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## Intussusception associated with a linear foreign body in a dog: A case report

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### ABSTRACT

Intussusception due to linear foreign body obstruction was described in this clinical report in a dog presented with a history of lethargy, anorexia, vomiting and abdominal pain. Diagnosis of intussusception was confirmed by contrast radiography. Manual reduction of jejuno-jejunal intussusception and removal of thread were done in laparotomy. No other complications were identified during the 4-month postoperative period in this case.

## 1. Introduction

Intussusception is defined as the invagination of an intestinal segment (intussusceptum) into the lumen of an adjacent segment (intussusciens)[1,2]. This condition can form under the direction of normal peristalsis from proximal to distal or vice versa[3,4]. Based on location, it may occur anywhere in the gastrointestinal tract; nevertheless, ileocolic intussusception has the highest prevalence[5,6]. Intussusception may be seen independently with an unknown etiology or in association with a number of abnormalities such as parasitism, viral enteritis, acute gastroenteritis, dietary indiscretion, intestinal masses, anesthesia, and abdominal surgery[7,8]. Moreover, it may be accompanied by gastrointestinal

foreign bodies and in particular the linear ones[6]. The severity and type of clinical signs can be determined by the location and duration of the intestinal obstruction[9]. The most common clinical signs and symptoms due to intussusception concurrent with linear foreign body are anorexia, lethargy, vomiting, absence of defecation or scant bloody diarrhea, a palpable mass and pain in the abdominal region. Electrolyte and acid-base imbalances are also present[6]. Plain abdominal radiographs may reveal obstruction; however, definitive diagnosis is only made by contrast radiography and ultrasonography[2,6]. Considering the linear foreign body as a causal agent, small gas bubbles and pleating may be seen in the intestines with diagnostic imaging[1,2]. Treatment should be aimed at the correction of hemodynamic and electrolyte disturbances, reduction of the intussusceptum from the intussusciens and elimination of secondary infections and the other complications. Enterotomy or intestinal resection and anastomosis are necessary in cases of concurrent linear foreign bodies[6]. Herein, we reported a case of intussusception that liner foreign body was considered as its underlying cause.

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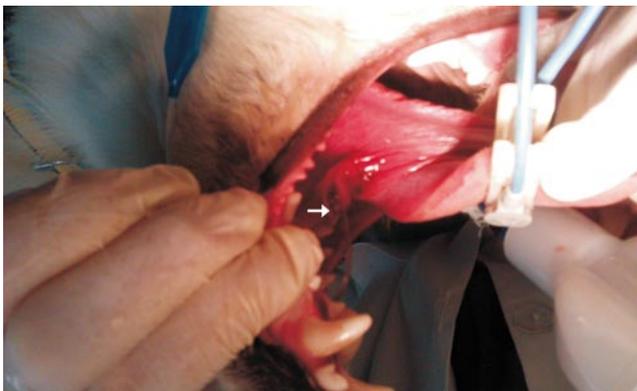
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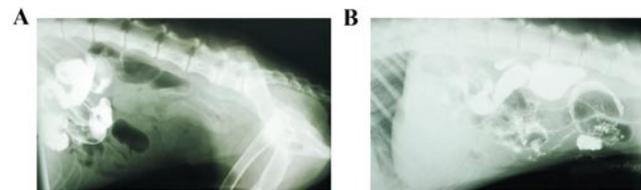
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## 2. Case history

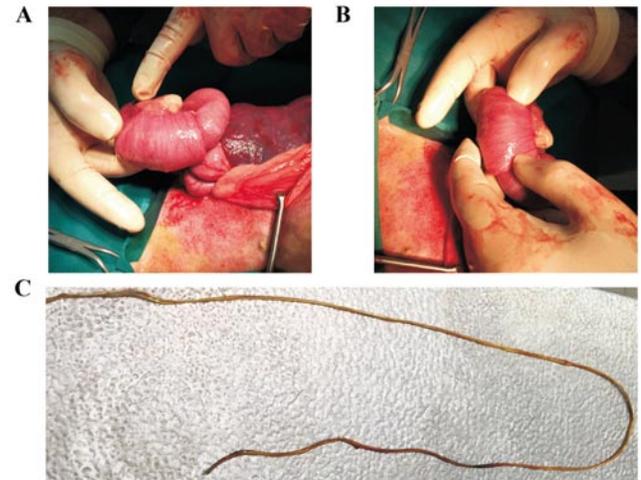
A 1-year-old, male, mongrel dog was referred to the Veterinary Medicine Teaching Hospital of the Shahid Bahonar University of Kerman with a history of lethargy, intermittent vomiting, reluctance to move, and diarrhea for several days. Clinical examinations revealed dehydration, tachypnea, poor capillary perfusion and abdominal pain. A thread lodged under the tongue was observed on oral examination (Figure 1). It was cut from its attachment to the base of the tongue. A cylindrical mass was palpated in the mid-abdominal region. According to the clinical signs, an intussusception due to a linear foreign body was suspected. Therefore, blood sample was collected for hematological evaluation which revealed leukocytosis with a shift to left. Plain radiography demonstrated an obstructive ileus. A ribbon of contrast material as a thin column was seen in the jejunum by contrast radiography. Moreover, coiled-spring shaped filling defect was present in the radiographs of the abdominal region (Figure 2). Therefore, the diagnosis of intussusception was confirmed. After correction of hemodynamic and electrolyte status, anesthesia was induced with 4 mg/kg of propofol intravenously and maintained with isoflurane. Then, the exploratory laparotomy was performed. One intussusception was detected in the jejunum, and manual reduction was attempted by gentle traction on the intussusceptum concurrent with pushing on the intussusciptens. It seemed that the intestinal wall was viable. Several enterotomies were carried out to remove the thread (Figure 3). Intestine, abdominal wall and skin were sutured according to the standard method. The postoperative recovery was uneventful. Ceftriaxone (30 mg/kg q12h, Dana Pharma Co., Iran) and metronidazole (20 mg/kg q12h, Alborzdarou, Iran) were administered for five days, and Tramadol (1 mg/kg, Alborzdarou, Iran,) injection for two days post-surgery. Water and food were given 12 and 24 h after surgery respectively. Recheck was done at 4 months later, and no other complications were identified at this time.



**Figure 1.** Photograph showing foreign body lodges under tongue (arrows).



**Figure 2.** Radiographs of the abdomen (A, B) of lateral radiographic view illustrate a ribbon of contrast material as a thin column and coiled-spring shaped filling defect in intestines.



**Figure 3.** Intra-operative appearance of a jejunum-jejunal intussusception at laparotomy (A); gentle traction on the intussusceptum concurrent with pushing on the intussusciptens for manual reduction (B); a thread as a causal agent of the intussusception (C).

## 3. Discussion

Telescoping of two adjacent segments of the gastrointestinal tract refers to the intussusception. Intestinal obstruction is a constant feature of this disease, which may precede or follow the predominant telescoping[2]. Intussusception can be detected at any age or breed of dogs; however, some breeds such as German Shepherds are more susceptible. This condition is infrequently seen in cats[6,10]. We describe here a case of intussusception in a 1-year-old, male mongrel dog.

Intussusception may be primary without any evidence of previous causes, or secondary to either preexisting factors. Rallis *et al.*[3] found intestinal intussusception in 29 of 220 dogs. In the mentioned study, acute enteritis or gastroenteritis was considered as the most likely predisposing factor. Linear foreign bodies, including string, thread, dental floss, nylon stockings, cloth, sacks, ribbon, plastic, and *etc.* are among the causes of intussusception[1]. The linear foreign object can be anchored in the pylorus (dogs and cats) or lodged under tongue (cats) and intussusception can occur following an increase in the intestinal peristalsis[2,8]. In this case, intussusception was associated to the linear foreign body, and a thread was diagnosed as a causal agent. Interestingly, the thread lodged under the tongue and propelled aborally by normal peristalsis. In one study performed in Cambridge, linear foreign bodies represented 33% and 16% of gastrointestinal obstructions in

cats and dogs respectively[11]. Compared with dogs, these objects are more commonly seen in cats[8].

Although the location and extent of intussusception can be different, the ileocolic region is the most affected site[3]. On the contrary, jejuno-jejunal intussusception was found as the most common type of feline gastrointestinal intussusception in another study[10]. In the present case, intussusception was centrally located on the jejunum.

In accordance with our findings, intussusception was previously described in different sites of gastrointestinal tract with various causes. Allman and Pastori[7] described a case of duodenogastric intussusception with a concurrent foreign body (golf ball) in a 3-year-old female boxer. Moreover, gastro-pyloro-duodenal obstruction associated with linear foreign body was found by Patil *et al.* in 2013[12]. Pietra *et al.*[13] also reported a case of intermittent gastroesophageal intussusception in a 4-year-old male pug. Pylorogastric intussusception was also detected by Applewhite *et al.* in a dog[14]. Lukanc *et al.* reported retrograde jejunal intussusception in a cat following treatment with metoclopramide and menbutone in a 1-year-old male Maine Coon cat[9].

Diagnosis of intussusception is based on the history, clinical signs and diagnostic imaging. The present case is similar to the other studies reporting depression, anorexia, dehydration, vomiting, intractability, intermittent diarrhea, abdominal pain and emaciation which are the main clinical symptoms of intussusception[1]. As we described here, ileus can be detected by plain radiography. In the current case, diagnosis of intussusception was confirmed by contrast radiography, which is in agreement with the description mentioned by other researchers[6,8]. Since definitive diagnosis was done by contrast radiography, ultrasonography was not performed for this case.

In this case, intussusception was associated with a linear foreign body; therefore, management of hemodynamic disturbance, reduction of intussusception and removal of thread were considered as the top priorities to treat the case. In comparison, Patsikas *et al.*[15] reported spontaneous reduction of intestinal intussusception in five young dogs in 2008. Reduction of intussusception via percutaneous manipulation was also described; however, intestinal viability was not evaluated by this method[6].

Recurrence, ileus, intestinal obstruction, intestinal strangulation, and peritonitis are possible complications following surgery[6,10,14,16]. Fortunately, no other complications were identified at 4 months post-surgery in the mentioned case.

### Conflict of interest statement

We declare that we have no conflict of interest.

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