

CASOS CLÍNICOS



Adenocarcinoma in the jejunum of a dog: a case report



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Summary

A 10-year-old male Pit-bull was attended for presenting sporadic vomiting and occasional diarrhea. In the last 48 hours the patient had presented multiple vomiting and no oral food was tolerated. During the physical examination an abdominal cranial mass was palpated. Survey radiographs of the abdomen and contrast study with barium sulfate suspension showed an accumulation of a radiopaque material causing an intestinal obstruction pattern. During the surgical exploration, the foreign material was extracted from the jejunum using an enterotomy, but an intramural mass was detected occluding the lumen at this point. A complete bowel resection was performed in the intestinal loop affected by the tumor and an end-to-end anastomosis was performed. The histologic examinations revealed an adenocarcinoma involving the entire intestinal wall. The patient recovered from the surgical procedure and no signs of metastasis have been proved nine months after the surgery.

Key words: enteroanastomosis, intestine, neoplasia, obstruction

Introduction

Intestinal obstructions are a common condition seen in small animal practice, but rarely caused by an intramural small bowel neoplasm. As in human beings, primary tumors of the small intestine are infrequent in dogs, although the small intestine constitutes almost 90% of the mucosal surface of the alimentary tract (2,7,9). Adenocarcinoma is the most common neoplasm in the small intestine of dogs followed by lymphosarcoma, and smooth muscle tumors (4). In dogs, carcinomas of the large intestine are more common than those of the small intestine (2,4).

In the next report, the clinical characteristics of a male dog suffering the symptoms caused by an

adenocarcinoma in the jejunum that involved the greater part of the luminal circumference are presented. It is described the surgical resection of the bowel segment, the pathologic characteristics of the tumor and the complete recuperation of the patient after the surgical procedure.

Clinical case

Anamnesis

A 10-year-old Pit Bull Terrier was presented with a 2-month weight loss history, intermittent vomiting and sporadic diarrhea. The dog was vomiting 3 times a

week, unrelated to eating and characterized by large volumes of odiferous material. During this 2-month period, the dog's weight had decreased from 35 to 28 kg although the dog had good appetite and history of pica. 48 hours prior to the examination, the dog had vomited continuously and didn't tolerate any oral food.

Physical examination and laboratory findings

The dog presented a normal attitude during the clinical examination and a normal body condition (previously considered obese). No fever was present, but severe periodontal disease was detected. A large abdominal mass was palpated in the cranial abdomen, and excess of fluid and gas were palpated in some areas of the intestines. The palpation of the mass caused evident discomfort in the patient. The auscultation of the abdomen revealed excessive noises related to increased peristaltic movements. Blood was collected for a CBC and chemistry panel. Hematological and biochemical parameters were all within established reference ranges (see Table 1, Table 2).

Tabla 1. Hematological parameters.

Parameters	Results	Reference interval
Hct %	37	37 - 55
Hgb g/dL	12.8	12 - 18
RBCx 10 ³ /mm ³	5.9	5.5 - 8.5
WBCx 10 ³ /mm ³	12,0	6 - 11.5
NE %	75	60 - 77
LY %	24	12 - 30
EO %	1	0-5
Plt x 10 ³ /mm ³	491	120 - 500

Tabla 2. Serum biochemical profile.

Parameters	Results	Reference interval
Creatinine mg/dL	1.2	0.5 - 1.6
Urea mg/dL	22	8.8 - 25.9
ALT U/l	46	8.2 - 57.3
FA U/l	55	10.6 - 100.7

Tabla 3. Antibiotic protocol the first 72 hours after the surgical procedure.

Antibiotic	Posology
Cefalotine	20 mg/kg TID IV
Ornidazol	15 mg/kg BID IV
Gentamicin	2 mg/kg BID IV

Radiographic interpretation

Lateral (see Figure 1) and ventrodorsal abdominal radiographs were obtained and a barium sulfate contrast study was performed. The abdominal radiographs clearly showed an accumulation of a radio opaque foreign material in the small intestine (between 10 and 15 cm in diameter) in the cranial region of the abdomen and a great dilatation of the intestinal loop at this point. These findings are called the gravelling sign and are due to the accumulation of indigestible material anterior to the obstruction. Small intestine showed excessive distension due to accumulation of gas (see Figure 1). In the contrast study the barium sulfate reached the site of the suspected obstruction about one hour after oral administration and showed very little contrast medium had passed this point in the next four hours (see Figure 2).

Surgical treatment and evolution

A standard midline laparotomy procedure, using isoflurane as the anesthetic agent was performed in order to explore the suspected intestinal obstruction. A segment of the jejunum presented a severe distended loop in the site of the obstruction and also a large segment anterior to this point showed distension (see Figure 3). The aspect of the mucosa was edematized with no signs of wall necrosis. An initial enterotomy was performed and a large amount of foreign material including stones and grass, was extracted from the site of the obstruction. Once the material was completely retired, a circular mass inside the lumen of the intestinal segment was palpated. The suspicion of a tumoral mass followed to a bowel resection of a 15 cm segment. And end-to-end anastomosis was performed. Since the mass was suspected as tumoral, an exploration of the abdominal organs was done before the abdominal closure, showing no macroscopic abnormal findings.

The patient recovered normally from the anesthesia and any oral food or water was restricted during 36 hours. After this period, water was given and well-tolerated, so liquated food was allowed 12 hours later. In the next 5 days the patient was gradually introduced to solid food.

During the first 72 hours after the surgical procedure the dog was maintained to the protocol showed in Table 3. After this time, 1 gram of cefalexin (40 mg/kg) BID PO and 500 miligrams of Metronidazol (20 mg/kg) BID

PO, were maintained during seven more days. The patient finished its recuperation at home without any complications.

Macroscopic and Histological findings

The tumoral mass was polypoid and ulcerative, as a bulky mass with an elevated surface centrally and

occluding the greater part of the luminal circumference (see Figure 4). Microscopically, the intestinal mucosa was ulcerated and lined by fibrin and neutrophils. The submucosa was invaded by a well-differentiated adenocarcinoma that secreted variable amounts of mucina. The tumor infiltrated all the layers of the bowel and extended into the serosa (see Figure 5).



Figure 1. Lateral survey radiograph showing and accumulation of radiopaque material in the small bowel and intestinal loops distended with gas.



Figure 2. Lateral radiography of a barium sulfate contrast study 4 hours after oral administration showing that small amounts of barium passed the obstruction site.



Figure 3. Severe distention in a segment of the jejunum in the site of the obstruction and anterior to this point.



Figure 4. Macroscopic appearance of the tumor, showing a growing ulcerated polypoid mass.

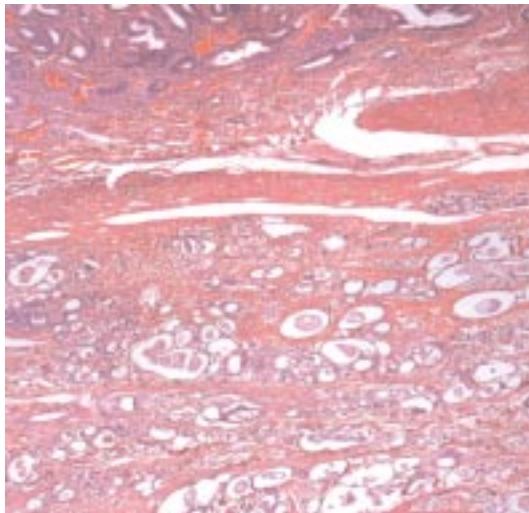


Figure 5. Microscopic appearance of the tumor. Note normal mucosa (top) and the tumor on the lower half. There is an infiltrative growth pattern of small glands between small muscle fascicles.

Discussion

Clinical signs associated with small intestinal carcinomas may include chronic vomiting, diarrhea, weight loss, and anorexia (4,5,8). This patient presented a history of recurrent vomiting and occasional diarrhea, which resulted from the partial obstruction caused by the growing mass in the jejunum. Finally, in the last 48 hours, the patient suffered a complete obstruction due to the chronic ingestion of indigestible material that could not pass through the reduced intestinal lumen. Diarrhea was present occasionally in this case and is common in animals with partial obstruction of the small bowel, usually due to bacterial overgrowth and deranged intestinal motility (3).

Plain abdominal radiographs demonstrated in this patient the presence of the palpated abdominal mass and an intestinal obstructive pattern (see Figure 1). When the adenocarcinoma results in a concentric narrowing of the intestinal lumen, contrast radiography in the gastrointestinal tract can highlight areas of stenosis and aid in the diagnosis of the condition and planning of surgery (8). When the obstruction is still partial, the intestinal radiographs do not show a markedly dilated bowel loops but occasionally will be revealed by the "graveling sign". The graveling sign refers to the accumulation of indigestible material anterior to the partial obstruction (3). In this case, was obvious the accumulation of the radiopaque not

digested material and the excessive accumulation of gas resulting from the complete obstruction.

Laboratory findings in this patient were normal. In animals with small intestinal neoplasia the laboratory parameters are usually unspecific. Hematological parameters in affected dogs can show a degenerative left shift in cases of obstructions and severely affected by the inflammatory or the toxemic process. Anemia and/or melena may be observed if any blood loss occurs (3,4). Serum chemistry is usually normal in patients without complete obstructions. Electrolyte and blood gas estimations are a valuable aid in selecting the appropriate fluid therapy in obstructed animals (3,4).

Although ultrasonography has been proved to be an important tool in the diagnosis of an intestinal neoplasm and endoscopy occasionally helps to identify masses in the lumen of the proximal duodenum or distal ileum (1,6), the definitive diagnosis of a small bowel intramural neoplasm requires an exploratory laparotomy. Besides this, it allows a complete visualization of the primary tumor and the explorations of the entire abdominal cavity to locate metastasis. In the present case, no macroscopic evidence of metastasis was detected in any organ of the abdominal cavity, and no samples of the mesenteric lymph nodes were obtained. However, biopsy of the lymph nodes may yield additional prognostic information (8). Other sites of metastasis besides the lymph nodes have been reported, including the liver, lungs, peritoneum, prostate, testicles and rarer in the lumbar spinal cord and skin. (5)

Histopathological examination confirmed the presence of a well-differentiated adenocarcinoma. Adenocarcinoma of the small intestine tends to be annular in the dog (4). The gross appearance of adenocarcinomas is variable. They may appear as expansive, plaque-like, ulcerated masses; they may invade adjacent bowel wall producing an annular or fusiform obstruction; they may cause discrete ulcers or polypoid growths; or may widely infiltrate the submucosa causing diffuse thickening without causing obstruction (4). In the present case, the mass caused an ulcerated polypoid growth that caused a partial obstruction of the small intestine segment.

It was decided that the patient will not be treated with chemotherapeutic agents; in general, no benefic effects are seen in dogs treated with chemotherapy (2). The prognosis is guarded but long-term survival is common if patients with well-differentiated

adenocarcinomas survive the immediate postoperative period (as in this case) (4). No signs of metastasis or other diseases have been found nine months after the surgical procedure and the Pit-bull dog regained weight and actually eats a normal commercial food.

Conclusions

The diagnosis of small bowel obstruction in dogs is based on a comprehensive approach that includes

clinical background, patient history, and results of physical examination and laboratory tests. Conventional radiography and barium sulfate contrast studies remain the initial methods of imaging in patients with suspected small bowel obstruction. The definitive diagnosis of a small bowel intramural neoplasm causing the intestinal obstruction often requires an exploratory laparotomy in veterinary patients. Surgery may provide unique information about tumor extension and local or distant metastasis.

Resumen

Adenocarcinoma en el yeyuno de un perro: reporte de un caso

Un perro macho de raza Pitbull de 10 años de edad fue atendido por presentar vómito esporádico en los últimos 2 meses y diarrea ocasional. En las últimas 48 horas el paciente había presentado múltiples vómitos sin tolerar alimentación oral. Al examen clínico se palpó una masa abdominal. Las radiografías abdominales simples y contrastadas con sulfato de bario mostraron un acúmulo de material radiopaco causando un patrón característico de obstrucción intestinal. En la exploración quirúrgica el material causante de la obstrucción que se encontraba en el yeyuno fue retirado mediante enterotomía pero se detectó una masa intraluminal intestinal, por lo que se extrajo el segmento completo y se realizó una enteroanastomosis termino-terminal. El análisis histológico de la masa extraída evidenció un adenocarcinoma envolviendo todo el espesor de la pared intestinal. El paciente se recuperó normalmente y hasta los nueve meses posteriores a la cirugía, no ha aparecido ningún signo de metástasis.

Palabras clave: *enteroanastomosis, intestino, neoplasia, obstrucción.*

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