Dystocia damage-repair of the mare
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Abstract
Normal equine parturition or dystocia can result in serious trauma to the mare’s urogenital or gastrointestinal tract. An understanding of some of the potential problems that can develop is important to consider when relieving dystocia. Equine practitioners should be familiar with the treatment options available for particular injuries. The following proceedings will describe some of the possible injuries that can occur and potential management plan for each injury.

Keywords: Perineal laceration, rectal tear, uterine and vaginal tear, ruptured urinary bladder

Perineal lacerations
Perineal lacerations can occur commonly after parturition or dystocia. There are three degrees of perineal lacerations. First degree lacerations involve the vaginal mucosa. Second degree of perineal lacerations involve the vaginal mucosa and perineal body, but do not involve the rectal-vaginal shelf. Third degree perineal lacerations do disrupt the rectal vaginal shelf and there is communication between the vulva and rectum. This classification does not include rectal-vaginal fistulas which involve a communication between the vulva or vagina and the rectum, but the anal sphincter is not disrupted.

First and second degree perineal lacerations are generally treated conservatively. If a second degree perineal laceration is large enough and has healed by conservative management, a Caslick’s technique may be needed to repair the perineal body. If the laceration has disrupted the perineal body extensively, a Gadd technique may be needed to improve the overall conformation of the perineal body. A Gadd technique involves closure of the dorsal vulva after two large triangular flaps of mucosa, which connect dorsally, have been removed. The mucosal flaps can be removed using local anesthesia. The defect created by removing the mucosa is then sutured closed to appose the dorsal aspect of the vulva.

Third degree perineal lacerations generally require surgical repair. The surgical repair is generally performed after the defect has healed conservatively for three to four weeks. In some cases, primary closure just after the defect has occurred may work, but generally fails requiring a second repair three to four weeks later. Once the defect has had time to heal, the mare can be prepared for surgery. Epidural anesthesia is generally performed on typical third degree perineal lacerations and rectal vaginal fistulas. Caudal epidural anesthesia (S6-Cy1 or Cy1-Cy2) is performed using a combination of 100 mg xylazine hydrochloride and 40 mg 2% mepivacaine hydrochloride, diluted with sterile saline solution to make a final injection volume of seven to ten mL. The rectum, vulva and vagina are cleaned of gross contamination using a dilute iodine solution. The method of repair can involve one or two stages. A one stage repair involves complete closure of the rectal-vaginal shelf and perineal body. In a two stage repair, the rectal-vaginal shelf is repaired initially, and then at least three to four weeks later, the perineal body is repaired to complete the second stage. Generally the second stage can be performed using local anesthesia.

Rectal tears
Grade IV rectal tears after parturition are uncommon but require immediate intervention. The rectal tears are believed to develop when gas is trapped within the descending colon and the force of
partition causes the bowel wall to come under extreme tension and tear. Grade IV (full-thickness) rectal tears that communicate with the peritoneal cavity have a poor to guarded prognosis because of the severe peritonitis from fecal contamination of the abdomen. If the tear can be closed efficiently and effectively before severe peritonitis develops, the prognosis could potentially be favorable. Initial management of a parturition rectal tear is similar to iatrogenic rectal tears following palpation.

In the author’s practice, we utilize a standing technique to repair the defect within the descending colon. Upon admission mares are sedated with detomidine hydrochloride (0.01mg/kg IV) and butorphanol tartrate (0.02mg/kg IV) and restrained in standing stocks. Complete physical and rectal examinations are performed to evaluate the status of the mare and the severity of the tear. All mares should receive broad-spectrum antibiotics prior to surgical repair. Caudal epidural anesthesia (S6-Cy1 or Cy1-Cy2) is performed, using a combination of 100 mg xylazine hydrochloride and 40 mg 2% mepivacaine hydrochloride, diluted with sterile saline solution to make a final injection volume of seven to ten mL. The rectum is then completely evacuated and the perineal region is aseptically prepared. When an intestinal segment is prolapsed, it is lavaged with copious amounts of sterile saline solution and inspected for viability and traumatic injury, and repositioned through the tear into the abdomen. Once the rectum and caudal descending colon are cleaned of gross contamination, a cotton pack is gently placed cranial to the tear. Care is taken not to enlarge the tear. Stay sutures are placed through the external anal sphincter at the 2, 4, 8, and 10 o’clock positions. The external anal sphincter is transected at the 12 o’clock position to enhance exposure and the rectal tear is retracted caudally using either a finger or a stay suture placed through the caudal margin of the tear. The margins of the tear are inspected and debrided with sterile saline-soaked swabs. Allis tissue forceps are used to accurately appose the margins of the tear then a surgical stapling device (TA-90 or TA-55, 4.8 mm staple length; United States Surgical Corp., Norwalk, CT) is placed below the tissue forceps and then applied. Multiple stapling devices may be needed to completely close the defect. The incision in the anal sphincter can be left open or closed primarily. Abdominal exploration through a midline incision is generally not required, but in select cases involving further injury to a segment of bowel or severe peritonitis more aggressive management may be required.

Post-operatively mares are continued on broad-spectrum antibiotics and nonsteroidal anti-inflammatory agents. Fluid therapy may also be required based on the mare’s hydration status. The mares are monitored closely for signs peritonitis and abdominal lavage may be required in some cases. An abdominal drain is placed using a Foley catheter and the abdomen is lavaged using sterile antibiotic solution.

The prognosis varies from case to case and often is based on the degree of abdominal contamination. Initially the prognosis should be guarded, but obviously can change based on how the mare responds following closure of the bowel defect and medical management.

**Uterine and vaginal tears**

Full thickness tears within the mare’s uterus or cranial vagina are serious injuries and can potentially be fatal if not managed aggressively and repaired surgically. In most cases, the full thickness tear is within the gravid uterine horn. Less frequently, the tear is further caudal within the body of the uterus or cranial vagina. Diagnosis is often based on the clinical signs the mare is exhibiting (fever and depression postpartum) along with findings from digital palpation of the uterus or vagina and ultrasound examination. Digital palpation of the uterus is very important in every case to help confirm the diagnosis and determine the location of the tear. Tears in the cranial aspect of the uterus are repaired differently than tears in the caudal uterus or vagina. Ultrasound examination often reveals free fluid within the abdominal cavity. The abdominal fluid can have the characteristics of free abdominal blood. In some cases it can be difficult to determine the difference from hemoperitoneum due to a uterine tear or uterine artery hemorrhage.

Cranial uterine tears are generally repaired through a midline incision. The tear is closed in two layers and the abdomen is lavaged. It is important to check the entire uterus for a second tear. An abdominal drain should be placed in the cranial abdomen prior to closure of the midline incision. The prognosis is generally good if the surgical repair was performed prior to the development of severe septic peritonitis.

Cranial vaginal and caudal uterine lacerations are a potential complication during or after parturition in mares. Vaginal tears can also occur after breeding accidents when the stallion’s penis penetrates the cranial vaginal fornix. In cases associated with parturition, immediate clinical signs may
include hemorrhage and bowel evisceration. Surgical repair is indicated to prevent the development of fatal peritonitis. Caudal uterine tears are difficult to reach and adequately repair through a midline celiotomy. Caudal uterine and vaginal tears can be repaired with the mare standing, but repair and secure closure can be difficult. Other problems associated with standing repair include the inability to retract bowel, the complexity of making a multi-layer closure, and the difficulty in securing closure against the weight of the uterus. In the author’s practice, we utilize a technique with the mare placed in a Trendelenburg position to easily and efficiently repair most cranial vaginal and caudal uterine tears under general anesthesia. Straps are placed over the hind pasterns, and the mare’s hindquarters is elevated above the head using a hoist. In this position, gravity allows the intestines to fall away from the pelvic area.

In cases involving bowel evisceration in pregnant mares, the bowel is replaced into the abdomen after being lavaged with sterile saline, and the fetal position is evaluated. After the fetal position is determined and corrected if necessary, the mare is lowered, and the foal is delivered. The mare is then elevated back into Trendelenburg position for repair of the vaginal and/or uterine tear. Towel clamps are placed in the vulva margin for retraction. To help visualize and illuminate the cranial vagina and caudal uterus, a headlight and portable standing light should be used. The margins of the tear are identified and retracted toward the vulva using either stay sutures or a finger placed in the caudal margin of the tear. Long-handled instruments are needed for secure closure of the tears. The tear is closed in a cranial to caudal direction using an absorbable suture material in a continuous suture pattern. The repair is oversewn again using a continuous inverting pattern to ensure a secure closure. The mare is lowered from the hoist and placed on a padded mat for recovery. The mares are routinely treated with systemic antibiotics and nonsteroidal anti-inflammatory agents. An abdominal drain is placed with the assistance of an ultrasound once the mare is standing. Tears located on the dorsal aspect of the vagina or the dorsal aspect of the caudal uterus are easier to repair. Mares that are treated soon after the tear occurs or before extensive contamination of the abdominal cavity are more likely to survive after surgical repair of the tear.

Ruptured urinary bladder (cystorrhexis)

Rupture of the urinary bladder in postpartum mares is uncommon but should be one of the differential diagnoses in mares that are depressed, febrile, and mildly uncomfortable. Blood work may reveal and elevated or decreased white blood cell count, hyperkalemia, hypochloremia, hyponatremia, and metabolic acidosis. Ultrasound examination will reveal a significant amount of hypoechoic free abdominal fluid. Digital palpation through the urethra may reveal the defect in the bladder or urethra. Endoscopy of the urinary bladder can be used to confirm the presence of a tear within the bladder and/or urethra.

Mares are sedated and a caudal epidural is performed. The perineal region and vaginal cavity are cleaned using a diluted iodine solution. A dorsal speculum is placed and long-handled instruments are used. With the aid of a head light, a small 3 to 4 cm incision is made into the urethra cranial to the urethral sphincter. Using a finger passed through the incision and through the tear, the bladder is intussuscepted into the urethra and exteriorized through the urethral incision. A stay suture keeps the urinary bladder exteriorized during the repair. The defect is repaired using a one to two layer closure with monofilament absorbable suture material. Once the tear is repaired the bladder is repositioned through the urethral incision, and the urethral incision is closed in one or two layers. A urinary catheter is placed for five to seven days. Post-operatively, mares are treated with broad-spectrum antibiotics and nonsteroidal anti-inflammatory agents.