CLINICAL REPORT

Veterinary Research Forum. 2022; 13 (1) 145 – 147
doi: 10.30466/vrf.2021.526717.3155
Journal Homepage: vrf.iranjournals.ir

Veterinary Research Forum

Strangulating left colon volvulus following nonsurgical castration in a 6-year-old donkey

Saeed Azizi*, Hamed Masoudi

Department of Surgery and Diagnostic Imaging, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran.

Article Info

Article history:

Received: 15 March 2021
Accepted: 15 June 2021
Available online: 15 March 2022

Keywords:

Castration
Colic
Donkey
Large colon volvulus

Abstract

Colic is a clinical syndrome and has been defined as a visceral abdominal pain and/or acute abdominal disease. It is a common cause of morbidity and mortality in horses. The most common forms of colics are related to gastrointestinal tract in nature and most often linked to colonic disturbances. However, colics are not well understood in donkeys compared to those of in horses and the literature is poor regarding bowel strangulating obstruction in donkeys. This report described the clinical signs and post-mortem necropsy findings of an abdominal colic due to the left colon volvulus following a non-surgical castration using Burdizzo emasculatome in a 6-year-old donkey. The castration was done under local analgesia following a sedation with a combination of xylazine-acepromazine and physical restraint on a tilt table. Severe abdominal colic and death occurred after discharging from the hospital. Left colon volvulus at the sternal and diaphragmatic flexures in a ventromedial-dorsolateral direction of 720° was the main cause of colic found at the necropsy examination. Although left colon volvulus is not considered as a complication of castration, it maybe rational to prescribe an analgesic agent in postoperative care in donkeys undergoing non-surgical castration.

© 2022 Urmia University. All rights reserved.

Introduction

Colic is a clinical syndrome and has been defined as a visceral abdominal pain and/or acute abdominal disease. It is a common cause of morbidity and mortality in horses. The most common forms of colics are related to gastrointestinal tract in nature and are most often linked to colonic disturbances. Large colon volvulus (LCV) is defined as rotation or twisting of the colon across or around its mesentery. Volvulus at or beyond 360 degrees is considered a strangulating obstruction. Large colon volvulus typically occurs at the colonic base or at the level of the cecocolic ligament in a counter-clockwise (ventromedial dorsolateral) direction. Volvulus can also occur at the sternal and diaphragmatic flexures where anecdotally it appears to occur in a clockwise (ventrolateral-dorsomedial) direction.[1]

In general, colics are not well understood in donkeys compared to those of in horses and the literature is poor regarding bowel strangulating obstruction in donkeys. The prevalence, incidence, clinical signs and probable risk factor(s) for occurrence of LCV are also unknown.[2-3] Castration is the most common surgical procedure performed in donkeys. There are no any reports regarding of LCV as a complication of surgical and/or non-surgical castration in equidae. The purpose of present report was to describe the clinical signs and the post-mortem necropsy findings of an abdominal colic due to LCV following a non-surgical castration in a male donkey.

Case Description

A 6-year-old intact male donkey with approximately 300 kg body weight was referred to the Veterinary Medical Teaching Hospital, Urmia University (Urmia, Iran) for castration. At the arrival, the jack was apparently healthy, bright, alert, and in good body condition. The animal underwent routine clinical examination and the vital signs including heart rate (44 beats per min), respiratory rate (18 breaths per min), and rectal temperature (37.00 ˚C) were within the normal ranges. The external genital structures, including descended

***Correspondence:**

Saeed Azizi. DVM, DVSc
Department of Surgery and Diagnostic Imaging, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran
E-mail: s.azizi@urmia.ac.ir

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License which allows users to read, copy, distribute and make derivative works for non-commercial purposes from the material, as long as the author of the original work is cited properly.

testicles, were normal. Auscultation of the large bowel borborygmi thorough left and right abdominal wall showed a normal motility and no abnormalities were found on rectal examination. The main reason for elective castration was to eliminate masculine behavior of the donkey for working in sheep flock as a pack animal. Following briefing the owner and because of the cost of surgical castration for normal descended testes, elective non-surgical method of sterilization with Burdizzo emasculatome was performed.

Surgical technique. The animal was sedated with a combination of xylazine 0.20 mg kg^{-1} (Alfasan, Woerden, Netherlands) and acepromazine 0.02 mg kg^{-1} (Alfasan), through intra jugular vein administration. After 10 min, the animal was restrained on a surgical tilt table and bloodless castration was performed under local infiltration analgesia. The subcutaneous tissue of each spermatic cord was infiltrated with 15 mL of 2.00% lidocaine hydrochloride. Each spermatic cord was crushed via applying a Burdizzo emasculatome for 5 min. The crushed site was covered by oxytetracycline topical spray (Razak Pharmaceutical Lab, Karaj, Iran) and the castrated animal was recovered safely with no vigorous efforts and discharged from the hospital. The owner was advised to continue topical spraying twice a day and hand-walk the jack for a week, postoperatively. Also, he was advised to visually monitor the donkey within the first 24 hr and periodically within the first week after castration for possible complications. The animal did not receive any systemic anti-inflammatory and/or analgesic or systemic antibiotic agents, postoperatively. The animal was later reported to have signs of an acute onset of severe abdominal pain five hr after castration. Anorexia, dullness, backward-facing ears, lowered head, kicking, repeated lying down and standing, and rolling were the most common signs of the abdominal colic in the affected donkey. Finally, death happened 11 hr after castration.

Necropsy findings. In the next morning, the carcass was referred to the hospital to find out the cause of death. The abdominal and thoracic cavity necropsy was conducted. No unusual findings in the thoracic cavity was observed, however, large colon volvulus was found in the abdominal cavity (Fig. 1A). Meticulous examination of the external and internal genital organ showed normal appearance except for normal post castration mild inflammation and oedema in the region of the well crushed spermatic cords. There were no signs of bleeding or other complications, such as possible small intestinal incarceration in the adjacent structures. The left ventral and left dorsal colon torsion around its long axis at the sternal and diaphragmatic flexures in a counter-clockwise (ventromedial-dorsolateral) direction of 720° volvulus was other main finding (Figs. 1B and 1C). Large colon gross findings were distension, swelling, obvious oedema and congestion, increased wall thickness, diffused serosal hemorrhage and black discoloration (Fig. 1D).

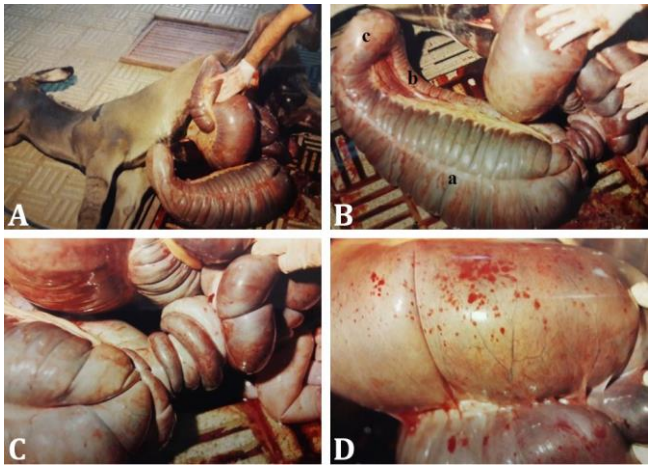

Fig. 1. A) Post-mortem findings of the donkey with the left large colon volvulus. **B)** Different parts of left colon including a: left ventral colon, b: left dorsal colon, and c: pelvic flexure. **C)** Left ventral and left dorsal colon torsion around its long axis at the sternal and diaphragmatic flexures in a counter-clockwise (ventromedial-dorsolateral) direction of 720° volvulus. **D)** Large colon displayed distension, swelling, obvious edema and congestion, increased wall thickness, diffused serosal hemorrhage and dark discoloration.

Discussion

Large colon volvulus is one of the most painful and rapidly fatal causes of colic in horses and accounts for 10.00 – 20.00% of colic cases undergoing exploratory laparotomy in hospital populations.[4] The exact risk factors associated with large colon volvulus are not well known and are quite challenging. Presumably, risk factors include increasing abdominal height, multiple colic episodes during the previous 12 months, quidding behavior, recent medication, increased stabling period in the previous 14 days, changing in pasture, being fed on hay and sugar-beet, over-population of horses on a farm, and multiple people involved in the horse's care.[5] Mares, particularly those that have previously foaled have also reported to be at an increased risk of large colon volvulus.[5,6] Microbiota disruption may also precede the volvulus of the large colon in broodmares.[6] Large colon volvulus may also be associated with an absent cecocolic ligament and abnormal mesenteric attachments of the cecum and transverse colon to the body wall.[7,8] The literature is poor regarding LCV in donkeys. Despite insufficient data to extrapolate donkeys specific risk factors for many types of identified colic, there are isolated reports concerning to acute or chronic colic in donkeys. Impaction colic (more common), spasmodic colic (less common), equine grass sickness[9] and pancreatic tumor are reported in donkeys' colics.[2,10] The prevalence, incidence, clinical signs and risk factor(s) for occurrence of LCV in donkey are not understood at all. In horses, tentative diagnosis is made based on signalment and clinical signs and then confirmed

in exploratory laparotomy.[1] In the present case an acute abdominal colic was seen as a typical abdominal severe painful condition. The LCV was diagnosed at post-mortem necropsy examination because of too rapid onset of the colic and death.

Castration was found to be the only main risk factor for abdominal pain in the present case. In the history of the affected donkey, no changes in diet or husbandry management, as a probable cause of colic was observed. Castration is the most common surgical procedure performed in adult donkey and accounts for about 87.00% of our referral hospital population within ten years (unpublished data). Castration is performed in order to diminish the donkey's aggression and for lessening of the impulse to wander, therefore, tend to work more as draft animals and shepherds' assistance.

Reportedly, castration by latex band, rubber ring, and Burdizzo in calves elicits greater cortisol response as a physiological marker compared to that seen in the surgical procedure.[11] The transient increase in cortisol level rapidly returns to the baseline following the surgical castration,[12,13] therefore, in the longer term the surgically castrated animal might suffer less pain compared to other non-surgical androgen-eliminating methods in ring or Burdizzo castration.[14] Surgery as well as other pathophysiological situations can also induce considerable stress and increase cortisol concentration in horses.[15] This phenomenon may also happen in donkey and castration as a stressor can result in pain in the affected donkey.

In practice, systemic analgesic drugs are not conventionally used in non-surgical castration procedures because of the cost of surgery. It is not clear for us that whether the pain resulted from a non-surgical castration induced an undesirable gastrointestinal condition in the affected donkey and acted as a risk factor to cause LCV. It needs further detailed clinical investigations to clarify the condition. There are no any documented reports regarding LCV as a complication of surgical and/or non-surgical castration in equidae. Adult surgically castrated horses, more than 10 years, may display the signs of a transient mild colic due to postoperative pain. However, horses display the signs of severe colic that fail to respond favourably to analgesic drugs administration suspected to small intestine incarceration in the mesoductus deferens rent.[1] There is no any experimental or clinical reports regarding the effects of acepromazine or xylazine on colonic motility function in healthy normal horses. Both of these drugs negatively affect gastrointestinal (GI) motility in general and it has been demonstrated that xylazine significantly decreases cecal motility.[1] However, GI tract motility alteration is a transient response and it last mostly for an hour. Moreover, the systemic analgesic effects of these drugs last mostly for 4 to 6 hr. Therefore, it might be rational to prescribe an analgesic agent in postoperative care in donkeys' non-surgical castration.

Conflict of interest

None declared.

References

1. Auer JA, Stick JA. Equine surgery. 5th ed. Pennsylvania, USA: Elsevier, Saunders 2019; 577, 607-609, 1023-1029.
2. White NA, Moore JN, Mair TS. Equine acute abdomen. 1st ed. Jackson, USA: Teton NewMedia 2009: 471-485.
3. Morrow LD, Smith KC, Piercy RJ, et al. Retrospective analysis of post-mortem findings in 1,444 aged donkeys. J Comp Pathol 2011; 144(2-3): 145-156.
4. Harrison IW. Equine large intestinal volvulus. a review of 124 cases. Vet Surg 1988; 17(2): 77-81.
5. Suthers JM, Pinchbeck GL, Proudman CJ, et al. Risk factors for large colon volvulus in the UK. Equine Vet J 2013; 45(5): 558-563.
6. Weese JS, Holcombe SJ, Embertson RM, et al. Changes in the faecal microbiota of mares precede the development of post partum colic. Equine Vet J 2015; 47(6): 641-649.
7. Ross MW, Bayha R. Volvulus of the cecum and large colon caused by multiple mesenteric defects in a horse. J Am Vet Med Assoc 1992; 200(2): 203-204.
8. Alzidjali T, Dowling BA, Dart AJ. Volvulus of the ascending colon and caecum in a horse secondary to absence of dorsal mesenteric attachments. Aust Vet J 2005; 83(1-2): 60-61.
9. Pirie RS. Equine grass sickness in a donkey. Equine Vet Educ 2013; 25(12): 633-635.
10. Proudman CJ. A two year, prospective survey of equine colic in general practice. Equine Vet J 1992; 24(2): 90-93.
11. Robertson IS, Kent JE, Molony V. Effect of different methods of castration on behaviour and plasma cortisol in calves of three ages. Res Vet Sci 1994; 56(1): 8-17.
12. Webster HB, Morin D, Jarrell V, et al. Effects of local anesthesia and flunixin meglumine on the acute cortisol response, behavior, and performance of young dairy calves undergoing surgical castration. J Dairy Sci 2013; 96(10): 6285-6300.
13. Laurence M, Barnes A, Collins T, et al. Assessing and mitigating post-operative castration pain in Bos indicus cattle. Anim Prod Sci 2016; 58(5): 909-919.
14. Stafford KJ, Mellor DJ. The welfare significance of the castration of cattle: a review. N Z Vet J 2005; 53(5): 271-278.
15. Ayala I, Martos NF, Silvan G, et al. Cortisol, adrenocorticotropic hormone, serotonin, adrenaline and noradrenaline serum concentrations in relation to disease and stress in the horse. Res Vet Sci 2012; 93(1): 103-107.