How to Repair Cranial Vaginal and Caudal Uterine Tears in Mares

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1. Introduction

Cranial vaginal and caudal uterine lacerations are a potential complication during or after parturition in mares.[1] Vaginal tears can also occur after breeding accidents when the stallion's penis penetrates the cranial vaginal fronix.[2] In cases associated with parturition, clinical signs may include mild hemorrhage, evisceration into the vagina and vulva, and penetration of the foal's head and/or legs into the peritoneal cavity. After breeding, the vaginal tears may not be identified immediately. Hemorrhage may be noted coming from the vulva. In some cases, the bowel may eviscerate into the vulva.[3]

Surgical repair is indicated to treat cranial vaginal and caudal uterine tears to seal the communication between the reproductive tract and the peritoneal cavity. Contamination of the abdominal cavity with the postpartum secretions favors the presence of peritonitis. Peritonitis with continuous contamination from the reproductive tract is difficult to treat and frequently has a fatal outcome. Mares with peritonitis can also develop adhesions of the peritoneal organs. In addition, vaginal and uterine tears large enough to permit penetration of the intestinal contents should be treated surgically to avoid evisceration of the mare. Caudal vaginal tears located caudal to the peritoneal reflection can be treated medically and allowed to heal by second intention.

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 are difficult. Other problems associated with standing repair include the inability to retract bowel, the complexity in making a multi-layer closure, and the difficulty in securing closure against the weight of the uterus. In this report, we describe an easy and efficient technique to securely repair most cranial vaginal and caudal uterine tears under general anesthesia.

2. Materials and Methods

The mares were referred to the Davidson Surgery Center at Hagyard Equine Medical Institute in Lexington, Kentucky for emergency dystocia examination or tears diagnosed after parturition. If the tear was identified at the farm or at Davidson Surgery Center, the intestines were replaced into the vagina or the peritoneal cavity; then, the vulva was

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temporarily closed using towel clamps, and the mare was anesthetized. In cases of parturition, the mare was immediately prepared for general anesthesia. The mares were sedated using xylazine[a] (1.1 mg/kg, IV) and induced into anesthesia using ketamine[b] (2.2 mg/kg, IV) and diazepam[c] (0.2 mg/kg, IV). The mares were intubated and maintained under anesthesia using isoflurane[d] and oxygen. Straps were then placed over the hind pasterns, and the mare's hindquarters were elevated using a hoist. The mare was elevated into a Trendelenburg position (~50°). In the Trendelenburg position, the hindquarters are elevated above the level of the head. In this position, gravity allows the intestines to fall away from the pelvic area.

In cases involving pregnant mares, the bowels were replaced into the abdomen after being lavaged with sterile saline, and the fetal position was evaluated. After the fetal position was correct, the mare was lowered, and the foal was pulled. The mare was then elevated immediately back into Trendelenburg position for repair of the vaginal and/or uterine tear.

Towel clamps were placed in the vulva margin for retraction. To help visualize and illuminate the cranial vagina and caudal uterus, a headlight and portable standing light were used. The margins of the tear were identified and retracted toward the vulva using either stay sutures or a finger placed in the caudal margin of the tear. The tears were then closed in a cranial to caudal direction using an absorbable suture material in a continuous suture pattern. Long-handled instruments were needed for secure closure of the tears. The repair was sewn over using an absorbable suture in a continuous inverting pattern to ensure a secure closure. The mare was then lowered and placed on a padded mat for recovery. The mares were routinely treated with systemic antibiotics and non-steroidal anti-inflammatory agents. The day after surgery, the repair was palpated, and the uterus was lavaged with low-volume fluids. Uterine lavage was continued as needed for each specific case.

Ultrasound examination of the abdomen was performed after repair. An abdominal drain (Foley catheter) was placed transabdominally on most of the mares on the right ventral aspect of the abdomen. The catheter was used for drainage and lavage of the abdominal cavity.

3. Results

Between January 2007 and March 2008, eight adult Thoroughbred mares were treated with the described method at the Davidson Surgery Center at Hagyard Equine Medical Institute. One mare presented 2 yr in a row with a dorso-cranial vaginal tear as a result of penile penetration during live breeding. Six mares presented for dystocia that could not be resolved at the farm. The tear in the cranial vagina and caudal uterus was diagnosed at the time of admission. One mare was referred with a vaginal tear and a uterine tear after foaling at the farm.

Vaginal tears were treated in five mares, and uterine tears were treated in four mares. One mare presented with two tears: one in the vagina and one in the uterus. The vaginal tears were all located on the dorsal aspect of the vagina. Three uterine tears were located dorsally, and one was located in the ventro-lateral wall of the uterus. The tears were all closed using a two-layer closure, and none of the repairs showed signs of complete dehiscence.

The mares that presented for dystocia were all to term except for one that was aborting a 10-mo pregnancy. Four foals were in anterior presentation and dorso-sacral position. One foal was in dorso-sacral position with the forelimbs flexed at the carpal level. It had one hindlimb in the pelvic canal and the other through a uterine tear on the peritoneal cavity. One foal was in anterior presentation and dorso-pubic position.

The mares that had vaginal tears all recovered well and went home. Of the four mares with uterine tears, two survived and two were euthanized because of severe diffuse peritonitis. One mare that survived had a vaginal tear and a uterine tear. The contamination occurred before closure of the tears. In the one mare that died, the foal had fetal diarrhea, and a significant amount of frank fecal peritoneal contamination occurred through the uterine tear. Another mare that died aborted at 10 mo of pregnancy, and at presentation, the foal was in an advance stage of decomposition.

Several surgical approaches have been described for repair of uterine tears in mares. Ventral midline approach has been used to repair tears involving the uterine body and horns. Vaginal and caudal uterine tears have been repaired blindly with the sedated horse standing.[4] However, repairing the tears under general anesthesia permits visualization of the tear using a two-layer suture and verification of the repair.

The tears located on the dorsal aspect of the vagina or the dorsal aspect of the uterus are easier to repair because of better visualization than the tears located on the ventral aspect of the vagina or the uterus when the horse is in dorsal recumbency. In mares with dorsal uterine tears passing a stay-suture through the cranial aspect of the tear facilitates retraction of the uterus into the vagina and offers superior exposure for the surgical repair.

Mares that were treated soon after the tear occurred or before extensive contamination of the abdominal cavity were more likely to survive after surgical repair of the tear. Severe fibrino-purulent peritonitis is a common complication that can occur in mares with uterine and vaginal tears. Postpartum mares with uterine or vaginal tears undiagnosed at the time of parturition frequently develop septic peritonitis and have a poor prognosis for survival.

Although all the tears healed well, two of the mares died because of fatal septic peritonitis. Contamination of the abdominal cavity when the tear occurs plays an important role in the prognosis for the affected mares. The two mares that died suffered severe contamination before the tears were repaired. Medical treatment failed to resolve the peritonitis, and the mares were euthanized. Postmortem examination confirmed fibrino-purulent septic peritonitis, but the sutured tears remained intact.

The two mares that died had uterine tears; three of six mares that survived presented with vaginal tears, and one of six mares that survived presented a vaginal tear and a uterine tear at the same time. We believe that cranial vaginal or caudal uterine tears should be surgically repaired any time that there is a possibility of peritoneal contamination with the postpartum secretions or a risk of evisceration through the defect.

The ability to raise the mare into a Trendelenburg position is very important in facilitating repair of full-thickness defects in the cranial vagina and caudal uterus. It is also important to have an adequate light source to aid in this technique. We feel that the technique reported here provides a relatively easy and efficient way to perform primary surgical repair of tears in the cranial vagina and caudal uterus.

References and Footnotes

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[a]Sedazine, Fort Dodge, IA 50501.
[b]Ketaset, Fort Dodge, IA 50501.
[c]Diazepam, Hospira, Inc., Lake Forest, IL 60045.
[d]Isothesia, Butler Animal Health, Dublin, OH 43017.