

Colic

Colic is defined as the manifestation of visceral abdominal pain. Colic may be the result of nongastrointestinal pain such as urinary tract obstruction .. Pain may be acute, chronic, or recurrent. Gas distention or recognizable organic problems such as displacements are most frequently associated with acute colic.

Five basic causes of colic in large animals are as follows:

- Distention of gut with fluid, gas, or ingesta
- Pulling on the root of the mesentery (mesenteric tension)
- Ischemia or infarction
- Deep ulcers in the stomach or bowel
- Peritoneal pain (peritonitis)

Signs of colic in the horse include

- restlessness, lying down and getting up, groaning, grunting, rolling, sweating, kicking at the abdomen, or suddenly dropping to the ground in pain. Anorexia and depression often accompany these signs.

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-Horses may develop hypovolemic or endotoxic shock characterized by tachycardia with weak pulse quality and prolonged capillary refill time, cold extremities, and bright red (vasodilatory phase) followed by dark or pale (vasoconstrictive phase or low cardiac output state) mucous membranes if the problem is severe and affects cardiovascular integrity.

-Evidence of shock is usually present only when the disease condition is severe and involves ischemic or infarctive disease (volvulus [Gastrointestinal Causes of Colic in Horses*](#)

Common Causes Accumulation of intestinal, cecal, or colonic gas Hypermotility and intestinal spasms Feed impaction, constipation Meconium impaction (newborn) Gastric ulcers (foal) .

Less Common Causes

Thromboembolism ,Intestinal foreign body (sand; enterolith; phytobezoar)

Volvulus of small intestine

Pedunculated lipoma with bowel strangulation Hernia, inguinal, epiploic, umbilical,

Diaphragmatic Nephrosplenic ligament bowel entrapment Ascarid impaction

Massive strongyle infection Gastric dilation ,Anterior enteritis (duodenitis or proximal jejunitis)

Enteritis, impending or active ,Peritonitis ,Parasympatho mimetic drugs Irritant cathartics

Necrotizing enterocolitis

Psychogenic colic

Rectal tear ,Volvulus or displacement of large bowel ,Rupture of stomach or intestine

Ileus ,Intussusception

Uncommon Causes

Abdominal adhesions ,Intramural hematomas of stomach or intestine

Stenosis or stricture of bowel lumen ,Botulism ,Tetanus,Potomac fever,Exhaustion

Anaphylaxis ,*Rhodococcus equi*, gut abscesses,Cribbing or wind sucking,Abdominal fibroma

Segmental ischemic necrosis following mesocolic tearing

Equine viral arteritis ,Anthrax with bleeding

Malignant edema (*Clostridium* species),Malignant mesothelioma

Gastric or intestinal tumor Atropine,Voxins

Cantharidin toxicity, Dioxin ,Trichloroethylene-extracted feed toxicity

Warfarin (dicumarol),Herbicides ,Lead, Nitrophenyl urea (vacor)

Phenylbutazone or other nonsteroidal antiinflammatory drugs

Poison plants (many of those that produce diarrhea also produce colic;

African horse sickness (exotic)

Grass sickness (exotic)

†Rinderpest was a cause of colic in ruminants until 2011, when it was eradicated worldwide.

■ vitamin K3 deficiency (moldy sweet clover)

Diagnosis and Management of Colic in the Horse

1. Take history. Because colic is a common problem in horses, mild to moderate degrees of abdominal pain are often initially treated symptomatically with analgesics and/or laxatives before major diagnostic efforts are undertaken.

Most colic of mild to moderate severity responds favorably to symptomatic treatment. In general, severe pain or pain that is unresponsive to analgesics indicates a more serious condition for which more aggressive medical management or surgical correction may be indicated.

Recurrent mild to-moderate colic may be an indication of a more serious problem such as bowel entrapment or displacement, thromboembolism, internal abscess, enterolith, sand or other foreign body, tumor, gastric ulcer, hypobiotic cyathostomiasis, *Strongylus vulgaris* larval migration, heavy burden of ascarids, abdominal adhesions, strictured bowel, or urinary tract disease.

2-Perform physical examination. Intestinal causes of colic can often be differentiated from colic associated with other organ systems by physical examination findings and laboratory data.

Although extra intestinal origins of acute colic are relatively uncommon in the horse, they include abdominal abscesses, tumors, cholelithiasis or cholestatic disease, and genitourinary tract disease and can be recurrent.

It is important to note the presence or absence of normal intestinal borborygmi and whether

or not feces are being passed in determining whether the problem is extra intestinal.

Careful auscultation of the thorax should be performed to evaluate for the presence of Diaphragmatic Hernias or pleural disease.

The testicles should be palpated on all stallions to screen for scrotal hernias or testicular torsions.

Rectal examination findings often help to determine anatomic location within gut or other site.

Abdominal tumors, abscesses, and other masses may be palpable.

- Although mild to moderate chronic intermittent colic may be of extra intestinal or intestinal origin, most cases of severe unremitting colic indicate gut involvement, often with anatomic displacement or ischemia.

3-Ultrasound and radiology.

Ultrasound may help in locating masses, adhesions, or enlarged liver. It may also be helpful in the diagnosis of gastrointestinal disease including nephrosplenic entrapment of the large colon and small intestinal distention.

- Detection of sand from the ventral abdomen may be possible.

- Ultrasound can be particularly useful in foals and small ruminants because of their size.

4-Radiology can also be useful in detecting enteroliths or sand abdominal fluid pH, lactate (as compared with blood lactate), and lactate dehydrogenase (LDH) concentrations can aid in the diagnosis of septic peritonitis.

5- Grossly, fluid changes to cloudy yellow, then to blood-tinged with fibrin clots, and finally to black in color as bowel necrosis and hemolysis of extravasated red blood cells (RBCs) occur.

Increased levels of peritoneal fluid protein concentrations are consistently found in anterior enteritis (duodenitis and proximal jejunitis) and often disproportionate to the increase in white blood cell concentration and therefore provide a useful differential aid, although this finding is nonspecific and observed with other conditions, such as in cantharidin poisoning.

Increased protein levels are present in peritonitis but accompanied by increased numbers of neutrophils. If peritoneal fluid is grossly contaminated with feed material, rupture of a viscus should be considered.

-Recently, abdominal fluid lactate has been shown to be predictive of intestinal ischemia secondary to strangulating obstruction and may aid in early detection of intestinal strangulation, rupture, and septic peritonitis.

- Many chemical analyses (e.g., lactate) of blood or peritoneal fluid have been recommended as an aid in prognosis and gauging severity of tissue damage. Plasma fibrinogen, as well as peripheral leukocyte counts, can aid in the differentiation of enterocolitis or anterior enteritis from strangulating lesions.

- Serum electrolyte concentrations and acid-base status are important from a therapeutic standpoint. Serum biochemistries, including liver enzymes, creatinine, and BUN, are important in evaluating for liver and renal compromise.

-Hyperglobulinemia may be indicative of chronic disease.

6. Evaluate response to treatment. The approach to diagnosis of colic signs is often tied in with management because if the animal's pain cannot be alleviated, surgical intervention and specific diagnosis of displacements, torsions or volvulus, internal hernias, masses, and adhesions are the next steps.

- The initial diagnosis considers the history of deworming and feeding. The findings of the physical examination, including rectal examination and evaluation of the degree of pain, determine whether additional laboratory workup is indicated.

- **In many cases with mild to moderate pain** and no evidence of shock, standard treatment is parenteral administration of an analgesic agent and oral administration of a mild laxative such as mineral oil (4 to 8 mL/ kg).

When a nasogastric tube is passed, the stomach should be checked for reflux and decompressed as needed.

- The pH of the gastric reflux may indicate primary gastric dilation if acidic, Or small intestinal blockage or ileus if alkaline.

- Dark brown, foul smelling, and alkaline reflux is often associated with anterior enteritis (duodenitis and proximal jejunitis). If a significant amount of reflux is present, oral medications should be withheld.

-If cardiovascular function is impaired (poor mucous membrane color and capillary refill, weak pulse, cold extremities, impending shock), balanced, polyionic, and isotonic crystalloid fluids should be given intravenously at a rate of 10 to 20 mL/kg boluses until signs of shock abate or plateau.

In addition, 4 mL/kg hypertonic saline can be administered as a rapid but transient treatment of shock. Large amounts of painful gas auscultable in the right flank can be tapped and drawn off with cecal trocharization, although the risk for peritonitis should be considered and this technique should be reserved when surgical exploration is not an option or is delayed.

The principles of colic management include

- (1) control of pain,
- (2) relief of distention,
- (3) relief of obstruction,
- and (4) treatment of shock.

7. Perform exploratory surgery.

In making a decision concerning management of colic, it is important to separate impending

enteritis and peritonitis from bowel disease requiring surgical intervention. Anterior or proximal enteritis can result in prolonged moderate pain and requires constant or frequently repeated analgesic administration and gastric decompression of the foul-smelling, dark reddish-to-brownish stomach contents.

However, pain often subsides and is replaced with depression after gastric decompression in horses with anterior enteritis, whereas horses with strangulating lesions often remain in pain.

The presence of fever or decreased total WBC count (with neutropenia) may be an indication of impending or ongoing enteritis, in which case surgery may not be indicated.

Surgery is indicated in the following situations:

- a. Pain is severe and intractable or nonresponsive/poorly responsive to analgesics.
- b. Pulse is weak and rate is over 70 beats/min, and oleander or other cardiotoxicity is ruled out.
- c. Perfusion is poor, as evidenced by cold extremities, mucous membranes are off color, and capillary refill is poor.
- d. No gut sounds are auscultated (a lack of fecal production).
- e. Bowel is markedly distended.
- f. Large volumes of yellowish alkaline gastric reflux are present.
- g. Abdominocentesis indicates damaged bowel (blood tinged, increased protein, increased WBCs).
When proximal enteritis remains a possibility, surgery should be avoided.

Surgery may be contraindicated in the following situations:

- a. Fever
- b. Neutropenia or marked neutrophilia
- c. Severe icterus or marked enzyme abnormalities indicating primary liver disease
- d. Foul-smelling, brownish-red gastric reflux characteristic of proximal enteritis (duodenitis/jejunitis), especially when removal of reflux results in discontinuation of signs of pain
- e. Evidence of an extraintestinal cause not amenable to surgical correction (such as severe pyelonephritis)
- f. Colitis or diarrhea
- g. Abnormal behavior or neurologic signs (look for neurologic diseases and blood ammonia concentrations).

Colic in Ruminant

These signs are manifestations of visceral pain, mediated by the sympathetic nervous system.

External palpation and pushing on the abdomen of adult horses does not usually elicit pain unless the affected inflamed or dilated viscus is contacted.

In contrast, parietal pain associated with peritonitis is sometimes responsive to external palpation.

Whereas the animal with visceral pain shows active signs of colic, the animal with parietal pain is

usually reluctant to move and has a splinted abdomen.

Acute peritonitis of an ulcer as a result of immediate irritation of serosal surfaces by the acid contents, whereas with rupture of the colon or rectum it may take several hours or more before peritonitis is clinically apparent.

Causes of Colic in Ruminants*

1-Common Causes

Increased intestinal gas, Intussusception, Torsion or volvulus of the mesenteric root

Peritonitis, Intestinal foreign body or obstruction, Urolithiasis

Ruptured bladder, Acute pyelonephritis, Abomasal torsion, Abomasal ulcer

Cecal dilation or volvulus, Severe bloat

2-Less Common Causes

Cystitis or urinary tract disease, Abomasal bloat (neonates), Uterine torsion or rupture

Hernia, Parturition, impending, Hypermotility and spasms of gut, Feed impaction

Right displaced abomasum, Acute traumatic reticulitis, abomasitis, or duodenitis

Acute liver disease, Vagal indigestion, Hemorrhagic bowel syndrome

Atresia coli (neonates), Uncommon Causes, Rabies, Rectal tear, Rectal prolapse,

Diaphragmatic hernia, Grain overload, Water intoxication, Winter dysentery

Ovarian abscess, Fat necrosis, Cholelithiasis, Intestinal adhesions, Enterotoxemia, Ileus,

Intestinal strangulation, Inversion of uterine horn, Malignant edema, Malignant mesothelioma

Ruptured uterine artery, Intestinal neoplasia, Aortic, iliac, or femoral thrombosis

Anaphylaxis, Renal cysts, Ruptured prepubic tendon

Vaginal laceration, Torsion of descending colon, Rinderpest (exotic)

Toxins

Plant poisonings (many of those that cause diarrhea also produce colic; see plant toxins listed under Diarrhea

torsion, thromboembolism) or advanced visceral distention (extreme flatulence, impaction, or dilation). Foreign bodies such as sand or enteroliths in the large colon may result in low-grade recurrent colic.

When an enterolith is passed into the transverse colon where it obstructs the bowel, signs of complete obstruction and acute colic ensue.

Ruminants exhibit colic less frequently than horses, probably because of a higher threshold for pain and because dietary shifts principally affect the rumen; thus intestinal gas pains occur less frequently.

- Colic with visceral pain (including urinary tract) is manifested by grinding the teeth

(odontoprisis or bruxism), grunting or groaning, treading with the hind feet, kicking at the abdomen, restlessness, repeatedly lying down and getting up, anorexia, and depression. With parietal pain caused by peritonitis, ruminants demonstrate abdominal pain by arching the back, splinting, and exhibiting pain on deep palpation of the area.

These signs are seen most commonly with traumatic reticuloperitonitis and abomasal ulcers; rarely are these diseases associated with the colic signs described previously.

Diagnosis and Management of Colic in Ruminants

1. Take history.

Colic in neonates is most often associated with increased abomasal or intestinal gas

Perforating ulcers are not uncommon as a cause of colic in calves 1 to 6 months of age. It should be determined whether the onset of colic was acute or whether the colic is chronically recurrent.

Few diseases cause recurrent colic in ruminants.

Urolithiasis is the most common cause of colic in male or neutered male goats and sheep and occurs under varied dietary and environmental conditions.

Urolithiasis in cattle occurs most frequently in bulls or steers eating high-grain diets, but silicate stones can occur in very young animals and animals on pasture diet.

2. Perform a physical examination.

Take vital signs; with torsion or severe peritonitis, shock signs such as rapid heart rate (>90 beats/ min), cold extremities, and weakness may be seen.

Tympany can be detected by simultaneous auscultation and percussion.

Such causes of colic as cecal dilation, bloat, free gas in the peritoneal cavity, and severe abomasal dilation can be diagnosed in this way .

Rectal examination detects such abnormalities as gas in the cecum, uterine abnormalities, urinary tract disease, and intussusception.

Observe animal urinating to rule out obstructive urolithiasis. Ultrasound examination of the abdomen is also useful .

3. Examine feces. Observe grossly; intussusception usually has scant dark red (almost black) feces.

Black tarry feces may also be seen with bleeding abomasal ulcer of some duration. Scant feces are seen with cecal dilation or displacement.

4. Check preputial hairs and urethral process for sediment and stones. Grit on the preputial hairs is often associated with urolithiasis.

Observe animal urinating and check urine for abnormalities. Rule out pyelonephritis. Radiology and ultrasound can be useful in sheep and goats when urolithiasis is a consideration.

Ultrasound can detect a distended bladder, and stones may sometimes be detected.

Radiology (lateral view) may detect a stone in the urethra or stones in the bladder.

A contrast urethrogram may also be diagnostic.

5. Perform paracentesis to look for peritonitis caused by perforated abomasal ulcer, serosal devitalization, intussusception, or ruptured bladder. Interpret as earlier for horses, except that normal peritoneal fluid protein concentration can go as high as 5 g/dL in ruminants.
6. Other laboratory aids such as CBC and clinical chemistries are seldom diagnostic in ruminant colic. If grossly abnormal, they may be grounds for formulating a poor prognosis. Intussusception may be associated with neutrophilia (as well as dark feces and colic) in cases where peritonitis is occurring.

7. Symptomatic treatment of colic includes analgesics and, if heart rate is over 90 beats/min, intravenous fluid therapy with a sodium containing fluid.

Take blood sample for electrolytes and acid-base status before initiating fluid therapy.

8. Surgical exploration is indicated if colic is persistent, abdominal distention occurs, the heart rate is over 100 beats/min, feces are scant (especially those that are dark red and indicative of intussusception), there are pings indicating abomasal or cecal displacement or torsion, or the peritoneal fluid indicates bowel devitalization (blood-tinged fluid with elevated protein and WBCs).

If surgical exploration is indicated, an important consideration is whether the animal will remain standing under local anesthesia during surgery. It is often best to perform abdominal surgery on animals with colic in left lateral or dorsal recumbency, aided by sedation and restraint, to avoid sudden collapse when painful surgical manipulations are performed. If the left lateral position is selected, use padding to raise the hip and shoulder so that the abdominal viscera can sit in a depression.

