Surgical Management of Colic

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Horses that present to the hospital for evaluation of abdominal pain are often challenging cases especially in the periparturient mare. Certain diagnostic tests are often of limited value in assessing the mare prior to foaling (i.e., palpation per rectum). Two categories of abnormalities will be discussed in the presentation: 1) abdominal pain caused by a lesion in the gastrointestinal tract and 2) abdominal pain caused by a lesion in the reproductive tract.

The primary causes of abdominal pain secondary to a problem in the reproductive tract are uterine torsion and uterine rupture. Mares with uterine torsion often show signs of mild to moderate abdominal pain. Uterine torsion typically occurs in the last two months of gestation. The diagnosis is typically made by palpation per rectum where the broad ligament is felt coursing dorsal to the caudal aspect of the uterus in the direction of the torsion. The examiner must palpate for this or it is easy to “overlook” the lesion by concentrating the rectal examination on the gastrointestinal tract. Typically the torsion is 180 degrees and can be clockwise or counter clock wise in direction when viewed from the rear of the mare. Uterine torsion can be corrected by anesthetizing and rolling the mare, standing flank laparotomy, or ventral midline laparotomy. The mare is sedated and restrained in stocks for the flank laparotomy procedure. Local anesthesia is used to desensitize the surgical site. The incision is typically made on the side in the direction of the torsion. If the uterine torsion is counter clockwise then the incision would be made in the left flank. It is wise to prepare both flanks for surgery in case the torsion cannot be corrected from the original surgical approach. The approach is a modified grid to gain access to the abdominal cavity. Once in the abdomen the uterus is rocked back and forth in order to “untwist” the torsion. In cases where the foal is very large and heavy a second person may be needed on the opposite side of the abdomen to assist in the correction. A ventral midline approach can be utilized to correct uterine torsion. This approach is extremely versatile since the entire abdominal cavity can be examined. In one report of 19 mares, there was a gastrointestinal tract lesion in addition to the uterine torsion in 53% of the cases. The stage of gestation affects the prognosis for survival of the mare and the foal. In a retrospective by Chaney, et al overall mare survival was 84%. When the torsion occurred at < 320 days of gestation the survival was 97% compared to 65% when the torsion occurred at > 320 days of gestation. The overall foal survival rate was 54%. Seventy-two percent of the foals survived when the torsion occurred at < 320 days of gestation compared to 32% when the torsion occurred at > 320 days of gestation.

Rupture or tearing of the uterus can occur secondary to dystocia, normal foaling or uterine torsion. Clinical signs of peritonitis typically occur within 48–72 hours of parturition. Depression, anorexia, mild colic, and fever are the most common. Palpation per rectum and vaginum, vaginal speculum examination, abdominocentesis, and abdominal ultrasound should be included in the diagnostic evaluation of a mare presented for evaluation for colic post-partum. Tears can be located in the uterine body or horns. It is uncommon to detect a tear in the uterine horn via palpation but a tear in the uterine body are nearly always identified. A tear in the uterine body is best accessed via a trans-vaginal approach as a standing procedure. The most common location for the tear to occur is the tip of the uterine horn. Retrospective studies by Javicsas et al and Sutter et al found that tears occur in the uterine horn in 74% of cases while tears in the uterine body occur in 26% of the cases. Surgical access to the uterine horn is achieved via a caudal ventral midline approach. The tear is then repaired using a 2 layer closure with either #1 or #2 absorbable suture material. The primary suture line should be oversewn using an inverting suture pattern. The remainder of the abdomen should be explored, lavaged and suctioned. There is often a significant amount of fibrin and inflammatory material in the abdominal cavity. A sample should be submitted for culture if one was not taken pre-operatively. An abdominal drain should be placed and post-operative abdominal lavage should be performed for at least 3 days. Uterine lavage can be initiated 24 hours post-operative. Mare survival rate has been reported to be 75–80%.

The most common causes of diaphragmatic hernia formation in the adult horse are trauma, parturition, and recent strenuous activity. The clinical signs can range from the horse being asymptomatic
to signs of severe abdominal pain. Ultrasound can be very useful in making the diagnosis prior to surgery. However, a pre-surgical diagnosis of a diaphragmatic hernia is not always made. The approach is via a ventral midline laparotomy. It is important to prepare and drape the abdomen cranial to the xiphoid for surgical access. The intraoperative diagnosis is not difficult if a portion of the gastrointestinal tract is incarcerated in the hernia. However, a thorough examination of the diaphragm should be performed rule out the possibility that the incarcerated section of the intestinal tract became free when the horse was placed in dorsal recumbency. Access to a tear in the ventral aspect of the diaphragm is not difficult but a tear located in the dorsal aspect of the diaphragm can be difficult if not impossible to access via a ventral approach. The defect should be repaired using suture material and/or prosthetic mesh. The surgeon must remember to address the pneumothorax that is created when the incarceration is reduced. Access to the defect can be improved by tilting the surgery table to displace the abdominal contents caudally.

A rent in the mesentery of the small colon or the small intestine can occur secondary to parturition. The origin is thought to be vigorous movements of the foal during parturition. These rents can lead to ischemic necrosis of a section of the small colon or small intestine or cause a strangulating obstruction if a section of the gastrointestinal tract is incarcerated in the rent. Most often there is a single tear but multiple mesenteric tears can occur. The rent may not cause a problem for many months to years or it may not every cause a problem (i.e., it is found as an incidental finding either at necropsy or exploratory laparotomy). It is important to close the defect completely and this can be difficult especially if the tear courses dorsally for a long distance. A laparoscopic approach may be necessary to access a mesenteric tear located dorsally.

Large colon volvulus is one of the most painful abnormalities of the gastrointestinal tract. It is also one of the most common reasons for an abdominal exploratory in the post-partum mare. A large colon volvulus can develop as early as “hours” post foaling or a late as many months post foaling. A large colon volvulus can develop prior to foaling as well. Clinical signs are typically seen as severe unrelenting abdominal pain. Not all mares show signs of marked abdominal discomfort. Most likely this is related to the severity of colonic distention, degree of vascular compromise, and the mare’s pain tolerance. These cases need surgical intervention as soon as possible. The approach to the abdomen is either a ventral midline or a left paramedian incision. The decision to make a paramedian incision is based on if the horse has had a previous abdominal exploratory and/or if a colopexy is planned. A colopexy can be performed via a ventral midline incision but a second incision (paramedian) is necessary. However, if a left paramedian incision is made then the colopexy can be performed as part of the body wall closure. This decreases surgical time and simplifies the colopexy procedure. The paramedian approach to the abdominal cavity is made approximately 8–10 cm to the left of midline. Intraabdominal palpation confirms the diagnosis and the direction of the volvulus. The most common is a 360 degree volvulus rotated in a counter clockwise direction when viewed from the ventrum. Intraluminal gas should be removed via needle decompression to assist in manipulating the large colon. The pelvic flexure and as much of the large colon as possible should be exteriorized. Then the volvulus is corrected by rotating the base of the colon in a clockwise direction. Once the volvulus is corrected the serosal color should improve. To confirm the volvulus is corrected the surgeon should follow the cecocolic ligament and then palpate the mesenteric attachment of the right dorsal colon to the dorsal body wall. Determining viability of the large colon can be difficult. There are many factors to consider such as serosal color, pulse of the mesenteric vasculature, mucosal color, plasma lactate, and clinical impression. Recurrence of a large colon volvulus is a possibility therefore prevention must be considered. There are two surgical options that address this - colopexy and resection and anastomosis. The colopexy can be performed at the time of surgery or at a later date as an elective laparoscopic procedure. In preparation for the colopexy the large colon must be positioned correctly in the abdomen. The “pexy” is performed by incorporating the lateral tenial into the body wall closure. The suture material should be #2 braided absorbable or #2 monofilament absorbable or non-absorbable. Care must be taken not to penetrate the lumen of the ventral colon when placing the suture. The size of the suture bite should be the width of the tenial band. The length of the colopexy should be approximately 15–20 cm. It is important that the length of colon that is...
distal to the colopexy site is not excessive (approximately 40 cm is the typical length). The remainder of the incision is closed routinely.

A large colon resection and anastomosis is another option to prevent recurrence. A resection and anastomosis is indicated if a portion of the large colon is non-viable. There are several different resection and anastomosis techniques that can be utilized. A side to side anastomosis between the dorsal and ventral colons followed by resecting the colon distal to the anastomosis is my preference. Placing the colon on a colon tray facilitates the procedure and by performing the anastomosis prior resecting the weight of the colon helps keep the anastomosis site exteriorized. The use of stapling equipment (ILA-100 & TA-90) minimizes contamination but the staple lines must be oversewn since the tissue is edematous and not likely to compress to less than 2 mm to ensure proper staple formation.