

FURST AID: PREVENTING AND TREATING COLIC IN HORSES

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Oregon State
University

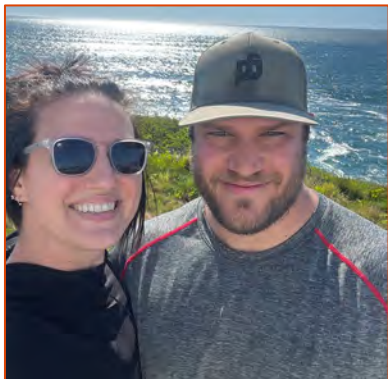
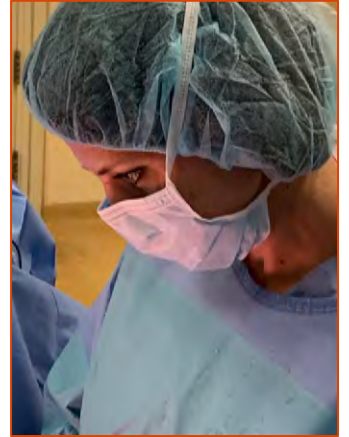
The presenter has no conflicts of interest to disclose

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Surgical photos are included – please be advised

Introduction

- DVM – University of Minnesota CVM, 2017
- Internships – Stillwater Equine Vet Clinic (MN), Tufts Cummings SVM (MA)
- Equine/Large Animal Surgery Residency – Oklahoma State CVM, 2019-2022
- Master of Science, Vet. Biomedical Sciences – Oklahoma State University, 2022
- Instructor, Large Animal Emergency – Oklahoma State CVM, 2022-2023
- Diplomate Am. Coll. Veterinary Surgeons, Feb 2023
- Assistant Clinical Professor, Large Animal Emergency – Oregon State CCVM, May 2023 - Present



Overview

- Defining colic
- How to respond
- Involving your veterinarian
- Referral to a veterinary hospital
- Surgical vs. medical colic
- Current cost of care
- Prognosis
- Prevention



Question

- How many of you have dealt with colic in your horse before?
- Has anyone lost a horse to colic?

Question

- Which of the following are potential causes of colic signs in the horse?
 - A. “Twisted gut”
 - B. Impaction
 - C. Scrotal hernia
 - D. Chronic kidney disease
 - E. Any of the above

Question

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Colic – What is it?

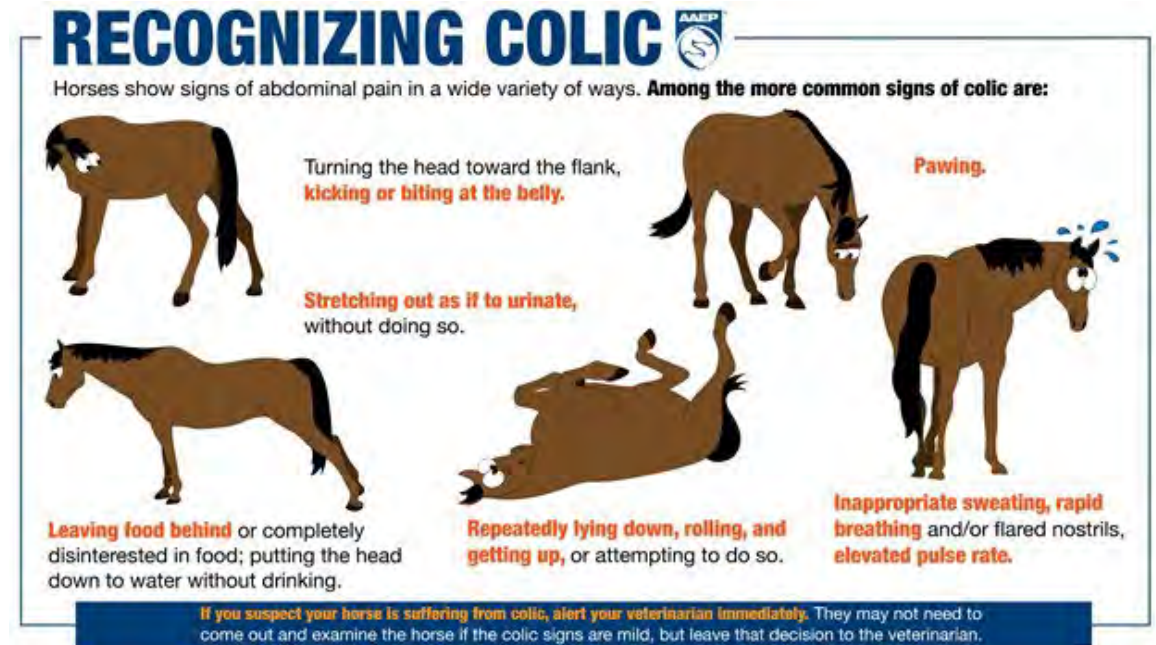
- Abdominal Pain
 - Gastrointestinal tract
 - Other abdominal organs
 - Urinary tract
 - Reproductive tract
 - Liver
 - Kidneys
 - Spleen
- Thoracic disease can mimic!
 - Pleuropneumonia
 - Cardiac abnormalities



<https://images.app.goo.gl/aYq8mcPRDVnwXSEd6>

Signs of Colic

- Off feed
- Looking at side (“flank watching”)
- Kicking at bell
- Getting up and down frequently
- Rolling
- Prolonged recumbency (laying down)
- “Not right”
- Grimace
- Change in attitude
- Minimal or no manure production
- Straining
- Bloating/abdominal distension



Courtesy of AAEP

What Should I Do?

- Physical examination
- Take away access to food
- Hand-walking
- Separate from herd-mates
- Contact veterinarian



Physical Examination

- Temperature
 - Taken rectally
 - 99.5-101.5 F
- Heart rate
 - Stethoscope left side behind elbow or feel pulse under lower jaw
 - Adult 24-48 bpm
 - Foal 40-60 bpm
- Respiratory rate
 - Watch flank or nostril flare
 - 12-24 bpm
- GI motility
 - Intestinal sounds should be present in all quadrants (1-2/min at least)
 - Very loud and frequent/constant sounds not necessarily normal

- Mucous membranes
 - Curl upper lip back, assess gums above upper teeth
 - Pink/Moist
- Capillary refill time
 - Press finger above corner upper incisor, count seconds until color is filled in again
 - < 2 seconds
- Skin turgor (“skin tent”)
 - Older horses always longer
 - Fold of skin stays tented up → may mean dehydrated
- Abdominal contour
 - Does the horse appear “bloated”?
- Stallions
 - Palpate scrotum/testes



Involving Your Veterinarian

- Good to involve regardless, whether they see the horse or not
- Signalment is important!
- History
 - Duration and severity of colic signs
 - Physical examination findings
 - Recent changes in feed, turnout, routine, weather, etc
 - Medical and/or surgical history
 - Recent administration of any medications (dewormers, NSAIDs, antibiotics)
 - Any treatments? Response?
 - Notable behaviors/stereotypies
- May be comfortable consulting on treatments, or may recommend evaluation

What Should I Do?

- Banamine
 - Drug: flunixin meglumine (NSAID)
 - Side effects: kidneys and stomach
 - Injectable formula NEVER to be given intramuscularly!
 - Can be given by mouth with similar efficacy



Best used under direction of veterinarian with established VCPR!!

What Should I Do?

Very mild signs, responds to minimal tx

- Consult with veterinarian, follow their recommendations
- Banamine
 - Given under vet guidance
- Withhold feed for ~12-18hr
- Confine for observation
 - Manure production
- Hand-walking every 2-4h
- Encourage water consumption
 - One bucket with “additive”, other bucket plain water
- Refeed gradually with small quantities mash and/or soft hay

Severe signs, unresponsive to tx

- Call a veterinarian promptly



Evaluation in the Field

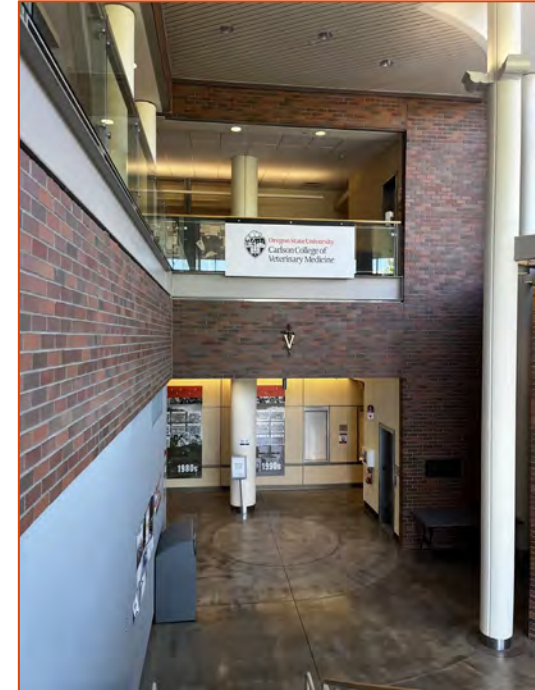
- Physical examination
- Medications
 - Sedation/analgesics
 - Buscopan
- Palpation per rectum
 - Displacements, impactions, distention
- Nasogastric intubation
 - Reflux?
 - +/- administration of oral fluids, laxatives
- +/- “Stall-side” bloodwork
- +/- Abdominal ultrasound



Referral to a Veterinary Hospital

- Physical examination
- Bloodwork
- Abdominal ultrasound
- Palpation per rectum
- Nasogastric intubation
- Abdominocentesis

Order of diagnostics depends on the case!



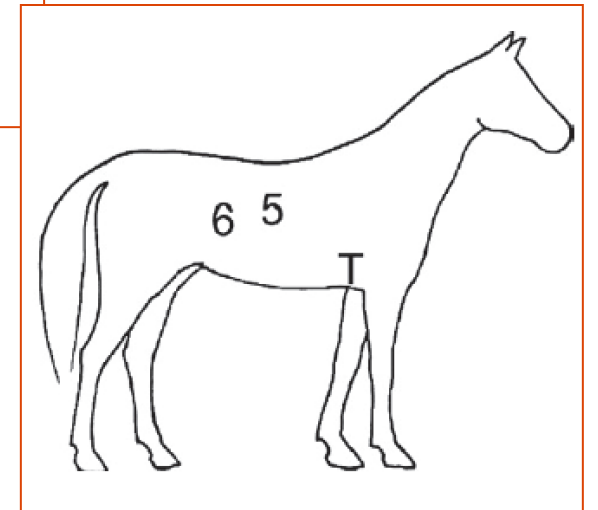
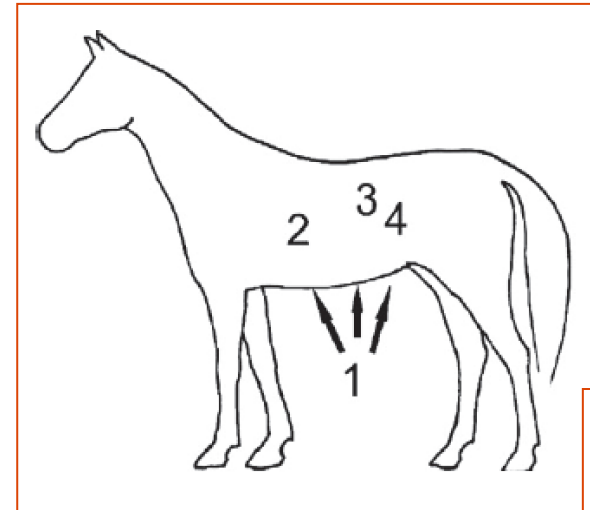
Bloodwork

- PCV/TS
 - PCV = packed cell count (% used to measure level of hydration or anemia)
 - Total solids = amount of protein (high with dehydration, low with protein loss via GI)
- Blood gas
 - Electrolytes (can be very abnormal with certain causes of colic)
 - Lactate (mildly increases with dehydration, higher with loss of oxygen to tissue)
- Complete Blood Count
 - WBC counts (leukocytes, lymphocytes, granulocytes/neutrophils)
- Chemistry
 - Kidney, liver, and muscle values

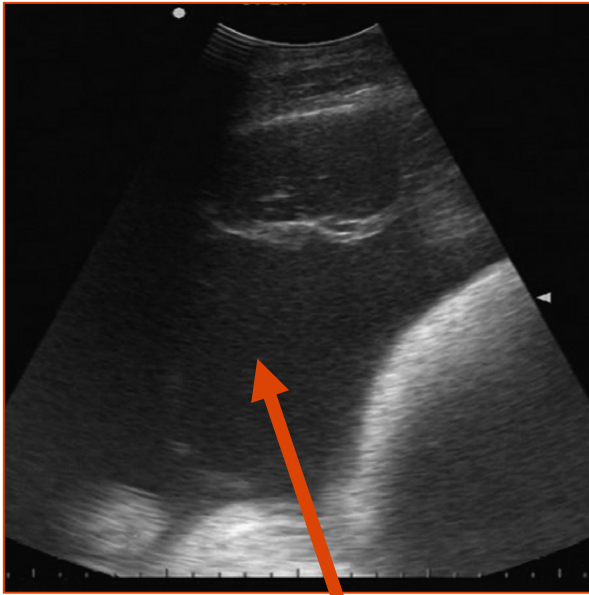


Abdominal Ultrasound

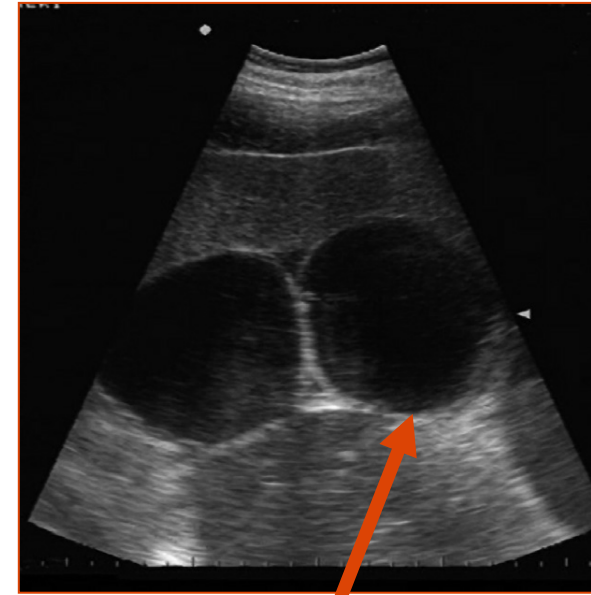
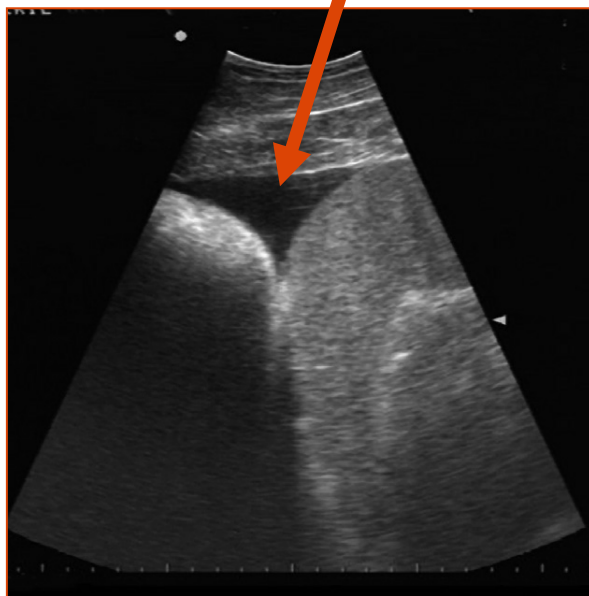
- Stomach
 - Size, contents
- Spleen/left kidney
- Small intestine
 - Size, motility, contents, wall thickness
 - 2 populations?
- Large intestine
 - Wall thickness, contents, visible vessels
- Cecum
- Ventral abdomen
 - Free fluid, sand in ventral colon



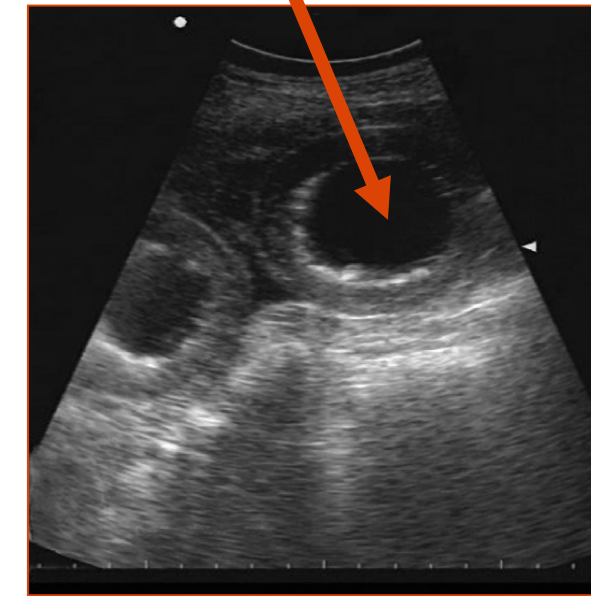
Busoni et al. Vet J 2011

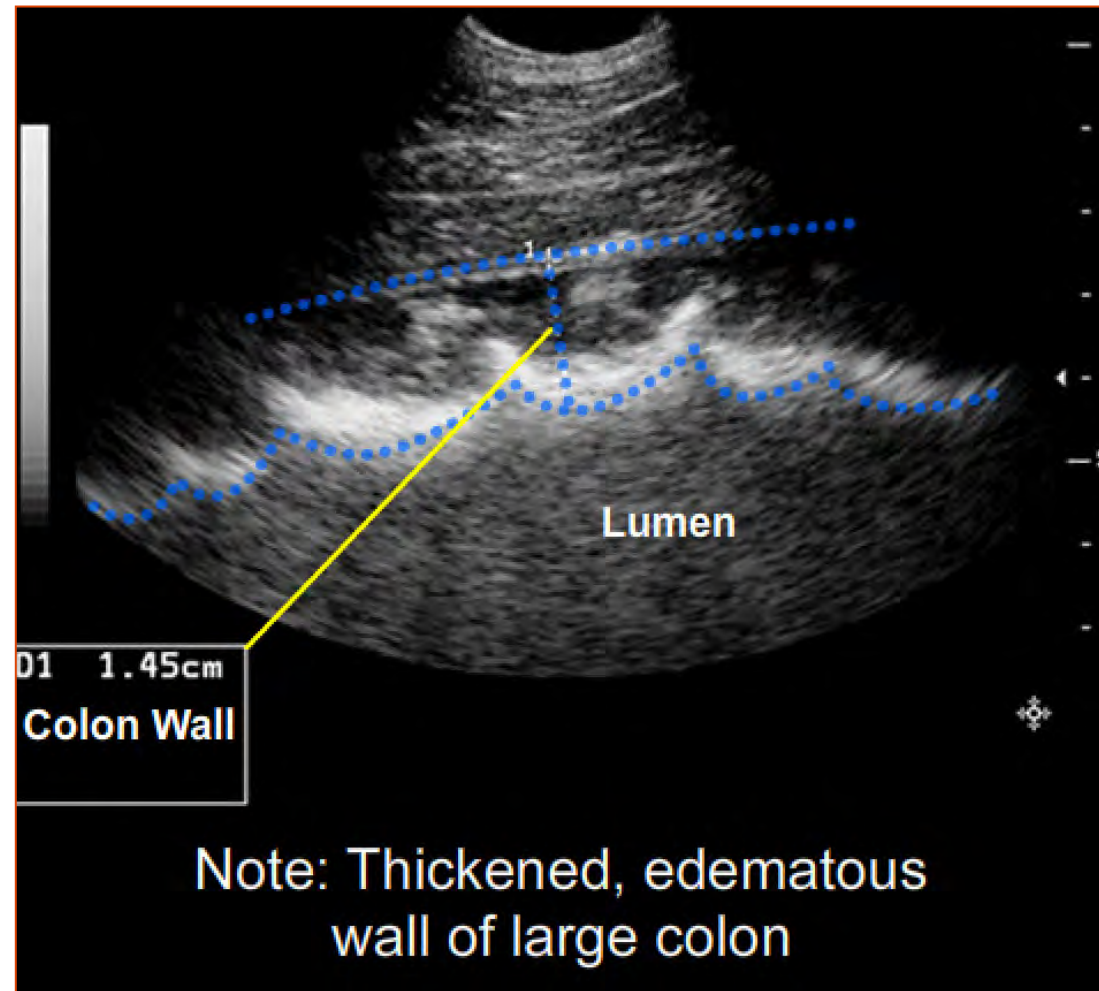


Increased Free Fluid



Dilated Small Intestine

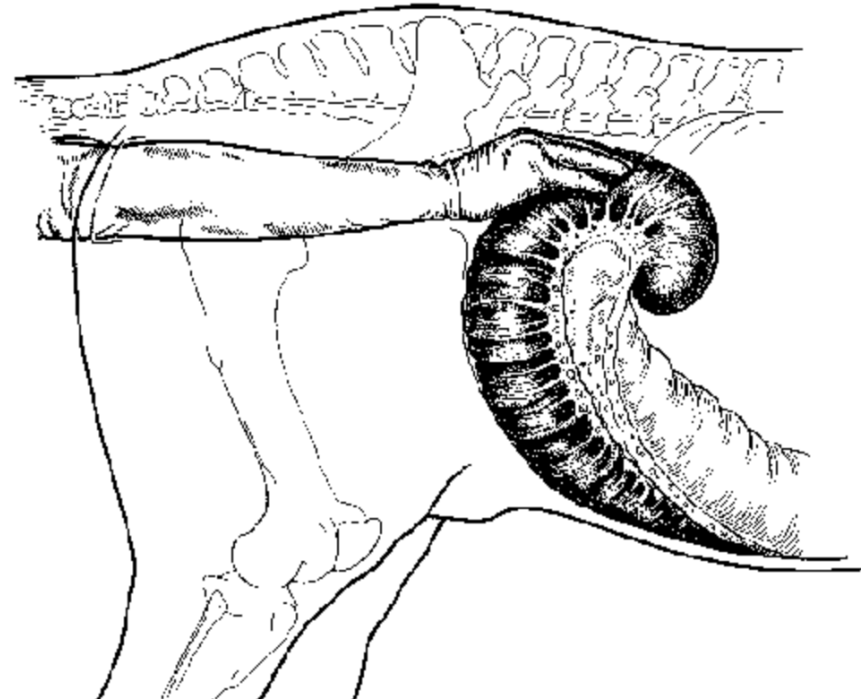




Busoni, et al. 2011

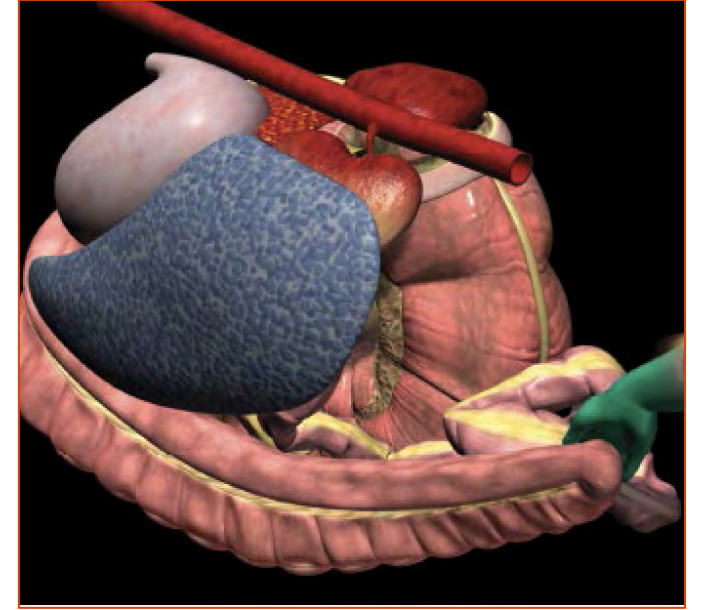
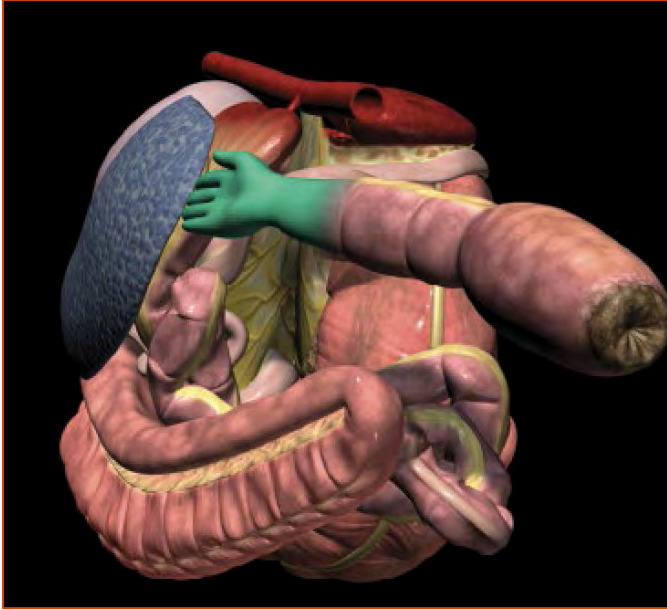
Palpation per Rectum

- Palpation of caudal 1/3rd of abdomen
- Assessing for:
 - Displacements
 - Impactions
 - Distention
- Safety for horse and veterinarian
 - Sedation
 - Buscopan
 - Lubrication
 - Risk of damage to rectal tissue



Desrochers and White, Equine Acute Abdomen, 3rd Edition

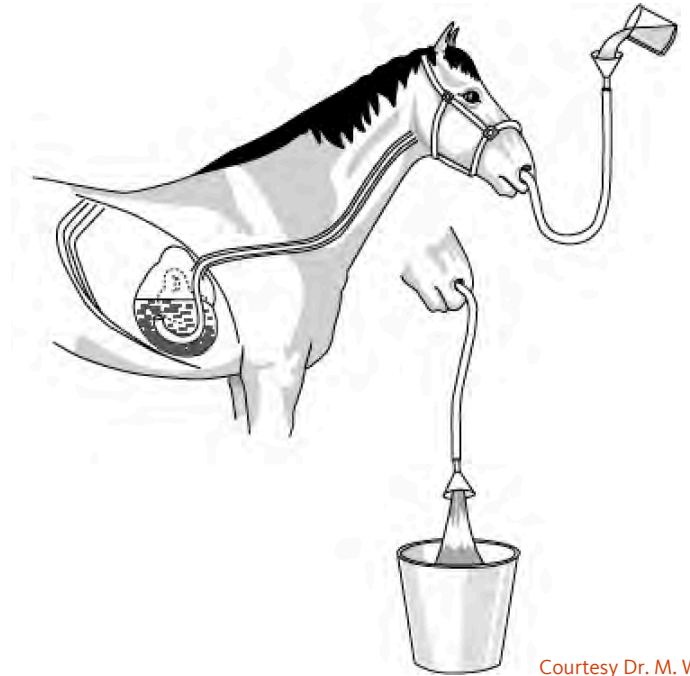
Palpation per Rectum



Images courtesy of The Glass Horse

Nasogastric Intubation

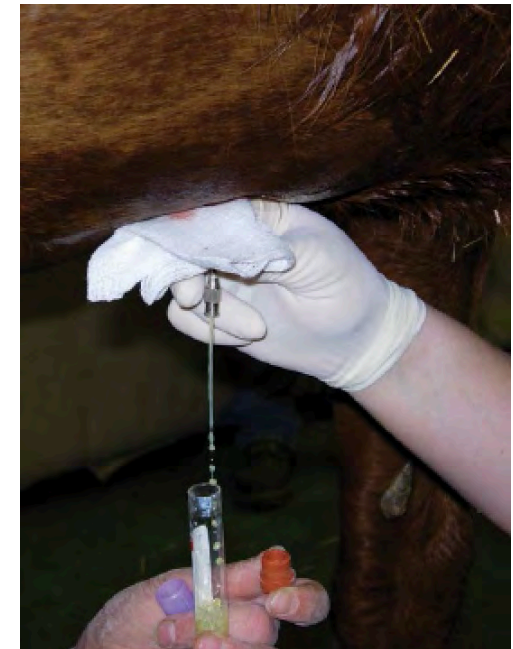
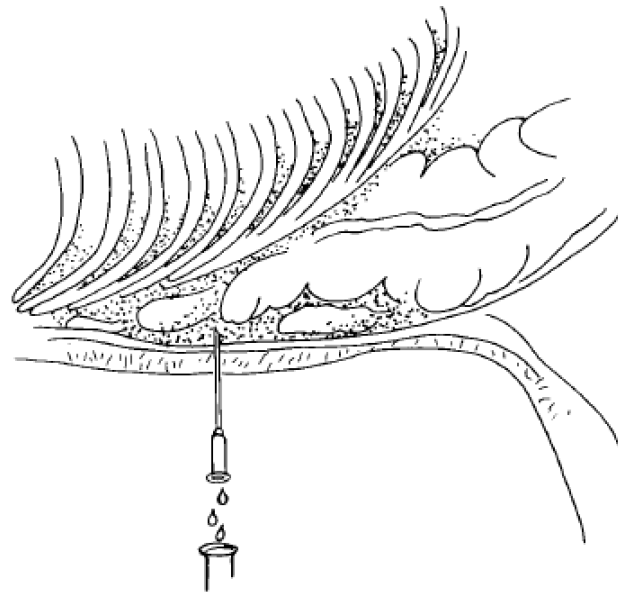
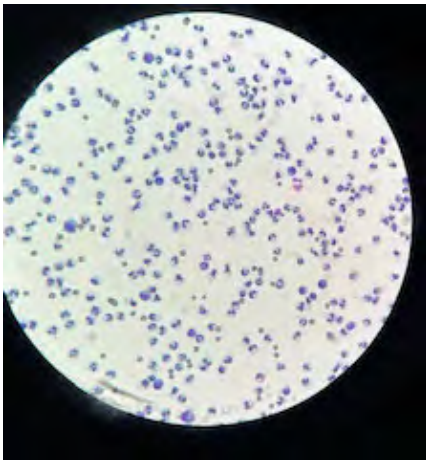
- Horses can't "vomit"!
- Tube passed to stomach via nostril
- Assessing amount and character of contents
 - Reflux?
 - Lots of feed lavaged out?
- Can be used for treatment with oral fluids
 - Laxatives, electrolytes
 - Mineral oil: better for prevention vs. treatment, does not penetrate impactions, fatal if administered into the airway



Courtesy Dr. M. Williams

Abdominocentesis

- Sterile cannula introduced into abdomen, collect sample
- Assess color, clarity
- Assess WBC count, total protein, lactate
- Cytology



Desrochers and White, Equine Acute Abdomen, 3rd Edition

Medical vs. Surgical Colic

MEDICAL

- Level of pain very mild/manageable
- Rapid response to treatment
- Impaction, gas/spasmodic, mild displacement
- Signs of infection/colitis on bloodwork

SURGICAL

- Unrelenting or severe pain
- Unresponsive to treatment
- Serosanguinous abdominal fluid
- Belly lactate > blood lactate
- Severe distention or displacement on rectal
- 2 populations of small intestine on ultrasound

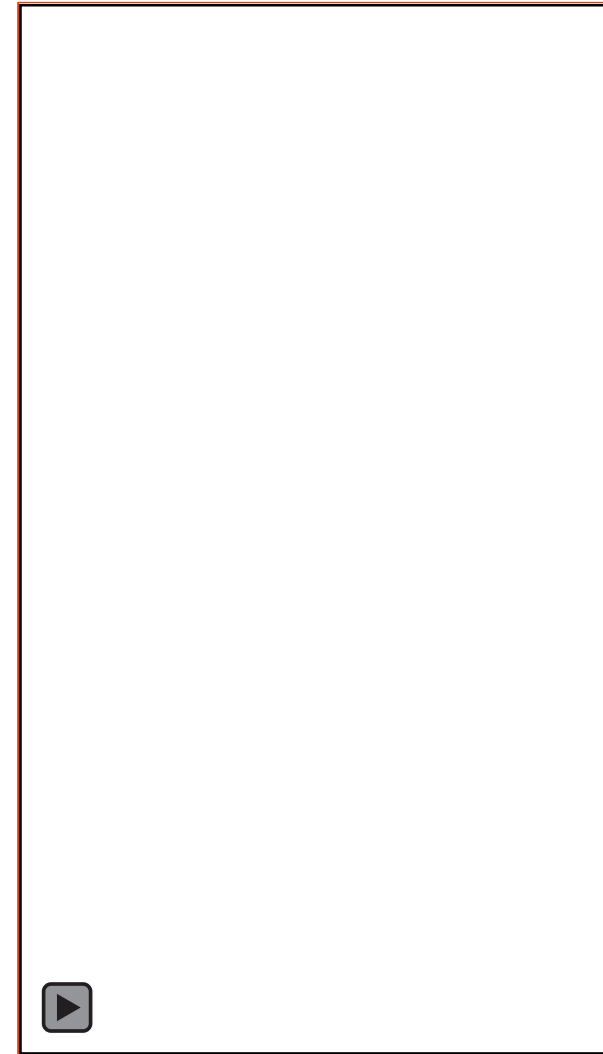
Medical Management

- Enteral fluids via NG tube
- IV catheterization + fluids
 - Electrolyte supplementation (Ca, K)
- Analgesics
 - Lidocaine IV CRI
- Trocarization
- Repeat diagnostics as necessary
- Ancillary diagnostics
 - I.e. Gastroscopy

Typical estimate:

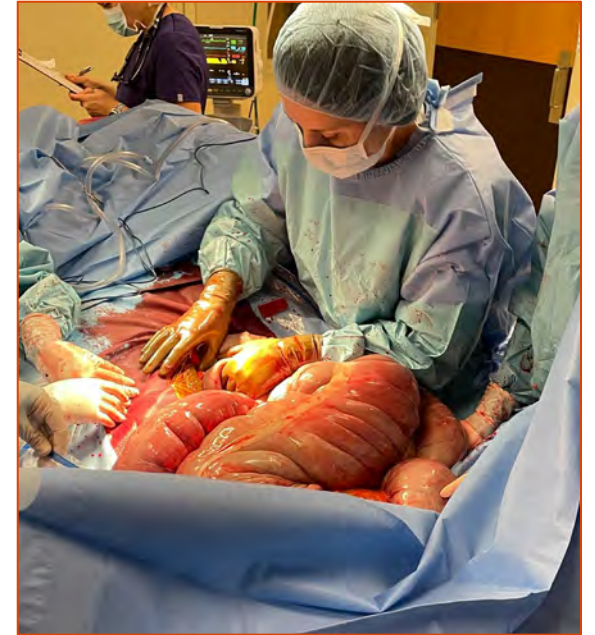
Without IV fluids \$2500-3000

With IV fluids \$3000-4000



Surgical Management

- Intake evaluation may vary based on patient's degree of pain, level of instability, etc
- Many cases require stabilization prior to surgery!!
- Large intestinal, uncomplicated
 - I.e. PF enterotomy, displacement
 - Typical estimate: \$11,000-13,000



Surgical Management

- Small intestinal or complicated large intestinal
 - I.e. Resection and anastomosis, large colon volvulus +/- resection
 - Considerations: longer procedure, greater supportive care necessary, higher incidence of post-op complications
 - Typical estimate: \$13,000-15,000+
- Standing [select cases, no option for VM celiotomy (always preferred)]
 - I.e. Fecolith
 - Typical estimate: \$7000-9000 (\$5000-7000 minis)



Question

- What is the most common cause of strangulating small intestinal lesions in geriatric (>20yr) horses?
 - A. Large colon impaction
 - B. Pedunculated lipoma
 - C. Mesenteric rent
 - D. Small intestinal volvulus
 - E. Right dorsal displacement

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Medical vs. Surgical Colic

Box 20.2 Specific diseases associated with the signalment (Southwood, 2013, p. 4)

Neonate:

- Meconium retention/impaction
- Enterocolitis
- Hypoxic–ischemic syndrome
- Jejunal intussusception
- Jejunal volvulus
- Atresia coli or jejunum

Geriatric horse (older than 10 years):

- Strangulation lipoma
- Large colon impaction

Pregnant mare:

- Uterine torsion
- Large colon displacement/volvulus
- Uterine artery hemorrhage
- Parturition
- Colic associated with pregnancy

Postpartum mare:

- Large colon volvulus
- Uterine artery hemorrhage

- Strangulation in mesenteric rent
- Small colon trauma during parturition
- Uterine involution

Stallion:

- Inguinal hernia (Standardbred and some Warmbloods)

Miniature horse:

- Small colon impaction
- Small colon fecoliths
- Tricobezoar

Yearling:

- Ileocecal intussusception

Weanling:

- Ascarid impaction

Breed:

- Ileocolonic agangliosis: Overo paint foal
- Enteroliths: Arabian, Morgan, American Saddlebred and Miniature horses

Potential Post-Op Complications

- Reflux/ileus
- Post-op colic
 - SI lesions at higher risk
- Adhesions
- Incisional infection
 - 11-42%
 - Predisposes to hernia formation, rarely dehiscence
- Hernia formation
- Endotoxemia
 - Laminitis
 - Jugular vein thrombosis



Prognosis

- Medical colics generally have good prognosis
 - Exception: severe colitis
 - Trocarization: 73% survival to discharge (Schoster et al. JAVMA 2020)
 - Recurrent colic: inflammatory disease most common histologic diagnosis (55%) (Steward et al. JAVMA 2018)
- Early surgical intervention improves prognosis!
- Tremendous improvement in last 20 years
- SI lesions have overall higher complication rates and poorer prognosis

Review Article

Exploratory Celiotomy in the Horse Secondary to Acute Colic: A Review of Indications and Success Rates

Alison Gardner, DVM, ACVS, DACVECC*, Allison Dockery, DVM, Vivian Quam, DVM



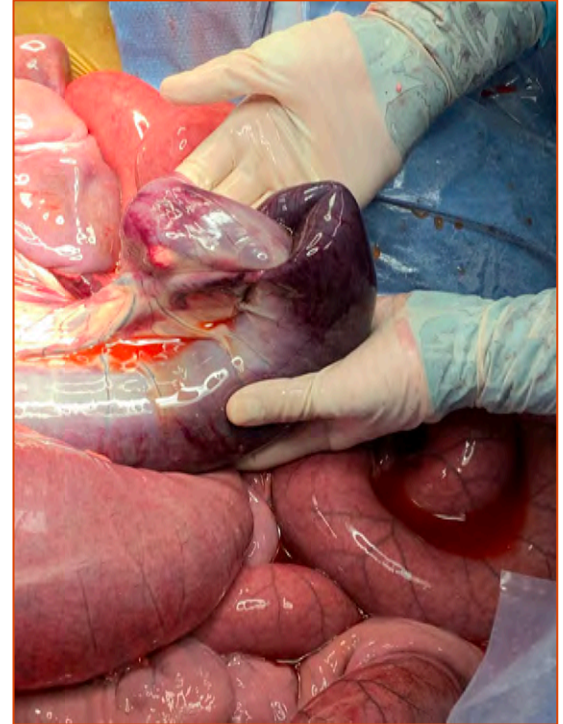
Short-Term Survival Rate in Horses Recovered From General Anesthesia Following Exploratory Celiotomy According to Underlying Disease Process

Underlying Disease Process	Survival Rate
Small intestinal disease	
Strangulating lipoma	71.7%*; 64.1%; 75% ^{10,104}
Small intestinal volvulus	91.3%*; 83.3%; 80% ^{10,113}
Epiploic foramen entrapment	86.7%*; 20%; 75% ^{10,42}
Mesenteric rent	70%*; 37.5%; 47% ^{10,114}
Duodenitis-proximal jejunitis	70%*; 66.6% ¹¹⁵
Inguinal Hernia	77.7%*; 80% ¹⁰
Ascending colonic disease	
Large colon volvulus	80%*; 88%; 70.7% ^{90,116}
Right dorsal displacement of the large colon [RDDLC]	97.3%*; 93% ¹⁰
Pelvic flexure impaction	87.5%*; 94.6%; 99% ^{20,117}
Nephrosplenic space entrapment [NSE]	100%*; 91.5%; 95% ^{118,119}
Descending colonic disease	
Enterolith	91.7%*; 96.2% ¹²⁰
Small colon impaction	90%*; 95% ¹²¹
Small colon strangulating lipoma	85.7%*; 77.8% ¹²²
Fecalith	100%*; 67.7% ¹⁰

* Data collected from 419 exploratory celiotomies over a 5-year period (2012–2017) at a tertiary referral center.

Prognosis

- Foals:
 - 3 most common causes were enterocolitis, meconium-associated colic, and medical colic (MacKinnon et al 2013)
 - Long-term survival if discharged >90%
- Geriatric horses (>20 years old)
 - Age not associated with post-op reflux or nonsurvival (Boorman et al. Vet Surg 2019)
 - Increased incidence of strangulating disease



Prognosis

- Foreign body obstruction: 41% complication rate, 79% survival to discharge (Oreff et al. EVE 2019)
- LC sand impactions: 95% survival in both medical and surgically treated horses (Kilcoyne et al. Vet Surg 2017)
- Epiploic foramen entrapment: 60% of horses cribbers, 48% rate of survival to discharge for all surgeries (Van Burgen et al. Vet Surg 2019)



<https://images.app.goo.gl/b8ga9Rh5ui5LvsBH8>

Prognosis

- Return to athletic function
 - 76-90.1% returned to expected performance at 1 year (Davis, et al. 2013)
 - 83% of neonates used for intended athletic performance (MacKinnon et al. 2013)
 - TBs intended to race: 63% that undergo colic surgery race vs. 83% of unaffected siblings (Santschi et al. 2000)
 - If they did race, they had as many starts and won as much money as siblings
- LC displacements: no detrimental effects on performance (deSouza and Mair EVE 2021)

Prevention

- Establish a routine
 - Consistent feeding and exercise schedules reduce stress
- Feed a high-quality diet
 - Should consist of mostly roughage
- Avoid excess grain
- Divide daily concentrate rations
 - Avoid overload
- Free choice hay
 - Avoid stemmy, low quality
- Regular parasite control program
- Regular dental exams and float
 - Every 6-12mo
- Daily exercise/turnout
 - Change intensity and duration gradually
- Fresh clean water
 - Encourage drinking: electrolytes, handful of grain, salt slurries
- Avoid feeding directly on sand/dirt
- Check hay, bedding, pasture, and environment
 - Ingestible foreign matter (hay netting!)
 - Toxic substances
- Reduce stress

Insurance

- Many different types available
 - Surgical coverage (typical \$7,500-\$10,000)
 - Mortality (value of animal)
- Most policies require communication prior to surgery or euthanasia!
 - Also hospitalization
- Need to know:
 - Insurance company
 - Policy number
 - Contact information

Key Take-Aways

- “Colic” is very complicated!
- Early intervention is key
 - Consult with veterinarian!
- Helpful to know physical examination
- Banamine – use appropriately and under guidance of vet!
- Each diagnostic is piece of a puzzle
 - No single diagnostic likely to give direct or complete answer
 - Attempting to put all the pieces together to get whole picture
- Appropriate management can help prevent

Questions?

