

Case Report

Permanent colostomy after small colon prolapse in a parturient mare

C. A. Espinosa Buschiazco*, M. C. J. Cancela and M. V. Simian

Centro Veterinario del Hipodromo de San Isidro. Diego Carman 222, San Isidro (1642), Buenos Aires, Argentina.

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Summary

Small colon prolapse is a possible complication during parturition and diarrhoea. A case diagnosed in a mare during birth labour was reduced by the attending veterinarian at the farm, and referred to the authors for evaluation. After thorough physical examination, blood and peritoneal fluid tests, a ruptured mesocolon was suspected and the mare explored under general anaesthesia by a median celiotomy approach. During the procedure the affected mesocolon-rectum was confirmed and a resection of the intestine elected. After prolapsing the segment of damaged viscera a permanent end colostomy was performed. Fourteen months later and after an uneventful recovery, the mare was in a very good physical condition and waiting to be covered for the next breeding season.

Introduction

Four types of rectum and small colon prolapse have been described in the horse. In *type I*, only the mucosa and submucosa are prolapsed through the anus whereas *type II* involves all the layers of the rectal ampulla. In *type III*, a variable part of the small colon prolapses through the anus, and in *type IV*, the peritoneal rectum and a variable part of the small colon prolapse through the anus. These conditions can be caused by straining, such as that associated with diarrhoea and parturition. *Types I* and *II* are amenable to treatment, and the prognosis is good. In *types III* and *IV*, the rectum and small colon can suffer damage to their vascular supply, which worsens the prognosis.

Mares with tears in the mesocolon after dystocia are usually subjected to euthanasia because of limited access to the damaged segment and the poor prognosis for recovery (Ragle *et al.* 1997). Discrete tears of the

mesocolon after foaling that can be treated by surgery have a good prognosis (Dart *et al.* 1991). Strangulation obstruction of the small colon, e.g. by a pedunculated lipoma, obstruction due to a submucosal haematoma and ischaemia due to mesocolon tears, can be treated by resection and end-to-end anastomosis. Prompt diagnosis of ruptured mesocolon is critical to avoid delay in the decision to explore the abdominal cavity. Such a delay can cause necrosis of the intestine to advance to the point of peritonitis, diminishing chances of a successful outcome. Another possible problem with this disease is the lack of accessible viable distal small colon to be anastomosed to the proximal segment of small colon.

This report describes the clinical presentation of a Thoroughbred mare with a small colon and rectum prolapse that was initially reduced at the farm. The damage to the mesocolon was such that it did not permit an entero-anastomosis, and a new alternative surgery was attempted to resolve the case.

Case details

History

A 6-year-old Thoroughbred mare was referred to the veterinary centre at San Isidro Race Track for evaluation after a prolapse of rectum and small colon had occurred and been reduced during delivery of a healthy foal. The prolapsed intestine was reported to reach the point of the hock (approximately 70 cm long). The mare had been at pasture and was found by the night watchman after the prolapse occurred.

Clinical findings

Upon presentation 6.5 h after delivery, the mare was bright, alert and responsive and the foal nursing.

Heart rate was 45 beats/min; rectal temperature was 38.1°C.

*Author to whom correspondence should be addressed.



Fig 1: Ruptured mesocolon and rectum.

Packed cell volume was 38%, total plasma protein 61 g/l, WBC count 12.4×10^9 cells/l, with 79% segmented neutrophils, 1% in band, 20% lymphocytes, fibrinogen 3.0 g/l.

A sample of peritoneal fluid was collected. Macroscopically it was serosanguinous and laboratory analysis revealed 36 g/l protein and 10.2×10^9 white blood cells/l. These changes were considered indicative of possible damage to the mesocolon.

No abnormalities were found on palpation *per rectum*.

Diagnosis

Based on history and findings at the hospital, a decision to explore the abdomen was made, with the presumptive diagnosis of ruptured mesocolon.

Treatment

During surgical exploration via a routine midline celiotomy, rupture involving approximately 1.5 m of mesocolon and mesorectum was confirmed (**Fig 1**), together with complete disruption of the blood supply to the involved intestinal segment. The tear was palpated up to where the hand of the surgeon could explore the intestine in an aboral direction, making the distal intestine unavailable for an entero-anastomosis. It was, therefore, decided to resect the affected small colon and rectum. The selection of the intestine to be resected was determined based upon the extent of ruptured mesocolon and appearance of the intestinal wall.

The first step was to lavage the entire small colon in order to evacuate all faecal material. This was achieved using a hose inserted through the anus. After emptying the intestine a blind stump was made in the aboral segment of the intestine to prepare it for removal. This blind stump was closed with a simple continuous appositional pattern followed by a Cushing pattern, both with size 0 polydioxanone (**Fig 2**). The stump was then prolapsed

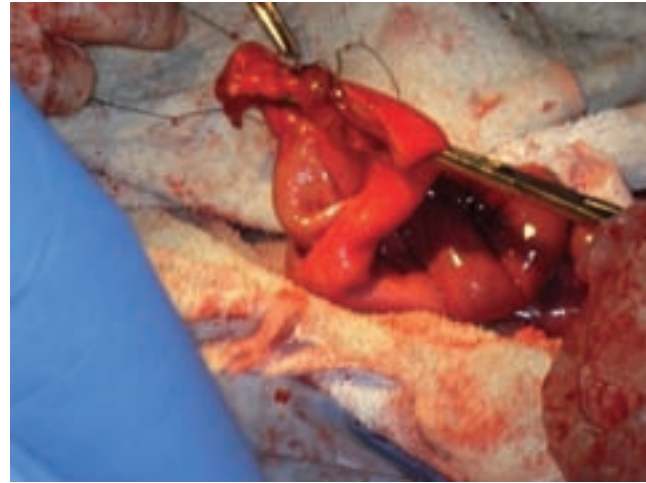


Fig 2: Suturing the aboral stump.

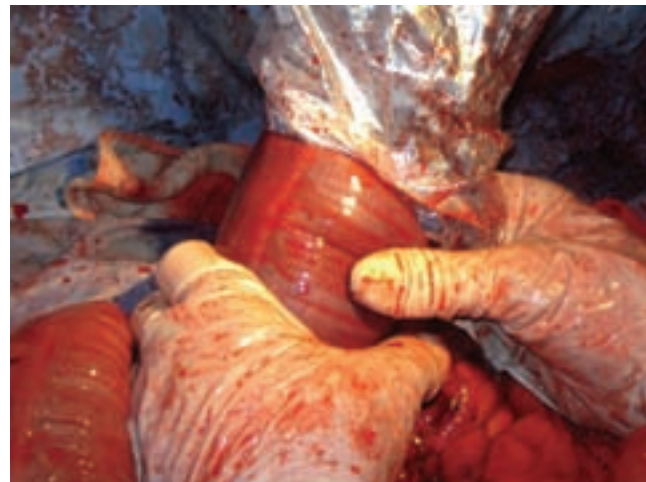


Fig 3: Prolapsing the colon and rectum.

toward the rectum by an assistant with a small arm (**Fig 3**). A second surgeon grasped the stump through the rectum and pulled it through the anus (**Fig 4**). A Doyen clamp perpendicular to the long axis of the rectum was applied as close to the sphincter of the anus as possible. The prolapsed colon and rectum were cut with a scalpel, and a blind stump was performed in 2 suture layers with 0-polydioxanone suture material. The first layer included the *seromuscularis* and the second the *mucosa-submucosa*, both in a simple continuous pattern (**Fig 5**). This rectal stump was inverted back into the pelvis at which time the arm of the surgeon could not be introduced far beyond the wrist (about 30 cm deep). A purse-string suture was applied to the external anal sphincter for a few days.

Meanwhile, the surgeon working in the abdomen closed the oral segment of intestine as a closed stump in the same way as the first one (**Fig 6**). After this second stump was finished, a transfixation through the mesocolon was made with No. 2 polyglactin 910, close to the extreme of the intestine, reducing its diameter in order to stop the faecal material from advancing and thus avoid its pressure



Fig 4: The prolapsed small colon and rectum ready for resection.

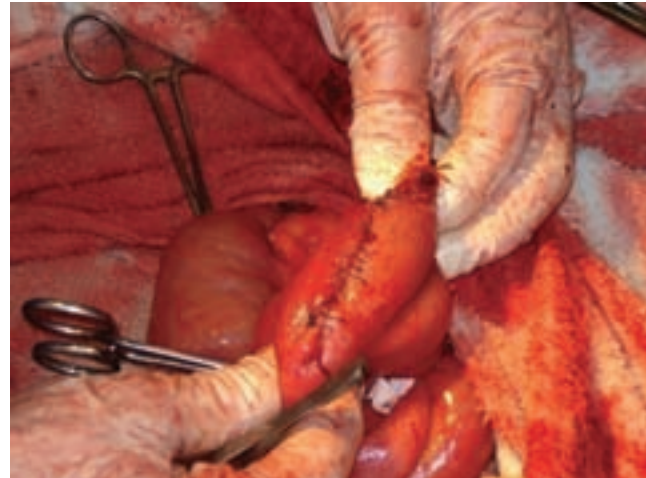


Fig 6: The oral or anterior stump to be fixed to the abdominal wall.

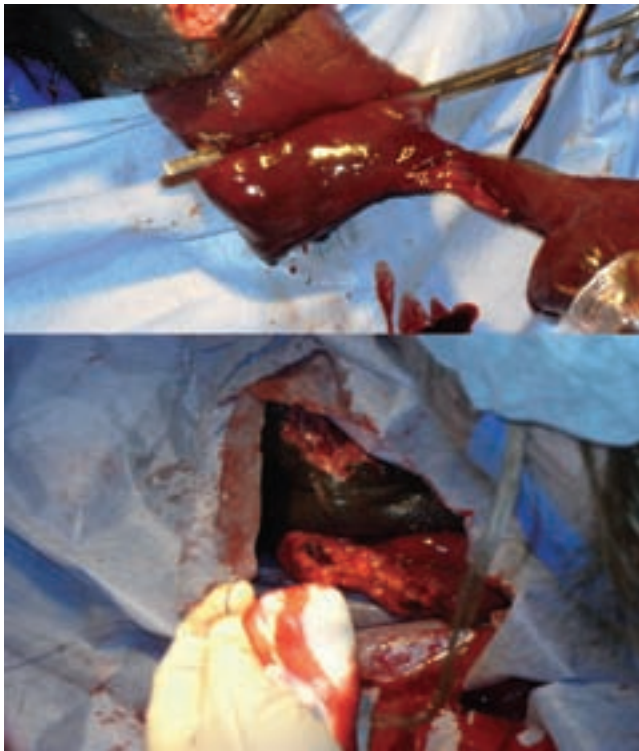


Fig 5: Resection of the rectum with a first suture layer of the seromuscularis and a second of the mucosa-submucosa.

against the sutures of the blind end (**Fig 7**). The suture ends of the transfixation were passed through the abdominal wall at the level of the low flank and fixed with a knot over a sponge (**Fig 8**).

It was decided not to evacuate the large colon as it did not have much faecal content, and doing so would only have prolonged the time of the surgical procedure. Because of possible contamination of the cavity a silicone tube drain was placed at the anterior aspect of the incision and left in place for 2 days. After closure of the celiotomy with monofilament nylon No. 60 in an inverted interrupted



Fig 7: Transfixation at the stump to stop the faecal material.

cruciate pattern, a second layer in a continuous horizontal pattern was made in the subcutis with No. 0 polyglactin 910. The skin was sutured in a continuous horizontal mattress pattern with monofilament nylon No. 40. A stent was applied over the skin suture and the mare was allowed to recover.

Recovery was uneventful and the mare was immediately restrained in stocks as soon as she could stand and a colostomy made through a celiotomy dorsal to the landmark of the suture material over the sponge (**Fig 9**). This last procedure was performed standing in order to avoid the changes in the different layers of muscles, subcutaneous tissues and skin that normally occur when a recumbent patient stands up. The blind end of the small colon was sutured to the wall in 3 layers; the first 2 layers anchoring the *seromuscularis* of the stump to the abdominal muscles in a simple interrupted pattern of No. 0 polyglactin 910, and the third layer using monofilament nylon No. 0 from the skin to the mucosa in the same pattern.



Fig 8: Fixation of the colon transfixation through the abdominal wall.



Fig 9: The end colostomy, at the low flank in standing position.

Post surgical treatment was the same as in other colic surgery patients, with the addition that in this case mineral oil was administered through a nasogastric tube daily for several days in order to maintain soft faeces. The colostomy was covered with an antibiotic cream to keep it moist and help the healing process.

Outcome

The mare recovered without complications and was sent to the farm one month after surgery (**Fig 10**).

Discussion

Ischaemic damage of the small colon can occur in association with impaction or obstruction by enteroliths. Rupture of the mesocolon is occasionally seen as a parturient injury or, as in this case, secondary to rectal prolapse.



Fig 10: The mare at pasture, 14 months post surgery.

In equine surgery practice it is well known that the mesocolon of the small colon and its blood vessels are prone to rupture in certain situations, such as impactions, presence of faecaliths and/or presence of enteroliths, making it mandatory to handle the intestine carefully. Grade IV rectal and small colon prolapse is seen in cases of parturient mares caused by the effort and straining during labour. Some cases of dystocia, such as foals that are too big for the size of the mare, can predispose to this pathology. In the present case, the mare was big and the foal relatively normal for the mare's size. There was no dystocia or any other abnormality reported during birth. The mare was found with the foal nursing at her side during the night and the prolapse was not noticed at that time.

Jacobs *et al.* (1982) described a similar case, but the author did not attempt to resect the intestine. The prolapsed small colon was reduced 3 days before and had signs of peritonitis, so the mare was subjected to euthanasia.

In the present case the prolapse was reduced by the veterinarian at the farm a few hours after delivery, and the mare was immediately sent to the veterinary centre.

On admission it was decided to explore the abdomen in order to better evaluate the viability of the intestine before making a decision, because the peritoneal fluid was haemorrhagic.

A few months previously, a mare from another farm had suffered a similar prolapse but had a 360° rupture of the rectum. The same procedure was performed at the veterinary centre, but the stump of the rectum was sutured from the anus attempting to evert the stump and applying only a 2 layer suture. The peritoneal contamination produced peritonitis and the mare was subjected to euthanasia.

In this case the mesentery was torn from the anus to the small colon close to 1.5 m in length and a decision to prolapse and amputate was made.

To the authors' knowledge there are few reports of this kind of parturition complication, and no reports of this type

of resolution were found. In the report by Bailey and Hutchins (1987), the prolapsed intestine was resected and anastomosed. A few days later, peritonitis was diagnosed and the mare again taken to surgery. A loop colostomy was performed in an attempt to avoid natural passage of faecal material but the peritonitis did not resolve due to leakage from the anastomosis and the mare was subjected to euthanasia.

No reports of cases with total disruption of the blood supply in such a long segment of small colon, including the rectum so close to the anus, were found, nor of cases that resolved after creating a blind stump of the distal rectum through the anal sphincter after resecting the affected segment of intestine.

In the paper by Livesey and Keller (1986), one of the cases was treated by resection of the affected colon and rectum and a stump was made with a Parker-Kerr pattern on the rectal side. At *post mortem*, the mesocolon and mesorectum were ruptured at their dorsal attachment. The authors did not prolapse the affected intestine or make a short rectal stump through the anus.

In the present case, the reproductive future of the mare was evaluated. The short rectal stump makes rectal palpation or scanning impossible, therefore precluding the possibility of diagnosing a twin pregnancy.

Acknowledgements

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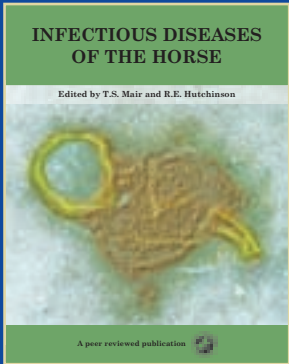
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