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Surgical management of ileocolic intussusception in a German shepherd pup: A case report

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Abstract

A three-month-old male German Shepherd puppy was presented with a medical history of a protruding mass through the anus, along with symptoms such as loss of appetite, vomiting, and watery diarrhea persisting for the past two days. To rule out possibility of rectal prolapse blunt end of thermometer was passed between rectal wall and prolapsed mass which progressed upto the cranial of pubis suggesting prolapsed mass of intestine. The ultrasound examination showed the presence of multiple concentric rings with varying echogenicity, resembling a bull's eye pattern, indicating intestinal intussusception. Subsequently, a ventral midline celiotomy was conducted under general anesthesia, revealing intussusception in the ileocolic region. Due to poor viability of the telescoped intestine in the ileocolic region, resection and oblique end-to-end anastomosis were performed. The animal experienced an uneventful recovery.

Keywords: Intussusception, pup, ileocolic, ultrasonography

Introduction

Intussusception is a common cause of mechanical obstruction in the intestines of dogs (Singh *et al.*, 2015) [12]. Intussusception occurs when a section of the gastrointestinal tract (intussusceptum) invaginates into the lumen of an adjacent segment (intussuscepiens) (Lewis and Ellison, 1987) [9]. Ileocolic and jejunojejunal intussusceptions are the most frequent in small animals, yet the condition can occur anywhere along the gastro-intestinal tract, from the stomach to the large intestine (Han *et al.*, 2008) [6]. Puppies and kittens are more commonly affected by intussusception, with a higher incidence observed in Siamese cats and German Shepherd dogs (Han *et al.*, 2008; Fossum, 2015) [4]. Intussusception can arise because of factors such as enteritis, intestinal irritation due to parasites, viral or bacterial infections, dietary modifications, foreign bodies, intraluminal and extraluminal intestinal masses, and systemic illnesses. These conditions may lead to increased intestinal motility, causing one loop of the intestine to invaginate into another, resulting in intussusceptions (Fossum, 2015; Rodriguez-Alarcon *et al.*, 2013; Valiei and Beheshti, 2011) [4, 11, 13]. In this article, the surgical treatment of a German shepherd pup with intussusception of the ileum and colon is described.

Case history and observations

A three months old male German shepherd pup weighing 10 kg was brought to the surgical department of the Veterinary Clinical Complex in Hisar with a history of mass protrusion via the anus, anorexia, and watery diarrhoea that had been present from two days and hemorrhagic gastroenteritis 20-daybefore. Anorexia, vomiting, and diarrhoea were the main clinical signs as reported as by Levitt and Bauer (1992) [8]. The prognosis for these cases can be improved with prompt diagnosis using typical clinical indicators and ultrasonographic findings, good treatment of haemato-biochemical parameters, and urgent surgical intervention (Atray *et al.*, 2012) [2]. Clinical examination revealed normal temperature, respiration rate and heart rate and animal was dehydrated, dull, inactive, and had sunken eyeballs, pale mucous membrane and tent-like skin. Haemato-biochemical analysis (Table: 1) showed anaemia, absolute neutrophilia, hypoproteinemia due to hypoalbuminemia.

Hemoglobin and hematocrit values had decreased below the normal range, potentially indicating the presence of fresh blood in the feces. (Jain, 1986) ^[7]. Neutrophilic leukocytosis has also been reported by Wilson and Burt, (1974) ^[15] in dogs with intussusception. The presence of devitalized intestinal tissues could be a contributing factor to the observed leucocytosis in the reported case (Dixon, 2004) ^[3]. The potential of rectal prolapse was ruled out by inserting the blunt end of a thermometer between the rectal wall and the protruding mass, which advanced up to the cranial of the pubis and suggested a prolapsed mass of intestine. Abdominal ultrasonography revealed concentric rings with hyperechoic and hypoechoic characteristics, forming a Bull's eye pattern on transverse section, thereby confirming the presence of intestinal intussusceptions (Fig.1). According to Valiei and Beheshti (2011) ^[13], ultrasonography is thought to be the most reliable approach for detecting intussusceptions. During the ultrasound examination, a sequence of concentric rings, exhibiting both hyperechoic and hypoechoic features, was observed, accompanied by notably weak intestinal motility in the transverse plane (Lewis and Ellison, 1987; Oakes *et al.*, 1994) ^[9, 10]. It was ultimately determined to be a case of intestinal intussusception based on ultrasonography.

Table 1: Haematobiochemical parameter before surgery

Parameter	Reference range	Case
Hemoglobin (g/dL)	12 to 18	9.8
PCV (%)	37 to 55	28
TLC (10 ³ /cc)	6 to 17	66.54
Neutrophil count (%)	60 to 70	90
Lymphocyte count (%)	12 to 30	6
Total protein (g/dL)	5.5 to 7.5	4.30
Serum albumin (g/dL)	2.5-3.5	1.86



Fig 1: Intussusception is hyperechoic Ultrasonogram showing multilayered appearance produced by intussusception is shown here in transverse section. Lumen

Treatment and Discussion

As per routine procedure, the puppy was prepared for aseptic surgery. The animal received premedication with atropine sulfate at a dosage of 0.04 mg/kg body weight, followed by intramuscular administration of xylazine hydrochloride at a dosage of 1 mg/kg body weight. General anesthesia was induced through intravenous administration of ketamine

hydrochloride at a dosage of 5 mg/kg body weight and diazepam at a dosage of 0.5 mg/kg body weight. Maintenance of anesthesia involved intermittent administration of 1/3 to 1/2 of the induction dose of the mixture as needed. Additionally, intravenous administration of cefotaxime at a dosage of 20 mg/kg and meloxicam at a dosage of 0.2 mg/kg body weight was carried out. The animal was held in a dorsal reclining position. A ventral midline celiotomy was performed. After being cleaned with a standard saline solution, the prolapsed mass of intestine was pulled back into the abdominal cavity. Intestines were then exposed from the site of the incision. On examination, intussusception was noticed at the ileocolic region (Fig. 2). A gentle traction was applied to reduce the intussusception but due to adhesion between the serosal surface of the intussuscepted mass and the intussusciens, manual reduction was unsuccessful. After a thorough assessment of intestinal viability considering factors such as color, thickness, and arterial pulsation, the decision was made to address the damaged segments through resection and subsequent anastomosis. The affected portions were excised, and an end-to-end anastomosis was performed on the remaining intestinal components. The surgical procedure aimed to reduce the intussusception and restore a functional gastrointestinal system. This involved exploratory celiotomy and either manually reducing the intussusception or resecting the intussuscepted mass and anastomosing the remaining intestine (Applewhite *et al.*, 2002) ^[1]. In this instance, anastomosis and intestinal resection were carried out. Surgery that was delayed had a higher risk of adhesion formation and a lower possibility of manual reduction (Singh *et al.*, 2015) ^[12]. Resection was necessary in the current case due to adhesions between the intussuscepted bulk. According to Applewhite *et al.* (2002) ^[1], any irregularity inside the intestine wall that alters the local intestinal mobility or pliability causes a lack of homogeneity in the bowel wall, which leads to the development of intestinal intussusception. The amount of accessible mesentery restricts the extent of intestinal involvement and degree of vascular compromise, even though reverse peristalsis may lengthen the intestine involved in intussusception (Fossum, 2015) ^[4]. Atraumatic clamps were applied on the proximal and distal ends of the affected parts, before resection. The atraumatic clamps were brought closer to each other with both ends of intestinal parts. The end-to-end anastomosis was performed by applying simple appositional suture pattern using a (polyglactin 910) Vicryl no: 3-0 (Fig. 3). The main side effects of intestinal surgery include recurrence, ileus, anastomotic suture dehiscence, small bowel syndrome, peritonitis, and death (Weaver, 1977). When compared to manual reduction, surgical resection and anastomosis of the intestine after intussusception is said to reduce the risk of recurrence (Gharhghaii *et al.*, 2017) ^[5]. Following the surgery, the puppy received intravenous fluids for a week, along with a five-day course of intramuscular antibiotics and analgesics. The owner was advised to withhold food for at least one week, followed by the gradual introduction of a semi-liquid diet in small portions starting from the second week. Daily wound dressing using povidone iodine and the application of fly repellent spray were recommended. Skin sutures were removed ten days postoperatively, and the puppy exhibited normal appetite and defecation, with no occurrences of vomiting or constipation.



Fig 2: Photograph showing intussusceptions

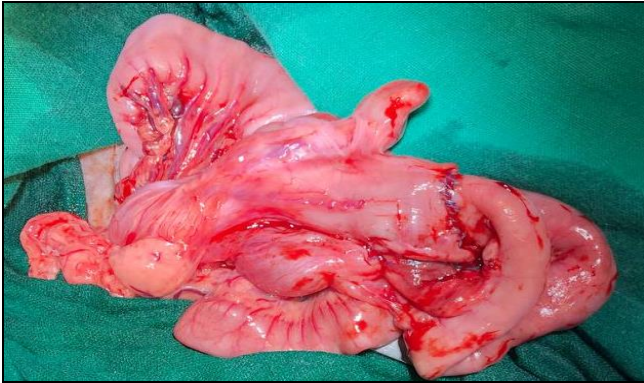


Fig 3: Photograph after intestinal resection and anastomosis

Conclusion

In the field of dog veterinary medicine, intussusception is considered one of the most critical situations that often need to be corrected with surgery. Early detection and appropriate medical care significantly improve the prognosis for affected dogs.

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