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Early View

Case Report

Colocolic Intussusception Associated With Intestinal Leiomyosarcoma in a dog

Key words

intussusception;
bowel obstruction;
contrast radiography;
intestinal neoplasm;
leiomyosarcoma

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Abstract: A 7-year-old neutered Standard Poodle was admitted due to chronic bloody diarrhea. The owner reported that the symptoms began approximately 5 months prior, including diarrhea, hyporexia, tenesmus, and weight loss. After performing a clinical examination, abdominal ultrasonography, plain radiography, and contrast rectal radiography, a diagnosis of colocolonic intussusception was made and confirmed by exploratory laparotomy. The procedure revealed that the cause of the obstruction and trigger of the intussusception was a mass that occluded more than 80% of the intestinal lumen. Histopathological analysis identified the mass as an intestinal leiomyosarcoma. This case represents one of the few published cases of colonic intussusception of neoplastic origin in a dog and highlights the utility of abdominal ultrasound and rectal contrast radiography for a timely diagnosis. Additionally, the complications associated with the therapeutic approach are emphasized.

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Introduction

Intussusception is the process of invagination of a segment of the gastrointestinal tract (intussusceptum) into the lumen of an adjacent segment (intussuscipiens). In dogs, intussusceptions have been identified in numerous locations throughout the gastrointestinal tract and are classified as gastroesophageal, pylorogastric, enteroenteric (duodenojejunal, jejunojejunal, and jejunoileal), enterocolic (cecocolic, ileocolic, and ileocecal), and colocolonic (1–3). Of these, ileocolic and jejunojejunal intussusceptions are the most frequent, whereas cecocolic intussusceptions are rare (4–6).

Clinical signs result from partial or total obstruction, bacterial overgrowth, intestinal ischemia, and localized peritonitis. The reported duration of clinical signs from onset has a large range of 1–90 days, and thus intussusception can exhibit acute or chronic development (4, 5, 7). To date, no predilection for breed, sex, or age has been identified. However, intussusception has been described more frequently in young animals, with ileocolic intussusception of idiopathic origin being the most common presentation (1, 3).

Intussusception can cause partial or total intestinal obstruction in small animals (1–3). Consequently, nonspecific signs can occur, including vomiting, diarrhea with melena or hematochezia, tenesmus, anorexia, weight loss, depression, and abdominal pain. In 50–70% of patients, the initial diagnostic approach can involve palpating an abdominal mass (4, 5, 7). However, structures palpated at the abdominal level can also include foreign bodies, neoplasm and enlarged lymph nodes. In small animals, intussusception occurs more frequently in young dogs, either idiopathically or due to inflammatory causes, and less frequently in cats, even though some instances have been reported in geriatric cats due to neoplastic processes. Intestinal parasites, viral enteritis, foreign bodies, and previous abdominal surgery are the most reported causes of intussusception in dogs. Conversely, intestinal neoplasms are the least frequent causes (1–5, 8).

Imaging techniques are essential for accurate diagnoses. Plain radiography usually reveals an obstructive pattern with distended intestinal loops with gas or fluid and symptoms of ileus. However, contrast radiography can provide more information about the location and involvement of the obstruction and usually obtains reliable results. It is performed by administering a radiopaque material (usually barium sulfate) orally or by enema (2, 9). Furthermore, ultrasonography is a less invasive method of great diagnostic utility (4, 6, 7, 10). Finally, computed tomography is a more up-to-date diagnostic method. However, even though it has been used as a diagnostic tool for some processes of intestinal intussusception in veterinary medicine, it is not a standard method for diagnosing intussusception (11–13).

This report describes a case of colocolic intussusception associated with intestinal neoplasia in a dog with chronic gastrointestinal symptoms and suggests appropriate diagnostic and prognostic approaches.

Case presentation

A 7-year-old neutered female Standard Poodle visited the Veterinary Hospital of the University of Caldas in Manizales, Colombia, due to a chronic condition of bloody diarrhea. The owner reported that the symptoms started approximately 5 months ago and included diarrhea, hyporexia, tenesmus, and weight loss. The owner reported that everything started with a slight difficulty in defecating, which gradually worsened over time. The patient assumed a position to defecate but could only evacuate a small amount of feces. Subsequently, the patient developed episodes of diarrhea, leading the owner to seek assistance from different veterinary centers. The patient received symptomatic medication, antibiotics, deworming treatment, and pain medication; however, the owner cannot remember the specific medications used and has no record of them. Unfortunately, the patient did not obtain satisfactory results after these treatments.

Upon admittance, the patient was lethargic and showed signs of moderate dehydration. Dog exhibited a temperature of 39.4 °C, heart rate of 120 beats/min, concordant pulse, respiratory rate of 40 breaths/min, and capillary refill time of >3 s. Palpation of the caudal abdomen caused pain, and a cylindrical mass of semi-hard consistency was identified. Hematologic examination revealed leukocytosis (21, 200/µL), neutrophilia (17, 800/µL), and bandemia (1, 100/µL). The biochemical test results were within normal ranges. Ultrasonography of the caudal abdomen revealed a hypoechoic mass with a diameter of 3 cm × 5 cm, located in the cystocolic quadrant from the transverse and sagittal plane. Several layers of concentric hyperechoic and hypoechoic rings were observed around the mass (Fig. 1), indicative of intussusception. However, changing the focus of the ultrasound image revealed that the suspected invagination was mistaken for a structure of homogeneous echogenicity. Referral for advanced diagnostic imaging was recommended but was not financially feasible for the owners. Therefore, to confirm the diagnostic suspicion and further clarify the location of the structure, contrast radiography was performed. Barium enema contrast radiography was used to identify the location of the intussusception and the extent of the obstruction. A 12 Fr urinary catheter was inserted rectally until its passage was occluded, and then 50 mL of contrast medium was injected, after which the catheter was removed. Radiographic projections were taken and revealed displacement of the contrast medium to the caudal portion of the descending colon. Here, the contrast medium was obstructed and delineated the intussusceptum within the colon (Fig. 2), confirming colocolonic intussusception.

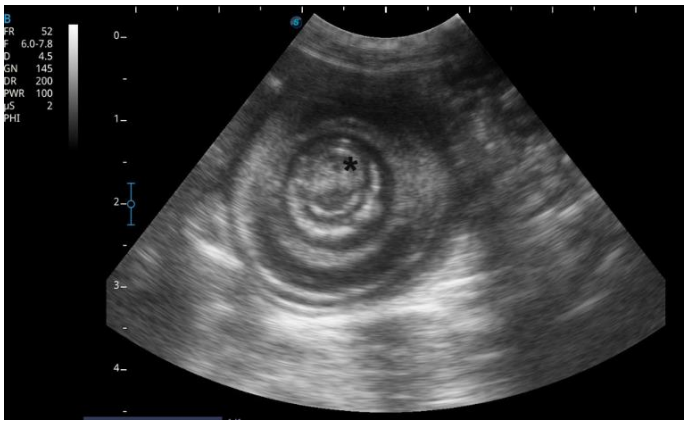

Figure 1: Abdominal ultrasonography. The transverse plane of a structure located in the cystocolic quadrant. Several layers of concentric hyperechoic and hypoechoic rings are observed with a hypoechoic area in the center (*)

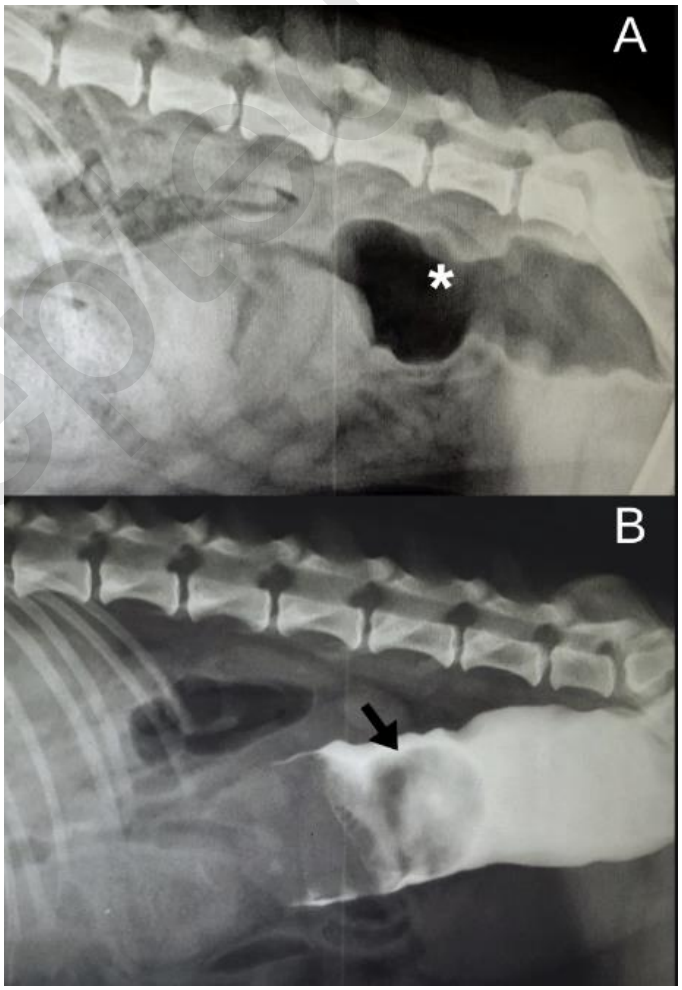

Figure 2: A: A simple lateral radiograph showing moderate colonic dilatation (*). B: A radiograph after administering contrast medium (barium sulfate) through an enema showing an intraluminal figure in the descending colon (arrow)

The patient was stabilized with intravenous administration of lactated ringer's injection USP (60 mL/kg/24 h), metronidazole (20 mg/kg/12 h; metronidazole solution for injection, 500 mg, Baxter® ARB7000), ampicillin-sulbactam (25 mg/kg/12 h;

Ampidelt® solution for injection, 1.5 g, Delta) and tramadol (2 mg/kg/12 h; tramadol solution for injection, 100 mg, Vitalis®). Caudal ventral midline celiotomy was performed. Upon approaching the abdominal cavity, distention and intussusception were evident in the descending colon. The intussusception exhibited adhesions in the serosal layer, ischemic foci, and a semi-hard consistency on palpation (Fig. 3). Additionally, the intussusception resisted manual reduction. The colon wall was incised, and a non-perforated mass was observed. Consequently, it was decided to resect the intussusception together with the invaginated tumor. The total resection was 10 cm, and as there was no evidence of other lesions, colocolonic end-to-end anastomosis was performed using an absorbable monofilament surgical suture (Monosyn® 3/0 suture) with a simple suture pattern. No leaks or bleeding were detected.

Inside the invagination, a cylindrical mass measuring 7.5 cm × 4 cm in diameter and occupying more than 80% of the intestinal lumen was found. The mass was well-adhered to the wall and showed no signs of ulceration (Fig. 4). The patient regained consciousness from anesthesia and remained alert. However, hours later, the patient became lethargic, with a weak pulse and a moderate increase in heart rate. These symptoms were interpreted as hypovolemic/cardiogenic shock. Despite fluid management, the patient did not respond, and rapid ultrasound examination revealed no evidence of free abdominal fluid. Unfortunately, the patient died before pharmacological interventions for the treatment of cardiogenic shock could be initiated.

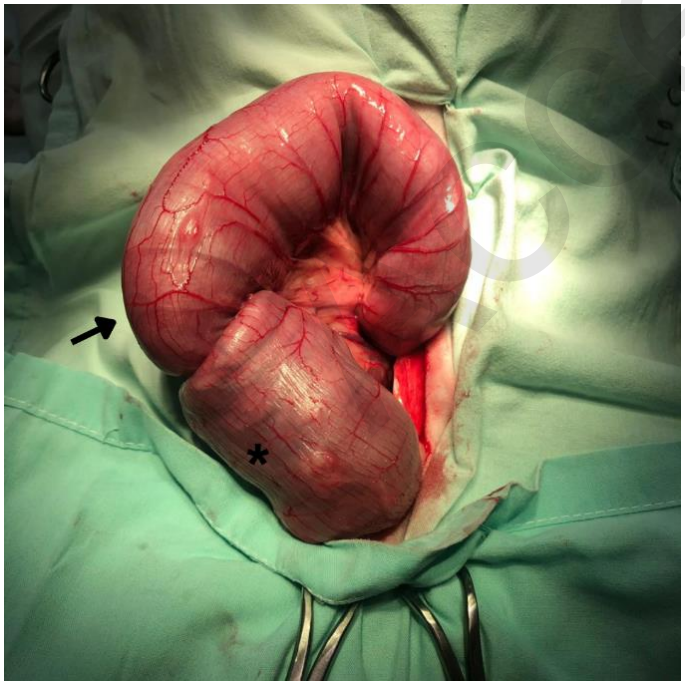

Figure 3: An intraoperative view revealing colocolic intussusception. The intussusceptum (arrow) is located in the last portion of the descending colon (*)

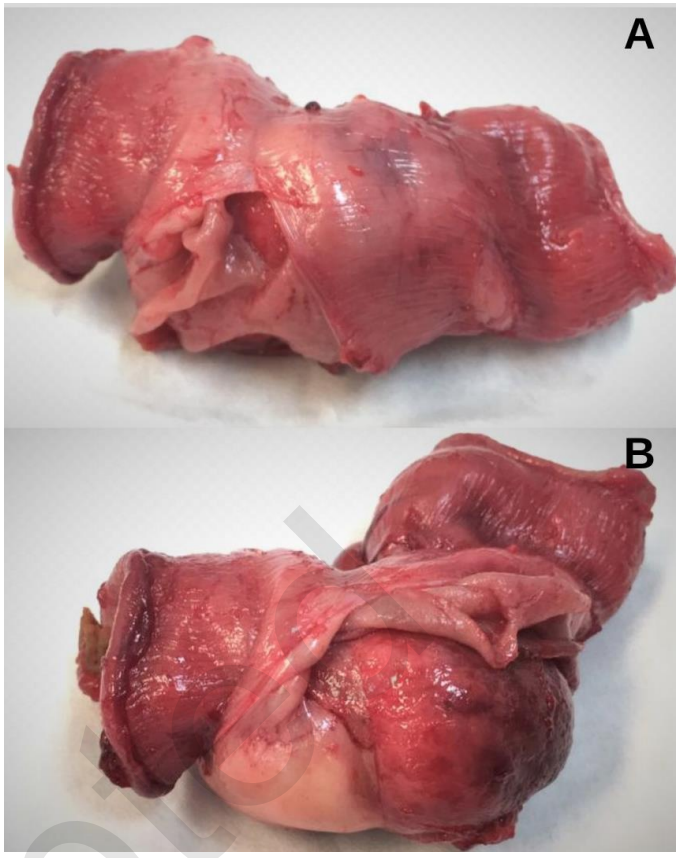

Figure 4: Post-surgical anatomical specimen showing a mural neoplasm invading more than 80% of the colon lumen. Images of the mass inside the colon (A) and after its exposure (B)

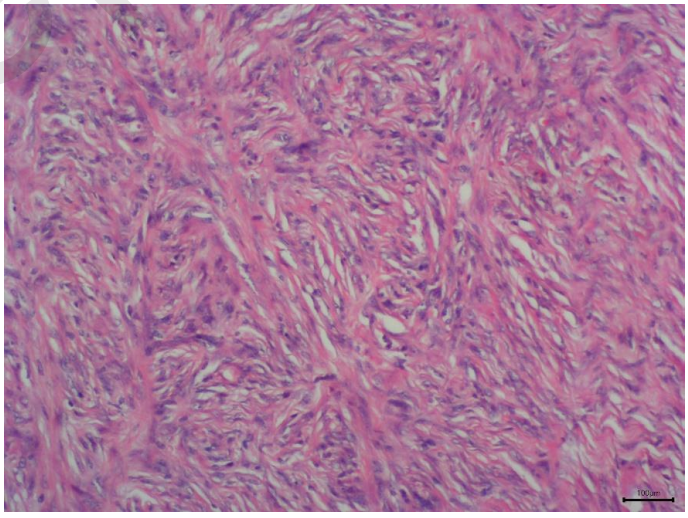

Figure 5: Histological evaluation. The representative image shows hematoxylin and eosin staining at 100× magnification. Cells form fascicles oriented in various directions. Spindle-shaped cells with elongated nuclei, finely vacuolated chromatin, and occasionally normal-sized nucleoli invading the muscle layers are present

The resected portion of the colon, along with the contained mass, was sent for histopathological examination. Histological evaluation revealed cells consistent with colonic tissue and evidence of spindle-shaped cells with elongated nuclei, finely vacuolated chromatin, and occasional normal-sized nucleoli

invading the muscle layers. No significant anisokaryosis or anisocytosis was observed. The mitotic count was low and even undetectable in some high-power fields (400×). Within the neoplastic process, foci of inflammatory reactions were present, composed of small lymphocytes, erythrocytes, and plasma cells (Fig. 5). These histopathological findings are consistent with mural leiomyosarcoma. The histological margins were infiltrated by neoplastic cells; however, vascular involvement was not detected.

Discussion

This is a case of colocolonic intussusception that was secondary to the presence of a mural neoplasm in the descending colon. Colocolonic intussusceptions are rare in both dogs and cats, and their association with intestinal tumors is even rarer. According to the review conducted by the authors, only eight cases of colocolonic intussusception in dogs have been documented to date. Of these, three were 3–8-month-old puppies with idiopathic processes suspected (14, 15). The remaining five cases were attributed to neoplasms: leiomyosarcoma (n=1), schwannoma (n=1), plasmacytoma (n=1), and lymphoma (n=2). The affected dogs belonged to large breeds, i.e., German Shepherds, Rottweilers, English Setters, and Great Danes. Intestinal intussusception caused by neoplasia generally occurs in 2-7 year old dogs; to date, only one case has been reported in a 10 month old puppy with lymphoma (4, 16–19). Information on colocolonic intussusception is limited to isolated reports with various causes and outcomes, making prognoses challenging. Of the documented cases, two lacked follow-ups, and six had follow-up periods of 24–47 months without disease recurrence. Our patient represents the sixth reported case of colocolonic intussusception associated with a neoplasm in dogs.

Imaging techniques are essential for both the precise diagnosis and therapeutic management of intussusception, with ultrasound being the main diagnostic tool (4, 11, 20). In our patient, intussusception was diagnosed by ultrasound; however, the presence of the intraluminal mass prevented adequate localization. In our case, computed tomography was not an option because it was too expensive for the pet owner. Therefore, rectal contrast radiography was used as an effective alternative, and the contrast medium was administered via enema to delineate the lumen of the intussusceptum and the walls of the intussuscipiens.

The correction of intussusception through exploratory celiotomy is the definitive therapeutic approach. As mentioned in the literature (2, 12, 21), a manual reduction should be attempted first, which may be sufficient if the patient does not present with serosal adhesions, vascular disorders, lesions, or neoplasms. However, in our case, the intussusception exhibited serosal adhesions and ischemic foci, making manual reduction difficult. As manual reduction was not viable, we opted to resect the intussusception along with the invaginated tumor, followed by an end-to-end anastomosis, which aligns with the management recommended in complex cases (22).

In this case, the prognosis of the intussusception was influenced by its association with a neoplasm. Overall, factors that determine the progression of intussusceptions include the anatomical location, time of development, degree of obstruction, and underlying cause (in this case, a malignant neoplasm). Intussusceptions associated with neoplasms generally have poor prognoses due to the tendency of intestinal tumors to exhibit malignant behavior (5, 17, 23).

A study of 31 cases of intussusception in various locations in dogs reported a survival rate of 80% when patients received adequate fluid therapy and timely surgical intervention (5, 6). In the current case, clinical signs of diarrhea, hyporexia, tenesmus, and weight loss began 5 months prior and can be attributed to both the development of the neoplasm and the subsequent intussusception. The tumoral mass likely triggered an increase in peristaltic movements, which facilitated the development of intussusception. Thus, the observed symptoms were related to both the presence of the mass and the complications arising from the intussusception. The presence of moderate malnutrition, mild hematologic alterations, and an obstruction suggesting bacterial translocation reflect that the patient was not in an adequate state of homeostasis. The patient experienced postoperative complications that led to death. These complications are attributed to the patient's homeostatic state rather than a surgical complication per se.

Finally, it is important to emphasise that rectal contrast radiography is a valuable diagnostic tool in colonic obstruction. Colonic intussusception is rare in dogs, with intestinal neoplasms being the main cause. There is the need to adapt the surgical approach according to the specific characteristics of each patient.

Given the limited number of reported cases and the lack of patient follow-ups, intussusception prognoses remain challenging, and thus documenting such cases is crucial.

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Kolokolična intususcepcija, povezana s črevesnim leiomiosarkomom pri psu

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Izvleček: Sedemletni kastrirani pudelj je bil sprejet zaradi kronične krvaveče driske. Lastnik je povedal, da so se simptomi začeli pred približno petimi meseci, vključno z drisko, hiporeksijo, tenezmi in izgubo telesne teže. Po opravljenem kliničnem pregledu, ultrazvočnem pregledu trebuha, navadni radiografiji in kontrastni rektalni radiografiji je bila postavljena diagnoza kolokolične intususcepcije, potrjene z eksplorativno laparotomijo. Postopek je pokazal, da je bila vzrok za zaporo in sprožitev intususcepcije masa, ki je zapirala več kot 80 odstotkov lumna črevesa. Histopatološka analiza je razkrila, da gre za črevesni leiomiosarkom. Ta primer je eden redkih objavljenih primerov intususcepcije debelega črevesa neoplastičnega izvora pri psu in poudarja uporabnost ultrazvoka trebuha in rektalne kontrastne radiografije za pravočasno diagnozo. Poleg tega so poudarjeni zapleti, povezani s terapevtskim pristopom.

Ključne besede: intususcepcija; črevesna obstrukcija; kontrastna radiografija; črevesne neoplazme; leiomiosarkom