Full Length Article

SURGICAL MANAGEMENT OF INTESTINAL DISORDERS THROUGH LEFT FLANK LAPAROTOMY IN BOVINE – A REVIEW OF SIX CASES

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ABSTRACT

Six cattle presented with history and clinical signs pertaining to intestinal disorders requiring surgical intervention were subjected to left flank laparotomy. The animals were clinically examined and stabilized with fluid therapy before performing exploratory laparotomy. Left flank laparotomy was performed under Farquharson's paravertebral nerve block in standing position. The efficacy of surgery through left flank to intestinal affections was evaluated by ease of approach, accessibility and visceral pain. It was found that caudal left flank approach allowed more ease of exteriorization of intussuscepted masses that were in jejunum, jejuno-jejunum, ileum and ileo-caecal parts of the intestine and also allowed complete exploration of the abdominal cavity. Left flank laparotomy approach with or without rumenotomy resulted in more area of exploration, prevented the proximal distended intestines to spill out and specific exteriorisation of the affected segment, by which mesenteric pain was alleviated that otherwise leads to recumbency and kicking at abdomen by the animals which could result in multiple rupture of intestines.

Keywords: Intestinal disorders, Left Flank Laparotomy, Farquharson's Paravertebral Nerve Block

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INTRODUCTION

Surgical diseases of digestive tract are numerous and constitute a major clinical problem in ruminants. Intestinal disorders in adult cattle often result from a wide range of etiologies including dietary, inflammatory and/or mechanical (Fubini and Ducharme, 2004) causes. Clinical examination by auscultation,

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palpation and percussion alone cannot form the sole basis for diagnosis of the intestinal disorders in cattle.

Hence various other diagnostic aids including rectal, radiographic and ultrasonographic examination were used in addition to the general clinical examination. Moreover, a single left flank laparotomy incision was adequate for exploration of the entire gastrointestinal tract in undiagnosed cases where a tentative presence of intestinal disorder could not be confirmed, and in cases where the inciting cause is due to forestomach disorders, left flank approach could be effectively utilized. In conditions where the rumen is full or distended with gas and ingesta, rumenotomy needs to be performed following which the intestinal tract c**a**n be examined. However, due to the delayed presentation and prolonged anorexia (Singh *et al.*, **2**018), the rumen is not always found to be distended. Hence, this study was conducted to evaluate the efficacy of left flank laparotomy for intestinal disorders in bovine.

MATERIALS AND METHODS

Six cattle presented with the history of intestinal disorders like anorexia, distended abdomen, signs of colic and cessation of defaecation were clinically examined and the observations of physiological parameters including rectal temperature (°C), heart rate (beats per minute) and respiratory rate (breaths per minute) were carried out. Out of six cattle, three animals had intussusception, one animal each had intraluminal faecolith, ileus and caecal dilatation. The animals were stabilized pre-operatively and were subjected to left flank laparotomy for surgical correction of the intestinal disorder. Left flank was prepared aseptically and Farquharson's proximal paravertebral nerve block was induced with lignocaine 2% as continuous rate infusion at 2 mg/kg loading dose followed by 50 mcg/kg continuous rate infusion to alleviate mesenteric pain while exteriorisation of the affected portion of the intestine.

Through caudal left flank laparotomy, the affected portion of the intestinal loops was exteriorized and surgical intervention was performed based on the nature of condition. In animals with intussusception (Plate 1), faecolith and caecal dilatation- enterectomy and entero–anastomosis (Plate 2), enterotomy and typhlotomy were performed, respectively. The mesenteric defects and mesenteric arcadial vessels were closed using chromic catgut size 1 while the intestinal incisions were closed using Polyglactin 910 size 2-0 and laparotomy incision was closed as per standard surgical procedure.

The ease of approaching and accessibility of the affected portion of the intestine, along with a peri-operative pain evaluation with visible signs such as movement, rushing out of intestinal loops, falling down, kicking at abdomen during the surgical procedure and vocalization due to mesenteric pain were recorded. Post-operative care with fluids, antibiotics, analgesics and in necessary cases, motility enhancers were administered as required. Cutaneous wound care was given according to standard procedure.

RESULTS AND DISCUSSION

Anamnesis and clinical signs

The mean ± SE of time of onset of clinical signs and the time of presentation was 4.67±0.77 days. The findings of the present study were in accordance with the research findings observed by Hussain *et al***.** (2015). In appetence was recorded in two animals and four animals were anorectic. Water intake was absent in five animals while one animal had reduced water intake. The reduction in consumption of water could be attributed to colic, and visceral pain that originated from the site of intestinal disorder (Sagar *et al***.,** 2021). Cessation of defaecation was noticed in four animals due to complete intestinal obstruction.

Sign of colic like kicking at the abdomen was noticed in one animal, frequent lying down and getting up was present in three animals, and bruxism was noticed in one animal. Signs of colic were observed only during initial time of obstruction due to nociceptive mechanoceptors which subside after 12 hours (Sagar *et al***.,** 2021). Rumination was absent in five animals. Examination of rumen revealed normal consistency in one animal and impacted rumen in five animals. Rumen motility was present in one animal and was absent in five animals. Empty rectum was a common clinical finding in five animals with intestinal obstruction due to absence of peristalsis and concurred with Singh *et al***.** (2018).

Surgical Procedure

Farquharson's paravertebral nerve block technique using 2% Lignocaine was found ideal and effective to desensitize the flank region. No pain and movement were noticed from skin incision to peritoneum in all the animals. Since deeper musculature and viscera could not be effectively desensitized through paravertebral nerve block alone (Tranquilli *et al***.**, 2007), a continuous rate infusion of lignocaine was used in the present study at 2 mg/kg loading dose and then at 50 mcg/Kg/minute as continuous rate infusion for alleviation of mesenteric pain while exteriorisation of affected part of the intestine through laparotomy incision. The dose rate of lignocaine used in the present study was not adequate to alleviate mesenteric pain in two animals. Jayakrishnan *et al***.** (2023) observed better pain alleviation with a continuous rate infusion of lignocaine at dose of 3 mg/kg body weight.

Standing left flank laparotomy was found to be convenient for abdominal exploration and exteriorization of intestinal disorder in all six animals and was in concurrence with that observed by Vani *et al***.** (2018). On exploration, it was confirmed that three animals had intestinal intussusception and one animal each had partial intraluminal obstruction by faecolith, ileus and caecal dilatation respectively. High incidence of intestinal disorder in the presented cattle was intussusception which could be due to sudden change in diet, previous history of hypermotility, sudden fall, *etc.,* (Yadav *et al.,* 2009). Polyglactin 910, size 2-0 was an ideal suture material for intestinal surgeries, namely- inversion sutures for typhlotomy and

Table 1. Summary of surgical parameters in selected animals with intestinal disorders

	Ease of approach of affected portion of intestine		Difficulties encountered during surgical procedure									
			Accessibility of affected part of intestine		Peri – operative pain							
					Movement		Intestinal loops rushing out		Animal falling down		Kicking at abdomen during surgery	
	Approachable	Not approachable	Accessible	Not accessible	Present	Absent	Present	Absent	Present	Absent	Present	Absent
No. of animals	6	-	6	-	-	6	-	6	1	5	2	4
Percentage	100.00	-	100.00	-	-	100.00	-	100.00	16.67	83.33	33.33	66.67

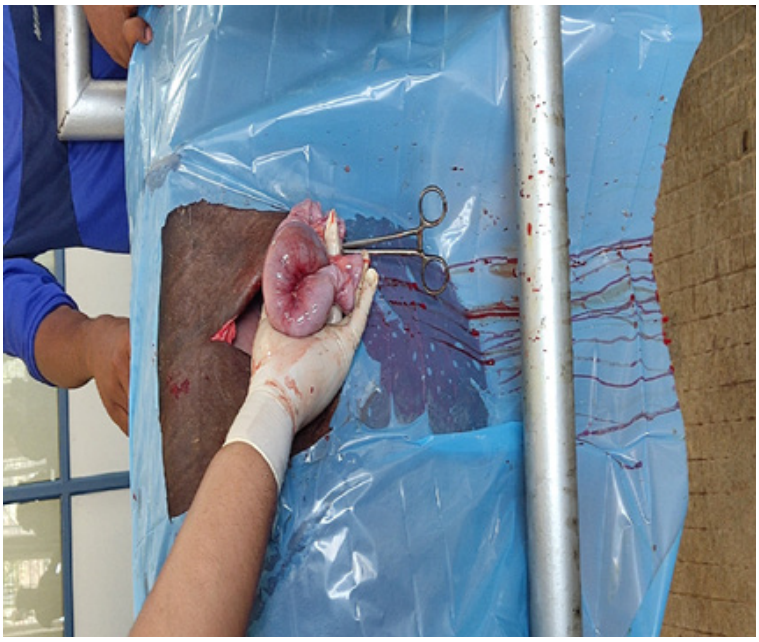

Plate 1. Intussuscepted mass exteriorized through left flank

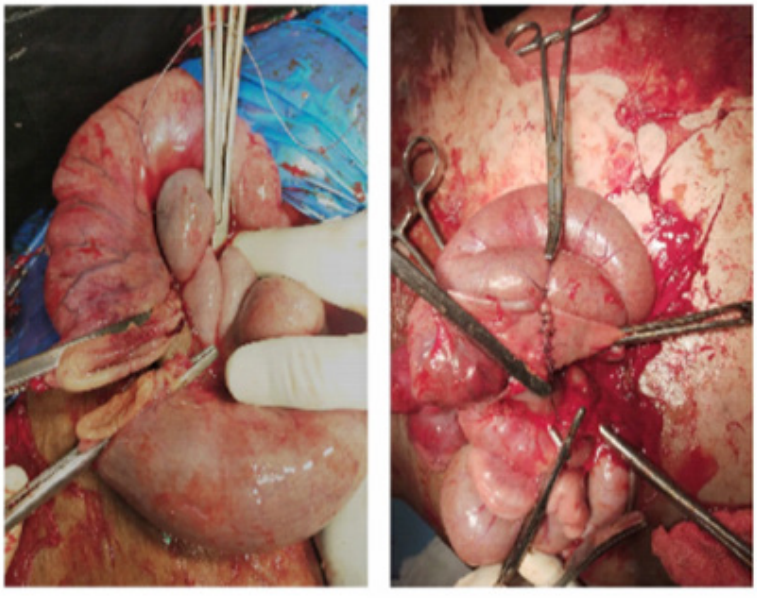

Plate 2. Enterectomy (a) and entero-anastomosis (b)

simple interrupted sutures for enterotomy and end-to-end entero-anastomosis were adequate. It also provided secure and leak free closure in the present study (Singh *et al.,* 2018).

Closure of mesenteric arcadial vessels was done using chromic catgut size- 1 and it provided extra knot security with its capillary action. The peritoneum and transverse abdominis muscle layers, followed by internal and external oblique muscles were closed using chromic catgut size-2 in two layers by Ford interlocking and horizontal mattress suture pattern respectively. The skin incision was opposed by apposition sutures in cross mattress suture pattern, using Polyamide size-1(Sagar *et al***.**, 2021).

Surgical parameters including ease of approach and accessibility of affected portion of intestine, peri-operative pain assessment and difficulties encountered during surgical procedures via left flank laparotomy were observed during the surgery (Table 1) and found that in all animals affected portion of intestine was easily approachable and accessible. In one animal, the site of intestinal disorder was approachable after rumenotomy and evacuation of ruminal contents. Signs of pain were elicited were represented in table 1. As the animals needed relatively less manipulation of the intestine through left flank approach, no animal moved during the surgical procedure. Intestinal loops did not rush out of the laparotomy incision in all six animals. One animal fell down during the surgical procedure. Kicking at abdomen during surgical procedure was noticed in two animals and vocalization due to mesenteric pain was absent in all animals. Peritonitis, dehydration and debilitation prior to surgery, excessive surgical manipulation of the intestine leads to tension on mesentery and causes pain that results in the animal to move or even become recumbent as reported by Braun *et al*. (2022)

CONCLUSION

Left flank laparotomy was ideal for intestinal exploration, exteriorisation of affected portion of intestine and allowed more surgical workspace for performing enterectomy and entero-anastomosis with less pronounced mesenteric pain when compared to right flank laparotomy in standing condition.

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