Clinical signs and treatment of chronic uterine torsion in two mares

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A 15-year-old 582-kg (1,280.4-lb) Quarter Horse mare (horse 1) that was 313 days pregnant was referred to the University of Illinois Veterinary Teaching Hospital (UI-VTH) for evaluation of pregnancy and status of the fetus. Four weeks before admission, the mare had an episode of colic and responded to medical treatment with mineral oil and analgesics. Three weeks before admission, the mare was anorectic, had a heart rate of 60 beats/min and rectal temperature was 38.3°C (101°F), had diarrhea, and was lame in both front feet. The referring veterinarian diagnosed laminitis and treated the mare with acepromazine, flunixin meglumine, and oxytetracycline. One week later, the heart rate was 64 beats/min, but rectal temperature was normal. Transrectal palpation revealed no fetal movement, but vaginal examination revealed the cervix to be closed and without signs of discharge. Two days before admission, the referring veterinarian could not identify a fetus on transrectal palpation or ultrasonographic examination. A structure, possibly the uterus and fetus, was described in the dorsal right quadrant and was firm, irregular, and pushed back into the pelvic inlet.

On initial examination at the UI-VTH, the mare had signs of depression and was lame in both front feet. Heart rate was 96 beats/min, respiratory rate was 32 breaths/min, and rectal temperature was 38.3°C (101°F). Mucous membranes were tacky and mildly icteric. On transrectal palpation, a large firm irregular mass could be palpated on the right side of the abdomen, but it was difficult to determine whether it was associated with the uterus or was a separate structure. An ovary could be palpated in close proximity to this mass and possibly attached to it. Ultrasonographic examination was performed per rectum and along the right flank; however, findings may be inconclusive in chronic uterine torsion.

Prognosis for life can be good after treatment by ventral midline celiotomy, cesarean section, correction of the torsion, and ovariohysterectomy.
and ligated with size-1 polydioxanone. A surgical stapler was applied cranial to the cervix and used to retract the uterus cranially. The uterus was transected caudal to the stapler, and the uterine stump was oversewn with size-1 polydioxanone in a Cushing pattern in 2 layers. The abdomen was thoroughly lavaged with saline (0.9% NaCl) solution, and the linea alba and skin were closed in a routine manner. Three retention sutures of doubled size-2 nylon through plastic tubing stents were placed at equal distances to support the suture line.

Potassium penicillin G (22,000 U/kg, IV, q 6 h), gentamicin (6.6 mg/kg, IV, q 24 h), and flunixin meglumine (1.1 mg/kg, IV, q 12 h) were continued for 6 days after surgery. Lactated Ringer’s solution was administered intravenously at a rate of 1 L/h for the first 36 hours after surgery. Phenylbutazone (1 g, PO, q 12 h) was substituted for the flunixin meglumine on day 7 for continued treatment of the laminitis. A subsolar abscess was discovered the day after surgery and was treated by drainage and magnesium sulfate foot soaks. The mare continued to recover well from surgery, the laminitis improved, and she was discharged from the hospital 9 days after admission weighing 524 kg (1,152.8 lb). The mare was used as a riding horse for 3 years but was sold and lost to follow-up.

The foal was 105 cm (41 in) long from crown to rump. There was no gross evidence of necrosis of the foal and placenta (Fig 2), and the foal’s coat was diffusely red from blood staining. Histologic examination of the uterine wall confirmed the chronic nature of the torsion, with transmural necrosis of the uterus with vascular fibrin thrombosis and diffuse serosal thickening, chronic fibrosis, and neovascularization.

A 5-year-old 441-kg (970.2-lb) Quarter Horse mare (horse 2) approximately 280 days pregnant was referred to the UI-VTH because of pyrexia and for evaluation of its pregnancy. The mare had a 2-week history of inappetence and signs of depression that resolved after IV administration of antibiotics for 2 days. However, 2 days before admission, the mare again had signs of depression and inappetence and had a rectal temperature of 105 F (40.7 C). A transrectal palpation was performed by the referring veterinarian to assess the pregnancy, and the uterus was found to be close to the pelvic inlet and collapsed around firm poorly defined irregular contents. Fetal viability could not be determined. Procaine penicillin G and gentamicin were administered, and the referring veterinarian performed a transrectal ultrasound examination on the following day. However, this could not be performed satisfactorily, because the uterus and contents obstructed the pelvic inlet, and the probe could not be passed far enough into the abdomen.

On initial examination at the UI-VTH, the mare had signs of mild depression and was in fair body condition. The owners reported weight loss in the preceding 2 weeks but had not observed signs of colic. Temperature and heart rate were 102 F (38.8 C) and 84 beats/min, respectively. Respiratory rate was 18 breaths/min, and mucous membranes were pale. On transrectal examination, it was determined that the uterus filled the right side of the pelvis, its contents were hard and irregular, and a nonviable fetus was palpated within the uterus (which was collapsed around it). A constriction could be palpated in the uterine body, but it was difficult to advance beyond that level and the most caudal part of the uterus. A tentative

Figure 1—Photograph of the exteriorized left uterine horn at surgery in a horse with chronic uterine torsion. Notice the area of attachment of diffuse fibrous and fibrinous adhesions on the uterus (arrows) that were manually detached from the peritoneum of the ventral portion of the abdomen and colon.

Figure 2—Photograph of the foal and entire placenta removed at surgery from the horse in Figure 1. A plastic trash bag lies under the right hindlimb and back of the foal. Notice that the foal and placenta were grossly well preserved, without obvious tissue necrosis. Bar = 5 cm.
diagnosis of uterine torsion was made, although the broad ligaments were not palpated. Transrectal and transabdominal ultrasound examinations were performed and revealed that fluid filled the right uterine horn along the ventral portion of the abdomen. Abnormal laboratory values at the time of admission included anemia (Hct, 12.5%; RBC count, 2.70 × 10⁶ cells/μl) and high total protein (8.2 g/dl) and globulin (5.6 g/dl; reference range, 2.6 to 4.0 g/dl) concentrations. The mare had mild hyponatremia (134 mEq/L), hypochloremia (90 mEq/L), and mildly high liver enzyme activities (alkaline phosphatase, 269 U/L; γ-glutamyltransferase, 26 U/L; aspartate transaminase, 400 U/L; sorbitol dehydrogenase, 9.8 U/L).

A decision was made to perform a ventral midline celiotomy to remove the dead fetus and to assess the viability of the uterus. Potassium penicillin G (22,000 U/kg, IV), gentamicin (6.6 mg/kg, IV), and a tetanus toxoid were administered before surgery. The mare was anesthetized and positioned in dorsal recumbency. A 40-cm ventral midline incision was made to end immediately rostral to the mammary glands. The peritoneum and omentum were adhered to the ventral wall of the uterus with fibrinous and fibrous adhesions. The adhesions were manually broken down until the uterus was free, and a counterclockwise uterine torsion was diagnosed. The serosal surface of the uterus was gray and tan, hemorrhagic, and friable, and the uterus was fully distended with fluid and judged as nonviable. The point of torsion was a tight constriction that reduced the uterine diameter to approximately 5 cm. The broad ligament and ovaries were not found by palpation and inspection. Adhesions to the omentum and spleen were manually broken down, and cesarean section, correction of the torsion, and hysterectomy were performed as described for horse 1. As with horse 1, the placenta was found completely detached from the uterus. After thorough lavage, the abdomen was closed in a routine manner. The mare was weak during recovery, and although it made several attempts to stand, the mare was unable to stay standing for longer than 10 seconds. The mare was given 5 L of whole blood from a universal donor and was strong enough to stay standing and walk 8 hours after surgery.

Potassium penicillin G (22,000 U/kg, IV, q 6 h) and gentamicin (6.6 mg/kg, IV, q 24 h) were administered for 5 days after surgery. After 5 days, trimethoprim-sulfamethoxazole (25 mg/kg [11.4 mg/lb], PO, q 12 h) was substituted for intravenous antibiotics. Flunixin meglumine (1.1 mg/kg, IV, q 12 h) was administered for the first 3 days; the dosage was then decreased (0.5 mg/kg [0.23 mg/lb], PO, q 12 h) for the next 2 days. Butorphanol (0.4 mg/kg [0.18 mg/lb], IV) was administered during the first 24 hours as needed for pain relief. Lactated Ringer’s solution was administered intravenously (1 L/h) for 48 hours after surgery. Four liters of mineral oil was given via nasogastric tube at 24-hour intervals for the first 2 days after surgery to help ease the passage of feces and the pain of straining to defecate. The mare received alfalfa hay and water ad libitum immediately after returning to its stall. An abdominal bandage was applied and changed every day for 7 days, because the mare had profuse serous incisional drainage during hospitalization.

Thrombophlebitis of the left jugular vein developed during the immediate postoperative period, and this was treated with hot packing and dimethylsulfoxide gel applications several times a day. The Hct was measured twice a day and ranged from 12% immediately after surgery to 19% after transfusion to 13% the day before discharge. The mare developed a fever of 102.6°F (39.2°C) 2 days after surgery, possibly caused by the thrombophlebitis, and rectal temperature returned to reference values over the next 2 days. Postoperative abdominal ultrasound examination revealed a small amount of fluid in the abdomen and that the body wall incision was intact despite continued incisional drainage. A corneal ulcer of the right eye was treated with corneal debridement and grid keratotomy along with neomycin sulfate, polymixin B sulfate, and bacitracin zinc ointment topically (q 8 h) and atropine topically (q 24 h) for 5 days. The mare was discharged from the hospital 8 days after admission weighing 365 kg (803 lb), and the owners were instructed to continue treatment with trimethoprim-sulfamethoxazole (25 mg/kg, PO, q 12 h) for 7 more days and to continue applying the eye medications. The referring veterinarian reported that the mare was doing well and was being used for trail riding 6 months after surgery.

The foal was similar in appearance to that removed from horse 1, weighed 19.1 kg (42 lb), and had a 71.2-cm (28-in) crown to rump length. In this horse, the ovaries could not be identified by palpation of the abdomen or inspection of the uterus, possibly because they were small and incorporated in the uterine adhesions. Histologic examination of the uterus and placenta confirmed the chronic nature of the torsion; these findings were severe diffuse granulating serositis of the serosal surface of the uterus and transmural coagulation necrosis of the uterus and placenta.

Uterine torsion constitutes 5 to 10% of all serious obstetric problems in horses. However, to the authors’ knowledge, there has been only 1 previous report of chronic uterine torsion in a mare. Barber1 reported on a 5-year-old Arabian mare that was examined 3 weeks after its expected foaling date with an 8-week history of inappetence and depression following an accident where it was trapped in right lateral recumbency for an unknown period of time. As with our mares, the broad ligaments could not be palpated on transrectal palpation. However, a clockwise twist of the cervix and caudal portion of the uterine body were palpable. In that case, a standing right flank laparotomy was performed, and a clockwise 360° torsion of the caudal uterus, cervix, and cranial vagina was diagnosed. The uterus had firm adhesions over much of its surface to the peritoneum lining the right side of the abdominal wall, and these prevented correction of the torsion through a standing flank approach. Treatment was not pursued in that case, and the mare was euthanized.

Colic is a common clinical sign in mares with uterine torsion,14 but in both mares of our report and in the
mare of the previous report, signs of colic were absent at admission. In 1 mare of the present report, mild colic was observed 4 weeks before admission, and the horse was responsive to medical treatment. It is possible that uterine torsion occurred at that time in this mare but was undetected. Lack of colic signs in our other mare is the most likely reason why uterine torsion went undetected. An absence of colic signs or signs that resolve with medical treatment would not be typical of uterine torsion in mares.4,9

Transrectal palpation is considered essential to diagnose uterine torsion in mares. In most instances, the direction of rotation can be determined by the relative displacement and asymmetry of the left and right uterine broad ligaments.4,5 The broad ligaments were not palpable per rectum in either of our mares nor in the mare of the other report.7 Findings on transrectal palpation were unusual and not informative in all 3 cases, with a nonresponsive foal being the only other similarity among them. During surgery in our mares, the broad ligaments and ovaries could not be located. It is possible that because of the duration of torsion, the broad ligaments underwent necrosis and were therefore no longer present at the time of surgery. A congenital abnormality would also have to be considered, such as hypoplasia or absence of broad ligaments, similar to a report of cecocolic fold hypoplasia that allowed cecal torsion in a horse.10 Such an abnormality may explain the development of torsion without signs of colic (absence of ligament tension), continued survival of the uterus because of major blood supply from another source, and the unusual tightness of the constriction at the point of torsion.

Anemia was a consistent finding in both mares in the present report; neither anemia nor the Hct was discussed in the mare of the previous report.3 Uterine torsion in both of our mares caused severe vasculitis of the uterine vessels, resulting in leakage of blood into the uterine lumen. Both mares had severe distension of the uterus with sufficient bloody fluid, which would explain why they became anemic.

The duration of uterine torsion could not be determined in either mare of this report, but it was assumed that torsion occurred at the time of first observed clinical signs. Neither mare was referred because of its deteriorated condition; rather, they were referred because of lack of complete recovery from a problem that began 2 and 4 weeks earlier. This would suggest torsion was chronic in both mares, and the gross and histologic changes were also consistent with chronic lesions. The time of death of foals could not be determined, although both foals were grossly well preserved, without obvious tissue necrosis (Fig 2).

The crown to rump length of 105 cm (41 in) for the foal of horse 1 was compatible with a pregnancy of 300 days,11 which would put the time of fetal death midway between the onset of signs (285 days) and total gestation (314 days). The crown to rump length of 71.1 cm (28 in) and fetal weight of 19.1 kg (42 lb) for the foal of horse 2 were compatible with a pregnancy of 240 to 270 days,11 and fetal death most likely occurred close to the time of onset of clinical signs (266 days). Other fetal characteristics were compatible with death of foals at these times.11 Lack of more advanced necrosis of foal, membranes, and uterus is difficult to explain for the proposed durations of torsion; however, the diffuse peritoneal adhesions could have contributed to the neovascularization seen on histologic examination and could thereby have brought blood supply to the uterine wall. Also, the sterile environment in the uterus may have reduced local and systemic effects that would have resulted from tissue necrosis.

Barber3 stated that hysterectomy was not possible in that horse because of the massive adhesions and inaccessibility of arteries for ligation through a standing flank laparotomy. On the basis of our findings, we believe hysterectomy following removal of the dead fetus is possible through a ventral midline approach and carries a good prognosis for mares with chronic uterine torsion. We recommend that all fluid and the dead fetus be removed before correction of the torsion, because the uterus is too friable to withstand correction with the fetus in place and would probably rupture. A caudal ventral midline approach is necessary to provide adequate access to arteries for ligation and to allow careful manipulation of the friable uterus. This approach also allowed for manual breakdown of fibrous adhesions to various organs and the peritoneum, which is essential to allow correction of the torsion. Care must be taken when opening the abdomen, because the most extensive adhesions were to the ventral part of the abdomen. We did not use any specific treatments aimed at preventing postoperative adhesions to the denuded peritoneal surface.

To our knowledge, this is the first report of successful treatment of chronic uterine torsion in 2 mares. On the basis of our findings, veterinarians should consider uterine torsion in mares in late gestation that have vague clinical signs and transrectal palpation findings different to those described in typical cases of uterine torsion. Supportive findings for diagnosis of chronic uterine torsion are anemia and pyrexia. Prognosis for life is good for mares after treatment of chronic uterine torsion by ventral midline celiotomy, cesarean section, correction of the torsion, and hysterectomy. Neither of our mares was referred early enough to save the foals and preserve the mares’ reproductive tracts, because initial clinical signs in each mare and subsequent clinical course were not typical of those of uterine torsion. Therefore, the importance of vaginal and transrectal examinations in pregnant mares that are ill, with or without signs of colic, is emphasized to distinguish uterine torsion from other causes of abdominal disease.3,9 Exploratory celiotomy early in the course of the disease could prevent the complications described in this report.

References

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