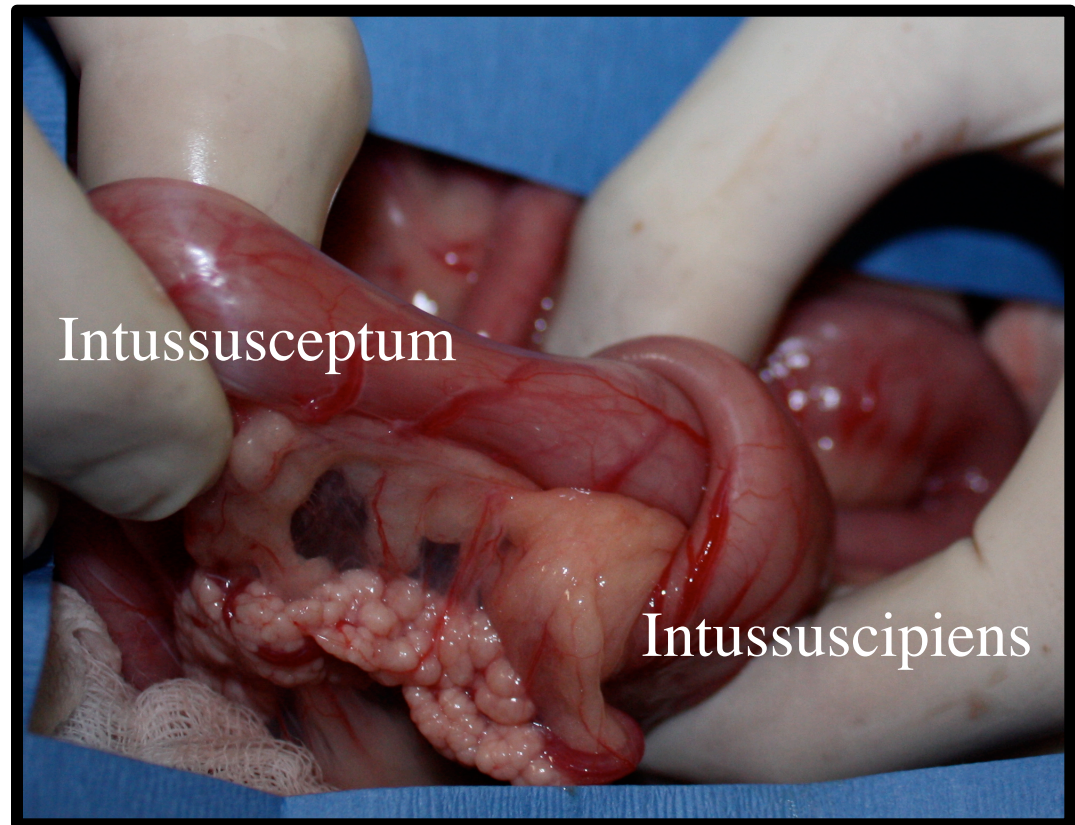


Linear foreign bodies



Intussusception

- Etiology
 - Enteritis
 - Foreign body
 - Neoplasia
- Ileo-colic jct.
- Partial or complete obstruction



Intussusception

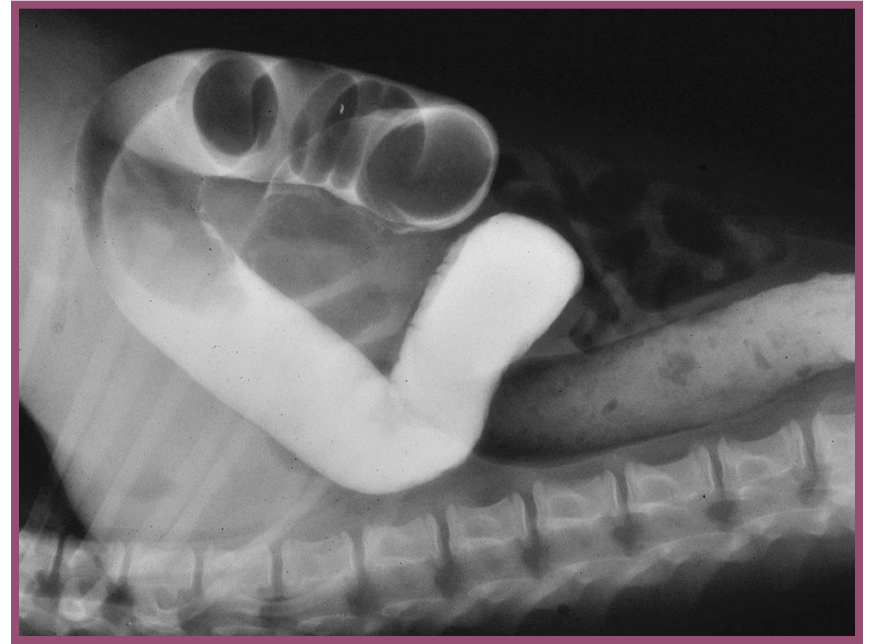
- Diagnosis

- PE

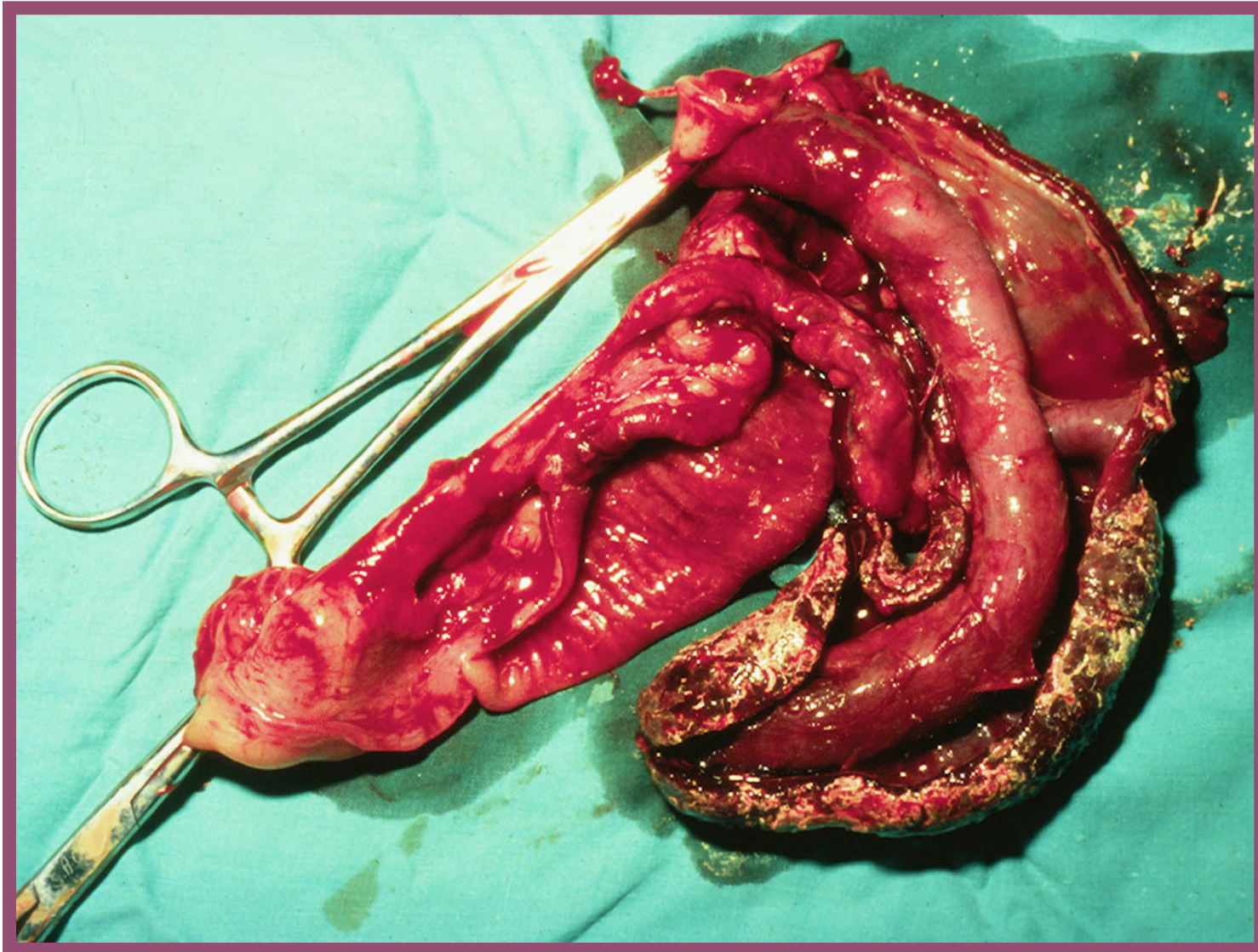
- Sausage-shaped mass

- Radiographs

- Ultrasound



Intussusception



Signalment, history, and outcome of cats with gastrointestinal tract intussusception: 20 cases (1986–2000)

Jamie M. Burkitt, DVM, DACVECC; Kenneth J. Drobatz, DVM, MS, DACVIM, DACVECC;
H. Mark Saunders, VMD, MS, DACVR; Robert J. Washabau, VMD, PhD, DACVIM

JAVMA, Vol 234, No. 6, March 15, 2009

- 10 cats less than 1 yr. old
- Rads and US were effective in dx
- Most common: jejuno-jejunal
- Older cats had IBD or lymphoma

Enteroplication for prevention of intussusception recurrence in dogs

(Oakes, et.al. JAVMA, 1994)

- 31 cases
- 9 plicated: no recurrence
- 21 not plicated: 6 recurred
- No adverse effects of plication



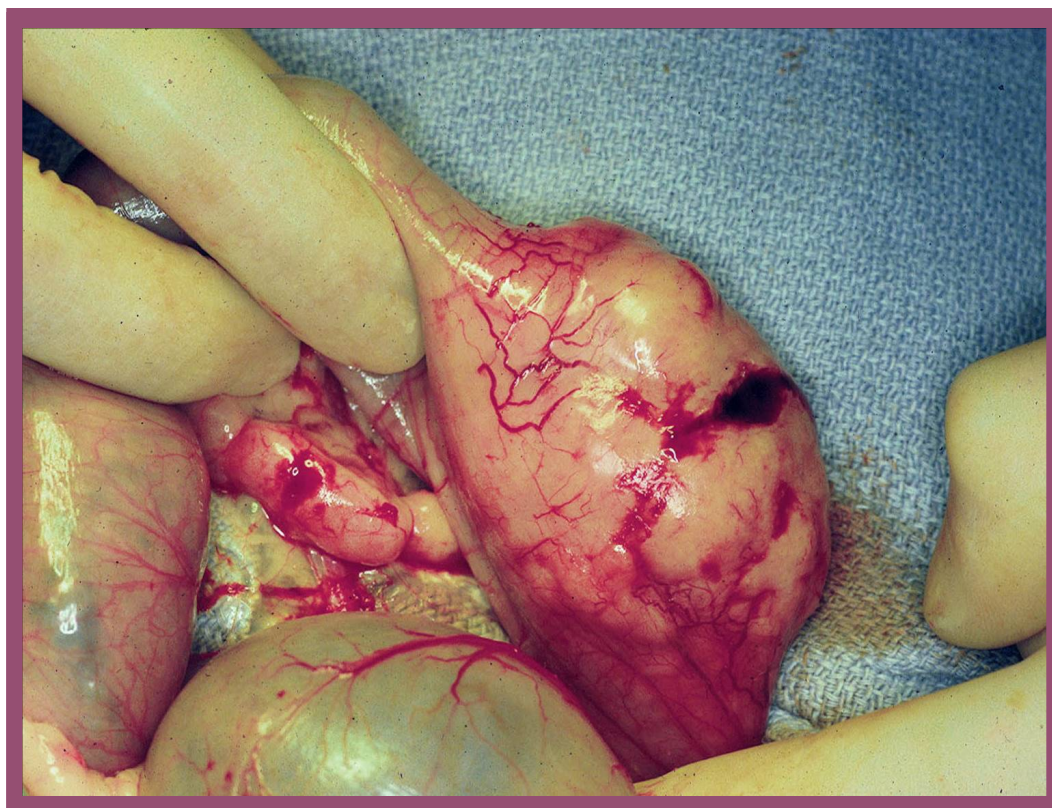
Complications of enteroplication

(Applewhite, et.al. JAVMA, 2001)

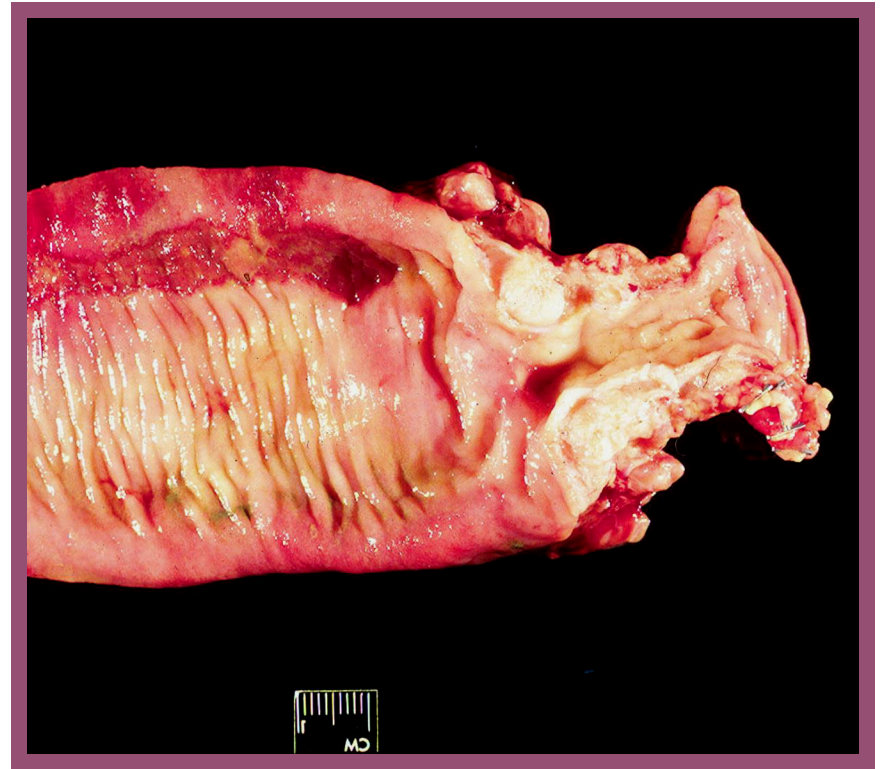
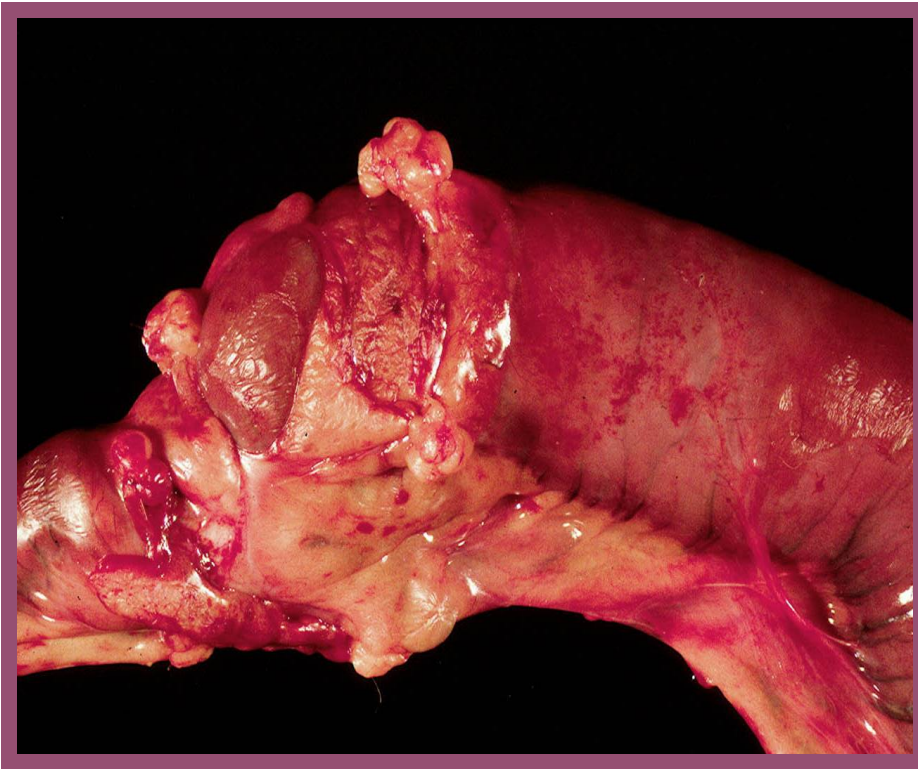
- 35 dogs with intussusception
- Enteroplication: 16
 - No recurrence
- No enteroplication: 19
 - 1 recurrence
- 3 dogs with enteroplication developed intestinal obstruction 1-5 mo. postop

Intestinal neoplasia

- Most common tumors: adenocarcinoma and lymphosarcoma
- Can cause obstruction or perforation



Intestinal neoplasia

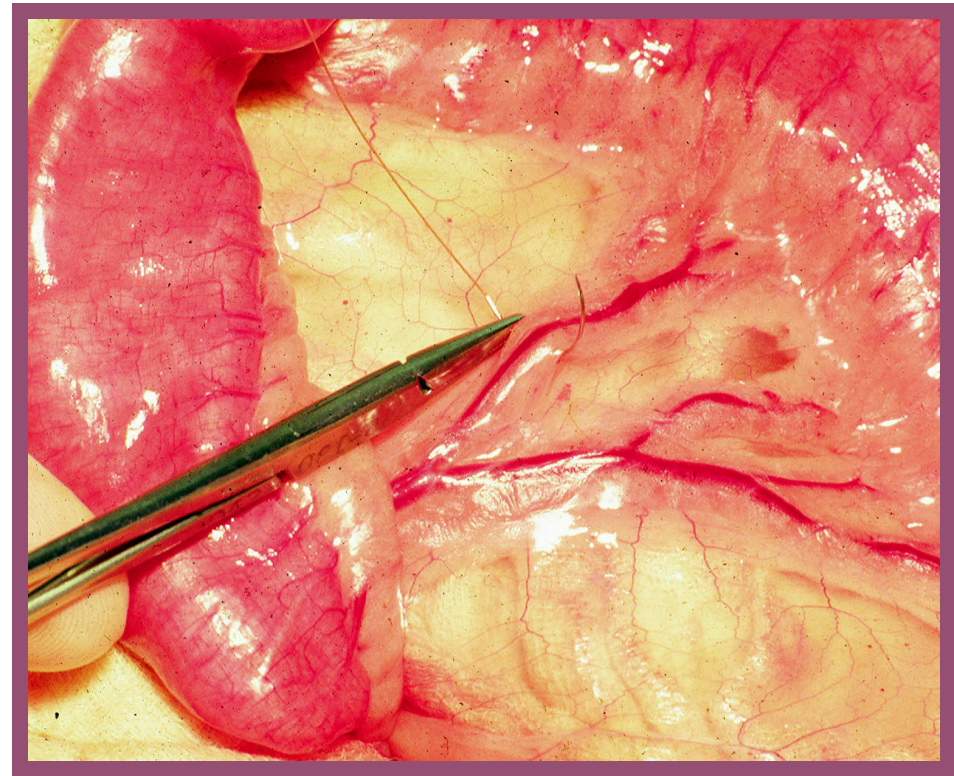
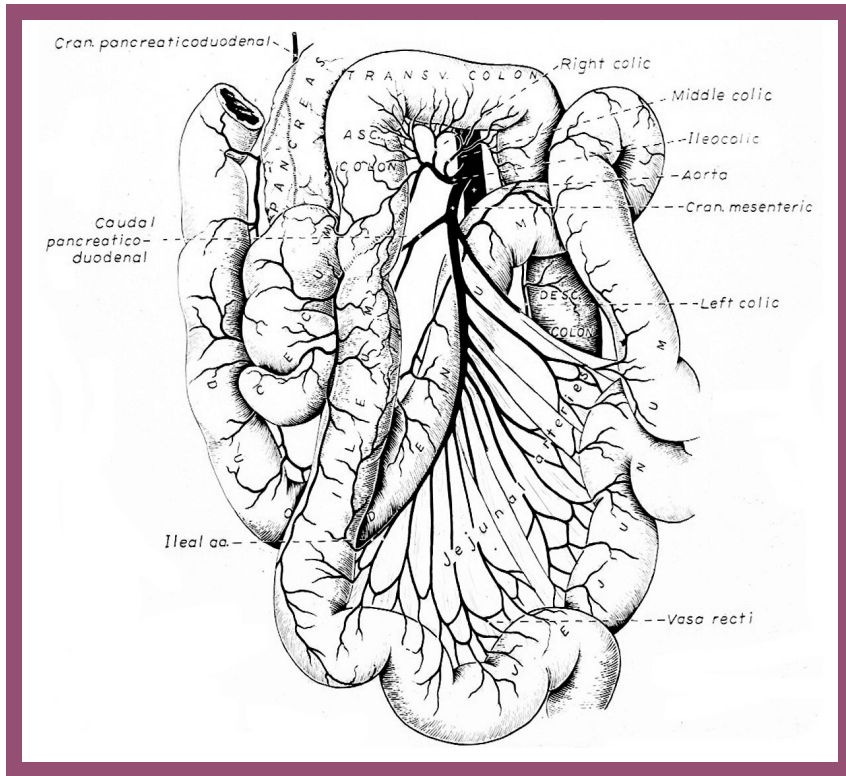


Resection and Anastomosis

- Isolate segment
- Ligate blood supply
- Clamps and fingers
- Anastomosis

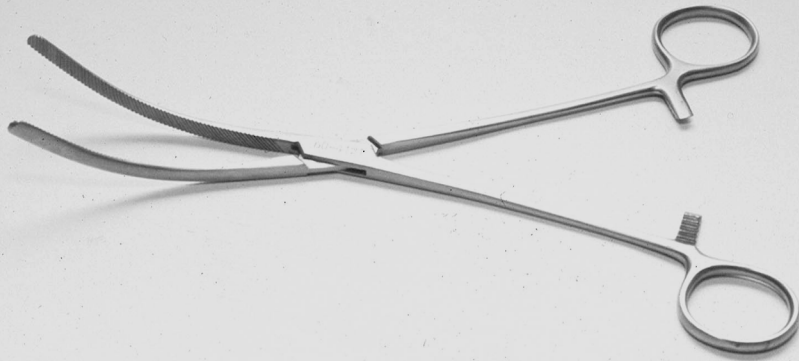


Intestinal resection



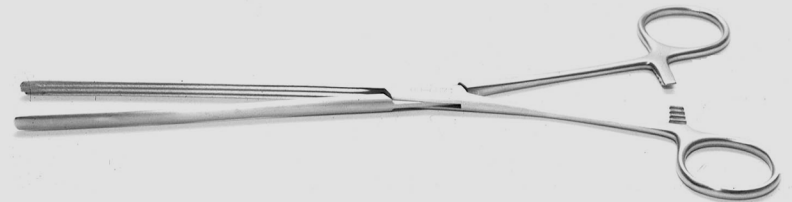
Clamps?

DOYEN INTESTINAL



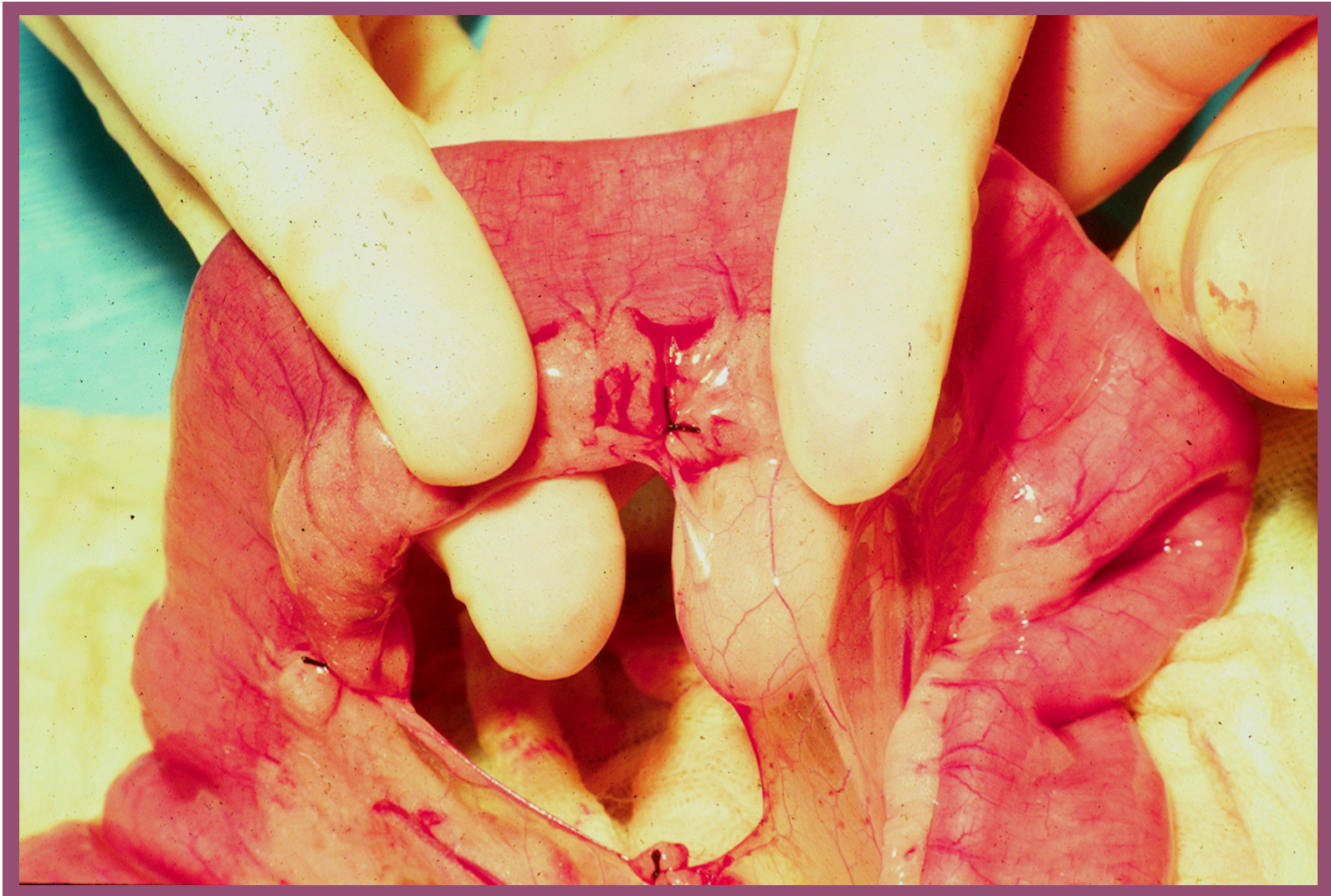
SPECTRUM INSTRUMENTS ORDER NO. 60-4121 (216) 292-7431

KOCHER INTESTINAL



SPECTRUM INSTRUMENTS ORDER NO. 60-6871 (216) 292-7431

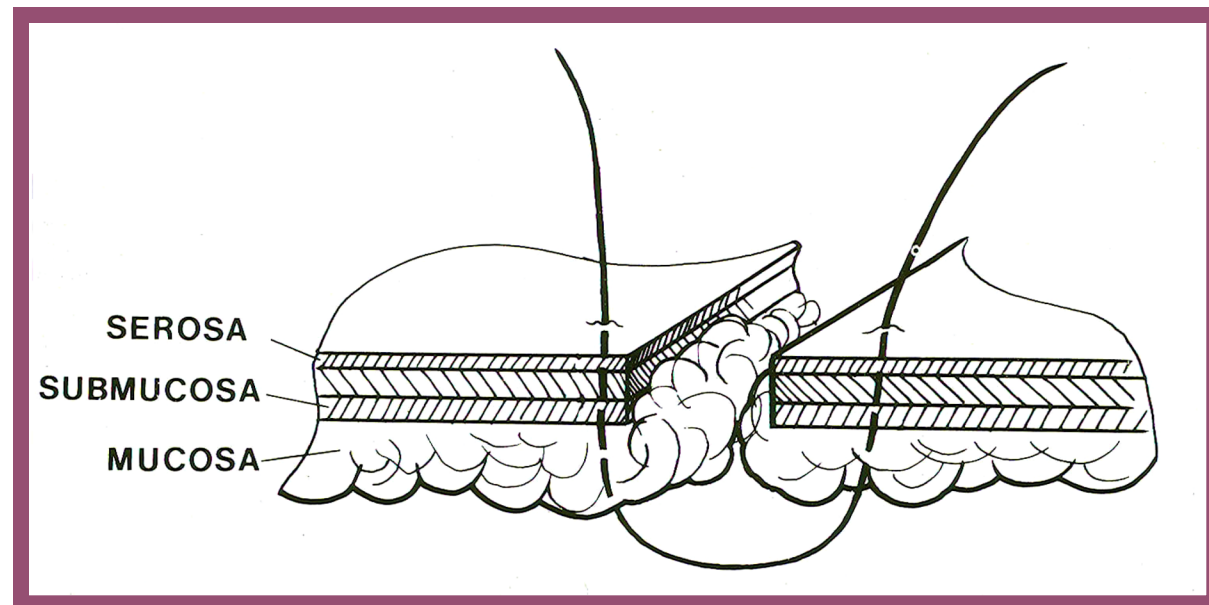
Intestinal resection



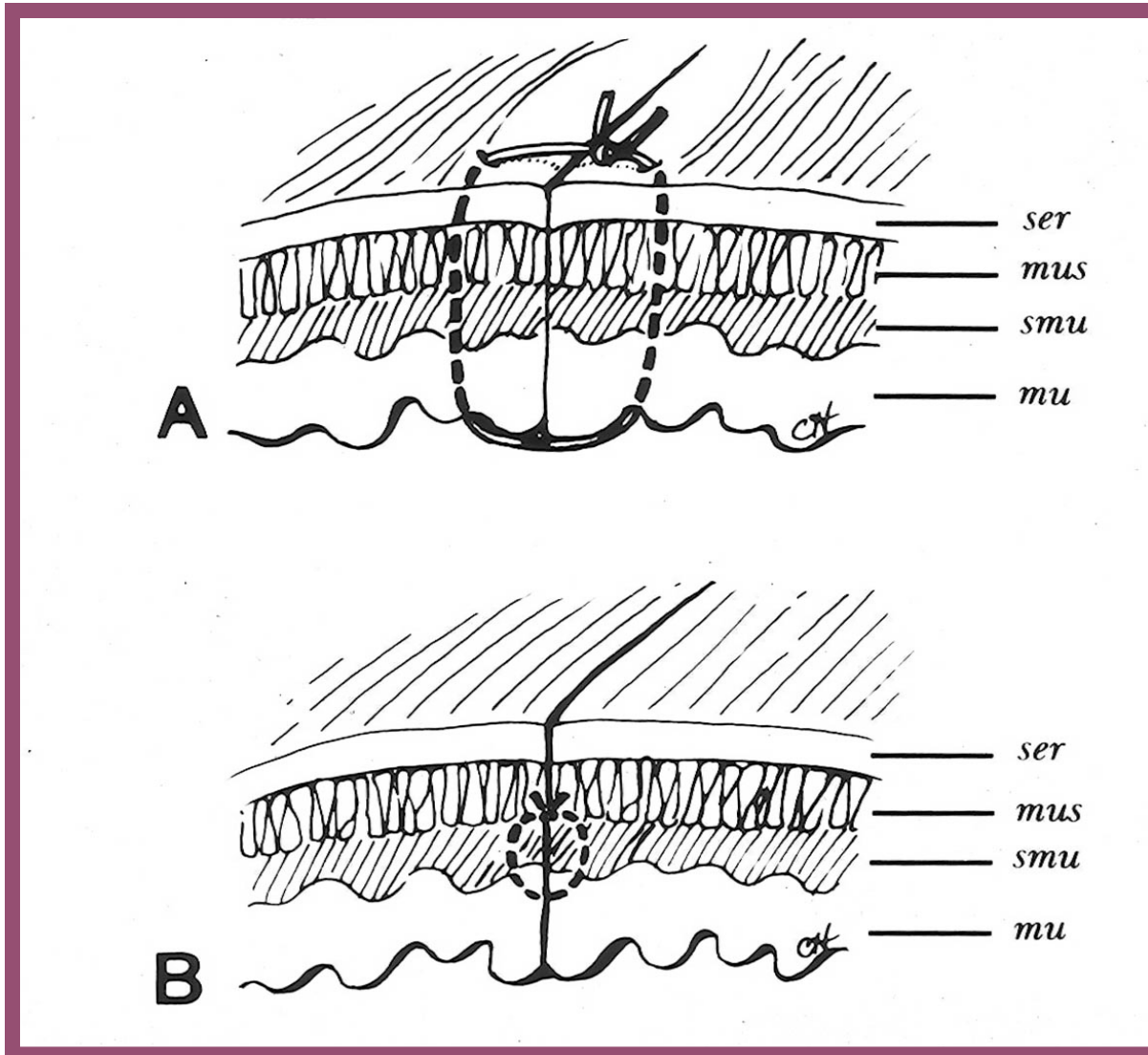
Anastomotic techniques - suture patterns

- Inverting
- Approx-imating
- Simple interrupted
- Simple continuous

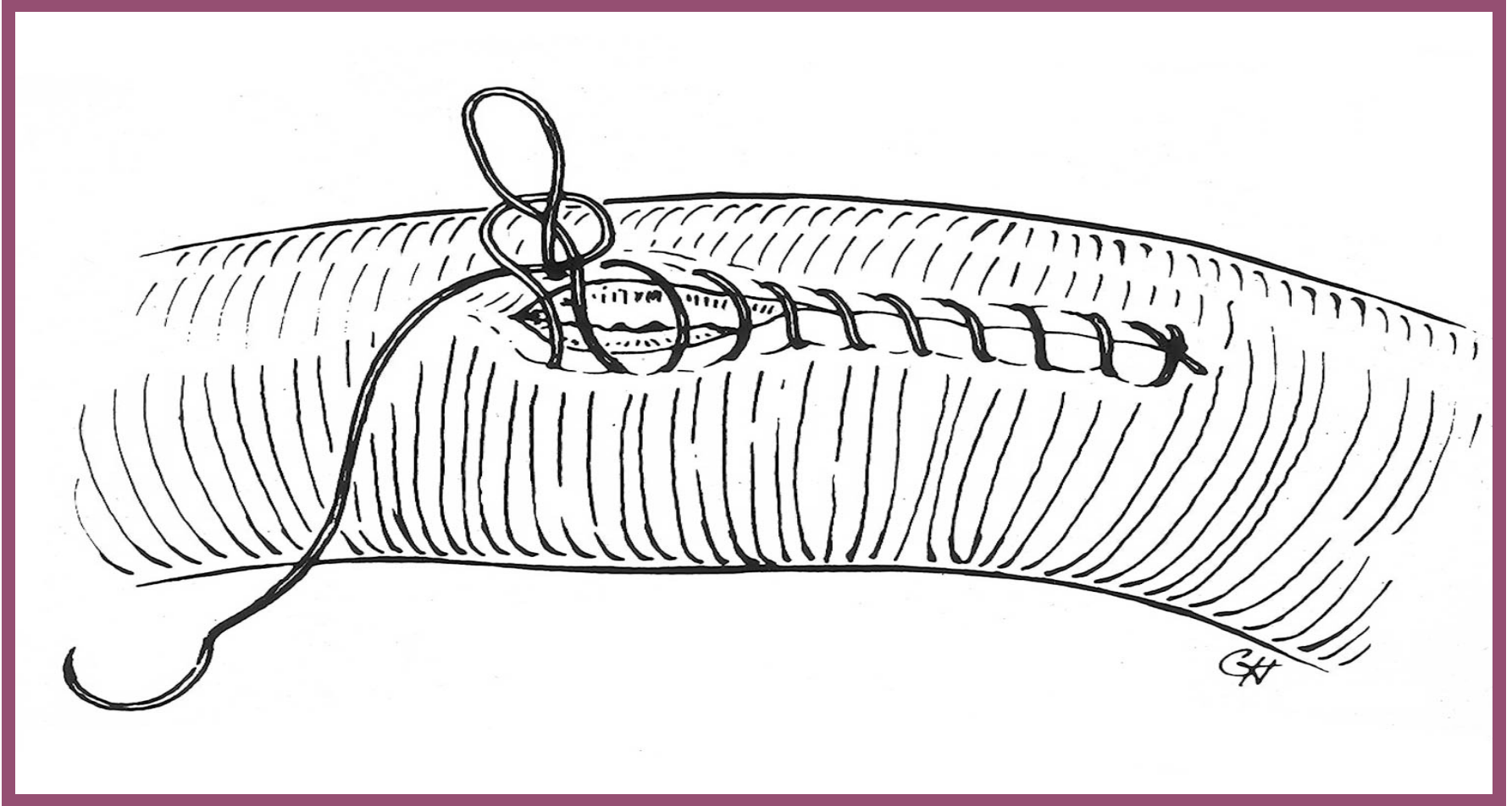
Full thickness



Crushing vs. approximating



Simple continuous



Use of skin staples for rapid closure of gastrointestinal incisions in the treatment of canine linear foreign bodies

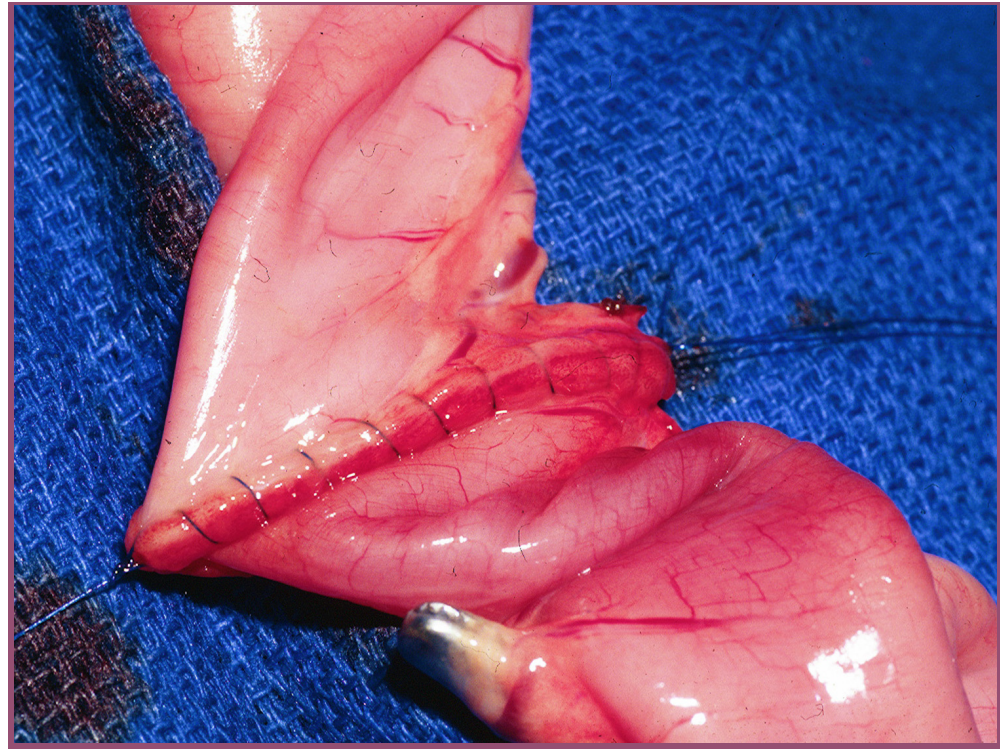
(Coolman JAAHA 2000)

- Disposable skin stapler
 - Gastrotomy
 - Enterotomy
 - Minimizes surgical time
 - 15.9 sec SI
 - 1.2 sec stapler

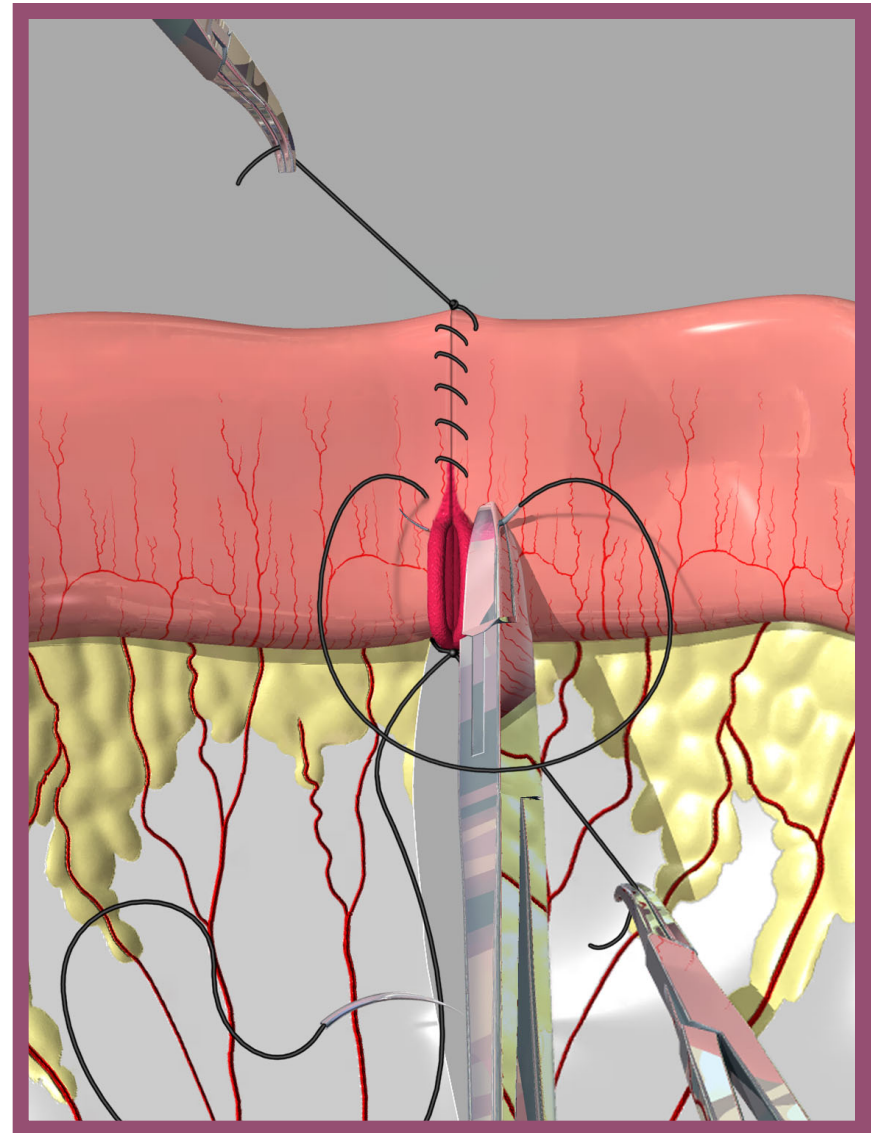
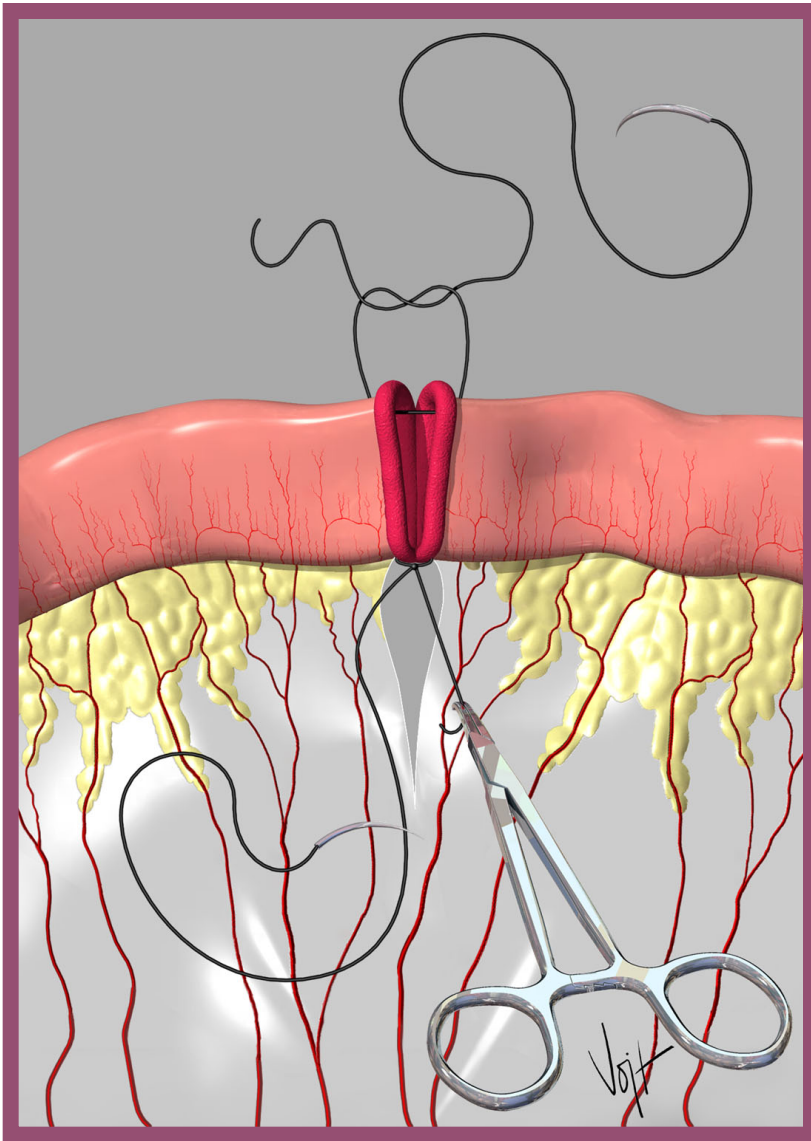
End to end approximating intestinal anastomosis in the dog

Ellison GW, et.al. JAAHA 18:729-736, 1982

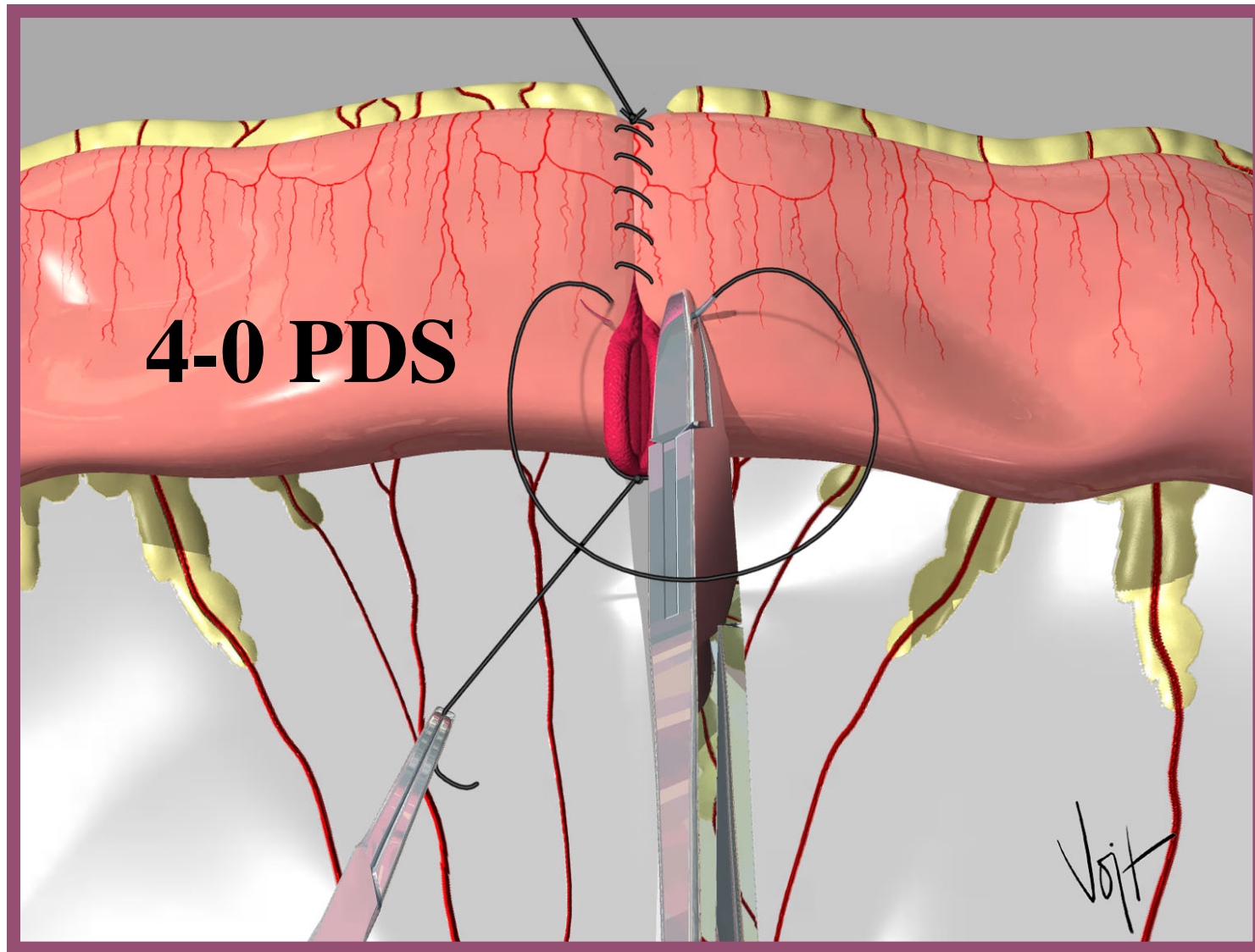
- Compared:
 - SI approximating
 - SI crushing
 - SC approximating
- Evaluated blood flow and healing
- SI (approx), SC: less ischemia
- SC: layers aligned



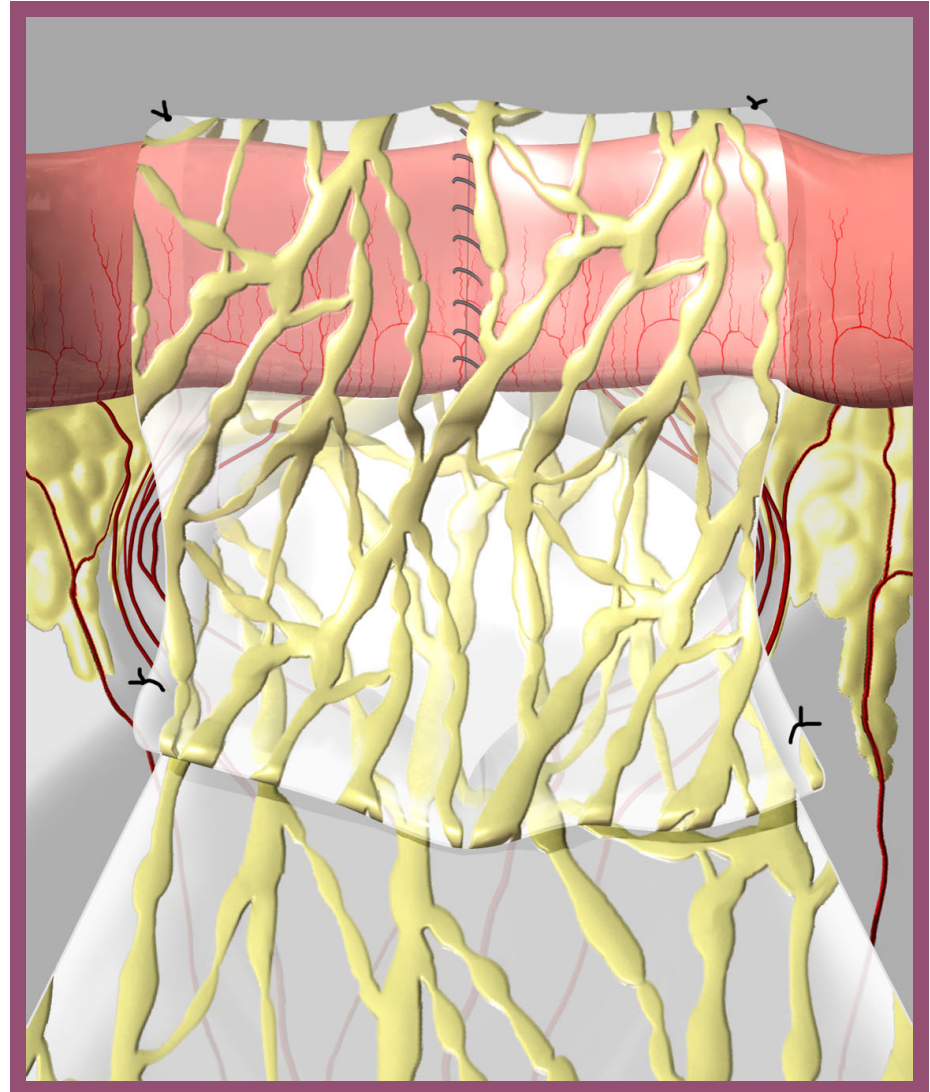
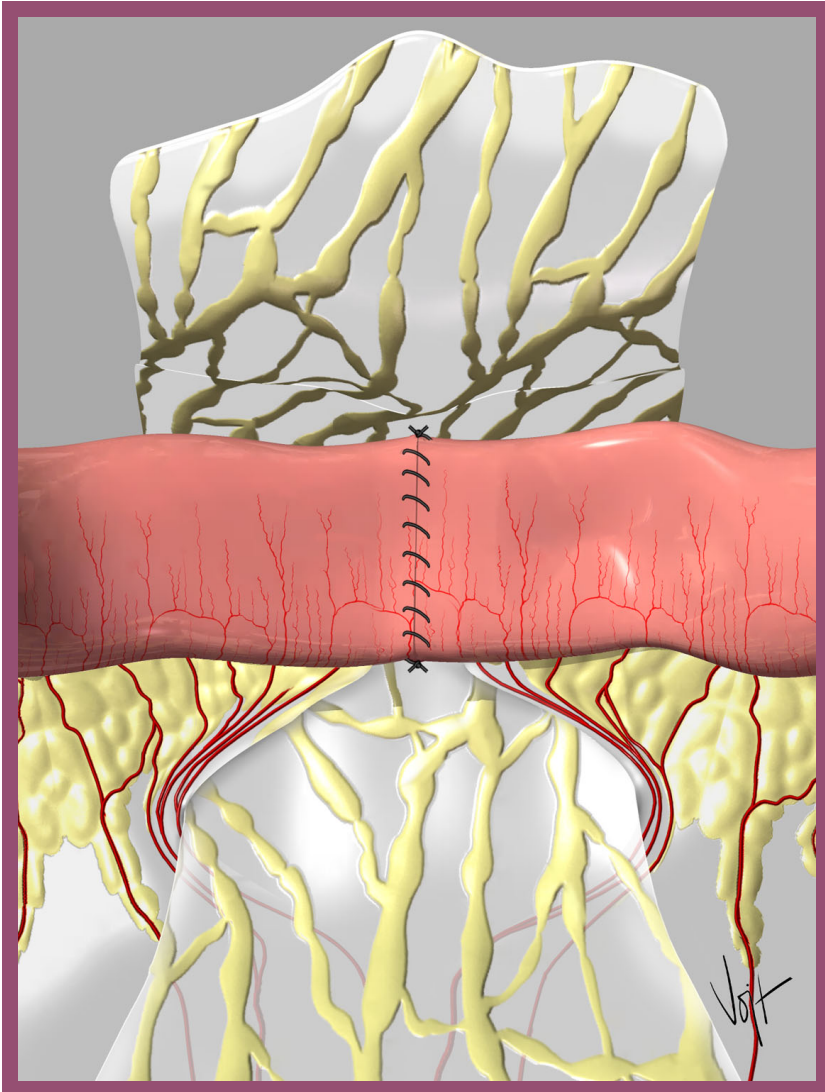
Simple continuous



Simple continuous



Wrap with omentum



Comparison of SI versus SC enteric closure in dogs and cats

(Weisman, Smeak, Birchard, Zweigart JAVMA, 1999)

- 81/83 (98%): no dehiscence
 - Dehiscence
 - 1 enterotomy - SI
 - 1 anastomosis - SC
 - Both were foreign body removal

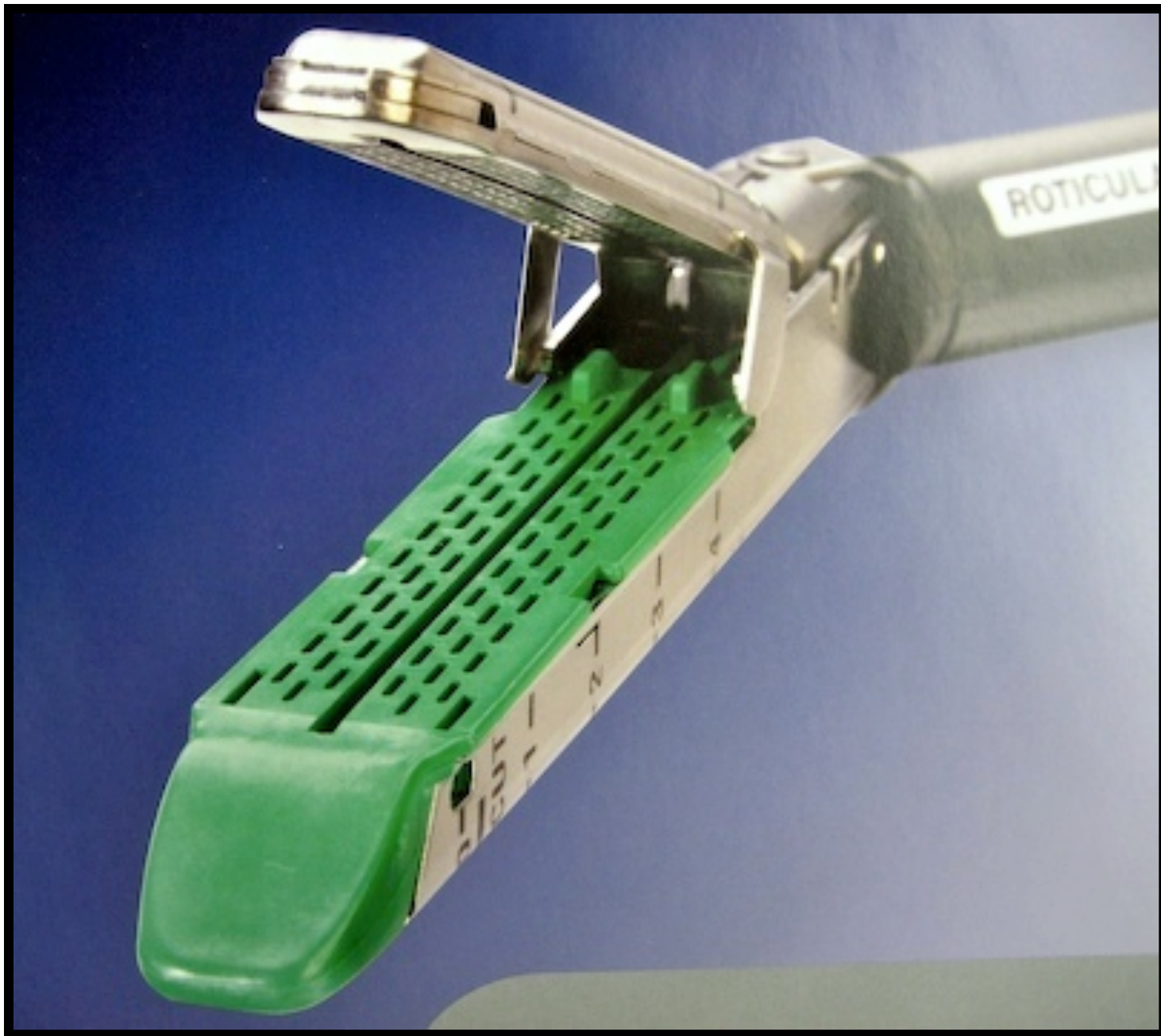
Staplers...

Modified functional end-to-end stapled intestinal anastomosis technique and clinical results in 15 dogs

(White, JSAP 2008)

- Requirements
 - GIA +/-TA

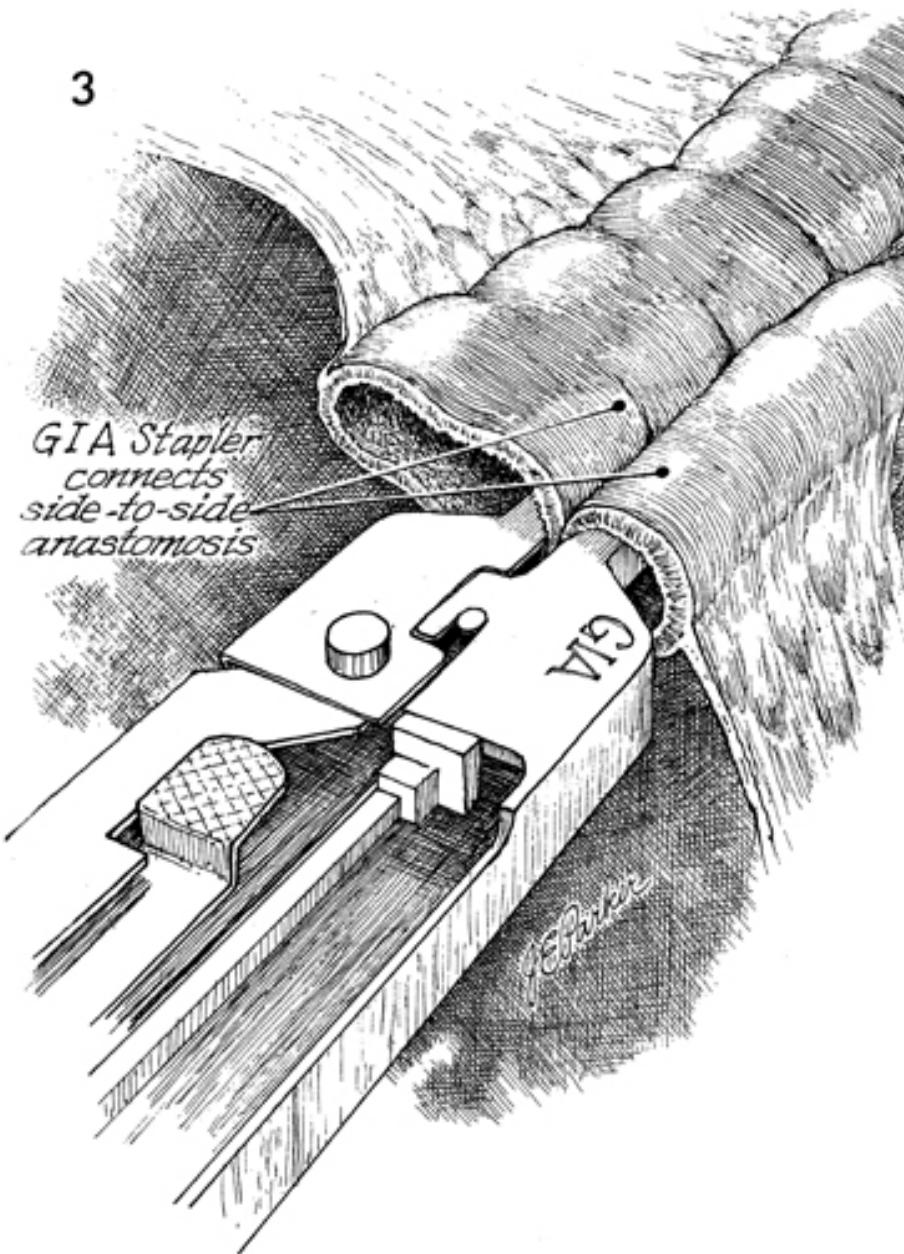






3

GIA Stapler connects side-to-side anastomosis

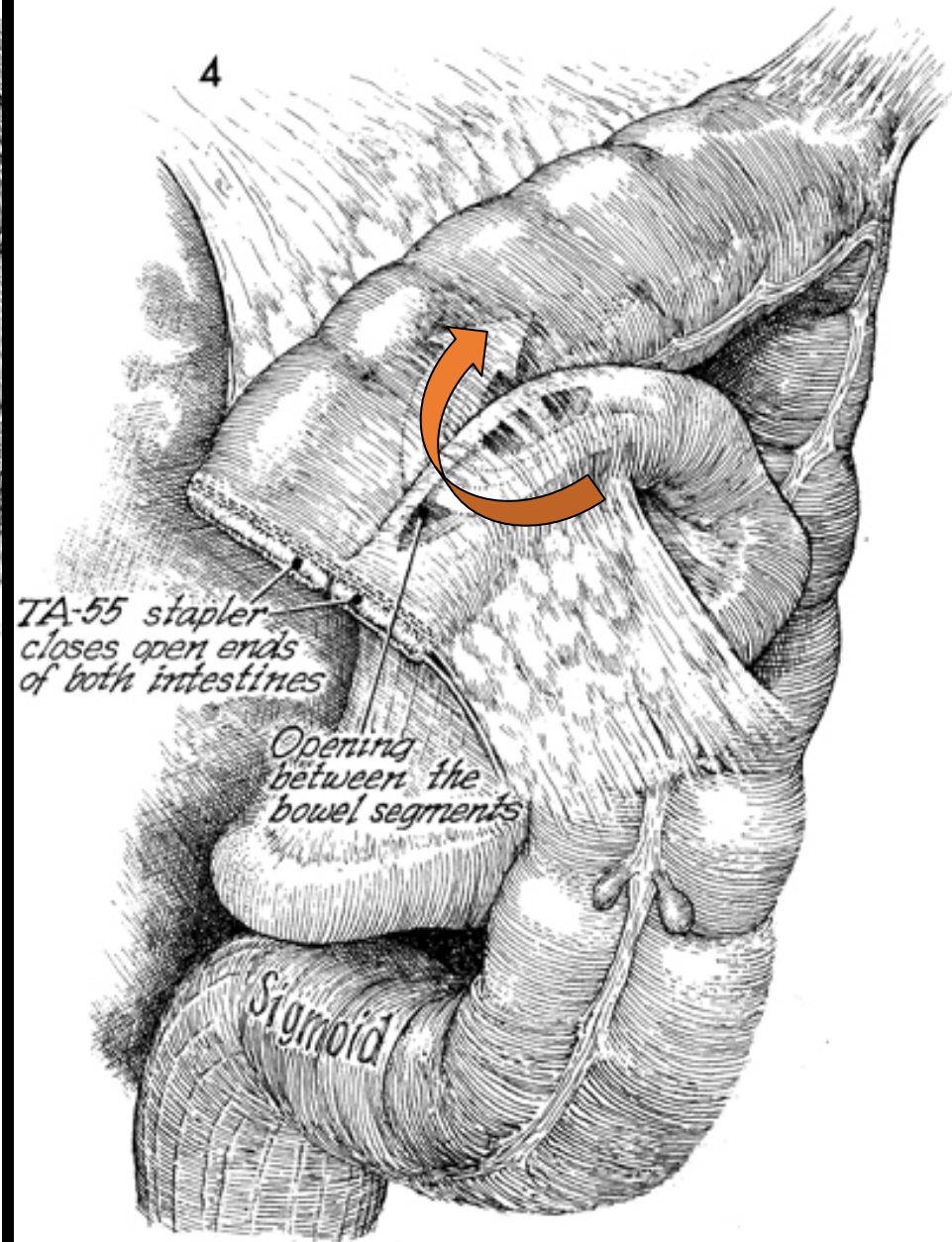


4

TA-55 stapler closes open ends of both intestines

Opening between the bowel segments

Sigmoid



Skin staples for intestinal anastomosis

Coolman BR et.al. Vet Surg 29: 293-302, 2000

- Cadavers and live animals
- Compared to hand sutured
- No difference in healing
- Less time with staples



I can't believe he ate the whole thing...

- Extensive small bowel resection in dogs and cats: 20 cases (1998-2004) Gorman et al JAVMA vol 228 Feb 2006
 - Massive (50-90%, mean 68%) small intestinal resection
 - Most had good outcome
 - Amount resected did not correlate with Px

Short Bowel Syndrome

- Chronic diarrhea
- Fluid and electrolyte abnormalities
- Weight loss

Adaptive Changes

- Compensatory growth of remaining intestinal segment
- Increase in mucosal surface area
 - Dilatation
 - Lengthening
 - Thickening
 - Epithelial cell proliferation in crypts and migration into villi

Postoperative Care

- Oral intake
 - *Water -12 hrs.*
 - *Food - 24 hrs.*
 - GI diet*
- Supportive Care
 - *Analgesics*
- Monitor TPR, electrolytes, hydration

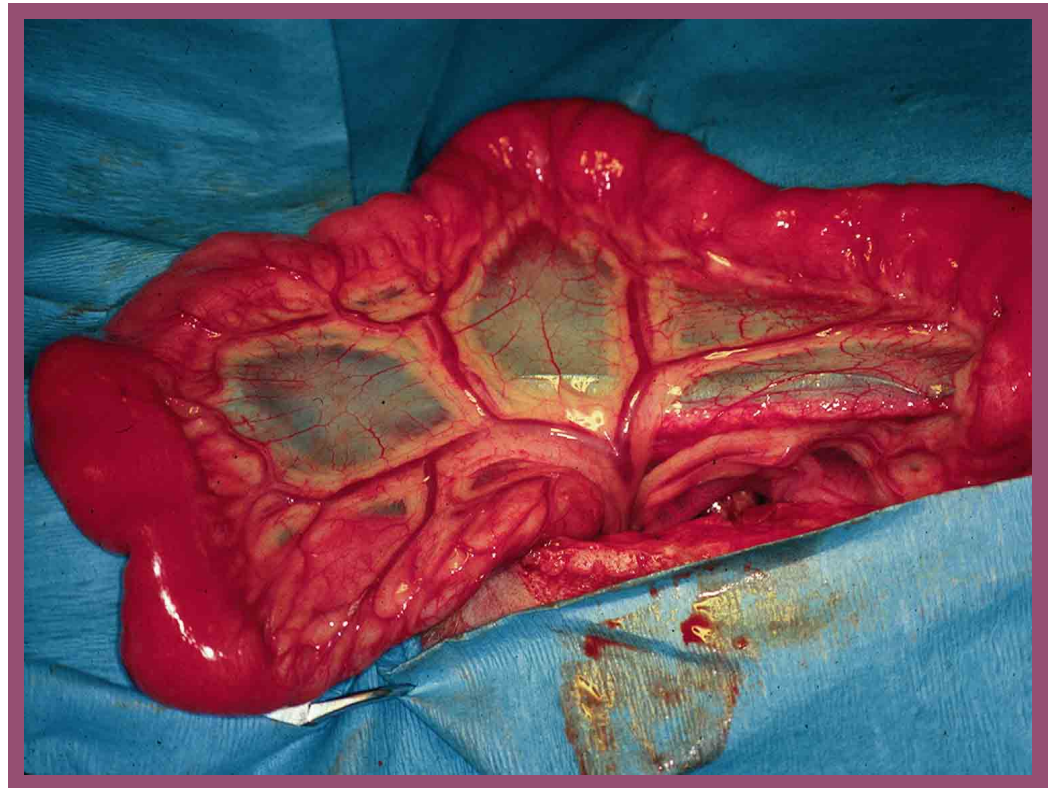


...Antibiotics...?



Complications

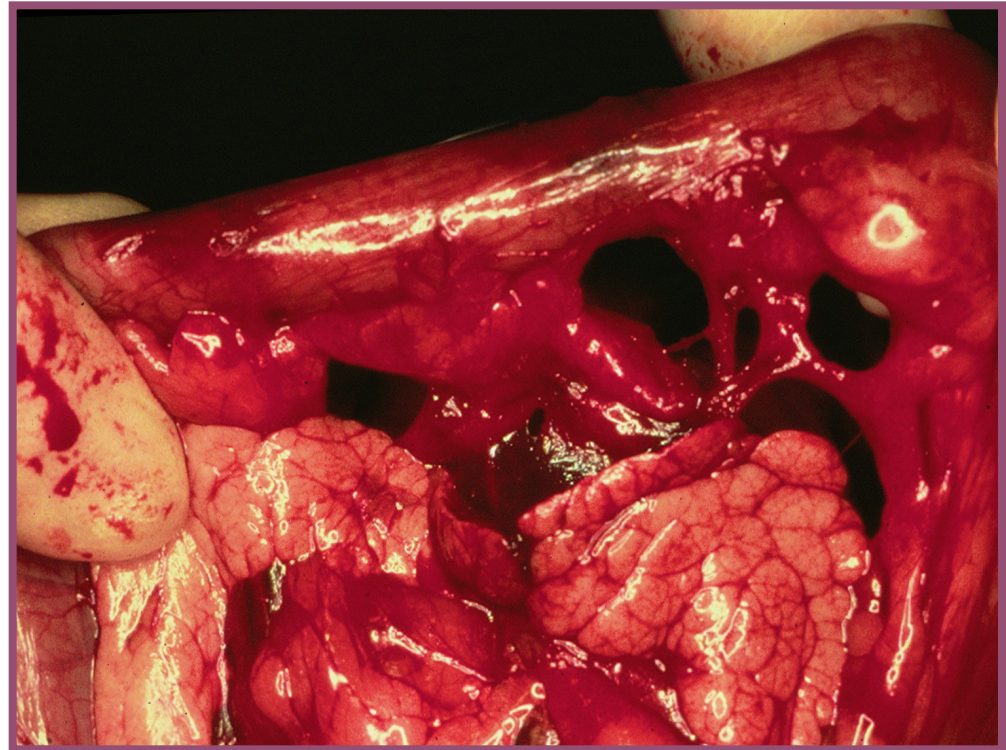
- Peritonitis
- Ileus
- Adhesions
- Malabsorbption



Small intestinal dehiscence

Allen DA, et.al. JAAHA 28: 70-76, 1992

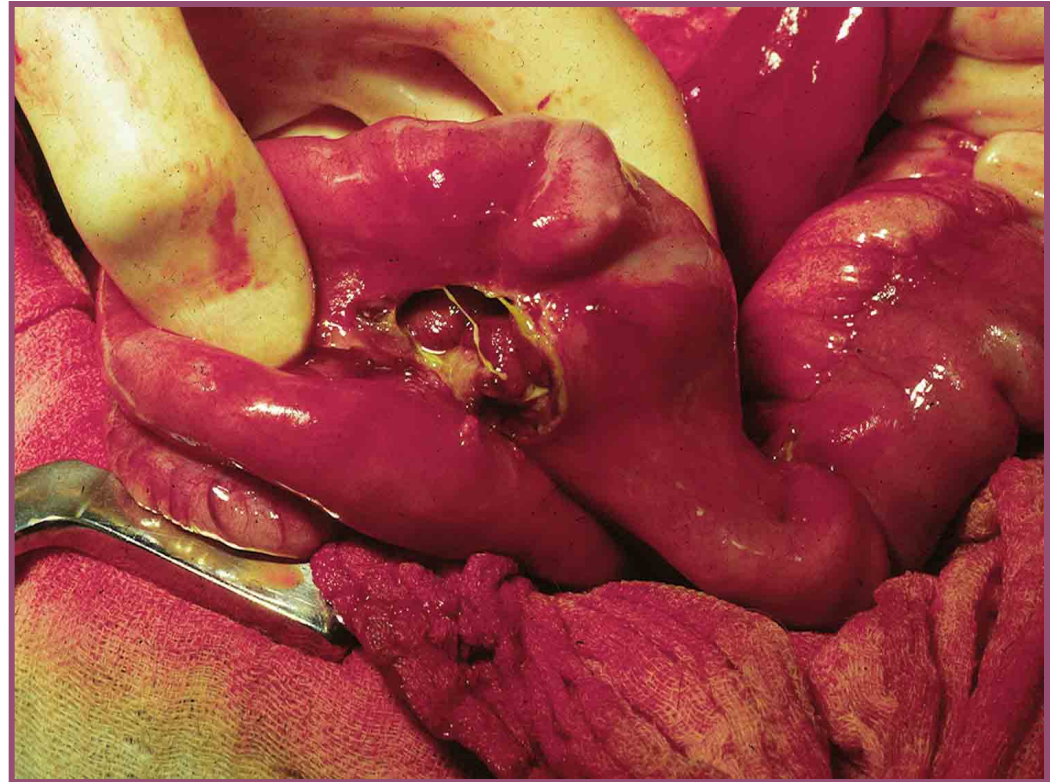
- 121 dogs
- Dehiscence in 16%
- Higher in trauma and foreign bodies
- Higher band neutrophil counts
- *74% mortality in dehiscence group*



Leakage Risk Factors

Ralphs SC, et.al. JAVMA 223:73-77, 2003

- 13 of 90 dogs had leakage
- High risk: 2 or more of the following factors
 - Pre-op peritonitis
 - Foreign body
 - Albumin less than 2.5g/dl



Key Points

- Assess viability
- Atraumatic handling of tissues
- Submucosa
- Postop care
 - Monitoring
 - Fluids/electrolytes



QUESTIONS?

