Making the Rounds

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In cases where strangulating umbilical hernias are suspected, both the hernial sac or subcutaneous tissue would consistently demonstrate signs of colic, this does not occur in most cases of strangulating umbilical hernias.

Horses with intestinal incarceration within an umbilical hernia can have several different clinical presentations. The most common is a reducible umbilical hernia in a young horse (i.e., usually 6 to 12 months of age) that develops acute abdominal pain concurrent with a firm, painful, nonreducible umbilical hernia. The antimesenteric surface of the ileum is most commonly incarcerated, which is called a Richter’s hernia (Figure 1). On rare occasions, the small intestine may rupture through the hernial sac and dissect subcutaneously. Depending on the duration of the incarceration and the amount of bowel involved, the bowel may not need to be resected. In some cases, wedge resection of damaged bowel can be performed instead of complete resection and anastomosis. However, the bowel does not always remain incarcerated permanently; therefore, signs of abdominal pain and significant umbilical swelling may be intermittent and unnoticed, as illustrated in this report.

I have also examined a few horses with incarcerated umbilical hernias that corrected while the patients were being transported to the hospital for surgery. Because the duration of the incarceration is usually undetermined in such cases, exploratory celiotomy should be performed to evaluate the health of the previously entrapped bowel.

A third clinical scenario is for the horse to present with swelling in the umbilical area without a history of colic, drainage, or other problems. Even without a history of colic, the bowel (usually ileum, large colon, or cecum) can be permanently incarcerated within the hernia. Alternatively, the bowel may have been entrapped for a prolonged period (resulting in inflammation and swelling around the umbilicus) and then spontaneously returned to the abdomen. Whether the bowel is incarcerated can usually be determined by a combination of external palpation and ultrasonography of the umbilical

CASE NOTES AND COMMENTARY

Umbilical Enterocutaneous Fistula

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This case report of an umbilical enterocutaneous fistula in a filly illustrates how something as seemingly benign as a 1 cm–diameter umbilical hernia can become life threatening. The following are two interesting features of this case:

• Failure of such a small umbilical hernia to resolve on its own
• The lack of a history of colic in this filly despite the possibility that the bowel had been incarcerated for nearly 1 month

It is highly unusual for a small hernia such as this not to resolve on its own in 1.5 years, especially if it was being manually reduced daily by the owners. Although it might seem unnecessary to close such a small umbilical hernia, this report suggests otherwise and reinforces the recommendation to repair umbilical hernias in foals if the hernia has not resolved by the time the patient is 6 to 12 months of age (regardless of size) because the likelihood of intestinal incarceration increases the longer the hernia persists.

The other interesting feature of this case was the lack of a history of colic during the month when the small intestine was either permanently or intermittently incarcerated within the umbilical hernia. It would be expected that bowel entrapped within such a small hole would lead to signs of abdominal pain due to “pinching” of the bowel. However, earlier reports of horses with strangulating umbilical hernias and enterocutaneous fistulae have warned that colic is not a definitive clinical sign of either condition. One possible explanation is the lack of complete intestinal blockage because only the antimesenteric side of the bowel is incarcerated (i.e., Richter’s hernia) in most horses. Another possible explanation for the lack of abdominal pain is that the mesentery of the affected bowel was not under increased tension because only a small amount of bowel entered the hernial sac. Although it might be assumed that horses with a longer length of small intestine exiting the body wall into the hernial sac or subcutaneous tissue would consistently demonstrate signs of colic, this does not occur in most cases of strangulating umbilical hernias.

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Regardless of whether the bowel is still entrapped at that time, surgery should be performed as soon as possible to resect the incarcerated bowel or to explore the abdomen to locate the bowel that was entrapped to determine its viability and need for removal. Failure to identify the portion of bowel that was incarcerated may result in signs of colic and perforation of the bowel with subsequent septic peritonitis (Figure 2).

The least common clinical presentation of a patient with an incarcerated umbilical hernia is the development of an enterocutaneous fistula, as illustrated in this report. For this to occur, the bowel must remain entrapped long enough to undergo ischemic necrosis with subsequent leakage of bowel contents into the subcutaneous tissue and eventually out through a defect in the skin. In other horses, a subcutaneous abscess may develop due to bowel leakage; subsequent rupture of the abscess and draining of bowel contents may occur. This usually requires several days to weeks to develop, and most owners realize that something is wrong based on the large umbilical swelling or signs of abdominal pain before this occurs. For example, the filly in this report had a history of umbilical swelling 30 days before digesta was seen draining from the umbilicus. If this filly had been evaluated and treated during this 30-day period, the fistula would not have developed, and a more routine closure of the abdominal wall may have been possible after correcting the incarcerated umbilical hernia. In addition, delaying surgical correction of an incarcerated umbilical hernia may increase the risk of the ischemic bowel being “released” from the hernial ring with subsequent perforation and leakage of bowel contents into the peritoneal cavity (Figure 2).

The key to recognizing the possibility of a strangulating umbilical hernia in a horse of any age often resides in a historical “change” in the appearance of the umbilicus together with external palpation of the umbilical region. Umbilical enlargement, inability to reduce a previously reducible hernia, subcutaneous swelling and edema around the umbilicus, and pain during palpation of the umbilicus are all clinical signs suggestive of a strangulating umbilical hernia. As illustrated in this report, systemic signs such as abdominal pain are not as consistent as are local changes to the umbilical area. Horse owners who elect not to repair umbilical hernias should be advised to watch for these changes in the umbilical region and to seek a veterinarian immediately if they occur. This may be especially true for small hernias (i.e., <3 to 4 cm); the bowel may be less likely to become entrapped within larger hernias because it can flow freely in and out of a larger space. This is supported by this report: although a 1 cm–diameter hernia is barely visible, ileum became incarcerated within it long enough to develop an enterocutaneous fistula.

Surgical correction or exploration is almost always indicated in horses with confirmed or suspected strangulating umbilical hernias or enterocutaneous fistulae. Although one report describes medical management of

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**Figure 1. Typical strangulating umbilical hernia.** This colt presented with mild clinical signs of colic and had a firm, nonreducible, painful umbilical swelling.

Before surgical correction.

Surgical correction. The antimesenteric surface of the ileum was entrapped within the hernial ring and did not require surgical removal.
two horses with enterocutaneous fistulae, this approach is not appropriate in most cases. Digitally guided en bloc removal of the entrapped intestine, hernial ring, and fistula, if present, is usually the preferred technique. A ventral midline incision cranial to the hernia and digital palpation of the tissue entering the ring from the peritoneal side can help determine how much of the ventral body wall to remove. Excision close to the hernial ring permits en bloc resection without removal of so much of the body wall that routine closure would be impossible. Most horses with strangulating hernias do not require extensive removal of the ventral body wall as was required in this report. However, local infection from bowel leakage can compromise the strength of the adjacent fascia and overlying skin, thereby necessitating their removal. Considering the condition of the remaining tissue in the filly, closure of the body wall with interrupted, horizontal mattress stainless-steel sutures in a single layer was appropriate. Stainless steel is more inert and resistant to infection than other suture materials while maintaining its strength under adverse conditions. Rubber tubing can be used with many tension-type sutures to prevent them from pulling through the skin; these are often called *quilled* or *stented sutures*. This technique of abdominal wall closure, which has been used successfully to close infected ventral midline incisions in horses and cattle, worked very well for the initial body-wall closure in this horse. However, in a previous report, interrupted, vertical, stainless-steel mattress sutures were used in horses instead of a horizontal mattress pattern. The disadvantages associated with this technique include the following:

- Difficulty working with stainless steel
- Increased time needed to place these sutures compared with a conventional three-layer closure
- Unavoidable pressure necrosis of the skin that occurs under the sutures

Given the circumstances, the authors’ decision not to use mesh to close the abdominal incision in the filly in the accompanying case report was appropriate because of the high probability of subsequent infection and the lack of skin to cover the mesh.

This case report reinforces four important points regarding the treatment of horses with an enterocutaneous fistula:

- It is important to accurately diagnose the condition before surgery.
- It is advisable to withhold feed before surgery to minimize the quantity of digesta within the bowel lumen.
- The subcutaneous tissues should be lavaged before surgery to remove digesta.
- The contaminated site should be covered with laparotomy sponges during the initial part of the surgery to minimize contamination of the surgical site.

Being mindful of these points allowed the authors to complete the en bloc removal of the fistula and perform intestinal anastomosis without abdominal contamination. Because the paramedian incisions were made first and then extended cranially and caudally, a wide area of the ventral body wall had to be removed, requiring the incision to be closed using interrupted, horizontal, quilled mattress sutures of stainless steel. Digital palpation of the hernial ring through a midline incision cranial to the mass before the paramedian incisions were made may have enabled the authors to stay closer to the hernial ring and remove less of the body wall. However, wide resection of the body wall was likely necessary in

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**Figure 2.** A 2-year-old American paint colt developed signs of abdominal pain, umbilical swelling, and peritonitis after an area of the left dorsal colon (shown) was initially incarcerated within an umbilical hernia but became dislodged into the abdomen. The bowel had undergone focal necrosis, which corresponded to the approximate size of the umbilical hernia. Resection of the colon was recommended, but the owners elected euthanasia. The author saw a similar case in which the incarcerated left dorsal colon remained within the hernia ring. Wedge resection of the colon was performed during surgery, and the outcome was successful.
this horse to remove all of the digesta-laden tissue. Regardless, single-layer closure of the body wall with stainless steel worked very well in this horse and could certainly be recommended for initial body-wall closure in horses with similar clinical conditions. The interrupted, horizontal, quilled mattress sutures permitted closure of the body wall under tension while minimizing the risks for incisional infection and acute dehiscence. Alternatively, the authors could have used single-layer, vertical, quilled mattress sutures with equal success. Although this approach would theoretically result in less vascular compromise to the wound edges, incisional wound healing did not appear to be a problem in this horse.

REFERENCES