How I Evaluate the Colicky Foal: Special Considerations

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Take Home Message

Evaluation of the foal with colic is more challenging than in adult horses particularly as the degree of pain is difficult to assess and rectal examination cannot be performed. However due to their size, abdominal radiography, ultrasonography, and gastroscopy can be more readily performed. Abdominocentesis provides critical information but has more risks than in an adult horse. If a surgical lesion is suspected, early intervention is critical to obtain the best prognosis.

Step 1: Obtain an Accurate Signalment and History

Because of the association with breed or age with certain specific conditions in foals, it is important to start with basic information. A history of the gestational age, possible dystocia, mare’s history, defecation and urination and nursing, all provide critical clues to the severity and possible cause of colic. For example, congenital lesions such as atretic portions of the gastrointestinal tract are likely to manifest in the first few days of life, but not always in the first few hours as owners may expect. Overo lethal white foals have ileocolic agangliosis due to an endothelin receptor type B defect that affects the neural crest cells and results in a loss of the enteric nervous system. Both these congenital lesions will result in a failure to pass any meconium.

Step 2: Observe, and Perform a Thorough Physical Examination

The signs of colic in foals are slightly different to those of adults. It is not unusual for foals to roll from side to side and lie on their backs. Foals with medical problems, such as enteritis or gastric ulcers can show severe pain and therefore degree of pain is not as useful as an indicator of a surgical lesion as it is in adult horses with colic. Physical examination should be performed as in an adult horse. Heart rate in the foal is higher than in adults, averaging 100 bpm in the first month of age and then decreasing to an average of 60-70 bpm at 2 and 3 months old. Additionally, the ductus arteriosus can be patent up to 3-5 days of age, and therefore a cardiac murmur is not necessarily pathologic. Bradycardia should not be overlooked as it could occur due to hyperkalemia from a uroabdomen. If a urine sample is obtained, the specific gravity should be <1.010 and an increase in SG could indicate hypovolemia. Meconium should be completely passed by 24 hours of age and is then followed by softer, lighter colored feces. A digital rectal examination can be performed to ensure the presence of feces and determine if meconium is still being passed. It should be noted that tan milk feces can pass around a high meconium impaction.
The umbilicus and scrotum should be palpated for hernias. A non-reducible umbilical hernia requires immediate surgical correction. Scrotal hernias should be evaluated with the foal lying down so that the skin and prepuce can be clearly seen. If there is reddening and edema of the scrotum and prepuce, it indicates that the vaginal tunic has ruptured and the small intestine is lying subcutaneously. Immediate surgical correction of these hernias is required.

A very useful technique for monitoring colic in a foal is to objectively, sequentially measure abdominal girth. This can be done by placing a piece of bailing twine around the same site of the abdomen and determining if the contour is increasing. Evidence of the foal becoming more bloated suggests a complete obstruction and that surgery may be necessary.

**Step 3: Perform an Abdominal Ultrasound**

This is an extremely useful tool for evaluating the colicky foal. Due to their small size and shorter hair coat, ultrasound of the foal is easier, and a more complete evaluation of the abdomen can be performed, than in an adult horse. A microconvex 8 MHz curvilinear probe or linear transducer >10 MHz are ideal for performing the examination. Lower frequency probes such as those used in adults result in a loss of detail. When performing the examination several things should be determined. First, the small intestine should be observed for motility, wall thickness and diameter. Round fluid filled amotile loops can indicate a small intestinal obstruction, enteritis, or ileus which can be due to electrolyte abnormalities or hypothermia. The stomach should be visualized in a similar way to adults to determine size. Gas distended colon may be observed and an increase in wall thickness >5-mm may indicate a large colon volvulus or colitis. A high meconium impaction may also be visualized with ultrasound. Additionally, the volume of peritoneal fluid should be assessed. Foals normally have very little peritoneal fluid, but an increase in volume is readily identified and most often indicates a uroperitoneum.

**Step 4: Abdominocentesis**

During the ultrasound evaluation, it is useful to identify a pocket of peritoneal fluid that could be aspirated. Abdominocentesis is extremely useful in foals with distended small intestine in order to differentiate small intestinal strangulation and enteritis. In foals the risk of enterocentesis and tearing of the intestine is much higher than in adults. Therefore it is advisable to sedate the foal first and use local anesthetic in the skin so that it doesn’t move as the needle is advanced. As in adults, the sample can be collected using either a 20G needle or a teat cannula. Some people feel that an enterocentesis is more likely with a needle; however, the hole made to pass the teat cannula can result in secondary evisceration of omentum. Protruding omentum should be cut off and a bandage or suture placed to close the body wall. If enterocentesis does occur, the foal should be placed on antibiotics for 7-10 days. Analysis of the peritoneal fluid is similar to that in adults, however, the nucleated cell count is usually <1800 cells/ul. An increase in TP or cell count can occur with enteritis or strangulation; however, a serosanguinous color is usually indicative of ischemic intestine. Creatinine concentration should be measured and compared to serum creatinine concentration. If the creatinine concentration in the peritoneal fluid is over twice the serum concentration then a diagnosis of uroperitoneum is made. Peritoneal lactate fluid lactate concentration can be measured using a portable lactate meter. The value should be
identical to that in blood. In adult horses, an elevation in peritoneal lactate suggests the presence of ischemic intestine, but this has not been investigated in foals.

**Step 5: Pass a Nasogastric Tube**

Due to the possibility of gastric outflow obstruction secondary to ulcer disease in foals, this is an important part of the evaluation. A stallion urinary catheter is ideal for a nasogastric tube in foals. Because the foal is usually lying down, it can be difficult to create a siphon with flow alone, so gentle suction using a 60ml syringe can be applied. If gastric reflux is present, it could be due to a functional or mechanical small intestinal obstruction or a gastric outflow problem. Fluid with a dark “coffee grounds” appearance may indicate ulcer disease.

If gastric reflux is obtained, the foal should not be allowed to nurse and therefore may require supplementation with 5% dextrose IV.

**Step 6: Abdominal Radiography**

This technique is much more familiar to the small animal practitioner than the equine practitioner. However, due to the inability to perform a rectal examination, plain and contrast lateral abdominal radiographs can provide helpful information as to the location of the lesion. Distended loops of small intestine should be assessed for size. Loops of varying sizes could indicate a mechanical obstruction whereas uniform sized loops may suggest a functional obstruction. However, small intestinal volvulus can involve the majority of the small intestine resulting in small intestinal distention to an equal size throughout the abdomen. Plain films can be used to detect the presence of granular material in the small colon or rectum indicative of a fecolith or meconium impaction. Large colon gas distention is easily visualized on radiographs, however, it is impossible to determine the correct positioning of the large colon from radiographs. Sand impaction can be visualized by an increase in opacity in the ventral colon. Barium can be administered via an enema for detection of possible atretic segments of colon. It is highly sensitive and specific for the small colon and transverse colon but is not quite as effective for evaluating the large colon.1 Barium can also be administered orally at a dose of 5ml/Kg of 30% W/V via gravity through a nasogastric tube. This is useful to detect delayed gastric emptying due to pyloric outflow obstruction or duodenal stricture. In these cases minimal or no barium is seen in the small intestine after 30-45 minutes.

**Step 7: Gastroscopy**

If a gastric or duodenal ulceration is suspected, gastroscopy should be performed. In foals <30 days old, a 1-meter endoscope is usually sufficient to visualize the stomach and duodenum. Foals should be sedated for the procedure and care taken not to overinflate the stomach with air. The region of the margo plicatus should be visualized for ulcers and the scope allowed to pass through the pylorus into the duodenum to determine the presence of a stricture at either location. Air should be removed from the stomach prior to withdrawing the endoscope. The esophagus should be evaluated as the endoscope is withdrawn to determine the presence of reflux esophagitis which is frequently present concomitantly with gastric outflow obstruction.
Decision for Surgery

The entire evaluation of the foal with colic is aimed towards determining what the potential problem is and if surgical treatment is necessary. The biggest dilemma is distinguishing a surgical lesion of the small or large intestine from enteritis and colitis. Unnecessary surgery should be avoided because of the high risk of postoperative adhesions, however, early surgical intervention prior to the onset of shock and sepsis results in an overall improved outcome in those foals that in fact need surgery. Indicators for surgery include progressive increases in pain, heart rate and abdominal distention. Additionally, serial abdominocenteses can be helpful in monitoring progression of the disease process if medical treatment is attempted first. Foals with surgical lesions frequently have systemic changes including fever and leucopenia/leucocytosis, due to bacterial translocation from the gastrointestinal tract therefore these cannot be relied on as indicators for enteritis rather than a surgical lesion.

Reference