

# Uterine torsion associated with small intestinal incarceration in a mare at 126 days of gestation

D. C. Ruffin, DVM; J. Schumacher, DVM, MS; J. S. Comer, DVM

- Uterine torsion in pregnant mares generally occurs during the later stages of gestation.
- Uterine torsion causes signs of abdominal pain that may be mistaken for gastrointestinal tract obstruction; however, gastrointestinal tract obstruction, such as small intestinal incarceration or large colon torsion, can occur in conjunction with uterine torsion.
- Correction of torsion of the uterus may involve a rolling technique, flank laparotomy, or ventral midline celiotomy.

An 11-year-old 450-kg Arabian mare was examined because of signs of colic that had persisted for 6 hours despite treatment with detomidine (10 mg, iv) and butorphanol tartrate (20 mg, iv). The mare had been treated with an anthelmintic 24 hours prior to signs of colic. According to the owner's records, the mare had been bred by artificial insemination 126 days earlier and was confirmed pregnant by palpation per rectum at 30 days of gestation.

The mare was sweating, and its abdomen was markedly distended. Loops of distended small intestine in the pelvic canal prevented palpation of the abdomen per rectum. The mare's heart rate was 64 beats/min, respiratory rate was 32 breaths/min, and rectal temperature was 35.6 C. Mucous membranes were pink, and the capillary refill time was less than 3 seconds. Eight liters of gastric reflux were collected by siphonage through a nasogastric tube. Plasma total solids concentration was 8 g/dl, and PCV was 48%.

The mare was anesthetized and positioned in dorsal recumbency, and a ventral midline celiotomy was performed after presurgical administration of balanced electrolyte solution (20 L, iv), flunixin meglumine (500 mg, iv), potassium penicillin (20 million U, iv), and gentamicin (2 g, iv). Cecum and small intestine were distended with gas. The distal portion of the jejunum could not be exteriorized, because it was incarcerated in a structure in the caudal region of the abdomen. The structure was determined to be the gravid uterus, which was rotated 360° in a counterclockwise direction (toward the left flank area). Because of its early gravid state, the uterus was easily rotated into correct position. Subsequently, the jejunum was exteriorized easily. Small intestine and cecum were decompressed, and the celiotomy was closed routinely. For 3 days after surgery, flunixin meglumine (125 mg, iv, q 6 h), procaine penicillin G (9 million U, im, q 12 h), and gentamicin (2 g, iv, q 12 h) were administered. Although a plasma progesterone concentration of 10 ng/ml was detected 24 hours after surgery, altrenogest (22 mg, po, q 24 h) was

administered for 30 days (normal plasma progesterone concentration for mares at this stage of gestation is 5 to 15 ng/dl).<sup>1</sup> Other than ileus lasting 24 hours, postoperative complications were not observed. The mare eventually delivered a healthy foal at 354 days of gestation.

Unusual features of this case of uterine torsion were the early stage of gestation at which torsion occurred and incarceration of jejunum by the torsion of the uterus. Torsion of the uterus in mares typically occurs during later stages of gestation than was observed in this mare. In 1 retrospective study and review of reported cases,<sup>2</sup> torsion did not occur before 8 months of gestation in 83 cases of uterine torsion in mares. It has been claimed that 50% of uterine torsions in mares occur at parturition.<sup>3</sup> In the experience of others,<sup>2,4-6</sup> uterine torsion seldom occurs at parturition but usually occurs between 7 months of gestation and term.<sup>2,4-6</sup> In a study of 7 mares, the earliest gestational date of uterine torsion corrected by a rolling technique was 225 days.<sup>7</sup>

We are unaware of any reports of small intestinal incarceration associated with uterine torsion in mares. Other forms of intestinal obstruction have been reported in association with uterine torsion in mares, including large colon torsion and small colon constriction proportional to the degree of uterine torsion.<sup>2</sup> Uterine torsion causes signs of abdominal pain that may be mistaken for gastrointestinal tract obstruction.<sup>2</sup> When concurrent gastrointestinal tract obstruction and uterine torsion occur, signs other than abdominal pain might be observed, such as nasogastric reflux, absence of gastrointestinal tract sounds, and scant feces.<sup>7</sup>

In this case, the decision to perform an exploratory celiotomy was prompted by gaseous distention of small intestine and signs of pain that were nonresponsive to analgesics. If uterine torsion had been diagnosed at the time of initial examination, celiotomy would have been the treatment of choice as opposed to other methods of correcting uterine torsion. Advantages of ventral midline celiotomy for correction of uterine torsion include visual assessment of uterine wall viability, correction of concomitant gastrointestinal tract problems, and performance of hysterotomy, if indicated.<sup>6</sup> The major disadvantage of celiotomy (ie, severe strain on the abdominal incision during labor<sup>6</sup>) was not a factor in this mare, because the pregnancy was far from term.

Rolling techniques have been used for correction of uterine torsion.<sup>7,8</sup> Correction by rolling leaves a non-compromised abdominal wall for subsequent labor and is less costly than celiotomy. The principle of correction by rolling is that inertia of the gravid uterus maintains the fetal position constant while maternal position changes.<sup>6</sup> Small fetal size in this case may have precluded correction by rolling.

Postsurgical treatment of this mare included oral administration of progestin to assist maintenance of preg-

From the Department of Large Animal Surgery and Medicine, College of Veterinary Medicine, Auburn University, Auburn, AL 36849-5522.

nancy, but the efficacy of progestin in preventing abortion after correction of torsion has not been documented. Abortion is an infrequent complication following correction of uterine torsion. In a retrospective study,<sup>2</sup> only 2 of 26 mares aborted after surgical correction of uterine torsion. Gentle intra-abdominal, extra-uterine manipulation does not appear to affect the developing fetus.<sup>9</sup>

Gastrointestinal tract disease in horses often is associated with endotoxemia,<sup>10,11</sup> and injection of endotoxin in mares less than 2 months pregnant can induce abortion.<sup>12,13</sup> Endotoxins can cause decreased luteal function or luteolysis mediated by prostaglandin  $F_{2\alpha}$  release<sup>14</sup>; however, oral administration of altrenogest prevented abortion in mares less than 2 months pregnant that had been administered endotoxin iv.<sup>13</sup> The mare in this report did not have clinical signs of endotoxemia, such as altered mucus membrane color, lethargy, or tachycardia.<sup>15</sup> Whether endotoxin can induce abortion at 4 months of gestation has not been documented. Because the placental unit becomes the main source of endogenous progestin between 100 and 150 days of gestation,<sup>16</sup> progestin treatment in this mare may not have been necessary to prevent abortion.

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