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ACUTE ABDOMEN IN FOALS: WHEN DO WE NEED TO CUT?

Summary

The treatment of colic in the foal aims not only to reduce the cause of abdominal pain but also to maintain hydration, blood glucose and blood values in electrolytes of the patient. This is essential in order to prevent renal failure following an hypovolemia which settles quickly in the foal at a young age. The foal with colic must remain under permanent medical supervision in case of preparation for laparotomy (especially in case of bladder rupture) or in order to react rapidly in case of nonresponse to drug treatment.

Foals with acute abdominal pain can be more challenging to the clinican compared to adult horses. In foals the sings of pain may not be as reflective of the type of problem as in adult horses. Also, with advancing deterioration of intestinal integrity signs of pain may become less and the patient appears more lethargic. **Apart from collection of information about the history, a thorough** clinical examination is essential. Nasogastric intubation should always be performed in foals with signs of colic. Ultrasound and radiography are the main diagnostic imaging tools but require a good anatomical understanding. Additional diagnostic procedures include abdominocentesis and collection of blood for haematology and blood chemistry.

The most common causes of colic in foals

Meconium retention

Foals passes meconium from birth and during the first day of life. Then the feces are soft and yellow in color. Meconium constipation develops 8 to 10 hours after birth and can cause strong signs of colic with pronounced tenesmus and anorexia. The rectal examination confirms the diagnosis and one or more rectal enemas are applied. The enemas are prepared on the basis of rectal gel and warm water or N-acetylcysteine (40 ml of a solution of acetylcysteine in 160 ml of water combined with 20 g of bicarbonate) and have a volume of 150 to 200 ml administered with a Foley catheter 20 cm cranially to the anus [1]. This treatment can become intensive in that the foal must be handled once or twice an hour for several hours and must be conducted atraumatically. It is often advisable to use analgesics to reduce pain and local non-propulsive intestinal spasm. The movement of the foal in the paddock or field under surveillance often allows him to pass the meconium. If the foal stops drinking from the mare, it is necessary to administer infusions.

If the signs of colic do not decrease and the foal does not pass further meconium, though very rarely laparotomy is indicated.

Malformations

The most common is the atresia of the colon. It induces severe signs of colic on the second or third day of life. The owners have not seen any meconium and the rectum is empty to the rectal touch. Only surgical treatment is possible with a reserved prognosis.

Mechanical ileus

Mechanical ileus is very rare in the foal and may be due to incarceration of loops of the small and large intestines in the inguinal or umbilical rings. In these cases the diagnosis is made quickly by inspection and palpation of the swollen regions. The treatment is medicated in cases where the intestinal loops can be pushed without effort into the abdominal cavity. In general, however, and especially in cases where the foal shows signs of colic, the treatment is surgical.

In the other cases of volvulus of the small intestine, the clinical examination does not reveal the specific changes of the small intestine. On the other hand, the ultrasound shows small intestine loops dilated, amotile, filled with anechoic fluid and sometimes the wall of the small intestine is thickened. Visualization of an intussusception associated with distended small intestinal loops gives a clear indication for laparotomy [2].

Another cause of mechanical ileus is obstruction of the small intestine with bundles of Parascaris equorum one to two days after deworming. Affected foals are lethargic and have a very distended abdomen. On ultrasound, the loops of the small intestine

FROM GESTATION TO A HEALTHY FOAL

are very numerous, dilated and filled with fluid. In some cases, it is possible to visualize filamentous structures in the lumen of the small intestine [3]. These are most likely Ascarids. In many cases, however, the diagnosis is made during laparotomy [4].
Much more rarely than in adults, the foal can develop a volvulus of the colon. The signs of colic are acute and severe and the abdomen distended [2]. On clinical examination, cardiovascular values are deteriorated and abdominal sounds are absent and the digital percussion of the abdomen can perceive a tympanic patch over a large area. Symptoms do not improve after analgesic treatment. Abdominal ultrasound reveals gas accumulation in large intestinal loops and usually the small intestine can only be seen in a restricted area of the abdomen. In the case where the foal does not improve rapidly after administration of analgesics, the treatment is surgical [5].

Paralytic ileus
Foals with neonatal asphyxia syndrome, prematurity or sepsis often develop symptoms of colic due to lack of perfusion of the intestinal wall. In this case the abdomen is distended, the faeces absent or soft and the abdominal ultrasound reveals distended intestinal loops, an increased amount of abdominal fluids and a stomach with liquid contents. In these foals, treatment is aimed at the primary condition and not overloading the digestive system. So the feeding is reduced to a minimum and the foal receives infusions and is intensively monitored.

Uroperitoneum
Foals of both sexes may develop bladder rupture. The causes of rupture are multiple, congenital, traumatic following a strong intra-abdominal pressure or during a dystocia or even during normal foaling or following tenesmus episode during retention of meconium. The symptoms of colic appear in these cases at the age of 2 to 4 days, rarely later. The abdomen is so distended that the foal often has dyspnea. The feces are normal and the owner has often noticed that the foal has no or only little urine. The abdominal ultrasound reveals an increase of the intra-abdominal fluid and since the rupture is not always visualized, the suspicion of rupture is then confirmed by the demonstration of a high level of creatinine in the abdominal fluid and hyperkalemia. The treatment is surgical but it is essential to stabilize the blood values especially the level of potassium and decompress the abdomen before the induction of anesthesia [5].

Gastritis
The gastric lesions cause colic of the foal at a young age but also in the first months of life. The symptoms are often violent, the foals rolling on the ground and keeping themselves on their backs. Generally affected foals drink little from the mare or have post prandial colic and prefer to drink water. Some cringe or salivate profusely. These signs are pathognomonic of gastric lesions in the foal.

The causes of gastric lesions in foals are diverse: ulcerogenic drugs such as non-steroidal anti-inflammatory drugs, pathogens such as rotavirus and stress.

Treatment of gastric ulcers includes removal of ulcerogenic factors, administration of antacids (magnesium oxide or aluminum hydroxide: phosphalugel ND, 20 to 40 ml 4 to 6 times daily), sucralfate (1 - 4 g / foal q 6 h, po), cimetidine (8 mg / kg q 6 h, po), ranitidine (6.6 mg / kg q 8 h, po) or omeprazole (1 to 4 mg / kg q 24 h, po) [6].

Surgical intervention in some of the above mentioned conditions is as much a diagnostic procedure as a treatment as often a definitive diagnosis cannot be established with the available diagnostic tools. It is critical to stabilize the patient before induction of general anesthesia. In particular, in foals with uroperitoneum (ie ruptured bladder) the presence of hyponatremia, hypochloremia, hyperkalemia renders the patient unsuitable for general anesthesia. Foals should receive intravenous NaCl-Glucose-infusion until the serum potassium levels have returned to normal range. Additional peritoneal lavage may be necessary.

Laparotomy in foals differs from laparotomy in adult horses and surgery should be reserved to cases only where other treatments are unsuccessful or a clear indication for surgery can be established. The most gentle handling of tissues is of vital importance as the intestines in the foal are by far more friable compared to adults and formation of intraabdominal adhesions is a very common complication post-laparotomy with the incidence of adhesion formation being as high as 33% [7].

The intestine should be kept moist with warmed sterile NaCl-Solution at all times. Surgical gloves should be rinsed prior to entering the abdominal cavitiy. Additional measures to reduce friction on the serosal surfaces during tissue handling should be employed

Prognosis

Survival rates in foals undergoing colic surgery are lower in younger foals (75%) and increase to 91% in yearlings [8]. Also, survival is significantly lower in foals with strangulating lesions compared to non-strangulating lesions.
Adhesion formation and subsequent recurrent colic is the most important factor effecting the outcome in foals undergoing colic surgery with a median time until onset of the first colic episode after initial surgery being 40 days [8]. Foals less than 6 months of age at the time of surgery have the highest incidence of adhesion formation and colic compared to weanlings and yearlings [8]. Laparoscopic adhesiolysis under general anesthesia offers a viable alternative to repeat laparotomy which may lead to additional inflammation and continued adhesion formation [9].

Conclusion

The foal with colic needs to remain under permanent medical supervision until recovery which implies intensive care, frequent clinical and ultrasound reassessments as well as regular measurements of blood values. The prognosis depends of course on the diagnosis but also on the speed of the implementation of the treatment. With detailed presurgical examination and careful planning of laparotomy procedures in foals a reasonably good prognosis can be expected. Strangulating lesions and intestinal wall necrosis may lower the prognosis significantly.

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