Intussusception in Dogs: Diagnosis and Surgical Management

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Abstract

The study included 14 canine patients suffering from mechanical obstruction of GIT due to intussusception. Diagnosis was made on the basis of history, clinical presentation, abdominal palpation, radiography and ultrasonography. Leukocytic anaemia, neutrophilia, lymphocytopenia, hypoproteinemia, hypoalbuminemia, hyperglobulinemia, hypoglycemia and elevated levels of alkaline phosphatase were the important haematobiochemical alterations. Animals were treated by manual reduction of intestinal loops (n=6) or intestinal resection followed by end to end anastomosis (n=8). Mortality was recorded in two animals. Other animals recovered well. It was concluded that early presentation, diagnosis and surgical intervention may improve the outcome of canine gastrointestinal affections.

Key words: Gastrointestinal tract, enterectomy, intussusception

Intussusception, is one of the most common causes of mechanical obstruction of intestines in dogs. Diagnosis is made from clinical presentation, radiographic and ultrasonographic examination. Enterectomy followed by anastomosis are the standard surgical procedures for intussusception. Intestinal anastomosis can be performed with sutures, staples, or anastomosis devices (Fossum, 2002; Brown, 2003; Holt and Brockman, 2003). Survivability of the animal depended on the time taken for diagnosis, correction of primary disorder and associated haematobiochemical complications. Present study was aimed at to evaluate diagnostic and surgical approaches in relation to survivability in patients suffering from intussusception.

Materials and Methods

The study was conducted on 14 dogs presented to the university teaching hospital for GIT obstruction. Diagnosis was made on the basis of history, clinical presentation, abdominal palpation, radiography and ultrasonography. Animals were grouped as follows;

Group I: Animals having intussusception without any externally visible sign (n=8).

Group II: Animals having intussusception along with protrusion of mass from anal opening (n=6).

Surgical management was performed using anaesthetic protocol comprising of preanaesthetic combination of Glycopyrrolate (Pyrolate®, Neon laboratory limited) @ 0.01 mg/kg bwt SC followed by Diazepam @ 0.5 mg/kgbwt (Lori®, Neon Vet) intravenously. Induction was achieved by thiopental sodium (Thiosol®, Neon Vet) @10 mg/kg bwt., followed by maintenance with Isofluorane (Isorane®; Piramal Healthcare) mixed with oxygen. Midline laparotomy was performed by taking animal in dorsal recumbency. Intussusception was corrected by manual reduction (3 animals each in groups I and II) and by enterectomy followed by end to end anastomosis in other 8 animals. End to end anastomosis of intestinal loops was performed using Polyglactin no. 3/0 (Vicryl®; Johnson and Johnson Ltd) by single layer of simple continuous suture pattern through all the layers of the intestinal wall with a swaged-on needle. A knot was tied after completing half of the suturing to prevent purse string effect. Mesenteric defect was closed by simple interrupted sutures using chromic cat gut no. 3/0. Intestinal defect was covered by a layer of omentum. Abdominal incision was closed in routine manner. Postoperatively animals were managed by intravenous administration of Ringer's Lactate and Dextrose saline solution as per requirement for 1-5 days, Cefotaxim@ 50 mg/kgbwt bid (Taxim®; Alkem...
Lab. Ltd.) for 5 days and Meloxicam @ 0.2 mg/kgbwt (Melonax®; Intas pharmaceutiles ltd.) for 3 days. Oral feeding with liquid diet like rice water and milk was started after 3 days. Normal feeding was started after 5-7 days. In animals where intestinal resection was not performed, oral feeding was started 1-2 days postoperatively.

**Results and Discussion**

Animals suffering from intussusception were reported with complaints of anorexia, depression, dehydration, diarrhea, lack of defecation, vomiting and abdominal pain. Similar signs had been reported by, Tyrrell and Beck (2006) and Papazoglou et al. (2010) in dogs with gastrointestinal disorders. Mild to severe dehydration was recorded in all the animals. Associated problems like diarrhea, vomiting and anorexia might have further aggravated the dehydration. Delay in presentation of animal for surgical or medicinal intervention might have led to deterioration of the hydration status. Capak et al. (2001), also recorded varying degree of dehydration in the dogs suffering from gastrointestinal disorders. Intravenous fluid administration during peri-operative period was therefore, performed for correcting fluid imbalances.

More number of cases were recorded in young animals. About 78.57% (11/14) animals were below 5 months of age. High incidence has been reported in animals below one year of age (Han et al., 2008). More than half (57.14%; 8/14) animals in the present study were not dewormed and vaccinated regularly. Fecal samples of 50% (7/14) animals were positive for worm infestation, while 64.28% (9/14) were having history of gastroenteritis. Parasitic infestation and gastrointestinal disorders might be predisposing factors for intussusception in young animals. All the animals reported were males. High incidence of gastrointestinal disorders in males has also been reported earlier (Capak et al., loc. cit.). Non descript (7/14; 50.00%), Labarodor retriever (3/14; 21.43%), German shepherd (2/14; 14.29%) and Spitz (2/14; 14.29%) were the commonly affected breeds.

Varying degree of anaemia; indicated by lower levels of Hb and PCV, marked leukocytosis, neutrophilia and lymphocytopenia were the important haematological findings (Table I).

**Table I. Haematological profile of the animals suffering with intussusception**

<table>
<thead>
<tr>
<th>Group</th>
<th>Hb g/dL</th>
<th>PCV %</th>
<th>TLC x10³/µL</th>
<th>DLC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>I (n=8)</td>
<td>8.29±0.72</td>
<td>24.13±2.23</td>
<td>19.88±1.16</td>
<td>84.63±1.78</td>
</tr>
<tr>
<td></td>
<td>(5.0-11.6)</td>
<td>(14.0-36.0)</td>
<td>(15.00-24.00)</td>
<td>(77-91)</td>
</tr>
<tr>
<td>II (n=6)</td>
<td>7.38±0.79</td>
<td>20.33±2.08</td>
<td>18.20±1.63</td>
<td>86.17±2.44</td>
</tr>
<tr>
<td></td>
<td>(4.5-10.25)</td>
<td>(13.0-28.0)</td>
<td>(15.00-25.00)</td>
<td>(75-92)</td>
</tr>
</tbody>
</table>

Fig. 1: Transverse ultrasonograph showing multiple alternating hyper and hypoechoic concentric rings (bull’s eye pattern) pathognomonic of intussusception.

Fig. 2: Longitudinal ultrasonograph showing multiple hyper and hypoechoic parallel lines pathognomonic of intussusceptions.
Blood loss owing to haemorrhage at the site of obstruction and long duration of anorexia in animals suffering from obstruction might be predisposing factors for anaemia. Similar haematological findings had been reported by Gal et al. (2007). Hypoproteinemia, hypoalbuminemia and hyperglobulinemia (Table II) indicated response of body to inflammatory reaction and GIT blood loss in chronic cases of intussusceptions, extravasation of plasma proteins from mucosal vasculature and interstitial spaces due to mucosal damage and increased secretion of albumin into the intestine as earlier observed by Kahn (2005). Elevation of alkaline phosphatase (AKP) indicated intestinal ischemia (Corke and Glenister, 2001). Serum glucose values were below the normal range which might be due to anorexia. As most of these animals were young pups, the effect of anorexia even for short duration could be fatal. Supplementation of appropriate intravenous fluids was made throughout the treatment period.

Early diagnosis and surgical intervention were important as the chances of intestinal perforation and peritonitis increased with delay in surgery. Abdominal palpation of a cord like structure was indicative of intussusception in 13 animals (92.86%). Kahn (loc. cit) found abdominal palpation diagnostic in 50-70% cases of intussusception. Radiographic examination showed soft tissue mass along with gas filled dilated intestinal loops. However, sonography was more reliable tool than radiography. Target like lesions comprised of multiple hyperechoic and hypoechoic concentric rings with hyperechoic mesenteric fat in centre (bull’s eyes pattern) on transverse scan (Fig. 1) and multiple hyperechoic and hypoechoic parallel lines in longitudinal scan (Fig. 2) were suggestive of intussusception. Similar sonographic patterns in animals suffering from intussusception had been reported by Penninck and Mitchell (2003) and Verma (2005).

Animals of group II, suffered for longer duration (13.83±1.14 days) than animals of group I (11.38±1.41 days) which might be responsible for protrusion of intestine from anal opening. Manual correction of the intussusception by holding the end of intussuscepted mass and milking out the intussusceptum following laparotomy was successful in 3 animals of group I and II each (Fig. 3 and 4). Delay in surgery

<table>
<thead>
<tr>
<th>Group</th>
<th>TP g/dL</th>
<th>Albumin g/dL</th>
<th>Globulin g/dL</th>
<th>AKP U/L</th>
<th>BUN g/dL</th>
<th>Creatinine g/dL</th>
<th>Glucose g/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (n=8)</td>
<td>5.06±0.24 (4.5-6.2)</td>
<td>2.50±0.26 (1.8-3.8)</td>
<td>2.56±0.12 (2.2-3.1)</td>
<td>208.29±50.56 (55-388)</td>
<td>26.14±3.92 (12-40)</td>
<td>1.30±0.17 (0.60-1.90)</td>
<td>72.29±6.19 (56-100)</td>
</tr>
<tr>
<td>II (n=6)</td>
<td>4.83±0.51 (3.5-6.9)</td>
<td>2.25±0.26 (1.5-3.3)</td>
<td>2.58±0.37 (1.6-3.8)</td>
<td>163.17±27.59 (66-251)</td>
<td>28.00±6.86 (18-60)</td>
<td>1.35±0.18 (0.90-2.00)</td>
<td>62.17±6.24 (45-86)</td>
</tr>
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Fig 3: Exteriorization of intussuscepted intestinal loops following laparotomy.

Fig 4: Manual correction of the intussusception. Some serosal tears are present.
leading to adhesion formation around the affected intestinal loops might be responsible for failure of manual reduction of intestinal loops in 8 animals where intestinal resection followed by end to end anastomosis was performed (Fig 5). Part of the intestine to be resected was determined after assessing the intestinal viability from colour, thickness, arterial pulsation and capillary bleeding. Blood vasculature at the site of intussusception was more compromised in animals of group II as compared to group I, which might be due to longer duration of illness and more tension on the intestinal loops due to protrusion of intestinal mass from the anal opening. End to end anastomoses performed by simple continuous suture pattern using Vicryl 3/0 suture material was satisfactory and quick method for leak free anastomoses. Inversion sutures had been reported to cause reduction in the lumen diameter while eversion sutures increased the adhesion formation (Brown loc. cit, Holt and Brockman loc. cit). Omentalization of the intestinal defect helped in providing additional blood supply to the area and protection from leakage (Fossum, loc. cit).

Fig 5 : Enterctomy followed by end to end anastomosis in cases of irreducible intussusception.

Postoperative mortality was recorded in two animals (14.44%). Comparable (12%) mortality rate in animals subjected to intestinal surgery had been reported by Kahn (loc. cit). The animals who could not survive were having more compromised haematobiochemical profile and were the animals presented late for the surgery. Other animals regained their normal appetite within one week of surgery. The haematobiochemical parameters were within the normal range in 1-2 weeks. Recurrence, suture dehiscence and peritonitis the major postoperative complications recorded in earlier studies (Weaver, 1977) however, were not noticed in the present study.

Summary

Ultrasonography in conjunction with clinical examination and abdominal palpation helped in diagnosis of intussusception. Early presentation, timely diagnosis and surgical intervention improved the outcome. Delay in surgery increased the chances of adhesion formation and subsequently decreased the chances of manual reduction. Good surgical technique, adequate postoperative care and fluid therapy were useful while dealing with animals suffering from intussusception.

References


Tyrrell, D. and Beck, C. (2006) Survey of the use of radiogra-
A Rare Incidence of High Superovulatory Response and Embryo Recovery in a Red Sindhi Cow and Its Conception Rate

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Abstract

The use of bovine embryo transfer technology to increase the reproductive potential of animals with high genetic merit is unquestionable. The limited availability of high yielding Red Sindhi cows in India especially in Tamilnadu makes this technology highly relevant and useful to produce large number of superior bulls and bull mother. The present investigation was carried out in Red Sindhi cow maintained at organized farm for superovulation, embryo recovery and conception rate.

Key words: Superovulatory Response, Embryo Recovery

Materials and Methods

Under NPCBB implemented Open Nucleus Breeding System through Multiple Ovulation and Embryo Transfer – Initiation of embryo transfer programme at District Livestock Farm, Hosur, Tamilnadu, TNLDA Funds scheme, a ten years old, fifth lactation (2800 litres/305 days) Red Sindhi cow was selected as a donor cow for superovulation. After selection, the donor cow was injected with synthetic PGF2α (Inj.Pragma, Intas Pharmaceuticals). After 11 days, second dose of PGF2α was given and 72 hours later Reference Estrum (Day 0) exhibited. Ninth day of reference heat big size of corpus luteum was noticed in right side of the ovary by rectal examination. Day 10th onwards Inj. Follicle Stimulating Hormone (Inj. Folltropin – V) 50 mg intramuscularly given morning 8 AM and evening 8 PM for 4 days (Carvalho et al. 2009). 12th day of reference heat along with 6th dose of Inj. FSH, third dose of Inj. PGF2α was given and after 36 hours animal exhibited superovulated estrum and AI was done consequently three times at 12 hours interval with high pedigree Jersey semen straws. Sixth day of superovulated heat, response of superovulation was checked per rectum, right ovary had more than ten and left ovary more than six corpus luteum. Embryos were flushed on seventh day of superovulatory heat with ordinary two way Foley’s catheter by non-surgical method.

Results and Discussion

Totally 16 embryos screened under Zoom stereo microscope, 13 embryos were graded as I (81.25%) and three embryos were Graded as III (18.75%). The quality of embryos was determined on the basis of morphological characters (Shea 1981; Linder and Wright 1983). Ten numbers of Grade I embryos were transferred to ten recipients, out of ten transfer’s four animals became pregnant (40.0 %). Out of three recipients transferred grade I embryo along with grade III embryo, one animal conceived (33.3%). Overall conception rate was 38.46%. First time in India, the highest embryo recovery and conception rate was recorded in ten year old, fifth lactation Red Sindhi cow. Efficient management plan, balanced feeding and more adequate dosage of 400 mg of Folltropin®-V for four days (50

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