Management of Equine Colic in Veterinary Practice

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What is Colic?

Colic is a general term for abdominal pain in the horse. It generally refers to gastro-intestinal pain but similar signs may present for other reasons, such as liver disease, urinary calculi, uterine disorders and tumours, or even pleuritis.

Gastrointestinal and non-Gastrointestinal Causes

Gastro-intestinal, or "true" colic, is a symptom, not a disease. Causes include:

- Disturbances to motility
- Impactions – sand, poorly masticated or dehydrated feed
- Calcifications – enteroliths
- Foreign Bodies
- Enteritis
- Parasitism
- Intestinal Accidents
- Tumours

What causes Pain?

The principal factor in causing pain is bowel wall distension. Conditions causing persistent bowel wall distension lead to persistent pain. Sometimes, complete infarction or rupture of a lesion may cause a temporary remission in signs. Bowel may be distended by gas or fluid, due to simple obstruction, strangulation, or ileus.

Signs of Colic

Classically, horses with colic roll persistently. Not all rolling horses have colic, and it is not now believed that horses "twist their bowel" by rolling. Pawing is another pain response, although some horses will paw with pain or boredom. Some turn and look at their flank, or just lie down.

Causes of Colic

There are many proposed initiating causes of colic. Most of these fall into one of the following categories:

Feed - Abrupt changes in feed, mouldy hay, coarse fibre feeds and lack of access to water. Intestinal gas produced during rapid fermentation of grain initiates intestinal distension and pain. Lush grass, like grain, may also cause intestinal distension.

Parasites

1) Strongylus vulgaris larval induced arteritis lesions occur in the branches of the cranial mesenteric artery. The lesions caused by these parasites may reduce or alter intestinal motility and predispose the animal to episodes of colic. These lesions are recognised less frequently with improvements to wormers and worming programs.

2) Cyathostomes ("small strongyles") have been proposed as a cause of colic in horses receiving anthelmintics that control large strongyles.

3) Parascaris equorum (roundworms) are an uncommon but serious cause of colic, and is often seen when young horses with heavy burdens are de-wormed, the parasites are killed and obstruct the jejunum. Rupture of the intestine can occur.

Foreign Bodies

Horses occasionally have colic episodes directly related to foreign bodies. The horse may ingest foreign bodies (plastic bags, hay nets, baling twine) which may obstruct the intestine or act as a nidus for accumulation of fibrous matter or calcification. When the intestine attempts to pass these objects and they lodge in the transverse or small (descending) colons. The concretions (enteroliths or bezoars) may specifically be associated with hair (trichobezoar), plant fibers (phytobezoar), or faecal material (faecalith).

Tumours

Tumours associated with colic usually are pedunculated lipomas, which develop in old horses and cause colic by wrapping around the small intestine and causing strangulation obstruction. Lymphosarcomas occasionally cause obstructive colic. A range of other tumours are occasionally seen.

Bacterial Enteritis

Severe enteritis leads to distension with gas and fluid.

Abdominal Adhesions

Fibrous intra-abdominal adhesions may induce colic by strangulating or obstructing the intestine. These adhesions may be secondary to previous surgery, parasitic migration, peritonitis, or proximal enteritis.

Diagnostic Approach

History

The history of the present colic episode and previous episodes, if any, is important to determine if the horse has had repeated or similar problems with colic or if this is a single isolated event. History includes:

- The duration of the colic,
- the rate of deterioration in the horse's cardiovascular status,
- the severity of the pain,
- whether faeces have been passed during this episode,
- the response to any therapy

- deworming history (has it been regular? has it been recent? which drugs have been used?),
- when the animal's teeth have been floated,
- any changes in feed or water supply or amount have occurred.

The physical examination

Oral mucous membranes should be evaluated for colour, moistness and capillary refill time. The colour may change to cyanotic/pale with acute cardiovascular compromise and eventually to hyperaemic or muddy as peripheral vasodilation develops later in shock. The capillary refill time may be shortened early but usually becomes prolonged as vascular stasis (venous pooling) occurs. The horse's membranes will become dry if the animal becomes dehydrated.

Heart rate increases due to pain, haemoconcentration, and hypotension; higher heart rates have been associated with more severe intestinal problems (strangulation obstruction).

Gastric Reflux is checked by passage of a well-lubricated stomach tube. If it is difficult to enter the cardia, 50 ml of Lignocaine can be inserted down the tube. Occasionally spontaneous reflux is obtained, but otherwise a concerted effort must be made to establish a syphon. The amount of water administered is compared with the volume of reflux recovered. Any more than 2 litres is significant. Reflux normally indicated small intestinal obstruction or ileus, but tension on the duodeno-colic fold may cause limited reflux with large intestinal disease.

The abdomen and thorax should be **ausculted**. The abdomen should be ausculted over 4 quadrants. Vesicular sounds can be distinguished from propulsive sounds.

The **respiratory rate** may be increased due to fever, pain, and acidosis as well as an underlying respiratory problem.

A rectal examination is mandatory in the diagnosis of severe or persistent colic. It should be done with the animal adequately restrained or sedated. It should be possible to palpate:

- the left kidney and the nephrosplenic space
- pelvic flexure
- inguinal rings
- female genitalia

The small intestines are not normally palpable unless distended. Significant findings include small bowel distension, impactions, displacements and mesenteric tension.

Paracentesis is useful in selected cases. The procedure carries some risk to horse and operator, and is not necessary in all cases. It is useful in the diagnosis of peritonitis or a ruptured viscus. It may help in some cases to determine the need for surgery. It can be performed by careful manipulation with an 18 gauge needle, or a teat canula.

Approach to the Colic Case in the Field

The diagnostic approach to a horse with colic; interpreting your findings

1. Attitude and severity of pain - related to degree of obstruction, distension, ischaemia, part of GI tract involved.

2. Vital signs - temperature, pulse rate, capillary refill time, membrane colour, and packed cell volume. Taken together, these reflect the degree of 'sickness' (endotoxemia and fluid imbalance).

3. Abdominal distension - related to part of GI tract involved and the age of the animal;

Adult horse - tends to be due to caecum and/or large colon

Foal - may be due to small intestine, caecum or large colon

4. Nasogastric reflux - related to part of GI tract involved, with small intestine being involved most often.

5. Intestinal sounds - related to intestinal perfusion, inflammation, obstruction, degree of distension, and intestinal contents. Altered by inflammatory mediators as a component of endotoxaemia.

6. Rectal examination findings - part of GI tract involved and intestinal contents.

7. Age-related diseases

Young horses (<3 yrs)

- Intussusception
- Ascarid impaction
- Gastric ulcers in foals
- Foreign body obstruction

Middle age horses (7-10 yrs)

- Caecal impaction
- Epiploic foramen entrapment

Old horses (>10 yrs)

- Enterolithiasis
- Pedunculated lipoma

8. Sex-related diseases

- Stallions - Inguinal hernia
- Mares -Large colon volvulus
- Uterine torsion

9. History and location - some specific relationships exist

- Recurrent history of colic
- Adhesions (particularly if history of colic surgery)
- Mesenteric abscess

10. Laboratory Aids

- Haematology
- Lactate – plasma and peritoneal fluid
- Paracentesis

11. Abdominal Ultrasound

- Distended bowel loops
- Motility
- Thickened bowel wall
- Peritoneal fluid
- Nephrosplenic space

Treating Horses with Colic

1. Pain control and prevent gastric rupture

- Never hesitate to pass the stomach tube

Analgesics - base their use on the clinical signs

Mild colic - Nonsteroidal anti-inflammatory drugs, Flunixin meglumine, Ketoprofen. Can use Phenylbutazone

Moderate colic - Nonsteroidal anti-inflammatory drugs, Flunixin meglumine, Ketoprofen, Alpha-2 agonists, Xylazine, Detomidine, Romifidine

Severe colic – Alpha-2 agonists plus butorphanol – note: this can seriously depress intestinal motility

2. Categorize the problem(s)

Pay attention to the animal's age, sex, breed, history and the physical examination findings. Link this information with the clinical signs and decide which categories of disease are likely or unlikely, and which part of the gastrointestinal tract is primarily involved. Keep in mind what can be gained by determining if the problem is due to obstruction, strangulating obstruction, enteritis, proximal enteritis or non-strangulating infarction (ie., which ones are likely to require intensive care or surgery)

3. Replenish fluid losses

Remember the likely effects that the condition can have on the horse's fluid balance and replenish fluid losses appropriately. Monitor PCV and total protein concentration to assess the adequacy of fluid therapy. Fluids can be given by stomach tube or intravenously. Remember: if the horse has nasogastric reflux, do not add to the problem by giving fluids by nasogastric tube.

4. Cathartics and intestinal lubricants

Mineral oil, DSS (Tympanyl) and magnesium sulfate (Epson salts) are used commonly in the treatment of horses with colic. They are given by nasogastric tube and are used to help break down feed obstructions (impactions) of the large colon and cecum. They should not be given to horses with nasogastric reflux. The most commonly mineral oil – 2-4 litres is used initially, perhaps continuing with 2x daily Tympanyl in warm water.

5. Oral fluids and electrolytes – isotonic formulas

6. Treat endotoxemia, if present or expected

The decision regarding treatment of endotoxemia must be made early if the treatment has a chance of being effective. For this reason, it is important to assess how 'sick' the animal is when the physical examination is performed. Treatment includes administration of flunixin meglumine, appropriate volumes of intravenous fluids, foot iceing and, if warranted, antiserum containing antibodies against endotoxin.

6. Re-evaluate before you re-treat (or retreat)

It is vital that the animal's status be re-evaluated before treatments are repeated. This is especially true regarding the administration of analgesics, such as flunixin meglumine, ketoprofen and detomidine. While these analgesics may control the animal's signs of pain and alter cardiovascular system function, they will not alter the amount of nasogastric reflux or the degree of distension of intestine. For these reasons, it is important to perform as thorough a physical examination as possible before repeating these treatments. The aim of re-examining the animal is to ensure that it does not have a condition requiring surgery before drugs are given that could produce a false sense of security for the practitioner and client.

Specific Conditions

Colic is a sign not a disease. Most of the conditions listed below will respond to timely and appropriate medical treatment. Surgery is not always accessible.

Diagnosis	Specific Therapy
Flatulent or Gaseous Colic	Surfactants eg oil or tympanyl, trocarise caecum in critical cases.
leus/Diarrhoea	Fluid therapy
Anterior Enteritis	Fluid therapy, gastric decompression.
Impaction	Lubricants, superhydration, oral fluids
Sand	Oil, psillium, analgaesics
Ulcerations – Gastric, Large Colon	Gastric ulcers respond to omeprazole and ranitidine
Choke – Oesophageal Obstruction	Oxytocin, sedatives, flushing and judicious with stomach tube
Periparturient Colic	Paraffin, flunixin, check foetal status
Small bowel Phytobezoars in mini ponies	Early vigorous faecal softeners and fluid therapy or surgery is inevitable
Liver Disease	Specific diagnosis and therapy
Urinary Tract Disorders	Specific diagnosis and therapy

The Surgical Colic

Indications for Surgery

Surgery is indicated where:

- a specific diagnosis indicates the need
- the case persists or fails to respond to medical therapy
- vital signs are deteriorating
- pain is persistent and uncontrolled
- Plasma lactate is a useful tool

Case Selection

- The best surgical cases are horses with relatively normal parameters, and of slower onset. Timely referral and decision to operate are the single most important factors in survival.

- Simple obstructive lesions have a better prognosis that strangulating lesions.

- Older horses, as well as even heavily pregnant mares can be successfully operated.

- Ponies, particularly minis and Shetlands, are logistically easier.

- Foals have been shown to do well an increased risk of perioperative complications such as sepsis. A relatively smaller proportion of foals presenting with acute colic require surgical intervention.

Cost and Prognosis

Typically an uncomplicated surgical colic at Agnes Banks Equine Clinic incurs a bill of $5-7,000. Mini ponies with small colon bezoars are quite straightforward and less expensive. Prognosis is highly dependent on the lesion encountered and the presenting state of the patient, however current figures show that most cases at Agnes Banks which reach the recovery box go on to perform in their intended career.

Exploratory Laparotomy

The standard midline ventral laparotomy is almost universally used. The whole GI tract is systematically examined, using the ileocaecal fold as a reference point. Lesions are appropriately managed, or if unresolvable euthanasia is performed. Decompression via pelvic flexure enterotomy and lavage is a cornerstone to success.