



Recurrent intussusception in a 14-month-old, spayed, female German shepherd cross

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A 14-month-old, spayed, female German shepherd cross presented with a history of diarrhea and weight loss since its ovariohysterectomy, 14 d earlier. There were no complications during the ovariohysterectomy, although on recovery from anesthesia, the dog had loose, unformed feces. During a vaccination visit 2 mo prior to presentation, the owner reported that the dog had always had loose feces, but had declined further work-up at that time.

On physical examination, the dog was very thin. The rectal mucosa was reddened with little fecal material in the rectum. There was mild discomfort on abdominal palpation; fluid-splashing sounds on ballottement and auscultation of the abdomen; and a mobile, firm, non-painful mass in the mid-caudal abdomen. Survey radiographs showed gaseous distension of the intestines. Differential diagnoses included an intestinal foreign body or an intussusception.

Upon exploratory laparotomy, there was a jejunojejunal intussusception about 8 cm from the ileocecolic junction. An enterotomy was performed to ease reduction of the intussusception; approximately 800 mL of greenish-brown, foul-smelling fluid was drained from the small intestine. Based on the presence of fibrous adhesions to and discoloration of the affected section of small intestine, resection and anastomosis of the devitalized area of intestine was performed and an omental patch was placed over the anastomosis. The dog was started on a liquid diet (Clinicare Canine Liquid Diet, MTC Pharmaceuticals, Cambridge, Ontario) on post-operative day 2 (POD 2). By POD 14, the dog's feces were of normal consistency and she had a good appetite with no further vomiting.

One month after initial presentation, the dog presented with vomiting, diarrhea, and lethargy. A non-painful soft tissue mass was palpable in the cranial abdomen and survey abdominal radiographs showed loops of intestine distended with gas. Recurrence of the intussusception was the primary differential diagnosis.

On exploratory laparotomy, there was a jejunojejunal intussusception, cranial to the first surgical site, which could not be reduced manually due to the presence of adhesions on the serosal surfaces. About 50 cm of devitalized intestine was resected, an anastomosis was performed, and an omental patch was placed. There was no evidence of deterioration or leakage at the previous

anastomotic site. Enteroplication was performed from the pancreas to the ileocecolic junction. On POD 2, the dog was having mild tenesmus and passing soft, unformed feces. She was started on small amounts of dry food (Canine i/d, Hill's Pet Nutrition Canada, Mississauga, Ontario) and had a good appetite. At the time of suture removal (POD 15), the dog's condition was markedly improved. Her appetite had remained good, although she had mild diarrhea towards the end of each bowel movement.

Microscopic examination of sections of intestine excised during the second surgery suggested an underlying abnormality of the inner muscular layer or the neuromuscular control of the intestine. There was mild edema and focal areas of congestion, associated with vascular changes during the intussusception were noted. There was marked hyperplasia of the smooth muscle of the intestinal wall, with the inner muscular layer being several times the normal thickness. There was also thickening and edema of the submucosa with an increased number of cells. The ganglia in the submucosa were much more prominent and numerous than normal. The subserosa was congested and edematous.

Several studies have identified clinical signs, predisposing causes, and treatment options for intussusceptions (5–8). The average ages of dogs diagnosed with the condition has been reported as 9 mo (7) and 32.9 mo (8). Although German shepherds have been identified as having a greater prevalence of the condition, other studies have shown no breed or sex predilection (5,8). Presenting clinical signs may include vomiting, bloody mucoid diarrhea, anorexia, tenesmus, and a palpable cylindrical abdominal mass (6,7). Intussusceptions have been reported as a sequela to intestinal parasitism, linear foreign bodies, viral-induced enteritis, intestinal masses, and recent abdominal or thoracic surgery (1,2,5,9); many cases are idiopathic. In dogs with a history of surgery prior to diagnosis of an intussusception, the surgeries varied from an exploratory laparotomy to surgical correction of a patent ductus arteriosus, with the time between surgery and diagnosis of an intussusception ranging from 1 to 56 d (2,8). Survey radiographs may show abnormal intestinal gas and fluid accumulation suggestive of an obstruction (8). The most common site is the ileocolic junction (4–6,8). Frequency of recurrence was lower following surgical resection and anastomosis than after manual reduction (8). Recurrence tended to be proximal to the site of initial involvement, if no preventive technique was used (5). Enteroplication has been shown to reduce the

rate of recurrence of intussusceptions by promoting the formation of adhesions between adjacent bowel segments, thereby decreasing intestinal mobility (6,7). Complications after reduction of an intussusception include leakage from the anastomotic site, postoperative recurrence, and intermittently or continuously soft feces (7). Short bowel syndrome can result with resection of greater than 80% of the small intestine; resulting in maldigestion or malabsorption (9). Resection of the ileocecal valve can allow bacterial ascension and bacterial overgrowth, thereby leading to diarrhea (9). Based on the amount of intestine resected, short bowel syndrome was not deemed a likely complication in this dog.

Although intussusceptions are not an uncommon occurrence in dogs, based on the microscopic findings, there was the possibility of an inherited or congenital condition in this animal. This dog had had a litter of 5 about 4 mo prior to initial admission; the owner was not in contact with the pups' owners regarding possible gastrointestinal problems. There was an anecdotal report that this dog's granddam had died due to an intussusception; this could not be confirmed. After the ovariohysterectomy, a postoperative ileus may have occurred and, as gastrointestinal motility returned, the intussusception occurred in part due to the abnormal musculature within the dog's intestinal tract.

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