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Case Report

Surgical management of ileocolic intussusception in two dogs

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Abstract

Background: 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. It can occur anywhere along the gastrointestinal tract; however, usually occurs in the middle portion of the small intestine or where the small intestine joins the large intestine. Although ileocolic intussusception is common in dogs, its proper surgical management is urgent to save the life of the animal.

Methods: Two mixed-breed dogs of 5-7 months old and 12-14 kg BW were presented with hemorrhagic and protruded mass of bowel through anus. Clinical examination revealed intussusception with severe dehydration in the dogs, and thereafter ventral midline laparotomy was performed in both dogs which exposed and confirmed the cases as ileocolic intussusceptions.

Results: The laparotomy was successful in both cases which involved certain level of intestinal resection and anastomosis. Postoperatively, the dogs were provided with adequate feed and necessary drugs; and successfully improved after 14 days of operation.

Conclusion: Ileocolic intussusception in dogs can be successfully treated by urgent laparotomy with intestinal resection and anastomosis, which resumes the adequate potency and vitality of the bowel segments.

Keywords: Bowel obstruction, laparotomy, resection, anastomosis, young dogs

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Introduction

Intussusception is known as a common cause of mechanical obstruction of intestine in dogs (Singh *et al*., 2015) that causes invagination of a portion of intestine called intussusceptum into the lumen of an adjacent intestinal segment (Garcia-Sancho *et al*., 2012) called intussuscipiens in the direction of normal peristalsis or occasionally in a retrograde direction (Rallis *et al*., 2000; Patsikas *et al*., 2003), and can restrict the blood flow to the trapped portion of tissue. If prolonged, the trapped tissue can become ischemic, devitalized and necrosed. Many investigations revealed that puppies and kittens have a much higher incidence of intussusception than the adults (Applewhite *et al*., 2002; Atray *et al*., 2012; Ghashghaii *et al*., 2017). It is believed that most intussusceptions in young animals are idiopathic, but several predisposing factors such as intestinal parasitism, linear foreign bodies (bones and plastic toys), parvo-viral enteritis causing intestinal hypo or hypermotility, non-specific gastroenteritis, intra-luminal masses, prior abdominal surgery, hypertrophied lymphoid nodules and granulomatosis secondary to inflammatory conditions may result in intussusception (Guilford and Strombeck, 1996; Rallis *et al*., 2000; Rewerts and Cohn, 2000; Patsikas *et al*., 2003, 2008; Schwandt, 2008; Allenspach, 2010; Gelberg, 2012). Oliveira-Barros *et al*. (2009) reported that inflammatory bowel disease might be a cause of intussusception in dogs. Diagnosis is often based on clinical presentation, radiographic and ultrasonographic examinations (Singh *et al*., 2015). Although clinical signs may vary with the amount of obstruction; in most cases the affected bowel may be palpable as a defined, firm and sausage (cylindrical) shaped intra-abdominal mass that must be differentiated from feces and foreign bodies (Butler, 1972; Larsen LH and Bellenger, 1974; Lewis DD and Ellison, 1987; Patsikas *et al*., 2003; Han *et al*., 2008). In dogs, intussusception may be presented with the protrusion of segments of small intestine along with large intestine through the anus like a tubular mass (Rosin, 1985). The survivability of affected animal depends on immediate diagnosis and surgical management (Valiei and Beheshti, 2011) based on gross evaluation of the viability of intestinal segments. Therefore, this report was taken into account to focus on the surgical resection and anastomosis for the management of ileocolic intussusception in dogs.

Case description

Two female mixed-breed dogs of 12-14 kg body weight (BW) and aged 5-7 months were referred to the Veterinary Teaching Hospital of Bangladesh Agricultural University. Each dog was presented with a dark, hemorrhagic and protruded tubular mass through the anus along with blood-stained perianal hairs (Fig. 1A). Clinically severe dehydration, rapid cardio-respiratory rate, inappetence, hematochezia and weakness were noted with the history of intermittent vomiting and depression. In each case, the protruded bowel segment was gently palpated and felt as a firm, thickened, multi-layered cylindrical mass; and thereafter a smooth and sterile clinical thermometer was inserted between the protruded portion and anus to differentiate the case from rectal prolapse. Every-time as it easily passed through the gap, the cases were clinically diagnosed as bowel obstructions and suggestive of intestinal intussusceptions. No further radiography or ultrasonography was done, and exploratory laparotomy was decided to perform for the dogs.

Preparation for surgery

Before surgery, fluid therapy was given by intravenous administration of Ringer's Lactate (RL) solution to check dehydration. Then the dogs were premedicated intramuscularly with Atropine Sulphate (Atrovet®, Techno Drugs Ltd., Narsingdi, Bangladesh) @ 0.04 mg/kg BW followed by Xylazine Hydrochloride (Xylaxin®, Indian Immunologicals Ltd., Telangana, Hyderabad, India) @ 1.1 mg/kg BW. After premedication, pre-surgical aseptic preparations were carried out properly, and anesthesia was induced intramuscularly with Ketamine Hydrochloride (Ketalar™, Popular Pharmaceuticals Ltd., Dhaka, Bangladesh) @ 5.5 mg/kg BW and maintained with half dose of the induction agent (Ketamine Hydrochloride).

Laparatomic correction

Laparotomy was performed in each case through ventral midline approach in dorsal recumbency. Intravenous supply of 5% Dextrose in Normal Saline (0.9% NaCl) was maintained throughout the operations. For each animal, the abdominal cavity was explored, and the affected portion was exteriorized (Fig. 1B) that revealed the normograde ileocolic intussusceptions where a portion (intussusceptum) of ileum was telescoped into the adjacent portion (intussuscipiens) of colon (Fig. 1C). Then the segments involving the ileocolic intussusception were released manually from the ileocolic junction through gentle traction (Fig. 1D) on the neck of the intussusceptum while milking its apex out of the intussuscipiens. After correction, some portions of the segments were found devitalized and traumatized (Fig. 1E). Hence, intestinal resection (Fig. 1F) was done eventually to discard the devitalized portions (Fig. 1M) along with few healthy tissues of intestine. The luminal disparities in diameter between the larger and smaller ends (Fig. 1G) of the intestine were minimized by transecting the border of the smaller end at an angle (Fig. 1H), and further end-to-end anastomosis (Fig. 1I) of the intestinal loops was performed using Polyglactin 910 of size 2-0 (Vicryl™, Ethicon, J & J Medical Devices Companies, United States) in a single layer of simple continuous suture pattern having triangulation to prevent purse string effect. In both cases, mesenteric defect was repaired (Fig. 1J) by simple interrupted sutures using Chromic Catgut of size 3-0 (Trugut™, Sutures India Pvt. Ltd., Bangalore, India), and a layer of omentum was used to cover the anastomotic part. Finally, the intestines were reduced back into the abdominal cavity, and the laparotomy incision (ventral midline) was closed in a routine manner (i.e., peritoneum, linea alba, subcutaneous tissue and skin) in each dog. Peritoneum with associated muscles and linea alba were closed using Vicryl™ (1-0) in a single layer of simple interrupted suture pattern (Fig. 1K). Subcuticular suturing was done using Vicryl™ (2-0), and the skin incision was closed with braided silk in a simple interrupted suture pattern (Fig. 1L).

Post-operative care

Post-operative care and management included appropriate courses of Ceftriaxone @ 35 mg/kg BW (Trizon Vet, ACME Laboratories Ltd., Dhaka, Bangladesh), Ketoprofen @ 3.3 mg/kg BW (Ketovet, Techno Drugs Ltd., Narsingdi, Bangladesh) and Pheniramine Maleate @ 1 mg/kg BW (Antihista-Vet®, Square Pharmaceuticals Ltd., Dhaka, Bangladesh) along with soft diet and oral Vitamin-C supplements for better healing and recovery of the dogs. After 14 days of surgery, the skin sutures were removed, and the dogs were found quite normal and comfortable.

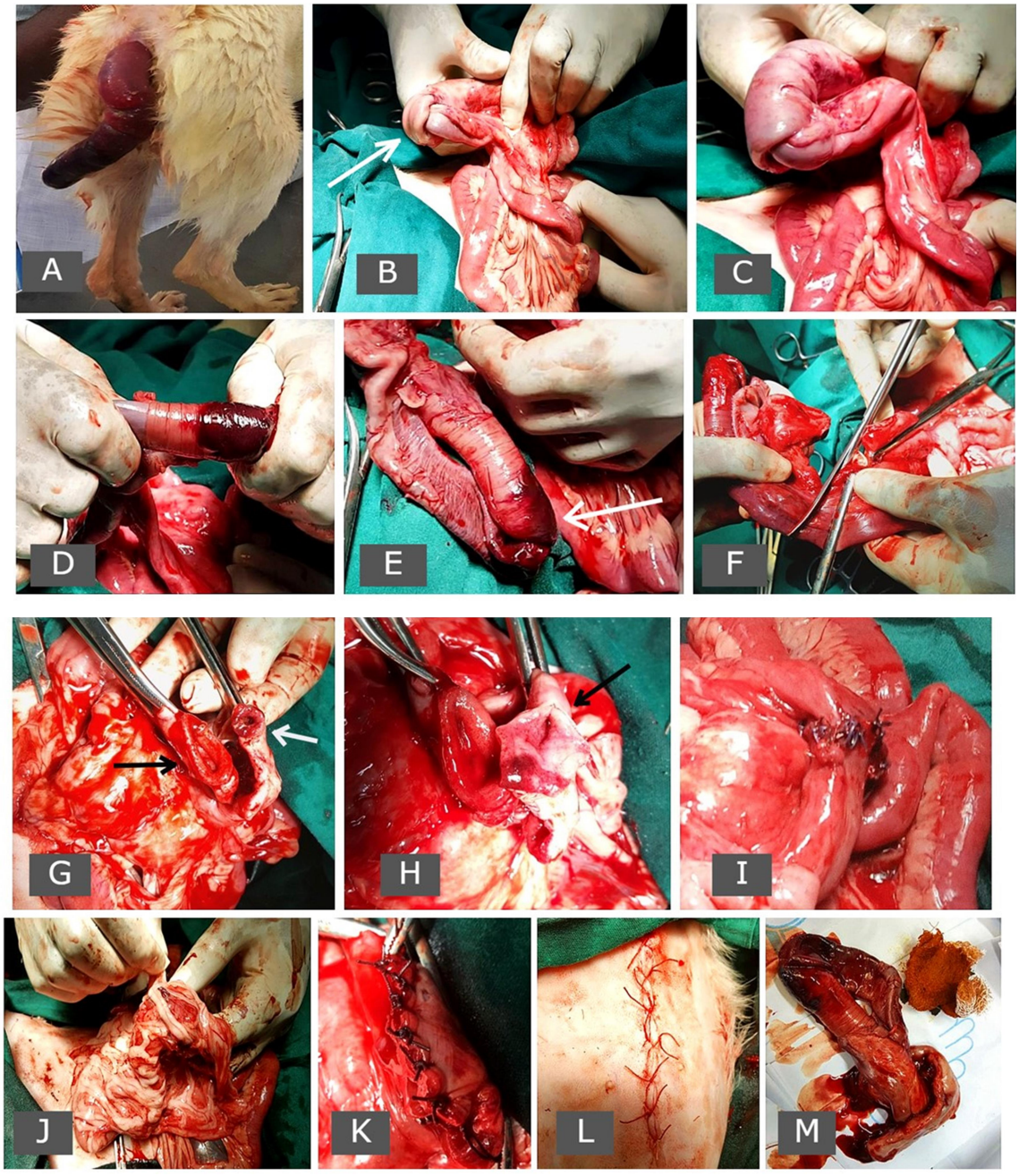

Figure 1: A. Dog with protruded tubular mass through the anus, B. Laparotomy exposing the affected portions (white arrow) of intestine, C. Telescoping section of intestine, D. Manual traction to separate intussusceptum from intussuscipiens, E. Traumatized and devitalized intestinal portion, F. Intestinal resection, G. Larger end (black arrow) and smaller end (white arrow) of intestine, H. Transection of smaller end at an angle (black arrow), I. End-to-end intestinal anastomosis, J. Repairing of mesenteric defects, K. Closure of abdominal muscles, L. Closure of skin, M. Discarded part of intestine

Discussion

In the clinical cases, young dogs were affected with intussusceptions as also reported by other authors (Levitt L and Bauer, 1992; Applewhite *et al*., 2002; Ghashghaii *et al*., 2017). It may involve in any portion of the alimentary tract (Hall and German, 2010; Valiei and Beheshti, 2011); however, majority of intussusceptions in small animals are enterocolic (Ghashghaii *et al*., 2017). The present cases revealed ileocolic intussusceptions in dogs which have also been reported by other researchers (Fossum *et al*., 2002; Allenspach, 2010). Gastroesophageal, gastroduodenal, pylorogastric, duodenojejunal, jejunojejunal, ileoileal and colocolic intussusceptions are common in young dogs (Levitt L and Bauer, 1992; Patsikas *et al*., 2003; Han *et al*., 2008). Canine intussusceptions involving the ascending colon (Han *et al*., 2008) and ileocolic orifice (Atray et. al., 2012) have been reported earlier, whereas involvement of ileocolic junction was found in the mentioned cases. Usually, intussusception follows the pattern of normal direction of peristalsis as also found in the present cases, although retrograde intussusceptions have been reported in some investigations (Han *et al*., 2008; Ghashghaii *et al*., 2017). Clinically intermittent vomiting, progressive loss of appetite, mucoid bloody diarrhea, depression are the common findings (Butler, 1972; Wilson and Burt, 1974; Weaver, 1977; Lewis DD and Ellison, 1987; Oakes *et al*., 1994; Ghashghaii *et al*., 2017) that were also observed in this case study. Abdominal pain is not a regular finding of intussusception (Joy and Patterson, 1978). Hayden and Sprouse (2011) investigated the differential diagnoses which included all other causes of intestinal obstruction e.g., foreign bodies, intestinal volvulus or torsion, intestinal laceration, adhesions, strictures, abscesses, granulomas, hematomas, tumors, and congenital malformations. Manual reduction was not a sole choice of management in these cases. The described cases were surgically treated through intestinal resection (enterectomy) followed by end-to-end anastomosis which are in agreements with other studies (Rallis *et al*., 2000; Ellison, 2014; Singh *et al*., 2015). Speedy healing and recovery were observed postoperatively in the dogs which might be due to the effective pre-operative, surgical and post-operative therapeutic managements.

Conclusions

Ileocolic intussusceptions are common in young dogs, need early diagnosis and appropriate surgical interventions based on the severity to prevent further complications and save the lives.

Competing Interest

The authors declare that they have no competing interests.

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