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Intussusception in canines: A review

Deny Jennes

Abstract

Intussusception is a serious condition affecting the gastrointestinal system of the body. If the condition is not diagnosed properly it can lead to the death of the animal also. It can occur due to various reasons. Inhomogeneity of the various intestinal segment is one of the major causes for the incidence of this condition. The diagnosis is mainly based on the clinical signs, abdominal palpation, ultrasonography and radiography. Treatment of the intussusception is mainly surgical.

Keywords: canine, intussusception, bull's eye, enteroplication

Introduction

The word 'intussusception' is derived from the Latin words *intus* means 'within' and *suscipere* means 'to receive' and it is defined as the telescoping of one intestinal segment (intussusceptum) into the lumen of adjacent segment (intussuscipiens). Intussusceptions are named by citing the intussusceptum followed by the intussuscipiens (Allman and Pastori, 2013) [1]. The simple intussusception consists of three layers of bowel wall from outer to inner lumen. The 'apex' of the intussusception is the junction between the entering and returning segment and the 'neck' is the junction between the returning segment and the intussuscipiens (Shanks and Kerley, 1970) [61].

Incidence and Aetiology

In the study of Schweighauser *et al.*, (2009) [60] revealed that the occurrence of small intestinal intussusception in concurrence with leptospirosis and acute renal failure in dogs. The most common predisposing factors for the occurrence include idiopathic, intestinal parasitic infestation, bacterial or viral enteritis, alimentary foreign bodies, non-specific gastroenteritis and neoplasia (Applewhite *et al.*, 2002) [5]. The main site of occurrence of the intussusception is the ileo-colic junction. The reason is explained on the basis of lack of homogeneity theory. Based on this theory the sudden change in the diameter of the bowel in the case of ileocolic or gastroesophageal junction can lead to inhomogeneity of the bowel wall that can alter motility and predispose to the occurrence of the condition (Lewis and Ellison, 1987) [40]. According to the case report of Ko *et al.*, (2020) [32] caecocolic intussusception in dog is occur due to the inflammation induced by the infection of *A. caninum* and the subsequent dysfunction of the intestinal motility leads to the occurrence of the condition.

Gastroesophageal intussusception in humans occur due to various aetiologies like increased intra-abdominal pressure, decreased thoracic pressure, sudden exercise in individuals with mechanical gastrointestinal diseases such as relaxation of the gastroesophageal sphincter, redundancy of the gastric mucosa or retrograde peristalsis (Roach and Hecht, 2007) [59].

Breed

In the study of Larose *et al.*, (2020) [36] the most commonly affected breeds include Labrador Retriever, mixed breed, German Shepherd dog, Golden Retriever and German Short Haired Pointer. Incidence rate of intussusception is more in the case of German shepherd dogs (Sivasankar, 2000) [62] and this breed is more prone to gastroesophageal intussusception (Leib and Blass, 1984) [38].

Age

Intussusception is commonly encountered in young animals and it is mainly due to intestinal parasitism and enteritis induced by viral infection (Wilson and Burt, 1974) [70]. In older animals it occur due to linear foreign bodies, enteritis and postoperative intestinal hypermotility (Kipins, 1977) [30]. Primarily occur in dogs of less than one year of age

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(Madrewar and Yaqub, 2016)^[43]. Weaver, (1977)^[69] reported that the incidence is high in the dogs of below 6 months of age. The highest incidence of parasites in the intestine of young puppies are the main reason for the occurrence of this condition. The presence of parasites in the intestinal lumen leads to abnormal peristaltic movement and results in the invagination of the intestinal segments (Rahman *et al.*, 2020)^[56].

Sex

According to Wilson and Burt, (1974)^[70] no sex predisposition for the occurrence of intussusception in dogs and cats.

Anatomical location and classification

Telescoping of the intestinal segments usually happens in the direction of peristaltic movement (direct or forward intussusceptions or aboral). The occurrence in opposite direction (indirect or retrograde intussusception or oral) is very much rare (Lewis and Ellison, 1987)^[40]. The types of intussusception are gastroesophageal, pylorogastric, enteroenteric, enterocolic and colocolic. Under the enterocolic types include cecocolic or cecal inversion, ileocolic and ileocecal (Shanks and Kerley, 1970)^[61] and also low (proximal to jejunum) and high (distal to duodenum) (Dixon, 2004)^[17]. Under gastroesophageal intussusception there are two forms, chronically recurrent form and acute persistent form (Cornell and Selcer, 2002)^[16]. Another classification is the simple and compound or double intussusception. In double intussusception a second the entire intussusception undergoes a second invagination at the same site and it consist of five layers of bowel wall from outside to inner lumen (Bellenger, *et al.*, 1982)^[7].

Pathogenesis

Any lesion in the bowel wall or irritant in the lumen of intestine will change the normal peristaltic pattern and initiate the invagination. Hypermotility of the one segment which is adjacent to the less motile segment can lead the telescoping of hypermotile segment into the lumen of less motile segment resulting the formation of an intussusception. Obstruction of the gastrointestinal tract causes the distension of the segment and finally its rupture and peritonitis. Compression of the mesenteric blood vessels leads vascular compromise to the segment, results venous congestion, oedema and necrosis. From the serosal surface of the intestine an inflammatory exudates will released and it can cause fibrous adhesions making the structure irreducible. Intussusceptions are commonly occur in association with enteritis, intestinal foreign bodies, heavy parasitism, previous intestinal surgeries, abrupt dietary changes, intramural masses and in motility disorders (Madrewar and Yaqub, 2016)^[43]. Jones *et al.*, (1997)^[24] stated that the intussusception results in luminal obstruction, mucosal congestion, infarction, depending on the the length of the intussusception and size of the intestinal loops involved. If the condition becomes prolonged, the animal undergo depression due to endotoxemia and finally death. In the study of Reymond, (1971)^[58] suggest that the intussusceptions begin as either an inhomogeneity in a bowel segment or a mechanical linkage of nonadjacent bowel segments. Inhomogeneity in the segment means a bowel

segment which is either flaccid or indurated or a region which the gastrointestinal tract undergoes a sudden anatomic change in the diameter, like ileocolic or gastroesophageal junction. Mechanical linkage of nonadjacent segments can be intraluminal and extramural. Intraluminal linkage include pedunculated polyps, linear foreign bodies or parasites. The extramural involve fibrous adhesions or bands. Anyone of these reason can cause a kink or fold in the bowel wall which become act as a initiation stimuli of the occurrence of the condition. Invagination is commences as a result of peristaltic contraction. The distance of the invaginated segment can be limited by the mesenteric pull, beyond this, further invagination requires the rupture of the mesentery (Jubb and Kennedy, 1970)^[26]. Obstruction of the segment can leads to the accumulation of fluids and gas proximal to this and causes the distension and increased intraluminal pressure. The different sources of gas that will accumulate proximal to the intussuscepted portion involve aerophagia, gaseous diffusion from the intestinal microcirculation and from the digestive fermentation (Tangner, 1982)^[66]. Continuous increase in the intraluminal pressure finally exceed the venous and lymphatic hydrostatic pressure resulting in the formation of intestinal oedema. Mucosal reabsorption capacity is then lost and sequestration of fluid within the bowel lumen (Chambers, 1981)^[15]. Exudation of fibrin from the serosal surface due to increased intramural pressure leads the formation of adhesions between segments and make the condition irreducible and complicated.

In the case of gastroesophageal intussusception, the herniation of the stomach into the caudal oesophagus will interfere with the normal expansion of the caudal lung lobe and thereby causing acute respiratory distress (Leib and Blass, 1984)^[38]. Invagination of the organs in gastroesophageal intussusception results in the obstruction of the local blood supply to the organs and leads to the incarceration of the herniated organs cranial to the hernia ring (Tufvesson and Viriden, 1953)^[67]. In pylorogastric intussusception acute gastric outflow obstruction and vomiting leads to hypochloremia, hyponatremia, azotemia, elevation of creatinine and hyperphosphatemia (Guilford, 1996). Severe vomiting led to hypotension and decreased renal perfusion causing acute renal failure also (Applewhite *et al.*, 2001).

Clinical signs

The clinical signs are depend upon the severity, level, completeness and duration of the obstruction. The most common clinical signs are vomiting, diarrhoea, anorexia, lethargy and hematochezia (Larose *et al.*, 2020)^[36]. According to Butler, (1972)^[11] the cardinal signs of intussusception are recurrent or sporadic vomiting, abdominal pain, bloody mucoid diarrhea and palpable sausage shaped abdominal mass.

In gastroesophageal intussusception animal exhibits regurgitation, persistent violent vomiting followed by unproductive retching, dyspnea, hematemesis and abdominal discomfort are the early signs (Watrous, 1983)^[68]. Dogs with lower intussusception (distal to duodenum) will exhibit chronic clinical signs and with high intussusception (proximal to jejunum) will exhibit acute clinical signs and death also happen with hypovolemia, electrolyte imbalances and acid-base imbalances (Applewhite *et al.*, 2002)^[5].



Fig 1: Animal with chronic intussusception- emaciated



Fig 2: Intussusception mimic rectal prolapse



Fig 3: Animal with intussusception – weak and dehydrated

Diagnosis

Diagnosis of the condition can be done by different methods like, abdominal palpation, based on the clinical signs, ultrasonography of the abdominal cavity, both plain and contrast radiography and computerised tomography. The differential diagnosis include intestinal obstruction, foreign

bodies, intestinal volvulus and torsion, intestinal laceration, adhesions, strictures, abscesses, granulomas, hematomas, tumors and congenital malformations (Hayden and Sprouse, 2011) ^[23]. In the study of Applewhite *et al.*, 2001 ^[3] animals affected with intussusception exhibited a wide range of clinical signs such as vomiting, diarrhoea, anorexia, weight loss, failure to gain weight, lethargy, melena, haematochezia, rectal prolapse, tenesmus and abdominal distension.

Abdominal palpation

Abdominal palpation is also an important tool for the diagnosis of the condition. During palpation the intussuscepted portion of the intestine felt like a cylindrical or sausage – shaped abdominal mass (Butler, 1972) ^[11]. According to Kim *et al.*, (2012) ^[29] abdominal palpation in intussusception condition revealed a tender, relatively mobile mass with multiple direction mobility. Most commonly involved segment of intestine is ileocolic region. So the mass can palpated in the cranial abdomen. Some intussusceptions are escape from the palpation because the remote craniodorsal position of the mass (Wilson and Burt, 1974) ^[70]. The differential diagnosis in abdominal palpation include foreign body, soft tissue swelling and neoplasia.



Fig 4: Abdominal palpation

Radiography

Abdominal radiography is not a good tool for identifying intussusception. If complete obstruction is present at the site of intussusception the intestinal loops proximal to the obstruction filled with air is only visible radiographically (Wilson and Burt, 1974) ^[70]. In plain radiography gas and fluid accumulate proximal to intussusception can visible and this may be matching with the signs of obstructive bowel disease. The case of complete obstruction the segment distal to the intussusception is devoid of faecal materials. Contrast radiography is a useful tool to take a decision about the condition. Contrast material is visible like a ribbon within the lumen of intussusceptum aboral to a dilated bowel segment if the obstruction is incomplete. The lesion is evident only 24 hours after the administration of the contrast material (Lewis and Ellison, 1987) ^[40]. In the case of human infants the barium enema is useful for the reduction of enterocolic intussusception (Raidlovo and Smith, 1981) ^[57] but this method is useful only in the case of acute ones. In chronic conditions due to the severe inflammation and adhesions barium enema is not working. According to Patsikas *et al.*,

(2003) [49] abdominal radiographs, survey radiographs and contrast studies are diagnostic but the findings are not specific for the confirmation of the condition. Survey radiograph of thorax in the case of gastroesophageal intussusception reveals a soft tissue density within the thoracic esophagus adjacent to the diaphragm (Aronson *et al.*, 2000) [6]. Accumulation of abnormal gas and fluid accumulation in the intestinal loops may suggesting the obstructive condition (Levitt and Bauer, 1992) [39]. In the case of gastroesophageal intussusception the contrast esophagram will show the uniform dilatation of proximal esophagus with uniform filling of contrast material and gastric rugal folds are may or may not be visible (Mathis *et al.*, 2013) [45].

Ultrasonography

Ultrasonography is an accurate diagnostic aid to find out the intussusception in both humans and animals (Penninck and Anjou, 2008). The characteristic 'target sign' or 'ring sign' or 'Bull's eye' appearance is the peculiar feature of intussusception during ultrasonography (Fig. 5) (Lee *et al.*, 2005). The target like structure consists of hyperechoic or anechoic center surrounded by multiple hyper and hypoechoic concentric rings. In longitudinal ultrasonogram revealed multiple hyper- and hypoechoic parallel lines (Patsikas *et al.*, 2003) [49]. Color Doppler is useful for predicting the reducibility of the condition (Patsikas, *et al.*, 2005) [49]. The presence of blood flow within the intussusception indicates the absence of vascular collapse in the intussuscepted bowel. This is mainly associated with reducible conditions. (According to Manczur (2000) [44] the best method for the differentiation of intussusception is abdominal ultrasonography. It can be appeared as concentric rings in transverse section and multiple hyper and hypo echoic parallel lines in longitudinal views (Patsikas *et al.*, 2003) [49]. Byrne *et al.*, 2005 says that the intussusception appeared as typical 'doughnut' shape in ultrasonography. Abdominal ultrasonography is the most important and reliable tool for conforming the condition (Lamb and Mantis, 1998) [34] and it totally replaced the conventional radiology for the diagnosis of intussusception in children (Goyal *et al.*, 2010) [21]. In the case of double intussusception the typical 'triple circle sign' in transverse plane of the ultrasonogram is the confirmatory diagnosis (Fig. 6) (Kazez *et al.*, 2004) [28].



Fig 5: Simple intussusception with target sign



Fig 6: Double intussusception with cystic fluid in the centre



Fig 7: Triple circle sign of double intussusception

Advantages of ultrasonography over other diagnostic tools include, safe and non-invasive, free from ionising radiations, diagnosis can be obtained very rapidly, does not require general anesthesia, readily available for practitioners and cost effective for clients (Emery *et al.*, 2015) [19]. In the case of gastroesophageal intussusception the ultrasonography also provides an additional information about the presence of an additional organ involvement. Most common additional organs include duodenum, pancreas and omentum may pulled into the esophagus (Mathis *et al.*, 2013) [45]. In the case report of Emery *et al.*, 2015 [19] the spleen was pulled into the distal oesophagus through gastrosplenic ligament. During ultrasonography to avoid misdiagnosis multiplane scanning of the lesion is also important. The identification of a semilunar or G-shaped hyperechoic center of the target lesion and confirmation of an overall width > 8-9 mm of the concentric rings are useful in supporting the diagnosis of intussusception (Patsikas *et al.*, 2004) [51]. Factors that are adversely affect the quality of an ultrasound image are poor transducer- skin contact, refractive and reflective edge artefacts arising from adjacent structures and gas in other parts of the intestinal tract and gas trapped within the lesion (Lamb and Mantis, 1998) [34]. According to the study of Patsikas *et al.*, 2003 [49], in the case of very long and irreducible intussusceptions are appeared as a double target like sign or hourglass

configuration in transverse section of ultrasonogram (Fig.8). These signs are appeared when scanning two different parts of the intussusception located very close to each other, because of the curvature of the intussusception caused by the tension of the mesentery.



Fig 8: Double target sign

The characteristic ultrasonographic appearance of the intussusception is due to the juxtaposition of the walls of the inner and outer intussusceptum and the walls of the intussusciens. The patterns vary with the quality of image, the length of bowel involved, duration of process and the orientation of the scan plane in relation to the axis of the intussusception (Penninck *et al.*, 1990) [52]. In the case of non compressed wall of the inner intussusceptum, the mesentery within the lumen of the intussusciens acquired a G shape, or reverse G shape, or semilunar, hyperechoic center and in the case of compressed walls of inner intussusceptum a wide hyperechoic center was present. Semilunar or G- shaped hyperechoic center is a typical of loose and reducible intussusception in humans and circular homogeneous, hyperechoic center is the sign of nonreducible ones (Bowerman *et al.*, 1982) [9].

Ultrasonography of a normal intestinal wall revealed five layers: the hyperechoic mucosal surface, hypoechoic mucosa, hyperechoic submucosa, hypoechoic muscularis and hyperechoic serosa (Penninck, 1995) [53]. But in the transverse section of the intussusception creates more than five hyperechoic and hypoechoic concentric rings because of the juxtaposition of the wall layers of the intussusceptum and intussusciens. These concentric rings are not clearly visible *in vivo* may be because of the compression of the mucosal and serosal surfaces and the presence of bowel oedema (Bowerman *et al.*, 1982) [9]. So the most commonly found ultrasonographic pattern consists of two or three thick, concentric rings representing the hypoechoic oedema and the hyperechoic compressed serosal and mucosal layers. The presence of more than five thin hyperechoic and hypoechoic concentric rings suggest the lack of oedema and compression and mainly in the case of uncomplicated and reducible intussusception. The thicker and more hypoechoic peripheral rings, the more complicated the intussusceptions and the presence of well differentiated wall layers is associated with loose and reducible intussusceptions in humans (Stefanidis *et al.*, 1996) [65].

Haemato-biochemical parameters

In the case report of Kaewamatawong *et al.*, (2010) [27] about the chronic gastroesophageal intussusception in dog revealed the blood picture of leucocytosis, with left shift and slight increase in the serum alkaline phosphatase suggestive of the inflammatory or stress condition of the animal. Elevation of packed cell volume indicate the dehydration status of the animal. Serum electrolyte abnormalities such as hypokalemia and metabolic alkalosis occur due to the result of vomiting. Leukocytosis, hyponatremia and hyperkalemia also reported in the dog with double intussusception of intestine reported by Kim *et al.*, 2012 [29].

Preoperative stabilization

Stabilization of the animal is very much important before surgery for the successful outcome. In preoperative stabilization of the patient should consider the parameters like patient hydration status, electrolyte imbalances, acid-base status and sepsis. Presurgical preparation involve complete blood count, serum electrolyte values, an acid base determination and initiation of the search for the predisposing factors (Lewis and Ellison, 1987) [40]. The main feature of gastroesophageal, pylorogastric and high duodenal intussusceptions is the vomiting. It will leads to severe fluid loss in which consist of mainly gastric secretions contains high H^+ , Cl^- , and K^+ . If these ions are lost through the vomitus the condition called metabolic alkalosis may occur. Vomiting associated with distal duodenal intussusception results in metabolic acidosis secondary to the loss of basic duodenal fluids. Vomiting, dehydration and electrolyte imbalances are not that much severe in low intussusception compare to high one (Lantz, 1981) [35]. Intravenous fluid therapy is important to correct the dehydration status of the patient. Lactated Ringers's will suitable for the animals with mild affections. If the animals with severe hypochloremia and hyponatremia 0.9% sodium chloride is the fluid of choice. Preoperative antibiotic therapy is also important to prevent the secondary bacterial infection and endotoxaemia. Many animals exhibited abdominal discomfort and nausea with intussusception. The nausea can be treated with appropriate antiemetics. Opioid analgesics are very good for control the pain (Kovak and Burlko, 2016) [33].

Surgical management

In acute case of the condition manual reduction is possible after opening the abdominal cavity. During manual reduction gently milk out the intussusceptum from the intussusciens. Minimum traction will applied during reduction. Excess force will cause the tearing of the segments (Ellison, 1986) [18]. The surgical management of intestinal intussusception involve reduction or resection and anastomosis or both depending on the severity of the condition. The abdominal cavity was approached through the midline laparotomy incision through the linea alba. Isolated the intussuscepted segment from the remaining intestinal segments. Gently corrected the condition through reduction or resection and anastomosis or both. Prophylactically performed enteroplication or enteropexy to prevent the recurrence (Butler, 1972) [11]. Manual reduction alone is not working in the case of chronic condition due to the adhesions of the segments. The reduction, resection and anastomosis can performed in the case of chronic intussusception (O'Brien, 1978) [48]. Typhlectomy is performed in dogs with caecocolic intussusception (Miller *et al.*, 1984) [46]. Long Standing cases there may be development

of adhesions between intussusceptiens and intussusceptum. Also when there is necrosis or neoplastic involvement of affected loops, the resection and anastomosis is the surgical method of choice (Brown, 2003) [10].

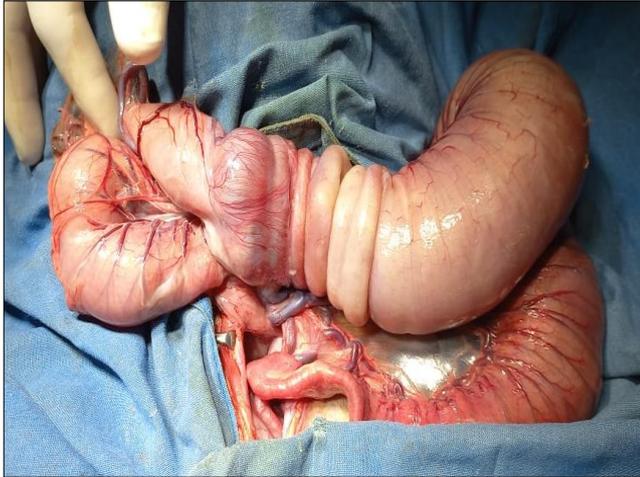


Fig 9: Chronic and irreducible ileo-caeco-colonic intussusception

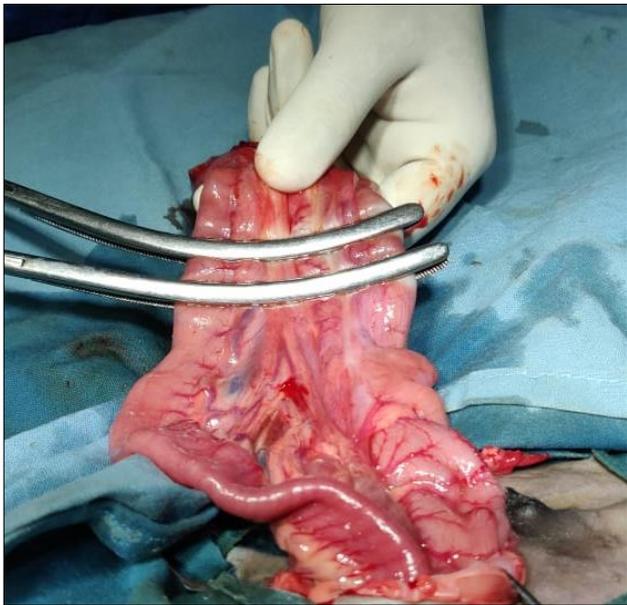


Fig 10: Doyen's clamp application for isolating the affected portion



Fig 11: Manual reduction of the intussusception (Milkout the intussusceptum)



Fig 12: Acute and simple ileo-caeco-colic intussusception

For the intestinal resection and anastomosis, exteriorized the affected portion from the remaining viscera to prevent contamination. Ligated the blood vessels to the segment properly. Mesentery is incised near the ligated vessels. Applied Doyen's clamp on either side of the affected segment. A few millimetres of healthy tissue is also removed with affected portion thereby making the anastomosis between healthy intestinal segments. Single layer, simple interrupted sutures are most commonly used for the intestinal anastomosis because this suture pattern cause minimal stenosis, leakage and heal rapidly (Madrewar and Yaqub, 2016) [43].

Omentum is usually called 'abdominal policeman' and it is used for covering the intestinal anastomosing site make healing faster. This method is known as suture line reinforcement. Omentum has an extensive vascular and lymphatic supply and also exhibits angiogenic, immunogenic and adhesive properties. These properties of the omentum will facilitate the restoring of blood supply, controlling infection and establishing lymphatic drainage (Slatter, 2003) [66].

Gastroesophageal intussusception was corrected through the midline laparotomy incision and gently applied traction on the pylorus of the stomach. To prevent the recurrence of the condition gastropexy was performed (Leib and Blass, 1984) [38].

Intestinal viability

Intestinal viability can be assessed by checking the parameters like color, perfusion and muscular peristalsis of the affected segment and the viable bowel will respond to mechanical stimulus. Another method to assess the intestinal viability is the intravenous dye test. For this 20mg/kg sodium fluorescein can be used. In normal viable intestinal segment will produce uniform bright green fluorescence under 3600 Å wavelength ultraviolet light (Lewis and Ellison, 1987) [40].

Enteroplication

For preventing the recurrence of the intussusception, create a permanent adhesions between adjacent loops of small intestine. This method is known as enteroplication (Wolfe, 1977) [71]. This procedure is a controversial one and it have some advantages and disadvantages also. Complications associated with enteroplication are intestinal obstruction, septic peritonitis, recurrence of the intussusception, ileus and

strangulation of bowel loops (Haider *et al.*, 2019) [22]. In the study of Applewhite *et al.*, 2001 [3] dogs undergo enteroplication developed intestinal obstruction due to the plant material which was unable to pass through the bend in the enteroplicated small intestine.

For performing enteroplication gently arrange the small intestinal loops side by side from the duodenal colic ligament to the level of ileum. After that the adjacent loops of intestine are sutured together with engaging the submucosa (Oakes, 1998) [47].

Post-operative management

After surgery the hydration, perfusion, *et al.*, 1990). The opioids are increased the tone of intestine and also amplitude of the nonpropulsive contractions which may decrease the local bowel wall inhomogeneity and segmental ileus (Applewhite *et al.*, 2001) [3]. Antiemetics, gastric acid reducers and prokinetics are given in post surgical period to prevent nausea, gastritis comfort level, electrolyte balance and acid-base balance of the patients should be monitored. Opioid analgesics are also important in post-operative periods because it play an important role for preventing the recurrence of the intussusception (Klinger *et al.*, 1990) [31]. Ideally the dog is kept off feed for 96 hrs post surgery and maintained the animal with parenteral fluid therapy and supplements. Broad spectrum antibiotics are also important which depend upon the degree of contamination during surgery (Madrewar and Yaqub).

Complications

According to the study of Larose *et al.*, 2020 [36] the common intraoperative complication is the tearing and perforation of the diseased intestine during the manual reduction. The intussusceptum portion of the intussusception is the primary part which undergo vascular compromise, ischemic necrosis and intestinal perforation (Cera, 2008) [14]. In canines the perforation is uncommon because the ensheathing component of intussusception generally retains its viability (Lewis and Ellison, 1987) [40]. Main complications after surgical management of the condition involve recurrence, dehiscence of intestinal incision and secondary occurrence of septic peritonitis, obstruction at the site of bowel anastomosis and short bowel syndrome (Applewhite *et al.*, 2001) [3]. Short bowel syndrome can happen if more than 80% of the intestine is resected due to maldigestion and malabsorption (Bojrab, *et al.*, 1998) [8]. Short bowel syndrome means the complex of symptoms associated with gastrointestinal insufficiency followed by a massive bowel resection (Cameron *et al.*, 1976) [13] especially small intestine (Mackby, 1976) [42]. The main clinical findings of short bowel diarrhea are watery diarrhea, excessive fluid and electrolytes loss, steatorrhea and malnutrition (Cameron *et al.*, 1976) [13]. The ileum is less metabolically active than jejunum because of this reason the resection of ileum can easily compensate by the animal (Spiro, 1970) [64]. However the ileum have some specific functions which can not compensate by jejunum include, active reabsorption of bile salts during enterohepatic recirculation and active transport of vitamin B₁₂ (Anderson, 1975) [2]. In normal healthy animals ileum will prolong the intestinal transit time by its lesser degree of motility. If the ileum is resected during the correction of intussusception 'jejunal hurry' will results decreased intestinal transit time (Mackby, 1965) [41]. Ileocaecal valve is also an effective tool for the prevention of reflux movement of colonic bacteria into

the small intestine (Joy and Patterson, 1978) [25]

Summary

This review provide an overall information about canine intussusception, aetiology, diagnosis and management.

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