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Acute intestinal volvulus in a dog

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Abstract

A 2 years old male Grey Hound dog was presented with sudden onset of depression, loss of ambulation, abdominal pain and distension since last night. On physical examination animal was found to be severely depressed with distended abdomen. Lateral abdominal radiograph demonstrated generalised gaseous distension of the small intestines. Based on history and clinical examination findings tentative diagnosis of intestinal volvulus was made and the dog was subjected to exploratory laparotomy. Abdominal incision revealed black coloured, distended intestines with fetid odour. The intestines were gently retracted and anti-clockwise $\geq 180^\circ$ mesenteric torsion was observed. Enterectomy of the affected intestine was done without its prior derotation and duodeno-colic anastomosis was done. Animal collapsed 3 hours after surgery. It was concluded that intestinal volvulus is an acute and often fatal condition in dogs in which the success of treatment depends upon the time lapse between the occurrence and presentation, severity of mesenteric torsion and early surgical intervention.

Keywords: Intestinal volvulus, mesenteric torsion, acute, dog, enterectomy

Introduction

Intestinal volvulus is a rare disorder in dogs in which there is rotation of a segment of the intestine on its mesenteric axis (Gillespie *et al.*, 2011) ^[1], causing occlusion of the cranial mesenteric artery. Obstruction of this artery leads to ischaemia of the distal duodenum, jejunum, ileum, caecum, ascending colon and proximal descending colon (Evans and Christensen, 1979) ^[2] resulting in bowel necrosis, toxin release and shock. Moreover, the lumen of the involved intestinal segment is occluded, becomes severely distended with bloody fluid and gas, leading to segmental intestinal infarction and breakdown of the mucosal barrier (Begeman *et al.*, 2013) ^[3]. This barrier break results in diffusion of intestinal bacteria and toxins into the peritoneal cavity and systemic circulation (Junius *et al.*, 2004; Gillespie *et al.*, 2011) ^[4, 1]. The clinical signs of mesenteric volvulus include abdominal pain, abdominal distension, haematochezia, pale mucous membranes, tachycardia, weak pulses and ultimately death Slatter, 1993 ^[5]. Without any specified cause, mesenteric volvulus has been reported to be associated with treatment for worm infestation, parvovirus infection, intussusception, vigorous exercise, closed abdominal trauma, concurrent gastric dilatation-volvulus, gastrointestinal foreign bodies, lymphocytic-plasmacytic enteritis, ileocolic carcinoma and exocrine pancreatic insufficiency (Junius *et al.*, 2004) ^[4]. Mesenteric volvulus is associated with an extremely high mortality rate (Cairo *et al.*, 1999) ^[6].

Case history

A 2 years old male Grey Hound dog was presented to the Department of Veterinary Surgery and Radiology, Khalsa College of Veterinary and Animal Sciences, Amritsar with sudden onset of depression, loss of ambulation, abdominal pain and distension since last night. Animal was having habit of eating bird droppings.

Clinical examination and Diagnosis

On physical examination animal was found to be severely depressed, having heart rate 160/min, rectal temperature 95.4° F, hyperaemic conjunctival mucous membrane and tachypnoea. The abdomen was distended and abdominal palpation revealed severely distended intestinal loops throughout the abdomen. Lateral abdominal radiograph demonstrated generalised gaseous distension of the small intestines caudal to duodenum (Fig.1). Based on history and clinical examination findings tentative diagnosis of intestinal volvulus was made. The dog was rehydrated by intravenous fluid therapy and was subjected to exploratory laparotomy as the owner accepted the risks involved with the surgical intervention.

Treatment and Discussion

Whole of the ventral abdomen was prepared for aseptic surgery followed by induction of general anesthesia. Ventral midline abdominal incision was made which revealed black coloured, distended intestines with fetid odour (Fig. 2) and brownish black coloured fluid was found in the abdominal cavity (Fig. 3). The intestines were gently retracted and anti-clockwise $\geq 180^\circ$ mesenteric torsion was observed (Fig.4) which led to the necrosis of entire jejunum. Enterectomy of the affected intestine was done (Fig. 5) without its prior derotation. Duodeno-colic anastomosis was done in two layers by simple continuous oversewn by cushing suture pattern using no. 3-0 polygalactin 910 (Fig. 6). Animal collapsed 3 hours after surgery.

Mesenteric volvulus is a rare, acute, and often fatal condition in dogs. It occurs when there is a twisting of bowel on its mesenteric axis, which is different from intestinal torsion where the bowel twists on itself (Junius *et al.*, 2004) [4]. Clinical signs encountered in intestinal volvulus are weakness, recumbency, abdominal pain and distension and shock in acute cases Spevakow *et al.*, 2010 [7] which were in accordance with the present case. Spevakow *et al.*, 2010 [7] further reported that may be a history of vomiting, diarrhea, hematemesis, or hematochezia. Radiography of the abdomen demonstrated generalised gaseous distension of the small intestines which were in agreement with the findings of Cairo *et al.*, 1999 [6], Ross, 2015 [8] and Junius *et al.*, 2004 [4]. This was an important factor in the decision to proceed for exploratory laparotomy Ross, 2015 [8].

The present case was having anti clockwise $\geq 180^\circ$ mesenteric torsion when the dog was viewed from above with the dog in dorsal recumbency. The decision to perform enterectomy without prior derotation was due to the threat of enterotoxins release into the general circulation, as well as the risk of intestinal perforation during manipulation as previously opined by Ross, 2015 [8]. Cairo *et al.*, 1999 [6] performed euthanasia in 3 cases of intestinal volvulus where necrosis was present in almost whole of the small intestine, since a complete surgical resection of the small bowel carries a poor prognosis. In the present case anastomosis was performed because the sentiments of owner were kept in view.

Shortly after intestinal volvulus occurs, peritoneal fluid begins to accumulate which is clear, odourless transudate with low protein concentration initially Ellison, 1990 [10]. Complete occlusion leads to oedema of the intestinal wall, haemorrhage and epithelial sloughing in one to three hours. Strangulated loops become turgid and permeable and blood accumulates within the bowel lumen. In eight to 12 hours, the intestine reaches maximum distension and its colour changes to greenish black (Ellison, 1990 and Cosenza, 1996) [10, 9]. If torsion persists, hypoxia of the intestinal wall results in destruction of the mucosal barrier, the bacterial population grows rapidly and their toxins diffuse through the wall into the peritoneal cavity. Bacteria can be readily absorbed from the peritoneum and enter the systemic circulation. Moreover, the abdominal fluid becomes black and fetid, as a consequence of the filtration of intestinal contents through the devitalised wall Ellison, 1990 [10]. If strangulation of the intestinal tract is extensive, 60 to 65 per cent of total circulating blood volume can be lost Cosenza, 1996 [9].

In intestinal volvulus even with surgical intervention, death from hypovolaemia, sepsis and toxic shock is the usual consequence (Gillespie *et al.*, 2011) [1]. Halfacree *et al.*, 2006 [11] further added that intestinal volvulus has a highly guarded

prognosis. Death in present case was most likely attributable to hypovolemia, septicemia and delay in surgical intervention because of delayed presentation. The number of cases surviving the mesenteric volvulus was high when compared to other reports in the literature which was probably the result of the early surgical intervention (Junius *et al.*, 2004) [4]. In other reports, surgery was often delayed for several hours, which may also account for the higher mortality rate.

Conclusion

It is concluded that intestinal volvulus is an acute and often fatal condition in dogs in which the success of treatment depends upon the time lapse between the occurrence and presentation, severity of mesenteric torsion and early surgical intervention. If surgical correction is planned it should be immediate to increase the chances of patient survival.'

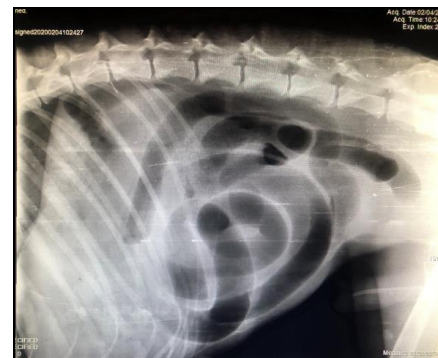


Fig 1: Gas distended small intestine.



Fig 2: Distended, black coloured, twisted intestinal loops.

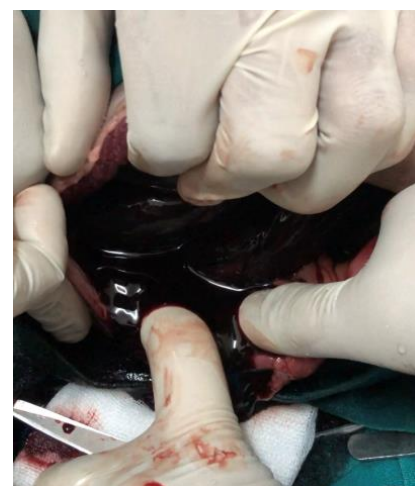


Fig 3: Black coloured fluid in the abdominal cavity

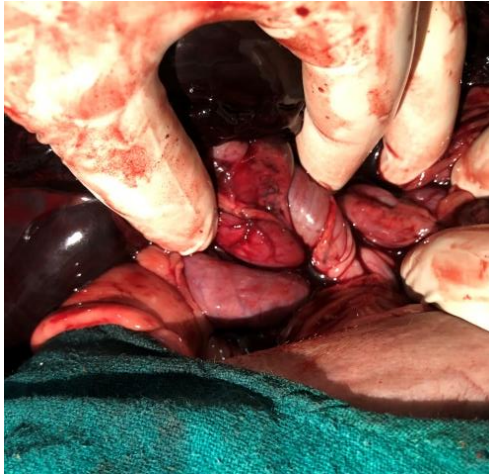


Fig 4: Anti clockwise mesenteric torsion



Fig 5: Resected intestine



Fig 6: Duodeno-colic anastomosis.

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