



Equine Colic Surgery

Prof. Ibrahim MH Alrashid
Department of surgery and obstetrics
College of veterinary medicine

OUTLINE

- ❖ The term “colic” can cause fear in many horse owners. For the novice horse owner, colic is often a term that is poorly understood. Colic can be caused by many things but is often a clinical condition that can be controlled and/or prevented with good management strategies.

OUT LINE

- ❖ The term “colic” is defined as a general manifestation of abdominal discomfort in the horse, regardless of the
- ❖ cause. While most cases of colic are associated with gastrointestinal disturbances, the nature of some abdominal

Introduction

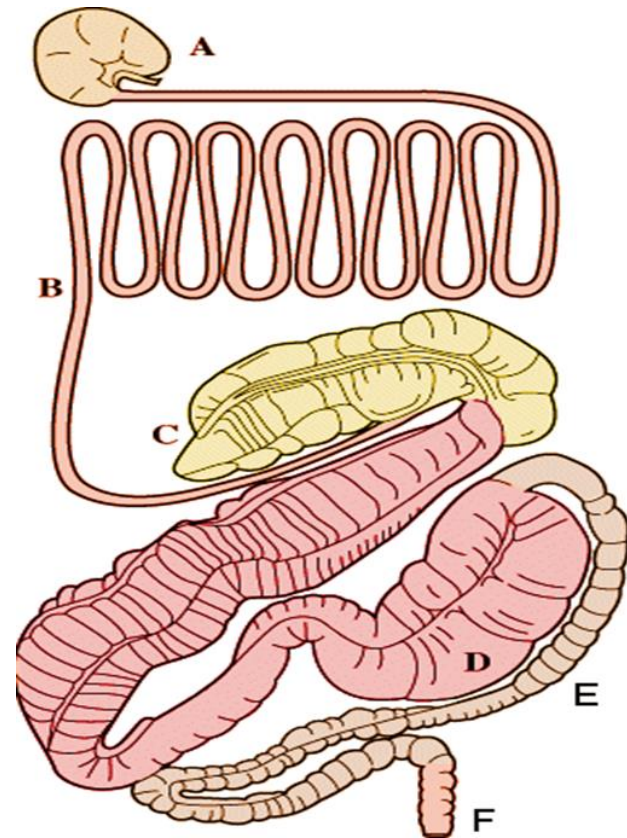
- discomfort may be non-gastrointestinal in origin, such as those resulting from other abdominal organs (including but not limited to the liver, spleen, ovaries, or kidneys). This discomfort can be anything from mild belly pain, causing the horse to paw, bite, and kick at its sides or seem restless, to excruciating pain that causes the horse to flail and thrash around.

Anatomy

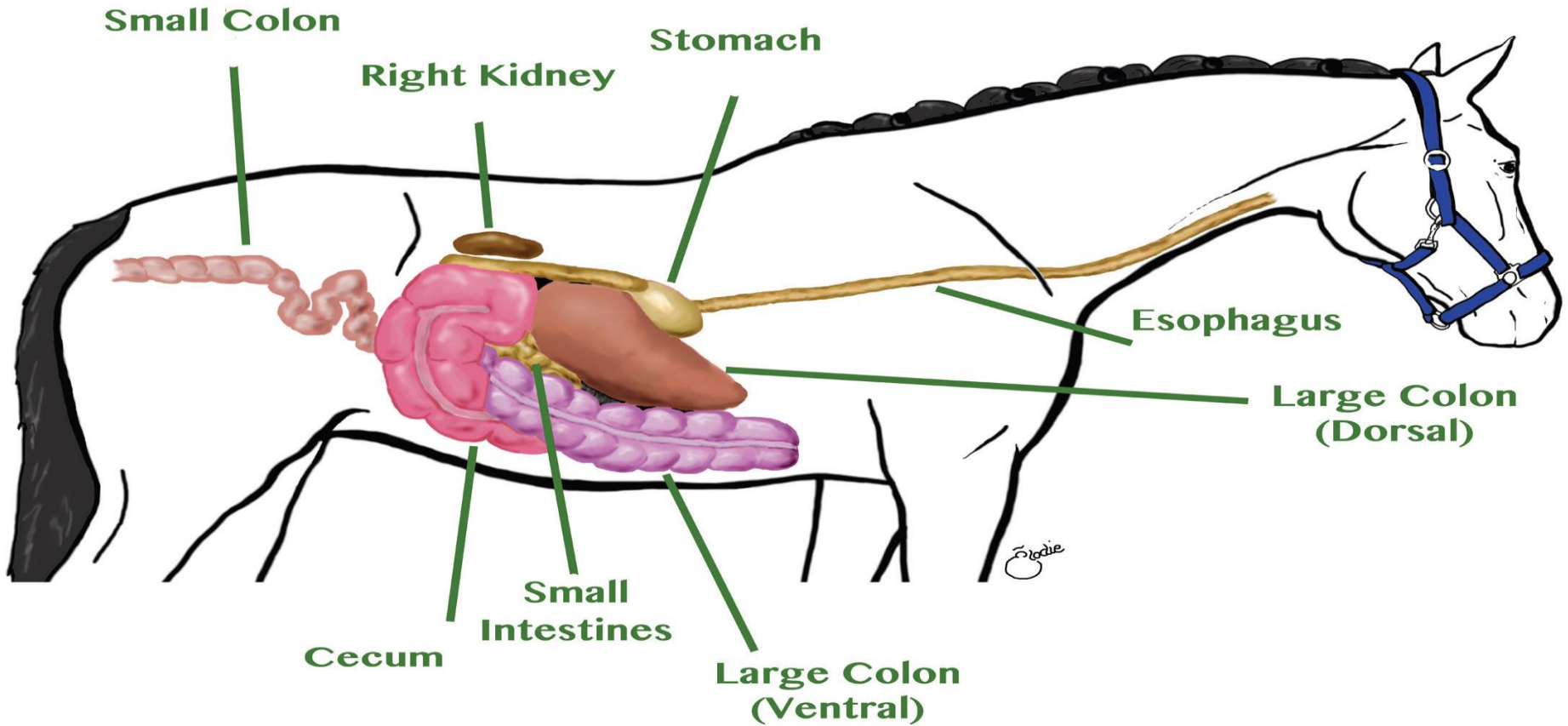
GIT

- A. The horse's small, one compartment stomach
- B. Small intestine
- C. Cecum
- D. Colon
- E. Small colon
- F. Rectum

GIT anatomy



Anatomy



Why do horses colic

- To understand why horses colic, it is important to understand the horse's digestive system. What is most critical and most overlooked by horse owners is that the horse is an animal that is adapted to eating forage, such as grass and hay.



Why do horses colic

- ❖ The horse's digestive system is designed to subsist on this type of roughage, as horses do in the wild. The horse has a relatively small stomach and a more extensive large intestine that includes a cecum filled with microbes to ferment and digest roughage

Causes

- overfeeding high starch/sugar grain-based concentrates (such as textured grain, pellets, or extruded feed) while not ensuring that the horse has adequate forage intake. The horse is designed to eat continuously throughout the day. If allowed access to pasture all day, horses typically graze from 9-19 hours.

Causes

- Parasites are recognized to inhabit the gastrointestinal tract without essentially causing disease. As horse owners, it is important to prevent excessive parasitization, which can damage the intestinal parenchyma and cause disease. Before the introduction of dewormers,

Causes

- large strongyles were commonly associated with colic; however, the parasite is now rarely present among our horse population. More prevalent is the presence of small strongyles. Fecal egg counts are a useful method at quantifying the amount of eggs shed by a horse to give a rough estimate of the worm load present.

Causes

- Sand ingestion
- Impaction from sand can also be common in parts of Georgia with sandy soil, typically caused by sand accumulation in the large colon. Good management practices are the best way to prevent this problem. Avoid feeding horses directly on the ground or over bare sandy areas



Causes

- where they will drop feed and then eat it off the ground. Keeping low stocking numbers in pastures to avoid deterioration of pasture into large sandy areas is also important.

Causes

- Toxic plants
- Toxic plants can cause colic in horses, as well as a variety of other health issues. Routinely inspecting pastures for toxic weeds, trees, and shrubs is important for horse health.

Causes

- Post-foaling complications
- Mares are predisposed to certain types of colic after foaling. The space created after the foal exits the abdominal cavity and the shrinkage of the uterus may cause the large colon to shift in an abnormal position and get displaced. In more severe cases, the large colon can twist and create torsion.



Causes

- As a result, the blood supply to the gastrointestinal tract gets compromised, and the prognosis is usually guarded. However, chances of survival increase if diagnosed early.

Causes

- Obstruction
- Distension can happen either because of physical obstruction due to accumulation of ingesta, or fluids in gastro intestinal tract, causing physical colic or without physical obstruction

Causes

- Complete obstruction, happen because of intestinal accidents such as torsion and intussusception, causing severe in tolerable pain, and shock due to intestinal infarction and bacterial toxins that pass into the blood stream

Causes

- Enteritis is inflammation of intestinal mucosa, because of microbial infection such as Salmonella, Clostridia and Rickettsia, and equine viral arthritis, or chemical poisons, enteritis causes colic of short-lived which is characterized by fever, depression, and diarrhea



Risk factors associated with equine colic

1. Species
2. Breed and age
3. Food and water
4. Control of internal parasite
5. Teeth problems
6. Exercise



Types of colic

Tympanic (flatulent) colic

Gas colic, also known as tympanic colic, is the result of gas buildup within the horse's digestive tract due to excessive fermentation within the intestines or a decreased ability to move gas through it



Types of colic

Impaction (obstructive) colic

This is caused by an impaction of food material (water, grass, hay, grain sand and stone) . The most common cause is when the horse is on box rest and/or consumes large volumes of concentrated feed, or the horse has dental disease and is unable to masticate properly Impaction generally responds well to medical treatment, usually requiring a few days of fluids and laxatives such as mineral oil

Types of colic

- • Extradural which cause the spinal cord to be compressed
- • Intramedullary, which are the least common, occur in the glial cells. Glial cells are one of the two types of cells that comprise the nervous system. Neurons transmit and receive messages and the glial cells that surround neurons.

Types of colic

Displacement (Extra-Luminal) colic

It occurs due to mechanical distortion or obstruction of intestine with consequence of interfere with blood supply. A volvulus is a twist along the axis of the mesentery, a torsion is a twist along the longitudinal axis of the intestine

Types of colic

Spasmodic (Spastic) colic

It is characterized by periodic spastic contraction of the intestinal muscle or visceral pain. It is the most common type of colic which occurs due to irritation of Gastrointestinal mucosa by unsuitable foodstuff, excitement and drinking of cold water after work. The clinical signs of these forms of colic are generally mild, transient (22% of spasmodic colic are associated with tapeworms).



Symptoms

Mild pain

1. Pawing the ground
2. Sweating
3. Looking at the belly
4. Restlessness
5. Lack of appetite
6. Stamping the hind feet
7. Lying down



Symptoms

Severe pain

1. Violently pawing ground
2. Appear bloated
3. Muscle straining
4. Kick violently
5. Sweat a lot
6. Lie down and get up frequently

Symptoms

- 7-Scalenus
- 8-Longus Capitis
- 9-Longus Colli
- 10-Rectus Capitis Centralis
- 11-Multifidus Lumborum
- 12-Multifidus Thoracis
- 13-Obliquus Capitis Caudalis



Symptoms

1. Sit on haunches like a dog
2. Roll or lie on their backs
3. Have below normal temperature-because of stock setting in
4. Increase respiration rate
5. Elevated heart rate
6. Few or no gut sounds



Diagnosis of equine colic

1. Case history
2. Clinical signs and parameters(Clinical parameters which include evaluation of the cardiovascular system, such as heart rate, mucous membrane color, capillary refilltime

Diagnosis of equine colic

- ❖ Distension of abdomen is rarely noticed in colicky horses, but symmetrical distension of abdomen refers to accumulation of gas in small colon, and distension of the right flank is indicator of gas accumulation in the caecum Colic increases capillary refill time and pulse rate.



Diagnosis of equine colic

3 -Nasogastric intubation

Nasogastric intubation is important for diagnosis of colic, and relief of gastric distension, which will rupture the stomach, if not treated, because of inability of equines to vomit



Diagnosis of equine colic

4- Rectal Examination

Rectal examination is important step in diagnosis of colic, through it clinician can examine reachable organs



Diagnosis of equine colic

5-Ultrasonography

Ultrasonography is used for examination of unreachable organs by rectal examination. Percutaneous ultrasonography is used in confirming of gastric rupture diagnosis which is characterized by increased volume of peritoneal fluids



Diagnosis of equine colic

6-Abdominal auscultation

Auscultation to the abdomen by stethoscope is carried out parallel to the edge of the last rib on both sides



Diagnosis of equine colic

7-Fecal examination

The amount of feces produced, and its character can be helpful, although as changes often occur relatively distant to the anus, changes may not be seen for some time.

Treatment of equine colic

- Medical treatment
- Nasogastric intubation is applicable for decompression of stomach distended by gas or fluids, intubation should be repeated until no gastric reflux is seen. Caecum is the most common place for gas accumulation, for removal of this gas, caecum is punctured from outside,

Treatment of equine colic

- in the right flank Unfortunately when caecum decompression is needed, surely there is lesion need surgical interference. Generally abdominal distension has to be taken in account when assessing colicky horses.

Treatment of equine colic

- Analgesics make the colicky animals relax and prevent it from injuring itself (White, 2006), the most used pain killers during colic period are: non-steroidal anti-inflammatory agents

Treatment of equine colic

- Nonsteroidal anti-inflammatory agents which include flunixinmeglumine, ketoprofen, phenylbutazone and meloxicam (Mezerovaet al.,2001) are the most drugs used for killing pain of either surgical or non-surgical cases and for manage of endotoxaemia associated with equinecolic.

Treatment of equine colic

■ Rehydration

- Colic cases with dehydration, almost have metabolic acidosis, so solutions contain lactic acid must be avoided so as not to deteriorate the case; fluids contain carbohydrate are suitable for such cases (infusion of 50gram in one liter intravenously and fluids with potassium and calcium should be administered according to the laboratory investigation)

Treatment of equine colic

- **Impaction** is treated either by laxatives or anthraquinone purgatives, efficacy of anthraquinones is variable and may cause severe diarrhea. They lubricate the intestine and prevent toxins absorption the recommended dose is 5-10ml/kg, mineral oil administration is contraindicated in horses with obstruction

Treatment of equine colic

- especially obstruction of small intestine because they worsen the already distended stomach, so they must not be given to horses with severe colic without accurate diagnosis

Treatment of equine colic

- Fluids support
- Fluids are commonly given, either orally by nasogastric tube or by intravenous catheter, to restore proper hydration and electrolyte balance. In cases of strangulating obstruction or enteritis, the intestine will have decreased absorption and increased secretion of fluid into the intestinal lumen,

Treatment of equine colic

- making oral fluids ineffective and possibly dangerous if they cause gastric distention and rupture. This process of secretion into the intestinal lumen leads to dehydration, and these horse require large amounts of intravenous fluids to prevent hypotension and subsequent cardiovascular collapse. The intravenous fluid requirement of horses

Treatment of equine colic

- with simple obstruction is dependent on the location of the obstruction. Those that are obstructed further distally, such as at the pelvic flexure, are able to absorb more oral fluid than those obstructed in the small intestine, and therefore require less intravenous fluid support.

Treatment of equine colic

- **Surgical treatment**

- Most of death due to colic happens after surgical treatment of colic due to post operative complications. Most cases of death are noticed during the first ten days post surgical operation. Surgical intervention should be done only when there is accurate diagnosis of



Procedure of surgical laparotomy

- ❖ Sedation by xylazine The horse was sedated with xylazine, 0.25 mg/kg body weight (BW), IV.
- ❖ administered an antispasmodic (Hyoscine butylbromide, 0.2 mg/kg BW, IV, to facilitate trans-rectal examination

Surgical laparotomy

- ❖ Palpation of abdominal viscera per rectum revealed moderate gas distension within the cecum and large colon, as well as multiple tight taenial bands consistent with colonic displacement.
- ❖ The large colon also contained a moderate quantity of firm fecal material, consistent with an impaction. Exact localization of the impaction and characterization of the displacement were difficult.

Surgical laparotomy

- ❖ A nasogastric tube was placed, and 4 L of net reflux were obtained, consisting of fibrous feed material. The tube was left in place and the stomach was lavaged every 2 h until cleared of food content.

Surgical laparotomy

- ❖ Repeat trans-rectal palpation the morning after admission (day 1) showed a decrease in gas distension of both the cecum and large colon, but the colonic displacement was still present

Surgical laparotomy

- ❖ The horse was sedated with xylazine 1 mg/kg BW, IV, and anesthesia was induced with ketamine (ketamine hydrochloride, 3 mg/kg BW, IV, and diazepam 16.6 mg/kg BW, IV. The horse was placed in dorsal recumbency and anesthesia was maintained with isoflurane inhalant anesthetic agent vaporized in oxygen.

Surgical laparotomy

- ❖ A lidocaine 2%; 1.3 mg/kg BW bolus over 15 min, followed by a continuous rate infusion at 3 mg/kg BW per hour was given. The ventral abdomen was prepared and draped for aseptic surgery according to hospital protocol.

Surgical laparotomy

- ❖ An incision was made through the ventral midline from the umbilicus extending 20 cm cranially and the abdomen was opened. Abdominal exploration revealed significant displacement and mild gas distension of the large colon. A tight band of tissue was palpated within the cranial abdomen and it appeared that a portion of the colon was attached to it.

Surgical laparotomy

- ❖ After decompression of the large colon using suction with 18-G needles, the colon could be partially exteriorized. It was then possible to further characterize the colonic displacement, which involved a volvulus at the level of the right colon. There was an abnormal band of tissue present that originated from the visceral surface of the quadrate lobe of the liver and

Surgical laparotomy

- ❖ attached to the mesentery of the large colon at the level of the diaphragmatic/sternal flexures. The band was approximately 40 to 50 cm long and about 3 cm in diameter along its length, becoming wider at the attachment sites. It contained several large blood vessels that were approximately 6 to 8 mm in diameter.

Surgical laparotomy

- ❖ The vascular band was exteriorized as much as possible and 2 transfixing sutures (USP size 2 polyglactin 910) were placed on each side of the planned transection site. The band was then transected using an emasculator, which was left in place for 2 min, then released.
- ❖ The volvulus, which was at the level of the right colon and was approximately 270°,

Surgical laparotomy

- ❖ was manually corrected and the colon was observed for approximately 15 min; it did not show any color changes and proper pulses were palpated within the mesenteric vessels.

Surgical laparotomy

- ❖ The horse recovered well from anesthesia and was maintained on a course of antibiotics [gentamicin, 6.6 mg/kg BW, IV, q24h, and procaine penicillin, 22 000 mg/kg BW, IM, q12h for 2 d, then trimethoprim sulfamethoxazole 25 mg/kg BW, PO, q12h for 5 d],

Surgical laparotomy

- ❖ and a tapering dose of intravenous flunixin meglumine (flunixin meglumine, Prevail; MWI) for 3 d. The horse made an uneventful recovery from the surgery, with no post-operative complications. He had 1 episode of colic 2 months after discharge, which resolved with medical intervention.



Thank You