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## Partial Obstruction of the Small Intestine by a Trichobezoar in a Dog

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### ABSTRACT

**Background:** Bezoars are accumulations of foreign material and indigestible organic substances in the gastrointestinal tract. There are different classifications for bezoars based on its primary composition. The trichobezoars are concretions composed of hair or hair-like fibers and are often associated with trichophagia in humans. The obstruction by a trichobezoar occurring in the stomach, with its tail extending to or beyond the ileocecal valve or jejunum is rare in humans. This condition is called Rapunzel Syndrome. Obstruction by trichobezoar has been reported few times in cats and dogs. This paper aims to describe an uncommon clinical presentation of a young dog with partial obstruction of the small intestine by a trichobezoar.

**Case:** A 2-year-old, 5.5 kg, intact male poodle was referred due to kyphosis and a history of pain in the thoracolumbar region for approximately 10 months. Physical examination revealed that the dog walked without any difficulty or ataxia, but had pain on palpation of the lumbar vertebral column. Thoracolumbar spine radiographies failed to show any sign of disease. Conservative therapy for intervertebral disk disease did not shown any improvement. In addition, the dog showed signs of pain on abdominal palpation and 18-month history of hyporexia, apathy and dark colored diarrhea. Abdominal ultrasonography detected a 5-cm intraluminal intestinal structure at the ileo-jejunal junction, forming an acoustic shadow, with focal thickening of the intestinal wall. Exploratory celiotomy followed by jejunal enterotomy revealed a trichobezoar consisting of undigested hair and textile fibers partially obstructing that segment. The intestinal wall in that region formed a sacculation, so a 5 cm jejunal resection with end-to-end anastomosis was performed. Histopathology of this segment did not show any neoplastic formation. After 20 days of surgical procedure, no clinical sign was reported by the owner, the animal return to normal appetite and back pain was not present. Ultrasonography confirmed normal intestinal flow. At the last follow-up 180 days after surgery, the dog was in excellent condition with no obvious clinical sign related to the disease or surgical procedure.

**Discussion:** The mild chronic signs presented by the animal lead to an initial inaccurate diagnosis, since abdominal pain may seem like a back pain. The ultrasonography was useful to identify the presence of an initially unknow foreign body. However, definitive diagnosis was only possible after exploratory celiotomy, since trichophagia was not reported by the owner. The trichobezoar found in this case cannot be classified as Rapunzel Syndrome, since it is not a gastric trichobezoar with a tail extending up to the small intestine. The occurrence of trichobezoar is usually associated with overgrooming, tumor or end-to-end anastomosis, but none of this conditions was present. The presence of omental adhesion on jejunum wall is suggestive of previous damage, probably caused due to long-term permanence of the trichobezoar in this segment. The intestinal perforation caused by trichobezoar is one of the most common life-threatening complication observed in human patients. A sacculation observed during surgery may have contributed to its formation. The case presented may be considered extremely uncommon, due to the partial obstruction of the intestinal lumen and long-term evolution.

**Keywords:** surgery, ultrasound, jejunum, obstruction.

## INTRODUCTION

Bezoars are considered concretions of foreign material or indigestible organic substances that accumulate in the gastrointestinal tract [4,12,15]. The bezoar may be classified based on the composition of the primary constituent as either trichobezoar, phytobezoar, lactobezoar, pharmacobezoar or miscellaneous [12,14,15].

The trichobezoars are composed of hair or hair-like fibers [4,12,15]. In human patients, the trichobezoar is related to hair accumulation mainly in the stomach, and Rapunzel syndrome is related to hair accumulation extending into the small intestine [4,5,14,15]. Both diseases occur in humans, in general, with a history of trichotillomania or trichophagia [5,10,14]. The Rapunzel syndrome is considered rare in humans while the intestinal obstruction may occur when the gastric trichobezoar tail extends to or beyond the ileocecal valve or at least to the jejunum [10,12,14].

A few reports have described intestinal obstruction by a trichobezoar in cats [1] and dogs [2,9,11]. Therefore, the purpose of this report is to describe an uncommon clinical presentation of a dog with partial obstruction of the small intestine by a trichobezoar.

## CASE

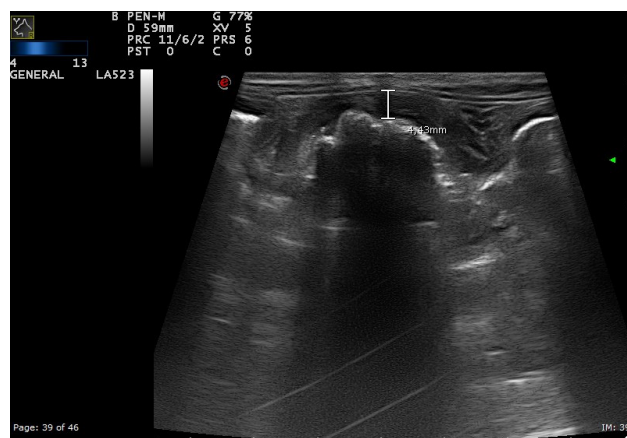
A 2-year-old, 5.5 kg intact male poodle was referred due to a history of pain in the thoracolumbar region and kyphosis for approximately 10 months. Because survey radiographs of the thoracolumbar spine had shown no signs of intervertebral disk disease, the dog had been treated conservatively without any improvement for 10 days. Strict cage rest and therapy with tramadol hydrochloride, meloxicam, dipyrone, ranitidine hydrochloride, and B complex had been prescribed. The owner then reported that for approximately 18 months the dog had been experiencing a loss of appetite, apathy, and recurrent episodes of dark-colored foul-smelling diarrhea. Overgrooming was not observed.

Physical examination revealed that the dog walked without any difficulty or ataxia, but had pain on palpation of the vertebral column especially in the lumbar region. Spinal reflexes and proprioception were normal. On abdominal palpation, the dog showed signs of pain, but the presence of a mass was not detected. Alopecia or other skin disorder was not detected. Laboratory tests revealed anemia (Hematocrit 27%, Hemoglobin 7.5 g/dL, Red Blood Cells 4.44 million cells/mm<sup>3</sup>), hypoproteinemia (5 g/dL), hypoalbuminemia (2.5 g/dL), and hypoglobulinemia (2.5 g/dL).

Abdominal ultrasonography showed focal intestinal wall thickening (0.75 mm) at the transition between the jejunum and the ileum (5 cm length), with loss of layer stratification, and the presence of an irregular hyperechoic content with strong acoustic shadow. This intestine segment was distended. Mesenteric and jejunal lymph nodes showed enlargement. The diagnosis was partial obstruction of the jejunum attributable to a foreign body. Another proposed differential diagnosis was intestinal neoplasm and severe inflammatory bowel disease.

The dog was pre-medicated with morphine (0.5 mg/kg, IM) and meloxicam (0.2 mg/kg, IV). General anesthesia was induced with a combination of propofol (4 mg/kg) and ketamine (1 mg/kg) administered intravenously, and maintained with isoflurane in 100% oxygen via an endotracheal tube. Intraoperative analgesia was performed with infusion of fentanyl (10 mcg/kg/h), lidocaine (0.5 mg/kg/h) and ketamine (1.2 mg/kg/h), plus intraperitoneal administration of bupivacaine (2 mg/kg). Ceftriaxone was administered intravenously (30 mg/kg) at the time of induction of anesthesia.

Exploratory celiotomy via a midline approach revealed a dilated jejunal segment of approximately 5 cm with small areas of serosal hyperemia and larger areas of omental adhesions (Figure 2). An unattached firm intraluminal structure was palpated in the jejunum. An antimesenteric longitudinal enterotomy was performed and a trichobezoar consisting of undigested hair and textile fibers (5 cm x 2.5 cm x 2 cm) was removed (Figure 3). Due to the presence of intestinal sacculaton



**Figure 1.** Intestinal Ultrasound image of a dog. Abdominal ultrasonography demonstrated an irregular hyperechoic interface with strong acoustic shadowing of the 0.44 cm foreign body, in this segment of small bowel, was wall-thickening hypoechogenic, without preservation of layers. Enlargement of mesenteric and jejunal lymph nodes was detected.

after trichobezoar removal, a 5 cm jejunal resection with end-to-end anastomosis was performed with 4-0 nylon<sup>1</sup> using a simple interrupted pattern. After abdomen lavage with warm saline, the anastomotic site was covered with omentum. The abdomen was closed routinely.

Histopathological analysis (Hematoxylin & Eosin Staining) of the removed intestinal fragment showed hyperplasia of the mucosal layer, and infiltration of inflammatory cells, mainly mononuclear cells.



**Figure 2.** Intra-operative view of small bowel dilated segment with omental adherence.



**Figure 2.** A- Intra-operative view after anti-mesenteric enterotomy, visualization of a foreign body composed of non-digested fibers and textile; B- Trychobezoar appearance after removal from the intestinal segment in which it had been housed.

Necrosis and cell debris were also present. The diagnosis was mucosal hyperplasia and chronic inflammation.

Cephalexin<sup>2</sup> (30 mg/kg, q12 h), metronidazole<sup>3</sup> (25 mg/kg, q12 h), meloxicam<sup>4</sup> (0.1 mg/kg, q24 h), dipyrrone<sup>5</sup> (25 mg/kg, q 8h), and ranitidine hydrochloride<sup>6</sup> (2.2 mg/kg, q12 h), orally for 5 days were prescribed. Feeding was started 24 h after surgery, and gradually liquids, bland diet and normal diet were introduced over 21 days. Ten days after surgery, the dog showed good recovery with no signs of pain on abdominal or vertebral column palpation. According to the owner, episodes of diarrhea or vomiting were not observed. An abdominal ultrasound performed 20 days postoperatively demonstrated intestinal peristalsis and no sign of obstruction or free liquid.

At the last follow-up 180 days after surgery, the dog was in excellent condition with no obvious clinical sign related to the disease or surgical procedure.

#### DISCUSSION

Clinical signs of weight loss, poor appetite, intermittent vomiting, and reduced quantities of feces have been observed in dogs that developed intestinal trichobezoar [2,11]. The initial history of kyphosis and pain in the thoracolumbar region contributed to make an inappropriate diagnostic in the present case. Sometimes abdominal pain may seem like back pain, an effect called referred pain [8,17]. However, the obtainment of an accurate anamnesis helped to define the diagnostic process given that the owner reported a loss of appetite, apathy, and recurrent episodes of diarrhea. The diarrhea in cases of partial obstruction of the intestine is associated with osmotic effects of unabsorbed substances and the secretory action of enterocytes [13].

Ultrasonography and computed tomography (CT) are considered reliable methods for diagnosing gastrointestinal bezoars in humans, but endoscopy is the method of choice for gastric bezoars [4,15]. In the present study, ultrasound was useful for identifying the presence of a foreign body obstructing the small bowel. Sonographic features of the trichobezoar in the small intestine in humans has been an arc-like echo casting a clear posterior acoustic shadow within the dilated lumen [12]. In a study of 11 dogs and five cats with clinical signs of gastrointestinal obstruction, the foreign bodies were identified by ultrasound due to distal acoustic shadowing and variable degrees of surface reflection [18]. However, the definitive diagnosis in the

present study was made during exploratory laparotomy, similar to other case reports of a gastrointestinal trichobezoar in dogs and cats that used radiography or ultrasound in the abdominal evaluation [1,2,7,11].

The trichobezoar in the present report was located exclusively in the small intestine, as observed in two other reports on dogs [2,11]. Thus, these cases cannot be classified as Rapunzel syndrome, since it is not a gastric trichobezoar with a tail extending up to the small intestine [10]. On the other hand, a report described a trichobezoar located in the stomach and duodenum of a 12-year-old female Briard dog [7].

The development of trichobezoars in dogs have been associated with overgrooming [7], stricture due to tumor [11], and as a complication of circular end-to-end anastomosis stapling [2]. In the present report, the dog did not have alopecia or any other skin disorder at the moment of patient consultation, and no history of overgrooming. However, the area of intestinal sacculatation observed during surgery may have contributed to trichobezoar formation.

Intestinal perforation caused by a trichobezoar is one of the complications reported in human patients

[3,16]. The presence of areas of omental adhesions in the jejunum in the present report is suggestive of previous damage to the intestinal wall, probably due to longer permanence of the trichobezoar in this area. A study showed that 63% of the obstruction of the gastrointestinal foreign bodies in dogs occur in the jejunum [6].

In summary, although intestinal obstruction secondary to ingestion of a foreign body is frequently observed in dogs, the intraluminal obstruction caused by a trichobezoar is considered uncommon. The case presented herein may be considered extremely uncommon, due to a partial obstruction of the intestinal lumen and long-term evolution.

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