

Case Report

Complete small colon ablation and fixation of the mesocolon to the internal anal sphincter due to prolapse in a young draft horse

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Abstract: A two-year-old draft stallion was referred for evaluation of a type IV prolapse. A thorough physical examination followed by blood tests was performed to assess the situation. Following the examination, it was concluded that the protruded small colon was devitalised, measured approximately one and a half meters and mesenteric and vascular injury were present. A standing surgery approach was chosen for the present case, in which the affected tissue was excised and the remaining mesentery was ligated to the internal anal sphincter to decrease pressure during straining in the physiological act of defecation. Six months later, after an uneventful recovery, the stallion was in good health and performing its reproductive duties. To our knowledge, this is the first report of a mesenteric fixation to the internal anal sphincter in a horse. The study confirms that this technique is a feasible method that can be used in the complete ablation of the small colon in prolapses.

Keywords: small colon, prolapse, mesocolon, colonic fixation, ablation

Received: 15.11.2023

Accepted: 25.12.2023

Published: 30.12.2023

DOI: [10.52331/cvj.v28i3.58](https://doi.org/10.52331/cvj.v28i3.58)



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1. Introduction

In horses, rectal prolapse frequently develops because of conditions that also cause prolonged and intense straining, such conditions usually have their origin in the gastrointestinal sphere some examples are intestinal parasitism, diarrhea, colitis, and proctitis. Other times, prolapse can develop secondary to conditions that increase abdominal pressure, such as dystocia, constipation, colic, urinary tract obstruction, retained fetal membranes, foreign bodies, or obstructive rectal tumors. [1-8] There are factors that can predispose to rectal prolapse and they are usually related to the lack of good function in the rectum and the anal sphincter, such as loss of tone in the anal sphincter, loose attachments of the mucous membrane to the muscular coat of the rectum, or loose attachments of the rectum to perirectal tissues. [4] There are four different kinds of rectum and small colon prolapse in horses. Only the mucosa and submucosa prolapse through the anus in type I, but all layers of the rectal ampulla do so in type II. A variable portion of the small colon prolapses through the anus in type III, and the peritoneal rectum as well as a variable portion of the small colon prolapse through the anus in type IV. Most

dystocia mares have this latter kind. [1-6] Due to mesenteric and vascular damage, the prognosis is guarded to poor for types III and IV but good for types I and II. As soon as the prolapse is longer than 30 cm, a descending mesocolon rupture should be suspected. Additionally, the anal sphincter itself may mechanically compress, reducing venous return. [3],[4],[6] To avoid postponing the choice to intervene surgically, prompt detection of a ruptured mesocolon is essential. The likelihood of a favorable outcome can be decreased if the necrosis of the intestine is allowed to progress to the point of peritonitis. The absence of a viable distal small colon that can be accessible and connected to the proximal portion of the small colon via anastomosis is another potential issue with this condition. [6]

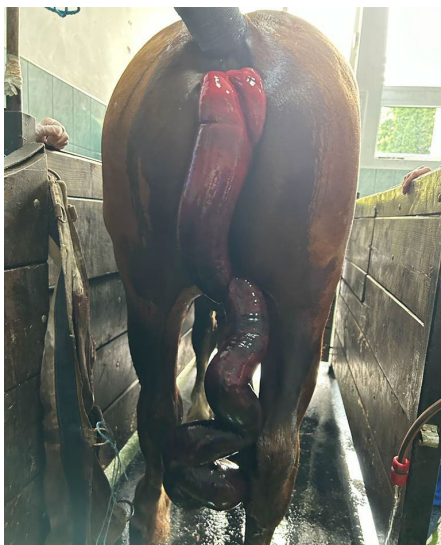
2. Case presentation

2.1. History

A two-year-old stallion was referred to the veterinary center at Cluj-Napoca Faculty of Veterinary Medicine Equine Clinic for assessment following a rectum and small colon prolapse. According to reports, the prolapsed intestine extended approximately 1.5 meters. The owner reported that the stallion entangled itself with the rope that it was tied with, fell, and struggled unsuccessfully to get back up until the morning when it was found.

2.2. Clinical findings

Upon arrival, the stallion was in moderate pain, depressed but stable. Rectal temperature could not be taken. Mucosal membranes were pink, heart rate was 50 bpm, respiratory rate was 18 rpm, capillary refill time of 3 seconds, and the extremities had a normal temperature without perceptible pulse on the digital arteries. A type IV rectal prolapse (Figure 1.a.) measuring approximately 1.5 meters in length and with an edematous, red-purple color was observed extending to a point below the hock (Figure 1.b.). A complete blood count, chemistry profile, and electrolyte panel were performed. The tests revealed mild metabolic acidosis, slight ionic calcium and sodium imbalance, and blood glucose elevation. The creatine kinase levels were elevated up to 6 times over the superior limit.



(a)



(b)

Figure 1. Preoperative assesment (a) Type IV rectal prolapse with an edematous, red-purple color extending to a point below the hock; (b) measuring approximately 1.5 meters

2.3. Preoperative management

A catheter was aseptically inserted in the jugular vein and flunixin meglumine (1.1 mg/kg, Niglumin®) was administered. Cefquinome (1 mg/kg, Cobactan) was administered intramuscularly. Afterward, the stallion was guided into a padded induction stall in preparation for the standing surgery to prevent accidents in case it became necessary to undergo general anesthesia due to pain and inability to remain in a standing position. There, fluid therapy was instituted with isotonic saline (NaCl 0.9%) and preparations for the surgery were started. The tail was braided and a tail bandage was applied to keep tail hairs out of the surgical field and to minimize contamination. The caudal gluteal region and the area at the base of the tail were clipped and aseptically prepared. An epidural anesthesia was performed using 8 ml of mepivacaine HCl (Mecain® 10 mg/ml) in the sacrococcygeal space using a 21 gauge hypodermic needle. The anal sphincter was additionally infiltrated with 40 ml of lidocaine HCl (Lidobel®) for further analgesic effect. The prolapse was resolved using standing resection and anastomosis of the rectal prolapse as described in the literature [1][5] with the addition of fixating the mesocolon to the internal anal sphincter.

2.4. Treatment

To sustain the prolapse during dissection, two catheter stylets were inserted perpendicularly in the anal sphincter and healthy mucosa in order to insert stay sutures. Full circumferential incisions were made in the intussusceptions's exterior and inner walls, with a No. 24 scalpel blade. (Figure 2.) Along the way, bleeding mesenteric arteries were ligated with AssuCryl® PGA No. 2. At this point, the remaining mesentery was ligated to the internal anal sphincter using a simple interrupted suture pattern with AssuCryl® PGA No. 2. (Figure 3.) Afterward, a whole thickness simple interrupted pattern was used to appoint the proximal and distal ends. (Figure 4.)



Figure 2. Full circumferential incisions in the exterior and inner walls

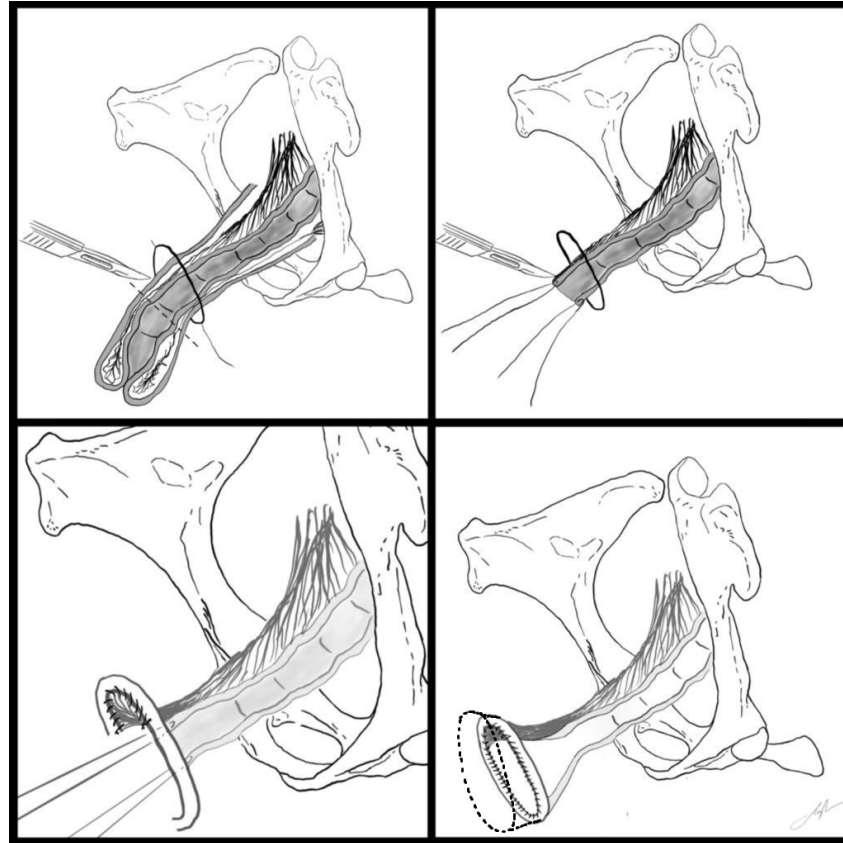


Figure 3. Schematic representation of the surgery (a) Small colon prolapse; (b) Full circumferential incision and stay sutures; (c) the mesentery ligated to the internal anal sphincter using a simple interrupted suture pattern; (d) end result, red arrow: internal anal sphincter; blue arrow: external anal sphincter

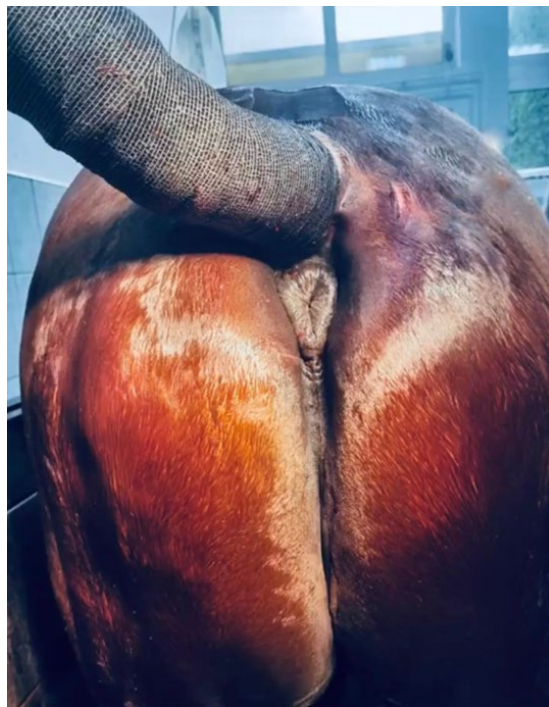


Figure 4. Postoperative result

2.5. Postoperative Care

After the surgery was completed, the stallion was admitted into the clinic for postoperative care for six days. Immediately post-surgery, the stallion was administered 20 ml of tetanus antiserum, and a nasogastric tube was placed. Via the nasogastric tube, the horse was administered daily 3 liters of mineral oil for five days. Flunixin meglumine (1.1 mg/kg, Niglumin®) and cefquinome (1 mg/kg, Cobactan) were administered intravenously respectively intramuscularly daily for the entire duration of the stay in the clinic.

2.6. Postoperative Results

After a week spent in the clinic, the stallion was discharged and transported back to its owner's stable. The owner agreed to regular telephonic questionnaires about the horse's evolution. The recuperation was reported to be uneventful up to the 6 months postoperatively mark and normal reproductive duties were resumed.

4. Discussion

Ischaemic damage of the small colon can occur secondary to a rectal prolapse,[6] in the case we presented, the mesentery was stretched and presented multiple tears thus disrupting the vascular supply to the terminal small colon. The interruption of the blood supply to the section of the small colon that has prolapsed must be considered while treating intussusception and small colon prolapse. [9] The patient must be closely watched for indications of peritonitis if intussusception of the small colon is suspected, and additional testing by a midline exploratory laparotomy may be necessary.[9] Jacobs KA et al suggested that if the small colon loses its blood supply, a colostomy should be considered because it is not surgically accessible enough to remove the small colon and connect it to the rectum.[9] The surgeon did not opt for a colostomy because we were able to connect the remaining intestine with the rectum and secure it with the remaining mesentery to the internal anal sphincter. It is the author's belief that securing the mesentery offered better stabilisation and decreased pressure during straining in the physiological act of defecation. Similar approaches are used in humans with rectal prolapses, the differences consisting in the type of material used to achieve a better fixation. The rectum is fixated via a prosthetic rectopexy based on the notion that rectopexy via adhesion and fibrosis is viable, and that mesh fixation would be more successful than a simple suture.[10] Materials including fascia lata, nylon, polypropylene, marlex, polyvinyl alcohol, and polytape are utilized in the development of meshes and other prostheses to facilitate fixation.[10] It was proven that using these methods improves fecal incontinence in most cases, however, opinions on the effects regarding constipation are divided.[10] In the case we are presenting, the owner did not report any episodes of constipation, normal bowel movement, and defecation being restored. The study confirms that this technique is a feasible method that can be used in the complete ablation of the small colon in prolapses.

Author Contributions: Cristian Mihăiță Crecan, Valeria Ciulu-Angelescu and Cosmin Petru Peștean had equal contribution. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding

Institutional Review Board Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Freeman, D.E. (2019) Rectum and anus. In: Equine Surgery, 5th edn., Eds: J.A. Auer and J.A. Stick, Elsevier, pp 632-645.
2. Archer, D.C. (2013) Oral and gastrointestinal emergencies. In: Handbook of Equine Emergencies, 1st edn., Ed: D.C. Archer, Elsevier, St Louis. pp 59-84.
3. Dallap Schaer, B. and Orsini, J.A. (2014) Gastrointestinal system. In: Equine Emergencies: Treatment and Procedures, 4th edn., Eds: J.A. Orsini and T.J. Divers, Elsevier, St Louis. pp 157-237.

4. Schumacher, J. (2002) Diseases of the small colon and rectum. In: Manual of Equine Gastroenterology, 1st edn., Eds: T. Mair, T. Divers and N. Ducharme, W.B. Saunders, St Louis. pp 299-315.
5. Turner, T.A. and Fessler, J.F. (1980) Rectal prolapse in the horse. J. Am. Vet. Med. Ass. 177, 1028-1032.
6. Buschiazzo, C. & Cancela, M. & Simian, M.. (2010). Permanent colostomy after small colon prolapse in a parturient mare. Equine Veterinary Education - EQUINE VET EDUC. 22. 223-227.
7. Levine SB. Surgical treatment of recurrent rectal prolapse in a horse. J Equine Med Surg. 1978;2:248–249.
8. Robert MP, Main de Boissiere M, Depecker MC, et al. Type IV rectal prolapse secondary to a long-standing urinary bladder lithiasis in a donkey. Equine Vet Educ. 2016;28:625–626.
9. Jacobs KA, Barber SM, Leach DH. Disruption of the blood supply to the small colon following rectal prolapse and small colon intussusception in a mare. Can Vet J. 1982 Apr;23(4):132-4.
10. Shin EJ. Surgical treatment of rectal prolapse. J Korean Soc Coloproctol. 2011;27(1):5-12.