EQUINE RECTAL EXAM: WHAT AM I REALLY FEELING?
A LAPAROSCOPIC PERSPECTIVE

P.O. Eric Mueller, DVM, PhD, Dipl. ACVS
Professor of Surgery
Department of Large Animal Clinical Sciences
College of Veterinary Medicine
University of Georgia
2200 College Station Road
Athens, GA 30602

Introduction
A complete and thorough rectal examination is an essential component of a diagnostic evaluation when examining horses with abdominal pain. Rectal examination findings should always be considered in conjunction with the results of physical examination, nasogastric intubation, abdominocentesis, and laboratory evaluation. A rectal examination should always be performed before abdominocentesis in order to recognize an extremely gas distended or ingesta-filled cecum or large intestine. If these abnormalities are identified, extreme care must be taken when performing an abdominocentesis to avoid accidental enterocentesis.

Occasionally, rectal examination findings clearly indicate the specific disease, such as a renosplenic entrapment, early ileal impaction, or herniation of small intestine through the inguinal ring in a stallion. Most often, however, rectal examination does not yield a specific diagnosis, but yields information regarding the severity of the problem and the need for surgical intervention. Abnormal rectal examination findings include abnormal positioning of the intestine, distention of the intestine with gas or ingesta, abnormally thickened intestinal wall, and the presence of intra-or extra-luminal masses.

The size and depth of the peritoneal cavity in the horse limit the examiner to palpation of the caudal 25-30% of the peritoneal cavity. Because of the inability to examine the entire peritoneal cavity, subtle abnormalities identified on examination are often used to make inferences concerning the more cranial regions of the peritoneal cavity. Consequently, the lack of abnormal rectal examination findings does not completely rule out an intestinal abnormality.

Technique
When performing a rectal examination, proper restraint is of the utmost importance to assure the safety of the horse and the examiner. Inadequate restraint may result in iatrogenic rectal tear, a potentially fatal complication of rectal examination, or serious injury to the examiner. A nose twitch should always be used to control the patient. Horses that resist rectal examination, or those with signs of unrelenting abdominal pain should be sedated with xylazine (0.3-0.5 mg/kg, IV) or detomidine (.01-.05 mg/kg, IV). The anticholinergic drug, N-butylscopolammonium bromide (Buscopan®, Boehringer, St. Joseph, MO) may also be administered (0.3 mg/kg, IV or 7-ml/450-kg horse) to promote rectal relaxation. It should be noted that the anticholinergic actions of the drug cause a marked increase in heart rate that may last for up to 30 minutes after administration. Adequate lubrication of the examiner's hand and arm is necessary to minimize
irritation to the rectal mucosa. Hydrated methylcellulose (Obstetric lube) is the most commonly used lubricant. Initial introduction of the examiner's hand through the anal sphincter is often met with great resistance. Therefore, this should be performed with a slow and steady motion. The fingers and thumb of the hand should be kept together in an extended position throughout the entire examination. Once the hand is through the anal sphincter, the feces within the rectum are evacuated. The amount and consistency of fecal material in the rectum should be noted. Absence of fecal material, or the presence of dry, fibrin and mucous covered feces is abnormal and is consistent with delayed intestinal transit. Fetid watery, fecal material is often present in horses with colitis. Large amounts of sand within the feces may be indicative of a sand impaction or sand-induced colitis. After evacuation of feces from the rectum, intra-rectal administration of 50-60 ml of 2% lidocaine via a 60 cc catheter tip syringe may help promote further rectal relaxation and reduce straining. The syringe may also be used to administer additional lubrication into the rectum at this time.

The examiner's arm is then re-introduced into the rectum and advanced slowly and steadily as far as comfortably possible. The arm is left in this position without excessive movement for 20 to 30 seconds. In most cases, this initial delay in internal palpation will allow the rectum to relax around the examiner's arm, facilitating a more thorough palpation of the more cranial aspects of the abdomen. Initial examination of the caudal aspects of the abdomen with a half-inserted arm is not recommended because it usually results in straining and excessive peristaltic contraction of the rectum.

The most severe complication associated with rectal palpation is an iatrogenic rectal tear. Although rare, tears usually occur dorsally between the 10 and 12 o'clock positions. Most rectal tears can be avoided by proper restraint, adequate lubrication, and steady and careful palpation technique. If a peristaltic contraction or increased resistance is felt during examination, the hand should immediately be withdrawn from the rectum to avoid potential rectal injury.

The examination should be performed in a consistent, systematic manner to assure a complete and thorough examination and minimize the chance of missing a lesion. I prefer a clockwise approach, starting with the spleen in the left dorsal abdominal quadrant. This is followed by examination of the right dorsal, right ventral, and left ventral quadrants. The pelvic canal and more caudal structures are examined just before removal of the hand from the rectum. In general, palpable characteristics of the abdominal contents and viscera are often helpful in identifying the particular segment of the intestine involved and the severity of the condition. The small intestine has a characteristically smooth serosal surface, with distention usually involving multiple loops of small intestine. The serosal surface of cecum, and ventral ascending colon contains multiple sacculations (haustra) and fibrous bands (taenia), while the dorsal colons and pelvic flexure have relatively smooth surfaces with no palpable bands. Severe gas or ingesta distended intestine, tight mesentery or taenia (bands), or thickened or turgid intestine are indicative of intestinal obstruction or strangulation. Free peritoneal gas or crepitus within the intestinal wall is usually indicative of intestinal rupture. A gritty or granular texture of the peritoneal cavity is indicative of intestinal rupture with contamination of the serosal and peritoneal surfaces with ingesta. It should be emphasized that rectal examination findings
should always be interpreted in conjunction with the physical examination and laboratory findings.

Rectal Palpation of the Normal Horse
In the normal horse, moist, soft fecal balls should be present in the rectal ampulla. The descending colon is easily identifiable in the caudal abdomen. It contains multiple, distinct fecal balls and is freely movable within the abdomen. Other intra-abdominal structures palpable in the normal horse starting in the left dorsal abdominal quadrant, and progressing in a clock-wise direction include: caudal border of the spleen, renosplenic ligament, caudal pole of the left kidney, portions of the mesentery ventral cecal taenia (no tension), cecal base (empty), and the pelvic flexure (Fig. 1). Normally, the duodenum and remaining small intestine are too soft and relaxed to be identified unless an underlying abnormality exists.

Figure 1. Caudal view depicting palpable intra-abdominal structures in a normal horse.

The spleen is located in the left dorsal abdomen. The caudal edge of the spleen is palpable against the body wall. The renosplenic ligament can be palpated coursing from the medial aspect of the head of the spleen, toward midline to the caudal pole of the left kidney. Immediately dorsal to the ligament is the renosplenic space. Three to four fingers may be placed in the renosplenic space. Moving the arm to the right and cranially along the dorsal midline, the aorta and portions of the mesentery may be palpated. The pulse in the aorta is easily palpable; however, the mesentery may be difficult to feel unless it is under tension secondary to intestinal distention or volvulus.

Continuing to move in a clockwise direction, the base of the cecum is palpable in the right dorsal-lateral abdominal quadrant. The ventral and sometimes medial cecal taenia are usually
palpable by sweeping the hand medial to lateral and caudally, hooking the taenia with the tips of the examiner’s forefingers. These bands usually course in a dorsocaudal to ventrocranial direction, just to the right of the midline. Because the majority of the body and apex of the cecum are beyond the examiner’s reach the tautness of the ventral and medial cecal taenia is used as an indicator of the amount of ingesta within the cecum. Normally the cecal taenia should be loose and easily movable. With increased amounts of ingesta in the cecum, the taenia becomes more taut. In addition to cecal disease, pain elicited upon palpation of the ventral or medial cecal taenia may be associated with tension of the ileum or its mesentery. This has been associated with pain originating from the ileum and its vasculature, such as occurs with entrapment of the ileum in the epiploic foramen.

Moving caudally and to the left side, the pelvic flexure may or may not be palpable in the caudal left abdomen, depending on the amount of ingesta within the large colon. If the pelvic flexure and associated left dorsal large colon are palpable, they may be identified by soft ingesta, and the absence of the taenia and haustra (sacculations). The adjacent left ventral colon contains similar contents and has two free palpable taenia and haustra. The taenia should course in a cranial to caudal direction, from the left caudal abdomen to the left cranial abdomen. Additional structures in the caudal abdomen included in a complete rectal examination include: bladder, uterus and ovaries in the mare, and internal inguinal rings in the stallion. The inguinal rings are identified just cranial, lateral, and slightly ventral to the ilipectineal eminence of the anterior brim of the pelvis. In stallions, the inguinal rings are large enough for insertion of a finger. If the testis or epididymis has descended, the ductus deferens is palpable in the caudomedial aspect of the ring. In geldings, the inguinal ring is palpable as only a slight depression and decreases in size with age.

**Recognition of Intestinal Abnormalities**

**Small Intestine**

Palpable small intestinal distention (Fig. 2) is always an indication of small intestinal obstruction. The obstruction may be a physical obstruction, such as an ileal impaction or small intestinal strangulation, or it may be a functional obstruction such as ileus secondary to enteritis or non-strangulation intestinal infarction. The small intestine is of a similar diameter to the descending colon. The small colon is distinguished from the small intestine by the presence of both a mesenteric and anti-mesenteric band and fecal balls.

Obstruction of the small intestine causes rapid dehydration of the ingesta in the ascending colon due to lack of fluid entering from the small intestine and ongoing absorption of fluid from the ascending colon. The colon becomes hard and indurated and feels as if it were vacuum-sealed. In a horse with an early small intestinal obstruction, and little or no palpable small intestinal distention, the inexperienced examiner may interpret this finding as a primary large colon impaction. The taenia and haustra of an ascending colon that is secondarily dehydrated contour to the ingesta within the intestinal lumen and are easily palpable. This is in contrast to a primary large colon impaction, where the taenia and haustra become less distinct with increasing colonic distention.

Non-specific small intestinal distention is the most common finding in horses with small intestinal lesions. However, occasionally specific findings identified on rectal examination will
lead to a diagnosis. An ileal impaction, detected early in the disease process, may be palpable as a firm, tubular structure in the center or the abdomen, coursing toward the cecum. Herniation of small intestine through the inguinal ring in a stallion is palpable as small intestinal distention with a segment of small intestine or mesentery coursing into one of the inguinal rings. In these cases the inguinal rings often feel asymmetric, and gentle traction on the mesentery associated with the affected ring elicits a painful response. Jejunojejunal intussusception causes generalized small intestinal distention, but the intussusceptum is occasionally palpable as an extremely thickened, edematous, tubular structure in the caudal aspect of the abdomen. Ileocecal intussusceptions are difficult to identify per rectum, but early in the disease process are occasionally identified as a turgid mass in the right dorsal abdomen.

Rectal examination findings in horses with proximal enteritis may mimic those of a physical obstruction. With enteritis, however, the small intestinal distention is often less severe and easily compressible. With nasogastric decompression and intravenous fluid therapy, the intestinal distention often decreases.

Cecum
Cecal distention may be a primary problem, such as impaction of the cecum with ingesta or fluid, or more commonly secondary to obstruction of the large or small colon. Early in the development of a cecal impaction, the apex of the cecum becomes distended with ingesta, but is beyond the reach of the examiner. Therefore, palpation of the ventral cecal taenia is used as an indirect indicator of cecal filling. Normally the cecal taenia should be loose and easily movable.
With increased filling of the cecum with ingesta, the taenia become more taut, and the cecum displaces cranial and toward the midline. If a cecal impaction is suspected, it is important to pay particular attention to the more cranial aspects of the right caudal abdomen, because the weight of the ingesta in the cecum will cause it to displace cranially, often just within the reach of the examiner. As the cecum becomes further distended, the weight of ingesta in the apex pulls the cecal base cranially within the abdomen, and the ventral taenia, which normally courses from the right dorsal to right ventral quadrant, crosses diagonally across the caudal abdomen, from the right dorsal to left cranioventral quadrant. As the cecum fills above the cecocolic orifice, complete obstruction occurs and the cecal base fills with fluid and gas. In cases of severe cecal tympany the cecal base feels like a tightly distended balloon in the right dorsal quadrant. The presence of severe cecal mural edema or emphysema is an indicator of intestinal compromise and possible cecal rupture, and is associated with a poor prognosis.

The distinction between cecal impaction and right dorsal displacement of the large colon may be difficult during rectal examination. The cecum has a dorsolateral mesenteric attachment to the right abdominal wall. This attachment prevents the examiner from passing the hand lateral to the cecum. With right dorsal displacement of the large colon, the cecal base and taenia are cranial to the displaced large intestine and therefore are not palpable and the examiner's hand can be passed between the displaced colon and right lateral abdominal wall. Additionally, primary cecal impactions are palpable more cranially in the abdomen, while large colon distention will often extend caudally into the pelvic inlet.

Large Colon
Abnormalities of the large colon have a variety of intestinal positions and degrees of intestinal distention, and include large colon impaction, left and right dorsal colon displacement, and colon volvulus. Impaction of the large colon usually occurs at the pelvic flexure and may be felt in the left or right caudal abdominal quadrants. The colon is enlarged, and easily identifiable upon palpation. The two free taenia of the ventral colon course in a cranial to caudal direction, from the left cranial abdomen to the left caudal abdomen. As the impaction enlarges, the taenia may continue to the right caudal abdomen, with the pelvic flexure lying in the right caudal abdomen, just cranial to the pelvic rim, with the taenia coursing right to left just cranial to the pelvic canal. The consistency of the ingesta forming the impaction may vary from soft and indentable to firm and indurated. With severe impaction, the colon may fill the entire caudal abdomen, and the haustra of the ventral colon become indistinct. It is imperative that the examiner rule out a large colon displacement before initiating aggressive medical therapy. Primary large colon impactions are usually treated medically; whereas horses with colon displacements and secondary impaction require surgery for resolution of the impaction.

Horses with impactions or obstructions (enteroliths) of the right dorsal colon and transverse colon most often present with generalized cecal and large colon tympany. Occasionally, however, the lesion may be identified on rectal examination, particularly if a concurrent right dorsal colon displacement exists (see below). In these cases, the impaction or enterolith may be balloted with the examiner's fingertips, but cannot be palpated in its entirety.

Right dorsal displacement of the large colon may assume a variety of anatomic configurations, but the common finding for all right dorsal displacements is displacement of the left ventral and
**dorsal colon lateral to the cecum.** The colon retroflexes on itself and passes between the cecum and right body wall. The colon and associated taenia are felt immediately cranial to the pelvic canal, coursing from the right caudal abdomen, **transversely** across the abdomen, and then continuing toward the left cranial abdomen (Fig. 3). While this orientation of the colon and taenia may be similar to that of a severe large colon impaction, with a primary displacement, the colon is distended primarily with gas as opposed to ingesta and the pelvic flexure usually comes to lie in the left cranial abdomen, beyond the reach of the examiner. The colon displaces the cecum medially, and cranially, making it difficult to palpate. With increased duration, the cecum often becomes secondarily distended with gas. The degree of intestinal distention is variable and severe gas distention of the colon will preclude complete examination of the abdomen.

![Figure 3](image)

**Figure 3.** Caudal view of the abdomen depicting right dorsal displacement of the large colon with colonic bands coursing horizontally across the abdomen.

**Left dorsal displacement** of the large colon (renosplenic entrapment) can be diagnosed by rectal examination if the colon is not markedly distended. The left dorsal and ventral colon become entrapped within the renosplenic space, between the spleen and left kidney (Fig. 4). The majority of the colon is palpable on the left side of the abdomen with the taenia coursing from the left craniodorsal abdomen to the left or right caudoventral abdomen. Following the taenia cranially and dorsally, the examiner can feel the taenia enter the renosplenic space. When moving the hand from left dorsal abdomen to the dorsal midline, the examiner should feel the head of the spleen, compressed large colon and associated taenia as it hangs over the renosplenic
ligament, and left kidney to confirm the diagnosis of left dorsal colon displacement. With increased duration, the cecum often becomes secondarily distended with gas. If the colon is severely distended, the colon may fill the left caudal abdomen and preclude examination of the renosplenic region. In this case, left dorsal displacement may be suspected but should be further evaluated with transcutaneous ultrasonography of the renosplenic region. Displacement of the spleen medially and ventrally may be associated with left dorsal displacement, but these findings alone do not confirm the diagnosis of left dorsal displacement.

Figure 4. Caudal view of the abdomen depicting left dorsal displacement of the large colon with colonic bands coursing over the renosplenic space.

**Torsion or volvulus** of the large colon is easy to diagnose in the later stages of the disease. The horse's abdomen is visibly distended and the large colon fills the entire abdomen. In extremely advanced cases, the examiner cannot introduce the hand beyond the pelvic rim. The marked colonic distention causes the colon to fan-fold (pretzel) within the limited space of the abdominal cavity. This is often evident as colonic taenia courses transversely across the caudal abdomen, and may be difficult to distinguish from that of a right dorsal displacement.

In the early stages of colon volvulus, colonic distention may not be severe. Often the pelvic flexure and left colon will be evident in the left abdominal quadrant. The pelvic flexure may be moderately distended with gas, displaced cranially, and appear to be suspended within the middle left abdomen. The haustra and taenia of the ventral colon may be palpated dorsal to the smooth dorsal colon, indicating malpositioning of the colon. The remainders of the colon and entire cecum are displaced cranially and beyond the reach of the examiner. In these cases, persistent abdominal pain and progressive colonic distention are often evident on sequential examinations.
Rectal examination of the horse with obstruction of the proximal small colon (fecalith or enterolith) is usually characterized by generalized cecal and colonic tympany. Impaction of the middle to distal small colon has additional findings of continuous, solid, ingesta within the descending colon and marked rectal mucosal edema. This forms a uniform, smooth tube of variable length in the central caudal abdomen. Individual fecal balls and haustra of the descending colon are not usually prominent in horses with small colon impaction. However, the pencil diameter, “rope-like” mesenteric band is unique to the small colon and a helpful identifying characteristic of the small colon. The ingesta is most often soft and easily indentable, in contrast to large colon impactions. In severe cases the entire small colon becomes impacted with ingesta and the weight of the impaction pulls the rectal ampulla and associated mesentery ventrally and to the left of midline. This makes complete examination of the rest of the abdomen difficult if not impossible.

Additional Reading