SURGICAL MANAGEMENT OF INTUSSUSCEPTION IN A GERMAN SHEPARD MALE DOG

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Abstract

A 1-year-old male German Shepard dog, weighing 29 kg presented with a history of weight loss, chronic anorexia, bloody diarrhoea and vomiting which was unresponsive to medicinal treatment at District Veterinary hospital. Blood biochemistry showed high values of glucose and low values total protein and albumin. Radiograph of the abdomen revealed distended intestines with gas and fluid suggestive of obstruction. Exploratory laparotomy diagnosed the condition as an intussusception cranial to the caecum with fibrosis and lack of blood supply to the affected portion of the intestine. The diseased portion of the duodenum was resected and end-end anastomosis was performed. The dog recovered uneventfully and follow up for six months show no recurrence.

Key words: *Dog; laparotomy; intussusception; anastomosis.*

Intussusception is a condition in which a part of the bowel is prolapsed or invaginates into the lumen of an immediately adjoining part (Valiei & Beheshti, 2011). Commonly the Intussusceptum, a proximal segment of bowel which slides into a distal segment and this pattern follows the normal direction of peristalsis. The incidence of intussusception is more in German shepherd dogs and occurs when excessive peristaltic motility forces one segment of the intestine into another slightly larger part of the intestine (Rahman et al., 2020). It can occurs at any location in the gastrointestinal tract from the stomach to the large intestine; however, previous studies have indicated that the majority of intussusceptions in small animals are enterocolic (Atray et al., 2012). The predisposing factors for the intussusception can be multiple, like intestinal parasitism, bacterial and viral enteritis, intestinal foreign bodies, prior abdominal surgery, intestinal neoplasia, and extra/intra-luminal mass lesions that cause intestinal motility disturbances (Rahman et al., 2020).

Diagnosis of intussusception can be done by palpation, radiography, ultrasonography, and computed tomography (Patsikas et al., 2019). However, Ultrasonography is a non-invasive, cost effective, non-hazardous diagnostic imaging modality which can confirm

intussusception. Target Sign or Bull's eye appearance in ultrasonogram is characteristics of intussusception (Rahman et.al, 2020). Manual reduction of intussusception can be performed otherwise resection of the affected segment of intestine is indicated followed by anastomosis if irreducible or the involved segments are unhealthy.

History and Clinical Findings: A 1 year old German Shepard male dog weighing 29 kg was presented to the national veterinary Hospital with a history of lethargy, weight loss, anorexia, chronic bloody diarrhoea, severe dehydration and vomiting. Clinical examination revealed hypothermia (99° F), Tachycardia and bounding pulse.

Diagnosis: Rapid antigen test was done to rule out canine distemper and faecal examination revealed *Toxocara canis* ova. Radiographic examination presented radiolucent, severely distended colon cranial to the caecum. Blood biochemistry showed increased level of glucose, reduced total protein and albumin pack system (Table 1).

The right lateral radiographs revealed radiolucent, severely distended colon pushing the liver ventrally and the stomach cranially. The stomach couldn't be visualized as it was superimposed by the distended fluid and gas filled colon (Fig. 1).

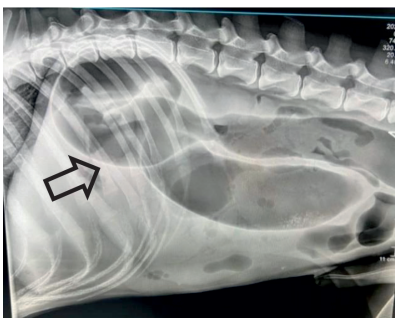

Fig. 1. Right lateral radiograph showing gas and fluid distended colon

Table 1. Blood Biochemistry Results

Test	Result	Normal range
Magnesium	4.39 mg/dl	1.80-2.60 mg/dl
Uric Acid	4.6 mg/dl	3.6-7.0 mg/dl
SGPT	30.2 U/L	21.0-102.0 U/L
SGOT	13.1 U/L	16.0-91.0 U/L
Cholesterol	104 mg/dl	135-270 mg/dl
Glucose	158.6 mg/dl	65.0-118.0 mg/dl
Total Bilirubin	0.15 mg/dl	0.00-0.20 mg/dl
Urea	9.9 mg/dl	21.4-59.9mg/dl
Total Protein	4.22 g/dl	5.40-8.00 g/dl
Triglyceride	54.9 mg/dl	40.0-160.0 mg/dl
Albumin	1.58 g/dl	2.30-4.10 g/dl
Creatinine	0.28 mg/dl	0.50-1.50 mg/dl
Alkaline Phosphatase	93 U/L	0-140 U/L

The clinical, laboratory finding and radiographic findings suggested intestinal obstruction either mechanical or functional.

Anaesthesia and Treatment: The animal was stabilized with intravenous fluids, prophylactic antibiotic, gentamicin @ 10 mg/kg body weight for 7 days, antiemetic, ondansetron @ 0.2 mg/kg and anti-diarrhoeal, Metronidazole @ 20mg/kg body weight.

The dog was premedicated with xylazine @ 1mg/kg body weight (b.wt) and atropine sulphate @ 0.04 mg/kg b.wt, intramuscularly. Following intravenous cannulation, general anaesthesia was induced with combination of ketamine + diazepam @ 5 mg/kg and 0.5 mg/kg b.wt. Pre-emptive analgesia was achieved with meloxicam @ 0.4 mg/kg b.wt through intravenous route. Anaesthesia was further maintained with the same drug combination through bolus administration.

The dog was positioned in dorsal recumbency for ventral midline celiotomy and surgical site was prepared was prepared aseptically with povidone-iodine (0.5% w/v) surgical scrub. The peritoneal cavity was opened after incising the skin, subcutaneous tissue, at linea alba and the peritoneum. On exploration, reducible intussusception was found cranial to the caeco-colic junction involving the caecum and colon (Fig 2).

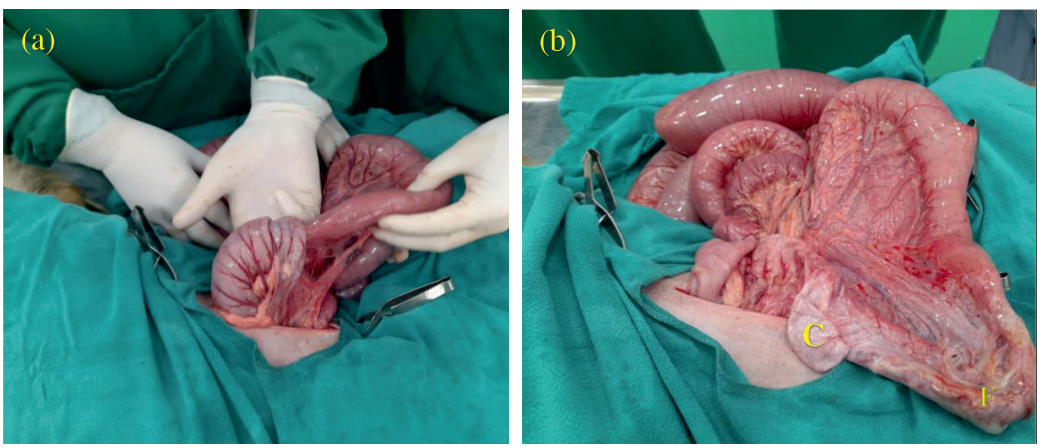

Fig 2. (a) Caeco-colic intussusception (b) Post reduction of intussusception showing caecum and fibrosed portion of intestine ,C- Caecum, F- Fibrosed portion of colon

Intestinal clamps were applied on proximal and distal ends of the colon before resection. The fibrosed loop was resected after ligating the mesenteric blood vessels. End to end anastomosis as performed using 5/0 polydioxanone suture in simple continuous pattern followed by Cushing (Fig 3b). The abdominal cavity was lavaged with normal saline. Laparotomy wound was closed in standard procedure.

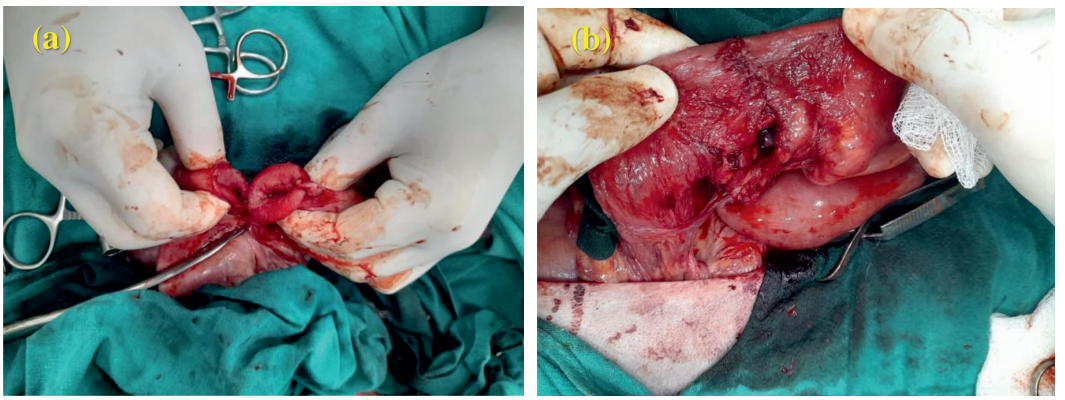

Fig. 3. (a) Proximal and distal of the colon after resection (b) End to end anastomosis

Post-operative follow up: Post operatively, the dog was treated with fluids (Dextrose normal saline and Ringer's lactate), antibiotics (cefotaxime @ 50mg/kg b.wt twice daily for 5 days), analgesic meloxicam (0.4 mg/kg b.wt once daily for three days) and injection omeprazole (1.5 mg/kg b.wt once daily for three days) intravenously. The owner was advised to give easily digestible liquid diet in small quantities and gradually shift to normal food. Post-operative follow up for 6 months showed an eventful recovery (Fig. 4)

Fig. 4. Six months follow up

Discussion

Intussusception needs to be differentiated from gastrointestinal foreign body, intraluminal lesions, Gastric dilatation and volvulus (GDV), Enteric form of canine distemper (CD) and bacterial gastro-enteritis. Canine distemper was ruled out using a CD rapid antigen test and radiographically, could diagnosed the case as intestinal obstruction either mechanical or functional. Exploratory laparotomy confirmed the condition as caeco-colic intussusception. Anorexia, vomiting and bloody diarrhoea were the predominant clinical signs of intussusception reported in this dog and in other studies (Rallis et al., 2000). Atray et al., 2012 also reported similar uniform gas-filled intestinal loops occupying the entire abdomen in radiograph. Exploratory laparotomy confirmed the condition as caeco-colic intussusception with no adhesion between the intussusceptum and intussuscipiens resulting in successful manual reduction of intussusception but anastomosis has to be performed after resection of the unhealthy, fibrosed portion of intestine. Further severe adhesion was found between the intussusceptum and intussuscipiens whereas, no such adhesions were appreciated in this case. Most of the intussusception in dogs are reported to occur as a sequela to a number of conditions such as linear foreign bodies, non-specific

gastroenteritis, viral-induced enteritis (parvovirus, distemper), leptospirosis, intraluminal masses and prior abdominal surgery (Rallis et al., 2000), whereas the aetiology in this study was suspected to be intestinal nematode as the faecal sample was positive to *Toxocara canis* eggs.

Intussusception is the invagination or telescoping of one part of the bowel into an adjacent part which causes bowel obstruction, and compromises blood flow to the affected portion and can be successfully treated by exploratory laparotomy with intestinal resection and anastomosis (Munif & Alam, 2021) which agreed to this study. Recurrence rate ranging from 3-25% that are surgically treated for an intussusception without entero-plication have been reported (Smeak, 2020). However, there was no recurrence although entero-plication was not done.

This study reports the successful surgical management of ileocaeco-colic intussusception with manual reduction, resection of fibrosed ileum and end to end anastomosis.

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