Common Gastrointestinal Surgery

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Providing the best quality care and service for the patient, the client, and the referring veterinarian.
Gastrointestinal tract

- Oral cavity
- Esophagus
- Liver
- Stomach
- Pancreas
- Small Intestines
- Cecum/Colon
- Rectum/Anus
Gastrointestinal tract

- **Stomach**
  - Gastrootomy
  - Gastropexy

- **Small Intestines**
  - Enterotomy
  - Resection & Anastomosis

- **Large Intestines/Colon**
  - Resection & Anastomosis
Prep/Approach

- Complete ventral abdominal shave
  - Extending cranial to xiphoid and caudal to the pubis
  - Lateral margins to the mid-body
- Mid-line celiotomy incision
  - From xiphoid to caudal umbilicus
Materials/instruments

- Balfour retractors
- Scapel blade holder
- Metzenbaum scissors
- Mosquito hemostats
- DeBakey forceps
- Lap sponges
- Suction w/ Poole tip
Stomach

- **Rapid healing**
  - Robust blood supply
  - Gastric acidity – reduced bacterial load
  - Quickly regenerating epithelium

- **Holding layer**
  - Submucosal layer

- **Suture material**
  - Absorbable (PDS, Maxon, Monocryl)
  - Taper needles
  - Avoid chromic gut and non-absorbable sutures
Gastrotomy

- Adequate exteriorization
- Abdominal cavity packed off with laparotomy pads
- Site of gastrostomy incision
  - Mid-body
  - Half way between greater and lesser curvatures of the stomach
Gastrotomy

- Stay sutures with 3-0 or 2-0 PDS at ends of the proposed gastrotomy incision
Gastrotomy

- Once secured, elevate the stay sutures while making a stab incision with a #11 blade
- Extend the gastrotomy with metzenbaum scissors
Gastrotomy

- Foreign body removal with either carmalt, Allis tissue forceps, or your double gloved hand
- Ensure the abdominal cavity is packed off with lap sponges to minimize contamination
Gastrotomy

- Closure of the mucosa/submucosa layer with simple continuous
- Lavage after closure of this layer prior to closure of second layer
Gastrotomy

- Second layer (muscularis and serosa) can be closed as simple continuous or an inverting pattern (Cushing)
Gastropexy

- Permanent adhesion to the body wall
  - prevent occurrence or recurrence of GDV (pyloric antrum; right)
  - prevent hiatal herniation (fundus; left)

- Types of gastropexies
  - Muscular flap/Incisional
  - Belt-loop
  - Circumcostal
  - Gastrostomy-tube
  - Incorporating (not recommended)
Gastropexy

- Site of gastropexy incision
  - Antrum
  - Half way between greater and lesser curvatures of the stomach
Gastropexy

- Palpate the seromuscular layer allowing the mucosal/submucosal layer to slip
- Incise just the seromuscular layer ~5cm in length
Gastropexy
Gastropexy

- Place a towel clamp on the right abdominal wall/edge to elevate
Gastropexy

Proposed body wall incision 6-10 cm lateral to ventral midline, caudal to the last rib
Gastropexy

- Appose the peritoneal and gastric wall incisions w/ 2-0 or 0 PDS or non-absorbable
Gastropexy

- Start at cranial edge of DORSAL incisions, suturing caudally
Gastropexy

- Then, caudal to cranial for the ventral edge
Gastropexy

- Ensure that the positioning of the pylorus is normal, verify that there isn’t an acute bend/kink
Small Intestines

- **Healing**
  - Blood supply
  - Accurate apposition
  - Atraumatic technique

- **Holding layer**
  - Submucosa – greatest tensile strength

- **Risk factors for dehiscence**
  - Infection (septic abdomen)
  - Hypovolemia/shock
  - Hypoproteinemia

- **Timeframe for dehiscence**
  - 3-5 days post-op
  - End of lag phase of healing
Enterotomy

- Adequate exteriorization
- Abdominal cavity packed off with laparotomy pads
- Site of enterotomy incision
  - Aborad to the obstruction on anti-mesenteric side
Enterotomy

- Gently milk the foreign object towards the enterotomy site
- If difficult, extend the incision orad with metzenbaum scissors or use hemostats to grasp the object to remove through the enterotomy
Enterotomy

- Avoid grasping the incised edge to avoid trauma
- 3-0 PDS in large dogs
- 4-0 PDS in small dogs & cats
- Closure either simple continuous or simple interrupted
- Bites should be at least 2mm from the cut edge and 2mm apart
Enterotomy
Enterotomy

- Full thickness (holding layer is the submucosa)
- Leak test with 25 gauge needle and 12 cc syringe containing sterile saline
- Long suture tags to allow omentum to attach
Linear foreign bodies

- Check the base of the tongue
- Anchor points either the base of the tongue or stomach (pylorus)
- In my opinion, do not cut the string prior to surgery if caught at the base of the tongue
  - Perform gastrotomy, identify the linear object, then cut and ask anesthetist to remove through the mouth
  - Alleviating the anchor point will possibly allow removal through a single gastrotomy
  - Severe plications may require multiple enterotomies
  - Check the mesenteric side for perforations
Resection/Anastomosis

- Indicated w/ necrotic tissue appearance
  - Paper thin w/ black/grey color
- Severe perforations
- Deep red or purple may still be viable
  - Allow for some time to reperfuse
  - Finish remainder of explore and re-examine
- Intestinal masses
  - 4-8 cm margins of normal appearing intestine
  - Safely remove up to 70% of intestine before developing short bowel syndrome
Resection/Anastomosis

- Make windows into the mesentery to double ligate the mesenteric artery, ligate the arcuate arteries
- Milk intestinal contents away from proposed resection site
- Atraumatic forceps applied to the tissue remaining (Doyens, Cooley, Satinsky) or bobby pins or assistant fingers
Resection/Anastomosis
Resection/Anastomosis

- Sutures placed at the mesenteric and anti-mesenteric end first
- Maintain orientation
- Closure can be performed as a simple continuous or simple interrupted
Resection/Anastomosis

- **Suture material**
  - 3-0 PDS for dogs
  - 4-0 PDS for small dogs & cats
Resection/Anastomosis

- Leak test (25 gauge needle)
- Placement of additional single interrupted sutures
Resection/Anastomosis

- Closure of mesenteric rent to avoid future strangulation of intestinal loops
Luminal disparity

Wedge/fish mouthing

Angling
Colon

- **Healing (< intestine)**
  - Blood supply
  - Accurate apposition
  - Atraumatic technique
  - Tension free closure

- **Holding layer**
  - Submucosa – greatest tensile strength

- **Increased risk for dehiscence**
  - Poor collateral blood supply
  - Large bacterial load
  - Increased intraluminal pressure (fecal bolus)
Colonotomy

- DON’T DO IT!
- Only three indications to cut into the colon
  - Subtotal colectomy for feline megacolon
  - Colonic mass
  - Intussusception
Colonic Resection/Anastomosis
Perforation/Septic abdomen

- Abdominal Lavage w/ sterile saline (200mLs/kg)
- Culture
- Abdominal drainage
  - Jackson-Pratt drain
- Continued care at a 24 hour facility
Negative explore

- Gastrointestinal biopsies
- Gastric
  - Small gastrostomy, remove a full thickness wedge
- Intestinal
  - Skin punch 4mm or 6mm
Biopsies

- Intestinal
  - Wedge technique using a suture
**Biopsies**

- Closure in transverse plane
  - Avoid decrease in luminal diameter
Post-operative treatment

- Analgesia
  - Hydromorphone
  - Oxymorphone
  - Fentanyl

- Intravenous fluids
  - Provide perfusion to promote healing

- Dextrose supplementation
  - Small young patients have decreased ability for gluconeogenesis
  - Septic patients

- Gastroprotectants
  - Famotidine 0.5mg/kg IV q 12hrs

- Anti-emetics
  - Dolasetron 0.6mg/kg IV q 24hrs

- Antibiotics
  - Perioperative antibiotics (Cefazolin 22mg/kg IV ~30minutes prior to surgery & q 2hrs)
  - Post-operative antibiotics?
Post-operative treatments

- NUTRITION!!!
- Enterocytes receive nutrients directly from enteral feedings
- Primary energy source is glutamine
- Provide food and water at approximately 12 hours after surgery
- Avoid hypoalbuminemia
  - Increases risk of dehiscence
- Feeding tubes
  - Nasogastric tubes
  - Esophageal feeding tubes