FURST AID: PREVENTING AND TREATING COLIC IN HORSES

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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

• 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
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
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
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
Increased Free Fluid

Dilated Small Intestine
Note: Thickened, edematous wall of large colon

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
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
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
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
Medical vs. Surgical Colic

<table>
<thead>
<tr>
<th>Neoneate:</th>
<th>Stallion:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Meconium retention/impaction</td>
<td>- Strangulation in mesenteric rent</td>
</tr>
<tr>
<td>- Enterocolitis</td>
<td>- Small colon trauma during parturition</td>
</tr>
<tr>
<td>- Hypoxic–ischemic syndrome</td>
<td>- Uterine involution</td>
</tr>
<tr>
<td>- Jejunal intussusception</td>
<td></td>
</tr>
<tr>
<td>- Jejunal volvulus</td>
<td></td>
</tr>
<tr>
<td>- Atresia coli or jejenum</td>
<td></td>
</tr>
<tr>
<td>Geriatric horse (older than 10 years):</td>
<td>Stallion:</td>
</tr>
<tr>
<td>- Strangulation lipoma</td>
<td></td>
</tr>
<tr>
<td>- Large colon impaction</td>
<td></td>
</tr>
<tr>
<td>Pregnant mare:</td>
<td>Stallion:</td>
</tr>
<tr>
<td>- Uterine torsion</td>
<td>- Inguinal hernia (Standardbred and some Warmbloods)</td>
</tr>
<tr>
<td>- Large colon displacement/volvulus</td>
<td>Stallion:</td>
</tr>
<tr>
<td>- Uterine artery hemorrhage</td>
<td></td>
</tr>
<tr>
<td>- Parturition</td>
<td></td>
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<tr>
<td>- Colic associated with pregnancy</td>
<td>Stallion:</td>
</tr>
<tr>
<td>Postpartum mare:</td>
<td></td>
</tr>
<tr>
<td>- Large colon volvulus</td>
<td></td>
</tr>
<tr>
<td>- Uterine artery hemorrhage</td>
<td></td>
</tr>
</tbody>
</table>

Box 20.2 Specific diseases associated with the signalment (Southwood, 2013, p. 4)
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 Cceliotomy 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 Cceliotomy According to Underlying Disease Process

<table>
<thead>
<tr>
<th>Underlying Disease Process</th>
<th>Survival Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small intestinal disease</td>
<td>71.7%*; 64.1%, 75%&lt;sup&gt;10,104&lt;/sup&gt;</td>
</tr>
<tr>
<td>Strangulating lipoma</td>
<td></td>
</tr>
<tr>
<td>Small intestinal volvulus</td>
<td>91.3%; 83.3%, 80%&lt;sup&gt;13&lt;/sup&gt;</td>
</tr>
<tr>
<td>Epiploic foramen entrapment</td>
<td>86.7%; 20%, 75%&lt;sup&gt;10,42&lt;/sup&gt;</td>
</tr>
<tr>
<td>Mesenteric rent</td>
<td>70%; 37.5%, 47%&lt;sup&gt;10,114&lt;/sup&gt;</td>
</tr>
<tr>
<td>Duodenitis-proximal jejunitis</td>
<td>70%; 66.6%&lt;sup&gt;115&lt;/sup&gt;</td>
</tr>
<tr>
<td>Inguinal Hernia</td>
<td>77.7%; 80%&lt;sup&gt;10&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ascending colonic disease</td>
<td></td>
</tr>
<tr>
<td>Large colon volvulus</td>
<td>80%; 88%; 70.7%&lt;sup&gt;90,116&lt;/sup&gt;</td>
</tr>
<tr>
<td>Right dorsal displacement of the large colon [RDDLC]</td>
<td>97.3%; 93%&lt;sup&gt;10&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pelvic flexure impaction</td>
<td>87.5%; 94.6%, 99%&lt;sup&gt;10,117&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nephrosplenic space entrapment [NSE]</td>
<td>100%; 91.5%, 95%&lt;sup&gt;118,119&lt;/sup&gt;</td>
</tr>
<tr>
<td>Descending colonic disease</td>
<td></td>
</tr>
<tr>
<td>Enterolith</td>
<td>91.7%; 96.2%&lt;sup&gt;120&lt;/sup&gt;</td>
</tr>
<tr>
<td>Small colon impaction</td>
<td>90%; 95%&lt;sup&gt;121&lt;/sup&gt;</td>
</tr>
<tr>
<td>Small colon strangulating lipoma</td>
<td>85.7%; 77.8%&lt;sup&gt;122&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fecalith</td>
<td>100%; 67.7%&lt;sup&gt;10&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

* 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)
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?